



U.S. DEPARTMENT OF ENERGY  
**SOLAR DECATHLON**

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**U.S. DEPARTMENT OF ENERGY SOLAR DECATHLON 2015 Project Manual**

**WVU-UTV SOLAR HOUSE**

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## Rules Compliance Checklist

RULE	RULE DESCRIPTION	LOCATION DESCRIPTION	LOCATION
Rule 4-2	Construction Equipment	Drawing(s) showing the assembly and disassembly sequences and the movement of heavy machinery on the competition site	O-902-O-907
Rule 4-2	Construction Equipment	Specifications for heavy machinery	01-51-13
Rule 4-3	Ground Penetration	Drawing(s) showing the locations and depths of all ground penetrations on the competition site	STRUCTURAL CALCULATIONS
	Impact within the Solar	Drawing(s) showing the location, contact area, and bearing pressure of every component resting directly	
Rule 4-4	Impact on the Competition Site	Low-impact footings shall be used to support all house and site components	S-102
Rule 4-5	Generators	Specifications for generators (including sound rating)	01-51-13
Rule 4-6	Spill Containment	Drawing(s) showing the locations of all equipment, containers, and pipes that will contain liquids at any point during the event	H-101
Rule 4-6	Spill Containment	Specifications for all equipment, containers, and pipes that will contain fluids at any point during the event	H-101
Rule 4-7	Lot Conditions	Calculations showing that the structural design remains compliant even if 18 in. (45.7 cm) of vertical elevation change exists	STRUCTURAL CALCULATIONS
Rule 4-7	Lot Conditions	Drawing(s) showing shimming methods and materials to be used if 18 in. (45.7 cm) of vertical elevation change exists on the lot	STRUCTURAL CALCULATIONS
Rule 5-2	Solar Envelope Dimensions	Drawing(s) showing the location of all house and site components relative to the solar envelope	G-201, G-202
Rule 5-2	Solar Envelope Dimensions	List of solar envelope exemption requests accompanied by justifications and drawing references	N/A



Rule 6-2	Finished Square Footage	Drawing(s) showing all information needed by the rules officials to measure the finished square footage electronically	G-101
Rule 6-2	Finished Square Footage	Drawing(s) showing all movable components that may increase the finished square footage if operated during contest week	N/A
Rule 6-3	Entrance and Exit Routes	Drawing(s) showing the accessible public tour route	G-103
Rule 7-1	Placement	Drawing(s) showing the location of all vegetation and, if applicable, the movement of vegetation designed as part of an integrated mobile system	L-601
Rule 7-2	Watering Restrictions	Drawing(s) showing the layout and operation of greywater irrigation systems	P-103
Rule 8-1	PV Technology Limitations	Specifications for photovoltaic components	26-31-00
Rule 8-3	Batteries	Drawing(s) showing the location(s) and quantity of all primary and secondary batteries and stand-alone, PV-powered devices	N/A
Rule 8-3	Batteries	Specifications for all primary and secondary batteries and stand-alone, PV-powered devices	N/A
Rule 8-4	Desiccant Systems	Drawing(s) describing the operation of the desiccant system	M-101
Rule 8-4	Desiccant Systems	Specifications for desiccant system components	Division 23
Rule 8-5	Village Grid	Completed interconnection application form	Interconnection Application Section above.
Rule 8-5	Village Grid	Drawing(s) showing the locations of the photovoltaics, inverter(s), terminal box, meter housing, service equipment, and grounding means	E-102, E - 104
Rule 8-5	Village Grid	Specifications for the photovoltaics, inverter(s), terminal box, meter housing, service equipment, and grounding means	26-31-00 26-05-26
Rule 8-5	Village Grid	One-line electrical diagram	E - 601
Rule 8-5	Village Grid	Calculation of service/feeder net computed load per Rule 8-5 Village Grid	
Rule 8-5	Village Grid	Rule 9-1 Container Locations	



Rule 9-1	Container Locations	Drawing(s) demonstrating that the primary supply water tank(s) is fully shaded from direct solar radiation between 9 a.m. and 5 p.m. PDT or between 8 a.m. and 4 p.m. solar time on October 1	P-101
Rule 9-2	Team-Provided Liquids	Quantity, specifications, and delivery date(s) of all team-provided liquids for irrigation, thermal mass, hydronic system pressure testing, and thermodynamic system operation	Detailed Water Budget
Rule 9-3	Greywater Reuse	Drawing(s) showing the layout and operation of greywater reuse systems	P-103
Rule 9-4	Rainwater Collection	Drawing(s) showing the layout and operation of rainwater collection systems	N/A
Rule 9-6	Thermal Mass	Drawing(s) showing the locations of liquid-based thermal mass systems	N/A
Rule 9-6	Thermal Mass	Specifications for components of liquid-based thermal mass systems	N/A
Rule 9-7	Greywater Heat Recovery	Drawing(s) showing the layout and operation of greywater heat recovery systems	N/A
Rule 9-8	Water Delivery	Drawing(s) showing the complete sequence of water delivery and distribution events	P-102
Rule 9-8	Water Delivery	Specifications for the containers to which water will be delivered	P-102
Rule 9-9	Water Removal	Drawing(s) showing the complete sequence of water consolidation and removal events	P-103
Rule 9-9	Water Removal	Specifications for the containers from which water will be removed	P-103
Rule 11-4	Public Exhibit	Interior and exterior plans showing entire accessible tour route	G-103



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## Structural Calculations

Please see Appendix



## Detailed Water Budget

Function	Total amount of Gallons used per function	Events in which water is consumed	Notes
Hot Water Draws	249	8. Homelife	15 Gallon draw intervals 16 times during the week
Water Vaporization	1	7. Appliances	About a gallon as per required by rules
Dishwater	20	7. Appliances	About 4 gallons per load at five loads
Dinner Party	20	8. Home Life	Two dinner parties using around 10 gallons each
Clothes Washer	120	7. Appliances	Around 15 Gallons per full load
Vegetation	50	2. Market Appeal	Water used to initially water plants
Fire Protection	350	3. Engineering	System filled
Testing	50	3. Engineering	Running of water through lines to remove air
Initial systems Fill	960	3. Engineering	This total is deducted from all appliances, lines etc.
Aesthetic Purpose	0	NA	No water features are used without function
Radiant Flooring	0	NA	NA
Safety Factor	100	3. Engineering	Estimate
<b>WATER REQUIRED</b>	<b>GALLONS:</b>	<b>960</b>	

### Summary of Unlisted Electrical Components



## Summary of Unlisted Electrical Components

All electrical components carry an approved testing agency's listing per section 6-7 of the SD2015 Building Code.

## Summary of Reconfigurable Features

STILE is a sustainable house designed for the combination of various aesthetic aspects from both Appalachian and Italian culture into one harmonious residence.

The layout of the space correlates to the typical West Virginia house with a large living area, an even bigger outdoor area, and a strong connection between interior and exterior spaces, seeking harmony with nature. To emphasize this connection, the Eastern and Western walls are large sliding-glass doors that open to allow residents to enjoy nice weather inside and out.

### Characteristics:

- Size: 6'x7.9'
- Extra clear glazed
- Triple glazed
- Argon fill
- Aluminum frame

### Details:

See drawing sheets A-501, A-501, E-11.

## Interconnection Application Form

Team Name and Lot Number



**PV Systems**

Module Manufacturer	Short Description of Array	DC Rating of Array (sum of the DC ratings)
Solar World	36 Solar World Sunmodule SW 285 mono panels	10.26KW

Total DC power of all arrays is 10.26 kW

**Inverter**

Inverter Manufacturer	Model Number	Max AC Power Output	Max Continuous Output Current	Quantity
Solar Edge	SE10000US	10950 @ 240V	42 @ 240V	1

Total Nominal AC power of all inverters is 10.00 kW

**REQUIRED INFORMATION**

The following information must be included in the project manual or construction documents. If located in the construction documents, list the drawing locations in this section of the project manual. (Example: B3/E-

201)

	Location
One-Line Electrical Schematic	E 601
Calculations of service/feeder net computed load and neutral load (NEC 220)	E-602 26-40-00
Plan view of the lot showing the house, decks, ramps, tour paths, the service point, and the distribution panel or load center	





## Load Calculations

Load Calculations		
Load Description		VA
lighting 990 sq ft * 3VA (NEC220.12)		2970
small appliances circuits 3, 7, 9, 10, 11, 14, 18 (NEC 220.14 I)		4320
washer (NEC 220.52 B)		1500
dryer (NEC 220.54)		5600
HVAC unit (NEC 440 IV)		4000
Refrigerator (estimated) (NEC 440 IV)		600
Sprinkler System pump (estimated - NEC 430.24)		373
Hot water pump (estimated - NEC 430.24)		373
range 12.2KW becomes 8KW as per NEC table 220.55		8000
water heater 4500@75% (NEC 220.53)		3375
dishwasher @75% (NEC 220.53)		639
range hood 500@75% (estimated - NEC 220.53)		375
Car Charger		3700
Total VA		35825
Total Current (Amps) Total VA/240V		149
Electrical panel rating:		>=150A



## Energy Analysis Results and Discussion

*Notice: Graphs and calculation in this section are simulated in a metric standard program. All the data will be converted to the imperial system in the near future.*

### Energy Analysis Results and Discussion

#### Introduction

The total energy consumption was calculated considering the amount of total power used in all electrical and thermal devices during their operation. With specific attention paid to the efficiency of the process and the right choice of associated technologies, in order to keep the costs limited and the conditions in the house comfortable in all seasons.

The energy analysis is one of the main steps in realizing the project goals within the restrictions that are imposed by the contest's rules. Consumption had to be calculated considering the usage of an HVAC system, heat pump, laundry machine, television and several other electrical devices that are typical furnishings for a common house; besides internal equipment, the contest rules state we must recharge an electrical car using the solar energy converted with the photovoltaic panels.

Of course in order to have a complete and accurate energy plan it is necessary to know the models, specific consumptions and efficiencies of all the appliances. It is also vitally important to be able to generate an energy plan we must know the efficiency of the solar panels. Since solar panels are required to be the solitary provider of energy in order to meet the household's everyday requirements. However we must keep in mind not too exceed the power consumed by too large a margin, but even more imperative than that we need to not allow the power generated to be inferior to the requirements, so we need to choose the product in a targeted way.

#### Tools

Numerous tools were used in running simulations on this project. Among those, our team utilized a cutting-edge energy implementation software linked and able to work in direct collaboration with the building information modeling. The tools most utilized by our engineers were Sketch up with an Energy plus plug-in making possible the integration of a modeler program with thermic simulation in dynamic regime.

*Energy Plus* is an application available as a free download from the US Department of Energy. Through the OpenStudio plug-in this program is able to simulate the thermal behavior of a 3D house model created with Sketch Up getting an output of the indoor thermal conditions. This software was used to integrate both natural and mechanical ventilation thanks to the class "hybrid ventilation control".

*Google Sketch-up* is a free, easy-to-use 3D modeling software through which our engineers designed schematically the house in order to evaluate the energy impact.



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*Microsoft Excel* is a spreadsheet software essential in evaluating simulation results, creating graphs and charts, and communicating results to the entire team. In particular it allows energy analysis templates using pivot tables enabling sensitivity studies to be evaluated quickly and in a standardized manner.

*Climate consultant* is a graphic-based computer program that helps to understand the local climate using EPW format climate data made available at no cost by the Department of Energy for numerous weather stations around the world. Through this application we were able to plot in an easy-to-understand graph about temperature, pressure, humidity etc.

## Climate Data

Using the climate data available for free on the Energy Plus database, it is possible to compare the different weather conditions between the two project cities and the competition location. The most suitable station for Irvine is 722977 “Santa Ana-John Wayne Airport”, distant approximately 8 miles beeline from the Solar Decathlon 2015 site. In the following graphs significant parameters for building’s design are monthly shown for each of these weather stations: Santa Ana-John Wayne Airport (Irvine, CA), Roma Urbe (Rome, IT) and Morgantown Muni-Hart Field (Morgantown, WV).

### Temperature Range

The ambient air temperature is an important parameter, which needs to be analyzed to predict the thermal behavior and the energy demand of a building.

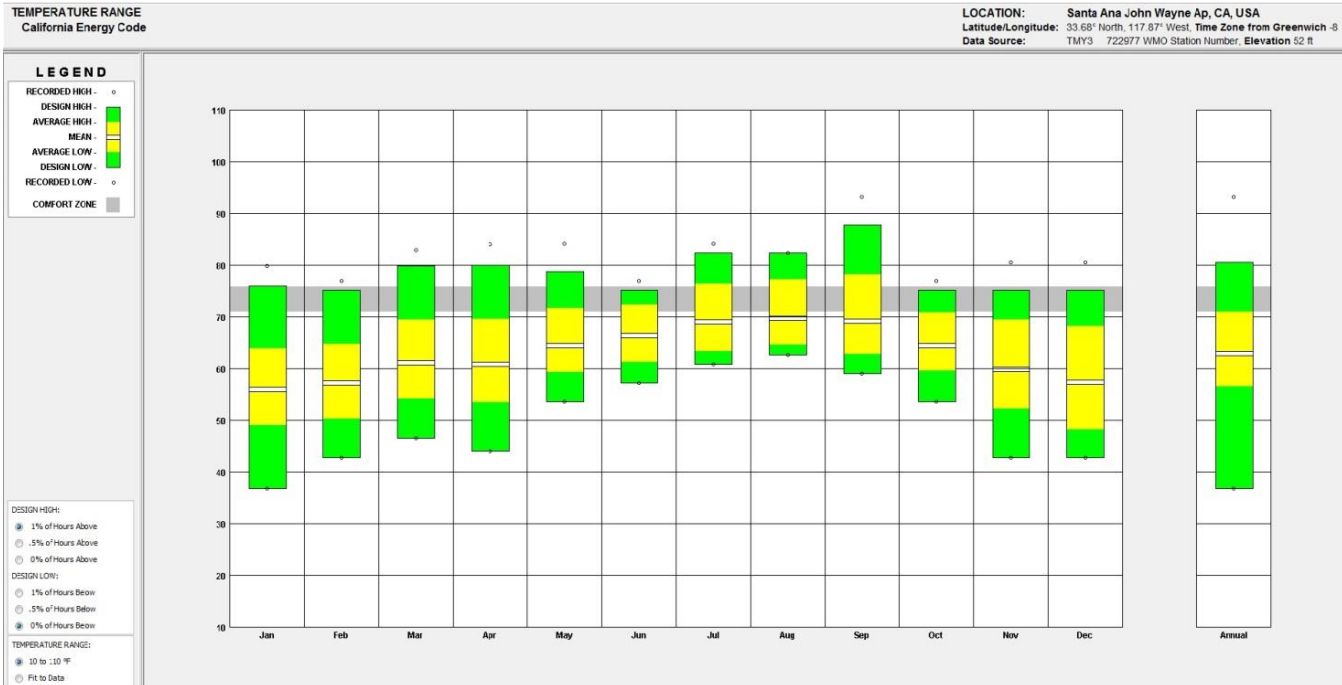


Figure 1: Irvine Temperature Range

As we can deduce from the diagram the temperatures in California are close to the comfort zone during all over the year. In summer months such as August or July the mean part of the bar representing the average temperatures reached, is set just in correspondence to the comfort zone, meaning that during those months the external temperature is more or less the comfort one.

Down there are two more graphs, for temperatures excursion in Rome and Morgantown. It is clear that in both places the climate data are almost exactly the same, so it is possible to deal with one of them meaning both. The annual average temperature is very similar in the three cases, but in Rome and Morgantown there is a greater excursion of temperatures between summer and winter: in fact summer months mean value of temperature is set always in the comfort zone, but a little bit upper than in California's case, as well as during winter time the bars are significantly lower than the comfort zone, so, differently from California's situation, there is probably higher request for heating.

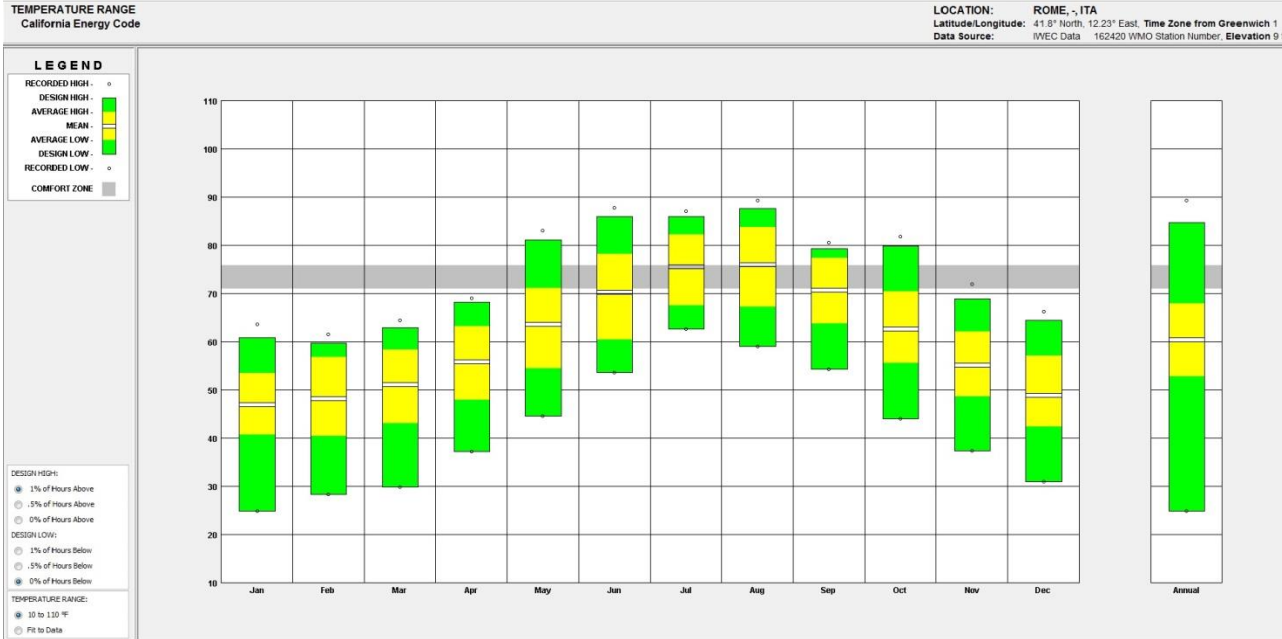


Figura 2: Rome Temperature Range

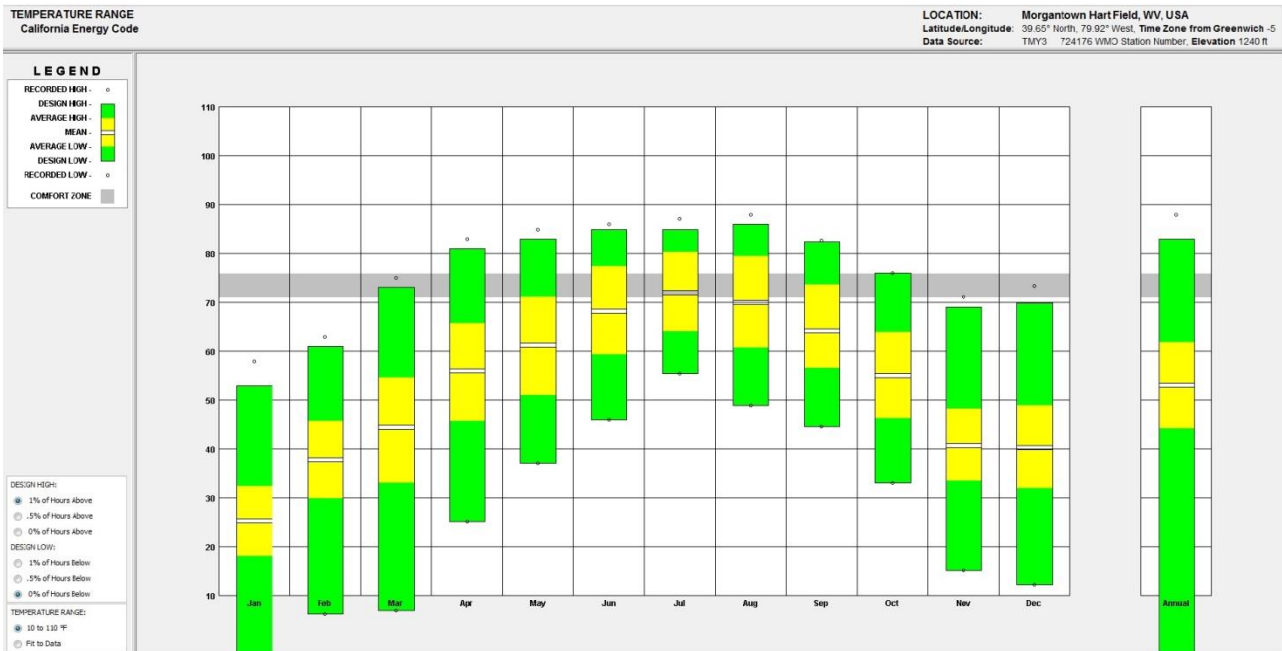


Figura 3: Morgantown Temperature Range



### Radiation Range

The next graphs show how much sun is available on the horizontal surface. On the left there is a legend for the colors used in the chart to underline the direct normal radiation, the global horizontal radiation and the total surface, measured in btu/sq. ft. per hour. This evaluation is very helpful working with solar panels. In fact it gives an idea of the utilization coefficient that the solar panel will be able to develop, and gives a meaningful advice on the result that an eventual photovoltaic energy production system will reach. As in previous graphs (as we were expecting since there is a direct correlation between temperature and captured radiation), the radiation range are very similar for California, Rome and Morgantown (that, once again, are basically identical), and as before, the greatest difference is evidently in January and December, winter months.

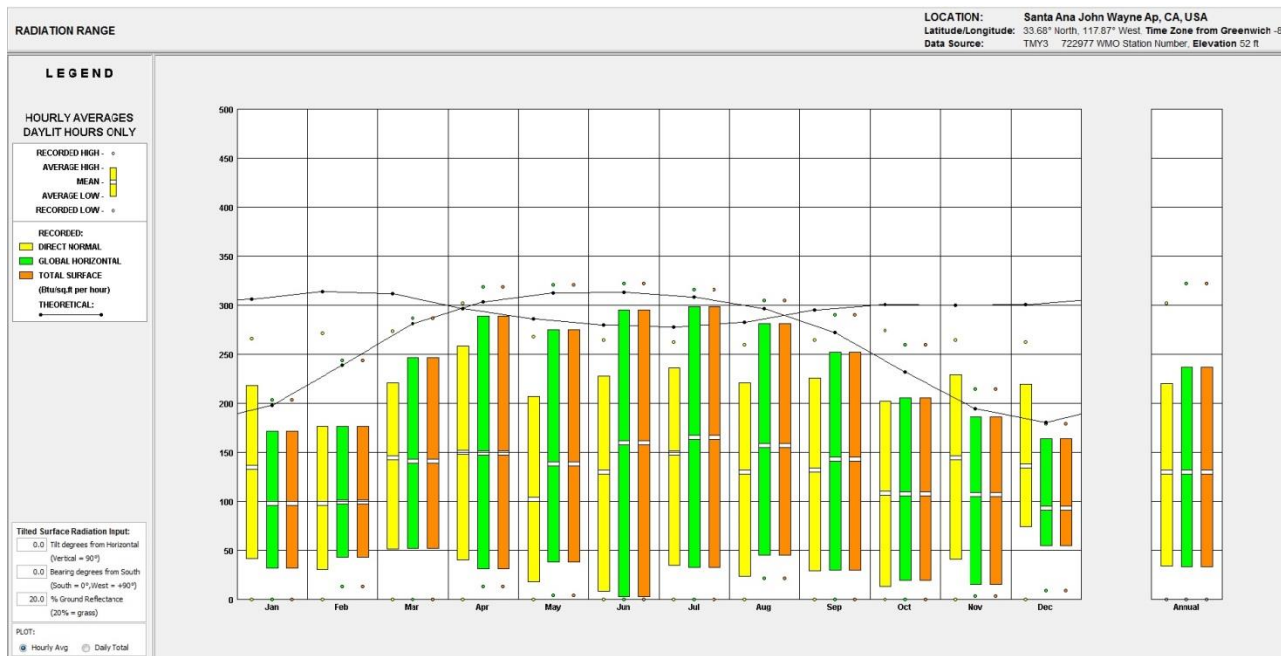


Figura 4: Irvine Radiation Range

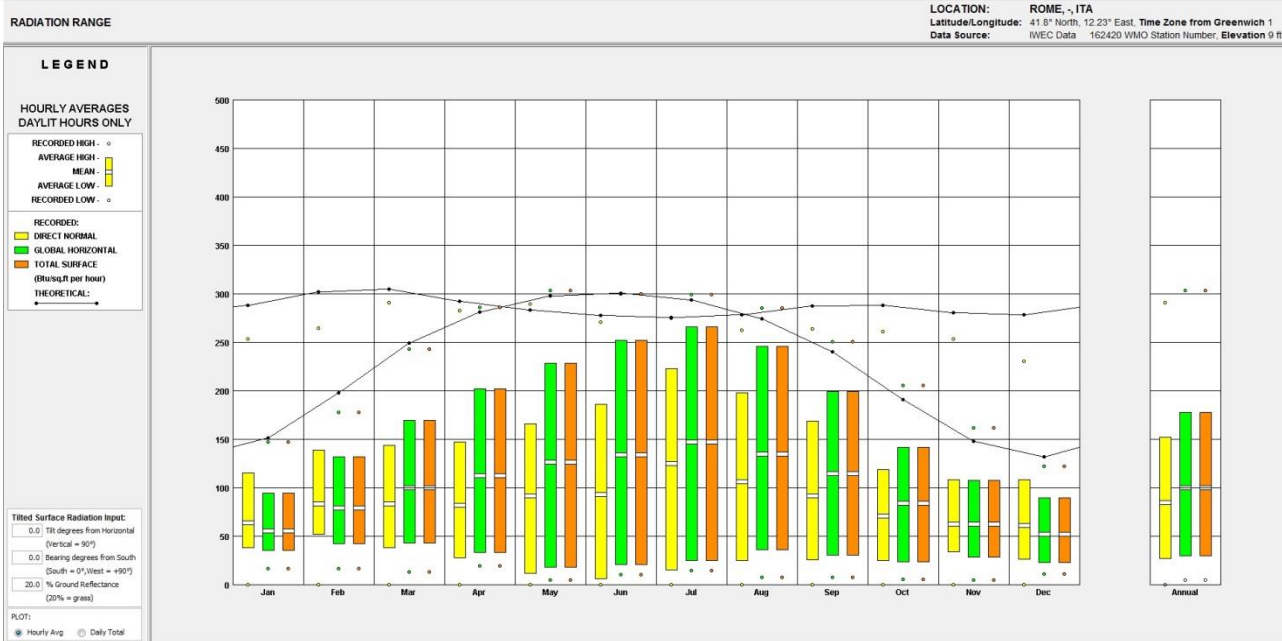


Figura 5: Rome Radiation Range

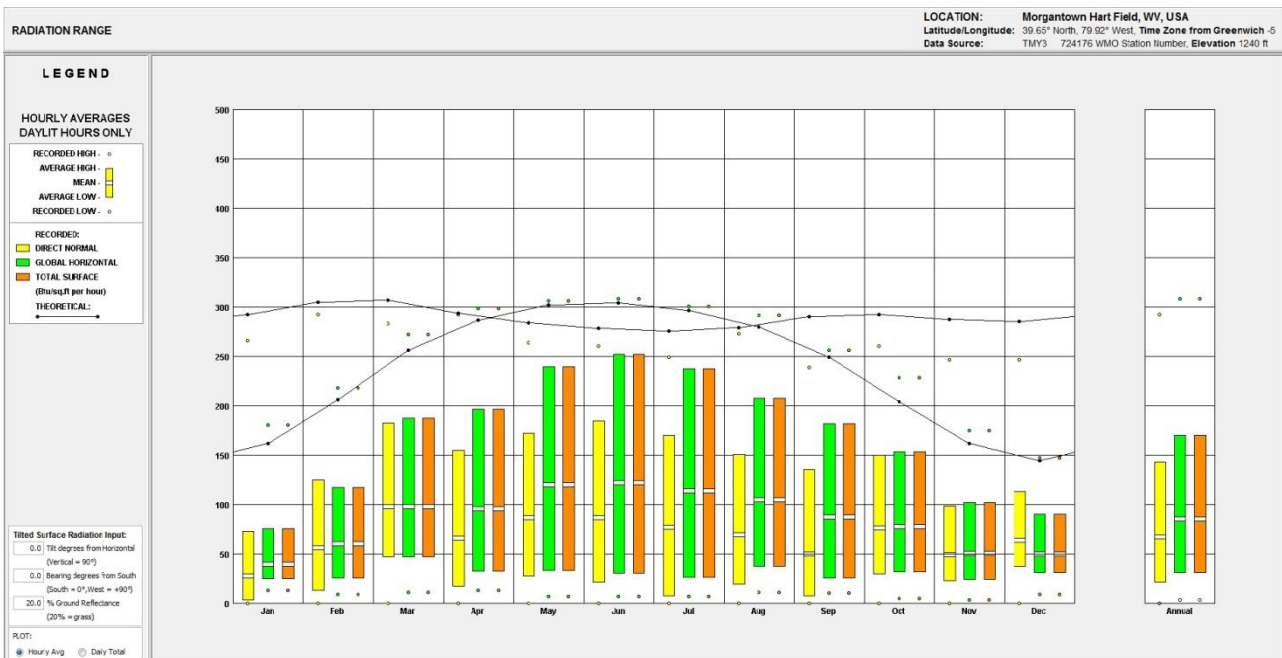


Figura 6: Morgantown Radiation Range

Ground Temperature





In these charts is clearly shown the ground temperature path over a year for three different depths. On the right there is a summary of the three average temperatures.

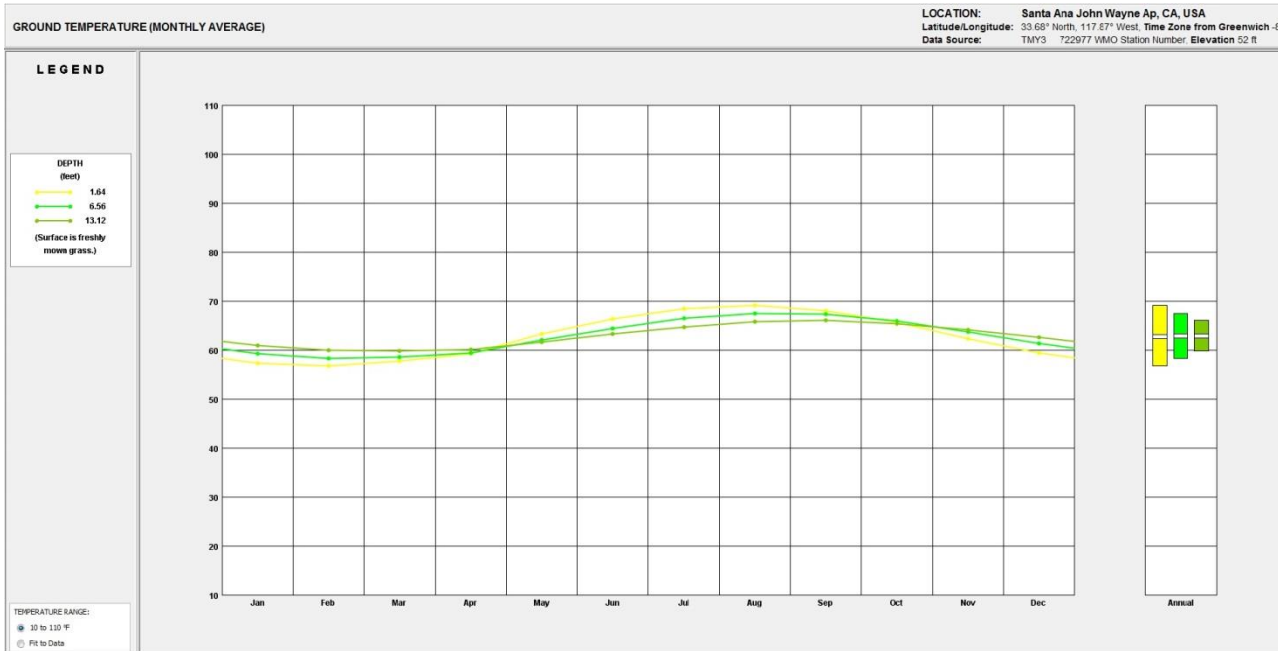


Figura 7: Irvine Ground Temperature

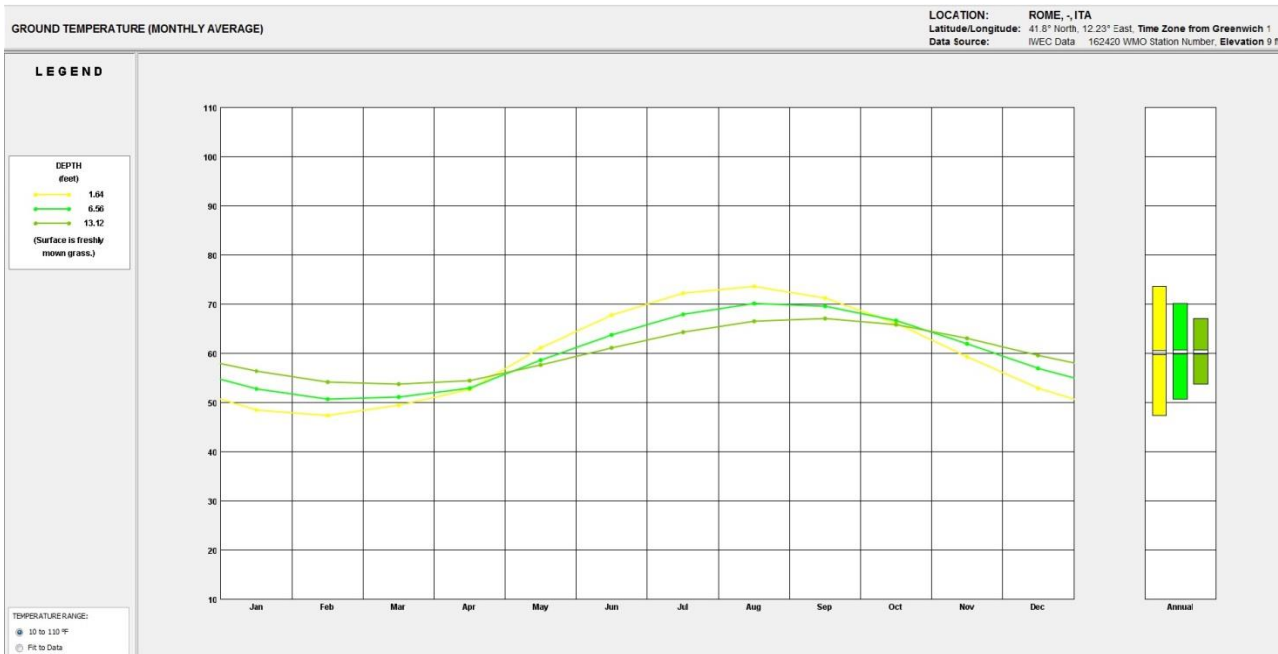


Figura 8: Rome Ground Temperature



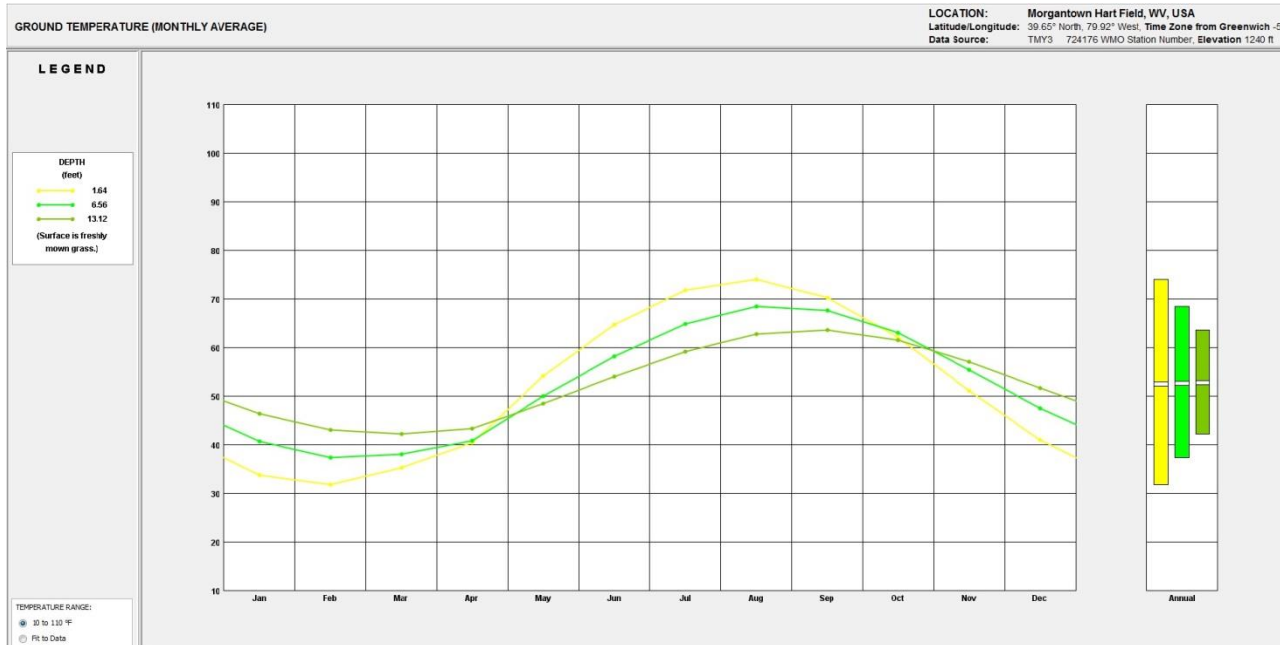


Figura 9: Morgantown Ground Temperature

In this case in Morgantown we have the greatest excursion of the ground temperature, probably because of the temperature excursion between summer and winter. There is a correspondence in the fact that going then to Rome and California's graphs the oscillation decreases significantly.

This data was particularly significant to design the solar chimney. Using those data we were able to understand how cold can be the air underneath the basement of the house. This led to the conclusion that the air passing through the basement is cold enough to install a solar chimney effect, through which the house is naturally cooled.

### Dry Bulb and Relative Humidity

Through a double-curve chart dry bulb and relative humidity were plotted for each month of the year. As in every other graph the grey stripe is the comfort zone, presented as a reference point to read the charts.

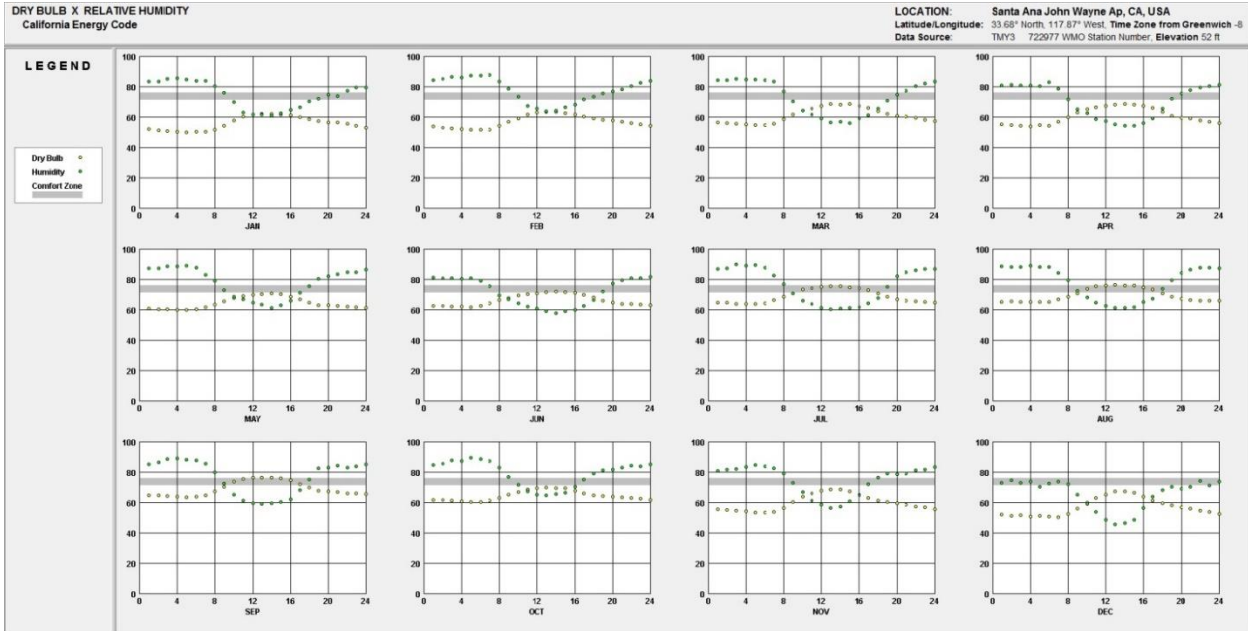


Figura 10: Irvine Dry Bulb & Relative Humidity

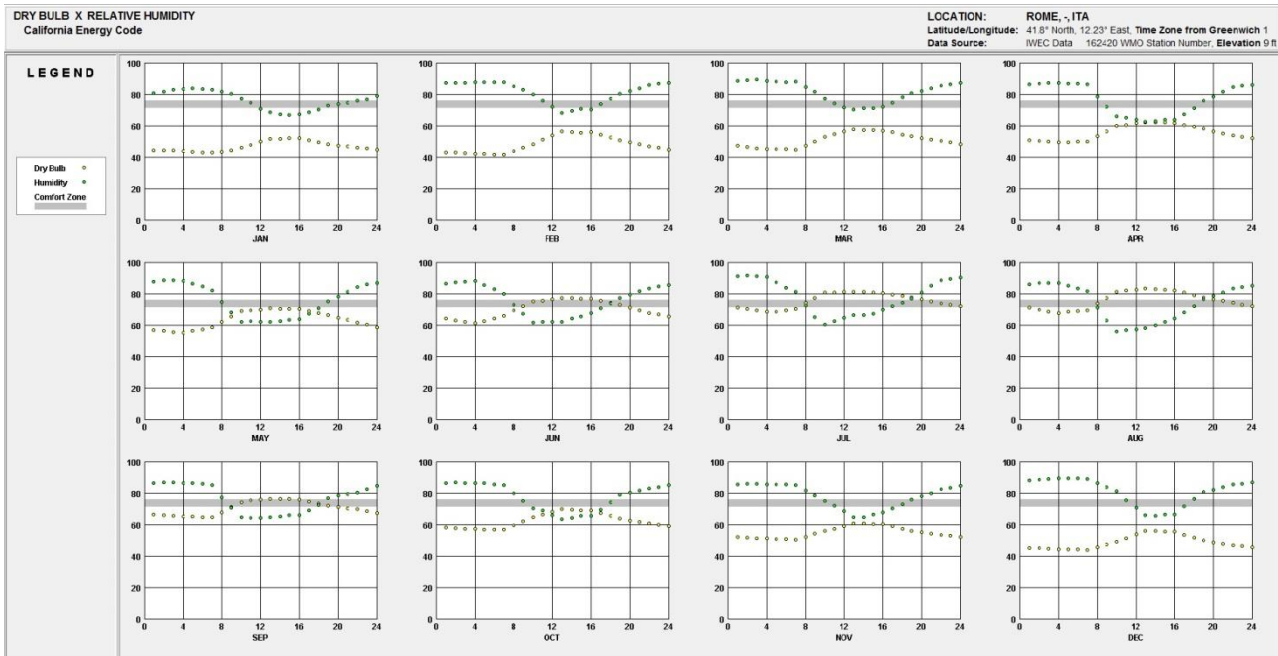


Figura 11: Rome Dry Bulb & Relative Humidity

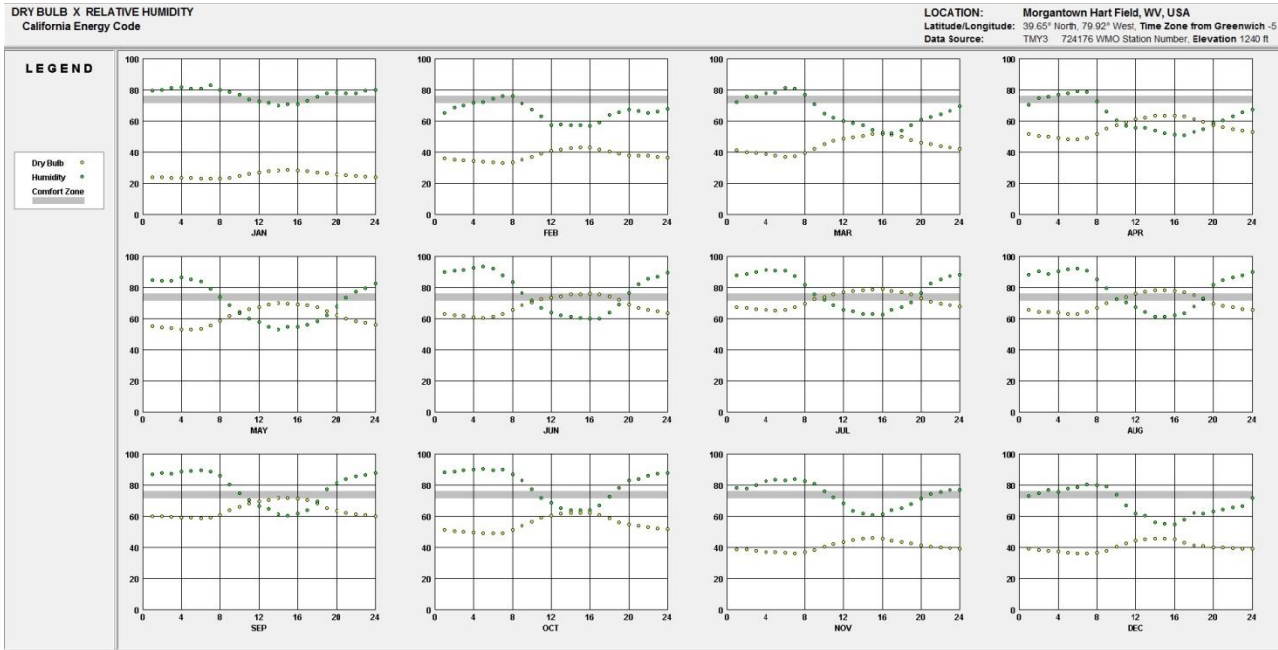


Figura 12: Morgantown Dry Bulb & Relative Humidity

### Dry Bulb and Dew Point

The dew point is the temperature at which the water vapor in a sample of air at constant barometric pressure condenses into liquid water at the same rate at which it evaporates. At temperatures below the dew point, water will leave the air. Now it is presented another double-curve graph that underline the differences between these two temperatures over a whole year.

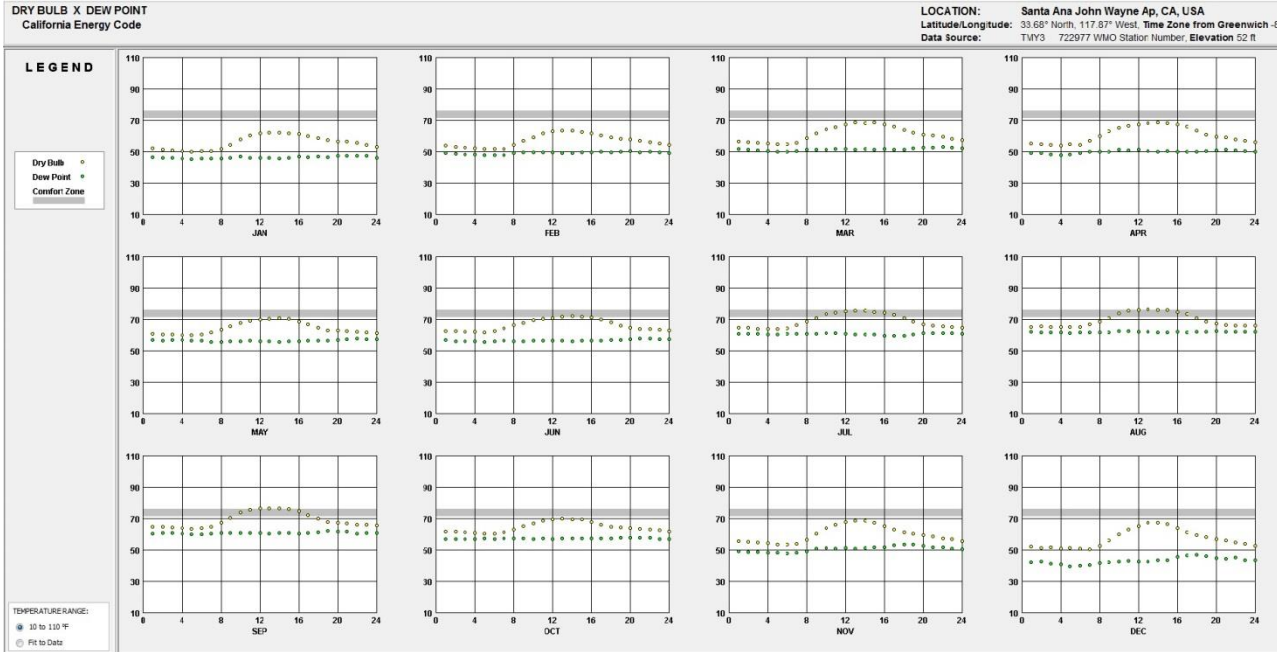


Figura 13: Irvine Dry Bulb & Dew Point

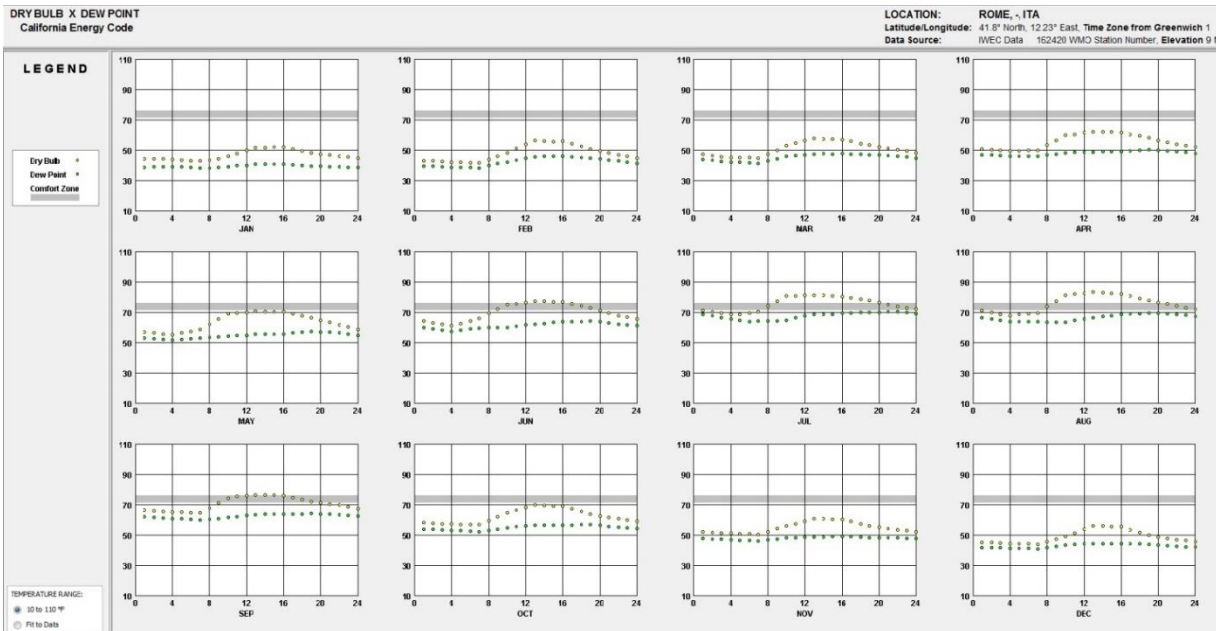


Figura 14: Rome Dry Bulb & Dew Point

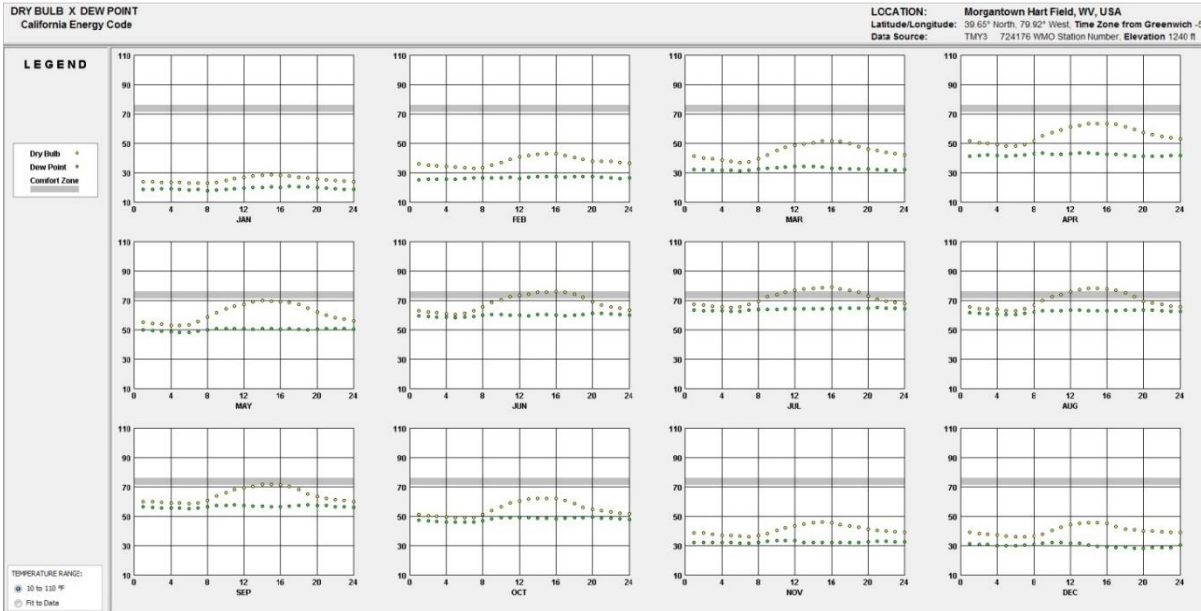


Figura 15: Morgantown Dry Bulb & Dew Point

### Wind Speed

From the next three charts is possible compare the wind speed in the three locations under consideration. Looking at the annual mean wind speed, the higher is the one in Rome. Therefore designing the arch for the worst wind speed situation, we expect to be in safety condition for all the others.

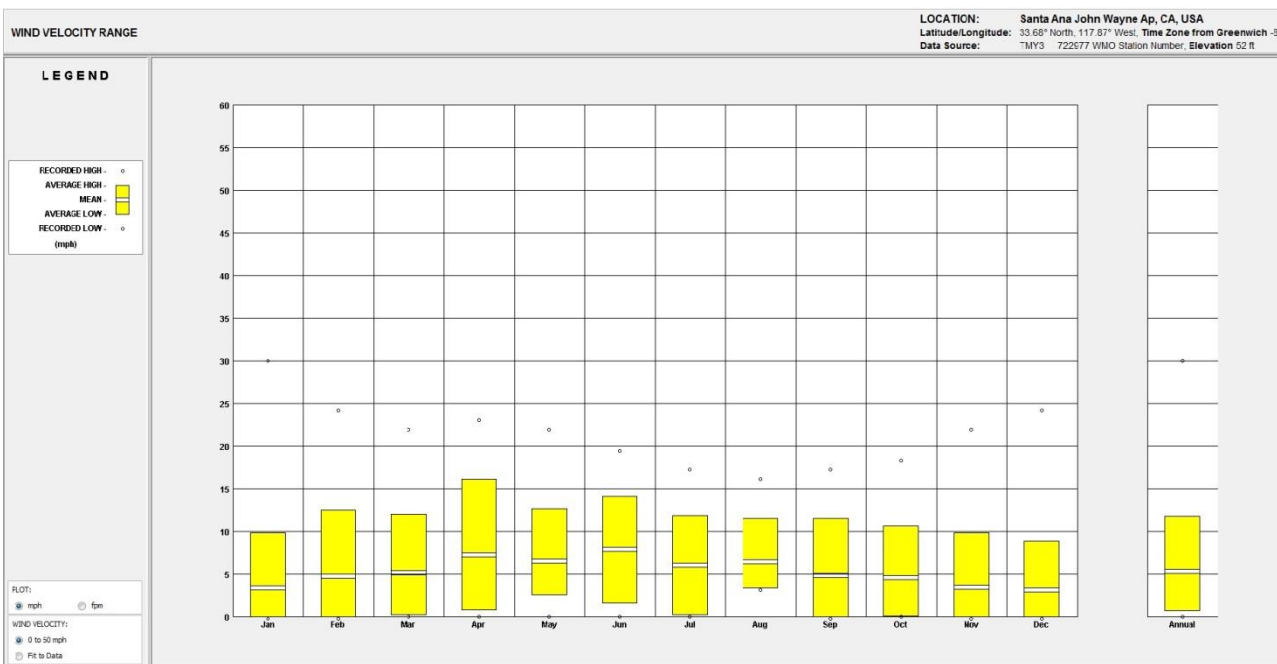






Figura 16: Irvine Wind Speed

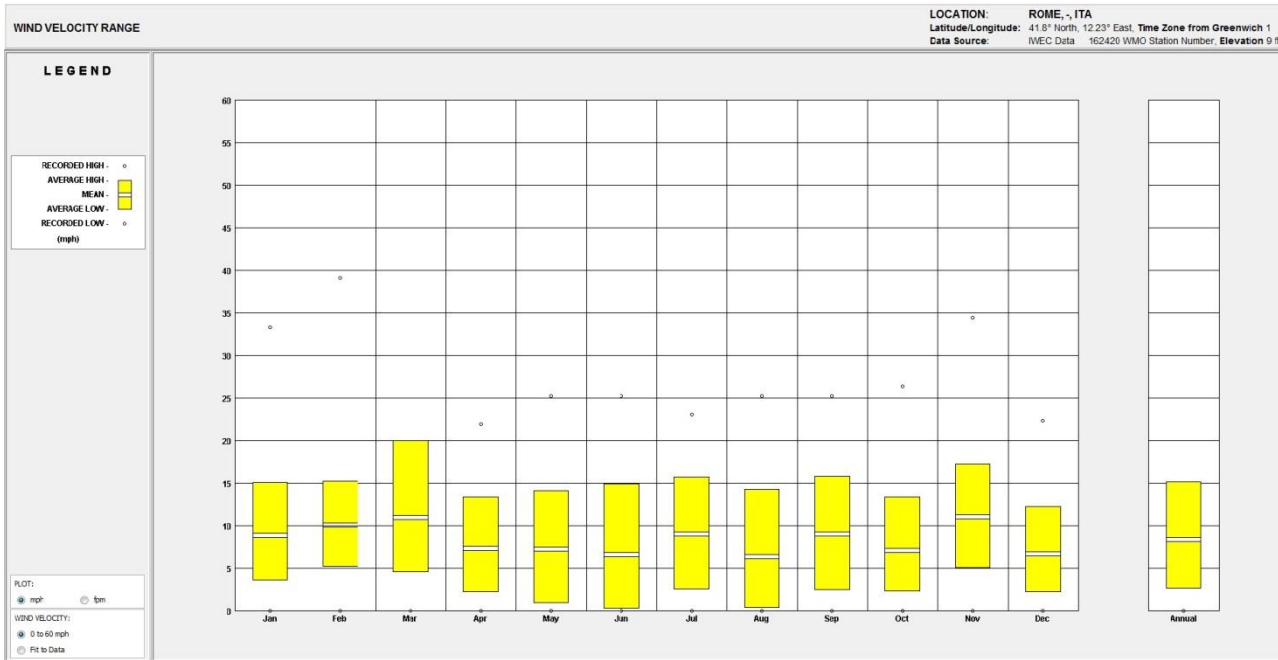


Figura 17: Rome Wind Speed

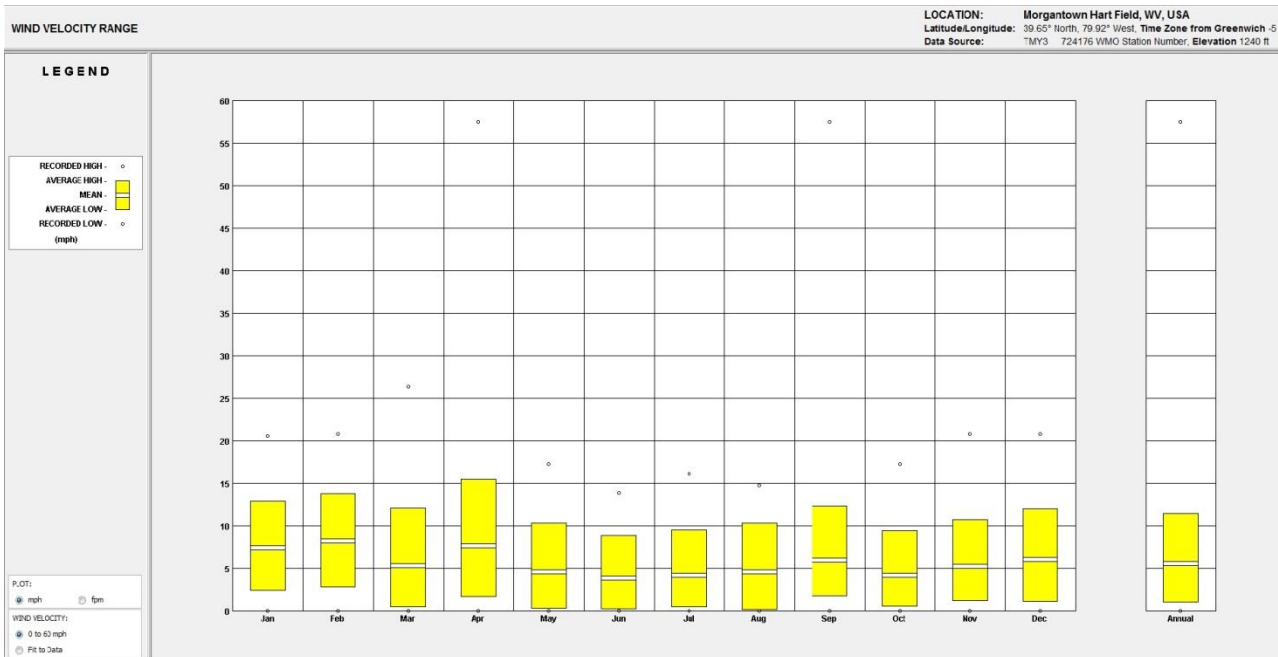


Figura 18: Morgantown Wind Speed

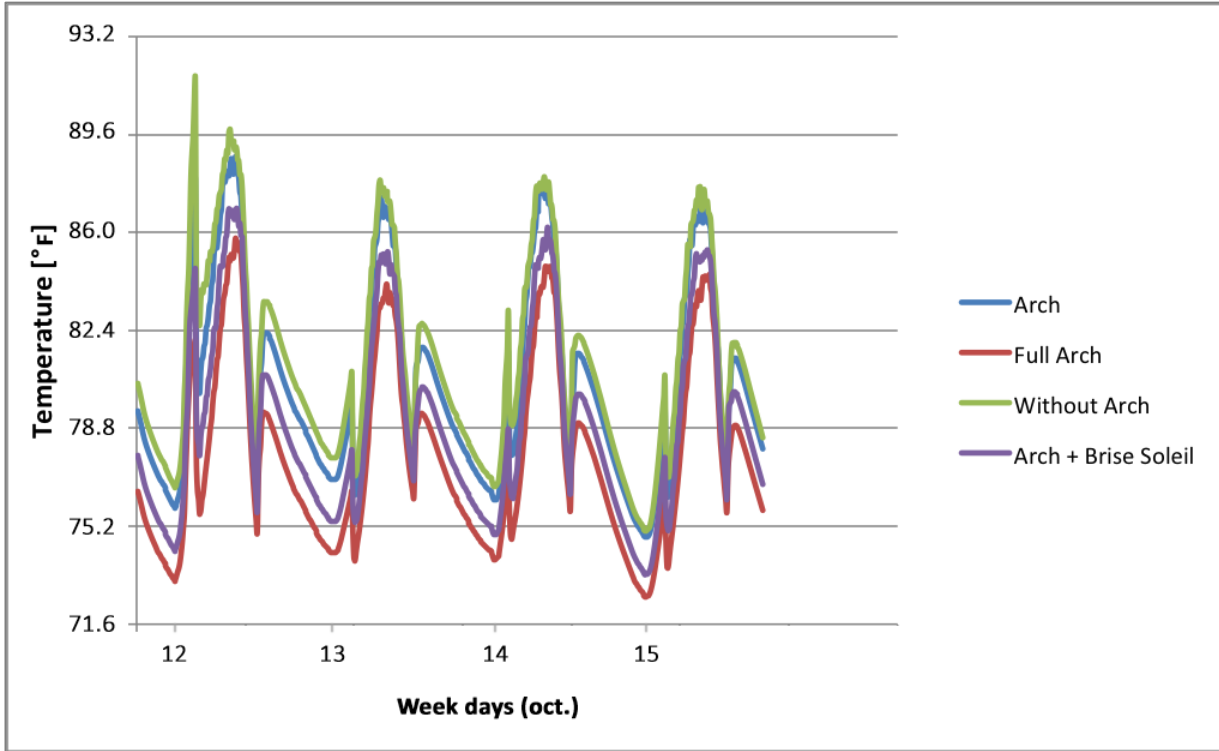


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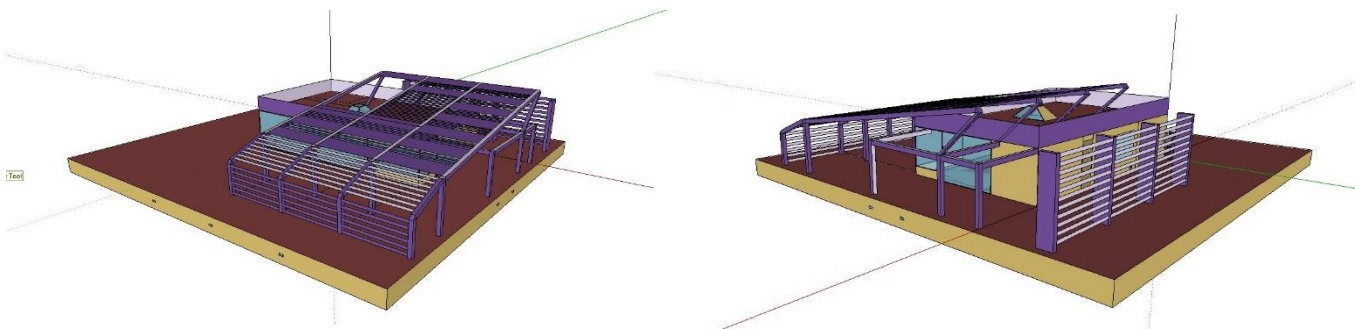
### Brief house description

STILE house is geometrically thought like a rectangular box made by a modular prebuilt section and an open space with glass walls. The south wall is fixed, while the west and the east ones are equipped with sliding doors. To shade all these glass walls we conceived and designed an arch to span the extent of the house. This element is multifunctional, intended to be a support for the solar panels and a shade object for the entire house. One of the first simulations computed with Energy Plus actually involved the arch; we needed to verify that it made a significant difference on the indoor temperature during a sunny day. As it is shown by the following graph, temperature in the living room is strongly influenced by the arch above. The green line is the temperature gait of a normal box house without the arch. It is clearly visible that this performs the higher range of temperature compared to the other three cases. The blue one represents the case in which the arch is made of beams as support for just solar panels. Temperature range is still high because there is much space between the panels and the shading is limited. Just to evaluate the difference, an extremely case is shown in red: the full arch. It means that now the arch is simulated as a total surface and not just as beams like it is. Definitely the living room is completely shaded, so this temperature gait is the lower one. At this point is immediate to think about a compromise between the two best results: with the arch and solar panels we have still high temperature, that is not positive for the house, but it is for the solar chimney that is well heated and it can work efficiently (in the next chapter the solar chimney is explained in detail); with the full arch the house is totally shaded vice versa this is good for the house, but not much for the chimney, that gets less sun than the other cases. The best compromise is shown by the violet curve, which remains in an acceptable temperature range for both our necessities, shading the house and heating the chimney. The configuration chosen is made of four arch beams as frame for solar panels and brise-soleil, simple shading elements; leaving opened the top of the chimney in order to not shade it. Simulation was evaluated in a time step of 4 days, from 12 to 15 of October, during the competition week. These multiple benefits helped to justify our architectural and economical choice of utilizing an arch.



Moreover thinking on Morgantown, the climate condition in winter is strongly different from Rome and Irvine, but the arch can be also a benefit for the house as a protection from heavy wind and snow. This could be one of the proofs of how the house is suitable in every type of weather.

The next pictures present the 3D model implemented with Energy Plus for all the simulations, over the year and during the time period in which the competition takes place.



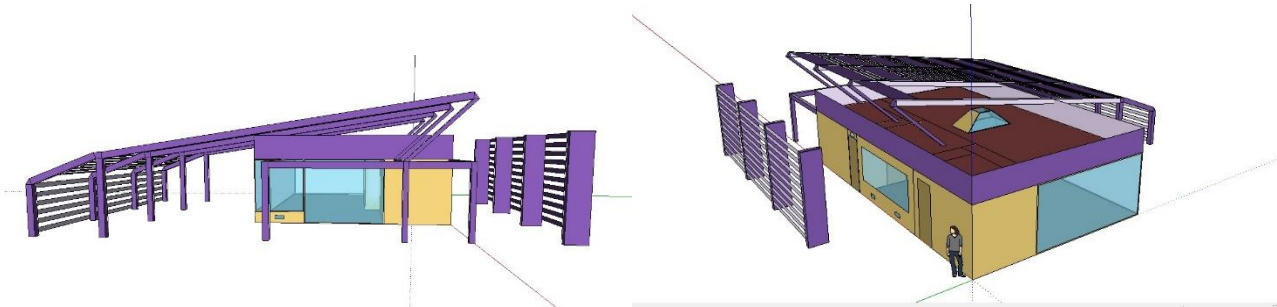
## Systems

### Solar Chimney and natural ventilation

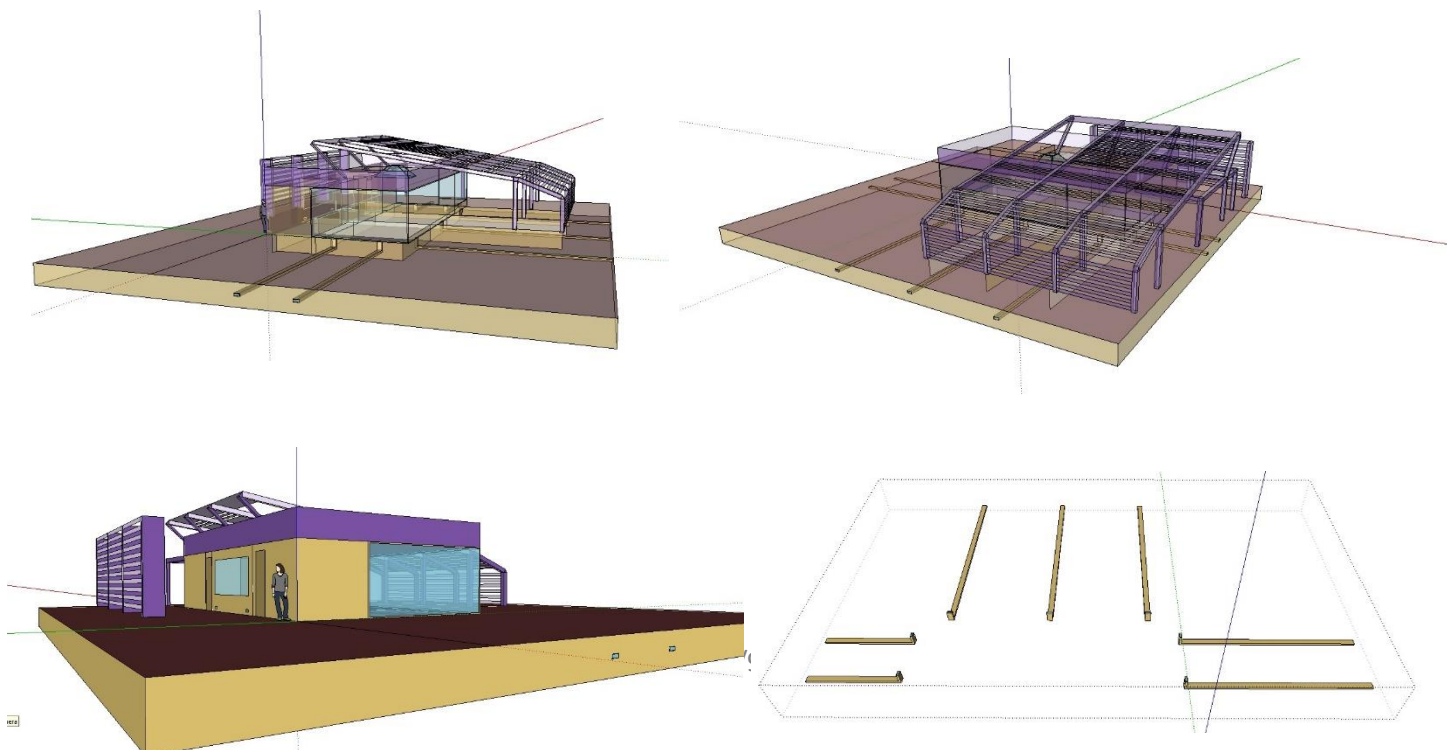


The main goal in designing the living rooms ventilation system was to allow the living room to have as much fresh air as possible. This goal was realized in the form of a solar chimney located in the ceiling of the living room and air vents set on the floor. Through the air vents fresh air can enter the house and due to density differences convection is established. The hottest air goes up, drawn by the chimney that is covered with highly conductive material in order to be heated by the sun. The hotter air is finally sent out from the chimney and the colder air is able to remain in the house to refresh the ambience. This is a practical method employed to cool the house during summer using the coldest air available during the night and storing it in the base of the house. The solution we devised is more sophisticated than the traditional one which uses the air vents on the bottom of the walls, our model imagines to use the house platform (composed by beams and where the air is fresh) to catch the air, canalizing it into the vents located on the floor around the house. The figures shown below represent the 3D model used in the simulation of the airflow from the vents to the chimney. Then, it will present the differences between the more standard configuration for the vents and the platform configuration we chose.

3D model: House with standard vents

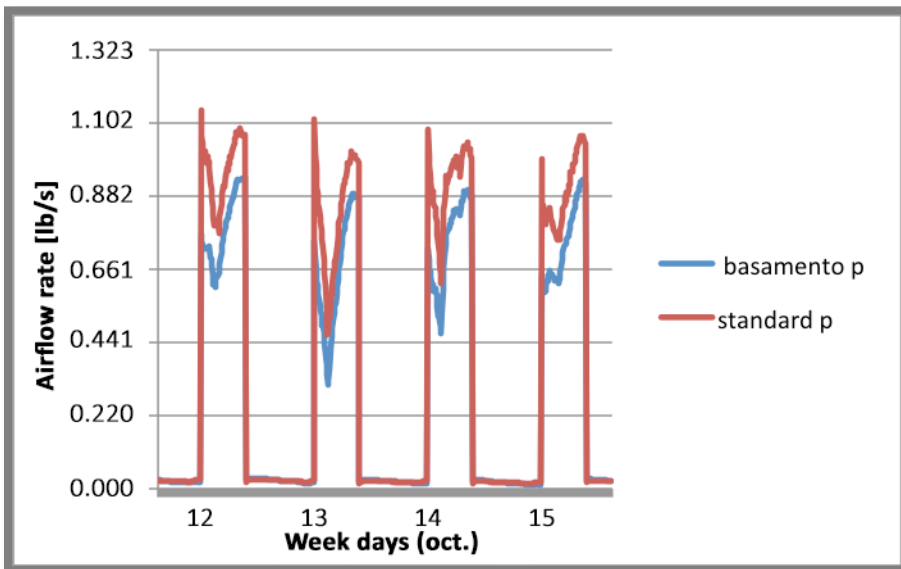


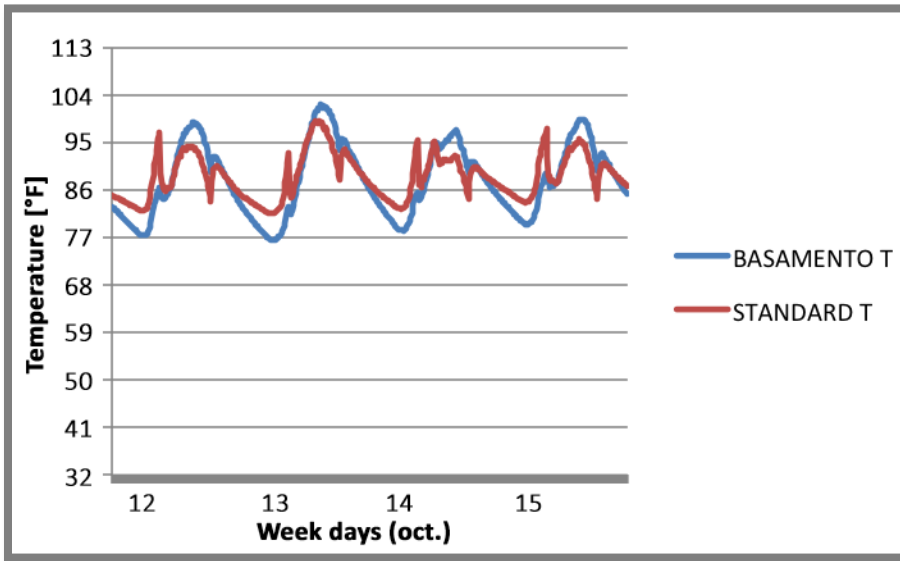
3D model: House with "platform-vents"





The following graphs are the proof of our choice to design this configuration. The former is the airflow mass gain plotted for 4 days of competition and as we expected the standard model is more efficient, in terms of flow rate, because with the platform we need pipes to conduct the air into the house and this lead to load losses. But this is acceptable compared to the gain in the temperature range. Indeed, in the latter chart is clear that the living room reach an optimal temperature in its minimum. This has been a work-in-progress research, since we continued to study in these two years different solutions for the pipes in order to optimize this configuration, minimizing the losses. Definitely this was not the final solution, even if it was acceptable because looking globally at the temperature chart the peak and the minimum are almost equalized and the chimney contribution on the total house balance is nearly unvaried, but starting from this solution we found an optimal configuration. Without using the pipes, we found particular linear vents that are going to be installed in the living room on both the east and west side. Through this vents the air is blown from the basement and brought inside the house. Appropriate filters are installed inside those vents and are perfectly able to clean the air from eventual impurities. When the weather conditions require the use of the solar chimney the vents are open and visible in the living room, instead, when the use of the hvac is preferred, a magnetic carpet is positioned on the top of each linear vent to close it, avoiding huge losses. In this way we don't need to handle the losses through the pipes and we are able to guarantee a perfect ventilation of the house, just using natural convection. In addition, the presence of the air under the platform creates a sort of "pad" that enhances the global house insulation.





### Mechanical Ventilation: Hvac

Ventilation concepts for moisture protection and minimum air exchanges in thermal insulated buildings can be fulfilled only by controlled, mechanical ventilation. Opened windows would negate the desired heating cost saving from the energy point of view. The proportion of ventilation heating losses through opened windows increases to over 50 % of the total heating loss of an energy efficient building. Research proves that people living or working in inadequately ventilated buildings suffer from many ailments such as headache and allergies. Humans spend about 90 % of their life in closed buildings. Therefore, it is important to provide healthier indoor air, free from odors and high humidity.

HVAC is an acronym to indicate Heating, Ventilation and Air conditioning indoor system. It is a compact technology that provides both thermal comfort and air quality in the house, and using fresh air from outdoors after having treated it, regulates safe and healthy building conditions. We decided to use this equipment because, maintaining reasonable installation and operations costs, can provide three central functions for hygrothermal comfort.

#### Heating:

Heat generation is not necessarily due to fuels but even to electricity, meaning that is possible to use renewable energy sources as solar heat (so our photovoltaic system). For distribution can be used water or steam, transported through pipes that transfer the heat to the rooms. It is even possible to use radiators or other heat exchangers and air after have been filtered to remove particles and dust

#### Ventilation:

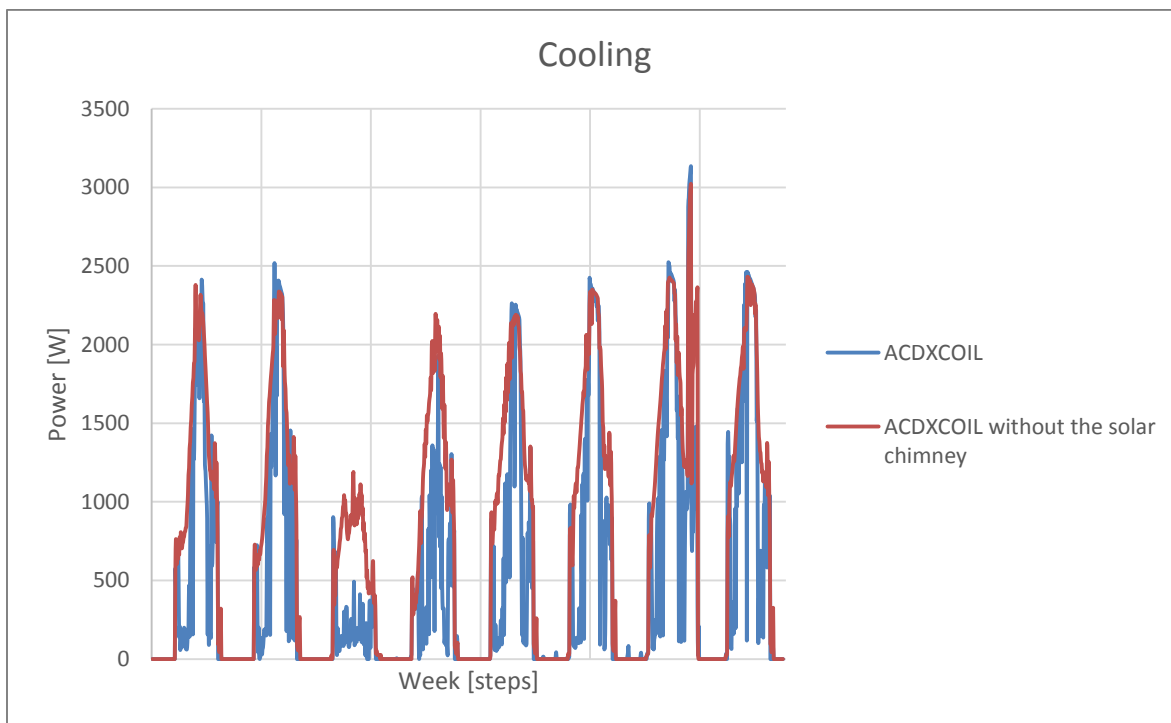


New air, that is taken from outdoors and purified, is periodically introduced into the house, to control the temperature and remove moistures, smoke, heat, dust, bacteria, CO<sub>2</sub> and humidity, and so maintain the hygrothermal comfort and acceptable air quality. Methods for ventilating are divided in forced (controlled by a air handles) and natural (without using fans or other mechanical systems, but it can be realized via windows for instance) types. In this latter case, care must be taken to ensure comfort: in warm or humid climates, maintaining thermal comfort only via natural ventilation may not be possible, so air conditioning or heating systems are used.

#### Air conditioning:

This system is used to supply cooling and humidity control for all part of the building. For this part of the system is usually a disadvantage to have opened windows because it works against the maintenance of indoor cooled conditions. In order to refrigerate the air, internal heat is removed through radiation, convection or conduction using a refrigerant such as water, air or ice. The refrigeration cycle provide the utilization of compressor pumps, heat exchanger (condenser), expansion valve (regulates the refrigerant liquid to flow) and another heat exchanger (evaporator).

Simulating the behavior of the cooling system and of the solar chimney in the contest week, it is clear from the blue line that we have a huge energy saving using the solar chimney in the hottest hours of the day. Whereas, the red line, that represents the cooling without the help of natural ventilation, is higher than the blue one, this means that the use of only the air conditioning system is not energetically convenient.





The system we chose in our house is a Carrier multizone ductless system, made of three internal units (2 in the living room, one in the bedroom) and one external unit. In order to follow the elegant line that the whole house present, we designed an innovative method to hide these units in the ceiling, obtaining the same comfort result through linear air diffusers installed on the ceiling of the living room and in the mechanical room close to the bedroom. A system of short pipes conducts the air to the diffusers located in the ceiling edge in the living room and close to the closet in the bedroom.

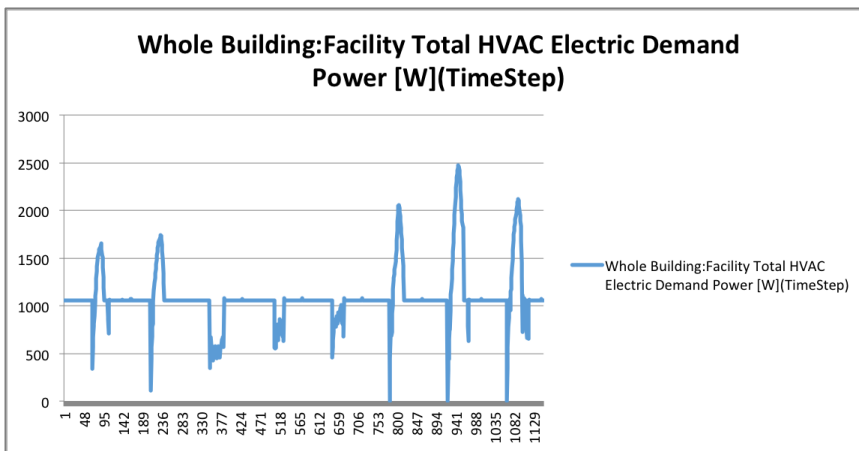
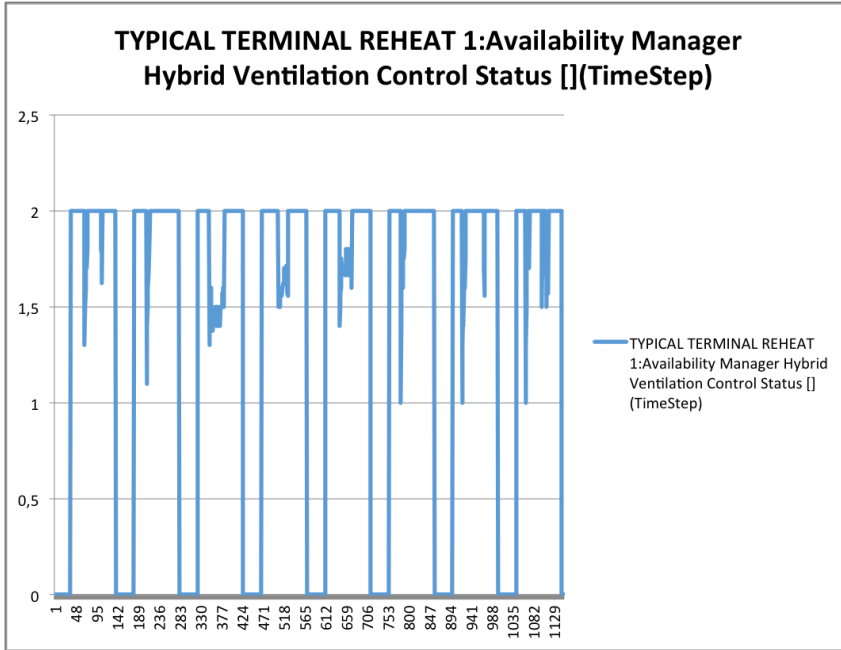
The overall result is the same in terms of hvac efficiency and performance, but it's very impressive from the esthetical and architectural point of view. Every system inside the house is technologically advanced as much as linear and modular to fit perfectly with the house style.

### **Hybrid Ventilation Control**

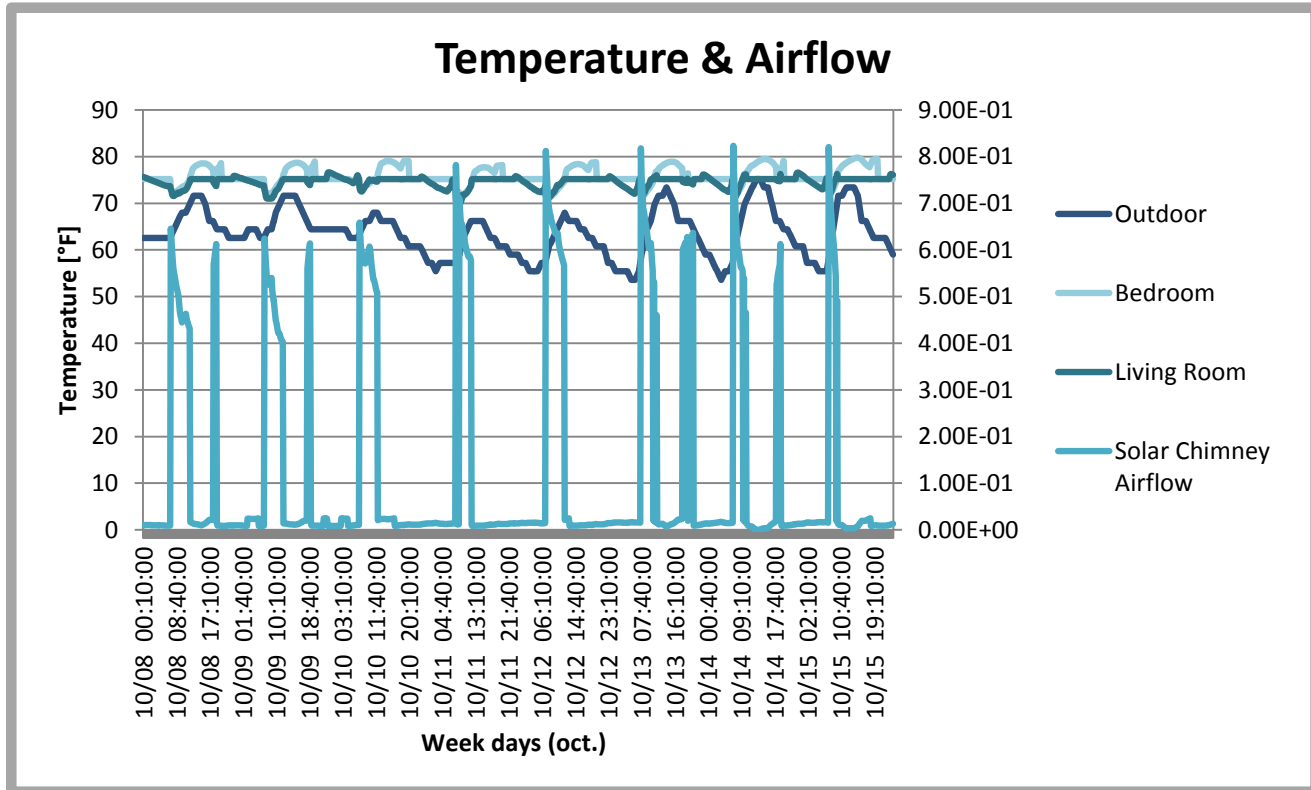
To integrate both mechanical and natural ventilation a control system was studied and implemented in the Energy Plus model through the class "Hybrid Ventilation Control". This maximizes natural ventilation to reduce cooling/heating loads by controlling HVAC system operation and natural ventilation calculated in the AirflowNetwork model, so that both cannot work simultaneously. The control has to work with the AirflowNetwork model to provide natural ventilation. The hybrid ventilation control is able to catch two important data from the weather predictive system: wind speed (and direction) and temperature. Getting this info the system is ready to iterate possible solutions deciding if is better natural or mechanical ventilation in those specific conditions. The main goal of this control system is to minimize the energy consumption in each case. For example in a particular hot summer day the system never opens the vents and the chimney. At the same time, if there are the right wind conditions and temperature is acceptable the system doesn't turn on the air conditioning, but it let the solar chimney work.

The first chart shows the hybrid ventilation gait, going from 1 when the ventilation is totally natural to 2 when vice versa is completely mechanical (and the openings are closed). The second one is strictly related to the first talking about consumption. It represents the electrical demand required to switch on the machines or just the automatic openings. The two graphs have the same trend because when the hybrid ventilation is up to 2, the power required reach a peak, instead when it is 1 the electrical demand is almost zero.

All the simulations are related to the competition period: 8-15 October 2015, considering on the x-axis the partition of the days of the week.



The last proof of the utility of the hybrid ventilation system is the graph below with the temperature walk over the 7 competition days.



In our house this control system is realized thanks to indoor and outdoor temperature sensors and a Nest thermostat. The system is able to determine when it would be best to turn off the air conditioning and open the vents and solar chimney using natural ventilation. Nest thermostat will automatically learn the homeowner's schedule and turn down the HVAC system when they aren't home.

In this way, our system is able to assist the homeowner in living a comfortable, environmentally friendly lifestyle. Moreover, thanks to the lights and outlets control the system will notify you through the smartphone app that you forgot the light on and you can turn it off remotely and easily. This is a simple way to save energy consumption and improve the homeowner lifestyle.

#### Water supply and distribution

The plumbing of STILE house is a simple system based on two tanks 500 gallons each. As it is shown in the relative table P102 new "domestic supply", the cold and hot water lines allow provision water to all the utilities of the house. Through some calculations we found out the best solution for our house in terms of pipes diameter and water flow rate. The final choice for all the pipes is a size of ¾ inch and just for the pipe connected to the tank we chose 1 inch.



Considering the tables given in the International Plumbing Code, it's easy to find the minimum pipes size for each fixture, the required capacity and the maximum flow rate. From the first table it is clear why we selected a pipe diameter of  $\frac{3}{4}$  inch, since we need to be in a safe range for each utility.

TABLE 604.5  
MINIMUM SIZES OF FIXTURE WATER SUPPLY PIPES

FIXTURE	MINIMUM PIPE SIZE (inch)
Bathtubs <sup>a</sup> (60" x 32" and smaller)	$1\frac{1}{2}$
Bathtubs <sup>a</sup> (larger than 60" x 32")	$1\frac{1}{2}$
Bidet	$\frac{3}{8}$
Combination sink and tray	$1\frac{1}{2}$
Dishwasher, domestic <sup>a</sup>	$1\frac{1}{2}$
Drinking fountain	$\frac{3}{8}$
Hose bibbs	$1\frac{1}{2}$
Kitchen sink <sup>a</sup>	$1\frac{1}{2}$
Laundry, 1, 2 or 3 compartments <sup>a</sup>	$1\frac{1}{2}$
Lavatory	$\frac{3}{8}$
Shower, single head <sup>a</sup>	$1\frac{1}{2}$
Sinks, flushing rim	$\frac{3}{4}$
Sinks, service	$1\frac{1}{2}$
Urinal, flush tank	$1\frac{1}{2}$
Urinal, flush valve	$\frac{3}{4}$
Wall hydrant	$1\frac{1}{2}$
Water closet, flush tank	$\frac{3}{8}$
Water closet, flush valve	1
Water closet, flushometer tank	$\frac{3}{8}$
Water closet, one piece <sup>a</sup>	$1\frac{1}{2}$

For 51: 1 inch = 25.4 mm, 1 foot = 304.8 mm,  
1 pound per square inch = 6.895 kPa.

- a. Where the developed length of the distribution line is 60 feet or less, and the available pressure at the meter is a minimum of 35 psi, the minimum size of an individual distribution line supplied from a manifold and installed as part of a parallel water distribution system shall be one nominal tube size smaller than the sizes indicated.

Figura 19: International Plumbing Code, Table 604.5





Choosing the size ¾ inch we are sure to provide the needed water flow rate in each zone of the house. To check this we calculate the needed water flow rate for the bathroom, that is the ambient with the larger number of appliances, and we verified that this flow rate is lower than the maximum allowed by the ¾ inch size pipes.

TABLE 604.3  
WATER DISTRIBUTION SYSTEM DESIGN CRITERIA  
REQUIRED CAPACITY AT FIXTURE SUPPLY PIPE OUTLETS

FIXTURE SUPPLY OUTLET SERVING	FLOW RATE <sup>a</sup> (gpm)	FLOW PRESSURE (psi)
Bathtub, balanced-pressure, thermostatic or combination balanced-pressure/thermostatic mixing valve	4	20
Bidet, thermostatic mixing valve	2	20
Combination fixture	4	8
Dishwasher, residential	2.75	8
Drinking fountain	0.75	8
Laundry tray	4	8
Lavatory	2	8
Shower	3	8
Shower, balanced-pressure, thermostatic or combination balanced-pressure/thermostatic mixing valve	3	20
Sillcock, hose bibb	5	8
Sink, residential	2.5	8
Sink, service	3	8
Urinal, valve	12	25
Water closet, blowout, flushometer valve	25	45
Water closet, flushometer tank	1.6	20
Water closet, siphonic, flushometer valve	25	35
Water closet, tank, close coupled	3	20
Water closet, tank, one piece	6	20

For SI: 1 pound per square inch = 6.895 kPa,  
1 gallon per minute = 3.785 *Lim*.

a. For additional requirements for flow rates and quantities, see Section 604.4.

Figura 20: International Plumbing Code, Table 604.3

Summing up all the flow rate values for each utilities of the bathroom we found out a total flow rate of 9.34 gpm. In the following table it is shown the maximum demand for a ¾ inch size pipe is 11 gpm, this demonstrates that this diameter of the pipes is correct for our plumbing.



TABLE 604.10.1  
MANIFOLD SIZING

NOMINAL SIZE INTERNAL DIAMETER (inches)	MAXIMUM DEMAND (gpm)	
	Velocity at 4 feet per second	Velocity at 8 feet per second
1/2	2	5
3/4	6	11
1	10	20
1 1/4	15	31
1 1/2	22	44

For SI: 1 inch = 25.4 mm, 1 gallon per minute = 3.785 *Lim*,  
1 foot per second = 0.305 *m/s*.

Figura 21: International Plumbing Code, Table 604.10.1

Another way to double-check this size was given through an analytical calculation based on the most distant appliance from the machine room, that is the shower. Also in this way, using the Moody Diagram with the flow rate value and the head losses, we found out the same pipe diameter of 3/4 inch.

Moreover, we provide a calculation of the expansion coefficient needed by the expansion vessel. The expansion vessel (or expansion tank) is necessary to maintain closed the water heating systems and domestic hot water system from excessive pressure. Considering the system total capacity of 40 gallons, the minimum water temperature (system start) of 10 °C, the maximum water temperature (system peak) of 80 °C, the minimum absolute working pressure of 1 bar and the maximum absolute working pressure of 3,5 bars we obtain the expansion coefficient equal to 0,048 pt (0,0228 l).

To heat our water heater we used the AO Voltex Hybrid Electric water heater which is more than twice as efficient than a standard water heater and is energy star rated. This water heater reduces water heating cost by up to 71% by pulling heat from the environment, while also cooling and dehumidifying ambient air. The Voltex water heater is equipped with four operating modes. The Efficiency Mode uses only the heat pump to heat water, Hybrid mode which uses mainly the heat pump but uses the element to quickly heat water after use, Electric Mode uses only the electric element to heat the water, and Vacation mode which keeps the water heated to 60 °F.

Another point we thought crucial for our plumbing was not wasting a precious resource like water. So we decided to water the plants on the deck with greywater filtered and rainwater collected from a drain pipe on the roof. In addition to this we also figure out a system

that purifies the drinking water.

This reverse osmosis filter has a semipermeable membrane that extracts particles from the water making it pure and refreshing to drink. Drinking from this filtered water removes any unpleasant tastes that are caused from chemicals and contaminants that can get into the water. This filter provides quality water that will minimize the dependence on bottled water, which can be expensive and wasteful.



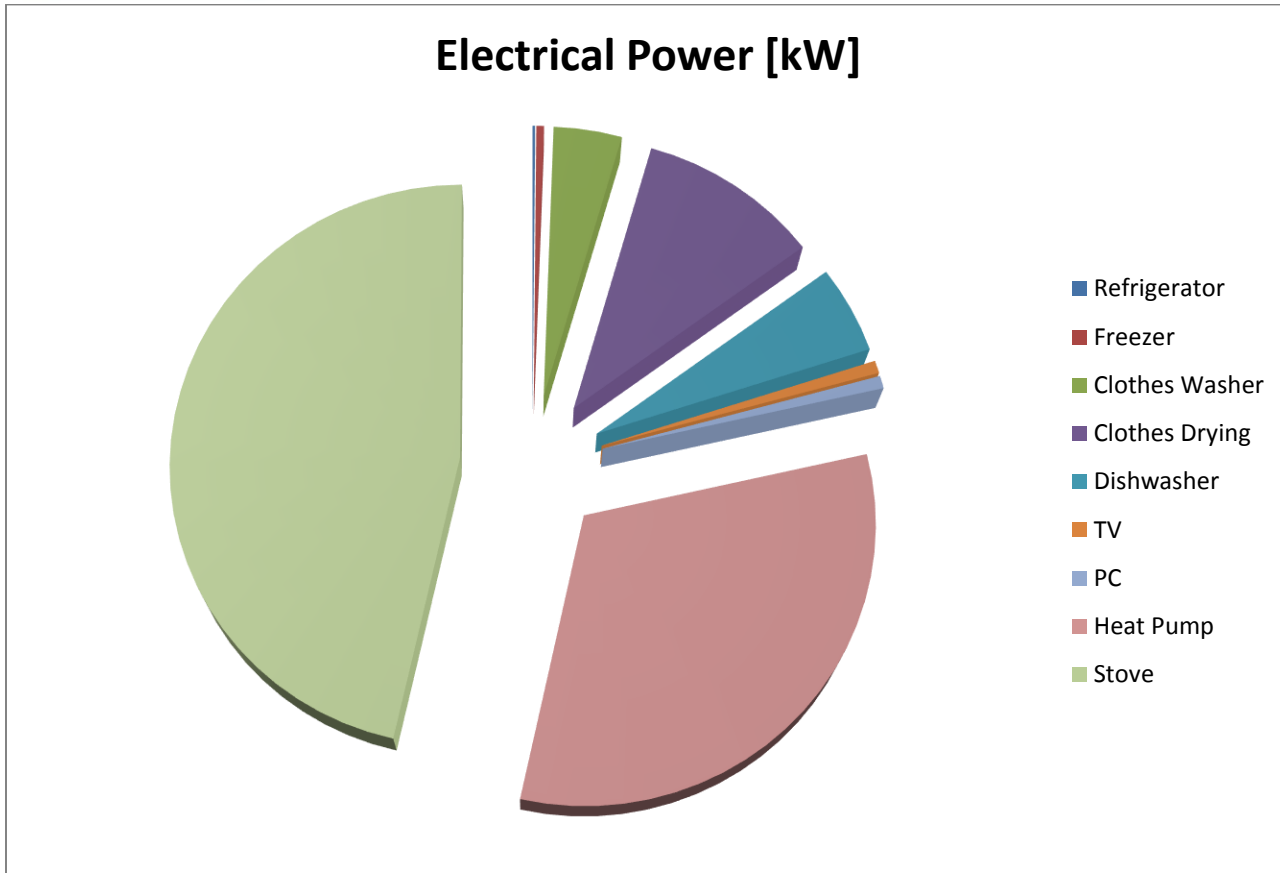
As the concept of the house, modularity plays a key role in the plumbing. Indeed, the main system is installed in the core container and it is composed by a manifold water distribution and a main pipe line that brings the water from the plants room to the kitchen and bathroom. In this way we used in the smartest way the pipe connections and we had everything already done before coming to California. The only task to do for the competition, since we don't want to be stressed working hard, is to plug-in the final pipes to the kitchen appliances and enjoying our plumbing.

### Consuming

To define the consumption of devices it is necessary to have an idea of the varying specific energy needed to operate them. In order to estimate the consumption we have chosen some similar appliances to those that will be used as furnishing in the contest and with their data sheet, we based the electric and thermic total utilization inserted in this paper. Based on our calculations we should have the following Power requests:

Appliances	ElectricalPower [kW]
Refrigerator	0,01
Freezer	0,03
ClothesWasher	0,27
ClothesDrying	0,72
Dishwasher	0,35
TV	0,05
PC	0,05
HeatPump	2,2
Stove	3,2

Energy values for the needed devices



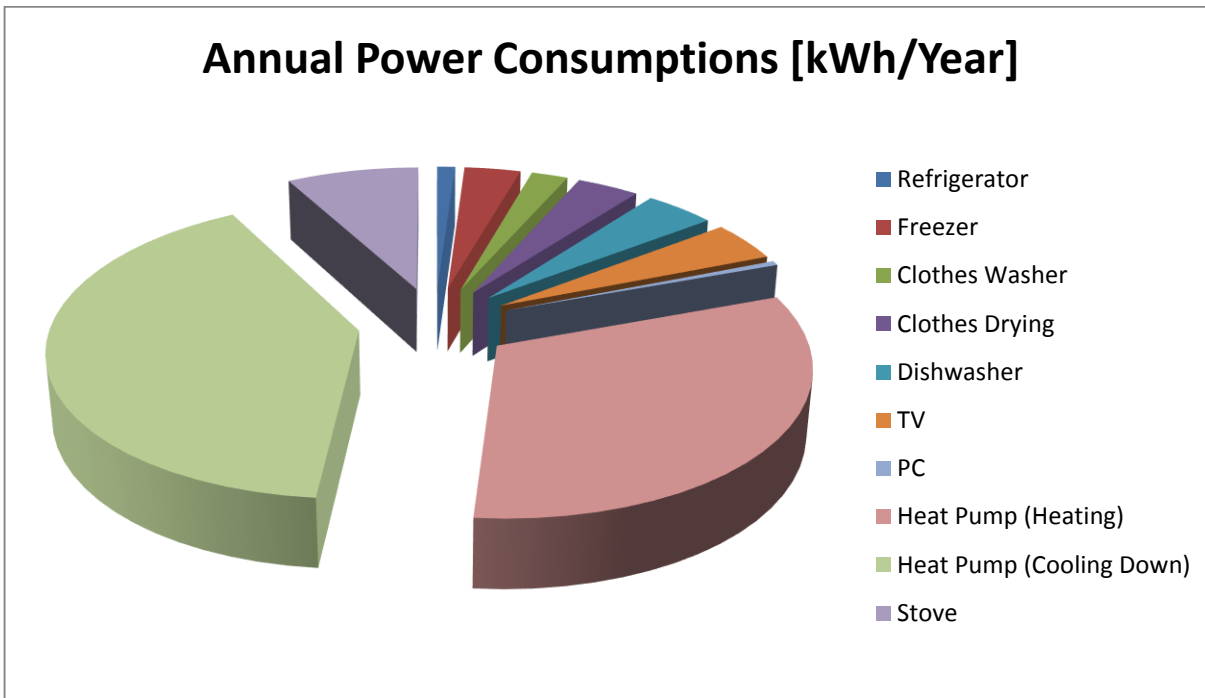
Energy graph for the devices

For the annual consumption so we expect:

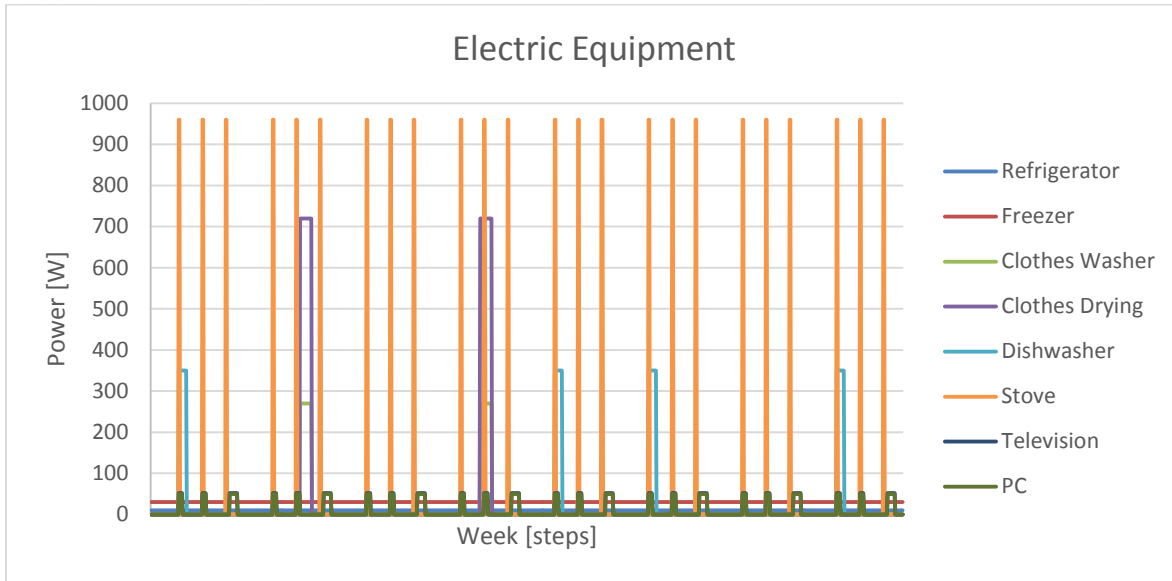
Appliance	Annual Power Consumptions [kWh/Year]
Refrigerator	75
Freezer	234
ClothesWasher	152
ClothesDrying	259
Dishwasher	295
TV	300



PC	34
Heat Pump (Heating)	2200
Heat Pump (Cooling Down)	2800
Stove	550



The following graph shows the power used for each appliances in the contest week.



## Solar Panels

The panels that are going to be used in the contest are produced by Sunmodule and is the *plus SW 280 mono* model. Those panels are very high efficient because of the monocrystalline cell type, that is the most expensive but even the best performing photosensitive material in the photovoltaic market. In every module we have 60 cells (156mmx156mm), covered by a tempered glass and framed in aluminum. The total weight of one module is 21.2kg.

## COMPONENT MATERIALS

<i>Cells per module</i>	60
<i>Cell type</i>	Mono crystalline
<i>Cell dimensions</i>	6.14 in x 6.14 in (156 mm x 156 mm)
<i>Front</i>	Tempered glass (EN 12150)
<i>Frame</i>	Clear anodized aluminum
<i>Weight</i>	46.7 lbs (21.2 kg)

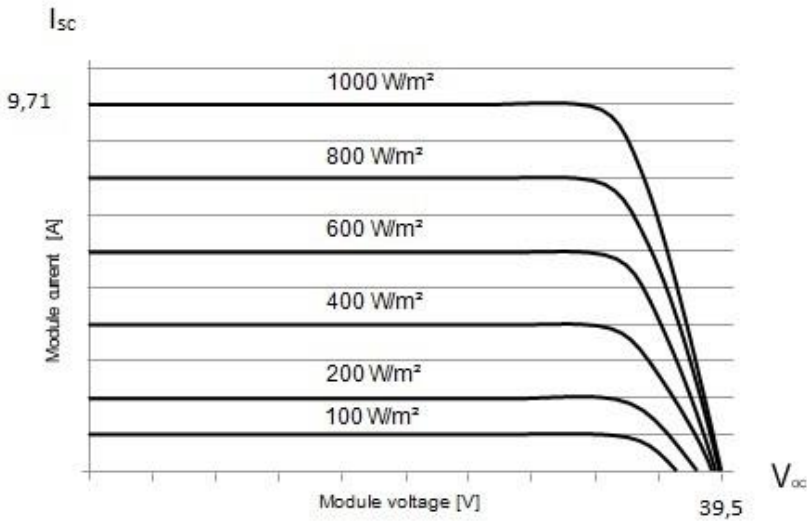
Here some scheduled details for Standard Conditions (STC: 1000 W/m<sup>2</sup>, 25°C, AM 1.5) and Nominal Operating Cell Temperature (NOCT: 800 W/m<sup>2</sup>, 46°C, AM 1.5):

### PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)

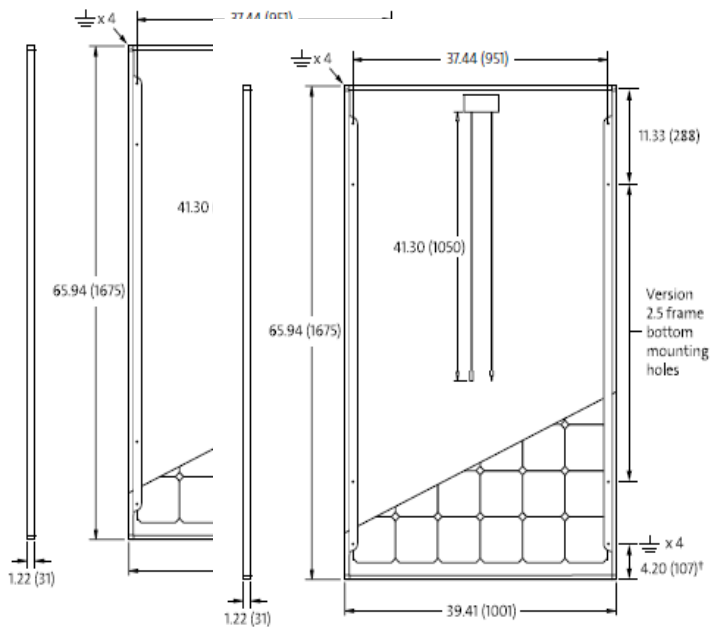
<i>Maximum power</i>	$P_{max}$	280 Wp
<i>Open circuit voltage</i>	$V_{oc}$	39.5 V
<i>Maximum power point voltage</i>	$V_{mpp}$	31.2 V
<i>Short circuit current</i>	$I_{sc}$	9.71 A
<i>Maximum power point current</i>	$I_{mpp}$	9.07 A

### PERFORMANCE AT 800 W/m<sup>2</sup>, NOCT, AM 1.5

<i>Maximum power</i>	$P_{max}$	209.2 Wp
<i>Open circuit voltage</i>	$V_{oc}$	36.1 V
<i>Maximum power point voltage</i>	$V_{mpp}$	28.5 V
<i>Short circuit current</i>	$I_{sc}$	7.85 A
<i>Maximum power point current</i>	$I_{mpp}$	7.33 A



We have to take into account that there will be a reduction in performance if operating under partial load conditions resulting in efficiency lower than the case study (really high temperatures as 46°C decrease panel's performances by 25%, but with 25°C even at 200 W/m<sup>2</sup>, the 98% of the STC efficiency is achieved), and varies of few percentage points. However the operating temperature of these devices ranges from -40°C to 85°C they are designed to withstand heavy accumulations of snow and ice and the glass on the top has an anti-reflective coating so that the radiation is not respited. The components have a guaranteed performance of 25 years (0.7% is the estimated maximum performance regression) and they satisfy requirements 3 times IEC's. The Plus-Sorting has high system efficiency and a positive performance tolerance: modules have greater than or equal to the nameplate rated power.

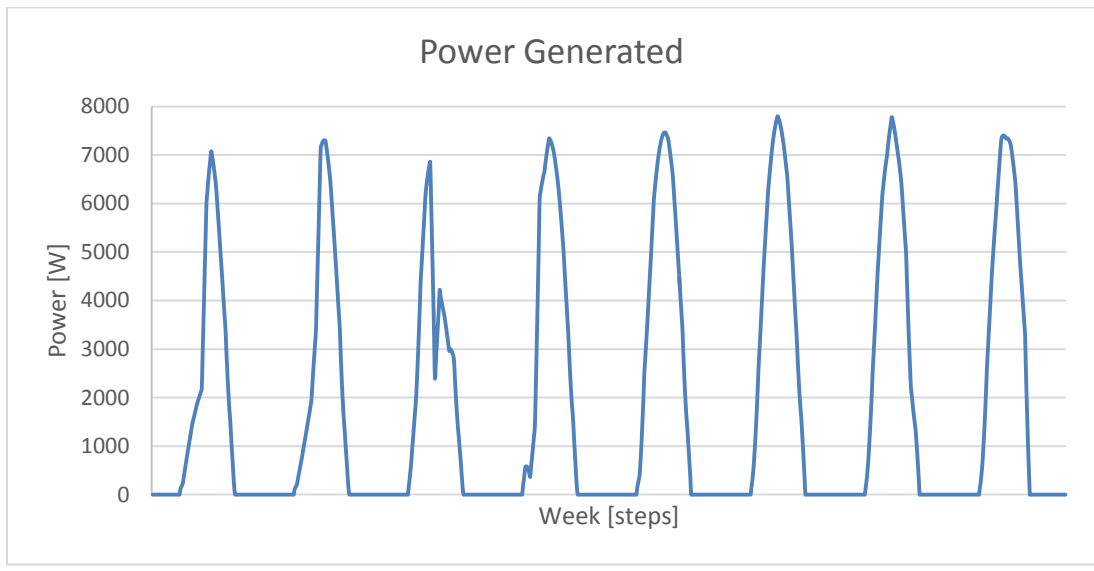






The modules are going to be installed on the arch, in the way to be flush with the arch itself, designed also to be a natural-inclined support for the panels. Actually the inclination, according to the structural necessities of the house is not the highest performance one. Since however the arch structure is directed at the South there is a significant surge in efficiency that recuperates the loss of wattage from the lack of optimal orientation.

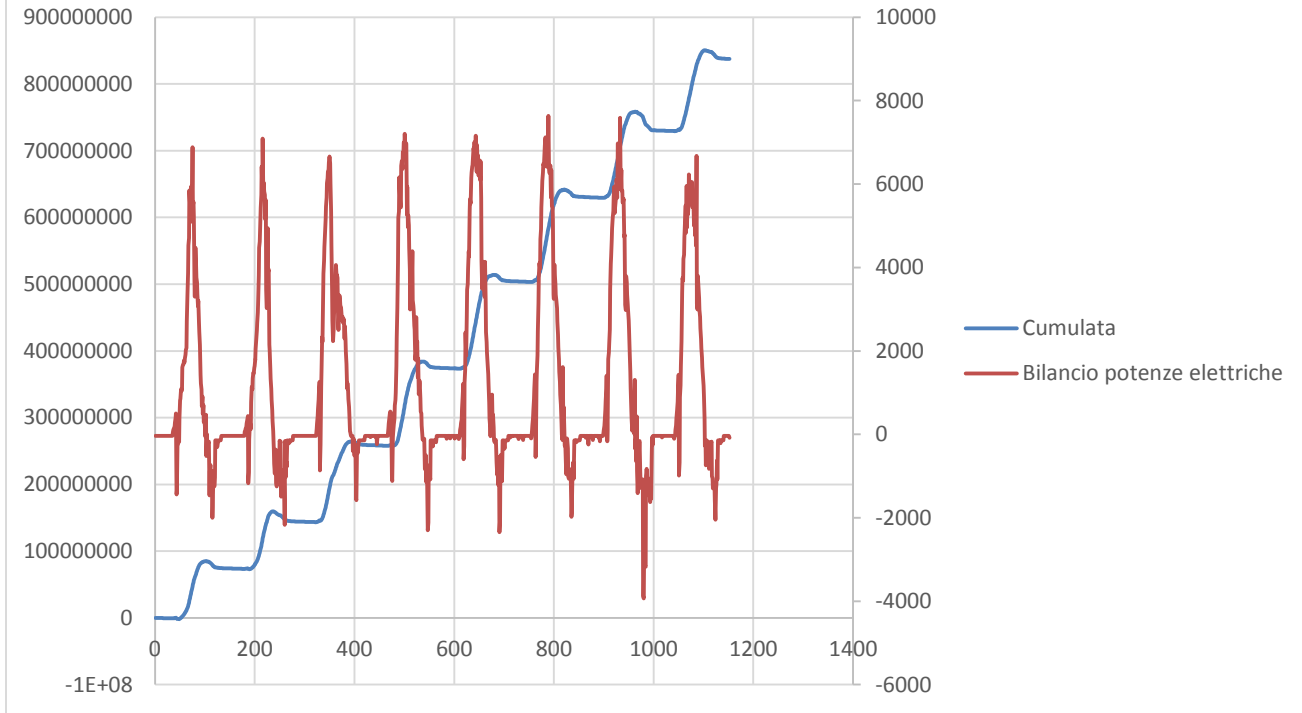
As far as the energy production goes, from the next graph is visible how much the house can produce in the contest week, according to the weather conditions given by the weather station Santa Ana-John Wayne Airport (Irvine, CA).



The last graph shows how much electrical power we produce compared to the total electrical balance.



Electrical power balances vs. generated power





## Quantity Takeoff of Competition Prototype House

Specification Number	Brief Description	Detailed Description	Qty	Unit
Division 01	General Requirements			
01 XX XX	Forklifts		2	Day
Division 02	Existing Conditions			
02 21 13	Site Survey, locate project on site	Lot Size	4680	Sq.Ft
Division 05	Metals			
05 12 23	Steel Structural Column	Section: HSS_SQR 6X6X1_4, Material: A500 GrB rectangular	10	L.F.
05 12 23	Steel Structural Beam	Section: W 12X19, Material A992 Gr50	7	Each
05 12 23	Steel Structural Long Girder	Section: W 16X26, Material A992 Gr50	6	Each
05 12 23	Steel Structural Girder	Section: W 10X12, Material A992 Gr50	12	Each
05 12 23	Steel Structural Beam	Section: W 10X12, Material A992 Gr50	7	Each
05 41 00	Steel Stud	Stud wall framing members	~50	Each
05 75 00	Formed Metal Arch	Arch structure used to support solar panels	4	Each
05 75 01	Decorative formed metal north wall	Structure for vegetated wall	1	Each
Division 06	Wood, Plastics and Composites			
06 13 23	Deck	Bison prefabricated decking	1854	S.F.
06 20 23	Cabinets	Various sized cabinets and cupboards for storage in kitchen area	200	S.F.
Division 07	Thermal and Moisture Protection			
07 13 54	Thermoplastic Sheet Waterproofing	Thermoplastic Membrane, Thickness: 48mm, Width: 5', SRI: 104	860	S.F.
07 21 16	Blanket Insulations	Recycled Denim Insulation, Depth: 2", R Value: 3.6-4/in, Properties: Flame spread: 5, Smoke Developed: 35	860	S.F.
07 21 29	Insulation	Roof insulation R-30	860	S.F.
07 25 00	Weather/Vapor Barrier	Tyvek Housewrap	1000	S.F.
07 53 23	RubberGard EPDM Roofing	Ethylene-Propylene-Diene-Monomer Roofing, Black waterproof roofing membrane	450	S.F.



07 27 19	EPDM Sealant	Seals the gaps in EPDM roofing	6	Sq.
07 71 23	MANUFACTURED GUTTERS AND DOWNSPOUTS	Aluminum downspouts, embossed, 2" x 3", .020" thick	60	L.F.
07 42 23	Typical Wood Siding	Wood Siding, Boards, cedar bevel, "A" grade, 1/2" x 6"	1000	S.F.
07 21 13.19	Exterior Walls Insulation	Foam board.	3600	S.F.
07 27 26	FLUID-APPLIED MEMBRANE AIR BARRIERS	Tremco ExoAir 220 Fluid Applied Vapor Permeable Air Barrier Membrane	1000	S.F.
07 53 29	Single-Ply Membrane, butyl, 1/16" thick, Elastomeric Sheet Membrane Conventional Roofing System	Thermoplastic Polyolefin Roofing, 60 mils, heat welded seams, fully adhered	6.9	Sq.
Division 08	Openings			
08 14 13	ENTRY/ KITCHEN, 90"W x 96"H, LOEWEN 5/32" THK. ARGON FILLED DBL. GLAZED CLEAR LITE W/ WOOD INT. FINISH, FD2 1520 LAR	French exterior door, fir, double, 1-3/4", 3'-0" x 6'-8", with glass lites	2	Each
08 16 13	OFFICE, 72"W x 96"H, LOEWEN 5/32" THK. ARGON FILLED DBL. GLAZED ETCHED LITE, Loewen FDR1824 W/ WOOD INT. FINISH, Metal Clad	French exterior door, fir, double, 1-3/4", 3'-0" x 6'-8", with glass lights	1	Each
08 15 16	BEDROOM DOOR, 60"W x 82"H, LOEWEN, 5/32" THK. ARGON FILLED DBL. GLAZED CLEAR LIT, FD2 1520 LARE, Metal Clad	French exterior door, fir, double, 1-3/4", 3'-0" x 6'-8", with glass lights	1	Each



08 16 13	MECHANICAL ROOM, 72"W x 93"H, THERMALLY RATED PANELS W/ EXT FINISH TO MATCH WALL FINISH, Allegeny Wood Works W/ EXT. FINISH TO MATCH WALL FINISH, Metal Clad	Rule of Thumb - Typical Exterior Door, prehung, exterior, wood	93	S.F.
08 14 73	BATHROOM, 66"W x 92"H, DBL. WOODED SLIDING PANELS W/OVERHEAD MOUNT ALUM. DBL. TRACK, Allegeny Wood Works	Rule of Thumb - Typical Interior Door, prehung, interior, flush, solid core	42	S.F.
08 33 23	LAUNDRY, 35"W x 84"H, WOOD ROLLING DOOR, Allegeny Wood Works	Doors, wood, residential, interior, closet, bi-fold, raised panel, pine, 6'-6" or 6'-8" x 2'-6" wide, incl. hardware, excl. frame and trim	1	Each
08 44 33	Awning 2' x 2', LOEWEN Wood low-E	Rule of Thumb - Typical Awning Window	576	Sq. In.
08 52 69	Casement 2' x 4'6", LOEWEN Wood low-E	Rule of Thumb - Typical Casement Window	1296	Sq. In.
08 XX XX	Fixed 4'-10" x 8'-0", LOEWEN Wood low-E	Rule of Thumb - Typical Fixed Window	5568	Sq. In.
08 XX XX	Fixed 5'-6" x 8'-0", LOEWEN Wood low-E	Rule of Thumb - Typical Fixed Window	1267 2	Sq. In.
Division 09	Finishes			
09 XX XX	GYPSUM BOARD	Gypsum wallboard, on walls, standard, w/compound skim coat (level 5 finish), 5/8" thick	2440	S.F.
9 XX XX	Typical Interior Paint	Paints & Coatings, walls & ceilings, interior, concrete, drywall or plaster, zero voc latex, 3 coats, smooth finish, roller	1200	S.F.
9 XX XX	Typical Exterior Paint	Paints & Coatings, siding, exterior, Texture 1-111 or clapboard, oil base, stain 2 coats, brushwork	1000	S.F.
				#REF!
Division 21	Fire Suppression			
21 10 00	Typical Wet Fire Sprinkler System	Sprinkler System Components, 6" fire cycle system, controls, includes panel, batteries, solenoid valves & pressure switches	739	SF/living
21 30 00	Fire Pump	A water pump used to provide pressure for the fire suppression system when it is triggered.	1	Each
Division 22	Plumbing			



22 16 00	Grey water filtration system	Aqua2use grey water filter and diverter to be used for irrigation purposes.	1	Each
22 00 00	Pumps	Pump, circulating, bronze, heated or chilled water application, in line, solder joints, 1/40 H.P., 3/4" size	3	Each
22 11 00	PEX pipe	Cross linked polyethylene water piping to be used for delivery and return of domestic water	739	SF/living
22 XX XX	DOMESTIC HOT WATER EXPANSION TANK	Amtrol 20 gal. capacity, factory pre-charge 40 PSI, max P 150 PSI, max temp 200 °F	1	Each
22 XX XX	HXEST EXPANSION TANK	Amtrol 2 gal. capacity, factory pre-charge 12 PSI, max P 100 PSI, max temp 240 °F	2	Each
22 33 00	50 gallon hot water heater	GE Geospring 50 gallon electric hybrid water heater	1	Each
22 XX XX	WALL MOUNTED CERAMIC TOILET	A wall mounted toilet with an in wall tank to be placed in the bathroom	1	Each
22 XX XX	ABOVE COUNTER MOUNTED CERAMIC SINK - Bath	A sink to be placed in the bathroom above the counter therein.	1	Each
22 XX XX	KITCHEN SINK	A double sink made of stainless steel to be placed on the kitchen counter.	1	Each
22 XX XX	KITCHEN FAUCET	A swiveling faucet to be placed in the kitchen.	1	Each
22 XX XX	SHOWER HEAD	A stainless steel shower head assembly complete with faucet to be placed in the bathroom	1	Each
22 XX XX	Shower Pan	A square shower pan to be placed in the bathroom.	1	Each
Division 23	Heating, Ventilating, and Air-Conditioning			
23 23 00	Refrigerant piping	Bendable teflon-cored steel wire wrapped refrigerant tubing use to connect and run fluid and gas to the HVAC cassettes from the central outdoor compressor unit.	350	ft
23 81 26	Fujitsu Ceiling Mounted Mini-split equipment	Fujitsu AUU18RCLX	5	Each
23 81 26	Outdoor Compressor	Fujitsu AOU18RLX	1	Each
23 81 26	Thermostat for HVAC	Fujitsu cassette type HVAC remote controller	1	
23 41 00	Particulate air filtration	Helios KWL EC 200 W	1	
23 41 01	Particulate air filtration for kitchen	Helios KWL EC 200 E	1	



Division 26	Electrical			
26 05 19	Type NM-B Cable	Copper Wiring, #14 AWG, #12 AWG		Each
26 05 26	Grounding Rod	Grounds entire electrical system form house	1	Each
26 05 33.16	Meter Socket	Accepts an electrical meter to connect to the house via panelboard	1	Each
26 09 13	Electrical Meter	Observes/records power usage through panelboard	1	Each
26 09 13	Smart Receptacles	Provide power to and monitors power use of a single device	30	Each
26 09 23	<u>Dimmer Switch</u>	Allows for variable luminosity control and on/off functionality of lights	8	Each
26 09 23	Single Pole Switch	Allows for on /off functionality of all lights connected in circuit	3	Each
26 09 23	Fan Switch	Allows variable motor speed control of fan motor	1	Each
26 24 16	Panelboard	150Amp, 16-space, 32-circuit panelboard,	1	Each
26 28 01	Fault Breaker	120V, 20 Amp, Arc Fault Breaker	1	Each
26 28 01	Fault Circuit Interrupter	120V, 20 Amp, Round Fault Circuit Interrupter Breaker	1	Each
26 28 01	Single Pole Breaker	120V, 15Amp, Single Pole Circuit Panel Insert	1	Each
26 31 00	Photovoltaic Collector	Sunmodule PLUS SW 280 Mono	30	Each
26 51 13	LED bulb	120V, 65W, 2850k	12	Each
26 51 13	Recessed Can Light Housing	6" dimmable LED housing	12	Each
26 51 13	Ceiling Fan	Hanging ceiling Fan	1	Each
26 51 13	Strip Lighting		1	Each
Division 34	Transportation			
N/A	Electric Car	Fiat 500e	1	Each





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## **Construction Specifications**

**Division 01 - General Requirements**

**Division 02 - Existing Conditions**

**Division 05 - Metals**

**Division 06 - Wood, Plastics, and Composites**

**Division 07 - Thermal and Moisture Protection**

07 21 16 Blanket Insulation

07 21 19 Foamed-In-Place Insulation

07 21 29 Sprayed Insulation

07 92 00 Joint Sealants

**Division 08 - Openings**

**Division 09 - Finishes Division**

**10 - Specialties**

**Division 11 - Equipment**

**Division 12 - Furnishings**

**Division 21 - Fire Suppression**

**Division 22 - Plumbing**

**Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC)**

**Division 25 - Integrated Automation**

**Division 26 - Electrical**

**Division 27 - Communications**

**Division 48 - Electrical Power Generation**



## **DIVISION 01- GENERAL REQUIREMENTS**

### **SECTION 01-11-00 - SUMMARY OF WORK**

#### **PART 1 - GENERAL**

##### 1.1 SUMMARY

- A. Project: STILE Home
  - 1. Project Location: Unknown
- B. Owner: West Virginia University & University of Roma Tor Vergata
- C. Designed by: West Virginia University & University of Roma Tor Vergata
- D. Constructed by: West Virginia University & University Roma Tor Vergata

#### **PART 2- PRODUCTS**

Not Used

#### **PART 3- EXECUTION**

Not Used

**END OF SECTION 01-11-00**



## SECTION 01-51-13 - TEMPORARY ELECTRICITY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Temporary electricity will be used during the construction phase of the competition.
- B. Following the construction phase all electricity will be obtained from the photovoltaic cells.

### PART 2 - PRODUCTS

#### 2.1 ELECTRICAL EQUIPMENT

- A. Manufacturer: APOLLO
- B. Model: AIR-COOLED DIESEL GENERATOR SET Model #: AED6500SR

### PART 3- EXECUTION

Not Used

**END OF SECTION 01-51-13**



## SECTION 01-51-26 - TEMPORARY LIGHTING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Temporary lighting will be needed throughout the construction process.

### PART 2 - PRODUCTS

#### 2.1 LIGHTING EQUIPMENT

- A. Manufacturer: Sunbelt Rentals
- B. Model: Terex/Amida Model #: AL4060D

### PART 3- EXECUTION

#### 1.1 TEMPORARY LIGHTING PLACED AS NECESSARY

**END OF SECTION 01-51-26**



## **SECTION 01-54-23 - TEMPORARY SCAFFOLDING & PLATFORMS**

### **PART 1- GENERAL**

#### 1.1 SUMMARY

- A. Temporary Scaffolding and Platforms will be needed during the beginning stages of construction

### **PART 2- PRODUCTS**

#### 1.1 SCAFFOLDING AND PLATFORM EQUIPMENT

- A. Manufacturer: Metaltech
- B. Model Number: M-MRT5710

### **PART 3-EXECUTION**

#### 1.1 INSTALLATION

- A. Construction of the scaffolding will meet all manufacture standards as well as all applicable OSHA standards.

**END OF SECTION 01-54-23**



## **DIVISION 05- METALS**

### **05-10-00 – STRUCTURAL METAL FRAMING**

#### **PART 1 – GENERAL**

##### 1.1 SUMMARY

A. Structural support for deck

##### 1.2 STANDARDS

- Complies with all regulations

#### **PART 2 – PRODUCTS**

##### 1.3 MATERIALS

###### 1.3.1 MANUFACTURER

- Versadeck

###### 1.3.2 MODEL

- VersaJoist Aluminum Deck Framing

###### 1.3.3 DESCRIPTION

- Aluminum beams and posts

#### **PART 3 – EXECUTION**



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1.4 Installation - See Appendix Below

**END OF SECTION 5-10-00**





## SECTION 05-12-23- STEEL COLUMNS

### PART 1 - GENERAL

#### 1.1 PERFORMANCE

- A. Product Data: HSS 6x6x1\_4 A992 Steel Typical
  - 1. Standards: Complies with ASTM standards
  
- B. Requirements
  - 1. Structural steel framing members, support members and struts
  - 2. Base plates, shear stud connectors

#### 1.2 REFERENCE STANDARDS

- A. AISC (MAN) - Steel Construction Manual; American Institute of Steel Construction, Inc.; 2011.
- B. AISC S348 - Specification for Structural Joints Using ASTM A325 or A490 Bolts; 2004.
- C. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- D. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2013.
- E. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2007.
- F. ASTM A514/A514M - Standard Specification for High-Yield Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding; 2005 (Reapproved 2009).
- G. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011.
- H. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2007a

#### 1.3 SUBMITTALS

- A. Shop Drawings:
  - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.

#### 1.4 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC "Steel Construction Manual."
- B. Comply with Section 10 of AISC "Code of Standard Practice for Steel Buildings and Bridges" for architecturally exposed structural steel.
- C. Maintain one copy of each document on site.



- D. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel (AC172).
- E. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in West Virginia.

## PART 2 – PRODUCTS

### 2.1 MATERIALS

- A. Steel Angles and Plates: ASTM A36/A36M
- B. Steel W Shapes and Tees: ASTM A992/A992M
- C. Rolled Steel Structural Shapes: ASTM A992/A992M
- D. Hot-Formed Structural Tubing: ASTM A992, seamless or welded
- E. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325N, Type 1, medium carbon, galvanized
- F. Headed Anchor Rods: ASTM F1554, Grade 36, zinc-coated

### 2.2 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors
- D. Develop required camber for members.

### 2.3 SOURCE QUALITY CONTROL

- A. Welded Connections: Visually inspect all shop-welded connections and test at least 10 percent of welds using one of the following:

### 2.4 MANUFACTURER

- A. Steel provided by Huntington Steel
- B. Fabricated by CEC Steel



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## **PART 3 – EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

### **3.2 ERECTION**

- A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges".
- B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components and shear studs indicated on shop drawing

**END OF SECTION 05-12-23**



**SECTION 05-70-00 – Decorative Metal**

Green Wall Columns

**Part 1 – General**

- 1.1 Performance
  - A. Continues the arch conceptually
  - B. supports the vertical garden
- 1.2 Material
  - A. Steel

**Part 2 – Products**

- 2.1 Manufacturer
  - A. Huntington
- 2.2 Model
  - A. HSS 10x4x3/8

**Part 3 – Execution**

- 3.1 Installation
  - A. Process – Standard
  - B. Quantity – 4

**END OF SECTION 05-70-00**



## **SECTION 05-73-00 – Decorative Metal Railings**

### Guardrails

#### **Part 1 – General**

- 1.1 Performance
  - A. Acts as a safety barrier on deck
  - B. ADA Compliant
- 1.2 Material
  - A. Rolled metal

#### **Part 2 – Products**

- 2.1 Manufacturer
  - A. Structural Systems, Wilson Works, comparable
- 2.2 Model
  - A. Custom

#### **Part 3 – Execution**

- 3.1 Installation
  - A. Standard

**END OF SECTION 05-73-00**



## SECTION 05-75-00- DECORATIVE FORMED METAL- STEEL ARCH

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. It is an Italian architectural design integrated as a functional energy-obtaining element.  
  
The Arch houses the solar panels and allows them to be placed at their optimal angle for maximum energy conversion. The arch also, thanks to the brises-soleil placed on it, shades the house which improves the passive ventilation system.
- B. Product Data: Custom made steel load bearing beams
- C. Standards: Complies with all laws and regulations

### PART 2- PRODUCTS

#### 2.1 MANUFACTURER:

- A. Huntington

#### 2.2 FABRICATION

- A. CEC

#### 2.3 MODEL

- A. Custom

#### 2.4 PRODUCT DATA

- A. Custom rolled ASTM Standard HSS 12x4x3\_8 A992 rolled steel (4)

### PART 3 – EXECUTION

#### 3.1 INSTALLATION

- A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges".
- B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components and shear studs indicated on shop drawings



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**END OF SECTION 05-75-00**





## SECTION 05-75-01 DECORATIVE FORMED METAL- NORTH GREEN WALL

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Performance: Provides structure for vegetated wall
- B. Product Data: Custom made steel columns HSS 10x4x3\_8
- C. Standards: Complies with ASTM Standards as outlined in 05-12-00

### PART 2 - PRODUCTS

#### 1.1 MANUFACTURER

- A. Steel provided by Huntington Steel
- B. Fabricated by CEC Steel

#### 1.2 OPERATIONS

- A. Support Green Wall

### PART 3 – EXECUTION

#### 1.1 INSTALLATION

- A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges".
- B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components and shear studs indicated on shop drawing

**END OF SECTION 05-75-01**



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**SECTION 05-75-02- DECORATIVE FORMED METAL- CARPORT SUPPORTS**



## DIVISION 06- WOODS, PLASTICS, AND COMPOSITES

### SECTION 06-10-63 – Exterior Rough Carpentry

#### Green Wall Beams

##### **Part 1 – General**

- 1.1 Performance
  - A. Continues the aesthetics of the Arch and Carport
  - B. Supports vertical garden planters
- 1.2 Material
  - A. Alaskan Yellow Cedar
  - B. 2"x2" nominal lumber
  - C. Posts ranging from 20" to 34" long
- 1.3 Standards
  - A. Complies with all laws and regulations

##### **Part 2 – Products**

- 2.1 Manufacturer
  - A. East Coast Lumber Company
- 2.2 Model
  - A. Alaskan Yellow Cedar

##### **Part 3 – Execution**

- 3.1 Installation
  - A. Process : Posts are located on the interior corners of the planters, as well as the interior center of the longer faces.
  - B. Quantity – 128

### **Lumber for Planters**

##### **Part 1 – General**

- 1.1 Performance
  - A. Frames and secures modular deck
  - B. Brings vegetation to the very edge at equal height of the deck
- 1.2 Material
  - A. Western Red Cedar
  - B. 5/4"x4" nominal lumber
  - C. Boards ranging from 18" to 8'



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### 1.3 Standards

- A. Complies with all laws and regulations

## **Part 2 – Products**

### 2.1 Manufacturer

- A. East Coast Lumber Company

### 2.2 Model

- A. Western Red Cedar

## **Part 3 – Execution**

### 3.1 Installation

- A. Process: The planter walls are built with the screws drilled starting from the interior of the planter. 2” deck screws are drilled through the interior posts, into the red cedar sides; 2 screws are drilled into each board.
- B. Quantity: 22

**END OF SECTION 06-10-63**



## **SECTION 06-10-63 – Exterior Rough Carpentry**

### **Part 1 – General**

#### 1.1 Performance

- A. Frames and secures modular deck
- B. Brings vegetation to the very edge at equal height of the deck

#### 1.2 Material

- A. Western Red Cedar

#### 1.3 Standards

- A. 5/4" x 4" nominal lumber
- B. Boards ranging from 18" to 8'

### **Part 2 – Products**

#### 2.1 Manufacturer

- A. East Coast Lumber Company

#### 2.2 Model

- A. Western Red Cedar

### **Part 3 – Execution**

#### 3.1 Installation

- A. Process: The planter walls are built with the screws drilled starting from the interior of the planter. 2" deck screws are drilled through the interior posts, into the red cedar sides; 2 screws are drilled into each board.
- B. Quantity: 22

**END OF SECTION 06-10-63**



## SECTION 06-13-23 - HEAVY TIMBER CONSTRUCTION- DECK

### PART 1- GENERAL

#### 1.1 SUMMARY

##### A. Performance

1. The deck creates a surface around the house that can be used for common outdoor living space.
2. Product data: 1"x6" composite boards of 60% recycled bamboo, 40% recycled plastic
3. Standards: Complies with all laws and regulations

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

##### A. Cali Bamboo

#### 2.2 MODEL NUMBER

##### A. 1x6 composite lumber

### PART 3- EXECUTION

#### 1.1 INSTALLATION: See following:

[http://www.calibamboo.com/mm5/pdf/installation\\_guides/bamdeck\\_composite\\_decking\\_installation\\_guide.pdf](http://www.calibamboo.com/mm5/pdf/installation_guides/bamdeck_composite_decking_installation_guide.pdf)

**END OF SECTION 06-13-23**



## **SECTION 06-13-63 – Wood Patio Decking**

### **Part 1 – General**

- 1.1 Performance
  - A. Provides decking level with the house
  - B. Enhances the exterior aesthetics
  - C. Modular for easy installation
- 1.2 Material
  - A. Cumaru hardwood
  - B. 23.875" x 23.875" x 1.69"
  - C. Weight: 24 lbs
  - D. Janka Hardness: 3,540 lbs.
  - E. Class A Fire rating
- 1.3 Standards
  - A. Complies with all laws and regulations

### **Part 2 – Products**

- 2.1 Manufacturer
  - A. Bison Innovative Products
- 2.2 Model
  - A. 2x2 Smooth Cumaru

### **Part 3 – Execution**

- 3.1 Installation
  - A. Process: See included Bison Guide
  - B. Quantity:



## SECTION 06-20-23 - INTERIOR FINISH CARPENTRY

### PART 1 - GENERAL

#### 1.1 PERFORMANCE

- A. Add storage space into the kitchen, dining, and or bathroom spaces

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. TBD

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Standard cabinet installation, involving screws and wall connectors

#### 3.2 QUANTITY

- A. TBD

**END SECTION 06-20-23**





## **DIVISION 07- THERMAL AND MOISTURE PROTECTION**

### **SECTION 07-13-54 THERMOPLASTIC SHEET WATERPROOFING**

#### **PART 1-GENERAL**

##### 1.1 PERFORMANCE:

- A. Provide exterior waterproofing with sheets of thermoplastic material

##### 1.2 MATERIAL

- A. thermoplastic membrane

##### 1.3 STANDARDS

- A. 48 mm thickness
- B. 5' width
- C. SRI: 104

#### **PART 2-PRODUCTS**

##### 2.1 MANUFACTURER

- A. Sika Sarnafil

##### 2.2 MODEL NUMBER

- B. Sarnafil G Membrane

##### 2.3 OPERATION See user manual

#### **PART 3 - EXECUTION**

##### 3.1 OPERATION

- A. See user manual

**END OF SECTION 07-13-54**



## SECTION 07-21-16-BLANKET INSULATION

### PART 1- GENERAL

#### 1.1 PERFORMANCE

- A. Provide interior insulation inside of thermal boundary

### PART 2 - PRODUCTS

#### 2.1 SUMMARY

- A. Recycled Denim Insulation

- 1. Specifications:
  - a. 2" Depth
  - b. R Value: 3.6-4/in
- 2. Properties: -Flame Spread 5 (class 1)
  - a. Smoke Developed 35 (class 1)
  - b. Corrosion, Fungal, Moisture, Bacterial Resistance Passed

- B. Batt Insulation

- 1. Specifications
  - a. 9" or less depth
  - b. R Value: 3.34/in
- 2. Properties
  - a. Flame Spread 25
  - b. Smoke Developed 50
  - c. Corrosion, Fungal, Moisture, Bacterial Resistance Passed

### PART 3 - EXECUTION



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### 3.1 PERFORMANCE

- A. Installed at a 2" depth on interior walls
- B. Installed at variant depth in roofing sections

**END OF SECTION 07-21-16**



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## SECTION 07-25-00 - WEATHER BARRIER

### PART 1 - GENERAL

#### 1.1 PERFORMANCE

- A. To be used to protect structure and substrate from moisture damage from the exterior

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. DuPont or comparable

#### 2.2 MODEL NUMBER

- A. Tyvek HomeWrap or comparable

#### 2.3 OPERATION

- B. See user manual

### PART 3 - EXECUTION

#### 3.1 STANDARD

**END OF SECTION 07-25-00**



## **SECTION 07-53-23 - ETHYLENE-PROYLENE-DIENE-MONOMER ROOFING**

### **PART 1 - GENERAL**

#### 1.1 PERFORMANCE

- A. Provide waterproofing for the roof in a simple and easy to install manner

#### 1.2 PRODUCT DATA

- B. RubberGard EPDM or comparable

#### 1.3 STANDARDS

- C. See manual for standards

### **PART 2 - PRODUCTS**

#### 2.1 MANUFACTURER

- A. Firestone Building Products

#### 2.2 MODEL NUMBER

- B. RubberGard EPDM or comparable

- 1. Operation

- a. See user manual

### **PART 3 - EXECUTION**

#### 3.1 INSTALLATION

- A. See user manual

**END OF SECTION 07-53-23**



## **DIVISION 08- OPENINGS**

### **SECTION 08-32-13 - SLIDING ALUMINUM-FRAMED GLASS DOORS**

#### **PART 1 - GENERAL**

##### 1.1 PERFORMANCE

- A. The Western and Eastern walls in the living room are large sliding-glass doors designed to emphasize the strong relation between interior and exterior.
- B. Product Data
  - 1. Size: 6'x7.9'
  - 2. Extra clear glazed
  - 3. Triple glazed
  - 4. Argon fill
  - 5. Aluminum frame
- C. Standards
  - 1. Complies with all laws and regulations

#### **PART 2- PRODUCTS**

##### 1.1 MANUFACTURER

- A. Askeen

##### 1.2 MODEL



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A. Custom

### 1.3 OPERATION

A. Operates normally under standard conditions

## PART 3- EXECUTION

### 3.1 PROCEDURES

A. Installation Standard

1. Process

a. Custom, Askeen will be hosting a training session to assist team with the installation of their custom manufactured window panels.

2. Quantity: 4

**END OF SECTION 08-32-13**





## SECTION 08-51-13 - ALUMINIUM WINDOWS

### PART 1 - GENERAL

#### 1.1 PERFORMANCE

- A. Windows will add visual appeal to the front of the house box. The windows will allow for a more open feel to the house, making the home feel larger. The windows will also act as a physical separation from the outside, while also allowing people in the house to feel as though they are sitting in the outdoors.

#### 1.2 PRODUCT DATA

##### A. Specifications

1. Size: 12.6'x7.9'
2. Extra clear glazed
3. Triple glazed
4. Argon fill
5. Aluminum frame

##### D. Standards

1. Complies with all laws and regulations

### PART 2- PRODUCTS

#### 2.1 SPECIFICATIONS



- A. Manufacturer
  - 1. Askeen
- B. Model
  - 1. Custom
- C. Operation
  - 1. Operates normally under standard conditions

### **PART 3- EXECUTION**

#### 3.1 SPECIFICATIONS

- B. Installation Standard
  - 3. Process
    - b. Custom, Askeen will be hosting a training session to assist team with the installation of their custom manufactured window panels.
  - 4. Quantity: 3

**END OF SECTION 08-51-13**



## SECTION 8-60-00 – SKYLIGHTS

### Part 1 – General

#### 1.1 PERFORMANCE

- A. The skylight is used for the solar chimney. It provides natural ventilation for the house using passive cooling.

#### 1.2 PRODUCT DATA

- A. Manufacturer:
  - 1. Velux
- B. Model:
  - 1. VSS-SO6
- C. Specifications:
  - 1. Size: 44 ¼ x 45 ¾ in.

**END OF SECTION 8-60-00**



## **DIVISION 09-FINISHES**

### **SECTION 09-22-16.13 – Non-Structural Metal Stud Framing**

#### **PART 1 – GENERAL**

##### **1.1 PERFORMANCE**

- A. Studs added for ease of construction and to hold gypsum wall board
- B. Product Data: Alloy steel stud to replace standard wooden stud
- C. Standards: Complies with all laws and regulations

#### **PART 2 - PRODUCTS**

##### **1.1 SUPPLIER**

- A. CSC- Construction Supply Co.

##### **1.2 MODEL**

- A. 22 gauge steel stud
- B. Operation: Operates normally under standard conditions

#### **PART 3 - EXECUTION**

##### **3.1 INSTALLATION**

- A. Process:
  - 1. Place toe board
  - 2. Erect studs 16" on center
  - 3. Add headboard and fasten

**END OF SECTION 09-22-16.13**



## SECTION 09-90-00 PAINTING

### PART 1-GENERAL

#### 1.1 INTERIOR PAINT

##### A. Performance

1. Seals the interior walls and improves aesthetic appeal

##### B. Material

1. Made from 100% Acrylic Latex

##### C. Standards

1. Complies with all laws and regulations

### PART 2-PRODUCTS

#### 2.1 MANUFACTURER

- A. Valspar, or comparable

#### 2.2 MODEL

- B. Ultra-Gallon Sized Interior Semi-Gloss White-Latex Base Paint and Primer in One

### PART 3-EXECUTION

#### 3.1 INSTALLATION

- A. Apply with paint brushes and rollers

**END OF SECTION 09-90-00**



## SECTION 09-91-00 WOOD FLOORING

### PART 1-GENERAL

#### 1.1 FLOORING

##### A. Performance

1. Flooring for living room, kitchen and bedroom.

##### B. Material

1. Tawny Oak

##### C. Surface

1. 615 SF

### PART 2-PRODUCTS

#### 2.1 Complies with all laws and regulations

##### A. MANUFACTURER

1. Best Laminate

##### B. MODEL

- 2 Malted Tawny Oak Reclaime Laminate

### PART 3-EXECUTION

#### 1. INSTALLATION

- A. Manual

**END OF SECTION 09-91-00**



## SECTION 09-91-01 WOOD FLOORING

### PART 1-GENERAL

#### 1. FLOORING

##### A. Performance

1. Flooring for bathroom.

##### B. Material

1. Appalachian Vinyl

##### C. Surface

1. 56 SF

### PART 2-PRODUCTS

1. Complies with all laws and regulations

#### 1. MANUFACTURER

##### A. Best Laminate

#### 2. MODEL

##### B. Appalachian Vinyl

### PART 3-EXECUTION

#### 1. INSTALLATION

##### A. Manual

**END OF SECTION 09-91-01**



## SECTION 09-91-02 WOOD FLOORING

### PART 1-GENERAL

#### 1. EXTERIOR PANELS

##### A. Performance

1. Panels for the exterior finish

##### B. Material

1. Fiber-reinforced plastic

##### C. Surface

1. 1. 808sf

### PART 2-PRODUCTS

1. Complies with all laws and regulations

#### 1. MANUFACTURER

- A. Fiber-tech Industries

#### 2. MODEL

- B. Custom counter

### PART 3-EXECUTION

#### 1. INSTALLATION

- A. Normal installation

**END OF SECTION 09-91-00**





## DIVISION 10-SPECIALTIES

### SECTION 10-10-00

#### PART 1-GENERAL

##### 1. TOWEL BAR

###### A. Performance

###### 1. Wall mounted

###### B. Dimensions

###### 1. 18"

#### PART 2-PRODUCTS

##### 1. Complies with all laws and regulations

##### 1. MANUFACTURER

###### A. Delta

##### 2. MODEL

###### B. 77118

#### PART 3-EXECUTION

##### 1. INSTALLATION

###### A. Manual

**END OF SECTION 10-10-00**



## SECTION 10-11-00

### PART 1-GENERAL

#### 1. TOWEL RING

##### A. Performance

1. Wall mounted

##### B. Dimensions

1. 5"

### PART 2-PRODUCTS

1. Complies with all laws and regulations

#### 1. MANUFACTURER

##### A. Delta

#### 2. MODEL

- B. 77150

### PART 3-EXECUTION

#### 1. INSTALLATION

##### A. Manual

**END OF SECTION 10-11-00**



**SECTION 10-12-00**

**PART 1-GENERAL**

1. PAPER TOILET HOLDER

A. Performance

1. Wall mounted

B. Dimensions

1. 5"

**PART 2-PRODUCTS**

1. Complies with all laws and regulations

1. MANUFACTURER

A. Delta

2. MODEL

- B. 77146

**PART 3-EXECUTION**

1. INSTALLATION

A. Manual

**END OF SECTION 10-12-00**



## Section 10 14 00- Signage

### Part 1- Sign Location

See Sign Placement Plan image

## DIVISION 11-EQUIPMENT

### SECTION 11-10-00 RANGE HOOD/ MICROWAVE

#### PART 1-GENERAL

##### 1. RANGE HOOD / MICROWAVE

###### A. Dimensions

1. 16-13/32H x 29-7/8W x 15-1/32"D

#### PART 2-PRODUCTS

1. Complies with all laws and regulations

##### 1. MANUFACTURER

- A. HD supply

##### 2. MODEL

- B. 286802

#### PART 3-EXECUTION

##### 1. INSTALLATION

- A. Manual

**END OF SECTION 11-10-00**



## SECTION 11-11-00 WASHER

### PART 1-GENERAL

#### 1. WASHER

##### A. Performance

1. performs normally under standard conditions

##### B. Dimensions

1. 36H x 27W x 30-9/16"D

### PART 2-PRODUCTS

1. Complies with all laws and regulations

#### 1. MANUFACTURER

##### A. HD supply

#### 2. MODEL

- B. 515410

### PART 3-EXECUTION

#### 1. INSTALLATION

##### A. Normal installation

**END OF SECTION 11-11-00**



## SECTION 11-12-00 DRYER

### PART 1-GENERAL

#### 1. WASHER

##### A. Performance

1. operates normally under standard conditions

##### B. Dimensions

1. 40.25H x 29.0W x 28.25D

### PART 2-PRODUCTS

1. Complies with all laws and regulations

#### 1. MANUFACTURER

##### A. HD supply

#### 2. MODEL

- B. 579964

### PART 3-EXECUTION

#### 1. INSTALLATION

##### A. Normal installation

**END OF SECTION 11-12-00**



## SECTION 11-14-00 DRYER

### PART 1-GENERAL

#### 1. DISHWASHER

##### A. Performance

1. operates normally under standard conditions

##### B. Dimensions

1. 35H x 24W x 25"D

### PART 2-PRODUCTS

1. Complies with all laws and regulations

#### 1. MANUFACTURER

##### A. HD supply

#### 2. MODEL

- B. 286782

### PART 3-EXECUTION

#### 1. INSTALLATION

##### A. Normal installation

**END OF SECTION 11-13-00**



## SECTION 11-13-00 REFRIDGERATOR

### PART 1-GENERAL

#### 1. REFRIGERATOR

##### A. Performance

1. operates normally under standard conditions

##### B. Dimensions

1. 1/8H x 28W x 29-7/8"D

### PART 2-PRODUCTS

1. Complies with all laws and regulations

#### 1. MANUFACTURER

##### A. HD supply

#### 2. MODEL

- B. 642251

### PART 3-EXECUTION

#### 1. INSTALLATION

##### A. Normal installation

**END OF SECTION 11-13-00**

## SECTION 11 31 13 - RESIDENTIAL KITCHEN APPLIANCES

### SECTION 11 31 00 - DISHWASHER





## **PART 1 - GENERAL**

### 1.1 PERFORMANCE

- A. performs normally under standard conditions

### 1.2 PRODUCT DATA

- A. controls on front panel with handle for opening door

### 1.3 STANDARDS

- A. complies with all laws and regulations

## **PART 2 - PRODUCTS**

### 2.1 MANUFACTURER - GE

### 2.2 MODEL – ADT521PGF2BS

### 2.3 OPERATION – washes dishes

### 2.4 DIMENSIONS -

- A. Height: 34-1/2"
- B. Width: 24"
- C. Depth: 24"

## **PART 3 - EXECUTION**



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### 3.1 1 INSTALLATION

- A. Normal installation
  
- B. PROCESSES – N/A
  
- C. QUANTITY -1

**END OF SECTION 11 31 00**



**DIVISION 12 FURNISHES**

**SECTION 12-10-00**

**PART 1-GENERAL**

1. KITCHEN CABINETS

A. Performance

1. operates normally under standard conditions

B. Dimensions

1. 18H / 33W / 12D
2. 36H / 30W / 12D
3. 36H / 24W / 12D
4. 18H / 30 W /12 D
5. 36H / 18 W / 12 D
6. 34.5H / 54W / 25D
7. 34.5H /18W /25D

C. Material

2. Plastic with aluminum edge banding

**PART 2-PRODUCTS**

1. Complies with all laws and regulations

1. MANUFACTURER

A. Wood-mode

2. MODEL

- B. 806 Vertical Gulf Shorts Laminate - HR2 Pulse

**PART 3-EXECUTION**

1. INSTALLATION

A. Normal installation

**END OF SECTION 12-10-00**



## SECTION 12-11-00

### PART 1-GENERAL

#### 1. BATHROOM VANITY

##### A. Performance

1. operates normally under standard conditions

##### B. Dimensions

1. 35H / 36W / 2D

##### C. Material

2. Plastic with aluminum edgebanding

### PART 2-PRODUCTS

1. Complies with all laws and regulations

#### 1. MANUFACTURER

##### A. Wood-mode

#### 2. MODEL

- ##### B. 806 Vertical Gulf Shorts Laminate - HR2 Pulse

### PART 3-EXECUTION

#### 1. INSTALLATION

##### A. Normal installation

**END OF SECTION 12-11-00**



## SECTION 12-12-00

### PART 1-GENERAL

#### 2. COUNTER TOP

##### A. Performance

1. operates normally under standard conditions

##### B. Dimensions

1. 30H / 44W / 26D

##### C. Material

2. Quartz

### PART 2-PRODUCTS

2. Complies with all laws and regulations

#### 3. MANUFACTURER

- A. Cambria Quartz

### PART 3-EXECUTION

#### 2. INSTALLATION

- A. Normal installation

**END OF SECTION 12-12-00**



## SECTION 12-13-00

### PART 1-GENERAL

3. BATHROOM COUNTERTOP

A. Performance

1. operates normally under standard conditions

B. Dimensions

1. 1.25H / 36W / 26"D

C. Material

2. Quartz

### PART 2-PRODUCTS

3. Complies with all laws and regulations

4. MANUFACTURER

A. Cambria Quartz

### PART 3-EXECUTION

3. INSTALLATION

A. Normal installation

**END OF SECTION 12-13-00**



## SECTION 12-14-00

### PART 1-GENERAL

- 4. BED
  - A. Performance
    - 1. operates normally under standard conditions
  - B. Dimensions
    - 1. 1' 8"H / 6' 8"W / 6' 2"D
  - C. Material
    - 2. Wood and aluminum

### PART 2-PRODUCTS

- 4. Complies with all laws and regulations
- 5. MANUFACTURER
  - A. Cassina or similar

### PART 3-EXECUTION

- 4. INSTALLATION
  - A. Normal installation

**END OF SECTION 12-14-00**



**SECTION 12-15-00**

**PART 1-GENERAL**

- 5. COUCH
  - A. Performance
    - 1. operates normally under standard conditions
  - B. Dimensions
    - 1. 26"H /70"W /34"D
  - C. Material
    - 2. Leather

**PART 2-PRODUCTS**

- 5. Complies with all laws and regulations
- 6. MANUFACTURER
  - A. Minotti or similar

**PART 3-EXECUTION**

- 5. INSTALLATION
  - A. Normal installation

**END OF SECTION 12-15-00**





## SECTION 12-93-00 – Site Furnishings

### Part 1 – General

#### 1.1 Performance

- A. Provides a means of creating a vertical garden through the use of pocketed fiber panels.
- B. Provides a media for nutrients and water to reach the plants conservatively.

#### 1.2 Material

- A. Recycled P.E.T. plastic felt pockets
- B. 1.5 LBS/SQ FT
- C. 5 LBS/ SQ FT fully planted
- D. Panel size is 32"x24"x5"
- E. Pocket size is 10"x6"x3"

#### 1.3 Standards

- A. Complies with all laws and regulations

### Part 2 – Products

#### 2.1 Manufacturer

- A. Florafelt Vertical Garden Systems

#### 2.2 Model

- A. 12-pocket panel

### Part 3 – Execution

#### 3.1 Installation

- A. Process: See included Florafelt Vertical Garden guide
- B. Quantity – 12

**END OF SECTION 12-93-00**

## DIVISION 13 SPECIAL CONSTRUCTION

### SECTION 13-31-00 FABRIC STRUCTURES



## **PART 1- GENERAL**

### 1.1 VERTICAL GARDEN PLANTERS

#### A. Performance

1. Creates a pocket and structure for plant material to grow in

#### B. Material

1. Made from 100% recycled PET plastic felt

#### C. Standards

1. Complies with all laws and regulations

## **PART 2- PRODUCTS**

### 2.1 MANUFACTURER

- A. FloraFelt

### 2.2 MODEL

- B. 12-pocket

## **PART 3- EXECUTION**

### 3.1 INSTALLATION

- A. Hang from nylon tabs onto backboard

**END OF SECTION 13-31-00**



## DIVISION 21 FIRE SUPPRESSION

### 21-10-00 WATER-BASED FIRE-SUPPRESSION SYSTEMS

#### PART 1- GENERAL

##### 1.1 SUMMARY

A. This section describes the wet pipe automatic sprinkler system used in the STILE house.

B. Related sections:

1. Division 21-30-00 Fire Pumps
2. Fire suppression water storage

##### 1.2 SECTION REQUIREMENTS

A. Fire suppression system description

1. The system shall be designed in accordance with IRC standards as well as the standards set forth in NFPA 13. The STILE house is categorized as a low hazard dwelling. The suppression system will be pressurized by a fire pump which meets NFPA standards and water used for suppression purposes will be stored meeting all ASME standards applicable.

B. Submittals

1. System drawings and information for all products used in the system.

C. Design and installation approval

1. The system will meet all requirements set forth by authorities in the area with jurisdiction.

D. The sprinkler system shall meet or exceed all of the requirements in both NFPA code and IRC as well as state-based requirements for such systems.

E. UL listed and labeled products are used.

##### 1.3 GENERAL REQUIREMENTS



A. The house shall be fitted with sprinklers in every room except for areas which NFPA code has determined that they are not necessary.

## **PART 2- PRODUCTS**

### 2.1 MANUFACTURERS

- a. Viking Corporation: <http://www.vikingcorp.com/>
- b. Blazemaster

### 2.2 PRODUCTS

- a. Pipe, fittings, and accessories: Chlorinated polyvinyl chloride pipe shall meet all requirements including UL listing for use in a wet pipe fire suppression system.
  - i. Product: 1 in Fire Protection CPVC pipe
- b. Service valves: UL listed valves that meet all requirements will be implemented in the system and will comply with NFPA guidelines.
- c. Automatic sprinklers: Residential sprinklers with heat responsive elements which are UL compliant will be implemented in appropriate areas depending on their individual requirements.
  - i. Product: Viking Freedom flat concealed pendent sprinkler- VK4570 or comparable

## **PART 3- EXECUTION**

### 3.1 INSTALLATION

- a. Installation of all components will be carried out in accordance with applicable building and fire codes and will follow the instructions given by the manufacturer of the specific products that are being employed.

**END OF SECTION 21-10-00**



## SECTION 21-30-00 FIRE PUMP

### PART 1- GENERAL

#### 1.1 SUMMARY

- A. This section describes the pump that is to be used for the STILE house's fire suppression system.
- B. Related sections
  - 1. 21-10-00 Water-Based Fire-Suppression Systems

#### 1.2 SECTION REQUIREMENTS

- A. Pump description: A fire pump shall be used to pressurize the fire suppression system in order to allow the system to dispense water properly when triggered.
- B. Submittals
  - 1. Manufacturer manuals and pump data
- C. Design and installation approval
  - 1. The system will meet all requirements set forth by authorities in the area with jurisdiction.
- D. The system will comply with all applicable NFPA code and IRC requirements.
- E. The pump is UL listed and labeled.

### PART 2- PRODUCTS

#### 2.1 MANUFACTURER

- A. Talco Fire Systems: <http://www.talcofire.com/>

#### 2.2 PRODUCTS

- A. Fire pump



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1. UL and NFPA compliant fire pump that will be compatible with the other components of the fire suppression system.
2. Product
  - a. Talco LSF-500CIG3 compact residential fire pump or comparable

### **PART 3- EXECUTION**

#### 3.1 Installation

- A. The pump is to be installed according to the instructions provided by the product's manufacturer.

**END OF SECTION 21-30-00**



## DIVISION 22- PLUMBING

### SECTION 22-11-00 – FACILITY WATER DISTRIBUTION

#### PART 1 – GENERAL

##### 1.1 DESCRIPTION

A. Domestic water systems, including piping, equipment and all necessary accessories as designated in this section.

##### 1.2 SUBMITTALS

###### A. General

1. Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

###### B. Product Data

1. Submit manufacturer's product submittal data and installation instructions.

##### 1.3 COMPLIANCE

###### A. International Plumbing Code (IPC)

1. ICBO Evaluation Service (ES) Evaluation Report No. 5142
2. SBCCI Standard Plumbing Code (PST and ESI Report No. 9661)

###### B. Building Officials and Code Administrators International (BOCA)

1. 1993 BOCA National Plumbing Code

###### C. Uniform Plumbing Code (UPC)

1. IAPMO Files 3558, 3946 and 3960

###### D. National Standard Plumbing Code (NSPC)

###### E. HUD Material Release No. 1269



## PART 2 - PRODUCTS

### 2.1 PIPING AND FITTINGS

#### A. PEX tubing

1. Wptc12, water PEX tubing, poly-alloy fittings

#### B. PEX

1. Manufacturer

- a. Apollo

2. Tubing

- a.  $\frac{1}{2}$ " &  $\frac{3}{4}$ " Apollo PEX (Red and White)

3. Fittings:

- a. Copper PEX adapters with rings

- b. Copper PEX manifolds with rings

- C. Transition Fittings: Manufactured piping coupling or specified piping system fitting.

1. Same size as pipes to be joined and pressure rating at least equal to pipes to be joined.





## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Comply with the International Plumbing Code and the following
  1. Install branch piping for water from the piping system and connect to all fixtures, valves, cocks, outlets, casework, cabinets and equipment, including those furnished by the Government or specified in other sections.
  2. Pipe shall be round and straight. Cutting shall be done with proper tools. Pipe, except for plastic and glass, shall be reamed to full size after cutting.
  3. All pipe runs shall be laid out to avoid interference with other work.
  4. Install union and shut-off valve on pressure piping at connections to equipment.
- B. Piping shall conform to the following:
  1. Domestic Water:
    - a. Grade all lines to facilitate drainage.
    - b. Provide drain valves at bottom of risers and all low points in system.
    - c. Design domestic hot water circulating lines with no traps.
    - d. Connect branch lines at bottom of main serving fixtures below and pitch down so that main may be drained through fixture. Connect branch lines to top of main serving only fixtures located on floor above.
- C. Soldered Joints
  1. Comply with procedures in ASTM B 828 unless otherwise indicated
- D. Plumbing System



1. Install the Plumbing System in accordance with the PEX tubing manufacturer's recommendations and as indicated in the installation handbook.
2. Do not install PEX tubing within 12 inches (305 mm) of any recessed light fixtures.
3. Do not solder within 18 inches (457 mm) of PEX tubing in the same waterline. Make sweat connections prior to making PEX connections.
4. Do not expose PEX tubing to direct sunlight for more than 30 days.
5. Ensure that no glues, solvents, sealants or chemicals come in contact with the tubing without prior permission from the PEX tubing manufacturer.
6. PEX tubing passing through metal studs shall use grommets or sleeves at the penetration.
7. Protect PEX tubing with sleeves where abrasion may occur.
8. Use strike protectors where PEX tubing penetrates a stud or joist and has the potential for being struck with a screw or nail.
9. PEX tubing manufacturer supplied bend supports shall be used where bends are less than six times the outside pipe diameter.
10. Tubing shall be supported to structural members using support methods required by local plumbing codes and the PEX tubing manufacturer's installation handbook.
11. Pressurize the plumbing system with air in accordance with applicable codes or in the absence of applicable codes to a pressure of 25 psi (173 kPa) above normal working pressure of the system.
12. Comply with safety precautions when pressure testing, including use of compressed air, where applicable. Water shall not be used to pressurize the system if ambient air temperature has the possibility of dropping below 32 degrees F (0 degrees C).



### 3.2 INSPECTING AND CLEANING

#### A. Inspect and test piping systems as follows:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired by visual inspection of all joints.

#### B. Clean and disinfect potable domestic water piping

1. Fill system with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine.
2. Isolate with valves and allow to stand for 24 hours.
3. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time by flushing out a volume equal to the system volume, then stopping the flow of water for one hour, and then flushing the system.

### 3.3 VALVE SCHEDULE

#### A. Valve types:

1. Shutoff Duty: Use dezincification resistant brass ball valve
2. Throttling Duty: Use dezincification resistant brass ball valve
3. Hot-Water-Piping, Balancing Duty
4. Drain Duty: Hose-end drain valves



- B. Install ball valves on inlet to each plumbing equipment item, on each supply to each plumbing fixture not having stops on supplies, and elsewhere as indicated.
- C. PVC ball, butterfly, and check valves may be used in matching piping materials.
- D. Install drain valve at base of each riser, at low points of horizontal runs, and where required to drain water distribution piping system.
- E. Install drain valve at base of each riser, at low points of horizontal runs, and where required to drain water distribution piping system.

**END OF SECTION 22-11-00**



## SECTION 22-11-16 DOMESTIC WATER PIPING

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section includes: Potable hot and cold water distribution system, using crosslinked polyethylene (PEX) tubing and ASTM F1960 cold expansion fittings.

#### 1.2 REFERENCES

A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority.

Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.

#### B. ASTM International

1. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
2. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials
3. ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops
4. ASTM F876 Standard Specification for Cross-linked Polyethylene (PEX) Tubing
5. ASTM F877 Standard Specification for Cross-linked Polyethylene (PEX) Plastic Hot- and Cold Water Distribution Systems
6. ASTM F1960 Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for use with Cross-linked Polyethylene (PEX) Tubing



- C. American National Standards Institute (ANSI)/National Sanitation Foundation (NSF)
  - 1. ANSI/NSF Standard 14 Plastics Piping System Components and Related Materials
  - 2. ANSI/NSF Standard 61 Drinking Water System Components - Health Effects
- D. American National Standards Institute (ANSI)/Underwriters Laboratories, Inc. (UL)
  - 1. ANSI/UL 263 Standard for Safety for Fire Tests of Building Construction and Materials
- E. Canadian Standards Association (CSA)
  - 1. CAN/CSA B137.5: Cross-linked Polyethylene (PEX) Tubing Systems for Pressure applications
- F. International Code Council (ICC)
  - 1. International Plumbing Code (IPC)
  - 2. ICC Evaluation Service (ES) Evaluation Report No. ESR 1099
- G. Building Officials and Code Administrators International (BOCA)
  - 1. 1993 BOCA National Plumbing Code
- H. International Association of Plumbing Officials (IAPMO)
  - 1. Uniform Plumbing Code (UPC)
- I. National Association of Plumbing, Heating and Cooling Contractors (NAPHCC)
  - 1. National Standard Plumbing Code (NSPC)
- J. U.S. Department of Housing and Urban Development (HUD)
  - 1. HUD Material Release No. 1269
- K. Plastics Pipe Institute (PPI)
  - 1. PPI Technical Report TR-4/06



L. Uponor, Inc.

1. Uponor Professional Plumbing Installation Guide, 2006

### 1.3 SYSTEM DESCRIPTION

#### A. Design Requirements

1. Standard grade hydrostatic pressure ratings from Plastics Pipe Institute (PPI) in accordance with TR-3 as listed in TR-4. The following three standard-grade hydrostatic ratings are required.

- a. 200°F (93°C) at 80 psi (551 kPa)
- b. 180°F (82°C) at 100 psi (689 kPa)
- c. 73.4°F (23°C) at 160 psi (1,102 kPa)

2. Certification of flame spread/smoke development rating of 25/50 in accordance with ASTM E84 provided the installation meets one of the following requirements.

a. Tubing spacing is a minimum of 18 inches apart for the following sizes.

- 1)  $\frac{3}{8}$  inch [9.53mm]
- 2)  $\frac{1}{2}$  inch [12.7mm]
- 3)  $\frac{5}{8}$  inch [15.88mm]
- 4)  $\frac{3}{4}$  inch [19.05mm]



b. Tubing is wrapped with ½” fiberglass insulation with a flame spread of not more than 20 and a smoke-developed rating of not more than 30 and a nominal density of 4.0 to 4.5 pcf. tubing can run with three tubes separated by zero inches and then 18 inches between the next group of three tubes for the following sizes.

- 1) ⅜ inch [9.53mm]
- 2) ½ inch [12.7mm]
- 3) ⅝ inch [15.88mm]
- 4) ¾ inch [19.05mm]
- 5) 1 inch [25.4mm]
- 6) 1¼ inch [31.75mm]
- 7) 1½ inch [38.1mm]
- 8) 2 inch [50.8mm]

B. Performance Requirements: To provide a PEX tubing hot and cold potable water distribution system, which is manufactured, fabricated and installed to comply with regulatory agencies and to maintain performance criteria stated by the PEX tubing manufacturer without defects, damage or failure.

1. Comply with ANSI/NSF Standard 14.
2. Comply with ANSI/NSF Standard 61.
3. Show compliance with ASTM F877.





4. Show compliance with ASTM E119 and ANSI/UL 263 through certification listings with Underwriters Laboratories, Inc. (UL).

- a. UL Design No. L557 — 1 hour wood frame floor/ceiling assemblies
- b. UL Design No. K913 — 2 hour concrete floor/ceiling assemblies
- c. UL Design No. U372 — 1 hour wood stud/gypsum wallboard wall assemblies
- d. UL Design No. V444 — 1 hour steel stud/gypsum wallboard wall assemblies

#### 1.4 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

B. Product Data: Submit manufacturer's product submittal data and installation instructions.

C. Shop Drawings: Provide installation drawings indicating tubing layout, manifold locations, plumbing fixtures supported and schedules with details required for installation of the system.

D. Samples: Submit selection and verification samples of tubing.

E. Quality Assurance/Control Submittals: Submit the following:

1. Test Reports: Upon request, submit test reports from recognized testing laboratories.

2. Certificates: Submit the following:

a. Manufacturer's certificate that products comply with specified requirements.

b. Certificate indicating that the installer is authorized to install the manufacturer's products.

F. Closeout Submittals: Submit the following:

Warranty documents specified herein

Operation and maintenance data



## PART 2 - PRODUCTS

### 2.1 HOT AND COLD POTABLE WATER DISTRIBUTION SYSTEM

#### A. Manufacturer: Watts Water Technologies

1. Contact: 815 Chestnut Street North Andover, MA 01845; Telephone: 1-978-689-6066; Fax: 1-978-794-1848; website: [www.watts.com](http://www.watts.com)

## PART 3 - EXECUTION

### 3.1 QUALITY ASSURANCE

A. Installer Qualifications: Use an installer with demonstrated experience on projects of similar size and complexity and possessing documentation proving successful completion of PEX plumbing installation training by the PEX tubing manufacturer.

B. Regulatory Requirements and Approvals: Provide domestic potable system that complies with requirements of the following:

#### A. International Code Conference (ICC) – International Plumbing Code (IPC)

- a. ICC Evaluation Service (ES) Evaluation Report No. ESR 1099

#### B. Building Officials and Code Administrators International (BOCA)

- a. 1993 BOCA National Plumbing Code

#### C. Uniform Plumbing Code (UPC)

- a. IAPMO Files 3558, 3946 and 3960

#### D. National Standard Plumbing Code (NSPC)

#### E. HUD Material Release No. 1269



C. Certifications: Provide letters of certification as follows:

A. Installer is trained by the PEX tubing manufacturer to install the PEX potable water distribution system.

B. Installer will use skilled workers holding a trade qualification license or equivalent, or apprentices under the supervision of a licensed trades professional

D. Pre-installation Meetings: [Specify requirements for meeting.] Verify project timeline requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

### 3.2 DELIVERY, STORAGE AND HANDLING

A. General: Comply with Division 1 Product Requirement Section.

B. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

A. Store PEX tubing in cartons or under cover to avoid dirt or foreign material from being introduced into the tubing.

B. Do not expose PEX tubing to direct sunlight for more than 30 days. If construction delays are encountered, provide cover to portions of tubing exposed to direct sunlight.



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### 3.3 WARRANTY

Watts offers a limited warranty of one year against defects in material and workmanship for all of its products.

**END OF SECTION SECTION 22-11-16**



## SECTION 22-33-00 ELECTRIC DOMESTIC WATER HEATER

### PART 1- GENERAL

#### 1.1 SUMMARY

A. This section describes the indoor electric water heater that will be used to provide hot water for the STILE house.

#### 1.2 REQUIREMENTS

- A. Product data submitted
- B. Comply with NFPA 70: National Electric Code

### PART 2- PRODUCTS

#### 2.1 MANUFACTURER

A. AO Smith

#### 2.2 PRODUCTS

A. Voltex Hybrid Electric Water Heater

1. An 80 gallon free standing water heater that generates heat through the heat pump technology instead of the heating elements.

### PART 3- EXECUTION

#### 3.1 INSTALLATION

A. The water heater will be installed according to the manufacturer's instructions and all applicable codes.

**END OF SECTION 22-33-00**



## DIVISION 23 HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

### SECTION 23-23-00 – REFRIGERANT PIPING

#### PART 1- GENERAL

##### 1.1 SECTION REQUIREMENTS

###### A. Submittals:

1. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop based on manufacturer's test data.

#### PART 2- PRODUCTS

##### 2.1 TUBES AND FITTINGS

###### A. Refrigerant Pipes

1. Pipe connection - Liquid

- a) Manufacturer: Mueller

- b) Model: D 04050PS

2. Pipe Connection – Suction

- a) Manufacturer: Mueller



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b) Model: LS03060PSE

## 2.2 REFRIGERANT PIPING SPECIALTIES

A. Copper piping, water proof insulation, wall thickness of pipe: 0.019-0.039 inch, bearing pressure: 3.0 MPa



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## **PART 3- EXECUTION**

### 3.1 INSTALLATION

- A. Install refrigerant piping in accordance with the manufacturer recommendations and guidelines
- B. Install piping as direct and short as possible, with minimum fittings.
- C. Ensure installation is watertight.

**END OF SECTION 23-23-00**





## SECTION 23-41-00 –PARTICULATE AIR FILTRATION

### PART 1 - GENERAL

#### 1.1 PERFORMANCE

- A. Compact unit with heat recovery set up in the L-short wall in the southeast angle of the house.
- B. Product Data
  - 1. Size: 598x345x650 mm
  - 2. Air flow rates up to 200 cubic meter per hour
- C. Standards
  - 1. Complies with all laws and regulations

### PART 2- PRODUCTS

#### 2.1 SPECIFICATIONS

- A. Manufacturer
  - 1. Helios
- B. Model
  - 1. KWL EC 200 W
- C. Operation
  - 1. Operates normally under standard conditions



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## **PART 3- EXECUTION**

### **3.1 SPECIFICATIONS**

#### **A. Installation Standard**

1. Process: Custom
2. Quantity: 1

**END OF SECTION 23-41-00**



## SECTION 23-41-01 PARTICULATE AIR FILTRATION KITCHEN

### PART 1 - GENERAL

#### 1.1 PERFORMANCE

- A. Compact ceiling unit with heat recovery set up in the ceiling roof on the top of the Kitchen.
- B. Product Data
  - 1. Size: 1140x236x548 mm
  - 2. Air flow rates up to 220 cubic meter per hour
- C. Standards
  - 1. Complies with all laws and regulations

### PART 2- PRODUCTS

- A. Manufacturer
  - 1. Helios
- B. Model
  - 1. KWL EC 200 D
- C. Operation
  - 1. Operates normally under standard conditions



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## **PART 3- EXECUTION**

### **3.1 SPECIFICATIONS**

- A. Installation Standard
  - 1. Process: Custom
  - 2. Quantity: 1

**END OF SECTION 23-41-01**



## SECTION 23-81-26 SPLIT SYSTEM AIR-CONDITIONERS

### PART 1- GENERAL

#### 1.1 DESCRIPTION

##### A. Mini-Split Systems

#### 1.2 SUBMITTALS

A. Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

##### B. Product Data

1. Submit manufacturer's product submittal data and installation instructions.

#### 1.3 QUALITY ASSURANCE

A. Components shall be furnished by a single manufacturer and the system shall be the standard cataloged product of the manufacturer.

B. Product shall comply with National Electrical Manufacturers Association (NEMA) and UL.

### PART 2- PRODUCTS

#### 2.1 OUTDOOR UNIT

##### A. Manufacturer

1. Carrier



2. Model: 38GJQG36---3

## 2.2 INDOOR UNIT

### A. Manufacturer

1. Carrier
2. Model: 40GJQB12D--3

## PART 3- EXECUTION

### 3.1 INSTRUCTIONS

A. Comply with manufacturer's product information, with technical bulletins, installation instructions and design drawings of the following

1. 38GJQG36---3 Outdoor Unit Service Manual
2. 40GJQB12D—3 Indoor Unit Service Manual

### 3.2 INSTALLATION

- A. The product should be installed according to the manufacturer's diagrams and recommendations.
- B. Operate and construct units in accordance with manufacturer's written instructions.
- C. Stabilize units to remain stationary at all times. A method of support shall be such that malfunctions of units will not occur.

**END OF SECTION 23-81-26**



**DIVISION 25-INTEGRATED AUTOMATION**

**SECTION 25-30-00 INTEGRATED AUTOMATION INSTRUMENTATION AND TERMINAL DEVICES**

**PART 1 - PRODUCTS**

Material List	Product	Description	Model	Quantity	Price	Total Price	URL
ZwaveProducts => Z-Wave Security => Motion Detectors & Sensors	Linear 2GIG-SMKT3-345 - Z-Wave Smoke Heat & Freeze Detector	Smoke, Heat, and Freeze Detector	2GIG-SMKT3-345	10	\$83.99	\$839.90	<a href="http://zwaveproducts.com">zwaveproducts</a>
	FortrezZ WWA02AAUSB - Z-Wave Water & Temperature Sensor - Black	Water and Temperature Sensor	WWA02AAUSB	5	\$ 54.99	\$274.95	<a href="http://zwaveproducts.com">zwaveproducts</a>
	Aeon Labs DSB05-ZWUS - Z-Wave Multi Sensor	Light, motion, temp sensor	DSB05-ZWUS	10	\$ 54.95	\$549.50	<a href="http://zwaveproducts.com">zwaveproducts</a>
	Schlage RS200HC V N N SL Home Motion Sensor	Motion sensor	RS200HC	8	\$ 59.99	\$479.92	<a href="http://zwaveproducts.com">zwaveproducts</a>
	Aeon Labs DSB04100-ZWUS - Z-Wave Door & Window Sensor	Door and Window Sensor	DSB04100-ZWUS	20	\$ 24.99	\$499.80	<a href="http://zwaveproducts.com">zwaveproducts</a>

	Schlage WCO100NX - Indoor/Outdoor Wireless IP Network Camera	Outdoor Security Camera	WCO100NX	8	\$ 199.99	\$1,599.92	<a href="#">zwaveproducts</a>
ZwaveProducts => Z-Wave Security => Zwave Door Locks	Schlage FE599NX CAM 619 ACC - Z-Wave Lever Lock - Satin Nickel	Door Lock	FE599NX CAM 619 ACC	3	\$ 219.99	\$659.97	<a href="#">zwaveproducts</a>
ZwaveProducts => Z-Wave Security => Zwave Security Cameras	Vera VistaCam 700 - Wireless High Definition 720p Network Camera	Indoor camera	VISTACAM-700	10	\$ 119.95	\$1,199.50	<a href="#">zwaveproducts</a>
ZwaveProducts => Z-Wave Lighting	GE 12722 - Z-Wave In-Wall Smart Switch	Smart Light Switch (ON/OFF)	12722	15	\$ 49.99	\$749.85	<a href="#">zwaveproducts</a>
	GE 12724 - Z-Wave In-Wall Smart Dimmer	Smart Light Dimmer (ADJUSTABLE)	12724	5	\$ 54.99	\$274.95	<a href="#">zwaveproducts</a>
	Domitech DTA19-750-27 - Z-Wave Plus - Dimmable Smart LED Bulb - 60W	Smart LED Bulb 60W	DTA19-750-27	20	\$ 39.99	\$799.80	<a href="#">zwaveproducts</a>
	GE 12720 - Z-Wave Plug-In Outdoor Smart Switch	Outdoor Power Outlet (Weather Proof)	12720	6	\$ 46.99	\$281.94	<a href="#">zwaveproducts</a>
	Aeon Labs DSC24-ZWUS - Z-Wave Plug-in Smart Appliance Switch	(ON/OFF) Smart Energy Meter/Switch	DSC24-ZWUS	10	\$ 44.95	\$449.50	<a href="#">zwaveproducts</a>
	Aeon Labs DSC25-ZWUS - Z-Wave Smart Energy Plug-In Dimmer	(DIMMER) Smart Energy Meter/Switch	DSC25-ZWUS	5	\$ 42.99	\$214.95	<a href="#">zwaveproducts</a>



	GE 12721 - Z-Wave In-Wall Smart Duplex Outlet	Smart Outlet	12721	20	\$ 49.99	\$99.80	<a href="#">roducts</a>
	Aeon Labs DSB09104-ZWUS - Z-Wave Smart Energy Meter	Smart Energy Monitor	DSB09104-ZWUS	15	\$ 23.99	\$35.85	<a href="#">zwaveproducts</a>
	Trane TZ400BB3VZNN 109 SL - Z-Wave Thermostat	Thermostat	TZ400BB3VZNNSL	1	\$ .99	\$10.99	<a href="#">zwaveproducts</a>
ZwaveProducts => Z-Wave Controllers	Nexia BR100NX - Z-Wave Home Intelligence Bridge		BR100NX	5	\$ 69.99	\$34.95	<a href="#">zwaveproducts</a>
	VeraEdge - Z-Wave Plus Home Controller with 500 Series Z-Wave Chipset		VERAEDGE	1	\$ 149.95	\$14.95	<a href="#">zwave</a> <a href="#">roducts</a>
	Aeon Labs DSA02203-ZWUS - Z-Wave USB Z-Stick Controller		DSA02203-ZWUS	1	\$ 44.95	\$44.50	<a href="#">zwave</a> <a href="#">roducts</a>
<b>TOTAL</b>				178	\$1,476.00	\$10,439.99	

**END OF SECTION 25-30-00**

## **DIVISION 26- ELECTRICAL**

### **SECTION 26-05-19 ELECTRICAL POWER CONDUCTORS AND CABLES**

#### **PART 1- GENERAL**

##### 1.1 CODE COMPLIANCE

- A. All electrical wiring must comply with the NFPA 70: National Electric Code® and California Building Codes.

##### 1.2 SECTION INCLUDES

- A. All Electrical Conductors and Cables on 120/240 volt circuits

#### **PART 2- PRODUCTS**

##### 2.1 MC Cable

###### A. Manufacturer

- 1. AFC Cable Systems

###### B. Uses

- 1. Used in steel stud walls for wiring of receptacles and switches, and in ceilings for wiring lights.

###### C. Specifications

- 1. Solid copper
- 2. 600V
- 3. 12/2 WG
- 4. 10/3 WG
- 5. 8/3 WG
- 6. 6/3 WG

##### 2.2 PV Wire

###### A. Manufacturer

1. Encore

B. Uses

1. Used in outdoor and wet locations for solar panels

C. Specifications

1. Stranded copper
2. 600V
3. #10 AWG

### 2.3 Service Entrance

A. Manufacturer

1. Stabiloy or Comparable

B. Uses

1. Used outdoors from the meter to our panel inside

C. Specifications

1. Stranded Aluminum
2. 600V
3. 2/0-2/0-2/0-1 AWG

## PART 3 - EXECUTION

### 3.1 INSTRUCTIONS

- A. Comply with manufacturer's product information and observe all safety precautions as outlined by NFPA

70: National Electric Code®

### 3.2 INSTALLATION

- A. The product should be installed according to the manufacturer's recommendation and specifications.
- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®

**END SECTION 26-05-19**

## SECTION - 26-05-26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

### PART 1- GENERAL

#### 1.1 CODE COMPLIANCE

- A. All electrical wiring and devices must comply with the NFPA 70: National Electric Code® and California Building Codes.

#### 1.2 SECTION INCLUDES

- A. Grounding rod provided by competition on site.

### PART 2- PRODUCTS

#### 2.1 GROUNDING ROD

- A. Manufacturer
  - 1. Provided by competition
- B. Uses
  - 1. Grounds entire electrical system for the house

### PART 3 - EXECUTION

#### 3.1 INSTRUCTIONS

- A. Comply with manufacturer's product information and observe all safety precautions as outlined by NFPA 70: National Electric Code®

#### 3.2 INSTALLATION

- A. The product should be installed according to the manufacturer's recommendation and specifications.
- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®

**END OF SECTION 26-05-26**

## SECTION - 26-05-33.16 BOXES FOR ELECTRICAL SYSTEMS

### PART 1- GENERAL

#### 1.1 CODE COMPLIANCE

- A. All electrical wiring and devices must comply with the NFPA 70: National Electric Code® and California Building Codes.

#### 1.2 INCLUDES

- A. All electrical boxes used in the wiring of the house.

### PART 2- PRODUCTS

#### 2.1 Switch Boxes w/ Metal Stud Brackets

- A. Manufacturers

- 1. Raco

- B. Specifications

- 1. Single Gang
  - 2. Double Gang
  - 3. With MC straps

- C. Uses

- 1. Used to mount switches and receptacles in to wire up.

### PART 3 - EXECUTION

#### 3.1 INSTRUCTIONS

- A. Comply with manufacturer's product information and observe all safety precautions as outlined by NFPA 70: National Electric Code®

#### 3.2 INSTALLATION

- A. The product should be installed according to the manufacturer's recommendation and specifications.

- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®

**END OF SECTION 26-05-33.16**

## SECTION 26-09-13 ELECTRICAL POWER MONITORING

### PART 1- GENERAL

#### 1.1 CODE COMPLIANCE

- A. All electrical wiring must comply with the NFPA 70: National Electric Code® and California Building Codes.

#### 1.2 INCLUDES

- A. Devices for monitoring Power usage at various points of delivery within the house

### PART 2- PRODUCTS

#### 2.1 ELECTRICAL METER

##### A. Manufacturer

- 1. TBD. Provided by Organizers.

##### B. Uses

- 1. Observes and records power usage through the panelboard
- 2. Observes and records power backfeed from photovoltaic generation into the grid

### PART 3 - EXECUTION

#### 3.1 INSTRUCTIONS

- A. Comply with manufacturer's product information and observe all safety precautions as outlined by NFPA 70: National Electric Code®

#### 3.2 INSTALLATION

- A. The products should be installed according to the manufacturer's recommendation and specifications.
- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®



**END OF SECTION 26-09-13**

## SECTION 26-09-23 LIGHTING CONTROL DEVICES

### PART 1- GENERAL

#### 1.1 CODE COMPLIANCE

- A. All electrical wiring must comply with the NFPA 70: National Electric Code® and California Building Codes.

#### 1.2 INCLUDES

- A. Dimmer Switch
- B. Single Pole Switch

### PART 2- PRODUCTS

#### 2.1 DIMMER LIGHT SWITCH

##### A. Manufacturers

- 1. Qolsys

##### B. Specifications

- 1. Single Pole
- 2. 600W
- 3. LED/CFL

##### C. Uses

- 1. Allows for variable luminosity control and on/off functionality of all lights on connected circuit.
- 2. Allows for remote operation of function(s) outlined in 2.1, Part B Section 1 remotely via the central network server.

## 2.2 SINGLE POLE SWITCH

### A. Manufacturers

1. Qolsys

### B. Specifications

1. 15 Amp

### C. Uses

1. Allows for on/off functionality of all lights on connected circuit.
2. Allows for remote operation of function(s) outlined in 2.2, Part B Section 1 remotely via the central network server.

## **PART 3 - EXECUTION**

### 3.1 INSTRUCTIONS

- A. Comply with manufacturer's product information and observe all safety precautions as outlined by NFPA 70: National Electric Code®

### 3.2 INSTALLATION

- A. The products should be installed according to the manufacturer's recommendation and specifications.
- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®

**END OF SECTION 26-09-23**

## **SECTION- 26-09-23 NETWORK LIGHTING CONTROLS**

### **PART 1- GENERAL**

#### 1.1 CODE COMPLIANCE

- A. All electrical wiring must comply with the NFPA 70: National Electric Code® and California Building Codes.

#### 1.2 SECTION INCLUDES

- A. Various wired and wireless network system components for controlling various functions of lighting throughout the house

### **PART 2- PRODUCTS**

#### 2.1 PRODUCTS

- A. TBD.

### **PART 3 - EXECUTION**

#### 3.1 INSTRUCTIONS

- A. Comply with manufacturer's product information and observe all safety precautions as outlined by NFPA 70: National Electric Code®

#### 3.2 INSTALLATION

- A. The products should be installed according to the manufacturer's recommendation and specifications.
- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®

**END OF SECTION 26- 09- 23**

## SECTION- 26-24-16 PANELBOARDS

### PART 1- GENERAL

#### 1.1 CODE COMPLIANCE

- A. All electrical wiring must comply with the NFPA 70: National Electric Code® and California Building Codes.

#### 1.2 INCLUDES

- A. Electrical Panels and Disconnects

### PART 2- PRODUCTS

#### 2.1 PANELBOARD

- A. Manufacturer Details:

Manufacturer	General Electric
Type	150 Amp, 42 Space, 32-circuit Panelboard
Model	TM3215C42
Max Amperage	200 Amps
Fully Rated	22 kAIC at 240V

- B. Uses:

1. Provides electrical connection of all circuits.
2. Provides means of disconnect and overcurrent protection for all circuits in the house.

## **PART 3 - EXECUTION**

### 3.1 INSTRUCTIONS

- A. Comply with manufacturer's product information and observe all safety precautions as outlined by NFPA 70: National Electric Code®

### 3.2 INSTALLATION

- A. The products should be installed according to the manufacturer's recommendation and specifications.
- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®

**END OF SECTION 26-24-16**

## SECTION 26-27-26 WIRING DEVICES

### PART 1- GENERAL

#### 1.1 CODE COMPLIANCE

- A. All electrical wiring must comply with the NFPA 70: National Electric Code® and California Building Codes.

#### 1.2 INCLUDES

- A. Switches, receptacles, and other wiring devices shown on drawings.

### PART 2 - PRODUCTS

#### 2.1 SMART RECEPTACLES

- A. Manufacturers

- 1. Qolsys

- B. Specifications

- 1. 15 Amp
  - 2. White

- C. Uses

- 1. Controls operation of device plugged in to receptacle from central network server.
  - 2. Tamper-proof functionality.

#### 2.2 DUPLEX TAMPERPROOF RECEPTACLES

- A. Manufacturers

- 1. Pass and Seymour

- B. Specifications

1. 15 Amp
2. White

C. Uses

1. Supply power to electrical fixtures

## 2.3 GFCI RECEPTACLES

A. Manufacturers

1. Pass and Seymour

B. Specifications

1. 20 Amps
2. White

C. Uses

1. Provides power to and monitors power of a single device plugged into a receptacle.
2. Controls operation of device plugged in to receptacle from central network server.
3. Provides ground fault protection for wet locations.
4. Tamper-proof functionality.

## 2.4 DIMMER LIGHT SWITCH

A. Manufacturers

1. Qolsys

B. Specifications

1. Single Pole
2. 600W
3. LED/CFL



C. Uses

1. Allows for variable luminosity control and on/off functionality of all lights on connected circuit.
2. Allows for remote operation of function(s) outlined in 2.1, Part B Section 1 remotely via the central network server.

## 2.5 SINGLE POLE SWITCH

A. Manufacturers

1. Qolsys

B. Specifications

1. 15 Amp

C. Uses

1. Allows for on/off functionality of all lights on connected circuit.
2. Allows for remote operation of function(s) outlined in 2.2, Part B Section 1 remotely via the central network server.

## PART 3- EXECUTION

### 3.1 INSTRUCTIONS

- A. Comply with manufacturer's product information and observe all safety precautions as outlined by NFPA 70: National Electric Code®

### 3.2 INSTALLATION

- A. The products should be installed according to the manufacturer's recommendation and specifications.
- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®

**END OF SECTION 26-27-26**

## SECTION- 26-28-01 CIRCUIT PROTECTION DEVICES

### PART 1- GENERAL

#### 1.1 CODE COMPLIANCE

- A. All electrical wiring must comply with the NFPA 70: National Electric Code® and California Building Codes.

#### 1.2 INCLUDES

- A. All circuit breakers.

### PART 2 - PRODUCTS

#### 2.1 120 volt 20A arc FAULT BREAKER

- A. Manufacturer Details

Manufacturer	General Electric
Product Number	THQL1120AF2
Category	Feeder Plug-in Circuit Breakers
Trip Style	Non-Interchangeable
Frame Type	Q-Line
Amperage	20A
System Voltage	120 Vac , 120/240 Vac
Poles	1
Product Line	Q-Line (Plug-In)

B. Uses

1. Provides 20 Amp overcurrent protection and means of disconnect for circuits.
2. Provides arc fault protection for circuit.

2.2 120V 20A GROUND FAULT CIRCUIT INTERRUPTER BREAKER

A. Manufacturer Details

Manufacturer	General Electric
Product Number	THQL1120GF
Category	Feeder Plug-in Circuit Breakers
Trip Style	Non-Interchangeable
Frame Type	Q-Line
Amperage	20A
System Voltage	120 Vac , 120/240 Vac
Poles	1
Product Line	Q-Line (Plug-In)
Ground Fault	Yes

2.3 SINGLE-POLE CIRCUIT BREAKER PANEL INSERT

A. Manufacturer Details

Manufacturer	General Electric
Product Number	THQL1115
Category	Feeder Plug-in Circuit Breakers
Trip Style	Non-Interchangeable
Frame Type	Q-Line
Amperage	20A
System Voltage	120 Vac , 120/240 Vac
Poles	1
Suitable for Reverse Feed	Yes
Product Line	Q-Line (Plug-In)

## 2.4 DOUBLE-POLE CIRCUIT BREAKER PANEL INSERT

### A. Manufacturer Details

Manufacturer	General Electric
Product Number	THQL1115
Category	Feeder Plug-in Circuit Breakers
Trip Style	Non-Interchangeable
Frame Type	Q-Line
Amperage	30A, 40A, 50A, 60A
System Voltage	120 Vac , 120/240 Vac
Poles	1
Suitable for Reverse Feed	Yes
Product Line	Q-Line (Plug-In)

## PART 3- EXECUTION

### 3.1 INSTRUCTIONS

- A. Comply with manufacturer's product information and observe all safety precautions as outlined by NFPA 70: National Electric Code®

### 3.2 INSTALLATION

- A. The products should be installed according to the manufacturer's recommendation and specifications.
- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®

**END OF SECTION 26-28-01**

## SECTION 26-31-00 PHOTOVOLTAIC COLLECTORS

### PART 1 - GENERAL

#### 1.1 CODE COMPLIANCE

- A. All electrical wiring must comply with the NFPA 70: National Electric Code® and California Building Codes.

#### 1.2 INCLUDES

- A. Photovoltaic Collectors.

### PART 2 - PRODUCTS

#### 2.1 PHOTOVOLTAIC COLLECTOR

- A. Manufacturer Details

Manufacturer	Sunmodule
Model	PLUS SW 285 mono
Maximum Power	285 Wp
Open Circuit Voltage	39.7 V
Maximum Power Point Voltage	31.3 V
Maximum Power Point Current	9.20 A
Short Circuit Current	9.84 A
Operating Temperature (Degree Celsius)	-40.0 to 85
Number of Bypass Diodes	3
Dimensions (inches)	65.94 x 37.44 x 1.22
Fire Rating	Class C
Module Efficiency	%16.70

### PART 3- EXECUTION

### 3.1 INSTRUCTIONS

- A. Comply with manufacturer's product information and observe all safety precautions as outlined by NFPA 70: National Electric Code®

### 3.2 INSTALLATION

- A. The products should be installed according to the manufacturer's recommendation and specifications.
- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®

**END OF SECTION 26-31-00**

## SECTION 26-51-13 INTERIOR LIGHTING FIXTURES, LAMPS, AND BALLASTS

### PART 1 - GENERAL

#### 1.1 CODE COMPLIANCE

- A. All electrical wiring must comply with the NFPA 70: National Electric Code® and California Building Codes.

#### 1.2 INCLUDES

- A. LED Light

### PART 2 - PRODUCTS

#### 2.1 LED Wallpack

##### A. Manufacturer Details

Manufacturer	Cooper Lighting
Model	XTOR9A
Dimmable	No
Color	White
Equivalent Wattage	400 W
Color Rendering Index	65
Color Temperature	5000 K
Lumens per Watt	7192 lm
Wattage	85 W
Voltage	120

#### 2.2 LED Can Lights

##### A. Manufacturer Details

Manufacturer	Cooper Lighting
Model	H750ICAT-ML5612935-696WB



Dimmable	Yes
Color	White
Equivalent Wattage	100 W
Color Rendering Index	90
Color Temperature	3500 K
Lumens per Watt	1200 lm
Wattage	20 W
Voltage	120

## 2.2 LED Vanity Light

### A. Manufacturer Details

Manufacturer	Cooper Lighting
Model	600-24-W-L3/835-120-SN-DL
Dimmable	No
Color	White
Equivalent Wattage	
Color Rendering Index	65
Color Temperature	3500 K
Lumens	2000 lm
Wattage	18.9 W
Voltage	120

## 2.3 LED Ceiling Light

### A. Manufacturer Details

Manufacturer	Cooper Lighting
Model	4WNLED-LD1-54-F-UNV-L835-CD1-U

Dimmable	Yes
Color	White
Equivalent Wattage	
Color Rendering Index	85
Color Temperature	3500 K
Lumens	5400 lm
Wattage	18.9 W
Voltage	120

## 2.4 LED UnderCabinet Light

### A. Manufacturer Details

Manufacturer	Cooper Lighting
Model	UCL-2-LD3-35-A12125-ED-UNV
Dimmable	Yes
Color	White
Equivalent Wattage	
Color Rendering Index	85
Color Temperature	3500 K
Lumens	750 lm
Wattage	18.9 W
Voltage	120

**END SECTION 26-51-13**

## **Division 31- Earthwork**

### **SECTION 31-60-00 SPECIAL FOUNDATIONS AND LOAD-BEARING ELEMENTS**

#### **PART 1- GENERAL**

##### 1.1 SUMMARY

- A. Adjustable levelling jacks will be used as structural support for both the house and the surrounding ramps and decking. The height will be changed to accommodate the slope of the ground and the necessary constraints of the floor/substructure levels
- B. Jacks will have metal plates attached to top and bottom for additional stability and load dispersion

##### 1.2 PERFORMANCE

- A. Jacks will be implemented as necessary to accommodate building load, structural calculations and load capacity

#### **PART 2- PRODCUTS**

##### 2.1 MANUFACTURER

- A. Ellis Manufacturing Co, Inc

##### 2.2 PRODUCT SPECIFICATIONS

- A. See Appendix

#### **PART 3- EXECUTION**

##### 3.1 SPECIFICATIONS

- A. Jacks will be levelled and placed and levelled accordingly by students according to necessary constraints of site and construction plan to account for grade changes.

**END OF SECTION 31-60-00**

## **DIVISION 32 – EXTERIOR IMPROVEMENTS**

### **SECTION 32-84-00 – Planting Irrigation**

#### **Part 1 – General**

- 1.1 Performance
  - A. Irrigates vegetation in conservative manner
- 1.2 Material
  - A. PEX tubing
  - B. ¾" diameter
  - C. Various lengths
- 1.3 Standards
  - A. Complies with all laws and regulations

#### **Part 2 – Products**

- 2.1 Manufacturer
  - A. PlantsOnWalls
  - B. Lowes or similar business

#### **Part 3 – Execution**

- 3.1 Installation
  - A. Process – Tubing is connected via slip connectors. Tubing runs from clean water source to vertical garden, then to the greywater bladder. From greywater bladder tubing runs along the planters surrounding the deck.
  - B. Quantity : 3 PEX-Ts from Florafelt and 175' PEX tubing

**END OF SECTION 32-84-00**

## **Division 32 – Exterior Improvements**

### **SECTION 32-93-00 - Plants**

#### **Part 1 – General**

##### 1.1 Performance

- A. Brings biodiversity and edible resources to the house
- B. Enhances the aesthetics of the house
- C. Aids in filtering and cooling the surrounding air

##### 1.2 Material

- A. Vertical Garden: edibles including herbs, flowers, small fruits.
  - 1) (144) 4”-6” sized herbs
- B. Planters: species native to the site’s regions
  - 1) (77) 3-5 gallon sized perennials
- C. Cubes: small fruit trees
  - 1) (2) trees

##### 1.3 Standards

- A. Complies with all laws and regulations

#### **Part 2 – Products**

##### 2.1 Manufacturer

- A. Laguna Hills Nursery
- B. TreeofLife Nursery

#### **Part 3 – Execution**

##### 3.1 Installation

- A. Process: Plants for the cedar planters will be place inside of planters while still in the given nursery containers. In a permanent location, soil would be placed into planters, with plants fully transplanted.
- B. For vertical garden plants, see Florafelt’s Guide

**END OF SECTION 32-93-00**

## SECTION 32-95-00 – EXTERIOR PLANTING SUPPORT STRUCTURES

### PART 1 – GENERAL

#### 1.1 SUMMARY

- 1.1.1 Performance: Contains Planting Material/Provides guard for deck
- 1.1.2 Material: Wood (specific TBA)
- 1.1.3 Standards: Complies with all regulations

### PART 2 – PRODUCTS

#### 1.2 MANUFACTURER

- 1.2.1 N/A

#### 1.3 MODEL

- 1.3.1 8'x2'x5'
- 1.3.2 8'x2'x3'

### 2 PART 3 – EXECUTION

- 2.1 INSTALLATION - We will build

**END OF SECTION 32-95-00**

## SECTION 32-84-00 – Planting Irrigation

### Part 1 – General

- 1.1 Performance

A. Irrigates vegetation in conservative manner

1.2 Material

A. PEX tubing

1.3 Standards

A. 3/4" diameter

B. Various lengths

**Part 2 – Products**

2.1 Manufacturer

A. PlantsOnWalls

B. Lowes or similar business

**Part 3 – Execution**

3.1 Installation

A. Process – Tubing is connected via slip connectors

B. Quantity – 3 PEX-Ts from Florafelt

**END OF SECTION 32-84-00**

## **SECTION 32-93-00 - Plants**

### **Part 1 – General**

#### 1.1 Performance

- A. Brings biodiversity and edible resources to the house
- B. Enhances the aesthetics of the house
- C. Aids in filtering and cooling the surrounding air

#### 1.2 Material

- A. Vertical Garden: edibles including herbs, flowers, small fruits.
- B. Planters: species native to the site's regions
- C. Cubes: small fruit trees

#### 1.3 Standards

- A. (144) 4"-6" sized herbs
- B. (77) 3-5 gallon sized perennials
- C. (2) trees

### **Part 2 – Products**

#### 2.1 Manufacturer

- A. Laguna Hills Nursery
- B. TreeofLife Nursery

### **Part 3 – Execution**

#### 3.1 Installation

- A. Process: Plants for the cedar planters will be place inside of planters while still in the given nursery containers. In a permanent location, soil would be placed into planters, with plants fully transplanted.
- B. For vertical garden plants, see Florafelt's Guide

## **END OF SECTION 32-93-00**



## SECTION 46-63-00 DEMINERALIZATION EQUIPMENT

### Part 1 – General

#### 1.1 Performance

A. This filter purifies the water using a pressurized machine that pushes the water through a reverse osmosis membrane.

#### 1.2 Product

A. Manufacturer:

1. Vertex

B. Model:

1. PT-4.0

#### 1.3 Installation

A. Use installation guide as directed.

**END OF SECTION 46-63-00**

**DIVISION 48 ELECTRICAL POWER GENERATION**

**SECTION 48-19-16 PHOTOVOLTAIC INVERTER**

**PART 1 - GENERAL**

1.1 CODE COMPLIANCE

- A. All electrical wiring must comply with the NFPA 70: National Electric Code® and California Building Codes.

1.2 INCLUDES

- A. Inverter

**PART 2 - PRODUCTS**

2.1 INVERTER

- A. Manufacturer Details

Manufacturer	SolarEdge
Model	SE10000A-US
Recommended input power (STC)	13500
Maximum Input DC Voltage	500 V
Max DC Short Circuit Current	45 A
Max Input Current	30.5 A @ 240V
Peak Output Power	10950 W @ 240V
Rated (continuous) Output Power	10000 W @ 240V
Nominal Output Current	42 A @ 240V

Nominal Voltage/Range	240 V / 183 – 264 V
Nominal Frequency/ Range	60 Hz / 59.3 – 60.5 Hz
Power Factor	>0.98
Maximum Units Per Branch	18 (Single Phase)
CEC weighted efficiency, 240 VAC	97.5%
Night Time Power Consumption	< 4 W
Dimensions (in) w/ Safety Switch	30.5 x 12.5 x 10.5
Weight (kg) w/ Safety Switch	40.1

### **PART 3- EXECUTION**

#### **3.1 INSTRUCTIONS**

- A. Comply with manufacturer’s product information and observe all safety precautions as outlined by NFPA 70: National Electric Code®

#### **3.2 INSTALLATION**

- A. The products should be installed according to the manufacturer’s recommendation and specifications.
- B. Observe all proper means of connection, mounting and securing as outlined by NFPA 70: National Electric Code®

**END OF SECTION 48-19-16**

## APPENDIX

### APPENDIX A. ATTACHMENTS



## TECHNICAL DATA

### FREEDOM® RESIDENTIAL CONCEALED PENDENT LEAD FREE SPRINKLER VK4570 (K4.9)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

#### 1. DESCRIPTION

Viking Freedom® Residential Concealed Pendent Lead Free\* Sprinkler VK4570 is a small high-sensitivity solder link and lever residential sprinkler designed for installation on concealed pipe systems where the appearance of a smooth ceiling is desired. The orifice design, with a K-Factor of 4.9 (70.6 metric†), allows the sprinkler's efficient use of available water supplies for the hydraulically designed fire-protection system. The operating element and special deflector characteristics meet the challenges of residential sprinkler standards.

The sprinkler is pre-assembled with a threaded adapter for installation with a low-profile small-diameter cover assembly installed flush to the ceiling. The two-piece design allows installation and testing of the sprinkler prior to installation of the cover plate. The "push-on", "thread-off" design of the concealed cover plate assembly allows easy installation of the cover plate after the system has been tested and the ceiling finish has been applied, while also providing up to ½" (12.7 mm) of vertical adjustment. The cover assembly can be removed and reinstalled, allowing temporary removal of ceiling panels without taking the sprinkler system out of service or removing the sprinkler.



\* Lead content complies with the definition of 'Lead Free' established in the Reduction of Lead in Drinking Water Act (S.3874) endorsed by AWWA's Water Utility Council, and California Assembly Bill #1953.

#### 2. LISTINGS AND APPROVALS



**UL Listed (C-UL-US-EU):** Category VKKW

**UL Classified to:** NSF/ANSI Standard 61, Drinking Water System Components and NSF 372 (MH48034).

Refer to the Approval Chart and Design Criteria for C-UL-US-EU Listing requirements that must be followed.

#### 3. TECHNICAL DATA

##### Specifications:

Available since 2011.

Minimum Operating Pressure: Refer to the Approval Chart.

Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).

Thread size: 1/2" (15 mm) NPT

Nominal K-Factor: 4.9 U.S. (70.6 metric†)

† Metric K-factor measurement shown is in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

##### Material Standards:

Sprinkler Body: Brass UNS-C89833

Deflector: Copper UNS-C51000

Deflector Pins: Stainless Steel UNS-S30200

Button: Brass UNS-C36000

Seat Assembly: Brass UNS-C64200

Compression Screw: Brass UNS-C36000

Fusible Element Assembly: Beryllium Nickel, coated with black acrylic paint

Levers: Stainless Steel UNS-S31600

Lever Bar: Copper Alloy UNS-C72500

Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape

Cover Adapter: Cold Rolled Steel UNS-G10080, Finish: Clear Chromate over Zinc Plating

Shipping Cap: Polyethylene

##### Cover Plate Materials:

Cover Plate Assembly: Copper UNS-C11000 and Brass UNS-C26800

Spring: Beryllium Nickel

Solder: Eutectic

**Ordering Information:** (Also refer to the current Viking price list.)

Viking Technical Data may be found on  
The Viking Corporation's Web site at  
<http://www.vikinggroupinc.com>.  
The Web site may include a more recent  
edition of this Technical Data Page.



## TECHNICAL DATA

### FREEDOM® RESIDENTIAL CONCEALED PENDENT LEAD FREE SPRINKLER VK4570 (K4.9)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Viking Freedom® Residential Concealed Pendent Sprinkler VK4570 and Cover Plate Assembly must be ordered separately:

**Sprinkler:** Part No. 16872AC (includes a 165 °F (74 °C) rated sprinkler with a protective plastic cap covering the unit).

**Cover Plate Assembly:** Base Part No. 13504 (2-3/4" diameter), Base Part No. 13642 (3-5/16" diameter), or Base Part No. 15394 (square cover plate, 3-5/16" diameter)

Specify finish and temperature rating of the cover plate assembly by first adding the appropriate suffix for the finish and then the appropriate suffix for the cover temperature rating to the base part number:

Finish Suffix: Polished Chrome = F, Brushed Chrome = F-/B, Bright Brass = B, Antique Brass = B-/A, Brushed Brass = B-/B, Brushed Copper = E-/B, Painted White = M-/SW1004, Painted Ivory = M-/SW1634, Painted Black = M-/SW1007

Temperature Suffix: 135 °F (57 °C) = A

For example, cover 13504 with a Polished Chrome finish and a 135 °F (57 °C) temperature rating = 13504FA.

**Available Finishes And Temperature Ratings:** Refer to Table 1.

**Accessories:** (Also refer to the "Sprinkler Accessories" section of the Viking data book.)

#### Sprinkler Wrenches\*\*:

A. Heavy Duty Part No. 13623W/B (available since 2006), or

B. Head Cabinet Wrench Part No. 13619\*\*\* (available since 2006)

C. Optional Concealed Cover Plate Installer Tool Part No. 14412 (available since 2007)

D. Optional Large Concealed Cover Plate Installer Tool Part No. 14867 (available since 2007)

\*\*Requires a ½" ratchet (not available from Viking). \*\*\*Also optional for removal of the protective cap. Ideal for sprinkler cabinets.

**Sprinkler Cabinet:** Part No. 01731A, Capacity: five (5) sprinklers (available since 1971)

## 4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

## 5. OPERATION

During fire conditions, when the temperature around the sprinkler approaches its operating temperature, the cover plate detaches, releasing the deflector. Continued heating of the exposed sprinkler causes the fusible element to disengage releasing the sealing assembly. Water flowing through the sprinkler orifice strikes the deflector, forming a uniform spray pattern over a specific area of coverage determined by the water supply pressure at the sprinkler to extinguish or control the fire.

## 6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

## 7. AVAILABILITY

Viking Sprinkler Model VK4570 is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

## 8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

**TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES**

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating <sup>1</sup>	Maximum Ambient Ceiling Temperature <sup>2</sup>	Temperature Rating of the Cover Assembly (Required)	Cover Plate Base Part Number <sup>3</sup>	Large Cover Plate Base Part Number <sup>3</sup>	Square Cover Plate Base Part Number <sup>3</sup>
Ordinary	165 °F (74 °C)	100 °F (38 °C)	135 °F (57 °C)	13504	13642	15394

**Cover Plate Finishes:** Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black

#### Footnotes

<sup>1</sup> The sprinkler temperature rating is stamped on the deflector.

<sup>2</sup> Based on NFPA-13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

<sup>3</sup> Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.



## TECHNICAL DATA

### FREEDOM® RESIDENTIAL CONCEALED PENDENT LEAD FREE SPRINKLER VK4570 (K4.9)


The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

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### Approval Chart

#### Viking VK4570, 4.9 K-Factor Residential Concealed Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to NFPA 13, 13R or 13D 2013 Editions

Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure		
		Inches	mm	U.S.	metric <sup>2</sup>			
16872A	VK4570	1/2	15	4.9	70.6	175 psi (12 bar)		
Max. Coverage Area <sup>6</sup> Width X Length Ft. X Ft. (m X m)	Ordinary Temp Rating (165 °F/74 °C)		Deflector to Ceiling	Installation Type	Listings and Approvals <sup>3</sup>		Minimum Spacing Ft. (m)	
	Flow <sup>6</sup> GPM (L/min)	Pressure <sup>6</sup> PSI (bar)			 <sup>4</sup>	NYC		NSF <sup>8</sup>
12 X 12 (3.7 X 3.7)	13 (49.2)	7.0 (0.48)	Refer to Figure	Concealed with Cover Plate Assembly	See Foot- note 7 and 10	See Foot- note 5	See Foot- note 7 and 10	8 (2.4)
14 X 14 (4.3 X 4.3)	13 (49.2)	7.0 (0.48)						
16 X 16 (4.9 X 4.9)	13 (49.2)	7.0 (0.48)						
18 X 18 (5.5 X 5.5)	17 (64.4)	12.0 (0.83)						
20 X 20 (6.1 X 6.1)	20 (75.7)	16.7 (1.15)						

#### Footnotes

- <sup>1</sup> Part number shown is the base part number. For complete part number, refer to current Viking price schedule.
- <sup>2</sup> Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
- <sup>3</sup> This chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals. Refer also to Design Criteria.
- <sup>4</sup> Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
- <sup>5</sup> Meets New York City requirements, effective July 1, 2008.
- <sup>6</sup> For areas of coverage smaller than shown, use the "Flow" and "Pressure" for the next larger area listed. Flows and pressures listed are per sprinkler. The distance from sprinklers to walls shall not exceed one-half the sprinkler spacing indicated for the minimum "Flow" and "Pressure" used.
- <sup>7</sup> Cover Temperature Rating is 135 °F (57 °C). Cover Part No. 13504<sup>1</sup>, 13642<sup>1</sup> (large diameter), or 15394<sup>1</sup> (square cover plate).
- <sup>8</sup> UL Classified to: NSF/ANSI Standard 61, Drinking Water System Components and NSF 372 (MH48034).
- <sup>9</sup> Other paint colors are available on request with the same listings as the standard finish colors. Listings and approvals apply for any paint manufacturer. Contact Viking for additional information. Custom colors are indicated on a label inside the cover assembly. Refer to Figure 3.
- <sup>10</sup> Accepted Cover Plate Finishes are: Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black <sup>9</sup>.



**TECHNICAL DATA**

**FREEDOM® RESIDENTIAL  
CONCEALED PENDENT  
LEAD FREE SPRINKLER  
VK4570 (K4.9)**

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058  
 Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

**DESIGN CRITERIA**

(Also refer to the Approval Chart on page 147w.)

**UL Listing Requirements (C-UL-US-EU):**

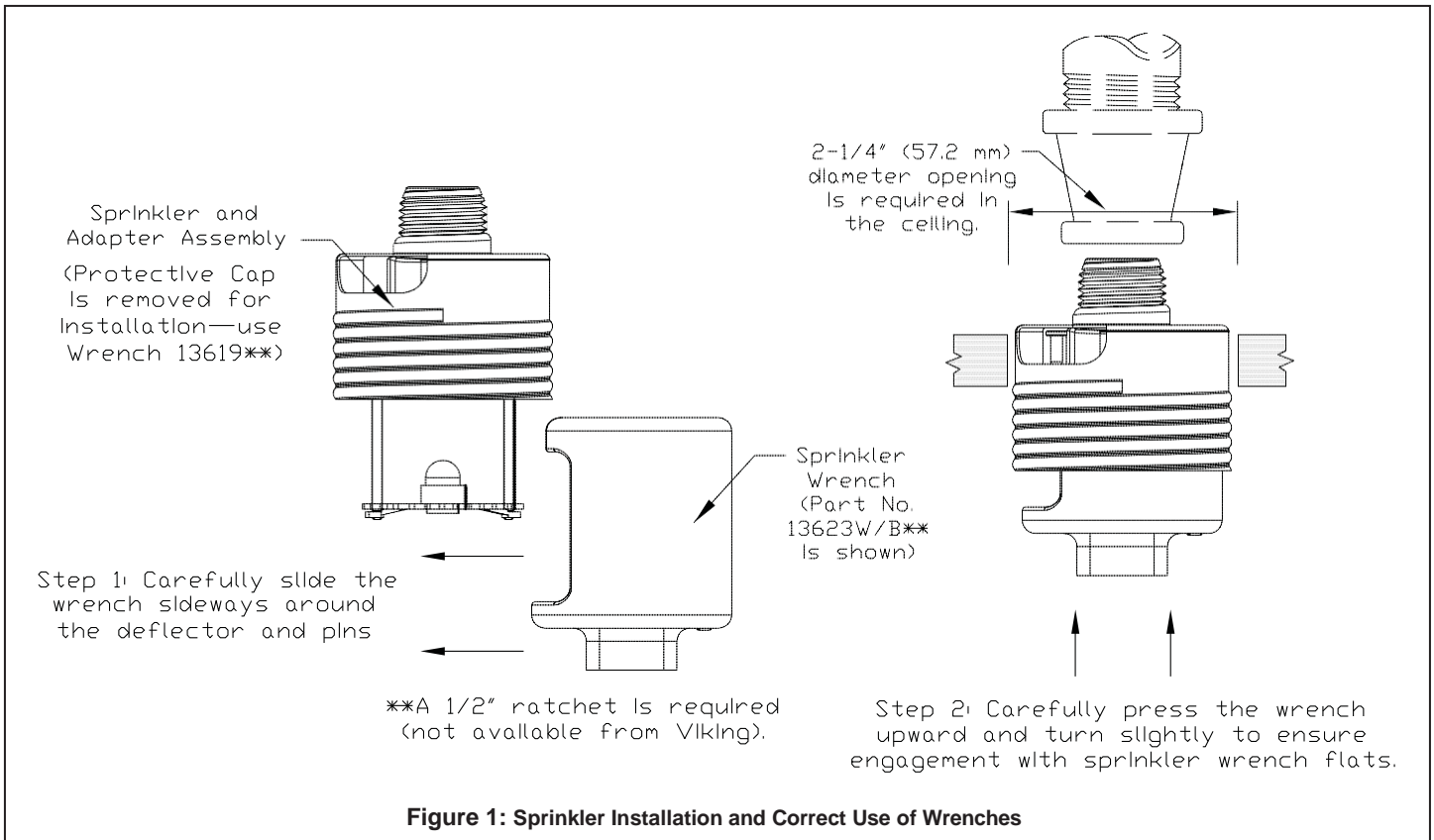
When using Viking Residential Concealed Pendent Lead Free Sprinkler VK4570 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart.

For systems designed to NFPA 13: The number of design sprinklers is to be the four contiguous most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in the Approval Chart for NFPA 13D and NFPA 13R applications for each listed area of coverage, or
- Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the "design area" in accordance with sections 8.5.2.1 or 8.6.2.1.2 of NFPA 13.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

**NOTE: Concealed sprinklers must be installed in neutral or negative pressure plenums only.**

**IMPORTANT: Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to pages RES1-17 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA and any other similar Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. Final approval and acceptance of all residential sprinkler installations must be obtained from the Authorities Having Jurisdiction.**



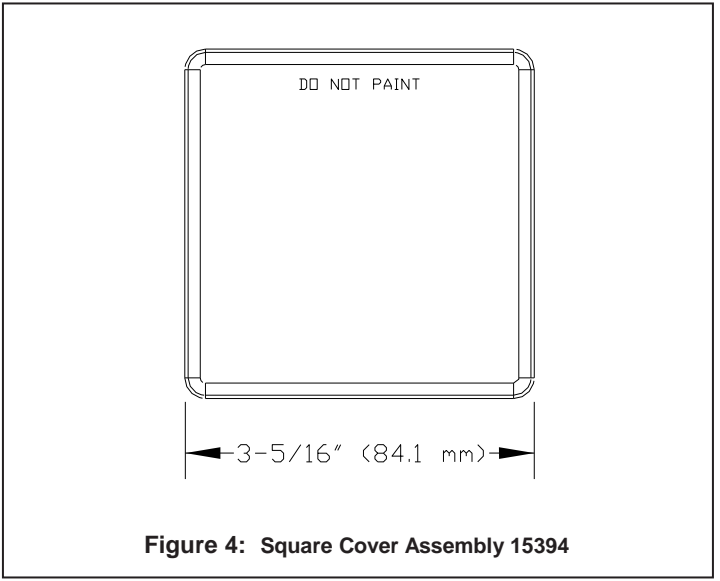
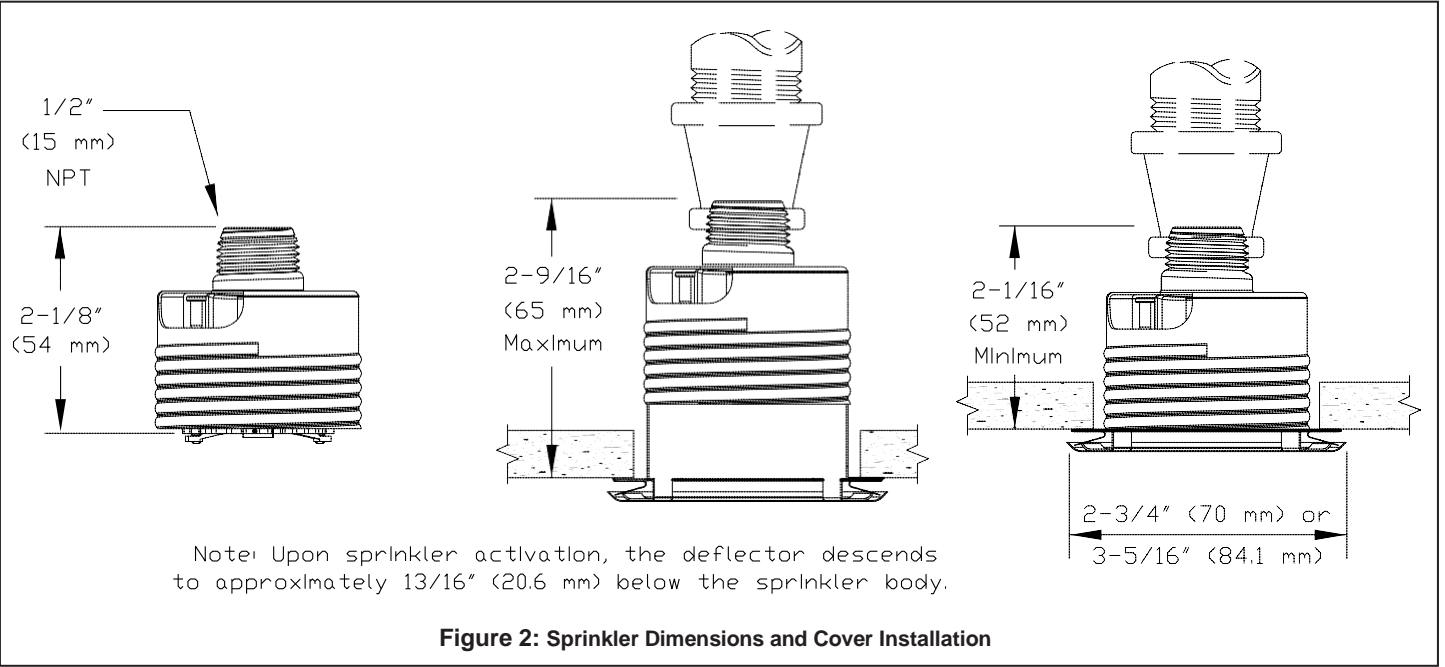




TECHNICAL DATA

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FIRESTONE RUBBERGARD EPDM  
APPLICATION GUIDE

March, 2013

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## 2.1 GENERAL

This section of Firestone's Technical Database provides instructions for the installation of Firestone's RubberGard EPDM Roof Systems. Reference to the Design Guide, Technical Information Sheets (T.I.S.), and other sections of Firestone's Technical Database and Manual is necessary to ensure that the finished roof system is installed in compliance with Firestone requirements.

15, 20, 25 and 30 year warranties and wind warranties in excess of 55 mph, may require special considerations with regards to fasteners, plates, insulations, membrane gauge, and attachment requirements. Refer to the System Design Guide of this Technical Database for specific requirements.

NOTE: IF A PROPOSED APPLICATION FALLS OUTSIDE OF THIS SPECIFICATION, CONTACT FIRESTONE ROOF SYSTEM SOLUTIONS GROUP FOR ADDITIONAL INFORMATION.

## 2.2 JOB SITE CONSIDERATIONS (CAUTION AND WARNINGS)

### A. SAFETY:

1. Comply with all applicable regulatory safety regulations.
2. Keep all adhesives, sealants and cleaning materials away from ALL ignition sources (i.e., flames, fire, sparks, etc.). Do not smoke while using these materials.
3. Consult container labels, Material Safety Data Sheets and Technical Information Sheets for specific safety instructions for all products used on the project.
4. Care must be used when installing fasteners to avoid possible conduits and other piping in and under the deck.
5. Fumes from adhesive solvents may be drawn into the building during installation through rooftop intakes. Refer to Firestone's Technical Information Sheet "Recommended Guidelines for Application of Roofing Materials to an Occupied Building".
6. Do not use heat guns or open flames to dry adhesives and primers.

### B. CAUTIONS:

1. Store Firestone RubberGard EPDM membranes in the original undisturbed plastic wrap in a manner to protect it from becoming damaged. Insulation must be properly stored and protected from ignition sources, moisture and damage. Consult container labels, Material Safety Data Sheets and Technical Information Sheets for specific safety, use and storage instructions for all products used on the project.
2. Do not use oil-base or bituminous-base roof cement with Firestone RubberGard EPDM membrane.
3. Store Firestone Insulations properly protected from ignition sources, moisture and damage.

### C. COLD WEATHER:

1. When the outside temperature is below 40 °F (4.4 °C), certain combinations of temperature and humidity may cause condensation on the surface of solvent-based adhesives and primers. If this condition occurs, discontinue the application. When the ambient air conditions no longer cause condensation on adhesive surfaces, and the

membrane is clean and dry, then re-apply additional adhesive or primer.

2. The consistency of sealants, adhesives and primers will begin to thicken as the temperature drops. To minimize this, the following is recommended:
  - a) Start work with sealants, adhesives and primers that have been stored between 60 F and 80F (15.5 C and 26.7 C). Insulated and heated boxes may be helpful.
  - b) Complete test areas to determine if conditions will cause problems such as condensation with the application of the material.
  - c) Stop the operation or change to another warm container when material becomes too thick to properly apply.
3. Do not use heat guns or open flames to dry adhesives and primers.
4. No-fold or single fold panels are easier to apply in cold weather and are recommended for fully adhered systems.
5. When the outside temperature is below 40 F (4.4 C), installation of the Firestone RubberGard EPDM System requires additional application procedures:
  - Ensure that the roof surface is dry. Moisture may cause poor adhesion, and may lead to moisture entrapment within the roofing system.
  - Use of temporary roofs should be considered when roof applications must occur in cold or potentially wet weather to permit continued interior construction or roof-top work to proceed.
  - Use of heat guns to warm flashing material should be considered to increase flashing flexibility if flashing material is difficult to form.
6. If using Water-Based Bonding Adhesive (WBBA), temperatures and substrate must be at least 40° F (4.4° C) and rising for the material to be applied and perform as designed. Longer drying times should be expected for lower temperatures and higher humidity.
7. When ambient temperature is below 60° F (16° C), Firestone EcoWhite EPDM membrane must be washed with Firestone Splice Wash SW-100 prior to the application of Single-Ply QuickPrime Primer and the installation of EcoWhite Flashings.

## 2.3 ROOF SUBSTRATE PREPARATION

**It is the roofing contractor's responsibility for ensuring that the substrate is acceptable for the Firestone roof system.**

### **A. CORRECT SUBSTRATE DEFECTS:**

1. Defects that need to be corrected before work can commence should be brought to the attention of the General Contractor or Owner in writing and addressed by them.
2. For re-roofing applications, remove existing roof system components as specified by the project designer. If components are discovered during installation that could be detrimental to the performance of the new roof system, they should be brought to the attention of the project designer for corrective action.
3. If soundness and integrity of the existing roof system cannot be verified, good roofing practice requires a complete tear-off to the structural deck. However, recovering an existing roof system is an alternative to removing existing roof components. Non-destructive testing, in conjunction with core cuts, must be completed to determine the condition of the existing roof system and decking.

4. The building owner or project designer is responsible for assuring that all wet insulation and/or wet substrate materials are removed in a re-roofing application. The best diagnostic technique is taking and evaluating a series of roof cuts. There are three other techniques that are currently available to make this determination by indirect means: These are:

- nuclear moisture detection,
- infrared thermograph
- electric capacitance.

These techniques provide measurement of factors that can be associated with the presence of moisture, which can then be verified with the use of roof core cuts to confirm the results of the non-destructive testing.

5. In the absence of a design professional, the roofer should coordinate with the building owner to assure conditions are satisfactory to commence with the project as designed.

**B. REMOVE MOISTURE:**

1. Ponded water, snow, frost and/or ice, present in more than trace amounts must be removed from the work surface(s) prior to installing the RubberGard EPDM Roofing System.

**C. PREPARE SURFACE:**

1. Acceptable substrates to which the RubberGard EPDM Roofing System is installed must be properly prepared prior to roof system installation. The surface must be relatively even, clean, dry, smooth, free of sharp edges, fins, loose or foreign materials, oil, grease and other materials that may damage the roof system. Rough surfaces that could cause damage to the membrane must be overlaid with insulation.

**D. FILL VOIDS:**

1. All surface voids of the immediate membrane substrate greater than 1/4" (6 mm) wide must be filled with insulation.

## 2.4 WOOD NAILER LOCATION AND INSTALLATION

Wood nailers must be installed as specified by the project designer or as noted in Firestone Details and the EPDM System Design Guide. Install wood nailers as follows:

Firestone Building Products no longer requires the use of treated wood nailers. This is due to the new EPA requirements that have caused treated lumber to have more corrosive properties than the previous generation of wood treatments.

**If architectural specifications require the use of treated wood nailers, the following Firestone requirements apply:**

- Refer to the Firestone Design Guide for the appropriate Firestone fastener to be used for securing membrane into wood nailers.
- Nails penetrating treated wood nailers must be hot-dipped galvanized, meeting ASTM A153, Class D or as currently recommended by industry associations.
- Aluminum fasteners, flashings and accessory products must not make direct contact

- with treated wood nailers.
- Uncoated metal and painted metal flashing and accessories, except for 300-series stainless steel, must not make direct contact with treated wood nailers.
- When in doubt of the type of treatment of the wood nailer or its compatibility with a metal component, use EPDM membrane as a separator.

Because of recent EPA regulations regarding treated wood, new treatments for lumber may be highly corrosive to fasteners. Contact the fastener manufacturer for their recommendations on fasteners if attaching nailers that have been treated with corrosive materials.

**A. WOOD NAILER GRADE:**

1. When wood nailers are used, Firestone specifications require the use of wood that is kiln-dried (Southern Pine, Douglas Fir) structural grade #2 or better, unless otherwise noted. While being stored on the roof, properly elevate and cover non-treated wood to protect from the weather and keep dry. Nailers must be properly anchored to provide secure attachment through the warranty term. Nailers are not covered by the Firestone warranty

**B. SIZE OF NAILER**

1. Nailers shall be a minimum thickness of 2" x 4" nominal (1-1/2" (38 mm) x 3-1/2" (89 mm)) and exceed the width of any metal flange attached to it by a minimum of 1/2" (13 mm).

**C. POSITION WOOD NAILER**

1. Total wood nailer height must match the total thickness of insulation being used and should be installed with a 1/8" (3 mm) gap between each length and each change of direction. When more than one nailer thickness is used end joints should be staggered a minimum of 12" (305 mm) from the prior layer in straight runs.

**D. SECURE WOOD NAILER**

1. Wood nailers must be firmly fastened to the deck or building. Mechanically fasten wood nailers to resist a minimum force of 200 lb/f (890 N) in any direction. Defer to attachment requirements of the roofing system as specified by the project designer if greater than 200 lbf (890 N).

**E. TAPER WOOD NAILER**

1. The wood nailer must be tapered (if applicable) so that it will always be flush at the point of contact with the insulation (refer to Firestone Details).

**F. POURED-IN-PLACE DECKS**

1. For new construction over poured-in-place decks or fill, and all recover projects, a waterproof separator membrane shall be placed between the non-treated lumber and the deck.

**G. INSTALLATION OF WOOD NAILERS BY OTHERS**

1. Make these specifications and details available when nailers are to be installed by others. Work that compromises the integrity of the roof system may jeopardize the roof warranty.

**H. FOR ADDITIONAL INFORMATION**

1. Please consult the NRCA Special Report, "Use of Treated Wood in Roof Assemblies." This Technical Bulletin is also posted on the Firestone website at

## 2.5 AIR OR VAPOR BARRIER INSTALLATION

### A. INSTALL VAPOR RETARDER (WHEN SPECIFIED):

1. Install a vapor retarder as specified by the project designer or as required by Firestone.

### B. INSTALL AIR BARRIER (WHEN SPECIFIED)

1. Install an air barrier as specified by the project designer or as required by Firestone.

## 2.6 INSULATION INSTALLATION

**WHERE A BASE SHEET IS REQUIRED PRIOR TO INSULATION INSTALLATION, USE THE FOLLOWING GUIDELINES AND REFER TO THE DESIGN SECTION OF FIRESTONE SPECIFICATIONS FOR SUITABLE SUBSTRATES AND TECHNICAL INFORMATION SHEETS FOR PRODUCT INFORMATION.**

### A. INSULATION BASE SHEETS

1. General
  - a) Starting at the low point of the roof, align the base sheet, unroll and allow the sheet to relax prior to attaching. After allowing to relax, adhere or attach to the substrate with appropriate materials as indicated below.
  - b) Roofing base ply shall never touch roofing single ply, even at roof edges, laps, tapered edge strips, and cants. Cut out fish-mouths/side laps, which are not completely sealed; patch. Fully adhered base sheets which are not fully and continuously bonded shall be replaced.
2. Hot Asphalt Attachment of Base Sheet
  - a) The Firestone base sheet may be attached using a solid mopping of Firestone SEBS mopping asphalt or ASTM D 312 Type III or IV hot steep asphalt. Priming of substrate may be required with ASTM D 41 and is determined by specification.
  - b) The substrate must be suitable for asphalt attachment (structural concrete, base sheet, coverboard, etc.). Refer to the Firestone EPDM Design section of this manual for suitable substrates and the Technical Information Sheets for additional information on specific Firestone base sheets.
  - c) The asphalt shall be at the manufacturer's stated EVT at point of installation.
  - d) Align subsequent rolls, shingling the laps with or along the flow of water, maintaining a minimum 2" (51 mm) side lap and minimum 6" (152 mm) end lap and repeat the application.
  - e) Firestone recommends that a half sheet be used as the first roll to ensure that the base sheet laps and the cap sheet laps are not aligned. Half length sheets may be required, depending on the roof slope
  - f) Refer to the Design section for slope limitations.
  - g) Starting at the low point of the roof, align the Firestone base sheet and unroll into a solid mopping of hot asphalt.



- h) With a stiff push broom, immediately broom the Firestone base sheet to ensure full contact with the asphalt.

### 3. Mechanical Attachment

- a) Starting at the low point of the roof, align the base sheet, unroll and allow the sheet to relax prior to attaching. After allowing sheet to relax, begin attachment at one end and work towards the other end, keeping the roll tight and wrinkle free. Align subsequent rolls, shingling the laps, maintaining a minimum 3" (76 mm) side lap and minimum 6" (152 mm) end lap and repeat the application. Stagger all end laps.
  - b) Fasten Base Sheet Using Firestone Insulation Plates and Fasteners: Structural Concrete, Plywood or OSB
  - c) Using Firestone Insulation Plates and Fasteners, base sheets may be attached directly to poured in place concrete, wood, or through a smooth surfaced built-up or modified bitumen roof system. Refer to the Design Guide Section of this manual for information on fasteners for a particular deck type.
    - 1. Firestone compatible base and cap sheets used as base sheets must be mechanically attached 12" (305 mm) o.c. in the side and end laps and 18" (457 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 13" (330 mm) (approx.) in from the sides of the sheet. See Attachment Guide for diagrams.
    - 2. 36" (914 mm) wide Firestone compatible base sheets must be mechanically attached 18" (457 mm) o.c. in the side and end laps and 36" (914 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (305 mm) (approx.) in from the sides of the base sheet. See Attachment Guide for diagrams.
  - d) Fasten Base Sheet Using Firestone LWC Fasteners: Gypsum, Tectum and LWC
    - 1. Using Firestone LWC fasteners, base sheets may be attached to Gypsum, Tectum and LWC. The base sheet must be mechanically attached with Firestone LWC's at 9" (229 mm) o.c. in the side and end laps and 18" (457 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (305 mm) (approx.) in from the sides of the base sheet.
  - e) Fasten Firestone base sheets using cap nails: plywood, OSB and wood plank decks
    - 1. 1" (25 mm) diameter cap nails with steel heads shall be used to attaché base sheets to plywood, wood plank, and oriented strand board decks. The base sheet must be mechanically attached with cap nails at 9" (229 mm) o.c. in the side and end laps and 18" (457 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (305 mm) (approx.) in from the sides of the base sheet. Cap nails cannot be used to attach insulation, attach a base sheet through an existing insulated roof, attach a base sheet over a gravel surfaced built-up roof, or through a smooth surfaced un-insulated built up roof over 1/2" (13 mm) thick. The fasteners used to attach base sheet must be manufactured for the particular deck type and be Factory Mutual Approved.
    - 2. This attachment pattern applies to all 36" (914 mm) and 1 meter (39.4") wide Firestone compatible base sheets and cap sheets used as base sheets.
- ### 4. Base Sheet Laps
- a) Hot steep asphalt applied Base sheets must be lapped a minimum of 2" (51 mm) for side laps
  - b) End laps must be minimum 6" (152 mm).

- c) In all cases, an offset of 12" (305 mm) minimum must be maintained between the side and end laps of the base sheet and the cap sheet.
- d) Seal all base sheet laps with hot asphalt or hot air welded.

## **B. INSULATION INSTALLATION:**

**Ballasted systems are not allowed when the membrane is installed directly over or onto a hard surface, such as HailGard, ISOGard HD, DensDeck®, SECUROCK®, OSB or concrete.**

**Ballasted systems are not allowed when the membrane is installed directly to a layer of insulation, which has been mechanically attached.**

**Adhesive attachment of insulation is acceptable for Ballasted systems, if required.**

1. Install Insulation
  - a) Install only as much insulation as can be covered with roofing membrane and completed before the end of the day's work or before the onset of inclement weather.
  - b) Form continuous insulation joints over deck flange. Do not cantilever insulation edges over deck ribs. Minimum bearing surface: 1" (25 mm).
  - c) When installing multiple layers of insulation, all joints between layers should be staggered 6" (152 mm) minimum.
2. Fit Insulation:
  - a) Neatly fit insulation to all penetrations, projections, and nailers. Insulation should be loosely fitted, with no gaps greater than 1/4" (6 mm) filled with acceptable insulation.
  - b) On metal decks, the edge of the board parallel with the roof deck flutes should be completely supported by the flute. The membrane should not be left unsupported over a space greater than 1/4" (6 mm).
  - c) Tapered insulation with acceptable facers for bonding must be installed around roof drains so as to provide proper slope for drainage as shown in Firestone Details.
3. Attach Insulation
  - a) Mechanical Attachment:
    1. Insulation must be attached using Firestone Insulation Plates and Fasteners. HailGard™ Fasteners can be used to attach HailGard™ insulation without insulation plates.
    2. If installing on a metal deck (where allowed by specification), the edge of the board parallel with the roof deck should be completely supported and fasteners must penetrate the top rib of the deck the required depth.
    3. When installing fasteners, care should be taken to avoid penetration of conduits and other piping below or encased in the deck.
    4. For attachment, refer to the Technical Information Sheets that references the specific insulation being used. Attachment patterns and fastening rates of that insulation will vary depending on performance required.
    5. For specific deck penetration requirements refer to the Technical Information Sheet that references the specific fastener being used.
    6. When installing a multi-layer insulation assembly, the fastening rate and pattern

is determined by the type and thickness of the top layer of insulation.

7. Ensure that the fasteners are fully seated, but not overdriven. A properly adjusted clutch or a depth sensing drill attachment should be used to prevent over-driving or under-driving fasteners.
8. Multiple layers may be installed using a common fastener.

**b) Asphalt Attachment:**

1. The substrate may require priming prior to installing the insulation. Refer to the Design Guide for specific information.
2. The insulation should be no larger than 4' X 4' (1.2 m X 1.2 m) panels.
3. Insulation may be attached using a solid mopping of Firestone SEBS Asphalt (as required by warranty term) or ASTM D 312 Type III or Type IV asphalt. RESISTA and ISOgard HD cannot be attached with hot asphalt.
4. Top insulation board shall be installed without displacing asphalt to the top of the seam where it can contact the RubberGard membrane.
5. The asphalt shall be at the manufacturer's stated EVT less ~ 25° F at the point of installation. Enough asphalt must be installed (approximately 25-30# /100 ft<sup>2</sup> (1.2 – 1.4 kg/m<sup>2</sup>)) to ensure that complete adhesion is achieved.
6. It is necessary to "walk" boards in to ensure complete adhesion to the substrate.
7. Additional layers of insulation may be installed in the same fashion.

**c) Adhesive Attachment:**

1. Insulation may be attached using I.S.O.Stick™, I.S.O. Twin Pack™, I.S.O.FIX™, I.S.O.SPRAY™ or Hot Asphalt. RESISTA and ISOgard HD cannot be attached with hot asphalt.
2. Apply the adhesive in strict accordance with the instructions provided with the product and the Technical Information Sheets that are a part of the Firestone Technical Database and Technical Manual.
3. It may be necessary to prime the substrate prior to installing the insulation adhesive. Consult the specific TIS of the Adhesive selected.
4. If installing on a metal deck (where allowed by specification), the edge of the board parallel with the roof deck flutes must be completely supported.
5. The insulation should be no larger than 4' X 4' (1.2 m X 1.2 m). DensDeck and SECUROCK products may be 4' x 8' (1.2 m x 2.4 m)
6. It is necessary to "walk" boards in and weight down to ensure complete adhesion to the insulation and substrate.

## 2.7 MEMBRANE INSTALLATION

This section contains information for Firestone RubberGard™ membranes systems. Read all of the information to ensure that it is the correct system and application. For RubberGard Platinum™ systems refer to Platinum Application Guide.

### QuickSeam RPF Strip

Membrane installations may require the use of a QuickSeam™ Reinforced

Perimeter Fastening Strip (QSRPFS) resulting in coordination with the layout and installation of membrane system. This process should be addressed early in the roofing process.

The additional securement details for the membrane (base tie-in) will occur at all locations where the membrane goes through an slope change greater than 1" (25 mm) in 12" (305 mm) (i.e., roof edges, curbs, interior walls, etc.) And other areas as details indicate. See additional information in Section 2.12.A.

RubberGard™ LSFR PT (Pre Taped) and RubberGard Max PT Panels

Firestone RubberGard and RubberGard Max PT Panels method of installation requires that the rolls be staged correctly for unrolling in order for the laps to shed water correctly.

#### **A. FULLY ADHERED SYSTEM**

1. Membrane Placement:
  - a) The RubberGard EPDM Adhered Systems must be installed so that the seams shed or run parallel to the flow of water.
  - b) Place membrane panel, unroll without stretching, over the acceptable substrate leaving sufficient membrane for tie-ins, roof edges and seaming; allow membrane to relax for a minimum of 30 minutes before attaching or splicing. During cold weather application, it is recommended that the smallest panels be used to minimize folds (larger panels have factory folds which may take longer to relax during cold weather).
  - c) Placement of additional rolls of membrane shall provide for sufficient overlaps for seaming of membranes. See standard lap splice details.
2. Fold the Membrane Back:
  - a) After making sure the sheet is placed in its final position allowing for the minimum lap width per Firestone specifications, fold it back evenly onto itself without wrinkles to expose the underside mating surface of the sheet.
3. Remove Dusting Agent and Dirt:
  - a) Sweep the mating surfaces with a stiff broom to remove any dusting agent or dirt that may have accumulated.
4. Apply the Bonding Adhesive:
  - a) Apply bonding adhesive with either a 9" (229 mm) wide solvent-resistant paint roller, power roller or a commercial-grade adhesive sprayer. Adhesive must be applied in a relatively uniform thickness to both surfaces at approximately the same time. If adhesive is spray-applied, it must be back-rolled with a paint roller to assure proper contact and uniform coverage. Refer to Firestone Technical Information Sheets and container labels for specific application instructions and information on spray equipment.
  - b) Apply bonding adhesive at specified coverage rate refer to the container label and Technical Information Sheet for specific application requirements and coverage rates.

#### **Stop Bonding Adhesive Short of membrane Seam Area**

**Care must be taken not to apply bonding adhesive over an area that is to be later spliced to another sheet or flashing. All bonding adhesives must be completely removed from the seam area.**

5. Test Bonding Adhesive for Readiness (Touch-Push Test)
  - a) Allow the bonding adhesive to flash-off. Touch the adhesive surface in several places with a clean, dry finger to be certain that the adhesive does not stick or string. As you are touching the adhesive, push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, the adhesive is not ready for mating. Flash-off time will vary depending on ambient conditions of temperature and humidity.
6. Bond the Membrane to the Substrate:
  - a) Starting at the fold, roll the previously coated portion of the membrane into the coated substrate slowly and evenly to prevent wrinkles.
  - b) Broom the membrane to assure proper contact, compress the bonded half of the membrane to the substrate with a stiff push broom.
7. Repeat Procedure:
  - a) Complete the membrane installation fold the un-adhered half of the membrane back onto itself, and repeat the procedure.
8. Splice the Laps
  - a) Splice the outside edge of the top sheet as specified in SECTION 2.09 using a QuickPrime™ Plus product and QuickSeam™ Splice Tape. Refer to Lap Splice Details.
  - b) Apply "T" patches at all 3-way sheet intersections and at all factory laps that intersect another sheet. Refer to Lap Splice detail series. Apply Seam Edge Treatment as required.

**B. MECHANICALLY ATTACHED SYSTEMS (B.I.T.S. WITH RUBBERGARD AND RUBBERGARD MAX USING BATTEN STRIPS)**

**Firestone recommends that when installing mechanically attached membranes over steel decks, the field attachment should run perpendicular to the deck panels. If a project is Factory Mutual insured or specified, per FM 1-29 for Global Loss Prevention Data Sheets, attachment must run perpendicular.**

1. Place Membrane and Allow to Relax:
  - a) Place membrane panel and unroll without stretching, over the acceptable substrate leaving sufficient membrane for tie-ins, roof edges and seaming. Allow to relax for a minimum of 30 minutes before attaching or splicing.
  - b) Position subsequent membrane sheets in the same manner, overlapping the ends of adjoining sheets a minimum of 3" (76 mm) and side laps a minimum of 6" (152 mm).
  - c) Perimeter and Field Panel widths are determined by using the Wind Design attachment Guide section of the Firestone Technical Database.
2. Layout Firestone Batten Strips:
  - a) Install Firestone batten strips continuously within the 6" (152 mm) side lap area. Center the batten strip 3" (76 mm) in from the edge of the lower panel. Refer to Firestone Lap Splice Details for specifics.
3. Secure Batten Strips:

- a) Place the Firestone fastener starting 1" (25 mm) in from the end of the Firestone Batten Strip, then every 12" (305 mm) o.c. maximum (unless a more frequent fastener spacing is required per wind/application design guide) using the pre-punched holes in the battens. Round the end of each batten and remove all burrs created by cutting, when required. Where field drilling of battens is necessary, use a 1/4" (6.35 mm) diameter drill bit.
  - b) Start fastening the Firestone batten strip from one end only. Install 2" (51 mm) diameter EPDM pads beneath the battens at batten terminations as shown in Firestone Details. Refer to EPDM system specific details.
  - c) Install fasteners so that it is properly engaged in the deck and seat the head flush with the batten strip surface. Use caution not to overdrive the fastener as this will cause the batten strip to buckle between the fasteners.
  - d) Use a common fastener to anchor overlapping Firestone Batten Strips using a common hole.
  - e) Do not lap corners and "T" joints. Do not overlap the Firestone Batten Strips at corners or "T" joints. Keep battens from the edge of intersecting splices as shown in Firestone Details.
4. Splice the Lap:
- a) Splice the outside edge of the top sheet as specified in Section 2.09 QuickSeam Splice Tape. Refer to Lap Splice Details located in the technical database.

**C. MECHANICALLY ATTACHED SYSTEMS (RUBBERGARD MAX USING V PLATES)**

RubberGard MAX Mechanically Attached Systems.

1. Place Membrane and Allow to Relax:
  - a) Place the membrane panels without stretching, over the acceptable substrate, and allow membrane to relax for a minimum of 30 minutes prior to attachment.
  - b) Position subsequent membrane sheets in the same manner, overlapping the ends of adjoining sheets a minimum of 3" (76 mm) and side laps a minimum of 6" (152 mm).
  - c) Perimeter and Field Panel attachment is determined by using the Wind Design attachment Guide section of the Firestone Technical Database.
2. Layout Firestone V-Plates:
  - a) Install Firestone V-Plate every 12" (305 mm) o.c. min. or as required by the specification within side lap area. Center of the V-Plate 3" (76 mm) in from the edge of the lower panel. Refer to Firestone Details for specifics.
  - b) Secure V-Plates: Install each fastener so that it is properly engaged in the deck and the head is seated in the V-Plate. Use caution not to overdrive the fastener.
3. Splice the Lap:
  - a) Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickSeam Splice Tape. Refer to Lap Splice Details.

**D. MECHANICALLY ATTACHED SYSTEM (MAS USING BATTEN STRIPS)**

1. Place Membrane and Allow to Relax: Place the membrane, without stretching, over the acceptable substrate, and allow it to relax for a minimum of 30 minutes prior to attachment. Position subsequent membrane sheets in the same manner, overlapping a minimum of 4" (102 mm).

2. Splice the Lap: Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickPrime and QuickSeam Splice Tape. Refer to Lap Splice Details.
3. Layout Firestone Batten Strips: Place the batten strips over the membrane in the designated pattern as outlined in the Wind Design Guide in the Firestone Technical Database.
4. Place the Firestone fastener starting 1" (25 mm) in from the end of the Firestone Batten Strip, then every 12" (305 mm) (unless an smaller fastener spacing is required) using the pre-punched holes in the battens.
  - a) Start fastening the Firestone Batten Strip from one end only. Do not start from both ends as this will buckle the batten.
  - b) Install Fasteners: install each fastener so that it is properly engaged in the deck and the bottom of the head is flush with the batten strip surface. Use caution not to overdrive the fastener as this will cause the batten strip to buckle between the fasteners.
  - c) Lap Field Runs of Firestone Batten Strips: Use a common fastener to anchor overlapping Firestone Batten Strips using a common hole.

When batten strips must be field cut, round the cut end. Assure that all burrs created by cutting are removed. Where field drilling of metal battens is necessary, use a 1/4" (6.35 mm) diameter drill bit. Refer to Detail LS-3

- d) Do not lap corners and "T" joints: do not overlap the Firestone Batten Strips at corners or "T" joints. Keep battens from the edge of intersecting splices as shown in Firestone Install 2" (51 mm) diameter EPDM pads beneath the battens at batten termination's and where two battens are joined to form a corner as shown in Firestone Details.
- e) Install QuickSeam Batten Cover Strips: All batten strips must be covered prior to the end of the workday. Should inclement weather strike before the batten cover strip is installed, ensure that the batten bar and the membrane surface beneath the bar is dry. As an option in unpredictable climates, a 3/8" (10 mm) bead of Lap Sealant may be installed beneath the batten bar at the fastener to reduce moisture migration into the roof system in the event of inclement weather before the batten cover is installed. After applying Firestone Single-Ply QuickPrime Primer to the membrane, apply the QuickSeam Batten Cover per Firestone Detail Lap Splice-3.

#### **E. BALLASTED SYSTEM**

1. Place Membrane and Allow to relax:
  - a) Place membrane panel, without stretching, over the acceptable substrate and allow membrane to relax for a minimum of 30 minutes before splicing or attaching. The RubberGard EPDM Ballasted System must be installed so that the splices shed the flow of water.
2. Move Membrane to its Final Position:
  - a) Move the membrane panel to its final position allowing for a minimum 4" (102 mm) field seam onto adjacent panels and sufficient membrane for proper membrane terminations.
3. Splice the Lap:
  - A) Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickSeam Splice Tape. Refer to Lap Splice Details.
4. Ballast installation:

**A) Firestone Ballast Paver System**

1. Install all Firestone Ballast Paver System Accessories, Paver Clips, AP Sealant, Metal Termination Bars and Protection Mat, as required in proper sequence for Paver system performance.
2. Place Firestone Ballast Paver System in accordance with Firestone Ballast Paver Installation Guide for the appropriate system requirement as determined by the design professional.

**B) Stone Ballast**

1. Spread Ballast: The ballast shall be spread over the completed Firestone System at the rate specified by the project designer but never less than 10 lb (4.5 kg)/sq. ft. using ASTM #4 stone. Refer to the system Design Guide of this Database for Ballast type and size requirements. Ballast must be spread over the membrane using soft rubber tired ballast buggies. Spread ballast around penetrations by hand.
2. Protect Membrane and Insulation at Ballast Loading Areas: At staging areas where ballast is loaded, protect the membrane and underlying insulation using insulation and/or plywood over an additional layer of Firestone protective membrane. Remove and replace all materials damaged from ballasting operation.
3. Distribute Ballast Around Walkway Pads: Any ballast displaced by a walkway should be distributed around the pad to maintain the specified average ballast rate.
4. Do not place a walkway and pads within 10' (3.0 m) of a roof edge. If needed around mechanical equipment, use appropriate ballast pavers.

## 2.8 MEMBRANE ATTACHMENT AT PERIMETERS FOR MAS SYSTEMS

Perimeters may be adhered or mechanically attached. When mechanically attaching a perimeter, the batten layout must be as specified in the Firestone Wind Design Guide as a minimum, or as required by the designer or local building codes. Should a fully adhered perimeter be chosen, the area of the adhered perimeter is the same as if the perimeter were mechanically attached.

**A. ADHERED PERIMETER:**

1. Follow Fully Adhered, Section 2.07.A for this method as required for perimeter plus the following added steps.
2. Terminate the Membrane at the Perimeter: After the perimeter sheets are adhered to the substrate, they must be terminated along the roof edge using an appropriate Firestone roof edge detail or base tie-in detail which is included as part of this specification.
3. Install Perimeter Isolation Batten Strip: Install Firestone Batten Strips continuously along the inside edge of the adhered perimeter sheet.
4. Splice the Lap and do detail work: Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickSeam Splice Tape. Complete required detail work such as transition and T-patches per Firestone details.

**B. MECHANICALLY ATTACHED PERIMETER - BATTEN STRIPS OR V-PLATES:**

As an alternative to the adhered membrane perimeter, Firestone's Reinforced Mechanically Attached, and Mechanically Anchored Systems may be installed using Firestone batten



strips or V-Plates as shown in Firestone's Wind Design Guide.

1. Batten Strips:

- a) Proceed to install as outlined in Section 2.07.D

2. V-Plates:

- a) Proceed to install V-Plates as outlined in Section 2.07.C.

**C. QUICKSEAM R.M.A. STRIP (QSRMA STRIP):**

- a) Secure the QSRMA Strip, center the fastening system (Firestone Batten Strips, 2" Seam Plates or V Plates) on the QSRMA Strip, a maximum of 4" (102 mm) from the end of the QSRMA Strip and fasten a maximum of 12 inches (305 mm) O.C. (unless a more frequent fastener spacing is required). If using battens, place the first fastener 1" (25 mm) in from the end of the batten strip, using the pre-punched holes in the battens.

- b) QSRMA Strip Intersections:

- 1. Do not intersect QSRMA Strips at "T" intersections or corner intersections. Do not overlap QSRMA Strips. A fastener and batten strip or plate must be placed starting and ending a maximum of 4 inches (102 mm) from the end of each QSRMA Strip.
- 2. Start Fastening Batten Strips From One End Only:
- 3. When fastening batten strips, start at one end and work towards the other. Fastening the two ends of the batten strip at the same time may cause buckling between fasteners.
- 4. Install Fastener.

**When using batten strips, Firestone AP Sealant must be applied over the fastener heads per Firestone details.**

Do not remove the release paper from the tape until all cleaning and priming has been completed and the membrane is in place

- 5. Use caution not to overdrive the fasteners as this will cause the batten strip to buckle between the fasteners or may cause the QSRMA Strip to wrinkle.

2. Membrane Installation (QSRMA Strip)

- a) Place membrane panel, without stretching, over the installed QSRMA Strip and allow to relax for a minimum of 30 minutes before splicing or attaching

Note: Do not allow field seams to be centered over the QSRMA Strip.

- b) After making sure the sheet is placed in its final position allowing for the minimum lap width per Firestone specifications, fold it back evenly onto itself without wrinkles to expose the underside mating surface of the sheet.

Note: It will assist in the application if the area of the membrane that will be mated to the QSRMA Strip is marked as the membrane is folded back.

- c) Apply Firestone Single-Ply QuickPrime Primer to the center of the QSRMA Strip, over the plates and fasteners, and the membrane where it will mate with the QuickSeam Tape on the QSRMA Strip using the Firestone QuickScrubber Plus. Allow Single-Ply QuickPrime Primer to dry.
- d) After the surfaces have dried properly, as determined by using the touch-push test, remove the release paper from the QSRMA Strip and roll the membrane into place and broom with a stiff push broom.
- e) Roll the membrane over the QSRMA Strip with:
  - 1. A 1-1/2"- 2" (38 mm – 51 mm) wide silicone roller or across the tape and then along its length covering the width in several passes.
  - or
  - Starting in the center of the strip, roll the QSRMA Strip with the Firestone QuickRoller in a back and forth motion along the length of the QSRMA Strip, not to exceed 3 feet (0.9 meter ) maximum at a time.
  - 2. Do not use metal rollers or power rollers over the QSRMA Strip

## 2.9 MEMBRANE SEAMING

When using RubberGard Max membrane, Firestone Seam Edge Treatment must be applied to all splice or detail edges where reinforcing scrim is exposed. Refer to Detail LS-9 using seaming using SA-1065 adhesive and Lap Sealant.

### A. SEAMING PROCEDURES

Firestone RubberGard LSFR PT (Pre Taped) and RubberGard MAX PT need to be positioned with the rolls in the correct location and orientation to unroll and have the tape located for the seaming of the laps.

PT rolls are marked with the tape location and direction of unroll. Panels need only to be marked to guide the application of QuickPrime Products to one sheet for side laps. Roll end laps require standard application of QuickPrime and QuickSeam Tapes.

1. Position and Fold Back the Lap Edge:
  - a) Position the membrane at the seam area by overlapping membrane 4" (102 mm) for 3" (76 mm) QuickSeam Tape, 7" (178 mm) for 6"(152 mm) QuickSeam Tape. Once the membrane is in place, mark the bottom membrane 1/2" (13 mm) to 3/4" (19 mm) from the edge of the top membrane every 4' (1.2 m) to 6' (1.8 m) using the marking crayon provided with the QuickSeam Tape.
  - b) Tack the membrane back with Single-Ply QuickPrime Primer as necessary to hold back the membrane at the splicing area.
2. Apply Single-Ply QuickPrime Primer to Seam Area:
  - a) Remove excess amounts of dusting agent on the membrane and at factory splices using a stiff push broom. In the case of adhered systems make sure there is no contamination of bonding adhesive in the tape area.
  - b) Stir Single-Ply QuickPrime Primer thoroughly before and frequently during use. Dip the

QuickScrubber or QuickScrubber Plus into the bucket of Single-Ply QuickPrime Primer, keeping the pad flat.

- c)** Apply the Single-Ply QuickPrime Primer uniformly at least 1" (25 mm) wider than QuickSeam Tape application area, using long back and forth type strokes with pressure along the length of the splicing area until surfaces become dark gray in color. Do not over-work the Single-Ply QuickPrime Primer.
    - 1. PT panels only require QuickPrime applied to the non-taped, bottom sheet, panel mating surface for the side seams. End seams require two sided application of Single-Ply QuickPrime Primer.
    - 2. Non-taped panels will need to have Single-Ply QuickPrime Primer applied to both sheet surfaces alternating between sheets while working down the seam area.
  - d)** Change the QuickScrubber Plus pad:
    - 1. PT panel side laps are one side application and will result in 400 feet (121.9 m) of usage or
    - 2. Other panels and PT ends are two sided application and will result in 200 feet (61.0 m) of seam or
    - 3. When the pad will no longer holds the proper amount of Single-Ply QuickPrime Primer, whichever is less.
  - e)** Additional scrubbing is required at all factory seams and at areas that may have become contaminated or have excess amounts of dusting agent in the creases. Allow QuickPrime to dry, check using the Touch-Push test.
- 3.** Apply the QuickSeam Splice Tape:
- a)** After allowing the Single-Ply QuickPrime Primer to dry properly, using the Touch-Push Test to verify.
    - 1. PT products require end laps be done, for side laps skip to 4
    - 2. On other panels, apply the QuickSeam Splice Tape to the bottom membrane, aligning the edge of the release paper with the markings. Refer to Lap Splice detail appropriate for system being installed.
  - b)** Immediately roll the splice tape with a 1 ½" to 2" (39 mm to 51 mm) wide silicone hand roller or a clean QuickScrubber or QuickScrubber Plus pad and handle.
- 4.** Position the membranes, check the Splice Tape Alignment:
- a)** Place the top membrane to rest on bottom membrane with the tape's release backing still in place.
    - 1. PT panels: Confirm the tape will be in full contact with Single-Ply QuickPrime Primer treated membrane on side laps. End laps should follow instruction 2 given below.
    - 2. Other panels: trim the top panel as necessary to assure that 1/8" to 1/2" (3 mm to 13 mm) of the QuickSeam Seam Tape will be exposed on the finished seam. Confirm the tape will be in full contact with Single-Ply QuickPrime Primer primed membrane.
- 5.** Remove Release Backing:
- a)** Allow the top membrane to fall freely onto the bottom membrane prior to removal of the release backing.
  - b)** Start to peel the release backing off the QuickSeam Splice Tape by pulling against the weight of the panel at approximately a 45° angle to the tape and parallel with the roof surface.



LS Details.

- b) Trim QuickSeam Splice Tape at "T" Joints - Trim QuickSeam Splice Tape so that the edge of QuickSeam Splice Tape and the edge of the membrane are flush beneath the "T" Joint area. Per LS Details.
- c) "T" Joints - Apply a section of Firestone QuickSeam Flashing or QuickSeam Joint Cover over the "T" joint area per LS Detail.
- d) Use of 6" or 7" QuickSeam Splice Tape with Cured EPDM as Flashing - If cured EPDM is used as flashing, apply a 9" (229 mm) long section of QuickSeam Splice Tape and cover with primed Membrane or a 9" (229 mm) section of QuickSeam Joint Cover over the intersection of the flashing and field seams per LS Details.
- e) When using RubberGard Max membrane, Firestone Seam Edge Treatment must be applied to all splice edges where reinforcing scrim is exposed. Refer to detail Is-9.

## **B. FLASHING SPLICES USING SA-1065 ADHESIVE (REPAIRS ONLY)**

Where splice adhesive is allowed by Firestone Details, use the following procedure for completing the seams:

1. Clean the flashing and roof membrane area to be seamed using clean natural fiber cloths with Firestone Splice Wash to remove all dusting agent, dirt, and other contaminants that will affect the finished seam and allow drying. Additional cleaning may be required to ensure that the membrane is completely cleaned. Additional cleaning at factory seams is required to remove accumulations of dusting agent. Natural fiber cloths must be discarded as they become dirty and replaced with clean ones to assure proper cleaning. Proper cleaning has been achieved when the membrane surface is uniformly black in color and no streaking is evident. FormFlash does not require cleaning unless it has been contaminated.
2. As an option, Single-Ply QuickPrime Primer may be used in lieu of the cleaning procedure described above. Refer to the QuickSeam Splice Tape Section of this specification and Firestone's Technical Information Sheet for proper application techniques of Single-Ply QuickPrime Primer.
3. Thoroughly stir Firestone's Splice Adhesive before and during use. Apply the Splice Adhesive using a Firestone Splice Adhesive Brush or a 3" to 4" (76 mm to 101 mm) wide 1/2" (13 mm) thick, solvent-resistant paint brush in a smooth, even coat with long brush strokes, such that brush marks bleed out, yielding a smooth, glossy adhesive surface. Apply Splice Adhesive to both mating surfaces at about the same time.
  - a) Do not use circular motions for applying Splice Adhesive. Do not use paint rollers, spray equipment or mechanical equipment for the application of splice adhesive. Do not use long handles on splice adhesive brushes to apply splice adhesive.
4. Test the splice adhesive for readiness by using the Touch-Push Test. Touch the adhesive surface in the thickest area with a clean dry finger to be certain that the adhesive does not stick or string. As you are touching the adhesive, push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, the adhesive is not ready for mating. Flash-off time will vary depending on ambient conditions.
5. After the splice adhesive has dried properly, mate the flashing to the mating area.

6. To complete the splice between the flashing and roof membrane, cut the flashing membrane down to each corner of the curb. Work the flashing membrane into the angle change as tightly as possible, and then allow the remainder of the flashing membrane to fall into place.
7. Roll the splice with a 1-1/2" to 2" (38 mm x 51 mm) silicone roller in both directions along the splice edge.

## 2.10 SEAM EDGE TREATMENT

SEAM EDGE TREATMENT (S.E.T.) IS REQUIRED WHEN USING SPLICE ADHESIVE AS SHOWN ON FIRESTONE DETAILS AND AT CUT EDGES OF RUBBERGARD MAX MEMBRANE. See Detail LS-9.

### A. APPLY SPLICE ADHESIVE TO SEAM EDGE:

1. Using a Splice Adhesive brush, apply SA-1065 Splice Adhesive a minimum of 1" (25 mm) on either side of the seam edge. Allow the Splice Adhesive to dry. If the seam edge has become contaminated, it will be necessary to clean the edge with Firestone Splice Wash prior to applying the adhesive.

### B. APPLY THE LAP SEALANT TO SEAM EDGE:

1. Apply a continuous bead of Lap Sealant, approximately 3/8" x 1/4" (10 mm x 6 mm) 20-22 lineal feet (6 m - 6.7 m) per 10 oz. (295 cc) tube centered over the seam edge using a standard caulking nozzle. Using the Firestone supplied Lap Sealant tool, feather the Lap Sealant immediately, taking care to leave a mound of sealant directly over the seam edge (refer to Lap Splice Details). Alternately, Lap Sealant may be applied using the plastic nozzle applicator supplied by Firestone, assuring the applicator is centered at the seam edge.

## 2.11 QUICKSEAM BATTEN COVER INSTALLATION FOR M.A.S SYSTEMS

### A. CLEAN AND PRIME BATTEN STRIP AREA:

1. Using Firestone QuickScrubber or QuickScrubber Plus, apply Single-Ply QuickPrime Primer to the membrane and batten area so that the prime extends 1/2" to 1" (13 mm to 25 mm) beyond the area to be covered with the Batten Cover Strip. Additional cleaning at factory splices and areas of excessive dusting agent is required. Allow Single-Ply QuickPrime Primer to flash-off.

### B. PLACE QUICKSEAM BATTEN COVER ROLL:

1. Place the roll of QuickSeam Batten Cover on the roof a few feet ahead of the application starting point, positioned so that it unrolls from the top of the roll (release paper will be on top).

### C. INSTALL QUICKSEAM BATTEN COVER:

1. Starting a minimum of 4" (102 mm) prior to the start of the EPDM protection pad under the end of the batten strip, center the QuickSeam Batten Cover and apply to the cleaned and primed surface.

**D. ADVANCE THE ROLL:**

1. Advance the roll along the batten strip, peeling away the release paper as the QuickSeam Batten Cover is applied using the perforations in the release paper as a guide.

**E. CUT THE QUICKSEAM BATTEN COVER:**

1. Cut the QuickSeam Batten Cover and release paper to extend 4" (102 mm) beyond the end of the EPDM protection pad.

**F. APPLY PRESSURE AND ROLL THE SPLICE:**

1. Apply hand pressure along the entire length of the QuickSeam Batten Cover to completely mate the two surfaces. Using a 1-1/2" to 2" (38 mm to 51 mm) wide silicone hand roller, roll the entire batten cover with positive pressure towards the outside edge and then along the entire length of the batten cover.

**G. INSTALL QUICKSEAM FLASHING AT END LAPS:**

1. Apply Single-Ply QuickPrime Primer to the overlap of the QuickSeam Batten Cover as necessary and allow to flash-off. Install a 12" (305 mm) long section of QuickSeam Flashing over the end lap. Roll the QuickSeam Flashing with a 1 1/2" to 2" (38 mm to 51 mm) wide silicone hand roller. Apply Splice Adhesive to edges of the QuickSeam Flashing and apply Lap Sealant as shown in Firestone Details.

Note: Intersections of QuickSeam Batten Covers must be completely covered at the intersecting T-Joints with a 12" (305 mm) long section of QuickSeam Flashing.

## 2.12 ADDITIONAL MEMBRANE SECUREMENT AND BASE TIE-IN FLASHING

Secure the membrane at all locations where the membrane goes through an angle change greater than 1" (25 mm) in 12" (305 mm) (i.e., roof edges, curbs, interior walls, etc.).

**A. USING QUICKSEAM REINFORCED PERIMETER FASTENING STRIP (QSRPF)**

1. Attach the QSRPF Strip to the penetration, parapet wall or deck using Firestone 2" (51 mm) Seam Plates or Firestone Batten Strips fastened a maximum of 12" (305 mm) o.c. Roll the membrane into place and then fold back, exposing the underside of the membrane and the QSRPF Strip. When using batten strips, apply Firestone All Purpose Sealant over each fastener head, assuring that the fastener head is completely covered.
2. Apply Single-Ply QuickPrime Primer to the membrane where it will mate with the QuickSeam Splice Tape and allow to dry. Apply Firestone Bonding Adhesive to the back half of the QSRPF, to the membrane that is to be bonded to the penetration or wall, and to the penetration or wall itself.
3. After the surfaces have dried properly as determined by using the Touch-Push Test, remove the release paper from the QuickSeam Reinforced Perimeter Fastening Strip and roll the membrane into place, assuring a tight fit into the transition between the horizontal and vertical surfaces. Continue to roll the membrane up the wall and broom in place with a stiff push broom. Roll the membrane over the QuickSeam Tape with a 1-1/2" to 2" (38 mm to 51 mm) wide silicone roller or QuickRoller across the tape and then along its length.
4. Complete vertical laps seams as described in the lap splice section of this specification. Install a T-Joint Cover over any vertical lap splices that go through an angle change (Refer to Firestone Details).

## **B. USING FIRESTONE BATTEN STRIP**

1. Install the RubberGard Membrane per Firestone Details and attach to the vertical substrate using Firestone Batten Strips a maximum of 12" (305 mm) o.c. (Polymer Battens may only be used over wood or metal substrates). Apply Firestone All Purpose Sealant over each fastener head, assuring that the fastener head is completely covered.
2. Cut a piece of flashing from RubberGard Membrane or QuickSeam Curb Flashing large enough to completely cover the substrate of the wall or curb and extend onto the roof membrane a minimum of 3" (76 mm). Complete the splice between flashing and the main roof membrane using QuickSeam Splice Tape before adhering flashing to the vertical surface. Provide lap seams in accordance with Firestone Details.
3. Apply bonding adhesive at about the same time to both the flashing and the surface to which it is being bonded so as to allow approximately the same flash-off time. Apply bonding adhesive evenly to avoid puddles.
4. After the bonding adhesive has dried properly as determined by the Touch-Push Test, roll the flashing into the adhesive evenly and carefully so as to minimize wrinkles. Broom the flashing to the substrate with a stiff push broom to assure proper contact.

## 2.13 FLASHING – PENETRATIONS

### **A. GENERAL:**

1. Remove all loose existing flashing (i.e. metal, bituminous materials, mastic, etc.).
2. Flash all penetrations passing through the membrane.
3. The flashing seal must be made directly to the penetration.

### **B. PIPES, ROUND SUPPORTS, STRUCTURAL STEEL TUBING, ETC.:**

1. Flash penetrations with Firestone EPDM Pre-Molded QuickSeam Pipe Flashing, Conduit Flashings or Quick Seam Penetration Pockets wherever possible. Do not cut or patch EPDM Pre-Molded Pipe Flashings to assist in their installation except where noted on instructions.
2. Flash penetrations using FormFlash when the use of Pre-Molded EPDM Pipe Flashings or Penetration Pockets is not possible.
3. Refer to Firestone's Technical Information Sheets for minimum and maximum pipe diameters that can be successfully flashed with Pre-Molded EPDM Pipe Flashings.
4. Structural Steel Tubing: Use a field-fabricated pipe flashing detail when the corner radius is greater than 1/4" (6 mm) and the longest side of the tube does not exceed 4" (102 mm). When the tube exceeds 4" (102 mm), use a standard curb detail including base-tie in and suitable termination.

### **C. ROOF DRAINS:**

The following applies for installation of cast iron drains only. For all other drain types contact Firestone Roofing Solutions Group.

1. Remove existing clamping ring. Remove any broken clamping hardware and replace.
2. Remove all existing flashing (including lead flashing), roofing materials and cement from the existing drain in preparation for membrane and Water Block Seal.
3. Provide a clean even finish on the mating surfaces between the clamping ring and the drain



bowl.

4. Install insulation, flat and tapered, with suitable bonding surfaces around the drain to provide a smooth transition from the roof surface to the drain. Slope into drain cannot be greater than 4 in 12 for standard membrane and 1 in 12 for reinforced membrane.
5. Position the membrane and cut a hole for the roof drain allowing a 1/2" (12.7 mm) to 3/4" (19.1 mm) of membrane inside the clamping ring. Make round holes in the membrane to align with clamping bolts (a paper punch may be used). Do not cut the membrane back to the bolt holes.
6. Install Firestone Water Block Seal on the clamping ring seat flange below the membrane. Use a minimum of one half of a 10 oz. (295 cc) tube for a 10" (254 mm) drain.
7. Install the roof drain clamping ring and all clamping bolts. Tighten the clamping bolts to achieve constant compression

#### **D. INSERT DRAINS**

Firestone 3" & 4" (76 mm and 102 mm) Insert Drains are intended for installation when existing drains are deteriorated and not suitable for reuse. For other conditions outside of these, contact Firestone Roofing Solutions Group.

1. Remove existing clamping ring. Remove any broken clamping hardware and debris.
2. Install wood blocking as required to support, level and square drain with new insulation sump.
3. Install Firestone Insert drain, securing to a solid substrate in accordance with instructions, in preparation to receive the roof membrane.
4. Install insulation, flat and tapered, with suitable bonding surfaces around the drain to provide a smooth transition from the roof surface to the drain. Slope into drain cannot be greater than 4 in 12 for standard membrane and 1 in 12 for reinforced membrane.
5. Position the membrane and cut a hole for the roof drain allowing a 1/2" (13 mm) to 3/4" (19 mm) of membrane inside the clamping ring. Make round holes in the membrane to align with clamping bolts (a paper punch may be used). Do not cut the membrane back to the bolt holes.
6. Install Firestone Water Block Seal on the clamping ring seat flange below the membrane. Use a minimum of one half of a 10 oz. (295 cc) tube for a 10" (254 mm) strainer basket/clamping ring.
7. Install Firestone roof membrane as prescribed and secure with strainer basket and bolt assembly.

#### **E. PIPE CLUSTERS AND UNUSUAL SHAPED PENETRATIONS:**

1. Install Firestone molded Penetration Pockets per instructions. Allow a minimum clearance of 1" (25 mm) between the penetration(s) and all sides of the Penetration Pocket.
2. Flash detail with shop made penetration pockets to allow a minimum clearance of 1" (25 mm) between the penetration(s) and all sides.
3. Secure penetration pockets and flash per Firestone Details.
4. Fill penetration pockets with Firestone Pourable Sealer and mound to shed water. Pourable Sealer must be a minimum of 2" (51 mm) deep and 1" (25 mm) thick around the penetrations.

#### **F. HOT PIPES:**

1. Protect the RubberGard EPDM components from direct contact with steam or heat sources when the in-service temperature is in excess of 180 °F (60 °C). In all such cases flash to an

intermediate "cool" sleeve with hood. See penetration details.

**G. FLEXIBLE PENETRATIONS**

1. Provide a weather-tight gooseneck set in Water Block Seal and secured to the deck. Flash in accordance with Firestone Details.

**H. SCUPPERS:**

1. Provide and install a new welded watertight sleeve.
2. Set welded watertight scupper in Water Block Seal and secure scupper to the structure.
3. Flash in accordance with Firestone Details.

**I. EXPANSION JOINTS:**

1. Install where specified by the project designer. Install expansion joints in accordance with Firestone details.
2. Ensure joints are sized to accommodate all anticipated movements and make logical transitions to other joint materials at roof perimeter.

**2.14 FLASHING - WALLS, PARAPETS, MECHANICAL EQUIPMENT CURBS, ETC.**

**A. GENERAL:**

1. Using the largest pieces of QuickSeam Curb Flashing or RubberGard EPDM membrane practical, flash all walls, parapets, curbs, etc., to the height as specified by the project designer.

**B. EVALUATE SUBSTRATE:**

1. The following substrates require an overlay of ½" (13 mm) Dens-Deck Prime®, ½"(13 mm) Dens-Deck® or 5/8" (16 mm) exterior grade or "Wolmanized" plywood mechanically fastened in accordance with project designer's requirements.
  - a) DensGlass Gold®
  - b) Interior Gypsum board
  - c) Stucco
  - d) Cobblestone
  - e) Textured masonry
  - f) Corrugated metal panels
  - g) Other uneven substrates
  - h) All loose existing flashing must be removed.
2. Install Additional Membrane Securement at Curbs, Penetrations, Walls, etc.:
3. Provide Termination:  
Provide termination directly to the vertical substrate as shown in Firestone Details where indicated.
4. Provide Intermediate Attachment:

- a) Intermediate attachment of membrane is required at 36" (914 mm) intervals in accordance with Firestone Details unless:
  - 1. The wall surface is smooth, without noticeable high spots or depressions (i.e., plywood, poured or pre-cast concrete, or hollow core block or masonry walls where joints are flush with masonry surface),
  - AND
  - 2. The termination is either a Termination Bar or membrane has been installed underneath a coping or fascia on the outer parapet edge, over the top to the outside edge and turned down to lap any nailer substrate parting line.

## 2.15 EDGE METALS

### A. FIRESTONE FASCIA AND COPING

- 1. Ensure membrane roof system extends enough to terminate per Firestone details at roof edge condition.
- 2. Install prefabricated Firestone perimeter metal edge treatment per instructions and details.

### B. GRAVEL STOPS OR ROOF EDGE METALS

- 1. Flash Gravel Stops or shop made Roof Edge Metals using Firestone QuickSeam Flashing:
  - a) Clean the Membrane and Metal Edge:
    - 1. Remove excess amounts of dusting agent by brooming. Apply Single-Ply QuickPrime Primer to the metal edging and membrane as described in Firestone Specifications. Allow the Single-Ply QuickPrime Primer to flash-off.
  - b) Apply QuickSeam Flashing:
    - 1. Place the roll of QuickSeam Flashing on the roof a few feet prior to the application starting point, positioned so that it unrolls from the top of the roll (release paper will be on top). Remove approximately 2' to 3' (0.6 m to 0.9 m) of release paper and apply to the metal flange and RubberGard Membrane. Lap adjacent rolls of QuickSeam Flashing a minimum of 1" (25 mm). Refer to Roof Edge Details.
  - c) Roll the QuickSeam Flashing:
    - 1. With a 1-1/2" to 2" (38 mm to 51 mm) wide silicone hand roller, roll the QuickSeam Flashing to assure proper adhesion. Additional attention must be given to factory seam intersections and to any change in plane.
  - d) Special Considerations (End Laps, "T" Joints, etc.):
    - 1. Apply 6" (152 mm) length of QuickSeam Flashing, a QuickSeam Joint Cover or 6" x 6" (152 mm x 152 mm) FormFlash to the inside edge of the QuickSeam Flashing at all overlaps. Refer to Roof Edge Details.
    - 2. Apply 6" (152 mm) length of QuickSeam Flashing, a QuickSeam Joint Cover or 6" x 6" (152 mm x 152 mm) FormFlash at all intersections between the QuickSeam Flashing and field-fabricated seams. Refer to Roof Edge Details.
    - 3. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, an additional piece of QuickSeam Flashing must be applied over the metal lap to the top of the gravel stop, after the initial application of QuickSeam

Flashing. Seam Edge Treatment shall be applied at the intersections of the two flashing sections.

**C. OPTIMAL APPLICATION:**

1. The optimal use of QuickSeam Flashing is where a 3" (76 mm) edge metal flange is being used. This will provide the minimum 2" (51 mm) seam to the RubberGard Membrane, with the remaining 3" (76 mm) of the material completely covering the metal flange.
2. If a flange wider than 3" (76 mm) is used, the joints of the sheet metal edge must be flashed using QuickSeam Flashing and Single-Ply QuickPrime Primer, after the primary flashing is complete. In addition, it is recommended that 3" (76 mm) QuickSeam Splice Tape be placed in the sheet metal laps to help seal the metal edge. Refer to Roof Edge Details.

**D. SPECIAL CONSIDERATIONS FOR COPPER EDGING:**

1. Copper may be weathered or coated with an anti-tarnish lacquer which makes adhesion difficult. Therefore, cleaning techniques must be used to prepare the copper surface to receive the QuickSeam Flashing. Firestone requires that the copper be scrubbed with acetone or lacquer thinner, using clean cotton cloths. Cleaning before installation is recommended, however, cleaning can take place after metal is attached if care is taken not to allow the solvents to come into contact with the membrane. After the cleaner dries, apply Single-Ply QuickPrime Primer and QuickSeam Flashing per Firestone Specifications.

## 2.16 MEMBRANE REPAIR

**A. REPAIR CUTS/PUNCTURES IN THE MEMBRANE OR WRINKLES WITHIN 18" (458 MM) OF A SEAM:**

1. A wrinkle running toward a seam or within 18" (457 mm) of a seam must be repaired.
  - a) The wrinkle must be cut out so that the membrane lays flat and patched with a piece of EPDM membrane having no factory seams that extends a minimum of 3" (76 mm) beyond the boundaries of the cut in all directions. If the wrinkle occurs through QuickSeam Flashing or FormFlash, like material must be used for repair. QuickSeam Flashing or FormFlash may not extend onto the roof surface more than 6" (152 mm). QUICKSEAM FLASHING OR FORMFLASH CANNOT BE USED TO REPAIR CURED MEMBRANE. If repairing of the same wrinkle must continue, then EPDM membrane must be used. Install the EPDM repair membrane first, and round all corners of the repair piece.
2. Repair a cut or puncture in the EPDM membrane with EPDM membrane. The repair must extend a minimum of 3" (76 mm) beyond the boundary of the affected area in all directions. Round all corners of the repair piece (Example: a pinhole will require a minimum 6" x 6" (152 mm x 152 mm) EPDM patch).

**B. CLEAN THE MEMBRANE:**

1. When repairing membrane which has been in service, it is necessary to remove accumulated dirt. Proper membrane preparation is made by scrubbing the membrane with a scrub brush and warm soapy water, rinsing with clear water and drying with clean cotton cloths. Clean the area using clean cotton cloths with Firestone Splice Wash. Additional cleaning using Firestone Splice Wash is often necessary.
2. As an alternative, Firestone Membrane PreWash can be used to clean existing membrane. Spray Membrane PreWash on the membrane and allow to sit for approximately ten minutes. Remove PreWash with power washer and allow membrane to dry before any repair activity. Additional applications of PreWash may be required. Refer to Technical Information Sheet

for Membrane PreWash for more detailed instructions.

**C. INSTALL REPAIR MATERIAL:**

1. Repairs must be made with SA-1065 Splice Adhesive. Refer to the Flashing Seam Details found in the Technical Database for application requirements of Splice Adhesive.

## 2.17 TEMPORARY CLOSURE

**A. TEMPORARY CLOSURES-TIE INS**

1. Temporary closures or tie-ins which assure that moisture does not damage any completed section of the new roofing system are the responsibility of the licensed applicator. This is not warranted in any Firestone warranty. Completion of flashings, terminations and temporary closures is required to provide a watertight condition.
2. See the V-Force Membrane Technical Information Sheet for more information.

## 2.18 ACRYLITOP PC-100 COATING

**A. ACRYLITOP PC-100 APPLICATION**

1. AcryliTop PC-100 can be applied to the RubberGard membrane or flashing to offer a reflective surface, and add to its service life. In addition, AcryliTop PC-100 can be applied to existing RubberGard EPDM roofs under warranty, helping extend the membrane life. Should the coating of an existing roof be considered, the roof system should first be inspected by a Firestone licensed contractor to ensure that the system itself is not in need of repair prior to applying AcryliTop PC-100.

**B. REFER TO THE TECHNICAL INFORMATION SHEETS AND MATERIAL SAFETY DATA SHEETS FOR ACRYLITOP**

1. PC-100, AcryliTop PC-100 Base Coat and Membrane PreWash for additional information on application, storage and safety.

**C. CLEAN MEMBRANE SURFACE:**

1. Before applying the AcryliTop PC-100, the RubberGard membrane must be cleaned using Firestone's Membrane PreWash. Clean the roof of debris, as needed, with a broom or leaf air blower. Remove any leaves or large pieces of debris, such as stones, branches, etc.
2. Apply Membrane PreWash at a rate of 300 to 500 square feet of membrane surface (27.8 sq. m to 46.5 sq. m) using a 2 to 3 gallon (7.6 L to 11.4 L) agricultural tank sprayer and allow to dry for 5 to 10 minutes (application rates may vary depending on the cleanliness of the membrane). Ensure that tank sprayer has a pressure relief valve. Do not allow PreWash to come in contact with other surfaces.
3. Using a 3000 to 4000 psi (20.7 mPa to 27.6 mPa) pressure washer that provides a minimum of 4 gallons (15.1 L) per minute, remove the PreWash working first away from the drains or gutters, then back towards them. A 40° fan spray nozzle for pressure washing should be used.
4. Should deposits of dirt and dusting agent remain, additional cleaning with the pressure washer is required. (Caution: Do not allow the spray wand to be closer than 12 inches (305 mm) from the membrane to prevent damage).

**D. APPLY ACRYLITOP PC-100 BASE COAT (ONLY REQUIRED WHEN USING A ROLLER**

**APPLICATION):**

1. After the membrane has dried, apply Firestone AcryliTop PC-100 Base Coat at a rate of approximately 200 square feet (18.5 sq. m) per gallon (3.8 L) using a 3/8" (9.5 mm) nap paint roller. At this rate, membrane may be slightly visible through the base coat. Allow Base Coat to dry thoroughly before applying the AcryliTop PC-100 top coat.

**E. APPLY ACRYLITOP PC-100:**

1. ROLLER APPLICATION:

- a) Using a 3/8" (10 mm) nap paint roller, apply the AcryliTop PC-100 coating at a 90° angle to the AcryliTop PC-100 Base Coat at a rate of approximately 200 square feet (18.5 sq. m) per gallon (3.8 L) or as necessary to assure complete coverage of the AcryliTop PC-100 Base Coat. The finished dry mil thickness shall be a minimum of 10 mils total.

2. SPRAYER APPLICATION:

- a) Once the membrane is properly cleaned, apply AcryliTop PC-100 at a rate of approximately 100 square feet (9.3 sq. m) per gallon (3.8 L), resulting in a minimum 10 mil dry film thickness. The sprayer used for application of the AcryliTop PC-100 shall be a 30:1 ratio pump using a pressure of 90-100 psi (621 kPa to 690 kPa) at a rate of 125 cubic feet (3.5 cu. m) per minute.

## 2.19 ROOF WALKWAYS

**A. LAY OUT FIRESTONE RUBBERGARD QUICKSEAM WALKWAY PADS:**

1. Install walkway pads in locations as specified by the project designer and in accordance with the System Design Guide Section of this Technical Database. Layout Firestone RubberGard QuickSeam Walkway Pads so that the flat surface is over the completed RubberGard Membrane, spacing each pad a minimum of 1" (25 mm) and a maximum of 3" (76 mm) from each other to allow for drainage.
2. If Firestone RubberGard Walkway Pads must be installed over field-fabricated seams or within 6" (152 mm) of a seam edge, install QuickSeam Flashing over the seam edge. The QuickSeam Flashing must extend beyond the walkway pad a minimum of 6" (152 mm) on either side.

**B. ATTACH FIRESTONE RUBBERGARD QUICKSEAM WALKWAY PADS TO THE MEMBRANE:**

1. Clean the Membrane:
  - a) Clean the membrane using Firestone Single-Ply QuickPrime Primer where the QuickSeam Splice Tape will contact the membrane.
2. Place Walkpad:
  - a) Remove the release paper from the QuickSeam Splice Tape. Turn the walkpad over and place it on the primed membrane.
3. Apply Pressure:
  - a) Walk on the pad to press in place assuring proper adhesion.

**C. RED SHIELD WALKWAY SYSTEMS:**

- a) Install Red Shield Walkway systems as instructed with supplied materials.

## 2.20 EQUIPMENT SUPPORTS

### A. RED SHIELD PIPE SUPPORTS:

1. Install Firestone Red Shield Pipe and equipment supports systems were specified. Follow manufactures installation instructions.

## 2.21 SHEET METAL WORK

- For specific installation instructions for Firestone Sheet Metal, refer to the System Design Guide and Technical Information Section of this Technical Database and Manual.
- For sheet metal work not supplied by Firestone, refer to fabrication and installation requirements specified by the project designer, as well as industry standards.

- END OF SECTION -

versamods™ R-40 Modular Alum in u  
m Decking System

Design Services Installation Instructions  
are & Cleaning Warranty Information

Versadeck products are available in standard sizes as well as made to order solutions to better fit jobspecific residential and commercial applications. Versadeck's design customizability allows us to better assist you in the creation of a design that is multifunctional, efficient and most cost effective specific to each application.

#### Design Services

If you would like assistance in the designing of your deck and to generate a parts list,

consult with a Versadeck design specialist to learn about professional design services that are available or we can refer you to a dealer in your area that can better assist you.

#### Handling

Always unload by hand and stack properly. A forklift can be used as long as the product is properly supported with a pallet. A forklift should only be used if it can gently and cleanly lift and set down the product without any horizontal sliding and scraping contact.

If the product is damaged upon delivery, be sure the damage is reported and noted by

the delivery driver at the time of delivery and make sure to have the report in writing and

signed before the delivery truck leaves the premises. Take photos of the packaging before you unload and before you unpack and after. Notify damage to Versadeck immediately.

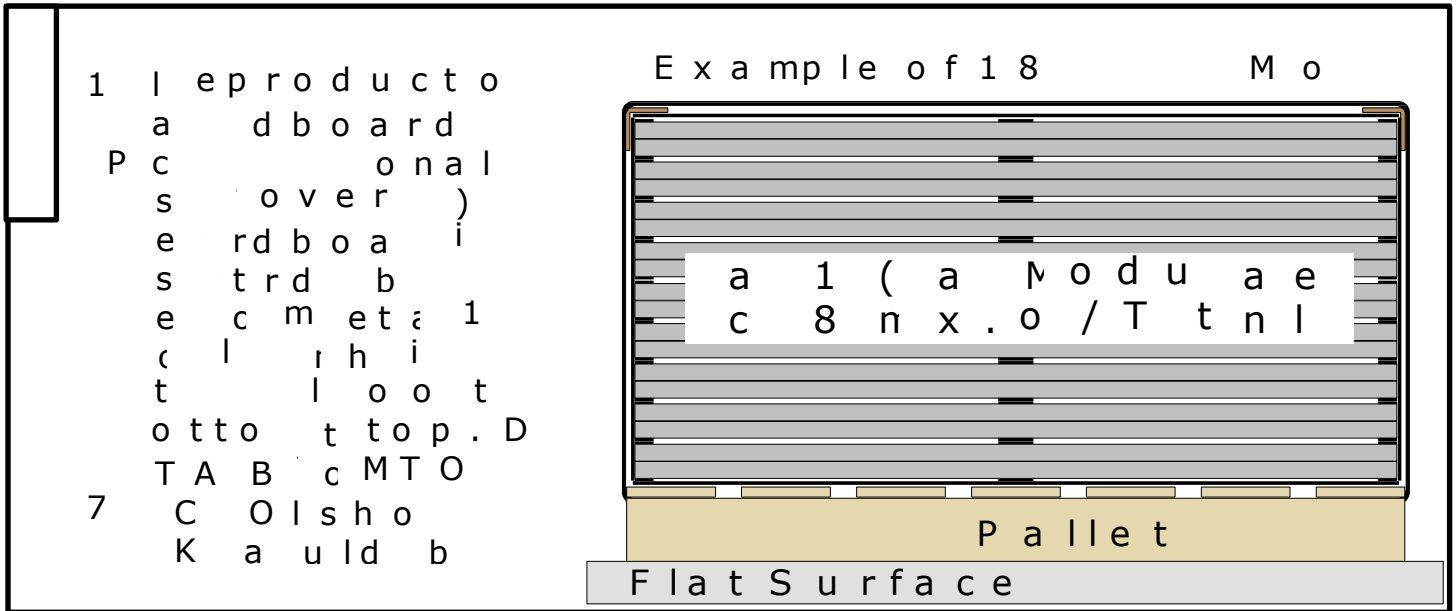
Any damages reported later than 10 days of delivery of the product may not qualify for replacement.



# Stacking and Storage

Always stack and store the product correctly. Stack and store the product on a flat surface covered with translucent waterproof material. Refer to the illustrations below to properly stack the product.

store the product correctly. Store Versadeck products with a non-transparent material. Refer to proper



# VersaMod<sup>TM</sup>R-40 Modular Aluminum Decking System

## Safety First

Always wear proper clothing and use proper safety equipment recommended for building a deck. Always wear safety glasses especially when cutting VersaDeck products. You can use the same saws and tools used to build a wood deck as long as the tools manufacturer's instructions are followed and specify safety precautions when cutting aluminum. Make sure you use sharp fine tooth carbide tip saw blades or aluminum cutting blades recommended by the tool manufacturer.

## Other Precautions

Only use VersaDeck decking for its intended use as a surface decking material to be applied to a properly constructed structure that will safely support it and meet applicable building requirements specific to the location and application. Never use VersaDeck decking for any other use other than its intended use.

- Always use an approved protective barrier to protect VersaDeck aluminum decking from corrosive treated lumber products and any other potentially corrosive material.

- Never use VersaDeck decking as a structural beam, joist, stringer, supporting post or any other primary load-bearing member.

- Always consult local building codes prior to installation.

- VersaDeck is available in three slip-resistant surface textures. Be sure to understand which texture is best fit for the intended use.

Supporting Structure Requirements  
VersaDeck aluminum decking is both lighter

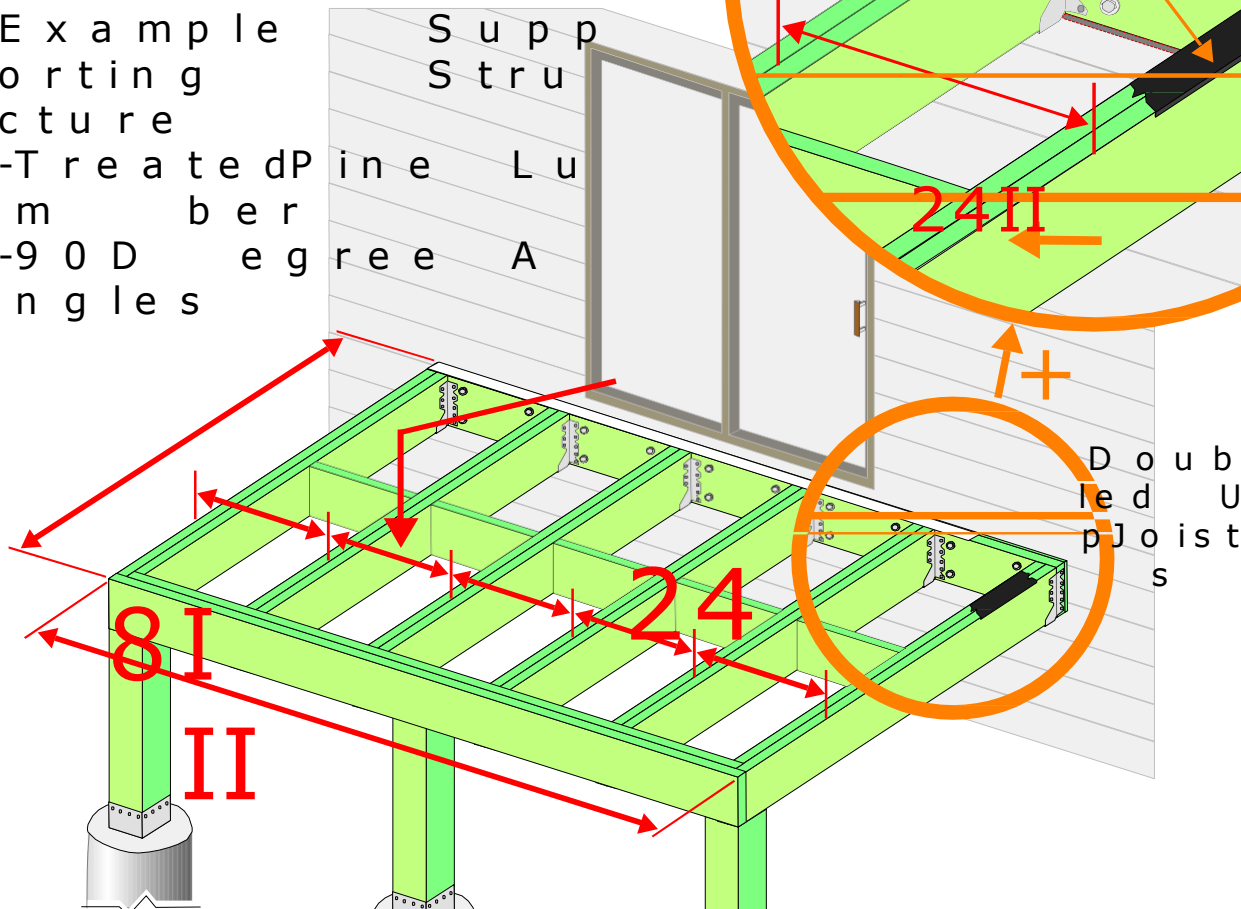
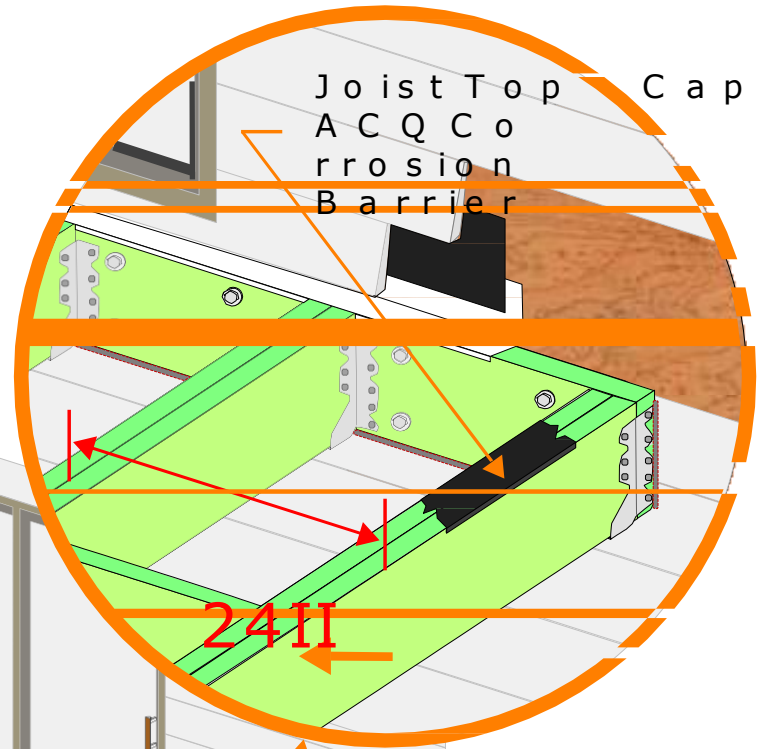


**Versamods™ R-40 Modular Aluminum Decking System**

Make Sure Supporting Structure is Built to Suit Versamods. The supporting structure must be built to specifications to suit the Versamods modular decking systems. Make sure that an approved corrosion barrier is installed to the top of structures that are corrosive to aluminum (ACQ treated lumber) in all places where the decking will be in contact.

The supporting structure must be built in 2 I inch increments with 90 and/or 45 degree angles only.

Example Supporting Structure - Treated Pine Lumber - 90 Degree Angles



10I

# Versamods™ R-40 Modular Aluminum Decking System

Convert On Site Labor Into Factory Controlled Production

75% of the labor that would traditionally be performed on site is completed at the factory instead of converting on-site labor into factory controlled production.

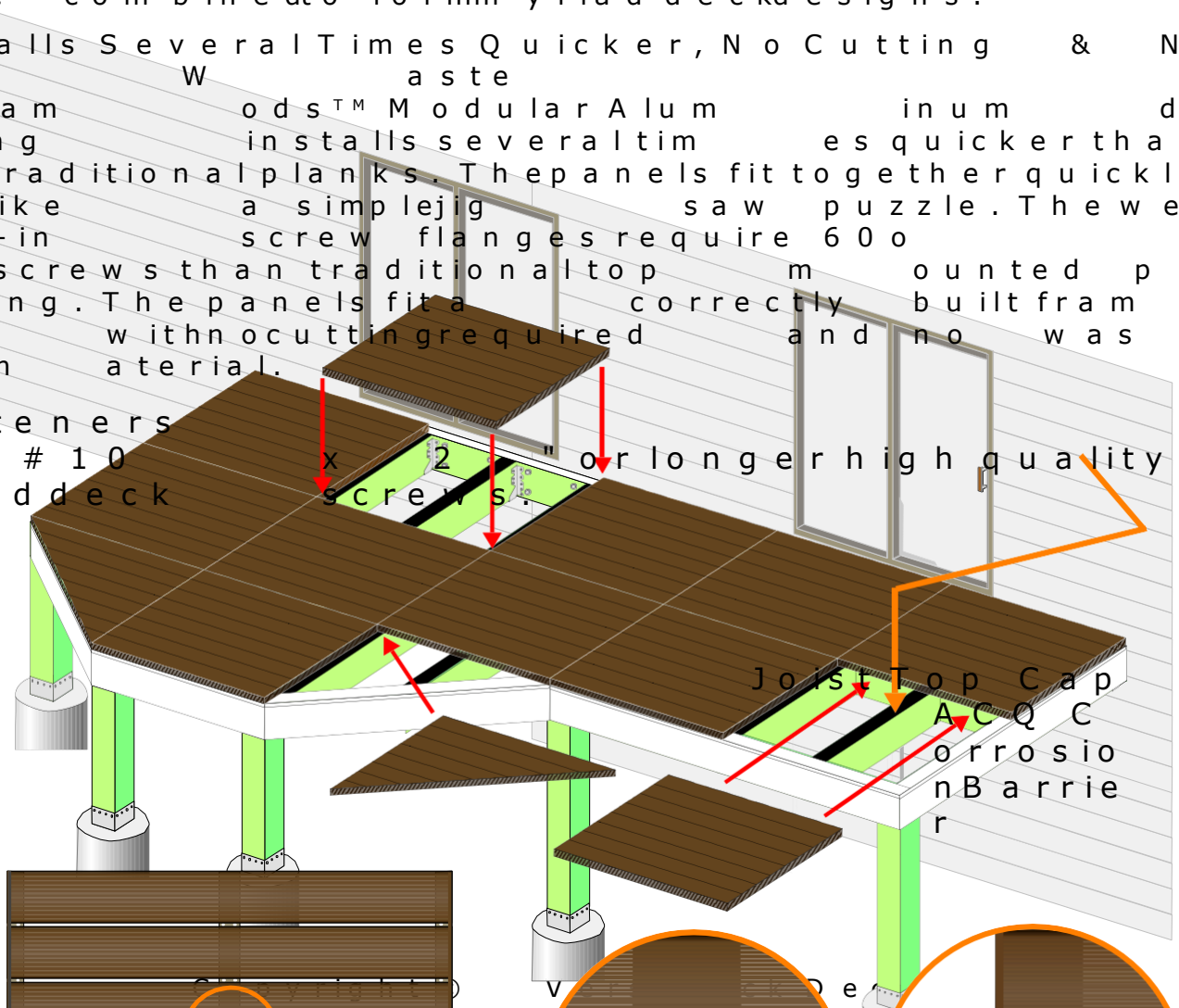
Versamods™ are aluminum planks cut to size and welded together to form a specific shape (modular component). Flat strips and angle mounting flanges are welded to the bottom of the planks to hold them together equally spaced. These flanges have pre-drilled holes positioned so screws can be installed between the planks through the flanges and into the supporting structure.

The panels are easily mounted from the top yet the result is a clean fastener free surface. There are several modular shapes available which are combined to form myriad deck designs.

Installs Several Times Quicker, No Cutting & No Waste

Versamods™ Modular Aluminum Decking installs several times quicker than traditional planks. The panels fit together quickly like a simple jigsaw puzzle. The welded-in screw flanges require 60% less screws than traditional top mounted plank decking. The panels fit a correctly built frame with no cutting required and no wasted material.

Fasteners Use #10 x 2" or longer high quality coated deck screws.



B u i l t - i n S c r e w F l a n g e  
S



# Stronger Modular Deck Tiles After

VerK Aluminum In str Pa

D versamods™ R-40 Modular Aluminum m

## Versadeck™

### Rooftop Decks



#### Supports

##### Adjustable Pedestals

- 2' - 4' grid layout design
- Screw to adjust height
- Stack-able up to 30"
- Slim-able up to 4%

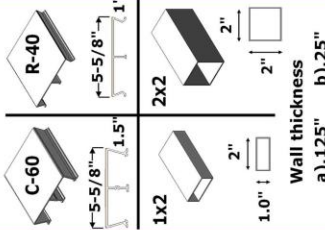


Distributes weight evenly for lower point loads on rooftop

#### Joists

##### Sleeper Joist Frame

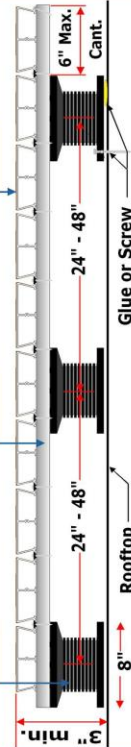
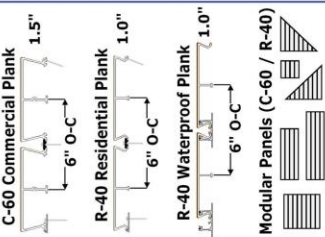
- Aluminum construction
- Noncombustible Class "A"
- Strong, Straight & Light
- Lengths up to 40'



#### Decking

##### Deck Planks or Modular

- Aluminum construction
- Noncombustible Class "A"
- 60 mil. protective coating
- Planks up to 40' / modular



High Performance Decking  
**Versadeck™**  
www.versadeck.com

FloaTiD  
ecking

Planks Welded into Modular Panels



ADJUSTABLE  
PEDESTALS

www.versadeck.com

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High Performance Decking  
www.versadeck.com



EndView

**NFPA**  
Class "A"

v e r s a m o d s<sup>™</sup> R- 4 0 M o d u l a r A l u m i n u  
m D e c k i n g S y s t e m

## C o m m o n Q u e s t i o n s

Is Versamods<sup>™</sup> Aluminum Decking Maintenance Free? Versamods<sup>™</sup> Modular Aluminum decking is a virtually maintenance free material that will provide years of like new performance with minimal upkeep. There are no applicants needed to preserve color or prevent deterioration from the elements. Any surface over a period of time will collect dirt or other debris. Wash your deck with a mild household soap twice per year to help prevent the build up of mold, mildew and other stains that may be difficult to remove if left over a long period of time. (do not use bleach or deck wash products).

Could the Polyurea Coating Peel Off the Aluminum? The aluminum is coated with a special primer prior to coating. This bonds the coating to the aluminum. Under normal residential wear and tear, it is warranted that the Polyurea coating will not peel unless it is intentionally peeled off.

Could the Coating Wear Down to the Aluminum? It is warranted that under normal residential conditions, the coating will not wear down to the aluminum for a lifetime.

Does Versamods<sup>™</sup> Decking Get Hot in the Sun? The coating reflects much of the UV energy. Aluminum transfers heat quickly so there is a minimal build up of temperature.

Even on the hottest days Versamods<sup>™</sup> aluminum decking stays uncommonly cool in comparison to wood, composite and powder coated aluminum decking products. If the bottom side is covered with a minimal

ng air flow , the decking may not stay as cool.

Is Versamods™ Slippery When Wet? The standard texture provides a slip resistant surface. There are two additional slip resistant textures to choose from for added traction. If the decking is wet or icy, take extra care as under these conditions the deck may not be as slip resistant.

## Care & Cleaning

**Ground In Dirt** Use a mild soap to remove the dirt. Do not use aggressive cleaners or products containing sodium hypochlorite.

**Oil and Grease Stains** Remove oil and grease stains with a mild household soap agent as soon as the stain occurs. Do not use aggressive cleaners or products containing sodium hypochlorite.

**Mold Stains** Mold may form (on any surface) where moisture is prevalent and/or there is heavy shading and pollen/debris that are allowed to collect on the deck. Use a mild household soap, do not use aggressive cleaners or products containing sodium hypochlorite. Periodic cleaning of your deck, even if it appears clean, is important to prevent the build up of pollen/debris that can cause mold. Wash your deck using this method at least twice per year.

versam ods™ R-4 0Modular Alum in u  
m Decking System

Ice and Snow Rock salt, available in many home centers, will melt ice on Versamods Decking. Rinse of your deck when first practical to help avoid surface stains.

Other Stains TREESAP, ASPHALT DRIVEWAY SEALER, SHOE POLISH, PAINT, VARNISH, CRAYON, LIPSTICK, JUICE/WINE, MUSTARD, PERMANENT MARKER, PEN INK, BLACKHEAL MARKS Rub the stain with Mineral Spirits or Turpentine using a clean white cloth as soon as stain occurs and then immediately chase wash the area with mild soap & water solution. If the stain still shows, contact us for instructions.

Deep Scratch It is not recommended to be abraded to the aluminum surface. The coating can be repaired.

Compression Marks The Polyurea coating is thick to provide comfort and durability.

Leaving heavy objects with pointed legs or sharp edges in contact with the coating could leave compression marks. Once the object is removed, the marks will usually come out on their own depending on the severity of the compression marks. Avoid leaving these types of objects unmoved over long periods of time.

Color Drifting The Polyurea formula contains UV (ultraviolet) ray blockers. It is warranted that the color will maintain a desirable event one throughout the lifetime of the product. Avoid leaving objects (welcome mats, storage containers, flower pots, etc.) unmoved for long periods of time. After about 3 to 8 weeks of exposure to the sun, the shine will dull out to a more natural desirable

e look. Ask for a color sample to understand the changes that will occur as the product ages. As with all materials when exposed to UV rays, the color may drift from its original color shade.

Versamods™ R-40 Modular Aluminum Decking System

## Limited Lifetime Transferable Warranty

Versamods™ Polyurea Coated Aluminum Decking provides a lifetime of comprehensive coverage when used on a residential structure under normal everyday conditions and when installed properly will not...

- Fail structurally as engineered
- Rot, decay or be damaged by insects
- Warp, cup, sag, dent or splinter
- Wear down to the aluminum or peel off
- Corrode resulting in fatigue or an undesirable appearance

\*Transferability is Optional \*15 Year Color Guarantee

Versadeck Decking, Inc. hereafter "Warrantor" warrants that Versamods Polyurea

Modular coated aluminum plank decking hereafter "Versamods" when purchased from an authorized Dealer, used in conjunction with a residential structure and installed

, maintained and cared for properly, under normal conditions, will not rust, splinter, warp, cup, sag, shrink, rot, wear down to the aluminum, peel apart or suffer structural damage due to termites or fungal decay for

A ) Standard coating option 25 year  
Non Transferable

B ) Thicker coating option As long as the original purchaser owns the property with the ability to transfer this warranty one time to the next owner. To transfer this warranty, there is a one time fee of \$500 which must be paid within 30 days of the date the new owner purchases the property.

In addition, Versamods will maintain a desirable aged weathered look for a period of 15 years (standard color only) from the date of the original purchase.



versamods™ R-40 Modular Aluminum Decking System

## Limited Lifetime Transferable Warranty

This warranty does not cover damage of any kind resulting from faulty installation, misuse, fire, negligent maintenance or acts of God. Warrantor does not warrant that and Purchaser is solely responsible for determining whether Versamods meets the requirements of any applicable safety code or similar regulation. Warrantor shall be the sole judge of whether or not Versamods is defective and whether the defect, if any, is due to manufacturing defects in materials or workmanship. Warrantor shall be the sole judge of whether or not Versamods can be reasonably repaired (applicants may be supplied that coat the surface to restore color and further protect) without replacement. Warrantor shall not be liable for installation or reinstallation costs or for any indirect, punitive, exemplary or consequential damages of any kind whatsoever. Purchaser's sole remedy for any claim whatsoever, whether in contract, warranty, tort or strict liability, arising out of the use, storage or possession of Versamods, including without limitation any claim that Versamods failed to perform as warranted above, at warrantor's option shall be repaired, or replaced with new Versamods. To obtain replacement, the original owner (or the new owner if warranty was transferred) must send this warranty certificate, along with the original purchase invoice indicating the date of purchase from a authorized Dealer showing that sufficient Versamods has been pur

chased to cover  
the quantity claimed to be damaged  
to the warrantor to Versadeck Decking, Inc.

No person or entity is authorized by Warrantor to make and warrantor shall not be bound by any statement or representation as to the quality or performance of Versamods other than as contained in this warranty. There are no oral promises or representations collateral to or affecting this warranty and it may not be altered in a written instrument signed by Warrantor and

Buyer. Some states do not allow limitation on how long any implied warranty lasts and/or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state. This warranty is exclusive and in lieu of any and all other warranties with respect to Versamods and there are no other warranties whether expressed or implied, including without

t  
lim itation , any im plied w  
arranty of m erchan tability  
or fitness for a particular purpo  
se .



# GeoSpring™ + \EULG (OHFWULF 5HVLGHQWLDO Water Heaters

**Important Safety Information**..2-4

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\*ENERGY STAR® ODEHOHG SURGXFW



As an ENERGY STAR® SDUWQHU, \*( KDV  
 GHWHUPLQHG WKDW WKLW SURGXFW PHHWV  
 WKH ENERGY STAR® JXLGHOLQHV IRU  
 HQHUJ\ H¿FLHQF\.

**Write the model and serial numbers here:**

**Model #** \_\_\_\_\_

**Serial #** \_\_\_\_\_

<RXFDQ¿QG WKHP RQ WKH UDWLQJ ODEHO  
 RQ WKH IURQW VLGH RI \RXU ZDWHU KHDWHU.

**Owner's Manual &  
 Installation Instructions**  
**GEH50DEED**

**&KDXφH-HDX**  
 réVLGHQWLHO K\EULGH pOHFWULTXH

**Manuel d'utilisation  
 et d'installation**

*La section française commence à la page 24*

**&DOHQWDGRUHV  
 GH DJXD**

UHVLGHQFLDOHV HOpFWULFRV KÍEULGRV

**Manual del propietario  
 e instalación**

*La sección en español empieza en la página 48*

# IMPORTANT SAFETY INFORMATION. READ ALL INSTRUCTIONS BEFORE USING.

## ⚠️ WARNING!

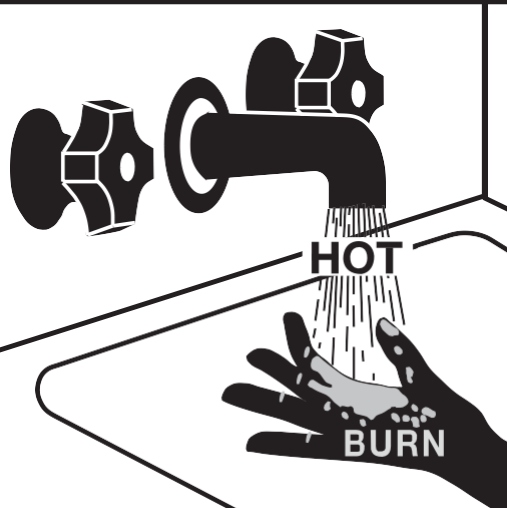
Water temperature over 125°F can cause severe burns instantly or death from scalds.

The electronic temperature control setting usually approximates tap water temperature. However, factors could cause water temperature to reach 160°F regardless of the control setting. Always feel water before bathing and showering.

## WATER TEMPERATURE ADJUSTMENT

Children, disabled and elderly are at highest risk of being scalded. See instruction manual before setting temperature at water heater. Feel water before bathing or showering. Temperature limiting valves are available; see manual.

**⚠️ DANGER**



Water temperature over 125°F can cause severe burns instantly or death from scalds.

The electronic temperature control setting usually approximates tap water temperature. However, factors could cause water temperature to reach 160°F regardless of the control setting. Always feel water before bathing and showering.

Children, disabled and elderly are at highest risk of being scalded.

See instruction manual before setting temperature at water heater.

Feel water before bathing or showering.

Temperature limiting valves are available; see manual.

Time/temperature relationship in scalds. Table courtesy of Shriners Burn Institute.

### Time/Temperature Relationship in Scalds

Temperature	Time to Produce a Serious Burn
120f) (49f&)	0RUH WKDQ 5 PLQXWHV
125f) (52f&)	1-1/2 WR 2 PLQXWHV
130f) (54f&)	\$ERXW 30 VHFRQGV
135f) (57f&)	\$ERXW 10 VHFRQGV
140f) (60f&)	/HVV WKDQ 5 VHFRQGV
145f) (63f&)	/HVV WKDQ 3 VHFRQGV
150f) (66f&)	\$ERXW 1-1/2 VHFRQGV
155f) (68f&)	\$ERXW 1 VHFRQGV

Table courtesy of Shriners Burn Institute

Households with small children, disabled or elderly persons may require a 120°F (49°C) or lower thermostat setting to prevent contact with "HOT" water.

NOTE: Households with small children, disabled or elderly persons may require a 120°F (49°C) or lower thermostat setting to prevent contact with "HOT" water.

**⚠️ DANGER:** There is a Hot Water SCALD Potential if the control water temperature is set too high.

**IMPORTANT SAFETY INFORMATION.  
READ ALL INSTRUCTIONS BEFORE USING.**

**⚠ CAUTION!**

**Risk of Fire - Hydrogen gas** FDQ EH SURGXFHG LQ D KRW ZDWHU V\WVHP VHUYHG E\ WKLV ZDWHU KHDWHU WKDW KDV QRW EHHQ XVHG IRU D ORQJ SHULRG RI WLPH (JHQHUDOO\ WZRZHNV RU PRUH). +<'52\*(1\*\$6,6(;75(0(/<)/\$00\$%/(!7R GLVVLSDWH VXFKJDV DQG WR UHGXFH ULVN RI LQMXU\, LW LV UHFRPPHQGHG WKDW WKH KRW ZDWHU IDXFWH EH RSHQH IRU VHYHUDO PLQXWHV DW WKH NLWFKHQ VLQN EHIRUH XVLQJ DQ\ HOHFWULFDO DSSOLDQFH FRQQHFWHG WR WKH KRW ZDWHU V\WVHP. ,IK\GURJHQLV SUHVHQW, WKHUH ZLOO EH DQ XQXVXDO VRXQG VXFK DV DLU HVFDSLQJ WKURXJK WKH SLSDV WKH ZDWHU EHJLQV WR IORZ. 'R QRW VPRNH RU XVH DQ RSHQ IODPH QH DU WKH IDXFWH DW WKH WLPH LW LV RSHQ.

**⚠ WARNING!**

**Risk of Fire** - '2 127 VWRUH RU XVH JDVROLQH RU RWKHU IODPPDEOH YDSRUV DQG OLTXLGV LQ WKH YLFLQLW\ RI WKLV RU DQ\ RWKHU DSSOLDQFH. .HHS UDJV DQG RWKHU FRPEXVLEOHV DZD\.

**⚠ FOR INSTALLATIONS  
IN THE STATE OF CALIFORNIA**

&DOLIRUQLD /DZ UHTXLUHV WKDW UHVLGHQWLDQ ZDWHU KHDWHUV PXVW EH EUDFHG, DQFKRUHG RU VWUDSSHG WR UHVLVW IDOOLQJ RU KRULJRWDO GLVSODFHPHQW GXH WR HDUWKTxDNH PRWLRQV. )RU UHVLGHQWLDQ ZDWHU KHDWHUV XS WR 52 JDOORQ (236.4 /) FDSDFLW\, D EURFKXUH ZLWK JHQHULF HDUWKTxDNH EUDFLQJ LQVWUXFWLRQV FDQ EH REWDLQH IURP: 2IILFH RI WKH 6WDWH \$UFKLWHFW, 400 3 6WUHHW, 6DFUDPHQWR, &\$ 95814 RU \RX PD\ FDOO 916.324.5315 RU DVN D ZDWHU KHDWHU GHDOHU.

\$\$SOLFDEOH ORFDO FRGHV VKDOO DOZD\ V JRYHUQ LQVWDOODWLRQ. )RU UHVLGHQWLDQ ZDWHU KHDWHUV RI D FDSDFLW\ JUHDWHU WKDQ 52 JDOORQV (236.4 /) FRQVXOW WKH ORFDO EXLOGLQJ MXULVGLFWLRQ IRU DFFHSWDEOH EUDFLQJ SURFHGXUHV.

**California Proposition 65 Warning:** 7KLV SURGXFW FRQWDLQV FKHPDFDOV NQRZQ WR WKH 6WDWH RI &DOLIRUQLD WR FDXVH FDQFHU, ELUWK GHIIHFW RU RWKHU UHSURGXFWLYH KDUP.

# IMPORTANT SAFETY INFORMATION. READ ALL INSTRUCTIONS BEFORE USING.

---

## **⚠ WARNING:**

*If the water heater has been subjected to flood, fire, or physical damage, turn off power and water to the water heater.*

'R QRW RSHUDWH WKH ZDWHU KHDWHU DJDLQXQWLO LW KDV EHHQ WKURURXJKO\ FKHFNHG E\ TXDOLILHG VHUULFH SHUVRQQHO.

## **Safety Precautions**

**A. Do**WXUQ.RII SRZHU WR ZDWHU KHDWHU LI

LW KDV EHHQ VXEMHFVHG WR RYHUKHDWLQJ, ILUH, IORRG RU SK\VLFDO damage.

**B. Do Not**WXUQ RQ ZDWHU KHDWHU XQOHV

LW LV ILOOHG ZLWK ZDWHU.

**C. Do Not**WXUQ RQ ZDWHU KHDWHU LI FROG ZDWHU VXSSO\ VKXW-RII YDOYH is closed.

**NOTE: Flammable vapors may be drawn by air currents from surrounding areas to the water heater.**

**D.** ,I WKHUH LV DQ\ GLJLFXOW\ LQ XQGHUJUVWDQGLQJ RU IROORZLQJ WKH

2SHUDWLQJ ,QVWUXFWLRQV RU WKH &DUH DQG &OHDQLQJ VHFWRU, LW LV

UHFRPPHQGHG WKDW D TXDOLILHG SHUVRQ RU VHUULFHPDQ SHUIRUP

WKH ZRUN.

---

## **Safety Controls**

7KH ZDWHU KHDWHU LV HTXLSSHG ZLWK WHPSHUDWXUH-OLPLWLQJ FRQWURO (7&2) WKDW LV ORFDWHG DERYH WKH KHDWLQJ HOHPHQW LQ FRQWDFW ZLWK WKH WDQN VXUIDFH. ,I IRU DQ\ UHVRQ WKH ZDWHU WHPSHUDWXUH EHFRRPHV H[FHVLYHO\ KLJK, WKH WHPSHUDWXUH-OLPLWLQJ FRQWURO (7&2) EUHDNV WKH SRZHU FLUFXLW WR WKH KHDWLQJ HOHPHQW. 2QFH WKH FRQWURO RSHQV, LW PXVW EH UHVHW PDQXDOO\, 5HVHWWLQJ RI WKH WHPSHUDWXUH OLPLWLQJ FRQWUROV VKRXOG EH GRQH E\ D TXDOLILHG VHUULFH WHFKQLFLDQ.

**⚠ CAUTION:** *The cause of the high temperature condition must be investigated by a qualified service technician and corrective action must be taken before placing the water heater in service again.*

## **To reset the temperature-limiting control:**

**1.** 7XUQ RII WKH SRZHU WR WKH ZDWHU KHDWHU.

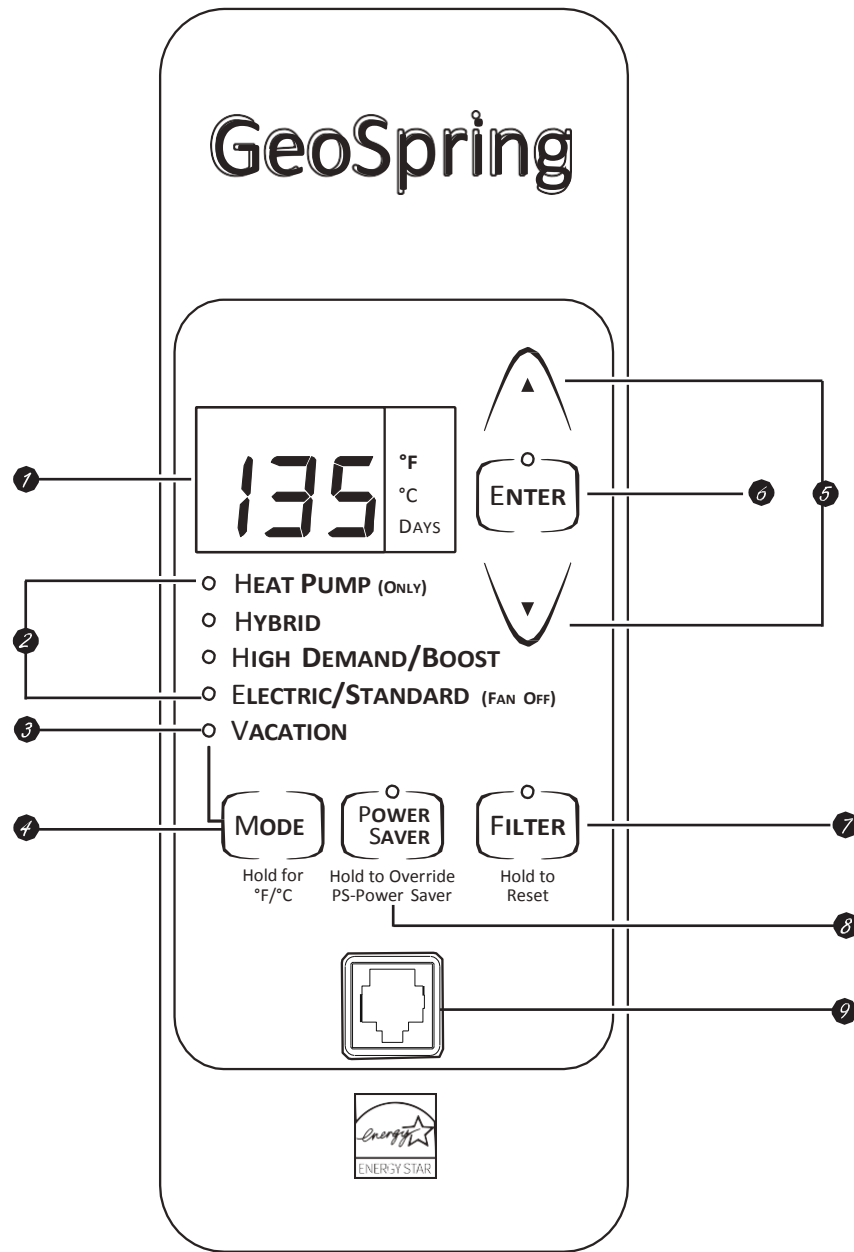
**2.** 5HPRYH WKH MDFNHW DFFHVV SDQHO(V) DQG LQVXODWLQJ.

7KH WKHUPRVWDW SURWHFWLYH FRYHU VKRXOG QRW EH UHPRYHG.

**3.** 3UHVV WKH UHG 5(6(7 EXWWRQ).

**4.** 5HSODFH WKH LQVXODWLQJ DQG MDFNHW DFFHVV SDQHO(V) EHIRUH turning on

WKH SRZHU WR WKH ZDWHU KHDWHU.



## Control Features

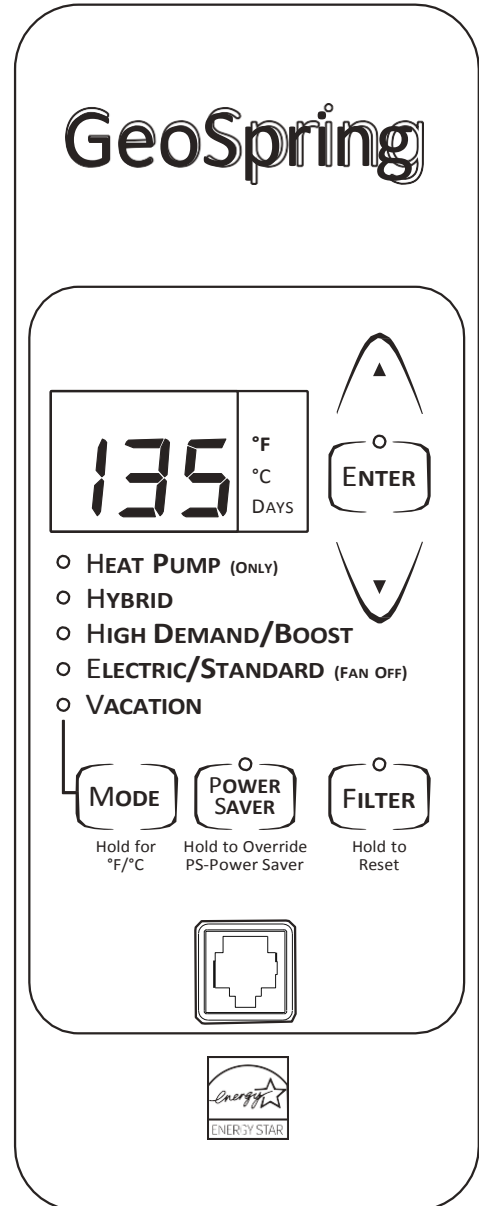
- 1 Display**
- 2 Operating Modes**  
(6HH SDJH 8 IRU GHVFULSWLRQ)
- 3 Vacation**  
(6HH SDJH 8 IRU GHVFULSWLRQ)
- 4 Mode Selector**  
8VH WKL V EXWWRQ WR DOWHUQDWH EHWZHHQ DYDLODEOH PRGHV.
- 5 Arrow Pads**  
8VH WKHVH EXWWRQ WR DGMXVW WKH WHPHUDWXUH VHWVLQJ.
- 6 Enter Key**
- 7 Filter Reset**  
7KH ILOWHU LV GLUW\ DQG UHTXLUHV FOHDQLQJ ZKHQ WKH 5HG OLJKW LV LOOXPLQDWHG. )LOWHU LV ORFDWHG RQ WRS RI WKH ZDWHU KHDWHU. 3UHVV EXWWRQ DQG KROG IRU 5 VHFRQGV WR UHVHW ILOWHU DODUP.
- 8 Power Saver Override**  
)RU XVH ZLWK \$&0 PRGXOH. 3UHVV DQG KROG WR EULQJ XQLW RXW RI 3RZHU 6DYHU PRGH. 2QFH SUHVHG DQG 3RZHU 6DYHU PRGH LV FDQFHOOHG, XQLW ZLOO UHPDLQRXW RI 3RZHU 6DYHU IRU WKH QH[W 18 KRUV.
- 9 Appliance Communication Module Port**  
)RU XVH ZLWK RSWLRQDO \$&0 PRGXOH (VHH SDJH 10 IRU details).



# Turning on the water heater.

7KHUHLVQRSRZHU EXWWRQIRU WKLXQLW. 2QFH WKHZDWHU KHDWHU LV ZLUHG DQG SRZHU LV VXSSOLHG, LW ZLOO EHRQ. 7KH GLVSOD\ ZLOO VKRZ WKH FXUUHQW ZDWHU WHPSHUDWXUH VHWWLQJ. &XUUHQW RSHUDWLQJ PRGH IRU WKHZDWHU KHDWHU LV LOOXPLQDWHG.

7R FRPSO\ ZLWK VDIHW\ UHJODWLRQV, WKH FRQWUROV DUH IDFWRU\ SUHVHW WR 120f) (49f&) DQG +\EULG ORGH. ,W LV UHFRPPHQGHG WKDW WKH XQLW EH VHW WR +HDW 3XPS (RQO\ PRGH WR PD[LPL]H HQHUJ\ VDYLQJV. 2SHUDWLQJ LQ +\EULG PRGH SURYLGHV D EDODQFH RI HQHUJ\ VDYLQJV DQG KRW ZDWHU XVH FRQYHQLHQFH. 5HSRUWHG HQHUJ\ FRQVXPSWLRQ LV EDVHG RQ RSHUDWLQJ WKH XQLW LQ +\EULG PRGH DW D WHPSHUDWXUH VHWWLQJ RI 135f) (57f&), DQG RSHUDWLQJ at lower temperature settings or in Heat Pump (only) mode will SURYLGH HYHQ JUHDWHU HQHUJ\ VDYLQJV.



## Temperature setpoint:

6DIHW\, HQHU\ FRQVHUYDWLRQDQG KRW ZDWHU FDSDFLW\ DUH IDFWRUV WR EH FRQVLGHUHG ZKHQ VHOHFWLQJ WKH ZDWHU WHPSHUDWXUH VHWWLQJ RI WKH ZDWHU KHDWHU. 7R FRPSO\ ZLWK VDIHW\ UHJXODWLRQV, WKH ZDWHU WHPSHUDWXUH VHSRQWLV IDFWRU\ VHW DW 120f) (49f&). 7KLV LV WKH recommended starting temperature setting.

**NOTE:** \$FRUGLQJ WR 86 'HSW RI (QHUJ\, WKH DYHUDJH UHVLGHQWLDO ZDWHU KHDWHU LQ WKH 86 LV VHW DW 135f) (57f&). \*( \*HR6SULQJCE +\EULG :DWHU +HDWHU V HQHUJ\ VDYLQJ FODLPV DUH EDVHG RQ D 135f) (57f&) WHPSHUDWXUH VHWWLQJ. 7KH ZDWHU WHPSHUDWXUH VHSRQW FDEH UDLVHG IURP WKH IDFWRU\ VHWWLQJ RI 120f) WR 135f) (49f& WR 57f&) ZLWKRXW VDFULFLOJ WKH FODLPHG HQHUJ\ VDYLQJ. , D ORZHU WHPSHUDWXUH VHWWLQJ WKDQ 135f) (57f&) LV XVHG, JUHDWHU VDYLQJ LQ HQHUJ\ DQG RSHUDWLQJ FRVWV PD\ EH DFKLHYHG.

6HH '7R \$GMXVW WKH 7HPSHUDWXUH VHFWRQ WR FKDQJH WKH ZDWHU KHDWHU V WHPSHUDWXUH.

## Hot water capacity:

, IPRUH KRW ZDWHU FDSDFLW\ LV GHVLUHG, LQFUHDVLRQ WKH WHPSHUDWXUH IURP 120f) WR 135f) (49f& WR 57f&) ZLOO HQDEOH WKH VDPH WDN RI KRW ZDWHU WR ODVV DERXW 25% ORQJHU EHFDXVH PRUH FROG ZDWHU LV PL[HG LQ DW WKH VKRZHU RIDXFHW.

## Time/Temperature Relationship in Scalds

7HPSHUDWXUH	7LPH WR 3URGXFH D 6HULRXV %XUQ
120qF (49qC)	ORUH WKDQ 5 PLQXWHV
125qF (52qC)	1-1/2 WR 2 PLQXWHV
130qF (44qC)	\$ERXW 30 VHFRQGV
135qF (57qC)	\$ERXW 10 VHFRQGV
140qF (60qC)	/HVV WKDQ 5 VHFRQGV
145qF (63qC)	/HVV WKDQ 3 VHFRQGV
150qF (66qC)	\$ERXW 1-1/2 VHFRQGV
155qF (68qC)	\$ERXW 1 VHFRQGV

Table courtesy of Shriners Burn Institute

## Risk of Scalding Reminder:

:DWHU WHPSHUDWXUH DERYH 125f) (52f&) FDQ FDXVH VHYHUH EXUQV RU GHDWK IURP VFDOLQJ. %H VXUH WR UHDEG DQG IROORZ WKH ZDUQLQJ RXWOLQH LQ WKLV PDQXDO DQG RQ WKH ODEHO RQ WKH ZDWHU KHDWHU. 7KLV ODEHO LV ORFDWHG RQ WKH ZDWHU KHDWHU QHDU WKH XSSHU HOHPHQW DFFHWV panel.

6HH '7LPH/7HPSHUDWXUH 5HODWLRQV LQ 6FDQV\ EORZ DV D JXLGH LQ GHWHUPLQLQJ WKH SURSHU ZDWHU WHPSHUDWXUH IRU \RXU KRPH.

## Mixing-valves:

OL[LQJ YDOYHV IRU UHGXFLOJ SRLQW-RI-XVH ZDWHU WHPSHUDWXUH E\ PL[LQJ KRW DQG FROG ZDWHU LQ EUDQFK ZDWHU OLQHV DUH DYDLODEOH. &RQWDFW D OLFHQVHG SOXPEHU RU WKH ORFDO SOXPELQJ DXWKRUWL\ IRU IXUWKHU LQIRUPDWLRQ.

**DANGER** There is a hot water scald potential if the water temperature is set too high. Households with small children, disabled, or elderly persons may require a 120°F (49°C) or lower thermostat setting to prevent contact with HOT water.

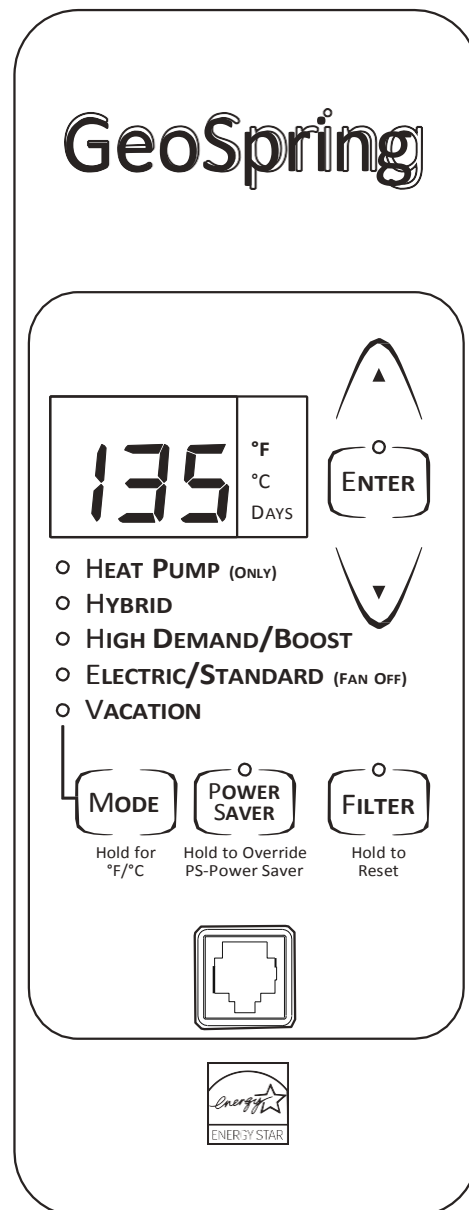
## To Adjust the Temperature

ORORZ WKHVH VWHSV:

- 3UHVV WKH 83 RU '2:1 DUURZ RQ WKH FRQWURO SDQH NH\ SDG to desired temperature.
- 3UHVV (17(5 WR DFFHSW WKH QHZ VHWWLQJ.

**Note:** 7R FKDQJH EHWZHHQ f) DQG f&, SUHVV DQG KROG 02'.

**DANGER** There is a Hot Water scald Potential if the water temperature is set too high. 120°F (49°C) is the recommended starting point for water temperature setting, but it can be adjusted to any temperature between 100°F and 140°F (38°C and 60°C).



## Operational Modes.

7KLV ZDWHU KHDWHU GHIDXOWV WR WKH +\EULG RSHUDWLQJ PRGH.  
\$YDLODEOH PRGHV DUH OLVVHG EHORZ DQG FDQ EH VHOHFWHG XVLOJ  
WKH 02' (EXWWRQ).

### **Heat Pump (only) Mode<sup>3</sup> 5 (& 200 (1' ) 25 0\$; , 080 6\$9, 1\*6**

+HDW 3XPS (RQO\ ) LV WKH PRVW HQHUJ\ -HÆFLHQW PRGH IRU WKLV  
ZDWHU KHDWHU. ,W WDNHV KHDW IURP WKH VXUURXQGLQJ DLU WR KHDW  
WKH ZDWHU. 7KH WLPH LW WDNHV WR KHDW WKH ZDWHU LV ORQJHU LQ WKLV  
PRGH, VR LW PD\ QRW EH VXÆFLHQW LI \RX KDYH D KLJK-GHPDQG  
VLWXDWLRQ VXFK DV D ODUJH KRXXVHKROG RU FRPSDQ\.

### **Hybrid Mode**

+\EULG PRGH FRPELQHV WKH HQHUJ\ HIILFLHQF\ RI +HDW 3XPS  
(RQO\ ) ZLWK WKH UHFHYHU\ VSHHG DQG SRZHU RI WKH (OHFWULF ( )DQ  
RII)/6WDQGDUG ( )DQ RII) PRGH LQ PRVW ZDWHU XVDJH VLWXDWLRQV.  
+\EULG PRGH ZLOO DOORZ WKH XQLW WR SHUIRUP OLNH D VWDQGDUG  
HOHFWULF ZDWHU KHDWHU ZKLOH SURYLGLQJ VLJQLILFDQW HQHUJ\  
VDYLQJV.

**NOTE:** 5HSRUWHG XQLW SHUIRUPDQFH, HQHUJ\ FRQVXPSWLRLQ  
DQG VDYLQJV DUH EDVHG RQ +\EULG ORGH RSHUDWLRLQ DW D  
WHPSHUDWXUH VHWWLQJ RI 135f) (57f&).

### **High Demand/Boost**

7KLV PRGH PD\ EH QHFHVVDU\ LI \RXU KRXXVHKROG KDV D  
KLJKHU-WKDQ-DYHJDJH ZDWHU XVDJH RU WKH XQLW LV XQGHUWLJHG IRU  
WKH KRXXVHKROG ZDWHU GHPDQGV. ,Q WKLV PRGH, WKH XQLW ZLOO XVH  
WKH HOHFWULF KHDWLQJ HOHPHQWV RQO\ ZKHQ WKH ZDWHU GHPDQG  
UDWH LV KLJK. :KHQ XVLOJ WKH KHDWLQJ HOHPHQWV, WKH ZDWHU  
WHPSHUDWXUH ZLOO UHFHYHU DW D IDVWHU UDWH EXW LW ZLOO XVH PRUH  
HQHUJ\ WR KHDW LW. 8QOLNH (OHFWULF/6WDQGDUG ( )DQ RA) PRGH, LW ZLOO  
XVH WKH KHDWLQJ HOHPHQWV RQO\ ZKHQ QHHGHG, DQG XVH WKH KHDW  
SXPSZKHQ ZDWHU GHPDQU UDWHV DUH ORZHU.

**NOTE:** 7KH GLÀHUHQFH EHWZHHQ +\EULG PRGH DQG +LJK  
'HPDQG/%RRVW PRGH LV WKDW LQ +LJK 'HPDQG/%RRVW PRGH WKH  
KHDWLQJ UHVLVWLYH HOHPHQWV DUH DFWLYDWHG VRRQHU WKDQ LQ WKH  
+\EULG PRGH.

### **(OHFWULF ( )DQ RA)/6WDQGDUG ( )DQ RA) ORGH**

7KLV PRGH XVHV RQO\ WKH XSSHU DQG ORZHU KHDWLQJ UHVLVWDQFH  
HOHPHQWV WR KHDW WKH ZDWHU. 7KH WLPH LW WDNHV WR KHDW WKH  
ZDWHU LV OHVV LQ WKLV PRGH, EXW LW LV WKH /(\$67 HQHUJ\ -HÆFLHQW  
mode.

**NOTE:** ,Q WKLV PRGH WKH JUHHQ/(' OLJKW ZLOO ÀDVK DIWHU 48  
KRXUV DV DQ LQGLFDWLRLQ WKDW WKH XQLW LV QRW RSHUDWLQJ LQ WKH  
PRVW HQHUJ\ HÆFLHQW PRGH. 7KH XQLW ZLOO FRQWLQXH WR RSHUDWH  
LQ WKLV PRGH DQG GRHV QRW LQGLFDWH DQ RSHUDWLQJ LVVXH.

## Vacation

7KLV IHDWXUH LV XVHG ZKHQ \RX ZLOO EH DZD\ IURP WKH KRPH IRU  
DQ H[WHQGHG SHULRG RI WLPH DQG KRW ZDWHU LV QRW QHHGHG. ,Q WKLV  
PRGH, WKH XQLW ZLOO GURS WKH ZDWHU WHPSHUDWXUH GRZQ WR 50<sup>o</sup>)  
(10f&) DQG ZLOO XVH WKH PRVW HÆFLHQW KHDWLQJ PRGH WR FRQVHUYP  
HQHUJ\ ZKLOH WKH KHDWHU LV VLWWLQJ LGOH. 7KH XQLW ZLOO DXWRPDWLFDQO\  
UHVXPH KHDWLQJ RQH GD\ EHIRUH \RXU UHWXUQ, VR WKDW KRW ZDWHU  
ZLOO EH DYDLODEOH.

)RU H[DPSOH LI \RX ZLOO EH JRQH 14 GD\, IROORZ WKHVH VWHSV:

1. 6HOHFW 9\$&\$7,21 E\ XVLOJ WKH ORGH EXWWRQ
2. ,QSW WRWDO GD\ \RX ZLOO EH JRQH (LQ WKLV H[DPSOH, 14) E\  
SUHVVWLQJ WKH 83 DUURZ EXWWRQ (WKH GHIDXOW LV 7 GD\)
3. 3UHVV (17(5.

7KH XQLW ZLOO GURS WKH ZDWHU WHPSHUDWXUH GRZQ WR 50<sup>o</sup>) (10f&) IRU  
RQH GD\ OHVV WKDQ \RX ZLOO EH JRQH (LQ WKLV H[DPSOH, IRU  
13 GD\). \$W WKH HQG RI WKH GD\ EHIRUH \RX UHWXUQ (LQ WKLV  
H[DPSOH, WKH 13WK GD\), LW ZLOO DXWRPDWLFDQO\  
UHWXUQ WR WKH SUHYLRXV RSHUDWLQJ PRGH DQG KHDW WKH ZDWHU WR WKH RULJLQDO  
WHPSHUDWXUH VHWWLQJ VR KRW ZDWHU LV DYDLODEOH XSRQ \RXU  
return.

### **To access any of these modes:**

1. 3UHVV WKH 02' (EXWWRQ RQ WKH FRQWURO WR WKH GHVLUHG  
operating mode.
2. 7KH JUHHQ OLJKW ZLOO EH LOOXPLQDWHG RQ WKH FKRVLQJ PRGH.

## Filter:

4: :K\LVWKHUHD ¿OWHU"

\$: ,Q+\EULGDQG+HDW3XPS(RQO\ )WKHXQLWPRYHV DLUWKURXJKWKH  
V\WVHP.7KH¿OWHUSURWHFWVWKHXQLWIURPGLUW.\$FOHDQDLU¿OWHULPSURYHV  
H¿FLHQF\.

4: +RZ WR FOHDQ WKH ¿OWHU"

\$: /HDYH SRZHU RQ DQG UHPRYH ¿OWHU IURP WRS RI XQLW. )LOWHU FDQ EH  
YDFXPHG FOHDQRU ULQVHGZLWKZDUPZDWHU. \$GLUW\¿OWHULZOOUHGXFH  
ZDWHUKHDWHUH¿FLHQF\!

## Modes:

4: :KDW LV +HDW 3XPS (RQO\)"

\$: +HDW 3XPS (RQO\ )LV WKH PRVW-H¿FLHQW PRGH. ,W WDNHV KHDW IURP  
WKH DLU WR KHDW ZDWHU, WKHUHE\ FRROLQJ WKH VXUURXQGLQJ DLU. 6ORZHU  
UHFRYHU\ EXW PRVW-H¿FLHQW PRGH.

4: :KDW LV +\EULG"

\$: 7KH +\EULG PRGH FRPELQHV EHQH¿WV RI +HDW 3XPS (RQO\ )ZLWK WKH VSHHG  
DQG SRZHU RI 6WDQGDUG (OHFWULF. 7KLV SURYLGHV JUHDW SHUIRUPDQFH ZLWK  
less energy.

4: :KDW LV +LJK 'HPDQG/%RRVW"

\$: +LJK 'HPDQG/%RRVW FDQ EH XVHG ZKHQ KRW ZDWHU XVDJH LV KLJKHU  
WKDQQRUPDO. 7KH XQLW ZLOO EH OHVV H¿FLHQW EXW ZLOO KHDW ZDWHUIDVWHU LQ  
UHVSRQVH WR ORQJ ZDWHU GUDZV. )RU DOO QRUPDO GUDZV, WKH XQLW ZLOO VWLOO  
XVH WKH H¿FLHQW +HDW 3XPS WKH PDMRULW\ RI WKH WLPH.

4: :KDW LV 9DFDWRQ PRGH"

\$: ,I\RX DUH JRQH IRU DQ H[WHQGHG SHULRG, WKLV PRGH ORZHUV WKH ZDWHU  
WHPSHUDWXUH WR UHGXFH HQHU\ XVHG. 8QLW ZLOO VZLWFK WR WKH SUHYLRXV  
PRGH RQH GD\ EH IRUH \RX JHW EDFN.

4: :KDW LV (OHFWULF/6WDQGDUG ( )DQ RÅ)"

\$: (OHFWULF/6WDQGDUG ( )DQ RÅ) PRGH XVHV RQO\ WKH UHVLVWDQFH KHDWHUV WR  
KHDW WKH ZDWHU. 7KLV JLYHV IDVWHU KRW ZDWHU UHFRYHU\ WKDQ +\EULG PRGH,  
EXW XVHV PRUH HQHU\. 7KLV PRGH RSHUDWHV ZLWKRXW WKH IDQ, VWRSSLQJ  
WKH FRRO DLU QRUPDO\ GLVFKDUJHG GXULQJ KHDW SXPS RSHUDWRQ.

4: :K\ GRHV WKH (OHFWULF/6WDQGDUG ( )DQ RÅ) JUHHQ /(' ÀDVK "

\$: ,QWKLV PRGH WKH JUHHQ /(' OLVK ZLOO ÀDVK DIWHU 48 KRUV DV DQ  
LQGLFDWRQ WKDW WKH XQLW LV QRW RSHUDWRQ LQ WKH PRVW HQHU\ H¿FLHQW  
mode.

## Operation:

4: :K\FDQ, KHDU WKH XQLW UXQ"

\$: ,Q WKH PRVW HQHU\-H¿FLHQW PRGHV, +HDW 3XPS (RQO\), +\EULG, DQG +LJK  
'HPDQG/%RRVW, WKH PHWKRG XVHG WR KHDW WKH ZDWHU XVHV D IDQWKDW  
FDQ EH KHDU ZKLOH UXQLQJ.

4: 7KH KHDW SXPS LV QRW UXQLQJ LWV QRUPDO OHQJWK RI WLPH. :KDW FDXVHV  
WKLV"

\$: 8QGHU VRPH FRQLWLRQV, WKH \*HR6SULQJ™ +\EULG :DWHU +HDWHU ZLOO  
RSHUDWH XLQJ WKH HOHFUWLF HOHPHQW LQVWHDG RI WKH KHDW SXPS WR  
SURWHFW \RXU XQLW DQG HQVXUH KRW ZDWHU LV DYDLODEOH WR \RX. 7KHVH  
FRQLWLRQV LQFOXGH H[WUHPH FROG DPDLHQW WHPSHUDWXUH (<45f)), H[WUHPH  
KRW DPDLHQW WHPSHUDWXUH (!120f)), RU YHU\ ORZ YROWDJH FRQLWLRQV.  
7KH XQLW ZLOO UHWHUQ WR QRUPDO RSHUDWRQ ZKHQ FRQLWLRQV SHUPLW.

# Appliance Communication Module (where installed).

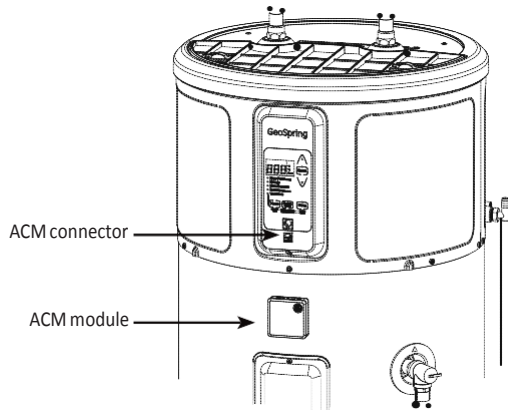
7KH +\EULG (OHFWULF KHDW SXPS ZDWHU KHDWHU LV FRPSDWLEOH ZLWK WKH **GE Smart Appliance communication module (ACM)** ZKLFK FDQ EH SXUFKDVHG VHSUDWHO\ . &RQWDFW \RXU ORFDO XWLOLW\ RU YLVLW ZZZ.\*(\$SSOLDQFHV.FRP/**Smart-Appliance**WR VHH LI your area is using **ACM**WHFKQRORJ\ . \$SSO\LQJ WKH \$&O DOORZV WKH XQLW WR UHVSQGV WR XWLOLW\ VLIQDOV RU WR MRLQ D KRPH QHWZRUN.

7KH IROORZLQJ GHPDQG UHVSQGV IHDXUHV PD\ EH DYDLODEOH DV SDUW RI D SLORW WHVW SURJUDP ZLWK WKH ORFDO XWLOLW\ FRPSDQ\ WR KHOS FRQVXPHUV UHGXFH SHDN HOHFWULFLW\ XVDJH LQ WKH KRPH.

## INSTALLATION

7KH \$&O PRGXOH LV HTXLSSHG ZLWK PDJQHVV LQ WKH EDVH RI WKH PRGXOH WKDW ZLOO HQDEOH LW WR EH DWWDFKHG WR WKH SDLQWHG PHWDO H[WHULRU RI WKH KHDW SXPS ZDWHU KHDWHU.

\*HWDLOV RQ KRZ WR FRQQHFV WKH FDEOHV WR WKH PRGXOH DUH LQ WKH LQVWUXFWLRQV WKDW FRPH ZLWK WKH PRGXOH.



2QFH WKH FDEOH IURP WKH \$&O PRGXOH LV SOXJJHG LQWR WKH ZDWHU KHDWHU-V FRQQHFWRU, IROORZ WKH SRZHU-XS GLUHFWRUQ LQFOXGHG ZLWK WKH \$&O PRGXOH. \$V VRRQ DV WKH \$&O PRGXOH LV RSHUDWLQJ, WKH KHDW SXPS ZDWHU KHDWHU LV UHJG\ WR UHFHLYH WKH ACM signals.

## QUICK GUIDE

,I \RXU ORFDO XWLOLW\ FRPSDQ\ LV XWLOLJLQJ \$&O WHFKQRORJ\, WKH \$&O PRGXOH ZLOO UHFHLYH WKH VLIQDOV VHQW IURP \RXU XWLOLW\ FRPSDQ\ . 2QH RI IRXU VLIQDOV ZLOO EH VHQW:

- /Rzµ (UHSUHVHQWV ORZHVW HQHUJ\ FRVW UDWH LV DYDLODEOH)
- 'OHGLXPµ (UHSUHVHQWV LQFUHDVHG HQHUJ\ FRVW UDWH)
- '+LJKµ (UHSUHVHQWV LQFUHDVHG HQHUJ\ FRVW UDWH)
- 'ULWLFDOµ (UHSUHVHQWV 'SHDN UDWHµ HQHUJ\ FRVW UDWH)

\$ KHDW SXPS ZDWHU KHDWHU HTXLSSHG ZLWK D \$&O PRGXOH ZLOO DXWRPDWLFDOO\ UHFRLQJH ZKDW HQHUJ\ FRVW UDWH LV DYDLODEOH and adjust its mode and temperature setting to use less HQHUJ\ ZKHQ UDWHV DUH PHGLXP, KLJK DQG FULWLFDO. :KHQ WKH KHDW SXPS ZDWHU KHDWHU UHVSQGV WR WKHVH VLIQDOV, WKH /(' OLJKW DERYH WKH 3RZHU 6DYHU EXWWRQ ZLOO EH RQ, LQGLFDWLQJ HQHUJ\ SULFLQJ SHULRGV DUH LQ H[HFV, DQG WKH OHWWHUV 36 ZLOO EH GLVSOD\HG RQ WKH /(' LI WKH XVHU DWWHPSWV WR FKDQJH WKH WHPSHUDWXUH ZLWKRXW ÷UVW SUHVVLQJ WKH 3RZHU 6DYHU RYHUULGH EXWWRQ.

:KHQ WKH VLIQDO LV ORZ RU ZKHQ QR \$&O PRGXOH LV FRQQHFVHG, WKH XQLW UXQV DV QRUPDO. 7KH IROORZLQJ VVHSV VKRZ KRZ WKH XQLW UHDFWV WR OHGLXP, +LJK DQG ULWLFDO VLIQDO OHYHOV.

:KHQ WKH \$&O VLIQDO LV **Medium**, WKH FRQWURO ZLOO RSHUDWH LQ +HDW 3XPS (RQO\ ) ORGH DQG WKH ZDWHU WHPSHUDWXUH ZLOO UHPDLQ DW WKH FXUUHQW XVHU VHWWLQJ. ,I WKH FXUUHQW XVHU temperature setting is 120f) WKH VFUHHQ ZLOO GLVSOD\:



:KHQ WKH ACM signal is **High**, WKH FRQWURO ZLOO RSHUDWH LQ +HDW 3XPS (RQO\ ) PRGH, ZLWK D ZDWHU WHPSHUDWXUH VHWWLQJ RI 110f), DQG WKH VFUHHQ ZLOO GLVSOD\:



:KHQ WKH \$&O VLIQDO LV **Critical**, WKH FRQWURO ZLOO RSHUDWH LQ +HDW 3XPS (RQO\ ) PRGH, ZLWK D ZDWHU WHPSHUDWXUH VHWWLQJ RI 100f), DQG WKH VFUHHQ ZLOO GLVSOD\:



**Notice:** \$SSOLDQFH \$&O FRQQHFWRU FDUULHV YROWDJH QRW FRPSDWLEOH WR FRPSXWHUV RU DFFHVVRULHV. 'R 127 SOXJ ODSWRSV, PRGHPV, URXWHUV, HWF LQWR WKH \$SSOLDQFH 5-45 \$&O FRQQHFWRU. 8VH RQO\ ZLWK GHVLIQDWHG \*( \$SSOLDQFH Accessories. Connection to computers and accessories may result in product damage.

:KHQ XQLW LV RSHUDWLQJ LQ PHGLXP, KLJK RU FULWLFDO, WKH /&' DERYH WKH 3RZHU 6DYHU EXWWRQ ZLOO EH OLW. ,I DW DQ\ WLPH \RX ZDQW WR FKDQJH WKH WHPSHUDWXUH VHSRLOQW ZKLOH WKH XQLW LV LQ 3RZHU 6DYHU PRGH, SUHVV DQG KROG WKH 3RZHU 6DYHU EXWWRQ WR RYHUULGH WKH 3RZHU 6DYHU PRGH, WKHQ XVH WKH DUURZ EXWWRQ WR FKDQJH WKH GHVLUHG VHWWLQJ. 2YHUULGH ZLOO EH LQ SODFH IRU 18 KRUV. ,I \RX WU\WR FKDQJH WKH WHPSHUDWXUH ZLWKRXW RYHUULGLQJ WKH SRZHUVDYHU IXQFWLRQ, WKH OHWWHUV 36 ZLOO VKRZ RQ WKH GLVSOD\, LQGLFDWLQJ LW LV VWLOO LQ 3RZHUVDYHU PRGH.



## Routine Preventive Maintenance

**⚠ DANGER** Risk of Scald - Before manually operating the relief valve, make certain no one will be exposed to the danger of coming in contact with the hot water released by the valve. The water may be hot enough to create a scald hazard. The water should be released into a suitable drain to prevent injury or property damage.

**NOTE:** If the temperature and pressure-relief valve on the hot water heater discharges periodically, this may be due to thermal expansion in a closed water system. Contact the water supplier or your plumbing contractor on how to correct this. Do not plug the relief valve outlet.

3URSHUO\ PDLQWDLQHG, \RXU ZDWHU KHDWHU ZLOO SURYLGH \H DUV RI GHSHQGDEOH WURXEOH-IUHH VHUYLFH.

,W LV VXJHVWHG WKDW D URXLQHU SUHYHQWLYH PDLQWHQDQFH SURJUDP EH HVWDEOLVKHG DQG IROORZHG E\ WKH XVHU.

### Temperature and Pressure-Relief Valve:

\$W OHDVV RQFH D \H DU, OLIW DQG UHOHDVH WKH OHYHU KDQGOH RQ WKH WHPSHUDWXUH DQG SUHVXUH-UHOLHI YDOYH, ORFDWHG RQ WKH IURQW-UJLKW VLGH RI WKH ZDWHU KHDWHU, WR PDNH FHUWDLQ WKH YDOYH RSHUDWHV IUHHO\, \$OORZ VHYHUDO JDOORQV WR IOXVK WKURXJK WKH GLVFKDUJH OLQH WR DQ RSHQ GUDLQ.

## Draining the Water Heater

**⚠ CAUTION:** Risk of Shock - Shut off power to the water heater before draining water.

**⚠ DANGER** Risk of Scald - Before manually operating the relief valve, make certain no one will be exposed to the hot water released by the valve. The water drained from the tank may be hot enough to present a scald hazard and should be directed to a suitable drain to prevent injury or damage.

## Extended Shutdown Periods or Vacations Exceeding Vacation Mode Options

,I WKH ZDWHU KHDWHU LV WR UHPDLQ LGOH IRU DQ H[WHQGHG SHULRG RI WLPH, WKH SRZHU DQG ZDWHU WR WKH DSSOLDQFH VKRXOG EH WXUQHG RII WR FRQVHUYH HQHUJ\ DQG SUHYHQW D EXLOGXS RI GDQJHURXV K\GURJHQJ DV. 7KLXQLW KDV QR SRZHU EXWWRQ, SRZHU FDQRQ\ EH VKXW RII DW WKH FLUFXLW EUHDNHU RU GLVFRQQHFV VZLWFK.

7KH ZDWHU KHDWHU DQG SLSLQJ VKRXOG EH GUDLQHG LI WKH\ PLJKW EH VXEMHFWHG WR IUHH\JLQJ WHPSHUDWXUHV.

\$IWHU D ORQJ VXWGRZQ SHULRG, WKH ZDWHU KHDWHU-V RSHUDWLRQ DQG FRQWUROV VKRXOG EH FKHFNHG E\ TXDOLILHG VHUYLFH

### Periodic Inspection (once a year):

,W LV IXUWKHU UHFRPPHQGHG WKDW D SHULRGLF LQVSHFWLRQ RI WKH RSHUDWLRQ FRQWUROV, KHDWLQJ HOHPHQWV DQG ZLULQJ VKRXOG EH PDGH E\ VHUYLFH SHUVRQQHO TXDOLILHG LQ HOHFWULF DSSOLDQFH UHSDLU.

ORVV HOHFWULFDO DSSOLDQFHV, HYHQ ZKHQ QHZ, PDNH VRPH VRXQG ZKHQ LQ RSHUDWLRQ. ,I WKH KLVVLQJ RU VLQJLQJ VRXQG OHYHO LQFUHDVHV H[FHVVLYHO\, WKH HOHFWULF KHDWLQJ HOHPHQW PD\ UHTXLUH FOHDQLQJ. &RQDFW D TXDOLILHG LQVWDOOHU RU SOXPEHU IRU LQVSHFWLRQ.

### Flushing Tank:

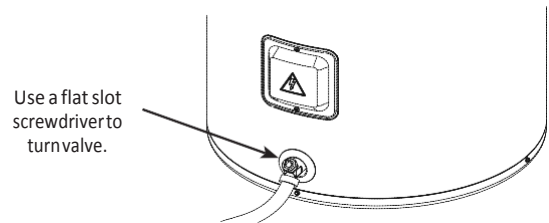
\$ ZDWHU KHDWHU-V WDNQ FDQ DFW DV D VHWWOLQJ EDVLQ IRU VROLGV VXVSHQGHG LQ WKH ZDWHU, ,W LV WKHUH IRU QRW XQFRPPRQ IRU KDUG ZDWHU GHSRVLWV WR DFFXPXODWH LQ WKH ERWWRP RI WKH WDNQ. 7R FOHDQ WKH WDNQ RI WKHVH GHSRVLWV, IROORZ WKHVH VWHSV:

1. \$WWDFK D JDUGHQ KRWH WR WKH GUDLQ YDOYH ORFDWHG DW WKH ERWWRP RI WKH XQLW DQG GLUHFV WKDW KRWH WR D GUDLQ.
2. 2SHQ WKH GUDLQ YDOYH ZLWK D IODW VFUHZGULYHU.
3. 2QFH D IHZ TXDUVV RI ZDWHU KDV EHHQ GUDLQHG, FORVH WKH GUDLQ YDOYH.

7KLXQLW VKRXOG EH GRQH ZLWK WKH FROG ZDWHU VXSSO\ RSHQ VXFK WKDW ZDWHU UHPRYHG WKURXJK GUDLQ YDOYH LV UHSODFHG, DQG ZDWHU VXSSO\ IORZ KHOSV WR UHPRYH VHGLPHQW.

- 7R GUDLQ WKH ZDWHU KHDWHU, IROORZ WKHVH VWHSV:
1. \$WWDFK D JDUGHQ KRWH WR WKH GUDLQ YDOYH ORFDWHG DW WKH ERWWRP RI WKH XQLW DQG GLUHFV WKDW KRWH WR D GUDLQ.
2. 7XUQR\ WKH FROG ZDWHU VXSSO\.
3. \$GPLW DLU WR WKH WDNQ E\ RSHQLQJ D KRW ZDWHU IDXFHW RU OLIWLQJ WKH KDQGOH RQ WKH UHOLHI YDOYH
4. 2SHQ WKH GUDLQ YDOYH ZLWK D \DW VFUHZGULYHU.

1RWH: 6HH SDJH 15 IRU SURGXFW VFKHPDWLF.



SHUVRQQHO. ODNH FHUWDLQ WKH ZDWHU KHDWHU LV FRPSOHWHO\ ILOOHG DJDLQ EHIRUH SODFLQJ LW LQ RSHUDWLRQ.

**NOTE:** Refer to the Hydrogen Gas Caution in the Operating Instructions (see page 3).



## CAUTION - IMPORTANT SAFETY NOTICE

7KLV LQIRUPDWLRQ LV LQWHQG HG WR XVH E\ LQGLYLGXDOV SRVVHVVLQJ DGHTXDWH EDFNJURXQG RI HOHFWULFDO, HOHFWURQLF DQG PHFKDQLFDO H[SHULHQFH. \$Q\ DWWHPSW WR UHSDLU D PDMRU DSSOLDQFH PD\ UHVXOW LQ SHUVRQDO LQMXU\ DQG SURSHU\ GDPDJH. 7KH PDQXIDFWXHU RU VHOHU FDQQRW EH UHVSQVLEOH IRU WKH LQVHUSUHWDLRQ RI WKLV LQIRUPDWLRQ, QRU FDQLW DVVXPH DQ\ OLDELOLW\ LQ FRQQHFWRU ZLWK LWV XVH.

### 7RROV QHHGHG:

- 720 7RUJ 6FUHZGULYHU
- 60RW 6FUHZGULYHU
- 7DSH
- 6RFNHW :UHQFK
- 6RFNHW ([WHQWLRQ 12µ ORQJ
- ‡ 1 1/16µ 6RFNHW
- 6RIWVHW 6HDODQW
- \$QRGH 5RG, LI QHHGHG
- \* 6HH SDJH 72 IRU SDUW RUGHULQJ LQVWUXFWLRQV

### 7RVHUYLFHWKH\$QRGH5RG:

1. 'LVFRQQHFW SRZHU, VKXW RII WKH ZDWHU VXS\, DQG SDUWLDQ\ GUDLQ RQH RU WZR JDOORQV IURP WKH ZDWHU KHDWHU WKURXJK WKH ORZHU GUDLQ YDOYH.
2. 5HPRYH WKH ILOWHU, WULP ULQJ, DQG IURQW WRS FRYHU DV VKRZ LQ ,OOXVWUDWLRQ\$.

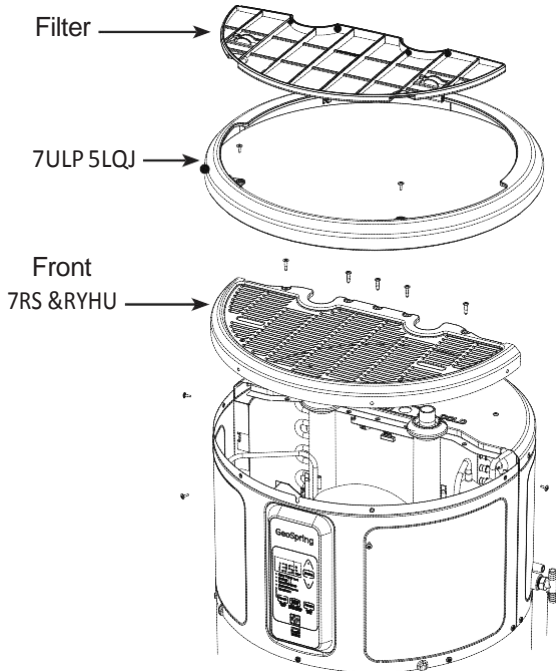


Illustration A

3. 5HLQVWDOO WKH WULP ULQJ, SODFH D SURWHFWLYH OD\HU RI WDSH RQ VKHHW PHWDO HGJHV, DQG UHPRYH WKH DQRGH URG FRYHU DV VKRZ LQ ,OOXVWUDWLRQ %.

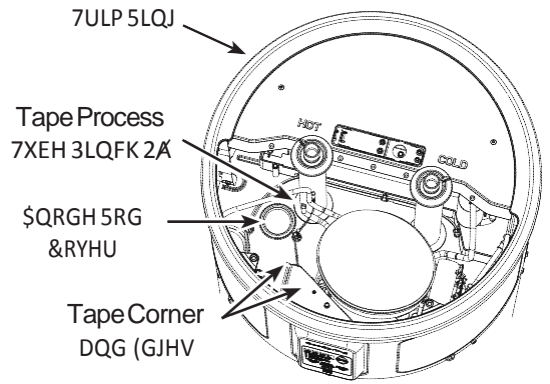


Illustration B

4. 8VLQJ D VORW VFUHZGULYHU DQG HQVULQJ WR DYRLG GDPDJH WR H[SRVHG ZLUHV, UHPRYH IRDP WR XQFRYHU WKH DQRGH URG DV VKRZ LQ ,OOXVWUDWLRQ &.

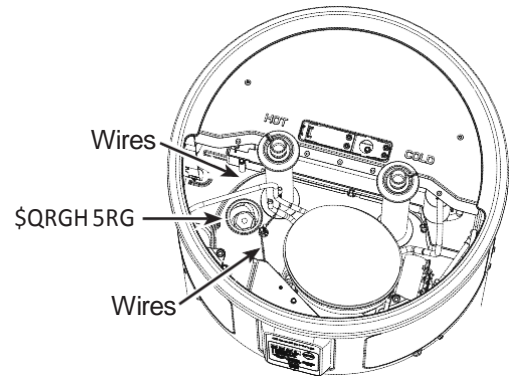


Illustration C

5. Using a 1 1/16µ VRFNHW DQG H[WHQWLRQ, XQVUHZ WKH DQRGH URG, WKHQ OLIV RXW WR LQVSHFW DV VKRZ LQ ,OOXVWUDWLRQ'.

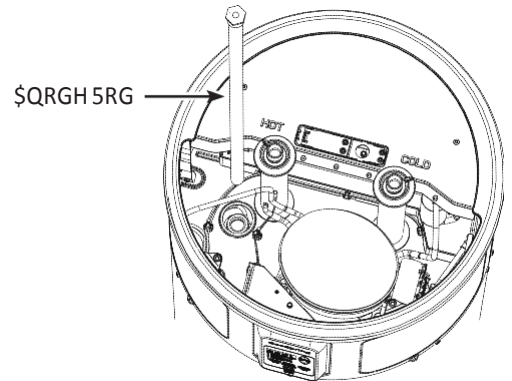


Illustration D

6. 7RLQVWDOO WKH DQRGH URG, VHDO WKH WKUHDGV ZLWK VRIW VHW VHDODQW, WKUHDG LQWR WKH SRUW DQG XVLOJ WKH WRUTXH ZUHQFK WLJKWHQ WR 50" 5 IW-OEV RI WRUTXH. 5HLQVWDOO WKH DQRGH URG FRYHU.
7. 7XUQ ZDWHU VXS\ RQ, RSHQ D WDS WR UHPRYH DQ\ DLU LQ SOXPDLQJ V\VVHP, LQVSHFW IRU OHDNV, WKHQ WXUQ WKH SRZHU RQ DQG UHVVHPEOH WKH XQLW LQ UHYHUVH RUGHU DV VKRZ LQ ,OOXVWUDWLRQ\$.



7KH ORFDWLRQ FKR VH Q IRU WKH ZDWHU KHDWHU PXVW WDNH LQWR FRQVLGHUDWLRQ WKH IROORZLQJ:

**/2&\$/ ,167\$/ /\$7,21 5(\*8/\$7,216**

7KLV ZDWHU KHDWHU PXVW EH LQVWDOOHG LQ DFFRUGDQFH ZLWK WKH VHQVLRQV LQVWUXFWLRQV, ORFDO FRGHV, XWLQOLW\ FRGHV, XWLQOLW\ FRPSDQ\ UHTXLUHPHQWV RU, LQ WKH DEVHQFH RI ORFDO FRGHV, WKH ODWHVW HGLWLRQ RI WKH 1DWLRQDO (OHFWULFDO &RGH. W LV DYDLODEOH IURP VRPH ORFDO OLEUDULHV RU FDQ EH SXUFKDVHG IURP WKH 1DWLRQDO )LJH 3UHYPHQWLRQ \$VVFRFLDWLRQ, %DWWHU\ PDUFK SDUN, 4XLQF\, 0\$ 02169 DV ERRNOHW \$16,/ 1)3\$ 70.

**32:(5 5(48,5(0(176**

&KHFN WKH PDUNLQJV RQ WKH UDWLQJ SODWH RI WKH ZDWHU KHDWHU WR EH FHUWDLQ WKH SRZHU VXSOLFRU UHVSRRQV WR WKH ZDWHU KHDWHU UHTXLUHPHQWV. 127(: 208V LQVWDOODWLRQV PD\ H[SHULQH ORZHU SHUIRUPDQFH.

**/2&\$7,21**

/RFDWH WKH ZDWHU KHDWHU LQ D FOHDQ GU\ DUHD DV QHDU DV SUDFWLFDO WR WKH DUHD RI JUHDWHVW KHDWHG ZDWHU GHPDQG. /RQ XQLQVXODWHG KRW ZDWHU OLQHV FDQ ZDVWH HQHUJ\ DQG ZDWHU. 8QLW PXVW EH LQVWDOOHG LQ D OHYHO ORFDWLRQ.

**127(:** 7KLV XQLW LV GHVLJQH IRU DQ\ FRPPRQ LQGRU LQVWDOODWLRQ LQFOXGLQJ: JDUDJH, XWLQOLW\ URRP, DWWLF, FORVHW, HWF. :LWK WKH LQVWDOODWLRQ RI D ORXYHUHG GRU, LW FDQ EH LQVWDOOHG LQ URRPV VPDOOHU WKDQ 10' [ 10' [ 7' (700 FX.IW.). /RXYHUV VKRXOG EH 240 VTXDUH LQFKHV (0.15 P<sup>2</sup>) OR JUHDWHU. ,I WZR ORXYHUV DUH XVHG RQH VKRXOG EH QHDU WKH WRS RI WKH GRU.

3ODFH WKH ZDWHU KHDWHU LQ VXFK PDQGHU WKDW WKH DLU ILOWHU, FRYHU, WULP ULQJ DQG IURQW SDQHOV FDQ EH UHPRYHG WR SHUPLW LQVSHFWLRQ DQG VHUYLFLQJ, VXFK DV UHPRYDO RI HOHPHQWV RU FOHDQLQJ RI WKH ILOWHU.

7KH ZDWHU KHDWHU DQG ZDWHU OLQHV VKRXOG EH SURWHFWHG IURP IUHH]LQJ WHPSHUDWXUH DQG *high-corrosive atmospheres*. R QRW LQVWDOO WKH ZDWHU KHDWHU LQ RXWGRRU, unprotected areas.

**▲ &\$87,21: Risk of Property Damage -**

7KH ZDWHU KHDWHU VKRXOG QRW EH ORFDWHG LQ DQ DUHD ZKHUH OHNDNDJH RI WKH WDNQ RU FRQQHFWRQV ZLOO UHVXOW LQ GDDPDJH WR WKH DUHD DGMDFHQW WR LW RU WR ORZHU IORRUV RI WKH VVWUXFWXUH. :KHUH VXFK DUHDV FDQQRW EH DYRLGHG, LW LV UHFRPPHQGHG WKDW D VXLWDEOH FDWFK SDQ, DGHTXDWHO\ GUDLQHG, EH LQVWDOOHG XQGHU WKH ZDWHU KHDWHU. \$WWLF LQVWDOODWLRQV UHTXLUH DGHTXDWH IORRULQJ DQG DFFHV VDWLUV.

**127(:** 7KH KHDW SXPS RSHUDWLRQ UDQJH LV 45f) WR 120f) (7f& WR 49f&). ,I WKH DPELHQW WHPSHUDWXUH LV RXWVLGH RI WKLV UDQJH, WKH KHDW SXPS ZLOO WXUQ RII DQG WKH HOHFWULF HOHPHQWV ZLOO EH XVHG XQWLO WKH DPELHQW WHPSHUDWXUH UHWXUQV WR ZLWKLQ WKH RSHUDWLRQ UDQJH.

**/2&\$7,21 I&217.)**

:\$7(5 +(\$7(5 6,=,1\* ,1)250\$7,21 - 5(\$' %())25( ,167\$/ ,1\*:

**)RU H[LVWLQJ KRPH UHSODFHPHQWV:**

- **5HSODFLQJ DQ H[LVWLQJ WDNQ ZDWHU KHDWHU** ,I \RXU FXUUHQW ZDWHU KHDWHU KDV SURYLGHG DGHTXDWH KRW ZDWHU, DQG QR RWKHU SOXPDLQJ FKDQJHV DQG/RU UHQRYDWLRQV WKDW ZRXOG UHTXLUH DGGLWLRQDO KRW ZDWHU GHPDQG DUH LQ SURFHVV RU SODDQHG, WKHQ:
  - 7KH \*HR6SULQJ™ +\EULG :DWHU +HDWHU FDQ UHSODFH DQ HTXLYDOHQW VL]H RU VPDOOHU VWDQGDUG HOHFWULF ZDWHU KHDWHU.
  - ,I VZLWFKLQJ IURP JDV WR HOHFWULF, WKH \*HR6SULQJ™ +\EULG :DWHU +HDWHU PD\ UHSODFH WKH QH[W VL]H VPDOOHU JDV WDNQ\SH ZDWHU KHDWHU.

**)RU QHZ FRQVWUXFWLRQ LQVWDOODWLRQ:**

5HVLGHQWDO :DWHU +HDWHU 6L]LQJ *XLGH			
]DPLO\ 6L]H	'HPDQG *	*DOORQ & DSDFLW\ 5HFRPPHQGHG	
		(OHFWULF RU *HR6SULQJ™	*DV
5+	+LJK	100 (378.5 /)	75 (283.9 /)
	\$YJ RU /RZ	80 (302.8 /)	50 (189.3 /)
3 to 4	+LJK	80 (302.8 /)	50-75 (189.3-283.9 /)
	\$YJ RU /RZ	50 (189.3 /)	40 (151.4 /)
2 to 3	+LJK	50 (189.3 /)	40-50 (151.4-189.3 /)
	\$YJ RU /RZ	40 (151.4 /)	40 (181.8 /)
1 to 2	+LJK	40-50 (151.4-189.3 /)	40-50 (151.4-189.3 /)
	\$YJ RU /RZ	30 (113.6 /)	30 (113.6 /)

\*\$VVXPSWLRQV IRU \$YJ RU /RZ 'HPDQG KRXXHKGROG:  
 - 8VH RI VWDQGDUG RU ORZ IORZ VKRZHU KHDG (2.5 JSP/11.4 / SHU PLQXWH RU OHV)  
 - 1R VKRZHU ZLWK PXOWLSOH VKRZHU KHDG DQG/RU ERG\ MHWW.  
 - 6WDQGDUG EDWKXWE (QR RYHUV]HG/MHWWHG XWE)

**:DWHU +HDWHU 7HPSHUDWXUH 6HWSRLQW:**

7KH ZDWHU KHDWHU WHPSHUDWXUH VHWWLQJ VWRUQJO\ LPSDFWV WKH DPRXQW RI XVDEOH KRW ZDWHU DYDLODEOH IRU VKRZHU DQG EDWKV.

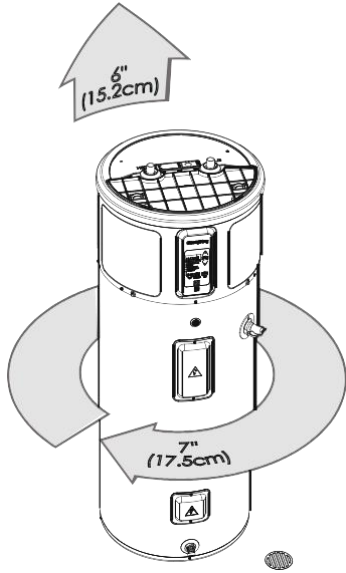
- (QHUJ\ FRQVXPSWLRQ/VLYLQJ DQG HZFLHQF\ VHWWLQJ RI ZDWHU KHDWHUV, LQFOXGLQJ WKH \*HR6SULQJ™, LV SHUIRUPHG DW D 135] (57] & ) VHWWLQJ, WKH DYUDJH ZDWHU KHDWHU VHWWLQJ DFFRUGLQJ WR WKH 'HSDUWPHQW RI (QHUJ\, \$OO VLYLQJ IRU \*HR6SULQJ™ are EDVHG RQ K\EULG PRGH RSHUDWLRQ DW 135] (57] & ).
- 6DIHW\ UHJODWLRQV UHTXLUH D IDFWRU\ VHWWLQJ RI 120f) WR 125f) (49f& WR 52f&) PD\ IRU DOO QHZ ZDWHU KHDWHUV. 7KHUHIRUH, LI \RXU ZDWHU KHDWHU LV FXUUHQWO\ VHW DW 130f) (54f&) RU DERYH DQG \RXU QHZ ZDWHU KHDWHU LV LQVWDOOHG ZLWK D IDFWRU\ VHW VHWWSRLQW RI 120f) (49f&), WKH QHZ ZDWHU KHDWHU PD\ VHHP WR SURYLGH ORZHU FDSFLW\ WKDQ \RXU H[LVWLQJ ZDWHU KHDWHU.
- 7KH XVHU FDQ DGMXVW WKH WHPSHUDWXUH VHWWLQJ WR PHHW WKHLU QHGHV. \$OZD\ V UHGD DQG XQGHUVWDQGHG WKH VDIHW\ LQVWUXFWLRQV FRQWDLQHG LQ WKH XVHUV PDQXDO EHIRUH DGMXVWLQJ WKH temperature setpoint.

/2&\$7,21 I&217.)

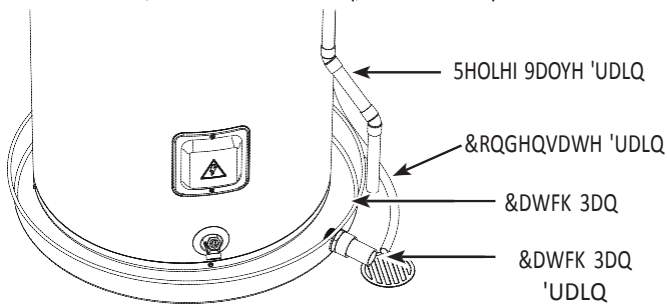
**5HTXLUHG FOHDUDQFHV:**

7KHUH PXVW EH D 7µ (17.5 FP) FOHDUDQFH EHWZHHQDQ\ REMHFW DQG WKH JURQW DQG 5HDU FRYHUV LQ WKH HYHQW VHUULFH LV QHHGHG. \$ PLQLXP RI 7µ (17.5 FP) FOHDUDQFH ZLWK WKH VLGHV RI WKH ZDWHU KHDWHU LV DOVR UHFRPPHQGHG IRU VHUULFH DFFHVV.

\$ 6µ (15.24FP) PLQLXP FOHDUDQFH LV UHTXLUHG WR UHPRYH WKH ILOWHU IRU FOHDQLQJ. 7KH KRW DQG FROG ZDWHU SOXPQLQJ DQG HOHFWULFDO FRQQHFWRQV PXVW QRW LQWHUIHUH ZLWK WKH UHPRYDO RI WKH ILOWHU.



**&DWFK 3DQ, QVWDOODWLRQ (UHTXLUHG)**

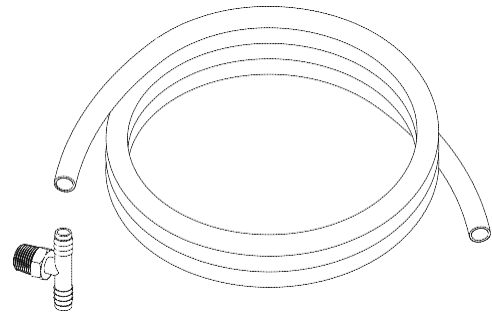


**127(:** \$X[LOLDU\ FDWFK SDQ 0867 FRQIRUP WR ORFDO FRGHV. &DWFK 3DQ .LWV DUH DYDLODEOH IURP WKH VWRUH ZKHUH WKH ZDWHU KHDWHU ZDV SXUFKDVHG, D EXLOGHU VWRUH RU DQ\ ZDWHU KHDWHU GLVWULEXWRU. 7KH FDWFK SDQ VKRXOG EH 2µ (5.1 FP) PLQLXP ODUJHU WKDQ WKH :DWHU +HDWHU EDVH GLDPHWHU. 7R SUHYHQW FRUURVLRQ DQG LPSURYH 'UDLQ 9DOYH DFFHVV LW LV UHFRPPHQGHG WKDW WKH ZDWHU KHDWHU EH SODFHG RQ VSDFHUV LQVLGH WKH FDWFK pan.

**&RQGHQVDWLRQ GUDLQ**

7KH XQLW KDV D FRQGHQVDWH GUDLQ; WKHUH IRU D GUDLQ PXVW EH DYDLODEOH LQ FORVH SUR[LPLW\ WR WKH XQLW. 7KH GUDLQ PXVW EH QR KLJKHU WKDQ 36µ (91.4 FP) DERYH WKH IORRU (GUDLQ PXVW PHHW VWDWH DQG ORFDO FRGHV). ,I QR GUDLQ LV DYDLODEOH, WKHQ D FRPPRQ FRQGHQVDWH SXPS ZLWK D FDSDFLW\ QR OHVV WKDQ 1.0 DOORQ (3.8) / GD\ PXVW EH SXUFKDVHG IURP D ORFDO EXLOGHU VXSSO\ VWRUH DQG installed.

12167\$1'S5' 3\$576 1(('':



1- 3/8µ [6·]OH[LEOH 7XELQJ  
1- 3/8µ [3/8µ [1/2µ 1370DOH %DUEHG 7HH  
(supplied on some models)

**7+(50\$/ (:3\$16,21**

'HWHUPLQH LI D FKHFN YDOYH H[LVVW LQ WKH LQOHW ZDWHU OLQH. ,W PD\ KDYH EHHQ LQVWDOOHG LQ WKH FROG ZDWHU OLQH DV D VHSUDWH EDFNORZ SUHYHQWHU, RU LW PD\ EH SDUW RI D SUHVXUH-UHGXFQJ YDOYH, ZDWHU PHWHU RU ZDWHU VRIWHQHU. \$ FKHFN YDOYH ORFDWHG LQ WKH FROG ZDWHU LQOHW OLQH FDQ FDXVH ZKDWH LV UHUUHG WR DV D 'FORVHG ZDWHU V\VVHP. µ \$ FROG ZDWHU LQOHW OLQH ZLWK QR FKHFN YDOYH RU EDFNORZ SUHYHQWLRQ GHYLFH LV UHUUHG WR DV DQ 'RSHQµ ZDWHU system.

\$V ZDWHU LV KHDWHG, LW H[SDQGV LQ YROXPH DQG FUHDWHV DQ LQFUHDV LQ WKH SUHVXUH ZLWK LQ WKH ZDWHU V\VVHP. 7KLV DFWLRQ LV UHUUHG WR DV 'WKHUPDO H[SDQVLRQµ, Q DQ 'RSHQµ ZDWHU V\VVHP, H[SDQGLQJ ZDWHU ZKLFK H[FHGHV WKH FDSDFLW\ RI WKH ZDWHU KHDWHU IORZ EDFN LQWR WKH FLW\ PDLQ ZKHUH WKH SUHVXUH LV HDVLO\ GLVWSDWHG.

A "FORVHG ZDWHU V\VVHPµ KRZHYHU, SUHYQW WKH H[SDQGLQJ ZDWHU IURP IORZLQJ EDFN LQWR WKH PDLQ VXSSO\ OLQH, DQG WKH UHVXOW RI 'WKHUPDO H[SDQVLRQµ FDQ FUHDWH D UDSLQ DQG GDQJURXV SUHVXUH LQFUHDV LQ WKH ZDWHU KHDWHU DQG V\VVHP SLSLQJ. 7KLV UDSLQ SUHVXUH LQFUHDV FDQ TXLFNO\ UHDFK WKH VDIHW\ VHWWLRQ RI WKH UHOLHI YDOYH, FDXVLQJ LW WR RSHUDWH GXULQJ HDFK KHDWLQJ F\FOH. 7KHUPDO H[SDQVLRQ, DQG WKH UHVXOWLQJ UDSLQ DQG UHSHDWHG H[SDQVLRQ DQG FRQWUDFWLRQ RI FRPSRQHQQV LQ WKH ZDWHU KHDWHU DQG SLSLQJ V\VVHP, FDQ FDXVH SUHPDWXUH IDLOXUH RI WKH UHOLHI YDOYH, DQG SRVLEO\ WKH KHDWHU LWVHOI. 5HSODFQJ WKH UHOLHI YDOYH ZLOO QRW FRUUHFV WKH SUREOHP!

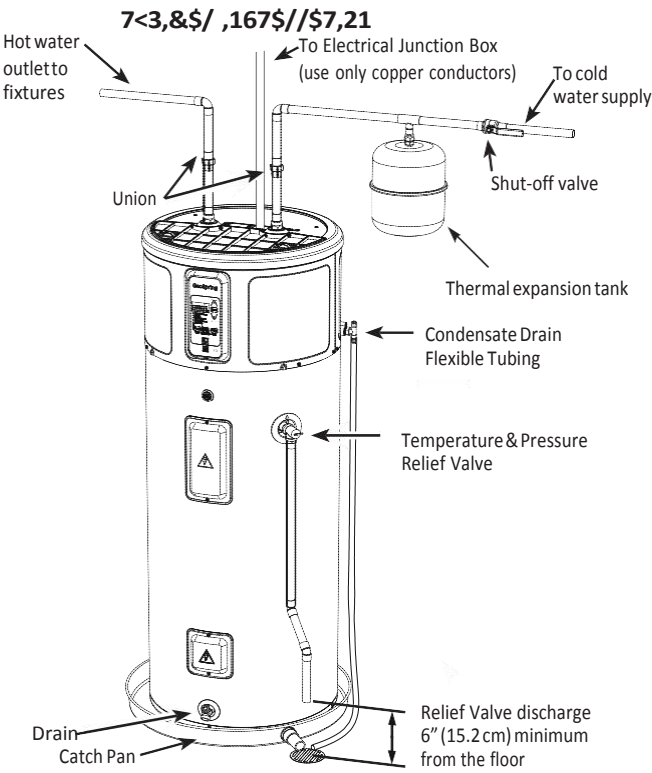
7KH VXJJHVWHG PHWKRG RI FRQWUROOLQJ WKHUPDO H[SDQVLRQ LV WR LQVWDOO DQ H[SDQVLRQ WDQN DQ WKH FROG ZDWHU OLQH EHWZHHQ WKH ZDWHU KHDWHU DQG WKH FKHFN YDOYH (UHUUH WR WKH LOOXVWUDWLRQ RQ SDJH 15). 7KH H[SDQVLRQ WDQN LV GHVLUHQG ZLWK DQ DLU FXVKLRQ EXLOW LQ WKDW FRPSUHVVHV DV WKH V\VVHP SUHVXUH LQFUHDVH, WKHUHE\ UHOLHYLQJ WKH RYHU-SUHVXUH FRQGLWLRQ DQG HOLPLQDWLQJ WKH UHSHDWHG RSHUDWLRQ RI WKH UHOLHI YDOYH. 2WKHU PHWKRGV RI FRQWUROOLQJ WKHUPDO H[SDQVLRQ DUH DOVR DYDLODEOH. &RQWDFW\RXU LQVWDOOLQJ FRQWUDFWRU, ZDWHU VXSSOLHU RU SOXPQLQJ LQVSHFWRU IRU DGGLWLRQDO LQIRUPDWLRQ UHJUGLQJ WKLV VXMHHFV.

**:\$7(5 6833/< &211(&7,216**

5HIHU WR WKH LOOXVWUDWLRQ EHORZ IRU VXJHVVHG W\SLFDO LQVWDOODWLRQ. 7KH +27 DQG &2/ ZDWHU FRQQHFWRU DUH FOHDU\ PDUNHG DQG DUH 1/2" DQG 3/4" DQG DOO PRGHV. KHQ FRQQHFWRU WR WKH LQOHV/RXWOHW SRUWV, WKH XVH RI 1/2" HPDQH 137 WDSHUHG WKUHDG ILWWLQJ ZLWK XVH RI WKUHDG VHDODQW LV UHFRPPHQGHG. 7KH LQVWDOODWLRQ RI XQLRQV LV UHFRPPHQGHG RQ WKH KRW DQG FROG ZDWHU FRQQHFWRU VR WKDW WKH ZDWHU KHDWHU PD\ EH HDVLO\ GLVFRQQHFWRU IRU VHUFLQJ LI QHFVVDU\.

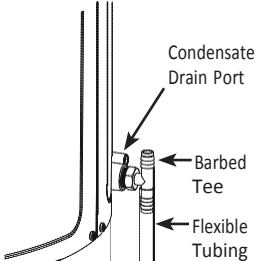
**127**: ,QVWDOODWLRQ D VXXW-RII YDOYH LQ WKH FROG ZDWHU OLQH QHDU WKH ZDWHU KHDWHU. 7KLV ZLOO HQDEOH HDVLUH VHUFLRU IRU PDLQWHDQFH RI WKH XQLRQV.

**,03257\$17: 'RQRW DSSO\ KHDW WR WKH +27 RU &2/' ZDWHU FRQQHFWRU. ,IVZHDW FRQQHFWRU DUH XVHG, VZHDW WXELQJ WR DGDSWHU EHURH ILWWLQJ WKH DGDSWHU WR WKH FROG ZDWHU FRQQHFWRU RQ KHDWHU. \$Q\ KHDW DSSOLHG WR WKH KRW RU FROG ZDWHU FRQQHFWRU ZLOO SHUPDQH\ GDDPDJH WKH LQVWDOODWLRQ SODVVLF OLQJ LQ WKH SRUWV.**



**&21'(16\$7,21 '5\$,1 &211(&7,21**

7KLV XQLRQ KDV D FRQGHQVWLRQ WUD\ 7KH ZDWHU FROOHFWHG LQ WKH WUD\ GUDLQV RXW RI WKH VLGH RI WKH XQLRQ. ,W LV LPSRUWDQW WR LQVWDOODWLRQ D EDUEHG WHH DQG GUDLQ KRWH WR WKH SULPDU\ GUDLQ SRUW FRPLQJ RII WKH VLGH RI WKH XQLRQ. 'LUFHW WKH RWKHU HQG WR WKH ORZHU GUDLQ SRUW RQ WKH VLGH RI WKH XQLRQ. 3OXPE WKH RWKHU HQG WR D GUDLQ LQ WKH IORRU RU QR KLJKHU WKDQ 3' (0.9 P) DERYH WKH IORRU. ,IVXFK GUDLQ LV XQDYDLODEOH, a condensate drain pump (not SURYLGHG) PXVW EH SXUFKDVHG DQG LQVWDOOHG. 7KH GUDLQ WXEH VKRXOG EH URXWHG VR WKDW WKH GLVFKDUJH ZDWHU FDQQRW FRQWDFW OLYH HOHFWULFDO SDUWV WR eliminate potential water damage.



**5(/,)9\$/9(**

**▲ :\$51,1\* : Risk of Unit Damage - 7KH**

**SUHVVXUH UDWLQJ RI WKH UHOLHI YDOYH PXVW QRW H[FHHG 150 36, 11.03 N3D), WKH PD[LXP ZRUNLQJ SUHVVXUH RI WKH ZDWHU KHDWHU DV PDUNHG RQ WKH UDWLQJ SODWH.**

\$ QHZ FRPELQDWLRQ WHPSHUDWXUH DQG SUHVVXUH-UHOLHI YDOYH, FRPSO\QJ ZLWK WKH 6WDQGDUG IRU 5HOLHI 9DOYHV DQG \$XWRPDWLF \*DV 6KXW-2II 'HYLFHV IRU +RW :DWHU 6XSSO\ 6\VVHPV, \$16, =21.22, LV VXSSOLHG DQG PXVW UHPDLQ LQVWDOOHG LQ WKH RSHQLQJ SURYLGHG DQG PDUNHG IRU WKH SXUSRWH RQ WKH ZDWHU KHDWHU. 1R YDOYH RI DQ\ W\SH VKRXOG EH LQVWDOOHG EHWZHHQ WKH UHOLHI YDOYH DQG WKH WDN. /RFDO FRGHV VKDOO JRYHUQ WKH LQVWDOODWLRQ RI UHOLHI YDOYHV.

7KH %78+ UDWLQJ RI WKH UHOLHI YDOYH PXVW QRW EH OHVV WKDQ WKH LQSWX UDWLQJ RI WKH ZDWHU KHDWHU DV LQGLFDWHG RQ WKH UDWLQJ ODEHO ORFDWHG RQ WKH IURQW RI WKH KHDWHU (1 ZDWW 3.412 %78+).

&RQQHFWRU WKH RXWOHW RI WKH UHOLHI YDOYH WR D VXLWDEOH RSHQ GUDLQ VR WKDW WKH GLVFKDUJH ZDWHU FDQQRW FRQWDFW OLYH HOHFWULFDO parts or persons and to eliminate potential water damage.

3LSLQJ XVHG VKRXOG EH RID W\SH DSSURYHG IRU KRW ZDWHU GLVWULEXWLRQ. 7KH GLVFKDUJH OLQH PXVW EH QRVPDOOHU WKDQ WKH RXWOHW RI WKH YDOYH DQG PXVW SLWFK GRZQZDUG IURP WKH YDOYH WR DOORZ FRPSOHWH GUDLQJH (E\ JUDYLW\ ) RI WKH UHOLHI YDOYH DQG GLVFKDUJH OLQH. 7KH HQG RI WKH GLVFKDUJH OLQH VKRXOG QRW EH WKUHDGHG RU FRQFHDOHG DQG VKRXOG EH SURWHFWHG IURP IUHH\ LQJ. 1R YDOYH RI DQ\ W\SH, UHVVULFWLRQ RU UHGXFHU FRXSOLQJ VKRXOG EH LQVWDOOHG LQ WKH GLVFKDUJH OLQH.

**▲ &\$87,21:**

7R UHGXFH WKH ULVN RI H[FHVVLVH SUHVVXUH DQG WHPSHUDWXUH LQ WKLV ZDWHU KHDWHU, LQVWDOODWLRQ WHPSHUDWXUH DQG SUHVVXUH SURWHFWLYH HTXLSPHQW UHTXLUHG E\ ORFDO FRGHV DQG QR OHVV WKDQ D FRPELQDWLRQ WHPSHUDWXUH DQG SUHVVXUH UHOLHI YDOYH FHUWLHG E\ D QDWLRQDO\ UHFJRQL]HG WHVWLQJ ODERUDWRU\ WKDW PDLQWDLQV SHULRGLF LQVSHFWLRQ RI SURGXFWLRQ RI OLVWHG HTXLSPHQW RU PDWHULDOV, DV PHHWLQJ WKH UHTXLUHPHQW IRU 5HOLHI 9DOYHV DQG \$XWRPDWLF \*DV 6KXWRII 'HYLFHV IRU +RW :DWHU 6XSSO\ 6\VVHPV, \$16, =21.22. 7KLV YDOYH PXVW EH PDUNHG ZLWK D PD[LXP VHW SUHVVXUH QRW WR H[FHHG WKH PDUNHG PD[LXP ZRUNLQJ SUHVVXUH RI WKH ZDWHU KHDWHU. ,QVWDOODWLRQ WKH YDOYH LQWR DQ RSHQLQJ SURYLGHG DQG PDUNHG IRU WKLV SXUSRWH LQ WKH ZDWHU KHDWHU, DQG RULHQW LW RU SURYLGH WXELQJ VR WKDW DQ\ GLVFKDUJH IURP WKH YDOYH H[LWW RQ\ ZLWKLQ 6 LQFKHV DERYH, RU DW DQ\ GLVWDQFH EHORZ, WKH VVUXFWXUDO IORRU, DQG GRHV QRW FRQWDFW DQ\ OLYH HOHFWULFDO SDUW. 7KH GLVFKDUJH RSHQLQJ PXVW QRW EH EORFNHG RU UHGXFHG LQ VL]H XQGHU any circumstances.

72 ),// 7+( :\$7(5 +(\$7(5

**▲ :\$51,1\* : Risk of Unit Damage - 7KH**  
 WDQN PXVW EH IXOO RI ZDWHU EHIRUH KHDWHU LV WXUQH RQ. 7KH  
 ZDWHU KHDWHU ZDUUDQW\ GRHV QRW FRYHU GDPDJH RU IDLOXUH  
 UHVXOWLQJ IURP RSHUDWLRQ ZLWK DQ HPSW\ RU SDUWLDOO\ HPSW\  
 WDQN.

ODNH FHUWDLQ WKH GUDLQ YDOYH LV FRPSOHWHO\ FORVHG.  
 2SHQ WKH VKXW-RII YDOYH LQ WKH FROG ZDWHU VXSSO\ OLQH.  
 2SHQ HDFK KRW ZDWHU IDXFHW VORZO\ WR DOORZ WKH DLU WR  
 YHQW IURP WKH ZDWHU KHDWHU DQG SLSLQJ.  
 \$ VWHDG\ IORZ RI ZDWHU IURP WKH KRW ZDWHU IDXFHW(V)  
 LQGLFDWHV D IXOO ZDWHU KHDWHU.

**F11" fault codeduring installation:**, I WKH XQLW LV  
 SRZHUHG RQ ZLWKRXW D IXOO WDQN, WKH HUURU FRGH '11µ ZLOO  
 VKRZLQ WKH GLVSOD\ 7XUQ RÅ WKH SRZHU, ¿OO WKH WDQN ZLWK  
 ZDWHU (VHH DERYH), WKHQ WXUQ WKH SRZHU EDFN RQ.

127,&(:

'R QRW PLV-ZLUH HOHFWULFDO FRQQHFWRQV. 2409 \$& RU 208&&  
 PXVW EH DSSOLHG DFURVV /1 DQG /2 ZLUHV DV VKRZQ LQ  
 ¶:DWHU KHDWHU MXQFWLRQ ER\ LOOXVWUDWLRQ. ¶DLOXUH WR GR VR  
 ZLOO 92, ' WKH ZDUUDQW\, DQG FDQ UHVXOW LQ 1209 DSSOLHG WR  
 ZDWHU KHDWHU, ZKLFK PD\ GDPDJH WKH FRPSUHVVURU RU RWKHU  
 electrical components.

,I 4-FRQGFWRU ZLUH LV VXSSOLHG WR WKH ZDWHU KHDWHU, FDS WKH  
 QHXWUDO, DQG FRQHFWRW WKH UHPDLQLQJ ZLUHV DV LOOXVWUDWHG.

127( 5(\*\$5',1\* 87,/,7< 32:(5-0\$1\$\*(0(17 '(9,&(6  
 (6RPHWLPHV FDOOHG 3HDN /RDG 5HGXFWRQ 6ZLWFKHV):

6RPH SRZHU-PDQDJHPHQW VZLWFKLQJ GHYLFHV RU HYHQ VRPH  
 EDVLF WLPHU VZLWFKHV H[LVW WKDW 5('8&( YROWDJH IURP 2409  
 WR 1209 GXULQJ KLJK-HOHFWULFDO\ -GHPDQG SHULRGV. 7KHVH  
 GHYLFHV PXVW EH UHPRYHG IURP WKH FLUFXLW SURYLGLQJ SRZHU  
 WR WKH ZDWHU KHDWHU EHFDXVH RI WKH SRWHQWLDO XQLW GDPDJH  
 QRWHG DERYH.

+RZHYHU, VZLWFKLQJ GHYLFHV ZKLFK FXW SRZHU IURP 2409 WR  
 09 RQ D SHULRGLF EDVLV DUH DFFHSWDEOH.

**"bAd linE" fault code during installation:**, I 'E\$GOLQ(µ LV  
 VKRZQ RQ WKH GLVSOD\, WKH XQLW LV QRW UHFHLYLQJ WKH FRUHFWRW  
 YROWDJH DV D UHVXOW RI LQFRUHFWRW ZLULQJ. 7R FRUHFWRW WKLV IDXOW,  
 WXUQ WKH SRZHU RÅ WR WKH XQLW, FRUHFWRW WKH ZLULQJ LVVXH, WKHQ  
 WXUQ WKH SRZHU EDFN RQ.

(/(&75,&\$/ &211(&7,216

\$ VHSUDWH EUDQFK FLUFXLW ZLWK FRSSHU FRQGFWRUV, RYHUFXUHQW  
 SURWHFWLYH GHYLFH DQG VXLWDEOH GLVFRQQHFWRQ PHDQV PXVW EH  
 SURYLGHG\ D TXDOLILHG HOHFWULFDO.

§OO ZLULQJ PXVW FRQIRUP WR ORFDO FRGH RU ODWHVW HGLWLRQ RI  
 1DWLRQDO(OHFWULFDO&RGH\$16,/1)3\$ 70.

7KH ZDWHU KHDWHU LV FRPSOHWHO\ ZLUHG WR WKH MXQFWLRQ ER\ DW WKH  
 WRS RI WKH ZDWHU KHDWHU. \$Q RSHQLQJ IRU 1/2µ HOHFWULFDO ILWWLQJ LV  
 SURYLGHG IRU ILHOG ZLULQJ FRQQHFWRQV.

7KH YROWDJH UHTXLUHPHQW DQG ZDWDWJH ORDQ IRU WKH ZDWHU  
 KHDWHU DUH VSHFLILHG RQ WKH UDWLQJ ODEHO RQ WKH IURQW RI WKH  
 ZDWHU KHDWHU.

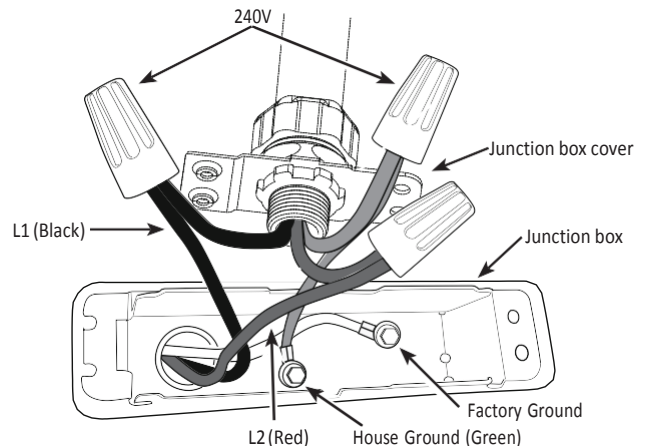
7KH EUDQFK FLUFXLW ZLULQJ VKRXOG LQFOXGH HLWKHU:

1. 0HWDOOLF FRQGLW RU PHWDOOLF VKHDWKHG FDEOH DSSURYHG  
 IRU XVH DV D JURXQLQJ FRQGFWRU DQG LQVWDOOHG ZLWK  
 ILWWLQJV DSSURYHG IRU WKH XSURVH.
2. 1RPHWDOOLF VKHDWKHG FDEOH, PHWDOOLF FRQGLW RU  
 PHWDOOLF VKHDWKHG FDEOH QRW DSSURYHG IRU XVH DV D  
 JURXQG FRQGFWRU VKDOO LQFOXGH D VHSUDWH FRQGFWRU  
 IRU JURXQLQJ. ,W VKRXOG EH DWDFKHG WR WKH JURXQG  
 WHUPLQDOV RI WKH ZDWHU KHDWHU DQG WKH HOHFWULFDO  
 GLVWULEXWLRQ ER\.

7R FRQHFWRW SRZHU WR WKH ZDWHU KHDWHU:

1. 7XUQ WKH SRZHU RÅ.
2. 5HPRYH WKH VFUHZ/VFUHZV KROGLQJ WKH MXQFWLRQ ER\  
 WRS FRYHU.
3. ,QVWDOO /1 WR /1, /2 WR /2 DQG JURXQG WR WKH JUHHQ  
 JURXQG ZLUH FRQHFWRW WR WKH ERWWRP RI WKH MXQFWLRQ  
 ER\.

127(: ,QVWDOO HOHFWULF FRQQHFWRQV DFFRUGLQJ WR ORFDO  
 FRGH RU ODWHVW HGLWLRQ RI 1DWLRQDO (OHFWULFDO &RGH \$16,  
 1)3\$ 70.



**▲ :\$51,1\* : 3URSHU JURXQG FRQQHFWRQ LV**  
 HVVHQWLDO. 7KH SUHVHQFH RI ZDWHU LQ WKH SLSLQJ DQG ZDWHU  
 KHDWHU GRHV QRW SURYLGH VXILFLHQW FRQGFWRU IRU D  
 JURXQG. 1RPHWDOOLF SLSLQJ, GLHOHFWULF XQLRQV, IOH[LEOH  
 FRQGFWRUV, HWF., FDQ FDXVH WKH ZDWHU KHDWHU WR EH  
 HOHFWULFDOO\ LVRODWHG. 'R QRW GLVFRQQHFWRW IDFWRU\ JURXQG.



7KH PDQXIDFWXUHU-V ZDUUDQW\ GRHV QRW FRYHU DQ\  
 GDPDJH RU GHIFW FDXVHG E\ LQVWDOODWLRQ, DWWDKPHQW  
 RU XVH RI DQ\ W\SH RI HQHUJ\ -VDYLQJ RU RWKHU  
 XQDSSURYHG GHYLFHV (RWKHU WKDQ WKRWH DXWKRUL]HG E\ WKH  
 PDQXIDFWXUHU) LQWR, RQWR RU LQ FRQMXQFWLRQ ZLWK WKH ZDWHU  
 KHDWHU. 7KH XVH RI XQDXWKRUL]HG HQHUJ\ -VDYLQJ GHYLFHV  
 PD\ VKRUWHQ WKH OLIH RI WKH ZDWHU KHDWHU DQG PD\  
 HQGDQJHU OLIH DQG SURSHUW\.

7KH PDQXIDFWXUHU GLVFODLPV DQ\ UHVSQVLELOLW\ IRU  
 VXFK ORVV RU LQMXU\ UHVXOWLQJ IURP WKH XVH RI VXFK  
 XQDXWKRUL]HG GHYLFHV.

, ORFDO FRGHV UHTXLUH H[WHUQDO DSSOLFDFWLRQ RI LQVXODWLRQ  
 EODQNHV NLWV, WKH PDQXIDFWXUHU-V LQVWUXFWLRQV LQFOXGHG  
 ZLWK WKH NLW PXVW EH FDUHIXOO\ IROORZH.

**§SSOLFDFWLRQ RI DQ\ H[WHUQDO LQVXODWLRQ, EODQNHV RU  
 ZDWHU SLSH LQVXODWLRQ WR WKLV ZDWHU KHDWHU ZLOO UHTXLUH  
 FDUHIXO DWWHQWLRQ WR WKH IROORZLQJ:**

- 'R QRW FRYHU WKH WHPSHUDWXUH DQG SUHVXUH-UHOLHI YDOYH.
- 'R QRW FRYHU DFFHVV SDQHOV WR WKH KHDWLQJ HOHPHQWV.
- 'R QRW FRYHU WKH HOHFWULFDO MXQFWLRQ ER[ RI WKH ZDWHU KHDWHU.
- 'R QRW FRYHU WKH RSHUDWLQJ RU ZDUQLQJ ODEHOV DWWDKPHG WR WKH ZDWHU KHDWHU RU DWWHPSW WR UHOFDWH WKHP RQ WKH H[WHULRU RI WKH LQVXODWLRQ EODQNHV.
- 'R QRW EORFN WKH DLU LQOHV/RXWOHWV LQ WKH WRS FRYHUV RU UHDU RI WKH XQLW.

**127(: 7KLV JXLGH UHFRPPHQGV PLQLPXP EUDQFK  
 FLUFXLW VL]LQJ EDVHG RQ WKH 1DWLRQDO (OHFWULF &RGH.  
 SHIHU WR ZLULQJ GLDJUDPV LQ WKLV PDQXDO IRU ¿HOG ZLULQJ  
 FRQQHFWRQV.**

**%5\$1&+ &,5&8,76,=,1\* \*8,'(**

7RWDO:DWHU +HDWHU :DWWDJH	5HFRPPHQGHG 2YHU-&XUHQW 3URWHFWLRQ (IXVHRU FLUFXLW EUHDNHU DPHUDJH UDWLQJ)			
	2089	2409	2779	4809
3,000	20	20	15	15
4,000	25	25	20	15
<b>4,500</b>	<b>30</b>	<b>25</b>	<b>25</b>	<b>15</b>
5,000	30	30	25	15
5,500	35	30	25	15
6,000	40	35	30	20
8,000	50	45	40	25
9,000	-	50	45	25
10,000	-	-	50	30
11,000	-	-	50	30
12,000	-	-	-	35

7RWDO:DWHU +HDWHU :DWWDJH	&RSSHU:LUH6L]H\$: *%DVHG RQ 1.(.& 7DEOH 310-16 1167f)/75f&.)			
	2089	2409	2779	4809
3,000	12	12	14	14
4,000	10	10	12	14
<b>4,500</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>14</b>
5,000	10	10	10	14
5,500	8	10	10	14
6,000	8	8	10	12
8,000	8	8	8	10
9,000	-	8	8	10
10,000	-	-	8	10
11,000	-	-	8	10
12,000	-	-	-	8

**,167\$// \$7,21 &+(&./,67**

- 1. 7DQN ORFDWLRQ:**  
<sup>2</sup>RHV URRP VL]H UHTXLUH ORXYHUHG GRRU RU VLPLODU YHQWLODWLRQ" 10· [ 10· [ 7· (700 FX. IW.) RU 240 VTXDUH LQFKHV (0.15 P<sup>2</sup>)  
 DLU-IORZ DUHD QHHGHG.  
<sup>2</sup>%DFN RI XQLW **DZD\ IURP ZDOO** E\ 7 LQFKHV (17.5 FP), DQG VLGHV KDYH DW OHDVW 7 LQFKHV (17.5 FP) FOHDUDQFH.  
 – )**JURQW** RI XQLW LV IUHH DQG FOHDU.  
<sup>2</sup>,V WKH ZDWHU KHDWHU **OHYHO**" ,IQR, DGG VKLPVXQGHU WKH EDVH RI WKH XQLW.
- 2. 9HULI\ \$LU )LOWHU** LV LQVWDOOHG. (/RFDWHG LQ SDFNDJLQ).
- 3. 30XPELQJ FRQQHFWRQV:**  
<sup>2</sup>RHV QRW SUHYHQW **DLU ILOWHU** UHPRYDO.  
<sup>2</sup>1R OHDNV DIWHU **ILOOLQJ** WKH WDQN ZLWK ZDWHU, HLWKHU ZKHQ ZDWHU LV IORZLQJ RU QRW.
- 4. &RQGHQVDWH OLQHV DUH LQ SODFH:**  
<sup>2</sup>ODLQ 'UDLQ IOH[LEOH WXELQJ LQVWDOOHG.
- 5. 7HPSHUDWXUH DQG SUHVXUH-UHOLHI YDOYH** is working and drain line completed per local code.
- 6. (OHFWULFDO** YHULI\ 208/240 9\$& WR /1 DQG /2 DW WDQN.
- 7. (OHFWULFDO** FRQQHFWRQ GRHV QRW SUHYHQW **DLU ILOWHU** UHPRYDO.
- 8. 9HULI\ FRQWURO SDQHO** GLVSOD\ V 120f) (49f&) +\EULG PRGH. \$VVLVW XVHU LQ KRZ WR DGMXVW WHPSHUDWXUH DQG PRGHV (VHH '\$ERXW WKH :DWHU 7HPSHUDWXUH 6HWWLQJµ VHFWRQ RQ SDJH 7).

**:+\$7 72 (;3(&7 )25 ´1250\$/ 67\$5783µ ,1 +<%5,' O2' (**

\$IWHU WKH XQLW KDV EHHQ LQVWDOOHG, ZLWK DOO HOHFWRULFDO DQG ZDWHU FRQQHFWRQV VHFUXH DQG FKHFNHG, WKHQ WKH XQLW VKRXOG EH ILOOHG ZLWK ZDWHU (YHQW WDQN E\ RSHQLQJ D KRW ZDWHU IDXFHW VRPHZKHUH LQ KRPH WR DOORZ WDQN WR IXOO\ ILOO ZLWK ZDWHU). 2QFH WDQN LV IXOO DQG SRZHU LV HQHUJL]HG, \RX PD\ H[SHULHQFH WKH IROORZLQJ:

<b>(ODSVHG 7LPH</b>	<b>+(:+\$FWLRQV</b>	<b>&amp;RPPHQVV</b>
0 to 2 minutes	8QLW ZLOO JR WKURXJK VHOI-FKHFN.	7KLW 2-PLQXWH RII-WLPH SUHYHQVV FRPSUHVVURU damage.
2 to 10 minutes	&RPSUHVVURU DQG IDQ WXUQ RQ	7KLW 8-PLQXWH SHULRG LV XVHG WR HQVXUH WKH WDQN LV IXOO RI ZDWHU ('U\ILUH SUHYHQWLRQ DOJRULWKP).
10 to 30 minutes	&RPSUHVVURU DQG IDQ WXUQ RII, KHDW-LQJ HOHPHQWV WXUQ RQ IRU DERXW 20 minutes	7R TXLFNO\ SURYLGH LQLWLDO DPRXQW RI KRW ZDWHU IRU XVHU (DERXW 25 JDOORQV/94.6 /)
30 minutes and EH\RQG	8SSHU HOHPHQW WXUQV RII DQG FRPSUHVVURU WXUQV EDFN RQ	8VHV HIILFLHQW KHDW SXPS IRU PDMRULW\ RI KHDWLQJ

127(: 7KH KHDW SXPS RSHUDWLQJ UDQJH LV 45f) WR 120f) (7f& WR 49f&). ,I WKH DPELHQW WHPSHUDWXUH LV RXWVLGH RI WKLV UDQJH, WKH KHDW SXPS ZLOO WXUQ RII DQG WKH HOHFWRULF HOHPHQWV ZLOO EH XVHG XQWLO WKH DPELHQW WHPSHUDWXUH UHWXUQV WR ZLWKLQ WKH operating range.

# Troubleshooting..



%HIRUH \RX FDOO IRU VHUYLFH....  
6DYH WLPD DQG PRQH\!5HYLHZ WKH FKDUW EHORZ ILUVW DQG \RX  
PD\ QRW QHGH WR FDOO IRU VHUYLFH.

3UREOHP	3RVVLEOH &DXVHV	:KDW 7R 'R
<b>Water heater makes sounds</b>	\$ IDQ LV XVHG WR PRYH DLU WKURXJK WKH V\ VWHP.	● 6RPH DPRXQW RI IDQ VRXQG LV QRUPDO. ,I \RX KHDU DQ DEQRUPDO VRXQG RU WKH VRXQG OHYHO VHHPV XQXVXDOO\ ORXG, WKHQ FRQWDFW VHUYLFH.
<b>Water heater is making the room cooler</b>	5RRP LV QRW YHQWGH SURSHUO\ RU LV WRR VPDOO.  +HDW LV UHPRYHG IURP WKH DLU WR KHDW WKH ZDWHU	● ,I WKH URRP LV VPDOOHU WKDQ 10· [ 10· [ 7· (3P [ 3P [ 2.1P), WKHQ LW PXVW KDYH D ORXYHUHG GRRU RU RWKHU PHDQV WR DOORZ DLU H\FKDQJH ZLWK VXUURXQGLQJ URRPV. ‡ 7KLV LV QRUPDO
<b>Water dripping down the outside of the heater.</b>	&RQGHQVDWH GUDLQ LV FORJJHG.  +RW/&ROG ZDWHU FRQQHFWRQV DUH QRW WLJKWHQHG.	● &OHU RXW DQ\ GHEULV LQ WKH GUDLQ SRUW RQ WKH XQLW. ● 7LJKWHQ WKH LQOHW DQG RXWOHW SLSH FRQQHFWRQV.
<b>Not enough or no hot water</b>	:DWHU WHPSHUDWXUH PD\ EH VHW WRR ORZ.  +RW ZDWHU XVDJH SDWWHUQ H\FHHGV WKH FDSDELWLW\ RI WKH ZDWHU KHDWHU LQ FXUUHQW PRGH  :DWHU XVDJH PD\ KDYH H\FHHGHG WKH FDSDFLW\ RI WKH ZDWHU KHDWHU.  \$PELHQW WHPSHUDWXUH LV WRR ORZ  &ROG ZDWHU LQOHW WHPSHUDWXUH PD\ EH FROGHU GXULQJ WKH ZLQWHU PRQWKV.  /HDNLQJ RU RSHQ KRW ZDWHU IDXFWV.  /RQ UXQV RI H[SRVHG SLSH, RU KRW ZDWHU SLSLQJ RQ RXWVLGH ZDOO.  1RW HQRXJK FOHDUDQFH WR DOORZ DLU WR FLUFKODWH IRU WKH KHDWHU SXPS.  5RRP VL]H LV QRW DSSURSULDWH IRU ZDWHU KHDWHU.  \$IXVH LV EORZQ RU D FLUFXLW EUHDNHU WULSSHG.  (OHFWULF VHUYLFH WR \RXU KRPH PD\ EH LQWHUUXSWHG.  ,PSURSHU ZLULQJ.  ODQXDO UHVHW OLPLW (7&2).  :DWHU FRQQHFWRQV WR XQLW UHYHUVHG.  (OHFWULF VXSSO\ PD\ EH RII.	● See \$ERXW WKH :DWHU 7HPSHUDWXUH 6HWWLQJ section. ‡ &KDQJH WR GLIIHUHQW PRGH  ● :DLW IRU WKH ZDWHU KHDWHU WR UHFRYHU DIWHU DQ DEQRUPDO demand  ● )RU WKH ZDWHU KHDWHU WR ZRUN SURSHUO\, LWV ORFDWLRQ QHGHV WR KDYH D WHPSHUDWXUH RI 32f WR 150f) IRU 6WDQG DUG (OHFWULF PRGH DQG 45f WR 120f) IRU DOO RWKHU PRGH. ‡ 7KLV LV QRUPDO. 7KH FROGHU LQOHW ZDWHU WDNHV ORQJHU WR KHDW.  ● 0DNH VXUH DOO IDXFWV DUH FORVHG.  ● ,QVXODWH SLSLQJ.  ● 0DNH VXUH XQLW LV 7μ DZD\ IURP WKH ZDOO.  ‡ ,I URRP VL]H LV OHVV WKDQ 10· [ 10· [ 7· (700 FX. IW.), install ORXYHUHG GRRU RU VLPLODU YHQWLODWLRQ.  ● 5HSODFH IXVH RU UHVHW FLUFXLW EUHDNHU.  ‡ &RQWDFW WKH ORFDO HOHFWULF XWLWLW\.  ● 6HH WKH ,QVWDOODWLRQ ,QVWUXFWLRQV section.  ● 6HH WKH 6DIHW\ &RQWURO section, see page 4.  ● Correct piping connections.  ● 0DNH VXUH HOHFWULF VXSSO\ WR ZDWHU KHDWHU LV FRUHFWRQ GLVFRQQHFW VZLWFK, LI XVHG, DUH LQ WKH 21 SRVLWLRQ.

3UREOHP	3RVVLEOH &DXVHV	:KDW 7R 'R
<b>Water is too hot</b>	:DWHU WHPHSHUDWXUH LV VHW WRR KLJK.  <b>⚠️ \$87.21:</b> )RU \RXU VDIHW\, '2 127 DWWHPSW UHSDLU RI HOHFWULFDO ZLULQJ, FRQWUROV, KHDWLQJ HOHPHQWV RU RWKHU VDIHW\ GHYLFHV. 5HIHU UHSDLUV WR TXDOLILHG VHUULFH SHUVRQQHO. (OHFWURQLF FRQWURO KDV IDLOHG.	‡ See \$ERXW WKH :DWHU 7HPSHUDWXUH 6HWWLQJ section.  ‡ &DOO IRU VHUULFH.
<b>Rumbling noise</b>	:DWHU FRQGLWLRQV LQ \RXU KRPH FDXVHG D EXLOGXS RI VFDOH RU PLQHDO GHSRVLWV RQ WKH KHDWLQJ HOHPHQWV.	‡ 5HPRYH DQG FOHDQ WKH KHDWLQJ HOHPHQWV. 7KLV VKRXOG RQO\ EH GRQH E\ D TXDOLILHG VHUULFH SHUVRQQHO.
<b>Relief valve producing popping sound or draining</b>	3UHVVXUH EXLOGXS FDXVHG E\ WKH UPDO H[SDQVLRQ WR D FORVHG V\VWHP.	‡ 7KLV LV DQ XQDFHFWDEOH FRQGLWLRQ DQG PXVW EH FRUUHFWHG. 6HH 7KH UPDO ([SDQVLRQ ,QIRUPDWLRQ RQ SDJH 15 'R QRW SOXJ WKH UHOLHI YDOYH RXWOHW. &RQWDFW D SOXPQLQJ FRQWUDFWRU WR FRUUHFW WKLV.
<b>The heater is beeping and the display says F11</b>	7KH ZDWHU KHDWHU KDV QRW EHHQ ILOOHG ZLWK ZDWHU EHIRUH SRZHULQJ XS. 3RZHULQJ XS WKH KHDWHU ZLWKRXW ZDWHU ZLOO GDPDJH WKH HOHFWULF KHDWHUV. 7KH ZDWHU KHDWHU ZDUUDQW\ GRHV QRW FRYHU GDPDJH RU IDLOXUH UHVXOWLQJ IURP RSHUDWLRQ ZLWK DQ HPSW\ RU SDUWLDOO\ HPSW\ WDNQ.	‡ )LOO WKH WDNQ FRPSOHWHO\ ZLWK ZDWHU. 3UHVV <b>ENTER</b> to stop WKH DODUP DQG WKHQ SUHVV <b>POWER</b> ZKHQ WKH WDNQ KDV EHHQ ILOOHG.
<b>The filter light is on.</b>	7KH ILOWHU UHTXLUHV FOHDQLQJ. \$ FOHDQ ILOWHU LV QHFHVVDU\ IRU HIIHFWLYH RSHUDWLRQ.	‡ )ROORZ WKH LQVWUXFWLRQV RQ KRZ WR UHPRYH DQG FOHDQ WKH ILOWHU RQ SDJH 12.
<b>The heater is beeping and the screen says "FA-F8"</b>	7KHUHV DQ LQVXHZLWK WKH KHDW SXPS V\VWHP.	‡ 7KH XQLW ZLOO DXWRPDWLFDOO\ VZLWFK WR DQRWKHU DYDLODEOH PRGH WR HQVXUH \RX FRQLQJ WKH KHDW SXPS V\VWHP. &RQWDFW VHUULFH LPPHGLWHO\ DQG JLYH WKHP WKH FRGHV OLVWHG RQ WKH display screen.
<b>The heater is beeping and the screen flashes an error code</b>	7KHUHV DQ LQVXHZLWK WKH ZDWHU KHDWHU WKDW UHTXLUHV LPPHGLDWH DWWHQWLRQ.	‡ 7KH KHDWHU PD\ VZLWFK WR DQRWKHU DYDLODEOH KHDWLQJ PRGH. &RQWDFW VHUULFH LPPHGLDWHO\ 7R VWRS WKH EHSLQJ QRLVH (XQHVV HUURU FRGH )2, )11 RU E\$G OLQ( ) SUHVV HLWKHU WKH 83 RU GRZQ DUURZ EXWWRQ DQG WKH DODUP ZLOO VWRS DQG WKH GLVSOD\ ZLOO JR EDFN WR QRUPDO (VHW WHPHSHUDWXUH).
<b>The water heater is beeping and the screen flashes, "bAd linE"</b>	8QLW LV QRW UHFHLYLQJ 2409\$ & DV LQWHQV.	‡ 7XUQ RII SRZHU WR ZDWHU KHDWHU (JHQHUDOO\ DW WKH EUHDNHU SDQH). 7KHQ UHGH\ (OHFWULFDO &RQHFWRQV\ VHFWRQ RI ,QVWDOODWLRQ ,QVWUXFWLRQV, VHH SDJH 17. 7KHQ, FRQWDFW WKH installer WR YHULI\ HOHFWULFDO LQVXW WR WKH ZDWHU KHDWHU.
<b>Hot Water has a rotten egg or sulfur smell</b>	&HUWDLQ ZDWHU VXSSOLHV ZLWK KLJK VXOIDWH FRQWQW ZLOO UHDFW ZLWK WKH DQRGH URG WKDW LV SUHVHQWLQJ DODUW ZDWHU KHDWHUV IRU FRUURVLRQ SURWHFWLRQ RI WKH WDNQ.	‡ 7KH RGRU FDQ EH UHGXFHG RU HOLPLQDWHG LQPRVW ZDWHU KHDWHUV E\ UHSODFLQJ WKH DQRGH URG ZLWK OHVV-DFWLYH PDWHULDO URG. ,QVWRPH FDVHV, DQ DGGLHG VWHS RI FKORULQDWLRQ WKH ZDWHU KHDWHU DQG DOO KRW ZDWHU OLQHV PD\ EH QHFHVVDU\, FRQWDFW \RXU ORFDO ZDWHU SURHVVLRQDO RU SOXPEHU IRU RSWLRQV DQG LQVWUXFWLRQV. &DOO *( DW 1.888.4*(.(+( (1.888.443.4394) WR OHDUQ KRZ WR SXUFKDVH WKLV UHSODFHPHQW DQRGH URG. \$ TXDOLILHG VHUULFHU RU SOXPEHU VKRXOG GR WKLV UHSODFHPHQW. 8VH RID QRQ-*( DSSURYHG DQRGH URG, RU RSHUDWLRQ WKH ZDWHU KHDWHU ZLWKRXW D *( DSSURYHG DQRGH URG ZLOO 92,' WKH ZDUUDQW\.
<b>Unit is not making normal sounds</b>	,IXQLVXLVLRQJ HOHFWULF UHVLVWDQFH HOHPHQWV, LW ZLOO QRW PDNH IDQ RU FRPSUHVVU VRXQGV.	• &KHFN PRGH RI XQLW.

**For Service, please call 1.888.4GE.HEWH (1.888.443.4394)**



## Fault codes

DXOW &RGH 'LVSOD\HG	&RQGLWLRQ	\$FWLRQ
)-\$	74 1RW 5LVVLQJ	&DOO VHUYLFH
)-%	'LVFKDUJH 7HPS 1RW 6WDEOH	&DOO VHUYLFH
)-&	(YDSRUDWRU 1RW )URVW )UHH	&DOO VHUYLFH
)-'	6XSHUKHDW 7RR /RZ	&DOO VHUYLFH
)-( )-)	'LVFKDUJH 7HPSHWDWXUH \$ERYH /LPLW (OHFWURQLF ([SDQVLRQ 9DOYH 2XW RI 5DQJH	&DOO VHUYLFH
)**	75 \$PELHQW 7HPSHWDWXUH &KHFN	7HFKQLFLDQ VHUYLFH GDWD
)+*	&RPSUHVRU /RDG 7HVW	7HFKQLFLDQ VHUYLFH GDWD
)I*	5HIULHUDQW /HDN 7HVW	&DOO VHUYLFH
)2	T2 Tank Temperature Sensor Failure	&DOO VHUYLFH
)3	Compressor Failure	&DOO VHUYLFH
)4	Fan Failure	&DOO VHUYLFH
)5	73D 6HQVRU ((YDS LQOHW WHPSHWDWXUH) )DLOXUH	&DOO VHUYLFH
)6	73E 6HQVRU ((YDS RXWOHW WHPSHWDWXUH) )DLOXUH	&DOO VHUYLFH
)7	T4 Sensor (Compressor outlet) Failure	&DOO VHUYLFH
)8	75 6HQVRU (DPELHQW WHPSHWDWXUH) )DLOXUH	&DOO VHUYLFH
)9	/RZHU +HDWLQJ (OHPHQW) )DLOXUH	&DOO VHUYLFH
)10	8SSHU +HDWLQJ (OHPHQW) )DLOXUH	&DOO VHUYLFH
)11	'U\ 7DQN )DXOW	See page 17
E\$G OLQ( I)12)	7KH YROWDJH LV WRR ORZ DW SRZHU-XS	See page 17
)13	Stuck Key Fault	&DOO VHUYLFH
'LUW\ )LOWHU I)14)	Filter is dirty	See page 12
)15	'DWD)ODVK )DXOW	&DOO VHUYLFH

\* Some Models



\$00 ZDUUDQW\ VHUYLFH SURYLGHG E\ RXU \$XWKRULJHG 6HUJLFHU 1HWZRUN. 7R VFKHGXOH VHUYLFH, FDOO 888.4\*(.+(888.443.4394). 3OHDVH KDYH VHULDO QXPEHU DQG PRGHO QXPEHU DYDLODEOH ZKHQ FDOOLQJ IRU VHUYLFH.

6WDSOH \RXU UHFHLSW KHUH. 3URRI RI WKH RULJLQDO SXUFKDVH GDWH LV QHHGHG WR REWDLQ VHUYLFH XQGHU WKH ZDUUDQW\.

**For The Period Of: We Will Replace:**

<p><b>One Year</b>                  )URP WKH GDWH RI WKH RULJLQDO SXUFKDVH</p>	<p><b>Any part</b> RI WKH +\EULG :DWHU +HDWHU ZKLFK IDLOV GXH WR D GHIHFW LQ PDWHULDOV RU ZRUNPDQVKLS. 'XULQJ WKL <b>limited one-year warranty</b>, *(ZLOO DOVR SURYLGH, <b>free of charge</b>, DOO ODERU DQG UHODWHG VHUYLFH WR UHSODFH WKH GHIHFWLYH SDUW.</p>
<p><b>Second through Tenth Year</b>                  )URP WKH GDWH RI WKH RULJLQDO SXUFKDVH</p>	<p><b>Any part</b> RI WKH +\EULG :DWHU +HDWHU ZKLFK IDLOV GXH WR D GHIHFW LQ PDWHULDOV RU ZRUNPDQVKLS. 'XULQJ WKL <b>limited ten-year parts warranty</b>, ODERU DQG UHODWHG VHUYLFH WR UHSODFH WKH GHIHFWLYH SDUW DUH QRW LQFOXGHG.</p>

**What Is Not Covered:**

- ↓ 6HUJLFH WULSV WR \RXU KRPH WR WHDFK \RX KRZ WR XVH WKH SURGXFW.
- ↓ ,PSURSHU LQVWODDWRQ, GHOLYHU\RU PDLQWHQDQFH.
- ↓ )DLOXUH RI WKH SURGXFW LI LW LV DEXVHG, PLVXVHG, DOWHUHG, XVHG FRPPHUFDOO\ \RU XVHG IRU RWKHU WKDQ WKH LQWHQGHG SXUSRVH.
- ↓ 8VH RI WKL SURGXFW ZKHUH ZDWHU LV PLFURELROJLFDQ\ XQVDIH RU RI XQNQRZQ TXDOLW\, ZLWKRXW DGHTXDWH GLVLQJHFWRQ EHIRUH RU DIWHU WKH \VWHP.
- ↓ SHSODFHPHQW RI KRXXH IXVHV RU UHVHWWLQJ RI FLUFXLW EUDNHUV.
- ↓ 'DPDJH WR WKH SURGXFW FDXVHG E\ DFFLGHQW, OLJKWLQJ, ILUH, IORRG RU DFWV RI \*RG.
- ↓ ,QLGHQWDO RU FRQVHTXHQWLDQ GDPDJH FDXVHG E\ SRVVLEOH GHIHFW ZLWK WKL DSSOLDQFH, LWV LQVWODDWRQ RU UHSDLU.
- ↓ 3URGXFW QRW DFFHVLEOH WR SURYLGH UHTXLUH VHUYLFH LQ D VDIH PDQQHU. \$WWLF LQVWODDWRQ PXVW KDYH IORRULQJ DQG DFFHVLEOH VWDLUV.
- ↓ ,SURGXFW UHPRYHG IURP RULJLQDO LQVWODDWRQ ORFDWRQ.
- ↓ 'DPDJHV, PDOIXQFWLRQV RU IDLOXUH FDXVHG E\ WKH XVH RI UHSDLU VHUYLFH QRW DSSURYHG E\ \*{.
- ↓ 'DPDJHV, PDOIXQFWLRQV RU IDLOXUH FDXVHG E\ WKH XVH RI XQDSSURYHG SDUWV RU FRPSRQHQWV.
- ↓ 'DPDJHV, PDOIXQFWLRQV RU IDLOXUH FDXVHG E\ RSHUDWLQJ WKH KHDWSXPS ZDWHU KHDWHU ZLWK WKH DQRGH URG UHPRYHG.
- ↓ \$QRGH 5RG FRQVXPSWRQ DQG UHSODFHPHQW.
- ↓ 'DPDJHV, PDOIXQFWLRQV RU IDLOXUH UHVXOWLQJ IURP RSHUDWLQJ WKH KHDWSXPS ZLWK DQ HPSW\ RU SDUWLDOO\ HPSW\ WDNQ.
- ↓ 'DPDJHV, PDOIXQFWLRQV RU IDLOXUH FDXVHG E\ VXEMHFWLQJ WKH WDNQ WR SUHVXUH JUHDWHU WKDQ WKRVH VKRZQ RQ WKH UDWLQJ ODEHO.
- ↓ 'DPDJHV, PDOIXQFWLRQV RU IDLOXUH FDXVHG E\ RSHUDWLQJ WKH KHDWSXPS ZDWHU KHDWHU ZLWK HOHFWULFDO YROWDJH RXWVLGH WKH YROWDJH UDQJH OLWWHG RQ WKH UDWLQJ ODEHO.
- ↓ :DWHU KHDWHU IDLOXUH GXH WR WKH ZDWHU KHDWHU EHLQJ RSHUDWHG LQ D FRUURVLYH DWPRVSKHUH.

(;/86,212),03/,/:\$55\$17,(6<RXUVROHDQGH[FOXVLYHUHPHG\LV SURGXFW UHSDLU DV SURYLGHG LQ this Limited Warranty. Any implied warranties, including the implied warranties of merchantability or fitness for a particular purpose, are limited to one year or the shortest period allowed by law.

7KLV ZDUUDQW\ LV H[WHQGHG WR WKH RULJLQDO SXUFKDVHU DQG DQ\ VXFFHHGLQJ RZQHU IRU SURGXFWV SXUFKDVHG IRU KRPH XVH ZLWK LQ WKH 86\$. ,I WKH SURGXFW LV ORFDWHG LQ D QDUHD ZKHUH VHUYLFH E\ D \*(\$XWKRULJHG 6HUJLFHU LV QRW DYDLODEOH, \RX PD\ EH UHVSQVLEOH IRU D WULS FKDUJH RU \RX PD\ EH UHTXLUH WR EULQJ WKH SURGXFW WR DQ \$XWKRULJHG \* (6HUJLFH ORFDWRQ IRU VHUYLFH. ,Q \$ODVND, WKH ZDUUDQW\ H[FOXGHV WKH FRVW RI VKLSSLQJ RU VHUYLFH FDOOV WR \RXU KRPH.

6RPH VWDWVH GR QRW DOORZ WKH H[FOXVLRQ RU OLPLDWRQ RI LQFLGHQWDO RU FRQVHTXHQWLDQ GDPDJHV. 7KLV ZDUUDQW\ JLYHV \RX VSHFLILF OHJDO ULJKWV, DQG \RX PD\ DOVR KDYH RWKHU ULJKWV ZKLFK YDU\ IURP VWDWVH WR VWDWVH. 7R NQRZ ZKDW \RXU OHJDO ULJKWV DUH, FRQVXOW \RXU ORFDO RU VWDWVH FRQVXPHU DIIDLUV RIILFH RU \RXU VWDWVH-V \$WWRUQH\ \*HQHUDO.

**For product purchased outside of the US, contact your dealer for Warranty and Service information.**

**Warrantor for Products Purchased in the United States: General Electric Company, Louisville, KY 40225.**

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**Inscrivez les numéros de modèle  
et de série ici :**

**N° de modèle** \_\_\_\_\_

**N° de série** \_\_\_\_\_

Vous trouverez ces numéros sur l'étiquette  
DSSRVpH j O-DYDQW GH YRWUH FKDXAH-HDX.

# INFORMATION IMPORTANTE SUR LA SÉCURITÉ

## LISEZ

## TOUTES LES INSTRUCTIONS AVANT L'UTILISATION [www.electromenagersge.ca](http://www.electromenagersge.ca)

### ⚠ AVERTISSEMENT!

Pour votre sécurité, vous devez suivre les instructions contenues dans ce manuel pour réduire les risques d'incendie ou d'explosion, d'électrocution ou pour prévenir les dommages matériels, les blessures ou la mort.

Assurez-vous de lire et de comprendre tout le manuel de l'utilisateur avant de tenter d'installer ou de faire fonctionner ce chauffe-eau. Vous sauvez du temps et de l'argent. Accordez une attention toute particulière aux directives de sécurité.

Tout manquement à ces avertissements peut occasionner des blessures graves ou la mort. Si vous avez de la difficulté à comprendre les instructions contenues dans ce manuel ou si vous avez des questions, ARRÊTEZ et demandez de l'aide à un technicien qualifié ou à votre fournisseur d'électricité.

### RÉGLAGE DE LA TEMPÉRATURE DE L'EAU

La sécurité et la conservation de l'énergie sont des facteurs à considérer lors du réglage de la température de l'eau à l'aide de l'interface utilisateur du chauffe-eau. Une température de l'eau supérieure à 52 °C (125 °F) peut causer des brûlures graves ou la mort par ébullition. Assurez-vous de lire et de suivre les avertissements exposés sous l'image de l'étiquette ci-dessous. Cette étiquette est également sur le chauffe-eau près du dessus du réservoir.

## ⚠ DANGER



L'eau à une température supérieure à 52 °C (125 °F) peut causer instantanément des brûlures graves ou la mort par ébullition.

Le réglage de la commande électronique de température est habituellement proche de la température de l'eau au robinet. Toutefois, certains facteurs peuvent causer une hausse de la température de l'eau pouvant aller jusqu'à 71 °C, peu importe le réglage de la commande. Touchez toujours l'eau avant de vous baigner ou de prendre votre douche.

Les enfants et les personnes handicapées ou âgées sont plus à risque de s'ébouillanter.

Consultez les instructions contenues dans ce manuel avant de régler la température du chauffe-eau.

Touchez l'eau avant de vous baigner ou de prendre votre douche.

Des valves de limitation de la température sont vendues; consultez ce manuel.

Il se vend des mélangeurs qui réduisent la température de l'eau au point d'utilisation en mélangeant de l'eau froide à l'eau chaude dans les canalisations de distribution. Communiquez avec un plombier certifié ou l'autorité en plomberie pour plus d'information.

#### Relation température/temps pour les brûlures

Température	Temps pour produire une brûlure grave
49 °C (120 °F)	Plus de 5 minutes
52 °C (125 °F)	1-1/2 à 2 minutes
54 °C (130 °F)	Environ 30 secondes
57 °C (135 °F)	Environ 10 secondes
60 °C (140 °F)	Moins de 5 secondes
63 °C (145 °F)	Moins de 3 secondes
66 °C (150 °F)	Environ 1-1/2 seconde
68 °C (155 °F)	Environ 1 seconde

Tableau courtoisie du Shriners Burn Institute

Vous pouvez utiliser le tableau ci-dessus comme pour déterminer la bonne température de l'eau pour votre maison.

**REMARQUE :** Les ménages avec des petits enfants ou des personnes handicapées ou âgées peuvent nécessiter un réglage du thermostat à 49 °C (120 °F) ou moins pour prévenir le contact avec de l'eau TROP CHAUDE.

**⚠ DANGER :** Il existe une possibilité de S'ÉBOUILLANTER si le chauffe-eau est réglé à une température trop élevée.

**INFORMATION IMPORTANTE SUR LA SÉCURITÉ**  
**CONSERVEZ CES INSTRUCTIONS**

# **INFORMATION IMPORTANTE SUR LA SÉCURITÉ**

## **LISEZ TOUTES LES INSTRUCTIONS AVANT L'UTILISATION.**

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### **⚠ AVERTISSEMENT!**

**Risque d'incendie** - L'essence ainsi que d'autres substances et liquides inflammables (adhésifs, solvants, etc.) et les émanations qu'ils produisent sont extrêmement dangereux. NE PAS manipuler, utiliser ou entreposer de l'essence ou d'autres substances inflammables ou combustibles près d'un chauffe-eau. L'arc électrique à l'intérieur de la commande du chauffe-eau peut allumer ces émanations. Le manquement à cette directive peut entraîner des dommages matériels, des blessures ou la mort.

### **⚠ AVERTISSEMENT!**

Risque d'incendie - NE stockez PAS et N'utilisez PAS d'essence ou d'autres vapeurs et liquides inflammables à proximité de cet appareil ou de tout autre. Gardez les chiffons et combustibles à l'écart.

### **⚠ POUR INSTALLATIONS DANS L'ÉTAT DE CALIFORNIE**

Les lois de la Californie exigent que les chauffe-eau résidentiels soient fixés, ancrés ou attachés pour qu'ils ne tombent pas et qu'ils résistent aux mouvements horizontaux causés par les tremblements de terre. Pour les chauffe-eau résidentiels d'une capacité inférieure à 197 litres (52 gallons), vous pouvez vous procurer une brochure avec des instructions génériques de fixation pour les tremblements de terre en vous adressant à : Office of the State Architect, 400 P Street, Sacramento, CA 95814 ou vous pouvez téléphoner au 916.324.5315 ou demander à un distributeur de chauffe-eau.

Cependant, ce sont les codes municipaux applicables qui régissent l'installation. Pour les chauffe-eau résidentiels d'une capacité supérieure à 197 litres (52 gallons), adressez-vous aux autorités municipales pour connaître les procédures de fixation acceptables.

**Avertissement en vertu de la Proposition 65 de la Californie :** Ce produit contient des produits chimiques connus dans l'État de Californie comme causant le cancer, les malformations et autres défauts de naissance.

# **INFORMATION IMPORTANTE SUR LA SÉCURITÉ**

## **LISEZ TOUTES LES INSTRUCTIONS AVANT**

### **⚠ AVERTISSEMENT :**

*Si le chauffe-eau a été soumis à une inondation, un incendie ou à des dommages matériels, coupez l'alimentation du chauffe-eau en électricité et en eau.*

Ne pas utiliser le chauffe-eau tant qu'il n'a pas été complètement vérifié par un technicien de service qualifié.

### **Précautions de sécurité**

- A. Coupez** l'alimentation au chauffe-eau si celui-ci a été soumis à une surchauffe, un incendie, une inondation ou des dommages physiques.
- B. Ne rallumez pas** le chauffe-eau s'il n'est pas rempli pas d'eau.
- C. Ne rallumez pas** le chauffe-eau si le robinet d'alimentation d'eau froide est fermé.

**REMARQUE :** *Des vapeurs inflammables provenant des zones environnantes peuvent être amenées par des courants d'air jusqu'au chauffe-eau.*

**D.** Si vous éprouvez des difficultés à comprendre les instructions d'utilisation suivantes ou la section d'entretien et nettoyage, nous vous suggérons de faire appel à une personne qualifiée pour accomplir le travail. the work.

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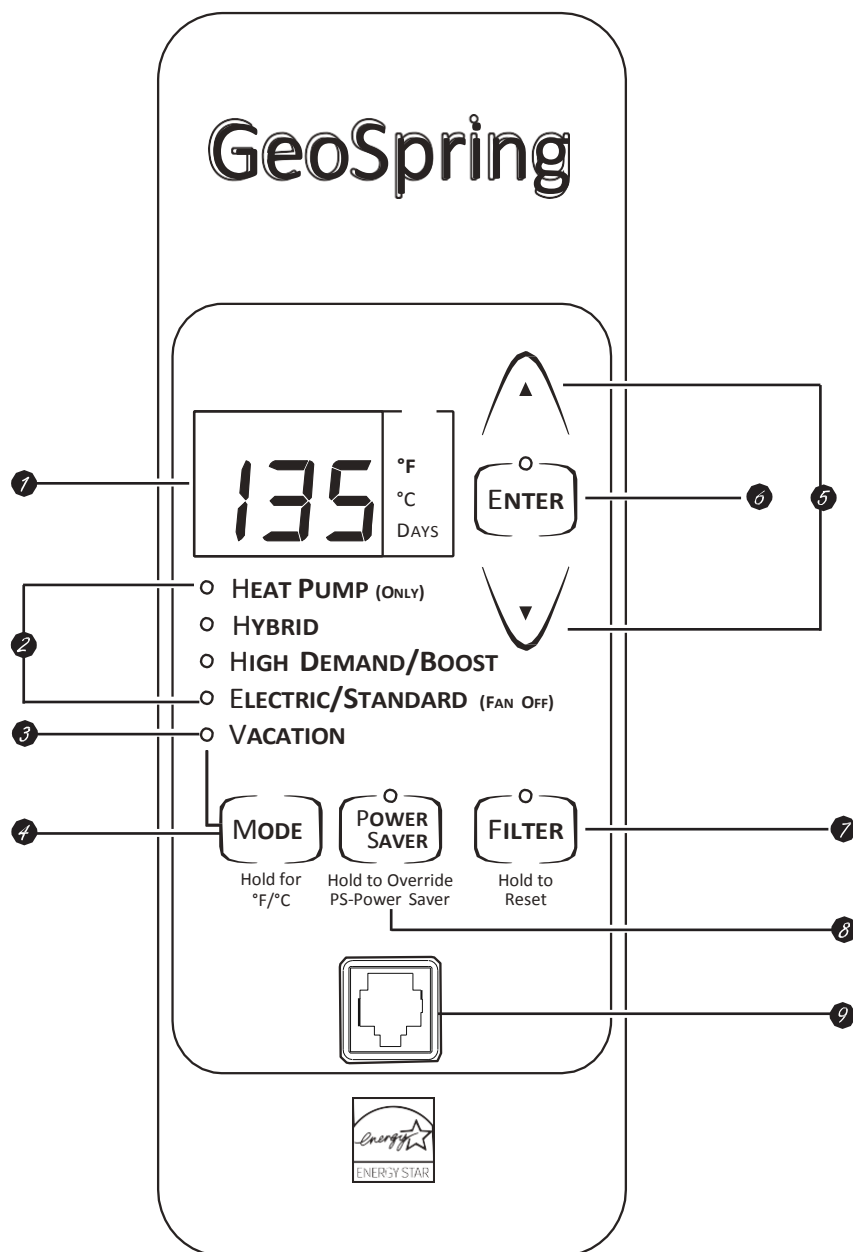
### **Commandes de sécurité**

Le chauffe-eau est équipé de deux commandes de limitation de température (CLT) qui sont situées au-dessus de l'élément chauffant en contact avec la surface du réservoir. Si pour une raison quelconque, la température de l'eau devient excessivement chaude, la commande de limitation de température (CLT) coupe l'alimentation électrique de l'élément chauffant. Lorsque la commande se déclenche, elle doit être réinitialisée manuellement. La réinitialisation de la commande de limitation de température doit être effectuée par un technicien de service qualifié.

**⚠ MISE EN GARDE :** *La cause de la température élevée doit être déterminée par un technicien qualifié et des mesures de correction doivent être prises avant la remise en service du chauffe-eau.*

### **Pour réinitialiser la commande de limitation de température:**

- 1.** Coupez l'alimentation électrique du chauffe-eau.
- 2.** Retirez le(s) panneau(x) d'accès et l'isolation.  
Le couvercle de protection du thermostat ne doit pas être retiré.
- 3.** Appuyez sur le bouton rouge marqué RESET (réinitialiser).
- 4.** Remplacez l'isolant et le/les panneau(x) d'accès avant de reconnecter le chauffe-eau à l'alimentation électrique.



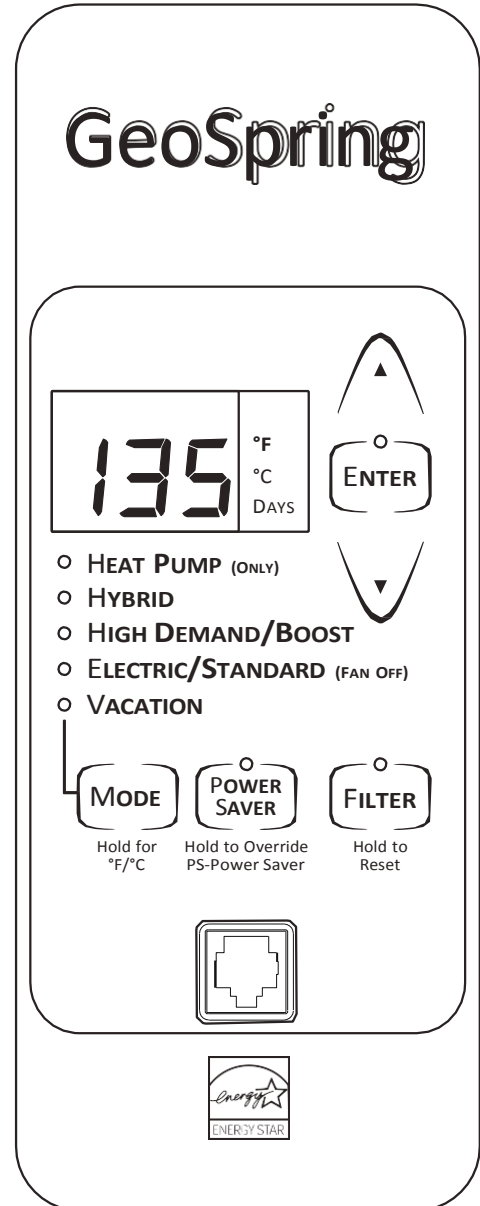
## Commandes Fonctions

- 1 Affichage**
- 2 Modes de fonctionnement**  
(Voir page 8 pour la description)
- 3 Vacation (Vacances)**  
(Voir page 8 pour la description)
- 4 Sélection du mode**  
Utilisez cette touche pour passer d'un mode à un autre.
- 5 Flèches**  
Utilisez ces touches pour régler la température.
- 6 Touche Enter**
- 7 Réinitialisation du filtre**  
Le filtre est sale et nécessite un nettoyage lorsque le témoin rouge est allumé. Le filtre est situé sur le dessus du chauffe-eau. Appuyez et maintenez appuyée cette touche pendant 5 secondes pour réinitialiser l'alarme de filtre.
- 8 Interrupteur de fonction d'économie d'énergie**  
Pour une utilisation avec le module MCA. Appuyez sur cette touche et maintenez-la enfoncée pour sortir l'appareil du mode Économie d'Énergie. Après avoir enfoncé cette touche et lorsque le mode Économie d'Énergie a été désactivé, l'unité restera hors du mode Économie d'Énergie pendant 18 heures.
- 9 Port du module de communication de l'appareil**  
Pour une utilisation avec le module ACM en option (voir page 10 pour plus d'informations).



Cet appareil n'a pas d'interrupteur. Une fois le chauffe-eau installé et l'alimentation électrique branchée, il sera allumé. L'écran affichera le réglage de la température d'eau. Le mode de fonctionnement en cours pour le chauffe-eau est allumé.

Pour se conformer aux règlements de sécurité, les commandes sont pré-réglées en usine à 120°F (49°C) et au mode Hybrid (Hybride). Il est recommandé que l'appareil soit mis sur le mode Thermopompe (uniquement) pour favoriser les économies d'énergie. Le fonctionnement en mode hybride permet d'équilibrer les économies d'énergie avec le confort de l'eau chaude. La consommation énergétique indiquée est basée sur le fonctionnement de l'appareil en mode Hybride à une température de 135°F (57°C). Un réglage à une température inférieure ou une utilisation de la thermopompe (uniquement) permettra une économie d'énergie encore plus importante.



## Au sujet du réglage de la température de l'eau.

### Point de consigne de la température:

La sécurité, la conservation d'énergie et la capacité de production d'eau chaude sont des facteurs dont vous devez tenir compte lors de la sélection de la température d'eau par le biais de l'interface utilisateur du chauffe-eau. Pour se conformer aux règlements de sécurité, la température de l'eau est réglée en usine à 120°F (49°C). Cette température est celle recommandée pour commencer.

**REMARQUE:** Selon Département de l'Énergie des États-Unis, le chauffe-eau résidentiel moyen aux États-Unis est réglé à 135°F (57°C). Les économies d'énergie potentielles du chauffe-eau hybride GE GeoSpring™ sont basées sur un réglage de la température à 135°F (57°C). La température de l'eau peut donc être augmentée du point réglé en usine de 120°F à 135°F (49°C à 57°C) sans sacrifier les économies d'énergie calculées. Si la température est réglée à une température inférieure à 135°F (57°C), des économies d'énergie et de fonctionnement légèrement supérieures peuvent être atteintes.

Consultez le paragraphe « Réglage de la température » ci-dessous pour modifier la température de l'eau.

### Capacité en eau chaude:

Si vous souhaitez obtenir une plus grande capacité d'eau, le fait d'augmenter la température de 120 à 135°F (49°C à 57°C) permet au même réservoir d'eau de durer environ 25 % plus longtemps, car davantage d'eau froide est mélangée au robinet.

### Relation température/temps pour les brûlures

Température	Temps pour produire une brûlure grave
49°C (120°F)	Plus de 5 minutes
52°C (125°F)	1-1/2 à 2 minutes
44°C (130°F)	Environ 30 secondes
57°C (135°F)	Environ 10 secondes
60°C (140°F)	Moins de 5 secondes
63°C (145°F)	Moins de 3 secondes
66°C (150°F)	Environ 1-1/2 secondes
68°C (155°F)	Environ 1 seconde

Tableau courtoisie du Shriners Burn Institute

### Rappel concernant le risque de brûlure:

Une eau à une température supérieure à 125°F (52°C) peut provoquer de graves brûlures pouvant entraîner la mort. Assurez-vous d'avoir lu et suivi les avertissements donnés sur les étiquettes ainsi que ceux présentés dans ce manuel. Cette étiquette est également située sur le chauffe-eau près du panneau d'accès de l'élément supérieur.

Consultez le paragraphe « Relation entre le temps d'exposition et la température de l'eau concernant les brûlures » ci-dessous pour déterminer la température de l'eau appropriée pour votre domicile.

### Robinets mélangeurs:

Des robinets mélangeurs qui réduisent la température de l'eau au point d'utilisation en mélangeant l'eau des conduites d'eau chaude et d'eau froide sont disponibles. Contactez un plombier certifié ou une compagnie de plomberie locale pour obtenir de plus amples renseignements.

**DANGER** Il existe une possibilité de s'ébouillanter si le chauffe-eau est réglé à une température trop élevée. Les ménages avec des petits enfants ou des personnes handicapées ou âgées peuvent nécessiter un réglage du thermostat à 49 °C (120 °F) ou moins pour prévenir le contact avec de l'eau TROP CHAUDE.

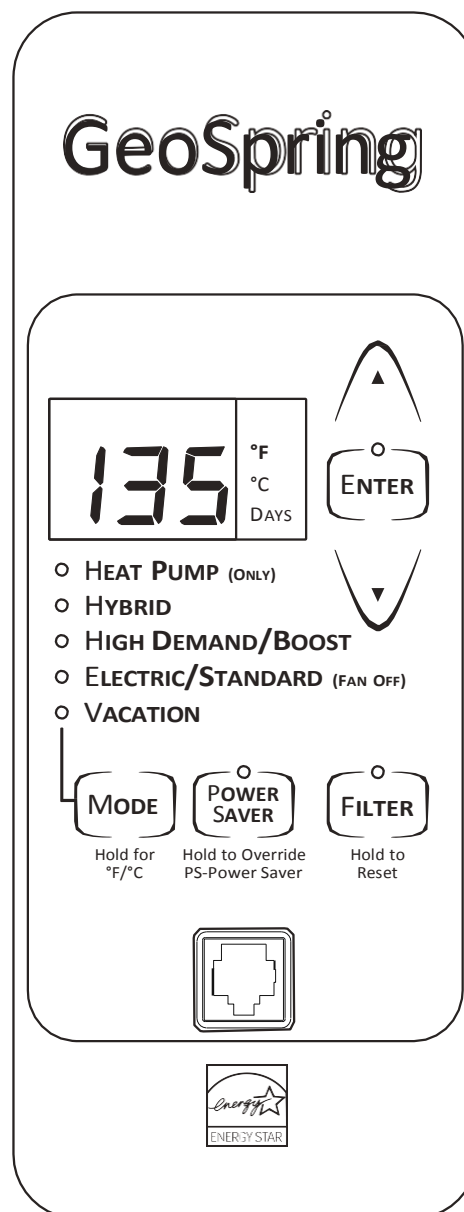
### Pour régler la température de l'eau

Veillez suivre les étapes suivantes:

1. Appuyez sur le bouton de commande pour arriver à la température désirée.
2. Appuyez sur ENTER (Entrée) pour accepter la nouvelle valeur.

**Remarque:** Pour passer de °F à °C, appuyez sur la touche **MODE** et maintenez-la enfoncée.

**DANGER** Il existe un risque de brûlure par l'eau chaude si le thermostat est réglé à une température trop élevée. La température de 120°F (49°C) est celle recommandée pour commencer, mais elle peut être ajustée à une température entre 100 et 140°F (38 et 60°C).



&H FKDXÅH-HDX UHYLHQW SDU GpIDXW DX PRGH GH  
IRQFWLRQQHPHQW K\EULGH. /HV GLÅpUHQWV PRGHV VRQW GRQQpV  
ci-dessous et peuvent être sélectionnés grâce à la touche  
MODE.

## **Mode Thermopompe (uniquement)** - RECOMMANDE POUR DESECONOMIES D'ENERGIE MAXIMALES

La thermopompe (uniquement) est le mode de  
IRQFWLRQQHPHQW OH SOXV G-pFRQRPLTXH SRXU FH FKDXÅH-HDX.  
,OH[WUDLW OD FKDOHXU GH O-DLU DPELDQW SRXU FKDXÅHU O-HDX.  
/H WHPSV GH FKDXÅDJH GDQV FH PRGH HVW SOXV ORQJ, GRQF  
LO SRXUUDLW QH SDV VXZUH GDQV XQH VLWXDWLRQ GH GHPDQGH  
importante (famille nombreuse ou visiteurs).

## **Mode Hybride**

Le mode Hybride associe l'efficacité énergétique de la  
Thermopompe (uniquement) à la vitesse de récupération  
et d'alimentation du mode électrique standard (Ventilateur  
éteint) adapté pour la majorité des utilisations d'eau. Le  
mode hybride permettra à l'appareil de fonctionner comme  
un chauffe-eau électrique standard tout en offrant des  
économies d'énergie significatives.

**REMARQUE:** La performance, la consommation et les  
économies énergétiques sont basées sur un fonctionnement en  
mode hybride à un réglage de la température de 135°F (57°C).

## **Demande élevée/Demande optimale**

Ce mode est seulement nécessaire si vous consommez plus  
que la moyenne des gens ou si l'unité est sous-dimensionnée  
pour la demande en eau chaude. Dans ce mode, l'unité utilise  
OHV pOpPHQWV FKDXÅDQWV pOHFWULTXH VHXOHPHQW ORUVTXH OD  
demande en eau est plus importante qu'à la normale. Avec  
O-XWLWLVWDLRQ GHV pOpPHQWV FKDXÅDQWV, OD WHPSpUDWXUH G-HDX  
remontera plus rapidement, mais la consommation d'énergie  
sera plus importante. Contrairement au mode Électrique/  
6WDQGDUG (YHQWLODWHXU pWHLQW), OHV pOpPHQWV FKDXÅDQWV VHURQW  
utilisés uniquement si nécessaire. La thermopompe sera  
utilisée si la demande en eau est plus faible.

**REMARQUE:** /D GLÅpUHQFH HQWUH OH PRGH +\EULGH HW OH PRGH  
'HPDQGH pOHYpH/%RRVW HVW TXH GDQV OH PRGH j 'HPDQGH  
pOHYpH/%RRVW, OHV pOpPHQWV FKDXÅDQWV VRQW PLV HQ PDUFKH SOXV  
rapidement que dans le mode hybride.

## **Mode Électrique (Ventilateur éteint)/Standard (Ventilateur éteint)**

&H PRGH XWLWLVH XQLTXHPHQW OHV pOpPHQWV FKDXÅDQWV  
VXSpULHXUV HW LQIpULHXUV SRXU FKDXÅHU O-HDX. /H WHPSV  
QpFHVVDLUH SRXU FKDXÅHU O-HDX HVW PRLQGUH GDQV FH PRGH,  
mais ce mode est le plus énergivore.

**REMARQUE:** Dans ce mode le voyant vert clignotera après  
48 heures pour signaler que l'appareil ne fonctionne pas dans  
le mode le plus éconergétique. L'appareil continuera de  
fonctionner dans ce mode et il n'indique pas un problème de  
fonctionnement.

## **Vacances**

Cette fonction est utilisée lorsque vous êtes absent de votre  
domicile pour une durée prolongée et l'eau chaude n'est pas  
nécessaire. Dans ce mode, la température de l'eau descendra  
j 50f) (10f&) HW O-DSSDUHLO XWLWLVH OH PRGH GH FKDXÅDJH OH SOXV  
HZFDFH SRXU pFRQRPLVHU O-pQHUJLH ORUVTXH OH FKDXÅH-HDX HVW  
DX UHSRV./-DSSDUHLO VH UHPHWWUD DXWRPDWLTXHPHQW j FKDXÅHU  
l'eau un jour avant votre retour, de sorte que vous ayez une  
réserve d'eau chaude à votre retour.

Par exemple, si vous êtes absent pendant 14 jours, suivez les  
étapes suivantes:

1. Sélectionnez VACANCES en utilisant la touche Mode
2. Entrez le nombre de jours d'absence (dans cet exemple, 14)  
HQ DSSX\DQW VXU OD ÀqFKH YHUV OH +\$87 (OD YDOHXU SDU GpIDXW  
est de 7 jours)
3. Appuyez sur ENTER(Entrée).

/H FKDXÅH-HDX FRQVHUYHUD OD WHPSpUDWXUH GH O-HDX j 50f)  
(10°C) pendant la durée de votre absence moins 1 jour (dans  
FHV H[HPSOH, SHQGQW 13 MRXUV). \$ OD çQ GX MRXU SUpFpGHQW  
YRWUH UHWRXU (GDQV FHV H[HPSOH, OH 13qPH MRXU), OH FKDXÅH-HDX  
revient automatiquement au mode de fonctionnement  
SUpFpGHQW HW FKDXÅH O-HDX j OD WHPSpUDWXUH G-RULJLQH DçQTXH  
de l'eau chaude soit disponible dès votre retour

## **Pour accéder à un de ces modes:**

1. Appuyez sur la touche MODE (Mode) pour sélectionner le  
mode de fonctionnement approprié.
2. Le voyant lumineux vert s'allumera sur le mode sélectionné.

## Foire aux questions.

### Filter:

4: 3RXUTXRL\D-W-LOXQ¿OWUH"

A: En mode Hybride et Thermopompe (uniquement), l'appareil fait circuler l'eau chaude à travers le filtre. Si le filtre est sale, l'appareil peut ne pas fonctionner correctement. Nettoyez le filtre régulièrement.

4: &RPPHQWQHWWR\HU OH ¿OWUH"

§: 1H FRXSH]SDV O-DOLPHQWDWLRQ HW UHWLWU] OH ¿OWUH GX KDXW GH O-DSSDUHLO. /H ¿OWUH SHXW rWUH QHWWR\p DYHF XQ DVSUDWDXU RX ULQFp j O-HDX WLqGH. 8Q ¿OWUH VDOH UpGLW O-H¿DFLWp GX FKDXÁH-HDX

### Modes:

4: 4X·HVW·TXH OH PRGH 7KHUPRSRPSH (XQLTXHPHQW)"

§: /H PRGH 7KHUPRSRPSH (XQLTXHPHQW) HVW OH PRGH OH SOXV H¿DFH. O H[WUDLW OD FKDOHXU GH O-DLU DPELDQW SRXU FKDXÁHU O-HDX, UHIURLGLVDDQW GX PrPH FRXS O-DLU DOHQWRXU. &H PRGH SUHQG SOXV GH WHPSV j FKDXÁHU O-HDX PDLV LO HVW pJDOHPHQW OH PRGH OH SOXV H¿DFH.

4: 4X·HVW·FH·TXH OH PRGH +\EULGH"

A: Le mode Hybride combine les avantages du mode Thermopompe (uniquement) avec la vitesse et la puissance du mode Électrique. Ce mode consomme moins d'énergie.

4: 4X·HVW·FH·TXH OH PRGH 'HPDQGH pOHYpH"

§: /H PRGH 'HPDQGH eOHYpH/%RRVW SHXW rWUH XWLQVp ORUVTXH OD consommation d'eau chaude est plus élevée qu'à la normale. /-DSSDUHLO VHUD PRLQV H¿DFH PDLV FKDXÁHU O-HDX SOXV UDSLGHPHQW après une consommation importante. Pour une consommation normale, l'appareil continuera d'utiliser la thermopompe la plupart du temps.

4: 4X·HVW·FH·TXH OH PRGH GH 9DFDQFHV"

A: Si vous êtes absent pendant une période prolongée, ce mode réduit la température de l'eau pour réduire la consommation d'énergie. L'appareil revient au mode précédent le jour qui précède votre retour.

4: 4X·HVW·FH·TXH OH PRGH eOHFWULTXH/6WDQGDUG (YHQWLODWHXU pWHLQW)"

A: Le mode Électrique/Standard (ventilateur éteint) utilise uniquement l'électricité pour chauffer l'eau. Ce mode fonctionne sans ventilateur, arrêtant la production d'air frais normalement rejeté pendant le fonctionnement de la thermopompe.

Q: Pourquoi le voyant vert Électrique/Standard (ventilateur éteint) clignote-t-il ?

A: Dans ce mode, le voyant vert clignotera après 48 heures pour signaler que l'appareil ne fonctionne pas dans le mode le plus éconergétique.

### Fonctionnement:

4: 3RXUTXRL SXLV-MH HQWHQGUH OH IRQFWLRQQHPHQW GH O-DSSDUHLO "

A: Aux modes les plus éco-énergétiques (Thermopompe, Hybride et Électrique), l'appareil utilise un ventilateur qui produit un certain bruit.

Q: La thermopompe ne fonctionne pas aussi longtemps que prévu.

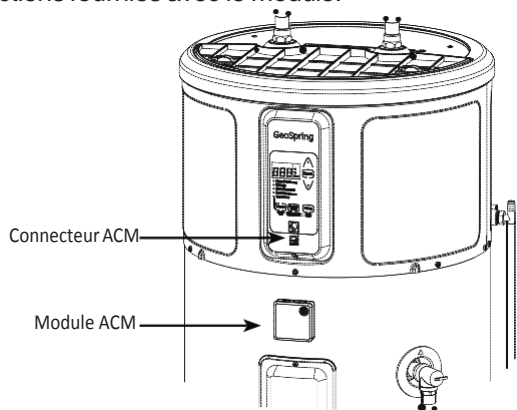
§: 'DQV FHUWDLQHV FRQGLWLRQV, OH FKDXÁH-HDX K\EULGH \*HR6SULQ¿EYD fonctionner en utilisant les éléments électriques au lieu de la pompe à chaleur pour protéger votre appareil et s'assurer que de l'eau chaude est disponible. Ces conditions incluent une température ambiante extrêmement basse (<45°F) ou extrêmement élevée (>120°F) ou encore une très basse tension. L'appareil reprendra son fonctionnement normal dès que les conditions atmosphériques ou d'alimentation le permettent.

/HFKDXAH-HDX pOHFWULTXH K\EULGH j WKHUPRSRPSH HVW compatible avec le module de communication **GE Smart Appliance (ACM)** qui peut être acheté séparément. Pour savoir si la technologie **ACM** HVW R\AHUWH GDQV YRWUH UpJLRQ, FRQWDFWH vos services publics locaux ou consultez le site [www.GEAppliances.com/Smart-Appliance](http://www.GEAppliances.com/Smart-Appliance). L'utilisation de l'**ACM** permet à l'appareil de répondre aux signaux de vos services publics locaux ou d'adhérer à un réseau domestique.

/HV IRQFWLRQ GH GLVWULEXWLRQ OD GHPDQGH VRQ R\AHUWHV GDQV le cadre d'un projet pilote organisé par les services publics de YRWUH ORFDOLWp DZQ G-DLGHU OHV FRQVRPPDWHXUV j GLPLQXHU OHXU consommation d'électricité en période de pointe.

## MONTAGE

Le module ACM est équipé d'aimants dans sa base qui lui SHUPHW G-rWUH z[pj OD SDUWL PpWDOOLTXH SHLQWH H[WpULHXUH GX FKDXAH-HDX j WKHUPRSRPSH. /HV GpWDLOV UHODWLIV DX branchement des câbles au module sont donnés dans les instructions fournies avec le module.



/RUVTXH OH FKEOH GX PRGXOH \$&0 HVW EUDQFKp DX FKDXAH-HDX, suivez les instructions de mise en marche comprises avec le module ACM. Dès que le module ACM est en marche, le FKDXAH-HDX j WKHUPRSRPSH HVW SURW j UHFHYRLU OHV VLJQDX[ ACM.

## GUIDE RAPIDE

Si les services publics de votre localité utilisent la technologie ACM, le module ACM recevra les signaux transmis par les services publics. Un des quatre signaux suivants sera envoyé:

- © )LEOH <sup>3</sup> (LQGLTXH TXH OH SOXV IDLEOH FRW pQHUpWLTXH HVW disponible)
- © OR\HQ <sup>3</sup> (LQGLTXH XQ FRW pQHUpWLTXH FURLVVDQW)
- © eOHYp <sup>3</sup> (LQGLTXH XQ FRW pQHUpWLTXH FURLVVDQW)
- © &ULWLTXH <sup>3</sup> (LQGLTXH XQ FRW pQHUpWLTXH PD[LPDQ)

8Q FKDXAH-HDX j WKHUPRSRPSH GRWp G-XQ PRGXOH \$&0 reconnaît automatiquement le coût énergétique disponible et adapte son mode et le réglage de sa température pour utiliser moins d'énergie lors de la transmission des VLJQDX[ OR\HQ, eOHYp HW &ULWLTXH. /RUVTXH OH FKDXAH-HDX à thermopompe répond à ces signaux, le LED au-dessus du bouton d'Économie d'Énergie sera allumé indiquant les FRWV G-pOHFWULFLWp HQ YLJXHXU. /HV OHWUWHV © 36 <sup>3</sup> V-DZFKHQW VL O-XWLQVDWHXU HVVDLH GH PRGLHU OD WHPSpUDWXUH VDQV DYRLU appuyé sur le bouton pour désactiver la fonction Économie d'Énergie.

Lorsque le signal ACM est Moyen, la commande fonctionne en mode Thermopompe (uniquement) et la température de l'eau reste au réglage en vigueur fait par l'utilisateur. /-pFUDQ DZFKH OH PHVVDJH VXLVDQW (R[[[ HVW OH UpJODJH GH OD température actuel):



Lorsque le signal ACM est Élevé, la commande fonctionne en mode Thermopompe (uniquement) et la température de l'eau UpJOpH j 110f ) (43f &) HW O-pFUDQ DZFKH OH PHVVDJH VXLVDQW:



Lorsque le signal ACM est Critique, la commande fonctionne en mode Thermopompe (uniquement) et la température GH O-HDX UpJOpH j 100f ) (38f &) HW O-pFUDQ DZFKH OH PHVVDJH suivant :



**A noter :** La tension du courant qui circule dans une connexion ACM n'est pas compatible avec les ordinateurs et OHV SpULSKpULTXH. 1(%\$1&+(=3\$6 GHV PRGHPV, URXWHXUV, etc. d'ordinateurs portatifs dans la prise RJ45 ACM pour appareils électroménagers. Ne l'utilisez uniquement qu'avec des accessoires d'électroménagers GE. La connexion à des ordinateurs et autres accessoires peuvent endommager le produit.

Lorsque l'appareil fonctionne aux coûts énergétiques moyen, élevé ou critique, l'écran LCD au dessus du bouton Économie d'Énergie sera allumé. Si, à tout moment, vous souhaitez PRGLHU OD WHPSpUDWXUH GH FRQVLQJH DORUV TXH O-DSSDUHLO HVW en mode Économie d'Énergie, appuyez et maintenez enfoncée la touche Économie d'Énergie pour annuler la fonction eFRQRPLH G-eQHULH, SXLV XWLQVH] OHV ÀqFKHV SRXU PRGLHU OH réglage. Cette fonction sera désactivée pendant 18 heures. 6LYRXV HVVD\H] GH PRGLHU OD WHPSpUDWXUH VDQV GpVDFWLYHU OD IRQFWLRQ eFRQRPLH G-eQHULH, OHV OHWUWHV 36 V-DZFKHQW à l'écran, indiquant qu'il est encore en mode d'Économie d'Énergie.



# Entretien et nettoyage.

## Entretien préventif

**⚠ DANGER** Risque de brûlure - Avant d'utiliser la soupape de sécurité, assurez-vous que personne ne sera exposé à l'eau chaude dégagée par cette soupape. L'eau peut être assez chaude pour créer un risque de brûlure. L'eau doit être envoyée vers une bonde de vidange pour éviter toutes blessures ou tous dommages matériels.

**REMARQUE :** Si une soupape de sécurité du chauffe-eau s'ouvre régulièrement, il s'agit peut-être d'une expansion thermique dans un circuit d'alimentation d'eau fermé. Contactez votre fournisseur d'eau ou votre plombier pour savoir comment corriger cette situation. Ne bouchez pas la soupape de sécurité.

Correctement entretenu, votre chauffe-eau vous fournira des années de service sans tracas.

Nous vous suggérons de suivre un programme d'entretien préventif.

### Soupape de sécurité (température et pression):

Au moins une fois par an, soulevez et relâchez la poignée de la soupape de sécurité sur le côté droit à l'avant du chauffe-eau afin de vous assurer qu'elle fonctionne librement. Laissez s'écouler quelques litres d'eau par la canalisation de vidange jusqu'à une bonde de vidange ouverte.

### Inspection périodique (une fois par an):

De plus, il est recommandé de faire effectuer une inspection périodique des commandes, des éléments chauffants et du câblage par un technicien qualifié dans la réparation d'appareils électroménagers électriques.

La plupart des appareils électriques, même neufs, font du bruit lorsqu'ils sont en marche. Si les sifflements ou le niveau sonore augmentent de manière excessive, il est peut-être nécessaire de nettoyer l'élément chauffant. Contactez un installateur qualifié ou un plombier pour une inspection.

### Vidange du réservoir :

Un réservoir de chauffe-eau peut agir comme un décanteur pour les solides en suspension dans l'eau. Il n'est donc pas rare de voir s'accumuler des dépôts d'eau dure dans le fond du réservoir. Pour éliminer ces dépôts du réservoir, suivez ces étapes:

1. Fixez un tuyau d'arrosage au robinet de vidange situé au bas de l'appareil et dirigez-le vers une bonde.
2. Ouvrez le robinet de vidange à l'aide d'un tournevis à tête plate.
3. Après avoir vidangé quelques litres d'eau, fermez le robinet de vidange.

Ceci doit être fait avec l'alimentation en eau froide ouverte de façon à ce que l'eau vidangée par le robinet de vidange soit remplacée. Le débit d'eau aidera à éliminer les sédiments.

## 9LGDQJH GX FKDXÁH-HDX

**⚠ MISE EN GARDE :** Risque de décharge électrique - &RXSHJ O-DOLPHQWDWLRQ DX FKDXÁH-HDX DYDQW GH vider l'eau.

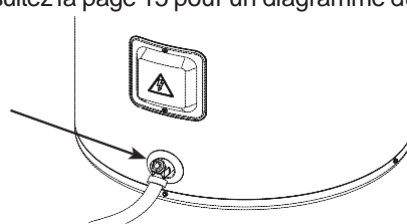
**⚠ DANGER** Risque de brûlure - Avant d'utiliser la soupape de sécurité, assurez-vous que personne ne sera exposé à l'eau chaude vidangée par la soupape. L'eau vidangée GX UpvHUYRLU SHXW rWUUh VXZVDPPHQW FKDXGH SRXU SUpVHQWHU XQ risque de brûlure et doit être envoyée vers une bonde de vidange pour éviter toutes blessures ou tous dommages matériels.

3RXU YLGDQJHU OH FKDXÁH-HDX, VXLYH] OHV pWDSHV VXLYDQWHV :

1. Fixez un tuyau d'arrosage au robinet de vidange situé au bas de l'appareil et dirigez-le vers une bonde.
2. Fermez l'alimentation en eau froide.
3. Laissez entrer de l'air dans le réservoir en ouvrant un robinet d'eau chaude ou soulevant la poignée du robinet de vidange.
4. Ouvrez le robinet de vidange à l'aide d'un tournevis à tête plate.

Remarque : Consultez la page 15 pour un diagramme du produit.

Utilisez un tournevis plat pour faire tourner le robinet..



## Fermeture pour vacances ou absence prolongée dépassant la durée de l'option Vacances

Si le chauffe-eau n'a pas à être utilisé pendant une période prolongée, l'alimentation en électricité et en eau à l'appareil devrait être coupée afin de réduire la consommation et d'empêcher l'accumulation de gaz hydrogène dangereux. Cet appareil n'est pas équipé d'un bouton de mise en marche, l'alimentation électrique peut uniquement être coupée par le disjoncteur ou l'interrupteur principal.

Le chauffe-eau et la tuyauterie devraient être vidangés s'il y a risque de gel.

Après une période d'arrêt prolongée, le fonctionnement et les commandes du chauffe-eau devraient être vérifiés par un technicien qualifié. Assurez-vous que le chauffe-eau est complètement rempli avant de le remettre en place.

**REMARQUE :** Reportez-vous à la rubrique de mise en garde relative au gaz hydrogène dans les instructions d'utilisation (voir page 3).

**1HWWR\DJH GX ¿OWUH**

Dans les modes Hybride (uniquement), Thermopompe et Demande élevée, le chauffe-eau déplace l'air dans le système et le fait ressortir à l'arrière de l'appareil. Le filtre est en place pour protéger l'évaporateur de la saleté et la poussière.

Un filtre à air propre est nécessaire pour une meilleure efficacité. Parfois, ce filtre devra être nettoyé (au minimum une fois par an). Lorsque le filtre doit être nettoyé, le témoin rouge au-dessus de la touche Filtre s'allume et un signal sonore est émis.

**REMARQUE:** Si le filtre est trop sale, l'appareil passe automatiquement au mode Électrique (Ventilateur éteint)/ Standard (Ventilateur éteint) et les économies d'énergie seront perdues.

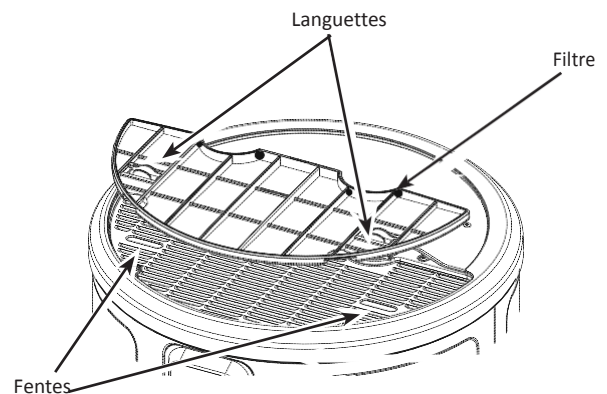
Ne coupez pas l'alimentation. Retirez le filtre par le dessus de l'appareil. Appuyez sur les deux languettes et soulevez pour retirer le filtre à air. Après avoir été retiré, le filtre peut être nettoyé avec un aspirateur, essuyé avec un chiffon humide ou rincé à l'eau tiède.

Lorsque le filtre a été nettoyé et séché, il peut être remis en place en l'alignant dans les fentes sur le dessus de l'appareil et en le poussant vers le bas pour l'enclencher.

Après avoir remis le filtre propre en place, appuyez sur le bouton FILTER (filtre) et maintenez-le appuyé pendant 3 secondes.

Si un cycle de chauffage est en marche lorsque l'alarme du filtre est acceptée, ce cycle va continuer en mode électrique pour terminer le cycle. Après cela, il reviendra automatiquement au mode précédent le nettoyage du filtre.

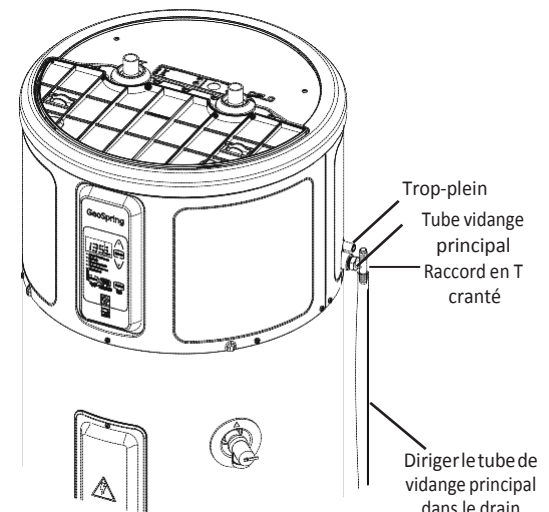
**IMPORTANT:** Le filtre doit être nettoyé lorsque l'alarme s'affiche. Un filtre sale rend plus difficile le travail du système et peut entraîner une réduction de l'efficacité, voire endommager le système. Afin d'obtenir le meilleur rendement éco énergétique, assurez-vous que le filtre est propre.

**Débouchage du tuyau de vidange de la condensation**

Le tuyau de vidange principal est destiné à éliminer toute la condensation. S'il est bouché, le condensat sera éliminé par le tuyau de trop-plein et s'écoulera au sol. Ceci est conçu pour prévenir l'utilisateur que le tuyau de vidange principal est bouché. Retirez le raccord en T cranté et le tube de vidange, nettoyez les débris et remettez-le en place.

Inspectez régulièrement les tuyaux de vidange et nettoyez tous les débris qui auraient pu s'y accumuler.

Consultez les instructions d'installation pour de plus amples informations.

**Surfaces Extérieures**

Laver à la main avec de l'eau tiède seulement.

**Tige d'anode**

La tige de l'anode doit être retirée du réservoir du chauffe-eau et inspectée après un maximum de 3 ans de service, chaque année ensuite, et remplacée lorsque plus de 15,2 cm (6 po) de l'âme sont exposés à l'une ou l'autre des extrémités de la tige.

**REMARQUE:** L'eau adoucie artificiellement exige que la tige de l'anode soit inspectée annuellement.

En raison des risques de choc électrique, et pour éviter toute fuite d'eau accidentelle, cette inspection devrait être effectuée par un

technicien ou plombier qualifié. De plus, elle exige la coupure de l'alimentation en eau avant le retrait de la tige d'anode.

**A NOTER:** Ne retirez pas la tige d'anode du réservoir à e d'autres moments que pendant une inspection ou un remplacement, puisqu'une utilisation sans tige d'anode réduit la durée utile du réservoir à revêtement de verre et annule la garantie.

La consommation et le remplacement de la tige d'anode ne sont pas couverts par la garantie.

# Entretien et réparation de la tige d'anode.

## ATTENTION-CONSIGNES DE SÉCURITÉ IMPORTANTES

Cette information est destinée aux personnes qui possèdent une compétence adéquate en électricité, électronique et mécanique. Toute tentative de réparer un gros appareil peut causer des blessures corporelles et des dommages aux biens. Le fabricant ou le vendeur ne peuvent être tenus responsables de l'interprétation ou de l'utilisation de cette information.

### Outils requis :

- 7RXUQHLYLV7RU[720.
  - 7RXUQHLYLVjODPHSODWH.
  - 5XEDQ.
  - &Op j GRXLOOH.
  - 5DOORQJHGHGRXLOOH12SR.
  - 1GRXLOOH.
  - ‡.6FHOOQW6RIWVHW.
  - ‡.7LJHG·DQRGHVLQpFHVVDLUH.
- \* Voir la page 72 pour la commande de pièces.

### Pour réparer la tige d'anode

1. Coupez l'alimentation électrique, fermez l'alimentation d'eau et vidangez un ou deux gallons du chauffe-eau par le robinet de drainage inférieur.
2. Retirez le filtre, l'anneau de garniture et le couvercle frontal supérieur comme indiqué à l'illustration A.

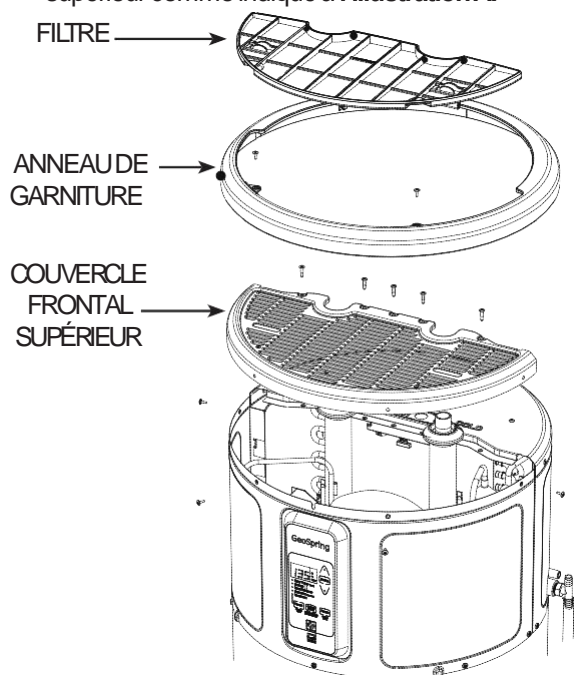


Illustration A

3. Réinstallez l'anneau de garniture, placez une couche de ruban protectrice sur les bords métalliques et retirez le couvercle de la tige d'anode comme indiqué à l'illustration B.

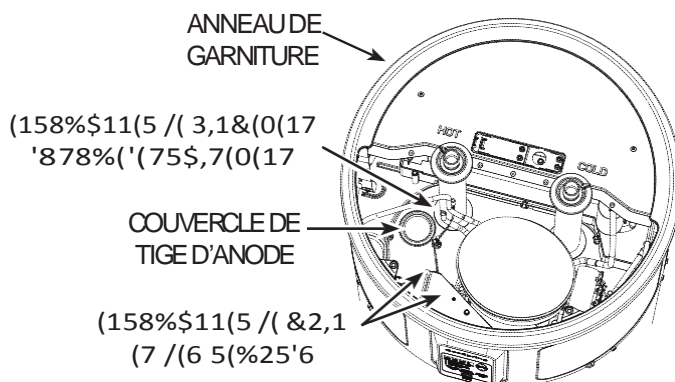


Illustration B

4. À l'aide d'un tournevis à lame plate et veillant à ne pas endommager les fils exposés, retirez la mousse qui recouvre la tige d'anode comme indiqué à l'illustration C.

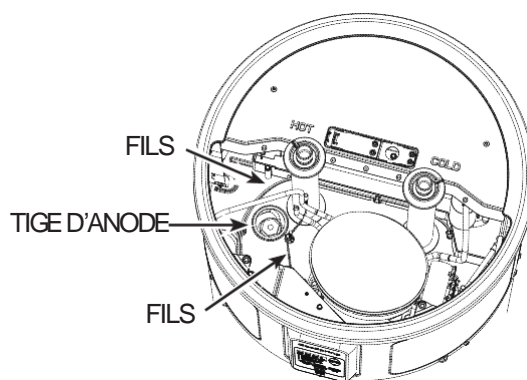


Illustration C

5. À l'aide d'une douille 1 1/16 po et d'une rallonge, dévissez la tige d'anode, puis soulevez-la pour inspecter de la manière indiquée à l'illustration D.

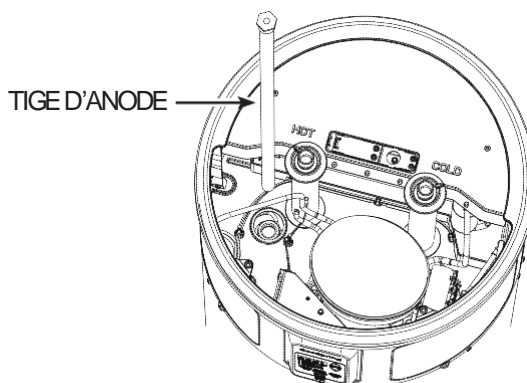


Illustration D

6. Pour installer une tige d'anode, scellez les filetages à l'aide du scellant Soft Set, vissez dans le réceptacle et utilisez une clé dynamométrique pour serrer au couple de  $50 \pm 5$  lb-pi. Réinstallez le couvercle de la tige d'anode.
7. Ouvrez l'alimentation d'eau, ouvrez un robinet pour évacuer l'air de la plomberie, vérifiez qu'il n'y a pas de fuites, rétablissez l'alimentation électrique et réassemblez l'appareil en ordre inverse comme indiqué à l'illustration A.



/HPSODFHPHQW FKRLVL SRXU OH FKDXAH-HDX GRLW SUHQGUH HQ considération les éléments suivants:

## RÈGLEMENTS MUNICIPAUX RELATIFS AUX INSTALLATIONS

&H FKDXAH-HDX GRLW rWUH LQVWDOOp FRQIRUPpPHQW j FHV LQVWUXFWLRQV, aux codes municipaux, aux codes des services publics, selon les exigences de la compagnie ou, en l'absence de réglementation municipale, conformément au Code national de l'électricité. Il est disponible dans certaines librairies ou peut être acheté auprès de O-DVVRFDLWLRQ QDWLRQDOH GH OD SUPYHQWLRQ G-LQFHQGLH (%DWWHU)PDUFK park, Quincy, MA 02169, USA, comme feuillet ANSI/NFPA 70).

## EXIGENCES EN MATIÈRE D'ALIMENTATION ELECTRIQUE

Check the markings on the rating plate of the water heater to 9pULçH] OHV LQIRUPDWLRQV VXU OD SODTXH VLJQDOPWLTXH GX FKDXAH-HDX DçQ GH YRXV DVVXUHU TXH O-DOLPHQWDWLRQ FRUUVSRQG DX [EHVRLQV GX FKDXAH-HDX. 5(0\$548(: /HV LQVWDOODWLRQV j 2089 SHXYHQW DYRLU des performances moindres.

## EMPLACEMENT

Localisez le chauffe-eau dans un endroit propre et sec aussi proche que possible de la zone de plus forte demande en eau chaude. De longues conduites d'eau chaude non isolées vont gaspiller de l'énergie et l'eau. L'appareil doit être installé dans un endroit de niveau.

REMARQUE: Cet appareil est conçu pour toute installation intérieure normale, y compris: garage, buanderie, grenier, placard, etc. Avec l'installation d'une porte à persiennes, il peut être installé dans des endroits d'une surface inférieure à 10 pi x 10 pi x 7 pi (700 pi<sup>3</sup>). Les persiennes devraient être de 240 po<sup>2</sup> (0,15 m<sup>2</sup>) ou plus. Si deux persiennes sont utilisées, une d'entre elles doit être située près du haut de la porte.

Positionnez le chauffe-eau de manière à ce que le filtre à air, le couvercle et les panneaux avant puissent être retirés pour permettre l'inspection et l'entretien, comme le retrait des éléments ou le nettoyage du filtre.

Le chauffe-eau et les conduites d'eau doivent être protégés du gel et des atmosphères hautement corrosives. N'installez pas le chauffe-eau en extérieur ou dans des zones exposées.

**▲ MISE EN GARDE : Risque de dommage matériel** - Le chauffe-eau doit être placé dans un endroit où les fuites d'eau provenant du réservoir ou des raccords n'endommageront pas la zone autour de l'appareil ou les étages inférieurs. Lorsque que de tels emplacements ne peuvent être évités, il est recommandé d'installer un bac de récupération d'eau avec un système d'évacuation approprié en dessous de l'appareil. Les installations dans un grenier nécessitent un plancher approprié et un accès par des escaliers.

REMARQUE: La plage de fonctionnement de la thermopompe est de 45°F à 120°F (7°C à 49°C). Si la température ambiante est en dehors de cette fourchette, la thermopompe s'éteint et les éléments chauffants seront utilisés jusqu'à ce que la température ambiante revienne dans la plage de fonctionnement normal.

## EMPLACEMENT (SUITE)

### INFORMATIONS RELATIVES AU DIMENSIONNEMENT DU CHAUFFE-EAU - LIRE AVANT L'INSTALLATION :

Pour le remplacement de systèmes domestiques existants:

- 9RXV UHPSODFH] XQ FKDXAH-HDX H[LVWDDQW " Si votre FKDXAH-HDX DFWXHO IRXUQLW VXçVDPHQW G-HDX FKDXGH HW TX-DXFXQH DXWUH PRGLçFDWLRQ RX UpQRYDWLRQ GH OD SORPEHULH Q-HVV HçHFWXpH RX SODQLçpH TXL SRXUUDLW DXJPHQWHU OD demande en eau chaude, alors:
  - /H FKDXAH-HDX K\EULGH \*HR6SULQçESHXW UHPSODFHU XQ FKDXAH-HDX pOHFWULTXH VWDQGDUG GH WDLLOH pTXLYDOHQWH RX inférieure
  - 6L YRXV SDVVH] G-XQH DOLPHQWDWLRQ DX JD] j XQH DOLPHQWDWLRQ électrique, le chauffe-eau hybride GeoSpring™ peut remplacer un chauffe-eau d'une taille immédiatement inférieure.

Pour les nouvelles installations:

Guide de sélection de la taille d'un chauffe-eau domestique			
Taille de la famille	Demande*	Capacité recommandée (gallons)	
		Électrique or GeoSpring™	Gaz
5+	Élevée	100 (378.5L)	75 (283.9L)
	Moyenne ou Faible	80 (302.8L)	50 (189.3L)
3 à 4	Élevée	80 (302.8L)	50-75 (189.3-283.9L)
	Moyenne ou Faible	50 (189.3L)	40 (151.4L)
2 à 3	Élevée	50 (189.3L)	40-50 (151.4-189.3L)
	Moyenne ou Faible	40 (151.4L)	40 (181.8L)
1 à 2	Élevée	40-50 (151.4-189.3L)	40-50 (151.4-189.3L)
	Moyenne ou Faible	30 (113.6L)	30 (113.6L)

\*Hypothèses pour une maison à faible demande ou à demande moyenne.  
 - Utilisation de pommes de douche standard ou à débit réduit (2,5 gal/min - 11,4L/min ou moins).  
 - Aucune douche munie de plus d'une pomme de douche et/ou de jets pour le corps.  
 -%DQLRUHV VWDQGDUG (SDVGH EDLQRUHVXUUGLPHQLRQpH RX] UHPRXV).

### Point de réglage de la température:

/H SRLQW GH UpJODJH GH OD WHPSpUDWXUH GX FKDXAH-HDX LQçXH grandement sur la quantité d'eau chaude disponible pour les douches et les bains.

- /D FRQVRPPDWLRQ HW OHV pFRQRPLH G-pQHULJH FDOFXOpHV GHV FKDXAH-HDX, \FRPSULV GX FKDXAH-HDX \*HR6SULQçEVRLQW HçHFWXpHV j XQ UpJODJH GH 135f) (57f &) TXL HVV OH UpJODJH PR\HQ G-XQ FKDXAH-HDX VHORQ OH PLQLVWqUH GH O-eQHULJH. /HV pFRQRPLHV énergétiques du GeoSpring™ sont basées sur un fonctionnement en mode hybride avec un réglage de la température de 135°F (57°C).
- /HV QRUPHV GH VpFXULWp H[LJHQW XQ UpJODJH HQ XVLQH GH 120f) j 125f) (49f & j 52f &) PD[LXP SRXU WRXV OHV QRXYHDX [FKDXAH-HDX. 3DU FRQVpTXHQW, VL YRWUH FKDXAH-HDX HVV DFWXHOOPHQW UpJOp VXU 130f) (54f &) RX DX-GHVXV HW TXH YRWUH QRXYHDX FKDXAH-HDX HVV installé avec le point de réglage d'usine de 120°F (49°C), le nouveau FKDXAH-HDX VHPEOHU DçULU XQH FDSDFLWp PRLQGUH TXH YRWUH FKDXAH-HDX H[LVWDDQW.
- /XWLOLVDDWLU SHXW UpJOHU OD WHPSpUDWXUH GH PDQLqUH j UpsRQUH j ses besoins. Veuillez toujours lire et comprendre les consignes de VpFXULWp çXUDQW GDQV OH PDQXHO GH O-XWLOLVDDWLU DYDQW G-DMXVWHU OD température.

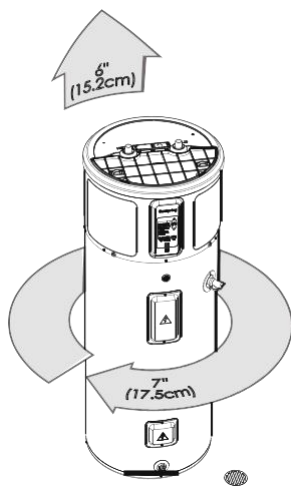
# Instructions d'installation

## EMPLACEMENT (SUITE)

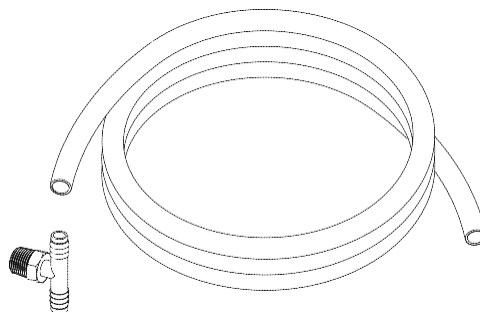
### Dégagements nécessaires:

Il doit y avoir un dégagement minimal de 7 po (17,5 cm) entre WRXW REMHW HW OHV FRXYHUFOHV DYDQW HW DUULQUH DGYHQDQW OH FDV R<sup>2</sup> XQ entretien serait requis. Un dégagement minimal de 7 po (17,5 cm) DYHF OHV SDURLV GX FKDXAH-HDX HVV pJDOHPHQW UHFRPPDQGp SRXU faciliter l'accès en cas d'entretien.

Un dégagement de 6 po (15,2 cm) est également requis pour retirer le filtre à des fins de nettoyage. La plomberie d'eau chaude et froide et les connexions électriques ne doivent pas interférer avec le retrait du filtre.

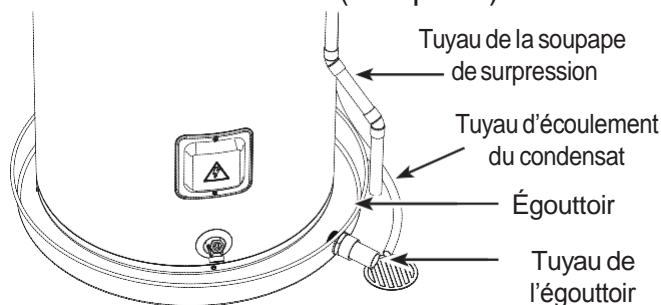


## PIÈCES NON STANDARD REQUISES:



Flexible 1 3/8 po x 6 pi  
Raccord en T cranté mâle NPT 1 3/8 x 3/8 x 1/2 po  
(certains modèles)

## Catch Pan Installation (If required)



**REMARQUE:** Le bac de récupération de l'eau doit être conforme aux codes municipaux. Des nécessaires d'installation de bac de récupération sont disponibles auprès du détaillant R<sup>2</sup> OH FKDXAH-HDX D pWp DFKHWp, XQ PDJDVLQ GH PDWpULD[X] GH FRQVWUXFWLRQ RX XQ UHYHQGHXU GH FKDXAH-HDX. L'égouttoir doit être d'une largeur supérieure de 5,1 cm (2 po), au minimum, par UDSSRUW DX GLDPqWUH GH OD EDVH GX FKDXAH-HDX. 3RXU SUPYHQLU la corrosion et améliorer l'accès à la soupape de surpression, il HVV UHFRPPDQGp GH SODFHU OH FKDXAH-HDX VXU GHV HVSDFHUV j l'intérieur de l'égouttoir.

### Tuyau de vidange du condensat

L'appareil est équipé d'un tuyau de vidange des condensats. Ainsi une bonde d'évacuation doit être disponible à proximité de l'appareil. La bonde ne doit pas être à une hauteur supérieure à 36 po (91,4 cm) au-dessus du sol (les codes nationaux et municipaux doivent être respectés). Si aucune bonde n'est disponible, alors une pompe ordinaire pour le condensat d'une capacité minimale de 1 gallon (3,8 L) par jour doit être achetée auprès d'un magasin de matériaux de construction et installée.

## EXPANSION THERMIQUE

Déterminez s'il y a un clapet anti-retour dans la conduite d'admission d'eau. Il peut avoir été installé dans la conduite d'eau froide pour empêcher les retours d'eau ou il peut être inclus dans une soupape de réduction de pression, un compteur d'eau ou un adoucisseur d'eau. Un clapet anti-retour dans la ligne d'admission d'eau froide peut provoquer ce qu'on appelle un « circuit d'eau fermé ». Un tuyau d'admission d'eau froide sans clapet anti-retour ou sans dispositif anti-refoulement est considéré comme un système d'eau « ouvert ».

Lorsque l'eau est chauffée, elle prend du volume et provoque une augmentation de la pression dans le système d'eau. Cette action est appelée « expansion thermique ». Dans un système « ouvert », l'eau en expansion qui dépasse la capacité du chauffe-eau reflue vers le système d'alimentation PXQLFSDO R<sup>2</sup> OD SUHVLRQ HVV IDFLOHPHQW GLVVLSpH.

Toutefois, un « système d'eau fermé », empêche l'eau en expansion de refluer vers la conduite principale d'alimentation. Cette expansion thermique peut provoquer une augmentation rapide et dangereuse de la pression dans le chauffe-eau et dans la tuyauterie du système. Cette augmentation rapide de la pression peut rapidement atteindre le point de réglage de la soupape de sécurité de sorte qu'elles'active à chaque cycle de chauffage. L'expansion thermique et l'expansion et la contraction rapides et répétées des composants du chauffe-eau et de la tuyauterie peuvent entraîner l'usure prématurée de la soupape de sécurité et possiblement du chauffe-eau lui-même. Le remplacement de la soupape de sécurité ne résout pas le problème!

La méthode proposée de contrôle de l'expansion thermique est d'installer un réservoir d'expansion dans la ligne d'eau froide entre le chauffe-eau et le clapet anti-retour (se reporter à l'illustration page 15). Le réservoir d'expansion est conçu avec un coussin d'air intégré qui se comprime avec l'augmentation de la pression du système, éliminant ainsi la surpression et le fonctionnement continu de la soupape. D'autres méthodes de contrôle d'expansion thermique sont également disponibles. Contactez votre installateur, fournisseur d'eau ou inspecteur de plomberie pour des informations supplémentaires concernant ce sujet.

# Instructions d'installation

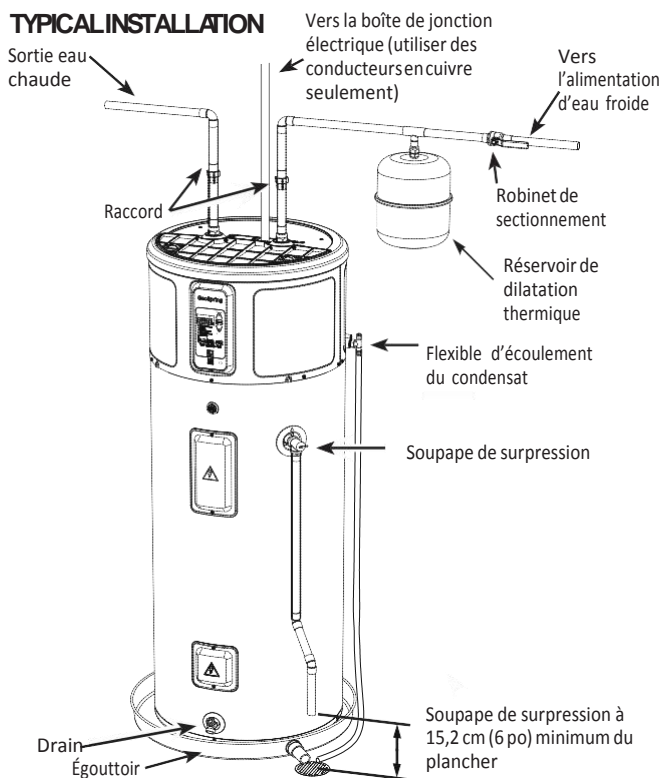
## WATER SUPPLY CONNECTIONS

Reportez-vous à l'illustration ci-dessous pour une suggestion d'installation. Les raccords d'eau CHAUDE (Hot) et FROIDE (Cold) sont clairement identifiés et mesurent 3/4 po NPT sur tous les modèles. Lors du raccordement sur les orifices d'entrée ou de sortie, l'utilisation de raccords à filetage conique femelles 3/4 po NPT avec scellant à filetage est recommandé. L'installation de raccords-unions est recommandée pour le raccordement à l'eau chaude et froide de façon à pouvoir débrancher le chauffe-eau aisément dans l'éventualité d'une réparation.

**REMARQUE:** Installez un robinet d'arrêt dans la conduite d'alimentation d'eau froide près du chauffe-eau. Ceci permettra plus tard de faciliter l'entretien ou la maintenance de l'appareil.

**IMPORTANT: N'appliquez pas de chaleur aux raccords d'eau FROIDE ou CHAUDE. Si des raccords soudés à l'étain sont utilisés, soudez le tuyau à l'adaptateur avant de fixer l'adaptateur aux raccords d'eau froide sur le chauffe-eau. Toute application de chaleur sur les raccords d'eau froide ou chaude peut endommager de façon permanente le revêtement interne en plastique des ces orifices.**

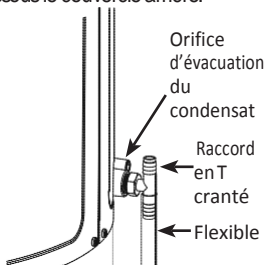
### TYPICAL INSTALLATION



## TUYAU DE VIDANGE DU CONDENSAT

Cet appareil est équipé d'un bac de condensation. L'eau recueillie dans le bac s'écoule du tuyau sortant sur le côté de l'appareil. Il est important d'installer un tuyau de vidange à l'orifice de vidange primaire à l'arrière de l'appareil. Raccordez une extrémité d'un tuyau plus long de 6pi (1,8 m) à l'orifice de vidange inférieur à l'arrière de l'appareil, en dessous le couvercle arrière.

Dirigez l'autre extrémité vers une bonde au sol ou à une hauteur inférieure à 3pi (0,9 m). Si une telle bonde n'est pas disponible, une pompe d'évacuation des condensats (non fournie) doit être achetée et installée. Le tuyau de vidange doit être acheminé de telle façon que l'eau évacuée ne puisse entrer en contact avec les parties électriques ou des personnes et de façon à éliminer tout dégât d'eau potentiel.



## SOUPAPE DE SECURITE

### ⚠ Avertissement: Risque de

**dommage pour l'appareil - La pression nominale de la soupape de sécurité ne doit pas dépasser 150 lb/po<sup>2</sup> (1,03 kPa), OD SUHVLRQ GH IRQFWLRQQHPHQW PD[LPDOH GX FKDXAH-HDX indiquée sur la plaque signalétique.**

Une nouvelle soupape de sécurité de pression et de température, FRQIRUPH DX[ QRUPHV 5HOLHI 9DOYHV DQG \$XWRPDWLF \*DV 6KXWR Devices for Hot Water Supply Systems (ANSI Z21.22) est fournie. (OOH GRLW rWUH LQVWDOOH GDQV O-RULz FH SUPYXH j FHW HAHW VXU OH FKDXAH-HDX. \$FXQH VRXSDSH GH TXHOTXH QDWXUH TXH FH RRLW QH doit être installée entre la soupape de sécurité et le réservoir. Les codes municipaux doivent toujours régir l'installation de soupapes de sécurité.

/DYDOHXU %WX/KGHOD VRXSDSH GH VpFXULWp QH GRLW SDV rWUH LQpULHXUH j OD YDOHXU QRPLQDOH G-HQWUpH GX FKDXAH-HDX, FRPPH FHFL HWW LQVFWLW VXU O-pWLTXHWWH j O-DYDQW GX FKDXAH-HDX (1 ZDWW 3,412 %WX/K).

%UDQFKH] OD VRUWLHG OD VRXSDSH GH VpFXULWp j XQH ERQGHRXYHUWH de telle façon que l'eau évacuée ne puisse entrer en contact avec les parties électriques ou des personnes et de façon à éliminer tout dégât d'eau potentiel.

La tuyauterie utilisée doit être agréée pour la distribution d'eau chaude. Le tuyau de vidange ne doit pas être d'une dimension inférieure à la sortie de la soupape et doit être incliné vers la bonde pour assurer une vidange complète (par gravité) de la soupape et du tuyau de vidange. L'extrémité du tuyau de vidange ne doit SDV rWUH zOHWpH RX GLVLPXOpH HW GRLW rWUH SURWpH FRQWUH OH JHO. Aucune soupape, restricteur ou réducteur ne doit jamais être installé sur le tuyau de vidange.

### ⚠ MISE EN GARDE:

Pour réduire les risques de pression et de température excessives dans ce chauffe-eau, installez l'équipement de protection de température et de pression exigé par les codes municipaux et, au moins, une soupape de sécurité (pression et température) certifiée par un laboratoire d'essai indépendant reconnu à l'échelle nationale et qui effectue des inspections périodiques de l'équipement ou des matériaux inscrits qui disent se conformer aux exigences relatives aux Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems (ANSI Z21.22). Cette soupape doit être marquée avec une pression maximale qui ne doit pas dépasser la pression maximale de fonctionnement indiquée pour le chauffe-eau. Installez la soupape dans l'ouverture prévue à cet effet sur le chauffe-eau et orientez-la (ou ajoutez un tuyau) de manière à ce que tout liquide soit évacué par la soupape à une hauteur maximale de 6 po (15,2 cm) du plancher, et qu'il n'entre en contact avec aucune partie électrique. En aucune circonstance, l'ouverture pour l'évacuation ne doit pas être bouchée ou de taille réduite.



# Instructions d'installation

## REPLISSAGE DU CHAUFFE-EAU

### **⚠ AVERTISSEMENT:** *Risque de*

**dommage pour l'appareil - Le réservoir doit être plein**  
G-HDX DYDQW GH PHWWUH OH FKDXQH-HDX HQ PDUFKH. /D JDUDQWLH GH  
FKDXQH-HDX QH FRXYUH SDV OHV GRPPDJHV RX GpDLOODQFHV  
**résultant d'un fonctionnement avec un réservoir vide ou**  
**partiellement vide.**

Assurez-vous que le robinet de vidange est complètement fermé.  
Ouvrez le robinet sur la conduite d'alimentation en eau froide.

Ouvrez chaque robinet d'eau chaude doucement pour permettre à  
O-DLU GH V-pYDFXHU GX FKDXQH-HDX HW GHV WX\DXWHULHV.

Un débit d'eau constant du/des robinet(s) d'eau chaude indique un  
FKDXQH-HDX SOHLQ.

**Code d'erreur F11 lors de l'installation :** Si l'appareil est mis  
en marche sans un réservoir rempli, le code d'erreur « F11 »  
V-DZFKH j O-pFUDQ. &RXSH] O-DOLPHQWDWLQ pOHFWULTXH, UHPSOLVVH]  
le réservoir d'eau (voir ci-dessus), puis rallumez-le.

## A NOTER :

Ne faites pas d'erreur de raccordements électriques. Une tension  
GH &\$ GH 2409 RX 2089 GRLW rWUH DSSOLTxp DX[ çOV /1 HW /2  
FRPPH LQGLTXp VXU GLDJUDPPH © ERVWH GH MRQFWLQGX FKDXQH-  
eau». Le non-respect de cette consigne ANNULE la garantie, et  
SHXW FRQGLUH j XQH WHQVLRQ GH 1209 XWLQVp VXU OH FKDXQH-HDX,  
qui peut endommager le compresseur ou d'autres composants  
électriques.

6L XQ FKEOH j 4 çOV HVW DPHQp DX FKDXQH-HDX, LVROH] OH QHXWUH HW  
EUDQFKH] OHV DXWUHV çOV FRPPH LQGLTXp.

**NOTE RELATIVE AUX DISPOSITIFS DE GESTION D'ALIMENTATION**  
(Parfois appelé Interrupteur de réduction en demande maximale):

Certains dispositifs de gestion de l'alimentation ou même  
certaines minuterie peuvent RÉDUIRE la tension de 240 V à 120 V  
pendant des périodes de demande importante d'électricité. Ces  
GLVSRVLWLIV GRLYHQW rWUH UHWLUpV GX FLUFXLW DOLPHQWDQW OH FKDXQH-HDX  
en raison des dommages potentiels mentionnés ci-dessus.

Toutefois, les dispositifs de commutation qui, de temps en temps,  
réduisent la tension de 240V à 0V sont acceptables.

**Code d'erreur "bAd linE" lors de l'installation:** Si «bAd linE»  
V-DZFKH j O-pFUDQ, O-DSSDUHLO QH UHRLW SDV OD ERQQH WHQVLRQ HQ  
raison d'erreurs de câblage. Pour corriger cette erreur, coupez  
l'alimentation électrique, corrigez les erreurs de câblage, puis  
UDOOXP] OH FKDXQH-HDX.

## RACCORDEMENTS ÉLECTRIQUES

Un circuit de dérivation distinct avec des conducteurs en cuivre,  
un dispositif de protection contre les surtensions et des moyens  
appropriés pour déconnecter le chauffe-eau doivent être fournis par  
un électricien qualifié.

Le câblage doit être conforme aux codes et règlements municipaux  
ou, en leur absence, à la dernière édition du Code national de  
l'électricité, ANSI/NFPA 70.

Le chauffe-eau est complètement raccordé à la boîte de jonction par  
le dessus du chauffe-eau. Une ouverture pour un raccord électrique  
d'1/2 po est fournie pour les connexions à faire sur place.

Les besoins en tension et puissance du chauffe-eau sont précisées  
sur l'étiquette signalétique apposée sur le devant du chauffe-eau.

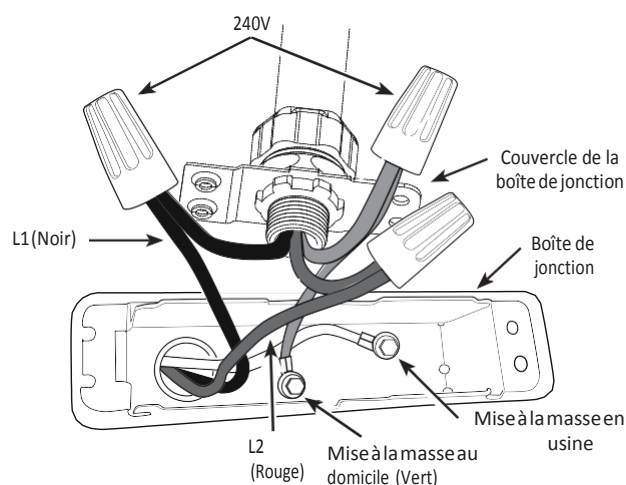
### Le câblage du circuit de dérivation doit inclure:

1. Un conduit métallique ou un câble métallique gainé  
approuvé pour une utilisation comme conducteur de mise à  
la masse et installé avec des raccords adaptés à cet usage.
2. Un câble gainé non métallique, un conduit métallique ou un  
câble gainé métallique non approuvé pour une utilisation  
comme conducteur de mise à la masse doit comprendre un  
conducteur distinct de mise à la masse. Il doit être raccordé  
aux bornes de mise à la masse du chauffe-eau et à la boîte  
de distribution électrique.

%UDQFKPHQW GH O-DOLPHQWDWLQ pOHFWULTXH DX FKDXQH-HDX:

1. Coupez l'alimentation.
2. Retirez le(s) vis maintenant le couvercle de la boîte de  
jonction.
3. )L[H]/1j/1,/2j/2HWPHWWH] j ODPDVVHOH çOGHWHUUHYHUW  
relié à la base de la boîte de jonction.

**REMARQUE :** Faites les raccordements électriques  
conformément aux codes et règlements municipaux ou,  
en leur absence, à la dernière édition du Code national de  
l'électricité, ANSI/NFPA 70.



**⚠ AVERTISSEMENT:** Un bon raccordement  
à la terre est essentiel. La présence d'eau dans les  
tuyauteries et le chauffe-eau ne fournit pas une  
conduction suffisante pour une masse adéquate. La  
tuyauterie non métallique, les raccords diélectriques ou  
flexibles, etc., peuvent isoler électriquement le chauffe-  
eau. Ne déconnectez pas la mise à la terre faite en usine.

La garantie du fabricant ne couvre pas les dommages ou défauts causés par l'installation, le branchement ou l'utilisation de tout dispositifs d'économie d'énergie ou d'autres dispositifs non autorisés (autres que FHX[DXWRULVpV SDU OH IDEULFDQW] DYHF OH FKDXÅH-HDX. L'utilisation de dispositifs d'économie d'énergie non DXWRULVpV SHXW UpGXLUH OD GXUpH GH YLH GX FKDXÅH-HDX et peut mettre en danger la vie et provoquer des dommages matériels.

Le fabricant décline toute responsabilité en cas de pertes ou blessures résultant de l'utilisation de ces dispositifs non autorisés.

Si les codes municipaux exigent la pose extérieure de couvertures isolantes, les instructions du fabricant fournies avec le nécessaire d'isolation doivent être suivies à la lettre.

**La pose de tout isolant externe, de couverture ou G-LVRODQW j WX\DXWHULH DYHF FH FKDXÅH-HDX GRLW rWUH HåHFWXåH HQ SRUWDQW XQH DWWHQWLRQ SDUWLFXOLåUH DX[ points suivants :**

- 1H FRXYUH] SDV OD VRXSDSH GH VpFXULWp (WHPSpUDWXUH et pression)
- 1H FRXYUH] SDV OHV SDQQHDX[ G-DFFqV DX[ pOpPHQWV FKDXÅDQWV.
- 1H FRXYUH] SDV OD ERVWH GH MRQFWLRQ GX FKDXÅH-HDX.
- 1H FRXYUH] SDV OHV pWLTXHWWHV G-XWLQVLDWLRQ RX GH PLVH HQ JDUGH DSSRVpHV DX FKDXÅH-HDX. 1·HVVD\H] SDV GH les déplacer sur l'extérieur de la couverture isolante.
- 1·REVWUXH] SDV OHV HQWUpHV\VRUWLHV G-DLU GDQV OHV couvercles supérieurs et sous ces derniers.

**REMARQUE :** Ce guide recommande un circuit de dérivation minimal basé sur le Code national de l'électricité.

Reportez-vous aux schémas de câblage dans ce PDQXH SRXU OHV UDFRUGHPHQWV j HåHFWXHU VXU SODFH

## GUIDE DE DIMENSIONNEMENT DE CIRCUIT DE DÉRIVATION

Puissance totale GX FKDXåH-HDX	Protection de surintensité recommandée IFSDFLWp GX IXVLEOH RX GX GLVMRQFWHXU)			
	208V	240V	277V	480V
3,000	20	20	15	15
4,000	25	25	20	15
<b>4,500</b>	<b>30</b>	<b>25</b>	<b>25</b>	<b>15</b>
5,000	30	30	25	15
5,500	35	30	25	15
6,000	40	35	30	20
8,000	50	45	40	25
9,000	–	50	45	25
10,000	–	–	50	30
11,000	–	–	50	30
12,000	–	–	–	35

3XLVDQFH WRWDOH GX FKDXåH-HDX	&DOLEUHGH¿OGHFKLYUH, EDVp VXU WDEOHDX1.(.& 310-16167f)/75f &).			
	208V	240V	277V	480V
3,000	12	12	14	14
4,000	10	10	12	14
<b>4,500</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>14</b>
5,000	10	10	10	14
5,500	8	10	10	14
6,000	8	8	10	12
8,000	8	8	8	10
9,000	–	8	8	10
10,000	–	–	8	10
11,000	–	–	8	10
12,000	–	–	–	8

# Instructions d'installation

## LISTE DE VÉRIFICATION D'INSTALLATION

- 1. Emplacement du réservoir:**  
<sup>2</sup>/D-WDLOOH GH OD SLqFH QpFHVVLWH-W-HOOH GHV SRUWHV j SHUVLHQQHV RX XQH YHQWLODWLRQ VLPLODLUH " 10SL [ 10SL [ 7SL (700 SL3) ou 240 pouces carrés (0,15 m<sup>2</sup>) de surface de ventilation nécessaire.  
 – Éloignez l'appareil du mur de 7 po (17,5 cm.) et dégagez les parois d'au moins 7 po (17,5 cm.)  
 – Le devant de l'appareil est libre et dégagé.  
<sup>2</sup>/H FKDXIIH-HDX HVW-LO GH QLYHDX " 6LQRQ, DMRXWH] GHV FDOHV VRXV OD EDVH GH O-DSSDUHLO.
- 2. Vérifiez que le filtre d'air est installé.** (Situé dans l'emballage):
- 3. Raccords de plomberie :**  
 – N'empêchent pas le retrait du filtre à air  
 – Aucune fuite après le remplissage du réservoir, avec ou sans débit.
- 4. Tuyaux pour les condensats sont en place:**  
 – Tuyau de vidange principal installé
- 5. La soupape de sécurité (température et pression) fonctionne correctement et le tuyau de vidange est installé conformément au code municipal.**
- 6. Le branchement électrique** correspond à du 208/240 VCA à L1 et L2 au réservoir.
- 7. Le branchement électrique** n'empêche pas le retrait du filtre à air.
- 8. Assurez-vous que le panneau de commande** affiche 120°F (49°C) et mode Hybride. Aidez l'utilisateur à régler la température (se reporter à la rubrique « À propos du réglage de la température » à la page 30).

## À QUOI S'ATTENDRE POUR UNE « MISE EN MARCHÉ NORMALE » EN MODE HYBRIDE

Après installation de l'appareil et après que tous les branchements électriques et de plomberie aient été effectués et vérifiés, l'appareil doit être rempli d'eau (évacuez l'air du réservoir en ouvrant un robinet d'eau chaude, quelque part dans la maison pour permettre au réservoir de se remplir entièrement d'eau). Une fois que le réservoir est plein et que l'appareil est sous tension, vous rencontrerez peut-être ceci :

Temps écoulé	Actions HEWH	Remarques
0 à 2 minutes	L'appareil passera par un autodiagnostic	Cette période d'arrêt de 2 minutes empêche d'endommager le compresseur.
2 à 10 minutes	Le compresseur et le ventilateur se mettent en marche	Cette période de 8 minutes est utilisée pour s'assurer que le réservoir est plein d'eau (algorithme de prévention d'incendie à sec).
10 à 30 minutes	Le compresseur et le ventilateur s'arrêtent et les éléments chauffants se mettent en marche pendant environ 20 minutes	Pour fournir rapidement une première quantité d'eau chaude pour l'utilisateur (environ 25 gallons/94,6 L).
30 minutes et plus	L'élément supérieur s'éteint et le compresseur se rallume	Utilisation d'une thermopompe efficace pour la majorité du chauffage

REMARQUE : La plage de fonctionnement de la thermopompe est de 45°F à 120°F (7°C à 49°C). Si la température ambiante est en dehors de cette fourchette, la thermopompe s'éteint et les éléments chauffants seront utilisés jusqu'à ce que la température ambiante revienne dans la plage de fonctionnement normal.



Avant d'appeler à un technicien..  
Économisez du temps et de l'argent ! Consultez d'abord le tableau ci-dessous pour peut-être éviter de faire appel à un technicien.

Problème	Causes Possibles	Solution
<b>Le chauffe-eau est bruyant le système</b>	Un ventilateur est utilisé pour faire circuler l'air dans	<ul style="list-style-type: none"> <li>• Un certain niveau sonore du ventilateur est normal. Si vous entendez un bruit anormal ou si le niveau sonore semble, anormalement élevé puis contactez le service après-vente.</li> </ul>
<b>Le chauffe-eau rend la pièce trop froide</b>	La pièce est mal ventilée ou est trop petite.	<ul style="list-style-type: none"> <li>• Si les dimensions de la pièce sont inférieures à 10 pi x 10 pi x 7 pi (3m x 3m x 2,1 m), cette pièce doit être dotée de porte à persiennes ou d'un autre moyen pour permettre un échange d'air avec les pièces avoisinantes.</li> </ul>
	Le chauffe-eau extrait la chaleur de l'air ambiant pour chauffer l'eau.	‡ Ceci est normal.
<b>De l'eau coule sur les parois extérieures du chauffe-eau.</b>	Le tuyau d'évacuation du condensat est bouché.	<ul style="list-style-type: none"> <li>• Nettoyez les débris au niveau de l'orifice de vidange sur l'appareil.</li> </ul>
	Les raccords eau chaude/eau froide ne sont pas bien serrés.	‡ Serrez les raccords d'entrée et de sortie.
<b>Quantité insuffisante d'eau ou pas d'eau chaude</b>	La température de réglage de l'eau est peut-être trop basse.	<ul style="list-style-type: none"> <li>• Voir la section Réglage de la température de l'eau.</li> </ul>
	L'usage de l'eau chaude dépasse la capacité du mode actuel du chauffe-eau.	<ul style="list-style-type: none"> <li>• Essayer un autre mode ou modifier les habitudes d'usage.</li> </ul>
	La quantité d'eau demandée peut dépasser la capacité du chauffe-eau.	‡ Attendre que le chauffe-eau rétablisse la température après une demande anormalement élevée.
	/D WHPSpUDWXUH DPELDQWH HVW trop basse.	‡ Pour que le chauffe-eau puisse fonctionner correctement, la température de son emplacement en mode électrique doit se situer entre 0 et 65 °C (32 et 150 °F) ou entre 7 et 49 °C (45 et 120 °F) pour tous les autres modes.
	La température d'entrée de l'eau peut être plus froide pendant la saison hivernale.	‡ Ceci est normal. Une eau très froide est plus longue à réchauffer.
	Robinets d'eau chaude qui fuient ou sont ouverts.	<ul style="list-style-type: none"> <li>• S'assurer que tous les robinets sont fermés.</li> </ul>
	Des parcours longs de tuyauterie d'eau chaude sont exposés ou sont à l'extérieur du mur.	‡ Isoler la tuyauterie.
	(VSDFH OLEUH LQVXILVDQW QH permettant pas la circulation d'air de la thermopompe.	<ul style="list-style-type: none"> <li>• S'assurer que l'appareil est situé à au moins 18 cm (7 po) du mur.</li> </ul>
	/D GLPHQVLRQ GH OD SLqFH Q·HVW pas adéquate pour le chauffe-eau.	‡ Installer une porte à persiennes ou autre système de ventilation semblable si la dimension de la pièce est inférieure à 3 x 3 x 2 m (10 x 10 x 7 pi) (20 m <sup>2</sup> [700 pi <sup>2</sup> ]).
	Un fusible est brûlé ou un GLVMRQFWHXU HVW GpFOHQFKp.	<ul style="list-style-type: none"> <li>• Remplacer le fusible ou enclencher le disjoncteur.</li> </ul>
	Une panne de courant à votre domicile.	<ul style="list-style-type: none"> <li>• Communiquer avec le fournisseur local d'électricité.</li> </ul>
	Câblage inadéquat.	<ul style="list-style-type: none"> <li>• Voir la section Instructions d'installation.</li> </ul>
	Limite de réinitialisation manuelle.	‡ Voir la section Commandes sécuritaires à la page 4.
5DFFRUGVG·HDX YHUV O·DSSDUHLO inversés.	‡ Corriger les raccords de tuyauterie.	
L'alimentation électrique est peut-être hors tension.	‡ S'assurer que les connexions électriques sont correctement câblées et que l'interrupteur, si utilisé, est à la position ON (sous tension).	

# Dépannage..

Problème	Causes Possibles	Solution
<i>L'eau est trop chaude</i>	Le réglage de la température est trop élevé. <b>⚠ MISE EN GARDE :</b> Pour votre propre sécurité, N'ESSAYEZ PAS de réparer le câblage électrique, les commandes, les éléments chauffants et autres dispositifs de sécurité. Faites effectuer les réparations par un technicien qualifié. Défaillance de la commande électronique.	‡ Consultez la section portant sur le réglage de la température de l'eau.
<i>Grondement</i>	Les conditions de l'eau dans votre maison entraîne l'accumulation de tartre ou de minéraux sur les éléments chauffants.	‡ Retirez et nettoyez les éléments chauffants. Ceci doit uniquement être effectué par un technicien qualifié.
<i>La soupape de vidange produit des bruit d'éclatement ou se met en marche</i>	Augmentation de pression causée par une expansion thermique dans un système fermé.	‡ Il s'agit d'un état inacceptable qui doit être corrigée. Voir l'information sur la dilatation thermique à la page 38. Ne bouchez pas la soupape de sécurité. Communiquez avec un plombier pour corriger cette situation.
<i>Le chauffe-eau émet un signal sonore et l'écran affiche F11</i>	Le chauffe-eau n'a pas été rempli d'eau avant la mise en marche. La mise en marche d'un chauffe-eau sans eau endommagera les éléments électriques. La garantie de chauffe-eau ne couvre pas les dommages ou défaillances résultant d'un fonctionnement avec un réservoir vide ou partiellement vide.	‡ Remplissez complètement le réservoir d'eau. Appuyez sur ENTER (Entrée) pour arrêter l'alarme, ensuite appuyez sur POWER lorsque le réservoir est plein.
<i>Le voyant du filtre est allumé.</i>	Le filtre doit être nettoyé. Un filtre propre est nécessaire pour un fonctionnement efficace.	‡ Suivez les instructions sur le retrait et le nettoyage du filtre à la page 35.
<i>Le chauffe-eau émet un signal sonore et l'écran affiche « FA-F8 »</i>	Il y a un problème avec la thermopompe.	‡ L'appareil passe automatiquement à un autre mode disponible pour assurer la fourniture d'eau chaude. Contactez immédiatement le service après-vente pour leur donner les codes affichés à l'écran.
<i>Le chauffe-eau émet un signal sonore et l'écran affiche un code d'erreur</i>	Il y a un problème avec le chauffe-eau qui exige une action immédiate	‡ Le chauffe-eau passera peut-être à un autre mode de chauffage de l'eau. Contactez immédiatement le service après-vente. Pour interrompre le signal sonore (sauf pour codes d'erreur F2, F-11 ou bAdLinE), appuyez sur l'une des flèches vers le haut ou le bas et le signal s'arrêtera et l'afficheur retournera à la normale (réglage température).
<i>Le chauffe-eau émet un signal sonore et l'écran affiche un code "bAd linE"</i>	/-DSSDUHLO QH UH0RLW SDV GH 240V AC comme prévu.	‡ Coupez l'alimentation électrique du chauffe-eau (généralement au niveau du disjoncteur). Ensuite, lisez la section « Raccordements électriques » des instructions d'installation en page 40. Puis, contactez l'installateur pour vérifier l'alimentation électrique du chauffe-eau.
<i>Le chauffe-eau dégage une odeur d'œufs pourris ou de soufre</i>	Certaines eaux avec une concentration élevée de soufre réagissent avec la tige d'anode qui est présente dans tous les chauffe-eau pour la protection contre la corrosion du réservoir.	‡ L'odeur peut être réduite ou éliminée dans la plupart des chauffe-eau en remplaçant la tige d'anode avec une tige en un matériau moins réactif. Dans certains cas, une étape supplémentaire de chloration du chauffe-eau et de toutes les tuyauteries d'eau chaude peut être nécessaire. Contactez votre compagnie de eaux locale ou un plombier pour connaître les options qui s'offrent à vous ainsi que des instructions. \$SSH0H] *( DX 1.888.4*(.+(;+( 1.888.443.4394) SRXU VDYRLU R acheter cette anode de remplacement. Un réparateur qualifié ou un plombier doit effectuer ce remplacement. L'utilisation d'une tige d'anode non approuvée par GE, ou l'utilisation du chauffe-eau sans une tige d'anode approuvée par GE ANNULE la garantie.
<i>L'appareil n'émet pas les bruits habituels</i>	Si l'appareil utilise les résistances électriques, le ventilateur et le compresseur ne feront pas de bruit sounds.	‡ Vérifiez le mode de fonctionnement.

Pour obtenir un service, appelez le 1.888.4GE.HEWH(1.888.443.4394.)



Code d'erreur D\AFKp	Condition	Action
<b>FA</b>	T4 n'augmente pas	Appelez un technicien
<b>FB</b>	Temp. sortie instable	Appelez un technicien
<b>FC</b>	Évaporateur givré	Appelez un technicien
<b>FD</b>	6XUFKDX\H WURS IDLEOH	Appelez un technicien
<b>FE</b>	Température de sortie au dessus de la limite	Appelez un technicien
<b>FF</b>	Détendeur électronique hors des	Appelez un technicien
<b>FG*</b>	9pUL\FDWLRQ WHPS. DPELDQWH 75	Données du technicien en réparation
<b>FH*</b>	Test de charge du compresseur	Données du technicien en réparation
<b>FI*</b>	Test de fuite de réfrigérant	Appelez un technicien
<b>F2</b>	T2 Panne de la sonde thermique du réservoir	Appelez un technicien
<b>F3</b>	Panne de compresseur	Appelez un technicien
<b>F4</b>	Panne de ventilateur	Appelez un technicien
<b>F5</b>	Panne du capteur T3a (température d'entrée de l'évaporateur)	Appelez un technicien
<b>F6</b>	Panne du capteur T3b (température d'entrée de l'évaporateur)	Appelez un technicien
<b>F7</b>	Panne du capteur T4 (sortie du compresseur)	Appelez un technicien
<b>F8</b>	Panne du capteur T5 (température ambiante)	Appelez un technicien
<b>F9</b>	3DQQH G·pOpPHQW FKDX\ADQW LQIpULHXU	Appelez un technicien
<b>F10</b>	3DQQH G·pOpPHQW FKDX\ADQW VXS pULHXU	Appelez un technicien
<b>F11</b>	Erreur Réservoir à sec	Consultez la page 40
<b>bAd linE (F12)</b>	La tension est trop basse au démarrage	Consultez la page 40
<b>F13</b>	(UUHXU 7RXFKH %ORTXpH	Appelez un technicien
<b>Dirty Filter (F14)</b>	/H \OWUH HVVWDOH	Appelez un technicien
<b>F15</b>	Erreur DataFlash	Voir page 35

\* Certains modèles

## \*DUDQWLH GX FKDXAH-HDX K\EULGH \*.



Toutes les réparations sur garantie sont fournies par notre service de réparation. Appelez le 888.4GE.HEWH (888.443.4394). Veuillez avoir le numéro de série et le numéro de modèle sous la main lorsque vous appelez le service de réparation.

Agrafez le reçu d'achat ici. Pour obtenir le service sous garantie, vous devrez fournir la preuve de l'achat original.

### Pour la période d': Nous remplacerons:

<b>Un An</b> À partir de la date d'achat initiale	<b>Toute pièce</b> pendant la validité de la présente <b>garantie limitée d'un an</b> , GE fournira également gratuitement la main-d'œuvre et les services de réparation pour remplacer la pièce défectueuse.
<b>De la Deuxième à la Dixième année</b> À partir de la date d'achat initiale	<b>Toute pièce</b> pendant cette <b>garantie limitée de dix ans</b> sur les pièces, la main-d'œuvre et le service liés au remplacement de la pièce défectueuse ne sont pas inclus.

### Ce qui n'est pas compris:

- ↓ Les déplacements à votre domicile pour vous expliquer l'utilisation de ce produit.
- ↓ Une installation, livraison ou maintenance défectueuse.
- ↓ Une panne du produit par abus d'utilisation, par mauvaise utilisation ou par un but autre que celui pour lequel il a été fabriqué.
- ↓ L'utilisation de ce produit avec une eau microbiologiquement insalubre ou de qualité inconnue sans désinfection adéquate en amont ou en aval du système.
- ↓ Le remplacement des fusibles ou le réenclenchement du disjoncteur.
- ↓ Tout dommage causé par accident, par la foudre, par un incendie, par inondation ou par une catastrophe naturelle.
- ↓ Les dommages directs et indirects, causés par des défaillances possibles de l'appareil, de son installation ou de sa réparation.
- ↓ Tout produit auquel il n'est pas possible d'accéder pour effectuer les réparations nécessaires. Les installations dans un grenier nécessitent un plancher approprié et un accès par des escaliers.
- ↓ Si le produit est retiré de son emplacement original.
- ↓ Les dommages, les dysfonctionnements ou les pannes causés par l'utilisation d'un service de réparation non approuvé par GE.
- ↓ Les dommages, les dysfonctionnements ou les pannes causés par l'utilisation de pièces ou de composants non autorisés.
- ↓ Consommation et remplacement de la tige d'anode.
- ↓ Les dommages, les dysfonctionnements ou les pannes causés par l'utilisation de la thermopompe avec un réservoir vide ou partiellement vide.
- ↓ Les dommages, les dysfonctionnements ou les pannes causés par des pressions dans le réservoir supérieures à celles indiquées sur la plaque signalétique.
- ↓ Les dommages, les dysfonctionnements ou les pannes causés par des tensions dépassant les tensions inscrites sur la plaque signalétique.
- ↓ L'installation de l'appareil dans une atmosphère corrosive.

**EXCLUSION DE GARANTIES IMPLICITES – Votre seul et unique recours est la réparation du produit selon les dispositions de cette Garantie limitée. Toutes les garanties implicites, incluant les garanties de performance, sont exclues de cette garantie limitée. Cette garantie limitée ne couvre pas les dommages causés par l'usage abusif, l'installation incorrecte, l'entretien inadéquat, les modifications non autorisées, les conditions environnementales extrêmes, les événements de force majeure, les incendies, les inondations, les dommages causés par la foudre, les dommages causés par des animaux, les dommages causés par des véhicules, les dommages causés par des objets tombés du ciel, les dommages causés par des produits chimiques, les dommages causés par des produits inflammables, les dommages causés par des produits corrosifs, les dommages causés par des produits explosifs, les dommages causés par des produits radioactifs, les dommages causés par des produits toxiques, les dommages causés par des produits dangereux, les dommages causés par des produits inflammables, les dommages causés par des produits corrosifs, les dommages causés par des produits explosifs, les dommages causés par des produits radioactifs, les dommages causés par des produits toxiques, les dommages causés par des produits dangereux.**

Cette garantie s'étend à l'acheteur initial et à tout propriétaire ultérieur pour les appareils achetés pour un usage au Canada. GE n'est pas responsable des dommages causés par l'usage abusif, l'installation incorrecte, l'entretien inadéquat, les modifications non autorisées, les conditions environnementales extrêmes, les événements de force majeure, les incendies, les inondations, les dommages causés par la foudre, les dommages causés par des animaux, les dommages causés par des véhicules, les dommages causés par des objets tombés du ciel, les dommages causés par des produits chimiques, les dommages causés par des produits inflammables, les dommages causés par des produits corrosifs, les dommages causés par des produits explosifs, les dommages causés par des produits radioactifs, les dommages causés par des produits toxiques, les dommages causés par des produits dangereux.

Certains États ou provinces n'autorisent pas l'exclusion ou la restriction des dommages directs ou indirects. La présente garantie vous donne des droits juridiques particuliers, mais vous pouvez avoir d'autres droits qui varient d'un État ou d'une province à l'autre. Pour connaître vos droits, appelez le bureau de la protection du consommateur de votre localité, de votre État ou de votre province ou le procureur général de votre État.

**En cas de produit acheté en dehors des États-Unis, contacter le lieu d'achat pour des renseignements de réparation et de garantie.**

Garant pour les produits achetés aux États-Unis : General Electric Company, Louisville, KY 40225.

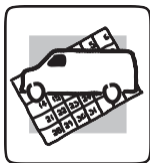
## Soutien au consommateur.

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### Site Web appareils électroménagers GE [www.electromenagersge.ca](http://www.electromenagersge.ca)

9RXV DYHJ XQH TXHVWLRQ RX YRXV DYHJ EHVRLQ G-DLGH SRXU YRWUH DSSDUHLO pOHFWURPpQDJHU" &RQWDFWHJ-QRXV SDU  
Internet au site [www.electromenagersge.ca](http://www.electromenagersge.ca) 24 heures par jour, tous les jours de l'année.



### Service de réparations

**1.800.561.3344**

Service de réparations GE est tout près de vous.

Pour faire réparer votre électroménager GE, il suffit de nous téléphoner.



### Studio de conception réaliste

Sur demande, GE peut fournir une brochure sur l'aménagement d'une cuisine pour les personnes à mobilité réduite.

Écrivez: Directeur, Relations avec les consommateurs, Mabe Canada Inc.

%XUHDX 310, 1 )DFWRU\ /DQH

ORQFWRQ, 1.%. (1& 903

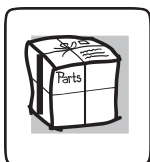


### Prolongation de garantie

[www.electromenagersge.ca](http://www.electromenagersge.ca)

Achetez un contrat d'entretien GE avant que votre garantie n'expire et bénéficiez d'un rabais substantiel. Ainsi le service après-vente GE sera toujours là après expiration de la garantie.

Visitez notre site Web ou appelez-nous au 1.888.261.2133.



### Pièces et accessoires

Ceux qui désirent réparer eux-mêmes leurs électroménagers peuvent recevoir pièces et accessoires directement à la maison (cartes VISA, MasterCard et Discover acceptées).

**Les directives stipulées dans le présent manuel peuvent être effectuées par n'importe quel utilisateur. Les autres réparations doivent généralement être effectuées par un technicien qualifié. Soyez prudent, car une réparation inadéquate peut affecter le fonctionnement sécuritaire de l'appareil.**

Vous trouverez dans les pages jaunes de votre annuaire le numéro du Centre de service Mabe le plus proche. Autrement, appelez-nous au 1.800.661.1616.



### Contactez-nous

Si vous n'êtes pas satisfait du service après-vente dont vous avez bénéficié :

**Premièrement**, communiquez avec les gens qui ont réparé votre appareil.

**Ensuite**, VLYRXV Q:rWHV WRXMRXUV SDV VDWLVIDLW HQYR\H] WRXV OHV GpWDLOV<sup>3</sup>QXPpUR GH WpOpSKRQH FRPSULV<sup>3</sup>DX

Directeur, Relations avec les consommateurs, Mabe Canada Inc.

%XUHDX 310, 1 )DFWRU\ /DQH

ORQFWRQ, 1.%. (1& 903



### Inscrivez votre appareil électroménager [www.electromenagersge.ca](http://www.electromenagersge.ca)

Inscrivez votre appareil électroménager en direct, aussitôt que possible. Cela améliorera nos communications et notre service après-vente. Vous pouvez également nous envoyer par la poste le formulaire d'inscription joint à votre documentation.

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**Escriba los números de modelo y de serie aquí:**

**Modelo #** \_\_\_\_\_

**Serie #** \_\_\_\_\_

/RV SRGui HQFRQWUDU HQ OD HWLTXHWD GH  
GHWDOOHV WpFQLFRV HQ OD SDUWH IURQWDO GH  
VX FDOHQWDGRU GH DJXD.

# INFORMACIÓN IMPORTANTE DE SEGURIDAD. LEA TODAS LAS INSTRUCCIONES ANTES DE USAR

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## ⚠ ¡ADVERTENCIA!


3DUD VX VHJXULGDG, VLJD ODV LQVWUXFFLRQHV GH HVWH PDQXDO D ¿Q GH PLQLPL]DU ULHVJR GH LQFHQGLR R H[SORVLYQ, GHVFDUJDU HOPFWULFDV, R SDUD HYLWDU GDxRV HQ VX SURSLHGDG, OHVLRQHV SHUVRQDOHV R OD PXHUWH.

SHVH~UHVH GH OHHU \ HQWHQGHO HO ODQXDO GHO 3URSLHWDULR HQ VX WRWDOLGDG DQWHV GH LQWHQWU LQVWODU R XVDU HVWH FDOHQWDGRU GH DJXD. (V SRVLEOH TXH OH DKRUUH WLHPSR \ JDVWRV. 3UHVVH HVSHFLDO DWHQFLYQ D ODV, QVWUXFFLRQHV GH 6HJXULGDG. 6L QR VH VLXHQH HVWDV DGYHUWHQFLDV, VH SRGUiQ SURGXFLU OHVLRQHV JUDYHV R OD PXHUWH. (Q FDUV GH WHQHU SUREOHPDV SDUD HQWHQGHU ODV LQVWUXFFLRQHV GH HVWH PDQXDO, R VL GHVH UHDO]DU DOJXD SUHJXQW, '(7e1\*\$( \ VROLFLWH D\XGD D XQ WpQLFR GH VHUULFLR FDO]FDGR R DO VHUULFLR HOPFWULFR ORFDO.

## AJUSTE DE LA TEMPERATURA DEL AGUA

/D VHJXULGDG \ FRQVHUYDFLYQ GH OD HQHUtD VRQ IDFWRUHV TXH VH GHEHQ WHQHU HQ FRQLGHUFLYQ DO VHOHFLRQDU OD FRQ]XUDFLYQ GH OD WHPSHUDWXUD GHO DJXD D WUDYpV GH OD LQWHUIDFH GHO VXDULR GHO FDOHQWDGRU GH DJXD. /DV WHPSHUDWXUDV GHO DJXD VXSHURUHV D ORV 125] SXHG RFDVLRQDU TXHPDGXUDV JUDYHV R OD PXHUWH SRU TXHPDGXUDV. SHVH~UHVH GH OHHU \ VHJLU ODV DGYHUWHQFLDV GH WDODODGDV HQ OD HWTXHWDTXH DSDUHFH D FRQLQXDFLYQ. (VWD HWTXHWDTXH WDPQLQ HVWi XELFDGD HQ HO FDOHQWDGRU GH DJXD, FHUFD GH OD SDUWH VXSHURU GHO WDTXH.

⚠ **PELIGRO**



**Las temperaturas de agua superiores a 125°F pueden provocar quemaduras graves en forma instantánea o la muerte por quemaduras.**

**La configuración del control electrónico de temperatura normalmente aproxima la temperatura del agua de grifo. Sin embargo, ciertos factores pueden hacer que la temperatura alcance los 160°F a pesar de la configuración del control. Siempre pruebe el agua antes de bañarse o ducharse.**

**Los niños, los discapacitados y las personas mayores corren un riesgo mayor de sufrir una quemadura.**

**Consulte el manual de instrucciones antes de configurar la temperatura del calentador de agua.**

**Pruebe el agua antes de bañarse o ducharse.**

**Se encuentran disponibles válvulas limitadoras de temperatura; consulte el manual.**

(VWiQ GLVSRQLEOHV YiOYXODV PH]FODGRUDV SDUD UHGXFLU OD WHPSHUDWXUD GHO DJXD HQ HO OXJDU GH XVR, ODV FXDOHV PH]FODQ DJXD FDOHQRWH \ IUtD HQ ODV OtQHUV GH DJXD GHULYDGDV. 3DUD PIV LQIRUPDFLYQ, FRPXQtTXHVH FRQ XQ SORPHUR PDWULFXODGR R FRQ OD DXWRULGDG GH SORPHUtD ORFDO.

### Relación de Tiempo/ Temperatura en Quemaduras

7HPSUDWXUD	7LHPSRSDUD3URGXFLUXQD4XHPDGXUD*UDYH
120f) (49f&)	0iVGH5 PLQXWRV
125f) (52f&)	1-1/2 D 2 PLQXWRV
130f) (54f&)	\$\$SUR[LPDGDPHQWH 30 VHJXQGRV
135f) (57f&)	\$\$SUR[LPDGDPHQWH 10 VHJXQGRV
140f) (60f&)	0HQRV GH 5 VHJXQGRV
145f) (63f&)	0HQRV GH 3 VHJXQGRV
150f) (66f&)	\$\$SUR[LPDGDPHQWH 1-1/2 VHJXQGRV
155f) (68f&)	\$\$SUR[LPDGDPHQWH 1 VHJXQR

La tabla es cortesía de Shriners Burn Institute

(O FXDGUR TXH VH PXHVWUD D FRQLQXDFLYQ SRGUi VHU XVDGR FRPR JXtD SDUD GHWHUPLQDU OD WHPSHUDWXUD GHO DJXD DSURSLDGD SDUD VX KRJDU.

(O WHUPRVWDR IXH FRQ]XUDGR HQ OD iEULFD D 120] (49] &) D ¿Q GH UHGXFLU HO ULHVJR GH OHVLRQHV SRU TXHPDGXUDV.

**NOTA: Los hogares donde haya niños pequeños, personas LQFSDFLWDGDV R PD\RUHV SRGUiQ UHTXHULU XQD FRQ]XUDFLYQ GHO WHUPRVWDR GH 120] (49] &) R LQIHULRU, D ¿Q GH HYLWDU HO contacto con el agua "CALIENTE".**

**⚠ PELIGRO:** Existe la posibilidad de que se produzca una QUEMADURA con Agua Caliente si el control de WHPSHUDWXUD GHO DJXD HVWi FRQ]XUDGR GHPDVLGR DWR.

# **INFORMACIÓN IMPORTANTE DE SEGURIDAD. LEA TODAS LAS INSTRUCCIONES ANTES DE USAR**

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## **⚠ ¡PRECAUCIÓN!**

**Riesgo de incendio** - 6H SXHGH SURGXFLU **gas hidrógeno** HQ XQ VLVWHPD GH DJXD FDOHQWH DEDVWHFLGR SRU HVVH FDOHQWDGRU GH DJXD, HO FXDO IXH XVDGR SRU XQ SHU tRGR GH WLHPSR SURORQJDGR (JHQHUDOPHQWH GRV VHPDQDVR PiV). £(/ \*\$6+, '5i\*(12(6(;75(0\$' \$0(17(,1))/\$0\$%/(! 3DUD GLVLSDU GLFKR JDV \ UHGXFU HO ULHVJR GH OHVLRQH, VH UHFRPLHQGD TXH HO JULIR GH DJXD FDOHQWH TXHG DELHUWR GXUDQWH YDULRV PLQWRV HQ HO ODYDER GH OD FRFLQD, DQWHV GH XVDU FXDOTXLHU DUWHIDFWR HOpFWULFR FRQHFWDGR DO VLVWHPD GH DJXD FDOHQWH. 6L KD\ KLGUyJHQR SUHVHQWH, KDEU i XQ VRQLGR DW tSLFR WDO FRPR DLUH TXH HVFDS D WUDYpV GH OD WXEHUtD FXDQGR HO DJXD FRPLHQFH D FLUFODU. 1R IXPH QL HQFLHQGD XQD OODPD FHUFD GHO JULIR HQ HO PRPHQWR HQ TXH pVWH VH DEUD.

## **⚠ ¡ADVERTENCIA!**

**Riesgo de incendio** - 1R JXDUGH QLXVH JDVROLQD X RWURV YDSRUHV LQIOPDEOHV \ OtXLGRV FHUFD GH pVWH QL GHRWURV HOHFWRGR pVWLFVR. ODQWHQD ORV WDSWHV \ RWURV PDWHULDOHV FRPEXVLEOHV DOHMDGRV.

## **⚠ PARA INSTALACIONES EN EL ESTADO DE CALIFORNIA**

/D /H\ GH &DOLIRUQLD UHTXLHUH TXH ORV FDOHQWDGRUHV GH DJXD UHVLGHQFLDOHV VHDQ VXMHWGRV, DSXQWODGRV R DPDUUDGRV D ILQ GH UHVLVWLU FdtGDV R GHVSOD]DPLHQWRV KRUL]RQWDOHV GH ELGR D PRYLPLHQWRV SRU WHUHPRWRV. 3DUD ORV FDOHQWDGRUHV GH DJXD UHVLGHQFLDOHV GH KDVWD 52 JDORQH (236.4 /) GH FDSDFLGD, VH SRGU i DFFGHU D XQ FDWiORJR FRQ LQVWUXFFLRQH JHQpULFDV SDUD VXMHFlyQ HQ FDVR GH WHUHPRWR HQ: 2IILFH RI WKH 6WDWH \$UFKLWHFW (2ILFLQD GHO \$UTXLWHFWR (VWDWDO), 400 3 6WUHHW, 6DFUDPHQR, &\$ 95814 R VH SXHGH FRPXQLFDU DO 916.324.5315 R VROLFLWDU OD DVLVWHQFLD GH XQ YHQGHGRU GH FDOHQWDGRUHV GH DJXD.

/RV FyGLRV ORFDOHV DSOLFDEOHV VLHPSUH GHWHUPLQDU i OD LQVWODFLyQ. 3DUD FDOHQWDGRUHV GH DJXD UHVLGHQFLDOHV GH XQD FDSDFLGD VXSHULRU D 52 JDORQH (236.4 /) FRQVXOWH VREUH SURFHGLPLHQWRV GH VXMHFlyQ DFHSWDEOH HQ OD MXULVGLFFlyQ GH FRQVWUXFFlyQ ORFDO .

\$GYHUWHQFLD GH OD 3URSRVLFLyQ 65 GH &DOLIRUQLD: (VWH SURGXFWR FRQLHQH TXtPLFRV TXH HO (VWDGR GH &DOLIRUQLD HQWLHQH TXH SURGXFWQ FiqFHU, GHIFWRV HQ HO QDFLPLHQWR X RWURV GDxRV UHSURGXFWLYRV.



# INFORMACIÓN IMPORTANTE DE SEGURIDAD. LEA TODAS LAS INSTRUCCIONES ANTES DE USAR

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## **⚠️ ADVERTENCIA:**

Apague el suministro de energía del calentador de agua si éste sufrió daños físicos o una inundación.

1R XWLOLFH HO FDOHQWDGRU GH DJXD QXHYDPHQWH KDVWD TXH KD\ D VLGR FRQWURODGR HQ VX WRWDOLGDG SRU SHUVRQDO FDOLILFDGR GHO VHUYFLR WpFQLFR.

## **Precauciones de Seguridad**

**A. Apague** HO VXPLQLVWUR GH HQHUtD GHO FDOHQWDGRU GH DJXD VL pVWH VXIUlyXQVREUHFDOHQWDPLHQWR, LQFHQGLR, LQXQGDfLYQR GDxR ItVLFR.

**B. No** HQFLHQGD HO FDOHQWDGRU GH DJXD D PHQRV TXH HVVp OOHQR GH DJXD.

**C. No** HQFLHQGD HO FDOHQWDGRU GH DJXD VL OD YIOYOD GH FLHUUH GHO VXPLQLVWUR GH DJXD IUtD HVWi FHUJDGD.

**127\$: 3RGUiQ VHU HPLWLGRV YDSRUHV LQIOPDEOHV SRU &RUULHQWHV de aire en áreas circundantes al calentador de agua.**

**D.** (QFDVR GH H[LVLWLU GLILFXOWDG SDUD HQWHQGHU R VHJLU ODV ,QVWUXFFLRQHV GH )XFLRQDPLHQWR R OD VHFFLyQ GH &XLGDGR \ /LPSLHJD, VH UHFRPLHQGD TXH XQD SHUVRQD FDOLILFDGD R SHUVRQDO GHO VHUYFLR WpFQLFR UHDFHQ HO WUDEDMR.

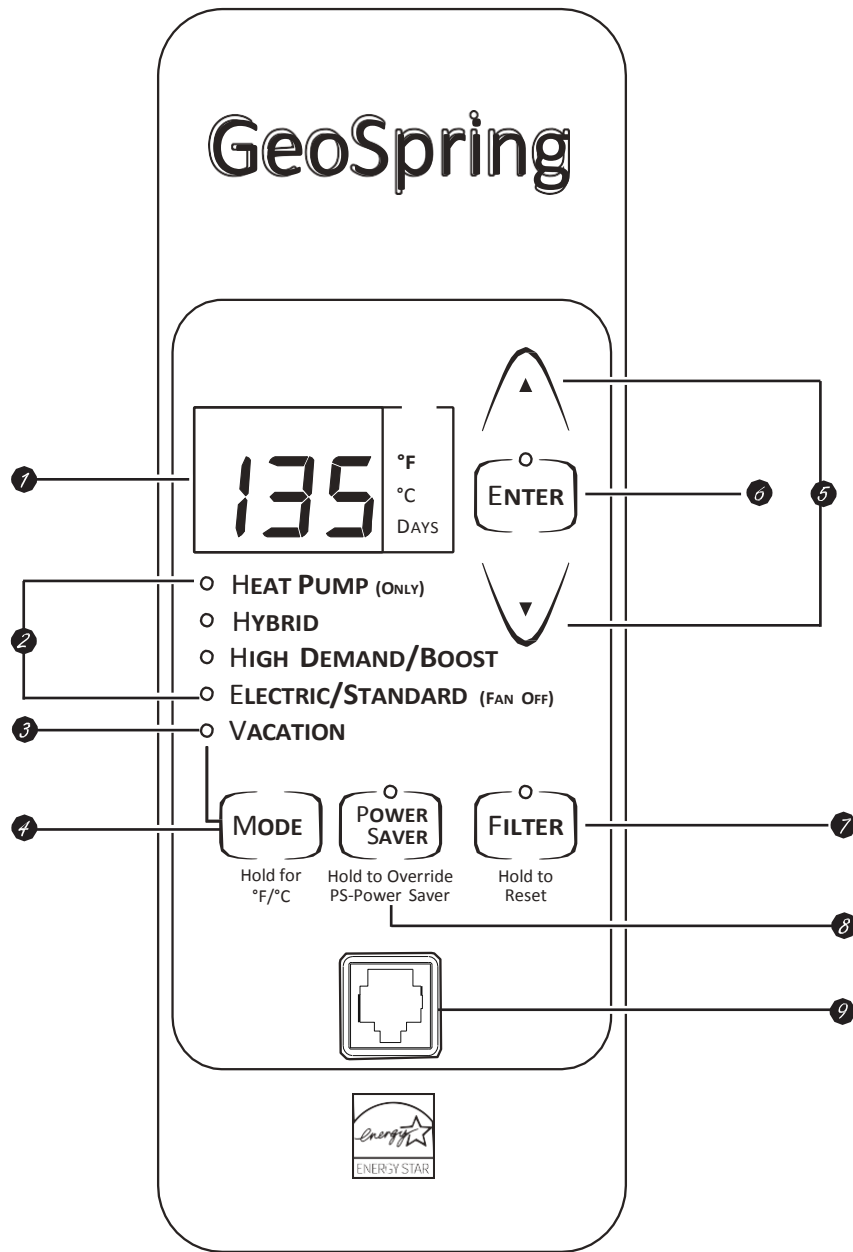
## **Controles de Seguridad**

(O FDOHQWDGRU GH DJXD HVWi HTXLSDGR FRQ XQ FRQWURO GH OtPLWH GH WHPSHUDWXUD (7&2) TXH HVWi XELFDGR VREUH HO HOHPHQWR GH FDOHQWDPLHQWR HQ FRQWDFWR FRQ OD VXSHUILFLH GHO WDQTXH. 6LSRU DOJXD UD]yQ OD WHPSHUDWXUD GHO DJXD VH YXHOYH H[FVLYDPHQWH DOWD, HO FRQWURO GH OtPLWH GH WHPSHUDWXUD LQWHUUXPSH HO FLUXLWR GH HQHUtD KDFLD HO HOHPHQWR GH FDOHQWDPLHQWR. 8QD YH] TXH HO FRQWURO VH DEUH, GHEH VHU UHLQLFDGR GH IRUPD PDQXDO. (O UHLQLFR GH ORV FRQWUROHV GH OtPLWH GH WHPSHUDWXUD GHEHi QVHU UHDFHQ SRU XQ WpFQLFR FDOLILFDGR GHO VHUYFLR.

**⚠️ PRECAUCIÓN:** La causa de la condición de WHPSHUDWXUD DOWD GHEHi VHU LQYHVWLJDGD SRU XQ WpFQLFR FDOLILFDGR GHO VHUYFLR R VH GHEHi UHDFHQ XQD DFFLyQ FRUHFVLYD DQWHV GH YROYHU D SRQH HQ XVR HO FDOHQWDGRU GH DJXD.

## **Para reiniciar el control de límite de temperatura:**

1. SDDJXH OD FRUULHQWH GHO FDOHQWDGRU GH DJXD.
2. SHWLUH HO SDQHO (HV) GH DFFHVR \ HO DLVODQWH GHO UHYHVWLPLHQWR /D WDSO SURWHFWRUD GHO WHUPRVWDWR GHEHi VHU UHVLUDGD.
3. SHVLRQH HO ERWyQ URMR GH 5(,1,&,2.
4. SHHPSODFH HO SDQHO (HV) GH DFFHVR \ HO DLVODQWH GHO UHYHVWLPLHQWR DQWHV GH HQFHQGHU OD FRUULHQWH GHO FDOHQWDGRU GH DJXD.



## Controles Funciones

### 1 Pantalla

### 2 Modos de Funcionamiento

(3DUD DFFHGHU D XQD GHVFULSFLyQ, FRQVXOWH OD SiJLQD 8)

### 3 Vacaciones

(3DUD DFFHGHU D XQD GHVFULSFLyQ, FRQVXOWH OD SiJLQD 8)

### 4 Selector de Modo

8VH HWWH ERWyQ SDUD DOWHUQDU HQWUH ORV PRGRV GLVSRQLEOHV.

### 5 Teclas con Flechas

8VH HWWH ERWyQ SDUD DMXVWUDU OD FRQLXUDFLyQ GH WHPSHUDWXUD

### 6 Tecla de Ingreso

### 7 Reinicio del Filtro

(O ILOWUR HVWi VXFLR \ UHTXLHUH XQD OLPSLH]D FXDQGR OD OX] 5RMD HVWi LOXPLQDGD. (O ILOWUR HVWi XELFDGR HQ OD SDUWH VXSHULRU GHO FDOHQWDGRU GH DJXD. ODQWHQJD SUHVLRQDGR HO ERWyQ GXUDQWH 5 VHJXQGRV SDUD UHLQLFLDU OD DODUPD GHO ILOWUR.

### 8 Anulación del Ahorro de Energía

3DUD XVR FRQ HO PRGXOR \$&0. ODQWHQJD SUHVLRQDGR SDUD DQXODU HO PRGR GH \$KRUUR GH (QHUJtD HQ OD XQLGDG. 8QD YH] SUHVLRQDGR \ FXDQGR VH KD\D FDOFHODGR HO PRGR GH \$KRUUR GH (QHUJtD, OD XQLGDG SHUPDQHWHUi VLQ \$KRUUR GH (QHUJtD SRU ODV VLJLHQWHV 18 KRUDV.

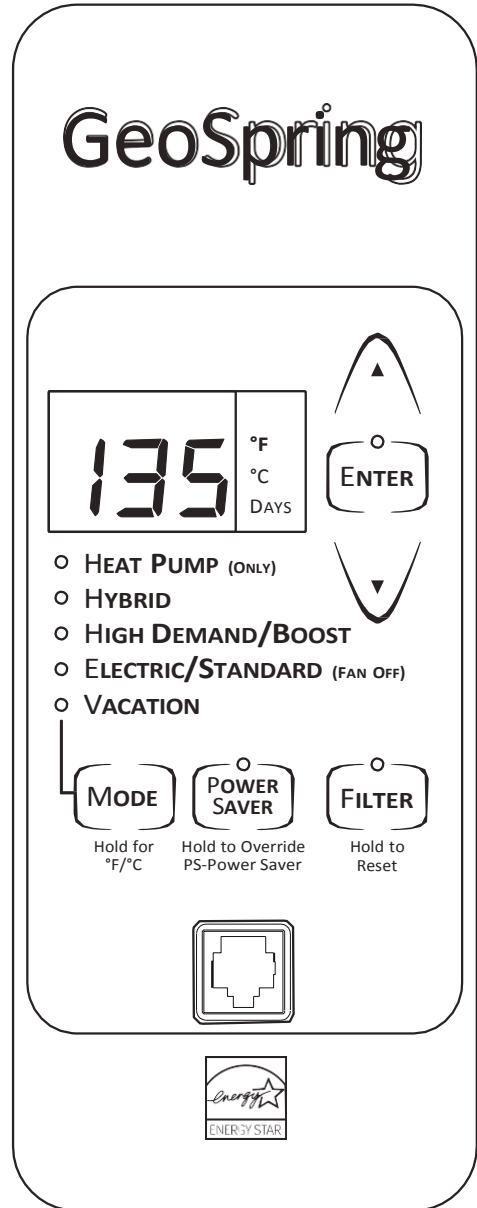
### 9 Puerto del Módulo de Comunicación del Artefacto

3DUD XVR FRQ XQ PyGXOR \$&0 RSFLRQDO (SDUD PiV GHWDOOHV, FRQVXOWH OD SiJLQD 10).



(VWD XQLGDG QR FXHQWD FRQ XQ ERWYQ GH HQFHQGLGR. 8QD YH] TXH HO FDOHQWDGRU GH DJXD HV HQFKXIDGR \ KD\D VXPLQLVWUR GH FRUULHQWH, HVWUUi HQFHQGLGR. /D SDQWDOOD PRVWUUi OD FRQILXUDFLyQ DFWXDO GH OD WHPSHUDWXUD GHO DJXD. (O PRGR GH IXQFLRQDPLHQWR DFWXDO GHO FDOHQWDGRU GH DJXD DSDUHFHUi LOXPLQDGR.

3DUD FXPSOLU FRQ ODV UHJXODFLRQHV GH VHJXULGDG, ORV FRQWUROHV HVWUiQ SUHFRQILXUDGRV GH liEULFD HQ 120°F) (49°F &) \ HQ +\EULG ORGH (ORGR +tEULGR). 6H UHFRPLHQGD TXH OD XQLGDG HVWUp FRQILXUDGD HQ +HDW 3XPS (RQO\)(%RPED GH &DOHQWDPLHQWR VRODPHQWH), DILQGH PD[LPL]DU HO DKRUUR GH HQHUjD. (O IXQFLRQDPLHQWR HQ +\EULG ORGH (ORGR +tEULGR) EULQGD HTXLOLEULR HQ HO DKRUUR GH HQHUjD \ HQ HO XVR FRQYHQLHQWH GHO DJXD FDOLHQWH. (O FRQVXPR GH HQHUjD LQIRUPDGR HVWi EDVDGR HQ HO IXQFLRQDPLHQWR GH OD XQLGDG HQ +\EULG ORGH (ORGR +tEULGR) HQXQD FRQILXUDFLyQ GH WHPSHUDWXUD GH 135°F) (57°F &), \ HO IXQFLRQDPLHQWR HQ FRQILXUDFLRQHV GH WHPSHUDWXUD EDMD R HQ HO PRGR +HDW 3XPS (RQO\)(%RPED GH &DOHQWDPLHQWR VRODPHQWH) EULQGDUiQ LQFOXVR PD\RUVV DKRUURV GH HQHUjD.



# ¿FHUF D GH OD FRQ¿JXUDFLYQ GH OD WHPSHUDWXUD GH OD DJXD.

## Posición de Ajuste de Temperatura:

/D VHJULGDG, OD FRQVHUYDFLYQ GH OD HQHUJTD \ OD FDSDFLGDG GH OD DJXD FDOLHQWH VRQIDFWRUHV TXH VH GHEHQ FRQVLGHUD DO VHOHFLRQDU OD FRQ¿JXUDFLYQ GH OD WHPSHUDWXUD GH OD DJXD FDOLHQWH HQ HO FDOHQWDGRU GH OD DJXD. \$¿Q GH FXPSOLU FRQ ODV UHJODFLRQHV GH VHJULGDG, OD SRVFLYQ GH DMXWH GH WHPSHUDWXUD GH OD DJXD HVWi FRQ¿JXUDGD SUHYLDPHQWH HQ OD iEULFD D 120 (49 &). eVWD HV OD FRQ¿JXUDFLYQ GH WHPSHUDWXUD LQLFD UHFRPHQGDGD.

**NOTA:** H DFXHUGR FRQ HO 86 °HSW RI (QHJ) \ ('HSDUWDPHQWR GH (QHJ) TD GH ((.88.)) HO FDOHQWDGRU GH OD DJXD UHVLGHQFLDO SURPHGLR HQ ((.88. HVWi FRQ¿JXUDGR HQ 135 (57 &)). /DV LQGLFDLORQH GH DKRUURGH (QHJ) TD GH O &DOHQWDGRU GH \$JXD +EULGR \* (\*HR6SULQJCE +EULG HVWiQ EDVDGDV HQ XQD FRQ¿JXUDFLYQ GH WHPSHUDWXUD GH 135 (57 &)). /D SRVFLYQ GH DMXWH GH WHPSHUDWXUD GH OD DJXD SXHG VHU HOHYDGD FRQ UHODFLYQ D OD FRQ¿JXUDFLYQ GH iEULFD GH 120 (49 & D 135 (57 &)) (49 & D 57 &)), VLQ VDFUL¿FDU ORV DKRUURV GH HQHUJTD LQGLFDGRV. 6L VH XVD XQD FRQ¿JXUDFLYQ GH WHPSHUDWXUD LQIHULRU D 135 (57 &)), VH SRGUHQ ORJUDU PD\RUHV DKRUURV GH HQHUJTD \ GH FRVWRV RSHUDWLYRV.

&RQVXOWH 3DUD \$MXVWUDU OD 7HPSHUDWXUD iVHFLYQ D FRQLQDFLYQ SDUD FDPDLU OD WHPSHUDWXUD GH ODOHQWDGRU GH OD DJXD.

## Capacidad del agua caliente:

6L VH GHVH D XQD PD\RU FDSDFLGDG GH OD DJXD FDOLHQWH, LQFUHPHQWU OD WHPSHUDWXUD GH 120 (49 & D 135 (57 &)) SHUPLWUi TXH HO PLVPR WDQTXH GH OD DJXD FDOLHQWH GXUH DSUR[LQDGD PHQWH XQ 25% PIV, \D TXH PD\RU FDQLGDG GH OD DJXD IUED HV PH]FODGD HQ OD GXFKD R JULIR.

## Relación de Tiempo/ Temperatura en Quemaduras

7HPSHUDWXUD	7LHPSR SDUD 3URGFLU XQD 4XHPDGXUD *UDYH
49q (120q))	0iV GH 5 PLQXWRV
52q (125q))	1-1/2 D 2 PLQXWRV
44q (130q))	\$SUR[LQDGD PHQWH 30 VHJXQGRV
57q (135q))	\$SUR[LQDGD PHQWH 10 VHJXQGRV
60q (140q))	0HQRV GH 5 VHJXQGRV
63q (145q))	0HQRV GH 3 VHJXQGRV
66q (150q))	\$SUR[LQDGD PHQWH 1-1/2 VHJXQGRV
68q (155q))	\$SUR[LQDGD PHQWH 1 VHJXQGR

La tabla es cortesía de Shriners Burn Institute

## Recordatorio de Riesgo de Quemaduras:

/DV WHPSHUDWXUDV FRQ DJXD VXSHULRUHV D ORV 125 (57 &)) SXHG HQ RFDVLRQDU TXHPDGXUDV JUDYHV R OD PXHUWH SRU TXHPDGXUDV. \$VH~UHVV GH OHHU \ VHJLU ODV DGYHUWHQFLDV GH WDODGDV HQ HVWH PDQXDO \ HQ OD HWTXHWD GH ODOHQWDGRU GH OD DJXD. (VWD HWTXHWD HVWi XELFDGD HQ HO FDOHQWDGRU GH OD DJXD, FHUF D GH SDQHO GH DFFHVR GH HOHPHQWR VXSHULRU.

&RQVXOWH 5HODFLYQ GH 7LHPSR/7HPSHUDWXUD HQ 4XHPDGXUD iV D FRQLQDFLYQ FRPR JXED SDUD GHWHUPLQDU OD WHPSHUDWXUD DSURSLDGD GH OD DJXD SDUD VX KRJDU.

## 9iOYXODV GH PH]FOD:

(VWiQ GLVSRQLEOHV YiOYXODV PH]FODGRUDV SDUD UHGFLU OD WHPSHUDWXUD GH OD DJXD HQ HO OXJDU GH XVR, ODV FXDOHV PH]FODGR DJXD FDOLHQWH \ IUED HQ ODV OtQHDV GH OD DJXD GHULYDGDV. 3DUD PIV LQIRUPDFLYQ, FRPXQTXHVH FRQ XQ SORPHUR PDWULFXODGR R FRQ OD DXWRULGDG GH SORPHUD ORFDO.

**PELIGRO:** Existe la posibilidad de que se produzca una quemadura con agua caliente si la temperatura del agua es demasiado alta. Los hogares donde haya niños pequeños, personas incapacitadas o mayores podrán requerir una FRQ¿JXUDFLYQ GH WHPSHUDWXUD GH 120 (49 &)) R LQIHULRU, D ¿Q GH HYLWUDU HO FRQWDFWR FRQ HO DJXD &\$/17{.

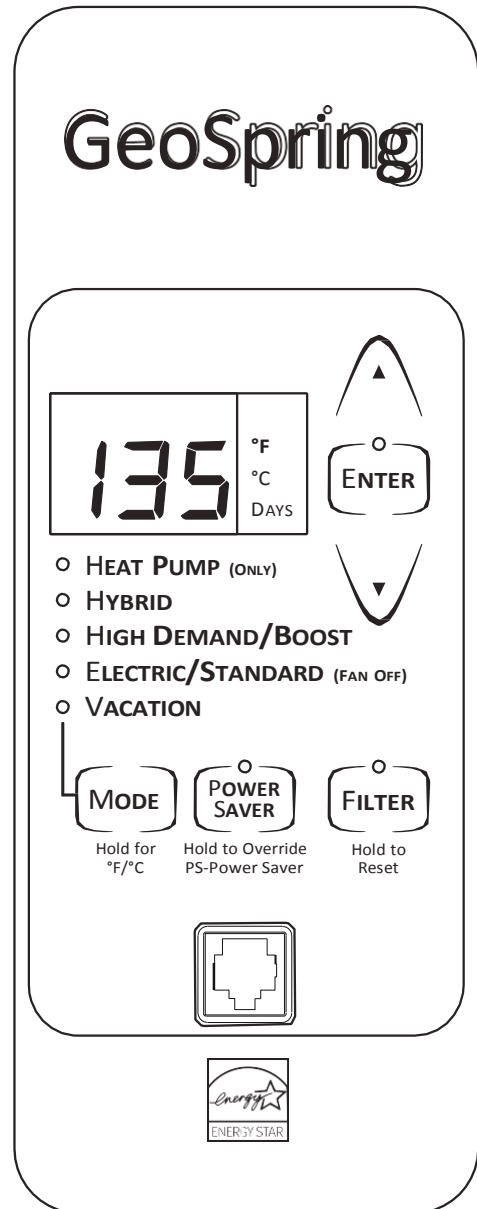
## Para Ajustar la Temperatura

6LJD HVWRV SDVRV:

- 3UHVLROH OD AHFKD KDFLD \$55,%\$ R \$%-2 HQ OD WHFOD GH SDQHO GH FRQWURO KDVWD OD WHPSHUDWXUD GHVHDGD.
- 3UHVLROH (17(5 (QJHVDU) SDUD DFHSWU OD QXHYD FRQ¿JXUDFLYQ.

**Nota:** 3DUD FDPDLU GH D &, PDQWHQJD SUHVLRODGD OD WHFOD O2' (ORGR).

**PELIGRO:** Existe la posibilidad de que se produzca una quemadura con Agua Caliente si la temperatura del agua está configurada demasiado alta. Se recomienda un punto de ajuste de temperatura del agua de 120°F (49°C) pero podrá ser ajustado a cualquier temperatura entre 100°F y 140°F (38°C y 60°C)



(VWH FDOHQWDGRU GH DJXD IXQFLRQD SRU GHIHFWR HQ HO PRGR GH IXQFLRQDPLHQWR +tEULGR. /RV PRGRV GLVSRQLEOHV ¿JXUDQD FRQWLQXDfLyQ\ SXHGHQ VHU VHOHFLRQDGRV XVDQGR HO ERWyQ O2'( (ORGR).

### Modo Heat Pump (only) (Bomba de Calentamiento solamente)<sup>3</sup>5(&20(1'2 3\$5\$ 81 0È;,02 \$+2552

+HDW 3XPS (RQO\ ) (%RPED GH &DOHQWDPLHQWR VRODPHQWH) HV HO PRGR PiV H¿FLHQWH GH XVR GH OD HQHUJtD HQ HVWH FDOHQWDGRU GH DJXD. 7RPD FDORU GHO DLUH FLUFXQGDQWH SDUD FDOHQWUDU HO DJXD. (O WLHPSR TXH WRPD FDOHQWUDU HV DJXD HV PiV SURORQJDR HQ HVWH PRGR, GH PDQHUR TXH SRGUi QR VHU VX¿FLHQWH VL WLHQH XQD VLWXDFLyQ GH DOWD GHPDQGD WDO FRPR XQ KRJDU R HPSUHVD JUDQGH.

### Modo Híbrido

+EULG ORGH (ORGR +tEULGR) FRPELQD OD HILFLHQFLD GH OD HQHUJtD GH OD %RPED GH &DOHQWDPLHQWR (VRODPHQWH) FRQ OD YHORFLGDG \ HQHUJtD GH UHFVSHUDfLyQ GHO PRGR (OHFWULF (JDQ RII) /6WDQGDUG (JDQR II) ((OpFWULFR FRQ YHQWLODGRU DSDJDR / (VWiQGDU FRQ YHQWLODGRU DSDJDR) HQ OD PD\RUtD GH OD VLWXDFLRQH GH XVR GHO DJXD. +EULG ORGH (ORGR +tEULGR) SHUPLWLUI TXH OD XQLGDG IXQFLRQH FRPR XQ FDOHQWDGRU GH DJXD HO OpFWULFR HVWiQGDU, PLHQWUDV EULQGD VLQLLFDWLRYV DKRUURV GH HQHUJtD.

**NOTA:** (O UHQGLPLHQWR GH OD XQLGDG, HO FRQVXPR \ DKRUUR GH HQHUJtD LQJRUPLDGRV HVWiQ EDVDGRV HQ HO IXQFLRQDPLHQWR HQ +EULG ORGH (ORGR +tEULGR) HQ XQD FRQ¿JUDfLyQ GH WHPSHWDWXUD GH 135° ) (57° &).

### Alta Demanda/ Incremento

(VWH PRGR SXHGH VHU QHFHVDULR VL HO XVR GH DJXD HQ VX KRJDU VXSHUD HO QLYHO SURPHGLR R VL HO UHQGLPLHQWR GH OD XQLGDG HV LQIHULRU D ODV GHPDQGDV GH DJXD GH VX KRJDU. (Q HVWH PRGR, OD XQLGDG XVDUI ORV HOHPHQWRV GH FDOHQWDPLHQWR HO OpFWULFRV VyOR FXDQGR HO QLYHO GH GHPDQGD GH DJXD VHD DOWR. \$O XVDU ORV HOHPHQWRV GH FDOHQWDPLHQWR, OD WHPSHWDWXUD GHO DJXD VH UHFVSHUDUI HQXQ QLYHO PiV DOWR SHUR XVDUI PiV HQHUJtD SDUD FDOHQWUDU OD PLVPD. \$ GLIHUHQFLD GHO PRGR (OpFWULFR / (VWiQGDU (9HQWLODGRU DSDJDR), pVWH XVDUI ORV HOHPHQWRV GH FDOHQWUDfLyQ VyOR FXDQGR VHD QHFHVDULR, \ XVDUI OD ERPED GH FDOHQWDPLHQWR FXDQGR ORV QLYHOV GH GHPDQGD GH DJXD VHDQ LQIHULRUHV.

**NOTA:** /D GLIHUHQFLD HQWUH +EULG ORGH (ORGR +tEULGR) \ \$OWD 'HPDQGD / ,QFUHPHQWR HV TXH HQ HVWH -OWLPR ORV HOHPHQWRV GH UHVLVHQFLD GHO FDORU VRQ DFWLYDGRV DQWHV TXH HQ HO ORGR +tEULGR.

### Modo Eléctrico/ Estándar (Ventilador apagado)

(VWH PRGR XWLQD VyOR ORV HOHPHQWRV GH UHVLVHQFLD GH FDORU VXSHULRU H LQIHULRU SDUD FDOHQWUDU HO DJXD. (O WLHPSR TXH WRPD FDOHQWUDU HO DJXD HV LQIHULRU HQ HVWH PRGR, SHUR HV HO PRGR GH O(125 H¿FLHQFLD GH HQHUJtD.

**NOTA:** (Q HVWH PRGR, OD OX] GH /(' YHUGH WLWLODUI OXHJR GH 48 KRUDV FRPR LQGLDFLyQ GH TXH OD XQLGDG QR HVWi IXQFLRQDQGR HQ HO PRGR GH HQHUJtD PiV H¿FLHQWH. /D XQLGDG FRQLQXDUI RSHUDQGR HQ HVWH PRGR \ QR LQGLFD XQ SUREOHPD GH IXQFLRQDPLHQWR.

### Vacaciones

(VWD IXQFLYQ HV XVDGD FXDQGR HVWUDUI IXHUD GHO KRJDU SRU XQ SHUtrGR GH WLHPSR SURORQJDR \ HO DJXD FDOHQWH QR HV QHFHVDULD. (Q HVWH PRGR, OD XQLGDG KDUi TXH OD WHPSHWDWXUD GHO DJXD GHVFLHQGD D 50° ) (10° &) \ XVDUI HO PRGR GH FDOHQWDPLHQWR PiV H¿FLHQWH SDUD FRQVHUYDU OD HQHUJtD PLHQWUDV HO FDOHQWDGRU TXHGD HQ GHVXVR. /D XQLGDG UHLQLFDUI HO FDOHQWDPLHQWR GH IRUPD DXWRPiWLFDXQGDQWHV GH VX UHUJHR, GH PRGR TXH KD\D DJXD FDOHQWH GLVSRQLEOH.

3RU HMHPSOR: VL HVWUDUI IXHUD GXUDQWH 14 GtDV, VLJD HVWRV SDVRV:

1. 6HOHFLRQH 9\$&\$7,21 (9DFDLRQH) XWLQDQGR HO ERWyQ ORGH (PRGR).
2. ,QUHVH HO WRWDO GH GtDV TXH QR HVWUDUI (HQ HVWH HMHPSOR, 14) SUHVLRQDGR HO ERWyQ FRQ OD ÀHFKD KDFLD \$5\$,%\$ (SRU RPLVLYQ HV 7 GtDV).
3. 3UHVLRQH (17/5 (,QUHVDU).

/D XQLGDG KDUi TXH OD WHPSHWDWXUD GHO DJXD GHVFLHQGD D 50° ) (10° &) SRU XQ GtD PHQRV TXH DTXHOORV TXH QR HVWUDUI (HQ HVWH HMHPSOR: SRU 13 GtDV). \$O ¿QDO GHO GtD DQWHV GH VX UHUJHR (HQ HVWH HMHPSOR, HO GtD 13°), DXWRPiWLFDPHQWH UHUJHVDUI OD PRGR GH IXQFLRQDPLHQWR SUHYLR \ FDOHQWUDUI HO DJXD HQ OD FRQ¿JUDfLyQ GH WHPSHWDWXUD RULJLQDO, GH PRGR TXH KD\D DJXD GLVSRQLEOH FXDQGR UHUJHVH.

### Para acceder a cualquiera de estos modos::

1. 3UHVLRQH HO ERWyQ O2'( (ORGR) HQ HO FRQUORO KDVWD HO PRGR GH IXQFLRQDPLHQWR GHVHDGR.
2. /D OX] YHUGH HVWUDUI LOXPLQGD HQ HO PRGR HOHJLGR.

# Preguntas Frecuentes.

## Filtro:

3: €3RU TXp KD\XQ ¿OWUR"

5: (O ORV PRGRV +EULGR \ %RPED GH &DOHQWDPLHQWR (VRODPHQWH), OD XQLGDG PXHYH DLUH D WUDYpV GHO VLVWHPD. (O ¿OWUR SURWHJH OD XQLGDG GH OD VXFHGDG. (O ¿OWUR GH DLUH OLPSLR PHMRUD HO UHQGLPLHQWR.

3: €&yPR VH OLPSLD HO ¿OWUR"

5: 'HMH HOHQFHQGLGRDFWLYDGR \ UHWLUHO ¿OWUR GH ODSDUWHVXSHULRU GH OD XQLGDG. (O ¿OWUR SXHGH VHU DVSLUDGR R HQMXDJDGR FRQ DJXD WLELD. €8Q ¿OWUR VXFRL UHGXFUj HO UHQGLPLHQWR GHO DJXD FDOHQWH!

## Modos:

3: €4Xp HV %RPED GH &DOHQWDPLHQWR (VRODPHQWH)"

5: %RPED GH &DOHQWDPLHQWR (VRODPHQWH) HV HO PRGR PiV H¿FLHQWH. 7RPD FODRU GHO DLUH SDUD FDOHQWU HO DJXD, SRU FRQLJLHQWH HQJLDQGR HO DLUH FLUFXQGDQWH. 5HFSSHUFLYQ PiV OHQWDSHUR PRGR PiV H¿FLHQWH.

3: €4Xp HV +EULGR"

5: (O PRGR +EULGR FRPELQD EHQH¿FLRV GH OD %RPED GH &DOHQWDPLHQWR (VRODPHQWH) FRQ OD YHORFLGDG \ HQHUtD GHO PRGR (OpFWULFR (VWiQGDU. (VWR EULQGD JUDQ UHQGLPLHQWR FRQ PHQRU FQWLGDG GH HQHUtD.

3: €4Xp HV \$OWD 'HPDQGD/ ,QFUHPHQWR"

5: \$OWD 'HPDQGD/ ,QFUHPHQWR VH SXHGH XWLOLJDU FXDQGR HO XVR GH DJXD FDOHQWH VHD VXSHULRU DO QRUPDO. /D XQLGDG VHUj PHQRV H¿FLHQWH SHUR FDOHQWUj DJXD PiV UjSLGR HQ UHVSXHVVWD D HQWUJJDV GH DJXD SURORQJGDV. 3DUD WRGDV ODV HQWUJJDV QRUPDOHV, OD XQLGDG D~QXVUj OD %RPED GH &DOHQWDPLHQWR H¿FLHQWH OD PD\RU SDUWH GHO WLHPSR.

3: €4Xp HV HO PRGR 9DFDFLRQHV"

5: 6LQR HVWUj SRU XQSHUtRGR SURORQJDGR, HVWH PRGR UHGXFH OD WHPSHUDWXUD GHO DJXD D ¿Q GH UHGXFU OD HQHUtD XVDGD. /D XQLGDG FDELDUj DO PRGR SUHYLR XQ GtD DQWHV GH VX UHJHVR.

3: €4Xp HV (OpFWULFR/ (VWiQGDU (9HQWLODGRU DSDJDGR)"

5: (O PRGR (OpFWULFR/ (VWiQGDU (9HQWLODGRU \$SDJDGR) XVD VRODPHQWH OD UHVLVWHQFLD SDUD FDOHQWU HO DJXD. (VWR EULQGD XQ UHFSSHUFLYQ GH DJXD FDOHQWH PiV UjSLGD TXH HO PRGR +EULGR, SHUR XVD PiV HQHUtD. (VWH PRGR IXQFLRQD VLQ HO YHQWLODGRU, GHWHQLHQGR HO DLUH IUtR QRUPOPHQWH GHVFDUJDGR GXUDQWH HO IXQFLRQDPLHQWR GH OD ERPED GH FDOHQWDPLHQWR.

3: €3RU TXp WLWLOD HO /('YHUGH (OpFWULFR/ (VWiQGDU (9HQWLODGRU DSDJDGR)"

5: (QHVVH PRGR, OD OX)/('YHUGH WLWLOD Uj OXHJR GH 48 KRUDV FRPR LQGLFDLYQ GH TXH OD XQLGDG QR HVWUj IXQFLRQDQGR HQ HO PRGR GH HQHUtD PiV H¿FLHQWH

## Funcionamiento:

3: €3RU TXp SXHGR HVFXFKDU OD XQLGDG IXQFLRQDU"

5: (Q ORV PRGRV GH PD\RU H¿FLHQFLD GH OD HQHUtD, +HDW 3XPS (RQ\ (%RPED GH &DOHQWDPLHQWR VRODPHQWH), \ +LJK 'HPDQGD/ %RRVW (\$OWD 'HPDQGD/ ,QFUHPHQWU), HO PpWRGR XWLOLJDGR SDUD FDOHQWU HO DJXD XVD XQ YHQWLODGRU TXH VH SXHGH HVFXFKDU PLHQWUDV IXQFLRQD.

3: /D ERPED GH FDOHQWDPLHQWR QR HVWUj IXQFLRQDQGR GXUDQWH HO SHUtRGR GH WLHPSR QRUPDO. €4Xp RFDVLRQD HVWUj"

5: %DMR FLHUWUDV FRQGLFRQH, HO &DOHQWDGRU GH \$JXD +EULGR \*HR6SULQJCE IXQFLRQDUj XVDQGR ORV HOHPHQWRV HO PFWULFRV HQ OXJDU GH OD ERPED GH FDOHQWDPLHQWR, D ¿Q GH SURWHJHU OD XQLGDG \ DVHJXUD TXH XVWHG FXHQWH FRQ DJXD FDOHQWH. (VWDV FRQGLFRQH VLFQ\HQ XQD WHPSHUDWXUD DPELHQWH H[WUHPDGDPHQWH IUtD (<45°C)), WHPSHUDWXUD DPELHQWH H[WUHPDGDPHQWH FDOHQWH (<120°C)), R FRQGLFRQH FRQ QLYHO GH YROWDMH P\ EDMR. /D XQLGDG UHJHVDUj DO IXQFLRQDPLHQWR QRUPDO FXDQGR ODV FRQGLFRQH OR SHUPLWDQ

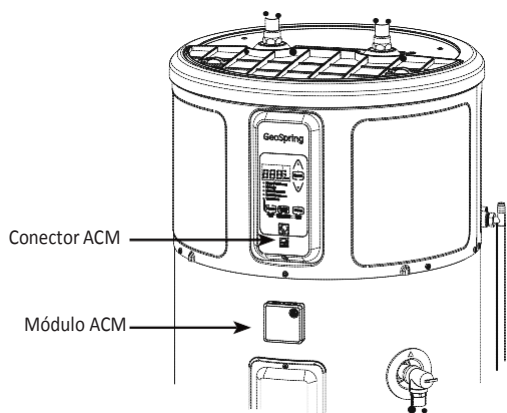
(O FDOHQWDGRU GH DJXD +tEULGR (OpFWULFR FRQ ERPED GH FDOHQWDPLHQWR HV FRPSDWLEOH FRQ **el módulo de comunicación del Artefacto Inteligente de GE**, HO FXDO SXHGH VHU DGTXLULGR HQ IRUPD DSDUWH. &RPXQtTXHVH FRQ VX VHUYLFLR ORFDO R YLVLWH ZZZ. \*(\$SOLDQFHV.FRP/ **Smart-Appliance** SDUD YHUL¿FUD VL HQ VX iUHD VH HVWi XLWOL)DQGR OD WHFQRORJtD **ACM** \$SOLFUD HO \$&O SHUPLWH TXH OD XQLGDG UHVSROGD D VHXDOHV GHO VHUYLFLR R TXH VH DGKLUHD D XQD UHG KRJDUHXD.

/DV VLJXLHQWHV FUDFWHUHVWLFDV GH UHVSXHVWD D GHPDQGDV SRGUiQ HVWUDU GLVSRQLEOHV FRPR SDUWH GH XQ SURJUDPD GH HYDOXDFLYQ SLORWR, GRQG OD FRPSDxtD ORFDO GH VHUYLFLRV S~EOLFRV D\XGD D ORV FRQVXLGRUHV D UHGFLU HO ULHVJR GH SLFRV GH HOHFWULFLGDG HQ HO XVR KRJDUHXR.

**INSTALACIÓN**

(O PRGXOR \$&O HVWi HTXLSDGR FRQ LPDQHV HQ OD EDVH GHO PyGXOR, ORV FXDOHV SHUPLWLUI TXH HVWp DGKULGR DO H[WULRU PHWiOLFR SLQWDGR GHO FDOHQWDGRU GH DJXD GH OD ERPED GH FDOHQWDPLHQWR.

/RV GHWDOOHV VREUH FyPR FRQHFWDU ORV FDEOHV DO PyGXOR VH HQFXHQWUDQ HQ ODV LQVWUXFLRQHV LQFOXGDV FRQ HO PyGXOR.



8QD YH] TXH HO FDEOH GHO PyGXOR \$&O HVWi HQFKXIDGR D OD FRQH[LyQ GHO FDOHQWDGRU GH DJXD, VLJD ODV LQVWUXFLRQHV GH FRQH[LyQ LQFOXGDV FRQ HO PyGXOR \$&O. 7DQ SURQWR FRPR HO PyGXOR \$&O HVWp HQ IXQLRQDPLHQWR, HO FDOHQWDGRU GH DJXD GH OD ERPED GH FDOHQWDPLHQWR HVWUDU OLVWR SDUD UHFLELU ODV VHXDOHV GH \$&O.

**GUÍA RÁPIDA**

6L VX HPSUHVD ORFDO GH VHUYLFLRV S~EOLFRV HVWi XLWOL)DQGR WHFQRORJtD \$&O, HO PyGXOR \$&O UHFLELUi ODV VHXDOHV HQYLDGDV GH VX HPSUHVD GH VHUYLFLRV S~EOLFRV. 8QD GH ODV FXDWUR VHXDOHV VHUi HQYLDGD:

- %DMRµ (UHSUHVHQWD HO QLYHO GH FRVWR GH HQHUJtD PIV EDMR GLVSRQLEOH)
- °HGLRµ (UHSUHVHQWD HO QLYHO GH FRVWR GH HQHUJtD LQFUHPHQWDGR)
- \$OWRµ (UHSUHVHQWD HO QLYHO GH FRVWR GH HQHUJtD LQFUHPHQWDGR)
- &UtWLFµ (UHSUHVHQWD HO QLYHO GH FRVWR GH HQHUJtD 'SLFRµ)

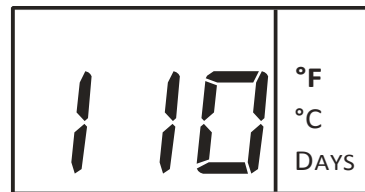
8Q FDOHQWDGRU GH DJXD FRQ ERPED GH FDOHQWDPLHQWR HTXLSDGR FRQ XQ PyGXOR \$&O UHFQRFHUi GH IRUPD DXWRPiWLFD TXp QLYHO GH FRVWR GH HQHUJtD HVWi GLVSRQLEOH \ DMXVWUi VX FRQ¿JXUDFLYQ GH PRGR \ WHPSHUDWXUD. D ¿Q GH XVDU PHQRV HQHUJtD FXDQGR ORV tQGLFHV VHDQ PHGLR, DOWR \ FUtWLF. &XDQGR HO FDOHQWDGRU GH DJXD GH OD ERPED GH FDOHQWDPLHQWR UHVSROGD D HVWUDV VHXDOHV, OD OX] GH /(' VREUH HO ERWyQ 3RZHU 6DYHU (\$KRUUR GH (QHUJtD) HVWUDU HQFHQGLGD, LQGLFDQGR TXH ORV SHUtrGRV GH SUHFLRV GH HQHUJtD WLHQHQ HHHFR, \ ODV OHWUDV 36 DSDUHFHUiQ HQ OD SDQWDOOD GH /(' VL HO XVXDULR LQWHQWD FDELDU OD WHPSHUDWXUD VLQ SUHVLRQDU SULPHUR HO ERWyQ SDUD DQXODU 3RZHU 6DYHU (\$KRUUR GH (QHUJtD).

&XDQGR OD VHXDO HVWp EDMD R FXDQGR QR KD\D LQJ~Q PyGXOR \$&O FRQHFWDGR, OD XQLGDG IXQLRQDUi QRUPDPHQWH. /RV VLJXLHQWHV SDVRV PXHVWUDQ FyPR OD XQLGDG UHFDFLRQD D ORV QLYHOHV GH VHXDO OHGLR, \$OWR \ &UtWLF.

&XDQGR OD VHXDO GH \$&O HVWi HQ **Medium (Medio)**, HO FRQWURO IXQLRQDUi HQ HO ORGR +HDW 3XPS (RQO\)(%RPED GH &DOHQWDPLHQWR VRODPHQWH) \ OD WHPSHUDWXUD GHO DJXD SHUPDQHFHUi HQ OD FRQ¿JXUDFLYQ GH XVXDULR QRUPDO. 6L OD FRQ¿JXUDFLYQ GH WHPSHUDWXUD DFWXDO GHO XVXDULR HV GH 120°F), OD SDQWDOOD H[KLELUi:



&XDQGR OD VHXDO \$&O HVWp HQ **High (Alto)**, HO FRQWURO IXQLRQDUi HQ +HDW 3XPS (RQO\) %RPED GH &DOHQWDPLHQWR VRODPHQWH, FRQ XQD FRQ¿JXUDFLYQ GH WHPSHUDWXUD GHO DJXD GH 110°F) (43°F &) \ HQ OD SDQWDOOD VH YLVXDOL]DUi:



&XDQGR OD VHXDO \$&O HVWp HQ **Critical (Crítico)**, HO FRQWURO IXQLRQDUi HQ +HDW 3XPS (RQO\) %RPED GH &DOHQWDPLHQWR VRODPHQWH, FRQ XQD FRQ¿JXUDFLYQ GH WHPSHUDWXUD GHO DJXD GH 100°F) (38°F &) \ HQ OD SDQWDOOD VH YLVXDOL]DUi:



**\$YLV:** /D FRQH[LyQ \$&O GHO DUWHDFWR FXHQWD FRQYROWDMHQR FRPSDWLEOH FRQ FRPSXWDGRUDV R DFFHVRLRV. 12 HQFKXIH ODSWRSV, PRGHPV, URXWHUV, HWF. HQ HO FRQWHFWRU \$&O GHO (OHFWURGRPvWLF 5-45. 8VH VyOR FRQ ORV \$FFHVRLRV GHO \$UWHDFWR GH \*( GHVLQDGRV. /D FRQH[LyQ D FRPSXWDGRUDV \ DFFHVRLRV SRGUi UHVXOWDU HQ GDxRV VREUH HO SURGFWR.

&XDQGR OD XQLGDG HVWp IXQLRQDQGR HQ PHGLR, DOWR R FUtWLF, OD SDQWDOOD GH /&' VREUH HO ERWyQ 3RZHU 6DYHU (\$KRUUR GH (QHUJtD) HVWUDU LOXPLQDGD. 6L HQ FXDOTXLHU PRPHQR GHVHD FDELDU HO SXQRV GH DMXVWH GH OD WHPSHUDWXUD PLHQWUD OD XQLGDG VH HQFXHQWUD HQ HO PRGR 3RZHU 6DYHU (\$KRUUR GH (QHUJtD), PDQWHQD SUHVLRQDGR HO ERWyQ \$KRUUR GH (QHUJtD) SDUD DQXODU GLFKR PRGR; OXHJR XVH ORV ERWRQHV FRQ ÆHFQV SDUD FDELDU D OD FRQ¿JXUDFLYQ GHVHDGD. /D DQXODFLYQ VH DSOLFUDU GXUDQWH 18 KRUDV. 6L LQWHQWD FDELDU OD WHPSHUDWXUD VLQ DQXODU OD IXQLRQDUi GH DKRUUR GH HQHUJtD, VH YLVXDOL]DUi ODV OHWUDV 36 HQ OD SDQWDOOD, LQGLFDQGR TXH D~Q VH HQFXHQWUD HQ HO PRGR GH DKRUUR GH HQHUJtD.



## Cuidado y limpieza.

5XWLQD GH 0DQWHQLPLHQWR 3UHYHQWLYR

**⚠ PELIGRO:** Riesgo de quemaduras - Antes de *XWLQD* PDQXDOPHQWH OD YIOYXOD GH DOLYLR, DVHJ~UHVH GH TXH QDGLH esté expuesto al peligro de tener contacto con el agua caliente OLEHUDGD SRU OD YIOYXOD. (V SRVLEOH TXH HO DJXD HVWp OR VX¿FLHQWHPHQWH FDOLHQWH FRPR SDUD FUHDU ULHVJR GH TXHPDGXUDV. (O DJXD GHEHUtD VHU OLEHUDGD D WUDYpV GH XQ GUHQDMH DGHFxDGR, D ¿Q GH HYLWDU OHVLRQHVR GDxRV VREUH OD SURSLHGDD.

127\$: 6L OD YIOYXOD GH WHPSHUDWXUD \ OLEHUDFLYQ GH SUHVLYQ HQ HO calentador de agua caliente se descarga periódicamente, esto se podrá deber a la expansión térmica en un sistema de agua cerrado. Para obtener información sobre cómo corregir esto, FRPXQtTXHVH FRQ XQ SURYHHGRU GH DJXD R FRQ XQ FRQWUDWLWVD GH SORPHUd. 1R HQFKXIH OD ¿FKD GH OD YIOYXOD GH DOLYLR.

6L VH PDQWLHQH FRUHFWDPHQWH, HO FDOHQWDGRU GH DJXD EULQGDUI DxRV GH VHUYLFLR VLQ SUREOHPDV.

6H VXJLHUH TXH HO XVXDULR HVWDEOH]FD \ VLJD XQ SURJUDPD GH PDQWHQLPLHQWR SUHYHQWLYR HQ IRUPD UXWLQDULD.

**9IOYXOD GH 7HPSHUDWXUD \ \$OLYLR GH 3UHVLYQ:**

3RU OR PHQRV XQD YH] DO Dxr, OHYDQWH \ OLEHUH OD PDQLMD GH OD SDODQFD GH OD YIOYXOD GH WHPSHUDWXUD \ DOLYLR GH SUHVLYQ, XELFDGD HQ HO iUHD IURQWDO GHUHFKD, D ILQ GH DVHJUDU TXH OD YIOYXOD IXQFLRQH OLEUHPHQWH. 'HMH TXH FRUUDQ YDULRV JDORQH V WUDYpV GH OD OtQHD GH GHVFDUJD KDVVD XQ GUHQDMH DELHUWR.

## Drenaje del Calentador de Agua

**⚠ PRECAUCIÓN:** Riesgo de descarga - Cierre el encendido del calentador de agua antes de drenar el agua.

**⚠ PELIGRO:** Riesgo de quemaduras - Antes de *XWLQD* PDQXDOPHQWH OD YIOYXOD GH DOLYLR, DVHJ~UHVH GH TXH nadie esté expuesto al peligro de tener contacto con el agua FDOLHQWH OLEHUDGD SRU OD YIOYXOD. (O DJXD GUHQDGD GH WDQTXH SRGUi HVWDU OR VX¿FLHQWHPHQWH FDOLHQWH FRPR SDUD SUHVHQWDU un riesgo de quemadura y debería ser dirigida a un drenaje DGHFxDGR D ¿Q GH HYLWDU OHVLRQHVR R GDxRV.

## Opciones de Períodos de Cierre Extendidos o Vacaciones que Superan el Modo de Vacaciones

6L HO FDOHQWDGRU GH DJXD SHUPDQHUI LQDFWLYR SRU XQ SHUtRGR GH WLHPSR H[WHQGLGR, HO HQFHQGLGR \ HO DJXD KDFLD HO HOHFWRGRpVWLFR GHEHUtD VHU DSDJDGRV SDUD FRQVHUYDU OD HQUHUtD \ HYLWDU OD DFXPXODFLYQ GH JDV KLGUyJHQR SHOLJURVR. /D XQLGDG QR FXHQWD FRQ XQ ERWyQ GH HQFHQGLGR; VyOR SXHG VHU DSDJDGD FRQ HO GLV\XQWRU R OD ILFKD GH GHVFRQH]LYQ.

(O FDOHQWDGRU GH DJXD \ OD WXEHUtD GHEHUtD VHU GUHQDGRV HQ FDVR GH TXH SXGLHUDQ HVWDU VXMHWDV D WHPSHUDWXUDV EDMR FHUR.

/XHJR GH XQ SHUtRGR GH FLHUH SURORJDGR, HO IXQFLRQDPLHQWR \ ORV FRQWUROHV GH FDOHQWDGRU GH DJXD GHEHUtD VHU FRQWURODGRV

## Inspección Periódica (XQD YH] SRU Dxr):

,QFOXVR VH UHFRLHQGD XQD LQVSHFFLYQ SHULyGLFD GH ORV FRQWUROHV GH IXQFLRQDPLHQWR, HOHPHQWRV GH FDOHQWDPLHQWR \ FDEOHGR SRU SDUWH GH SHUVRQDO FDOLILFGR GH VHUYLFLR WpQLFR HQ UHSDUFLRQH GH DUWHDFWR HOPFWULFR.

/D PD\RUtD GH ORV DUWHDFWRV HOPFWULFRV, LQFOXVR FXDQRV VRQ OXHVRV, UHDOL]DQ FLHUWRV VRQLGRV FXDQRV HVWpQLFR HQ IXQFLRQDPLHQWR. 6L HO QLYHO GH VRQLGR GH VLVHR R FDQRV VH LQFUHPHQWD GH IRUPD H[FHVLYD, HV SRVLEOH TXH VH UHTXLHUD XQD OLP]D]D GH HOHPHQWRV GH FDOHQWDPLHQWR HOPFWULFR. &RPXQtTXHVH FRQ XQ LQVWDODGRU R SORPHUR FDOLILFGR SDUD TXH VH UHDOLFH XQD LQVSHFFLYQ.

## Purga del Tanque

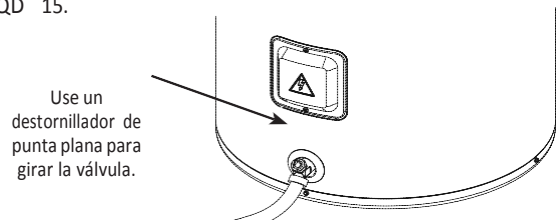
(O WDQTXH GH XQ FDOHQWDGRU GH DJXD SXHG IXQFLRQD FRPR XQ GHSyVLR GH VHGLPHQWDFLYQ SDUD VyQLGRV VXVSHQGLGRV HQ HO DJXD. 3RU OR WDQRV, QR HV H[WDxR TXH VH DFXPXOH GHSyVLRV GH DJXD GXUD HQ HO IRQRG GH WDQTXH. 3DUD HOLPLQDU GLFKRV GHSyVLRV GH WDQTXH, VLJD HVWRV SDVRV:

1. \$GMXQWH XQD PDQJHUD GH MDUGtQ D OD YIOYXOD GH GUHQDMH XELFDGD HQ OD SDUWH LQIHULRU GH OD XQLGDG \ GLULMD GLFKD PDQJHUD KDVVD HO GUHQDMH.
2. \$EUD OD YIOYXOD GH GUHQDMH FRQ XQ GHVWRUQLODGRU SODQR.
3. 8QD YH] TXH YDULRV FXDUWRV GH DJXD KD]DQ VLGR GUHQDGRV, FLHUH OD YIOYXOD GH GUHQDMH.

(VWR GHEHUtD VHU UHDOL]DGR FRQ HO VXPLQLVUR GH DJXD IUtD DELHUWR, GH PRGR TXH HO DJXD HOLPLQDGD D WUDYpV GH OD YIOYXOD GH GUHQDMH VHD UHHPSOD]DGD, \ TXH HO IOXMR GH VXPLQLVUR GH DJXD D\XGD HOLPLQDU VHGLPHQWRV.

3DUD GUHQDU HO FDOHQWDGRU GH DJXD, VLJD HVWRV SDVRV:

1. \$GMXQWH XQD PDQJHUD GH MDUGtQ D OD YIOYXOD GH GUHQDMH XELFDGD HQ OD SDUWH LQIHULRU GH OD XQLGDG \ GLULMD GLFKD PDQJHUD KDVVD HO GUHQDMH.
  2. &LHUH HO VXPLQLVUR GH DJXD IUtD.
  3. 3HUPLWD HO LQJHVVR GH DLUH DO WDQTXH DEULHQGR XQ JULIR GH DJXD FDOLHQWH R OHYDQWDQR OD PDQLMD GH OD YIOYXOD GH DOLYLR.
  4. \$EUD OD YIOYXOD GH GUHQDMH FRQ XQ GHVWRUQLODGRU SODQR.
- 1RWD: 3DUD FRQRFHU HO GLVxR HVTXHPiWLFR GH SURGXFWR, FRQVXOWH OD SIJLQD 15.



## Limpieza del Filtro

(Q ORV PRGRV +)EULG (+tEULGR), +HDW 3XPS (RQO) (%RPED GH &DOHQWDPHQWR VRODPHQWH) \ +LJK 'HPDQG/%RRVW {SOWD 'HPDQGD/ ,QFUIHPHQWU), HO FDOHQW DGRU PXHYH DLUH D WUDYpV GHO VLVVHPD \ KDFLD DIXHUD SRU OD SDUWH WUDVHUD GH OD XQLGDG. (O ILOWUR HVWÍ XELFDGR SDUD SURWHJHU DO HYDRUDGRU GH OD VXFLHGDG \ HO SROYR.

(V LPSRUWDQWH FRQWDU FRQ XQ ILOWUR GH DLUH OLPSLR SDUD REWHQHU HO PD\RU QLYHO GH HILFLHQFLD. 2FDVLRQDOPHQWH, HVVH ILOWUR GHEHUÍ VHU OLPSLDGR (PtQLPDPHQWH XQD YH) SRU Dxr). &XDQGR VH UHTXLHUD XQD OLPSLH]D GHO ILOWUR, OD OX) SRMD VREUH HO ERWYQ )LOWHU (ILOWUR) HVWDUÍ LOXPLQDGD \ VRQDUÍ XQ SLWLGR.

**NOTA:** 6L HO ILOWUR HVWÍ GHPDVLDR VXFLR, OD XQLGDG SDVDUÍ DXWRPÍWLFDPHQWH DO PRGR (OHFWULF (]DQRII) / 6WDQGDUG (]DQRII) ((OpFWULFR FRQ YHQWLODGRU DSDJDGR) / (VWÍQDUGU FRQ YHQWLODGRU DSDJDGR) \ ORV DKRUURV GH HQHUJD VH SHUGHUÍQ.

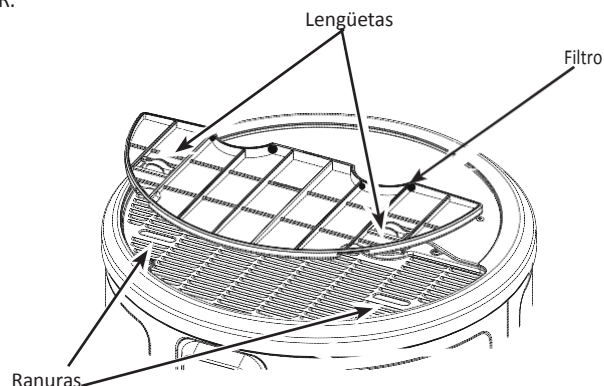
'HMH HO HQFHQGLGR DFWLYDGR. 5HWLUH HO ILOWUR GH OD SDUWH VXSHURLU GH OD XQLGDG. 3UHVLRQH GRV OHQWÍHWDUÍ \ OHYDQWH ODV PLVPDV SDUD UHWLUHU HO ILOWUR GH DLUH. 8QD YH] UHWLUJDGR, HO ILOWURSRGUi VHU DVSLUDGR OLPSLDGR FRQ XQD WHODK~PHGD R HQMXDJDR FRQ DJXD FDOHQWH.

8QD YH] TXH HO ILOWUR IXH OLPSLDGR \ VHFDR, SRGUi VHU UHHPD]DGR DOLQHDQGR HO PLVPR HQ ODV UDQXUDV HQ OD SDUWH VXSHURLU GH OD XQLGDG \

SUHVLRQDGR HO PLVPR KDFLD DEDMR KDVVD VX XELFDLYQ.

8QD YH] TXH HO ILOWUR OLPSLR IXH UHLQVWODGR, PDQWHQD SUHVLRQDGR HO ERWYQ **FILTR (Filtro)** 6L HO FLFOR GH FDOHQWDPHQWR HVWÍ DFWLYDGR FXDQGR VH UHLQFLD HO ILOWUR, VH FRQWLQXDUÍ HQ HO PRGR HO PFWULFR KDVVD ILQDOL]DU HO FLFOR. /XJR GH HVWR, VH SDVDUÍ GH IRUPD DXWRPÍWLFDO DO PRGR HQ HO FXDO HVWDEDQWHV GHVHU FDPELDGR.

**¡IMPORTANTE!** (O ILOWUR GHEHUÍ VHU OLPSLDGR FXDQGR VH PXHVWUH OD DODUD. 6L HO ILOWUR HVWÍ VXFLR, KDUÍ TXH HO VLVVHPD VH IXHUFH, VH UHGFLUI HO UHQGLPLHQWR \ HV SRVLEOH TXH HO VLVVHPD VH GDxH. \$ ILQ GH FRQWDU FRQ OD PHMRU HILFLHQFLD HQHUJpWLFDO SRVLEOH, DVH~UHVH GH TXH VX ILOWUR HVWp OLPSLR.

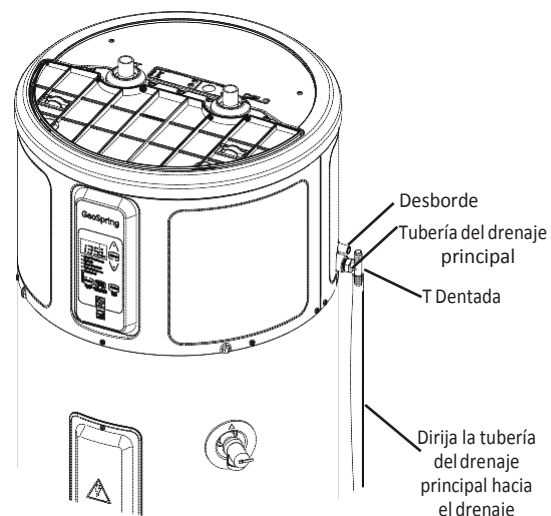


## Limpieza de la Tubería de Drenaje de Condensación

/D IXQFLYQ GHO GUHQDMH SULQFLSDO HV HOLPLQDU WRGD OD FRQGHQVDFLYQ. 6L HVWÍ REVWUXLGR, OD FRQGHQVDFLYQ VH GHVERUGDUÍ SRU HO WXER GH GUHQDMH \ KDFLD HO SLVR. (VWR FXPSOH OD IXQFLYQ GH QRWLLFDU DO VXVDULR GH TXH HO GUHQDMH SULQFLSDO HVWÍ DWDVDFGR. 5HWLUH HO GUHQDMH, OLPSLH FXDOTXLHU HVFRPEUR SUHVHQWH \ YXHOYD D FRORFDU HO PLVPR.

'H IRUPD SHULYGLFD, LQVSHFFLRQH ODV OtQHVDV GH GUHQDMH \ OLPSLH FXDOTXLHU HVFRPEUR TXH VH KD\ D UHFROHFWDGR HQ ODV OtQHVDV.

3DUD PÍV LQIRUPDFLYQ, FRQVXOWH ODV ,QVUXFFLRQHV GH ,QVWODDFLYQ.



## 6XSHU¿FLHV ([WHULRUHV

/YHVH ODV PDQRV VyOR FRQ DJXD FDOHQWH.

## Varilla del Ánodo

/D YDUOOD GHO iQRGR GHEHUÍ VHU UHWLUJDGD GHO WDQTXH GHO FDOHQW DGRU GH DJXD \ VHU LQVSHFFLRQDGD OXHJR GH XQ Pi [LPR GH 3 DxrV GH VHUYLFLR, OXHJR DQXDOPHQWH GHVGHVHV PRPHQR, \ GHEHUÍ VHU UHHPD]DGD FXDQGR PiV GH 6µ (15.2 FP) GH FDEOH GHO FHQWUR TXHGHQ H[SXVVDV HQ FDGD H[WUHPR GH OD YDUOOD.

127\$: (O DJXD DEODQDGD GH IRUPD DUWLILFLDO UHTXLHUH TXH OD YDUOOD GHO iQRGR VHD LQVSHFFLRQDGD GH IRUPD DQXD.

'HELGR D ULHVJRV GH GHVFDUJDV \ D ILQ GH HYLWDU JRWHRV GH DJXD DFFLGHQWDOHV, HVWLD LQVSHFFLYQ GHEHUÍ VHU UHDOL]DGD SRU XQ WpFQLFR

FDOLILFDR R SORPHUR, \ VH UHTXLHUH TXH HO VXPLQLVWUR GH DJXD IUÍ HVWp DSDJDGR DQWHV GH UHWLUHU OD YDUOOD GHO iQRGR.

\$9,62: 1R UHWLUH OD YDUOOD GHO iQRGR GHO WDQTXH GHO FDOHQW DGRU GH DJXD, H[FHSWR SDUD VX LQVSHFFLYQ \ R UHHPD]R, \D TXH HO IXQLRQDPLHQWR VLQ OD YDUOOD GHO iQRGR DFRUWDUÍ OD YLGD~WLOGHO WDQTXH YLWULILFDR \ DQXDUÍ OD FREHUWXUD GH OD JDUDQWtD.

(O FRQVXPR \ UHHPD]R GH OD 9DULOOD GHO ÈQRGR QR HVWÍQ FXELHUWRV SRU OD JDUDQWtD.

# ODQWHQLPLHQWR \ 6HUYLFLR 7pFQLFR GH OD 9DULOOD GH O ÈQRGR

## ⚠ PRECAUCIÓN - AVISO DE SEGURIDAD IMPORTANTE

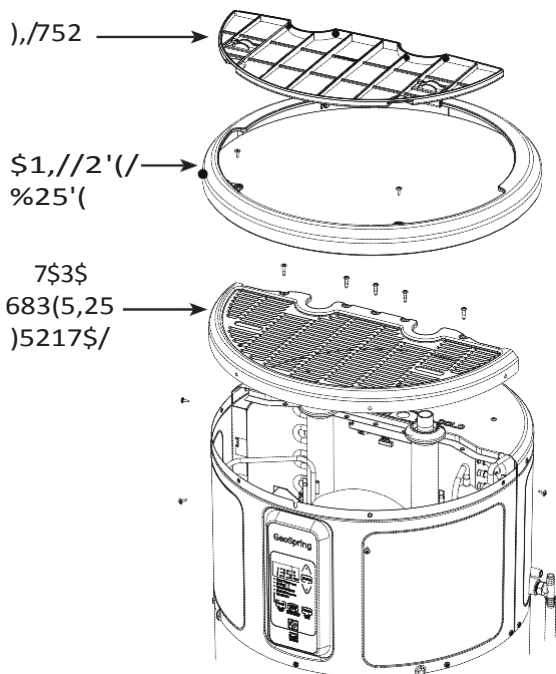
6H HVSHUD TXH HVVD LQIRUPDFLyQ VHD XVDGD SRU LQGLYLGXRV TXH SRVHDQ XQD H[SHULHQFLD DGHFxDGD D QLYHO HOpFWULFR, HOHFwUyQLFR \ PHFQLFR. &XDOTXLHU LQWHQWR GH UHSDUDU XQ HOHFwURGRppVWLFJR JUDQGH SRGUi SURGXFLU FRPR UHVXOWDGR OHVLRQH VSHUVRQDOHV \ GDxRV VREUH OD SURSLHGDG. (O IDEULFDQWH R YHQGHGRU QR VHUHQ UHVSROVDEOHV SRU OD LQWHUSUHWDLyQ GH HVVD LQIRUPDFLyQ, QL DVXPLUHQ FXDOTXLHU UHVSROVDELOLGDG HQ FRQH[LyQ FRQ VX XVR.

### Herramientas que necesitará:

- HVWRUQLOODGRU 3ODQR 720
  - HVWRUQLOODGRU SODQR
  - &LQWD
  - /ODYH SDUD 7RPDFRUULHQWH
  - ([WHQVLYQ GH 7RPDFRUULHQWH GH 12µ GH ORQLWXG
  - 7RPDFRUULHQWH GH 11/16µ
  - 6HOODGRU 6RIWVHW
  - 9DULOOD GH O ÈQRGR VL HV QHFHVVDULD
- \*3DUD DFFHGHU D LQVWUXFFLRQH SDUD RUGHQDU SLH]DV, FRQVXOWH OD SJJLQD 72.

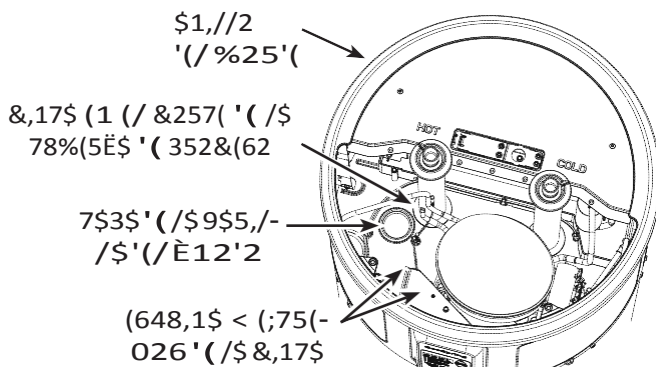
### To service the Anode Rod

1. HVFRQHFWH OD FRUULHQWH, FLHUH HO VXPLQVWUR GH DJXD, \ SDUFLDOPHQWH GUHQH XQR R GRV JDORQH V GH O FDOHQWDGRU GH DJXD D WUDYpV GH OD YIOYOD GH GUHQDMH LQIHULRU.
2. SHWLUH HO )LOWUR, HO \$LOOR GH O %RUGH, \ OD 7DSD 6XSHULRU )URQWDO FRPR VH PXHVWUD HQ OD **Ilustración A**.



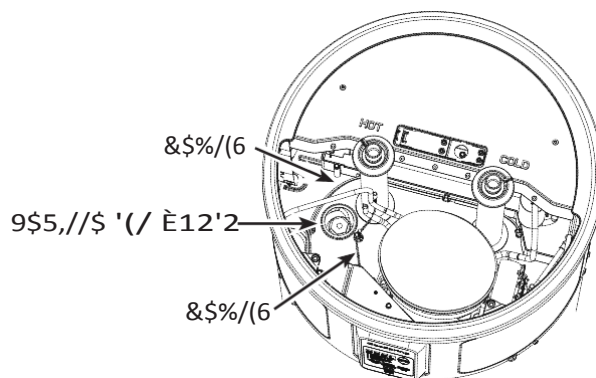
**Ilustración A**

3. SHLQVWDOH HO \$LOOR GH O %RUGH, FRORTXH XQD FDS SURWHFWURD GH FLQWD HQ ORV H[WUHPRV GH OD KRMD PHWOLFD, \ UHWLUH OD 7DSD GH OD 9DULOOD GH O ÈQRGR, FRPR VH PXHVWUD HQ OD **Ilustración B**.



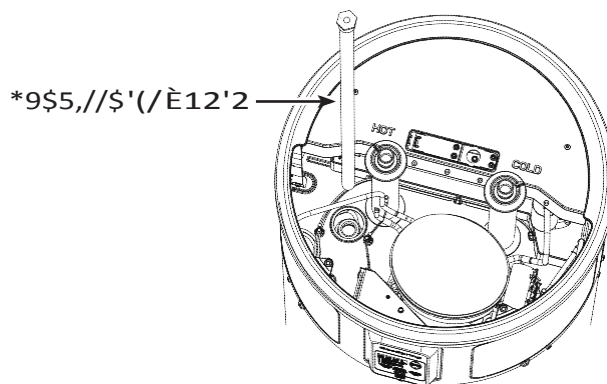
**Ilustración B**

4. 8WLOL]DQGR XQ GHVWRUQLOODGRU SODQR \ DVHJUDQGR HYLWDU GDxRV VREUH FDEOHV H[SHVWRV, UHWLUH OD JRPDHSVXPD SDUD GHVWDSDU OD 9DULOOD GH O ÈQRGR, FRPR VH PXHVWUD HQ OD **Ilustración C**.



**Ilustración C**

5. 8WLOL]DQGR XQ WRPDFRUULHQWH GH 11/6µ \ XQD H[WHQVLYQ, GHVWRUQLOOH OD 9DULOOD GH O ÈQRGR, OXHJR OHYDQWH OD PLVPD SDUD LQVSHFFLRQDU, FRPR VH PXHVWUD HQ OD LOXVWUDLyQ'.



**Ilustración D**

6. 3DUD LQVWDOU OD 9DULOOD GH O ÈQRGR, VHOOH ODV URVFDV FRQ 6HOODGRU 6RIW 6HW, HQRVTXH HQ HO SXHUWR \ XVH XQD OODYH GLQDPRppWULFD SDUD DMXVWUDU D 50" 5 SLHV SRU OLEUDV GH JLUR. 5HLQVWDOH OD 7DSD GH OD 9DULOOD GH O ÈQRGR.
7. \$EUD HO VXPLQVWUR GH DJXD, DEUD XQ JULIR SDUD UHWLUHU FXDOTXLHU DLUH TXH SXHGD KDEHU HQ HO VLVWHPD GH SORPHUtD, LQVSHFFLRQH TXH QR KD \ D SpUGLGDV, OXHJR HQFLHQGD OD FRUULHQWH \ YXHOYD D HQVDPEODU OD XQLGDG HQ RUGHQ LQYHUV, FRPR VH PXHVWUD HQ OD **Ilustración A**.



SO HOHJLU OD XELFDLYQ GHO FDOHQWDGRU GH DJXD VH GHEHUI WHQHU HQ FXHQWD OR VLXLHQWH:

## REGULACIONES DE INSTALACIÓN LOCALES

(VWH FDOHQWDGRU GH DJXD GHEHUI VHU LQVWDODGR GH DFXHUGR FRQ HVVWV LQVWUXFLRQH, FyGLRV ORFDOHV, FyGLRV GH VHUFLRV S~EOLFRV, UHTXLVLRV GH OD HPSUHVGDGH VHUFLRV S~EOLFRV, HQDXVHQFLD GH FyGLRV ORFDOHV, OD HGLFLYQ PIV UHFLHQWH GH &yGLR 1DFLRQDO GH (OHFWULFDG. (O PLVPR HVWV GLVSRQLEOH HQ DOXQDV OLEHUtdV ORFDOHV, R VH SXHG DGTXLULU D WUDYpV GH 1DWLRQDO LUH 3UHYHQWLQR \$VVFLDWRQR (\$VRFDFLYQ 1DFLRQDO GH 3UHYHQFLYQ GH ,QFHQLRV), %DWWHU\PDUFK SDUN, 4XLQF, O\$ 02169 HQ FXDGHUQLOOR \$16,/1) \$70.

## REQUISITOS DE ELECTRICIDAD

&RQWUROH ODV PDUFDV HQ OD SODFD GH FDOLEDFLYQ GHO FDOHQWDGRU GH DJXD SDUD HVWDU VHJUR GH TXH HO VXPLQLVWUR GH FRUULHQWH HV FRQVFXHQWH FRQ ORV UHTXLVLRV GHO FDOHQWDGRU GH DJXD. 127\$: /DV LQVWDODFLRQH GH 2089 SRGUiQ H[SHULPHQWU XQ UHQGLPLHQWR LQIHULRU.

## UBICACIÓN

8ELTXH HO FDOHQWDGRU GH DJXD HQ XQ iUHD VHFD \ OLPSLD, WDQ FHUFD FRPR VHD SUIFWLFR GHO iUHD GH PD\RU GHPDQGD GHO FDOHQWDGRU GH DJXD. /DV OtQHDV GH DJXD FDOHQWH ODUJ\ \ QR DLVODGDV SRGUiQ JHQHUDU GHVSHUGLFLRV GH HQHUtD \ DJXD. /D XQLGDG GHEHUI VHU LQVWDODGD HQ XQ XELFDLYQ D QLYHO.

127\$: (VWD XQLGDG IXH GLVHXDG SDUD FXDOTXLHU LQVWDODFLYQ LQWHULRU FRP~Q, LQFOX\HQGR: JDUDMH, ODYDGHUR, GHVYIQ, DUPDUR, HWF. &RQ OD LQVWDODFLYQ GH XQ SXHUWD GH FHORVtD, VH SXHG LQVWDODU HQ KDELWDFLRQH GH WDPDxR LQIHULRU D 10µ [ 7µ (700SLHV F~ELFRV). /DV FHORVtDV GHEHUtD VHU GH 240 SXOJDGDV FXDGUDGDV (0.15 P2) R PIV JUDQGHV. 6L VH XVDQ GRV FHORVtDV, XQD GHEHUtD HVWDU FHUFD GH OD SDUWH VXSHULRU GH OD SXHUWD.

&RORTXH HO FDOHQWDGRU GH DJXD GH PRGR WDOTXH HO ILOWUR GH DJXD, OD WDS, HO DQLOOR GHO ERUGH \ ORV SDQHUV IURQWDOHV VH SXHGQ UHWLUDU, D ILQ GH SHUPLWLU VX LQVSHFFLYQ \ VHUFLR WpQLFR, WDO FRPR HO UHWLUR GH HOHPHQWR R OLPSLH]D GHO ILOWUR.

(O FDOHQWDGRU GH DJXD \ ODV OtQHDV GH DJXD GHEHUtD HVWDU SURWHJLGRV GH ODV WHPSHUDWXUDV EDMR FHUR \ DWPyIHU DV DOWDPHQWH FRUURVLYDV. 1R LQVWDOH HO FDOHQWDGRU GH DJXD HQ iUHDV DOLUH OLEUH \ GHVSURWHJLGDV.

## ⚠ PRECAUCIÓN: Riesgo de daño sobre

**la propiedad** - El calentador de agua no se debería ubicar en un área donde los goteos del tanque o las conexiones resulten en daños sobre el área adyacente a éste o a pisos inferiores de la estructura. Donde dichas áreas no puedan ser evitadas, se recomienda la instalación de una bandeja de recolección, con un drenaje adecuado, debajo del calentador de agua. Las instalaciones en desvanes requieren pisos y escaleras de acceso adecuados.

**NOTA:** (O UDJR GH IXQLRQDPLHQWR GH OD ERPED GH FDOHQWDPLHQWR HV GH 45f) D 120f) (7f & D 49f &). 6L OD WHPSHUDWXUD DPFLHQWH HVWV IXHUD GHO UDJR, OD ERPED GH FDOHQWDPLHQWR VH DSDJUi \ ORV HOHPHQWRV HOPFWULFRV VHUHQ XVDGRV KDVV TXH OD WHPSHUDWXUD DPFLHQWH UHJUHV DO UDJR GH IXQLRQDPLHQWR.

## UBICACIÓN (CONT.)

### INFORMACIÓN DEL TAMAÑO DEL CALENTADOR DE AGUA – LEA ANTES DE INSTALAR:

#### Para reemplazos en viviendas existentes:

- **Reemplazará el tanque de un calentador de agua existente?**  
6LVX FDOHQWDGRU GH DJXD DFWXDO OH EULQDDED DJXD FDOHQWH HQ IRUPD DSURSLDGD, \ QLQ~Q DPFLR GH SORPHUtD \R UHQRYDFLRQH TXH UHTXHUtdQ GHPDQGDV GH DJXD FDOHQWH DGLFLRQDO HVWV HQ SURFHV R SODQLDFDGDV, HQWRQH:
- (O DQHQWDGRU GH \$XD +EULGRGH \*HR6SULQJCE SXHG UHPSOD]DU XQ FDOHQWDGRU GH DJXD HOPFWULFR HVWV GH WDPDxR HTXLDOHQWH R PHQRU.
- 6LVH SDV GH XQ VLVWHPD GH JDV XQR HOPFWULFR, HO DQHQWDGRU GH \$XD +EULGRGH \*HR6SULQJCE VH SRGUi UHPSOD]DU SRU HO VLXLHQWH FDOHQWDGRU GH DJXD FRQ WDQTXH GH JDV PIV SHTXHxR.

#### Para instalaciones en construcciones nuevas:

Guía de Tamaño del Calentador de Agua Residencial			
Tamaño Familiar	Demanda*	Capacidad de Galón Recomendada	
		Eléctrico o GeoSpring™	Gas
5+	\$OWR	100 (378.5 /)	75 (283.9 /)
	3URP. R %DMR	80 (302.8 /)	50 (189.3 /)
3 a 4	\$OWR	80 (302.8 /)	50-75 (189.3-283.9 /)
	3URP. R %DMR	50 (189.3 /)	40 (151.4 /)
2 a 3	\$OWR	50 (189.3 /)	40-50 (151.4-189.3 /)
	3URP. R %DMR	40 (151.4 /)	40 (181.8 /)
1 a 2	\$OWR	40-50 (151.4-189.3 /)	40-50 (151.4-189.3 /)
	3URP. R %DMR	30 (113.6 /)	30 (113.6 /)

\* (VLDFLRQH SDUD YLHLQGDV FRQ HPDQGD 3URPHGLR R %DMD:

- 8VR GH FDEH]DOHV GH GXFKD HVWV GDU R EDMR (2.5JSP/11.4/SRU PLQXWR PHQRV)
- 1R KD \ GXFKD FRQ FDEH]DOHV P~OWLSOHV \R FROXPQDV GH KLGURPDVDMH.
- %DXHUD HVWV GDU (QR PX) JUDQGHV/ VLQ FROXPQDV GH KLGURPDVDMH)

### Posición de Ajuste de la Temperatura del Calentador de Agua:

/DFRQJXUDFLYQ GH OD WHPSHUDWXUD GHO FDOHQWDGRU GH DJXD WLHQH XQ JUDQ LPSDFWR VREUH OD FDOHQWDGD GH DJXD FDOHQWH GLVSRQLEOH SDUD GXFKDV \ EDXHUV.

- (O FRQVPR/ DKRUUR GH HQHUtD \ HYDOXDFLRQH GH HFLHQFLD GH ORV FDOHQWDGRUV GH DJXD, LQFOX\HQGR HO \*HR6SULQJCE, HV UHDO]DGR HQ XQ FFRQJXUDFLYQ GH 135) (57) &), OD FFRQJXUDFLYQ SURPHGLR GHO FDOHQWDGRU GH DJXD GH DFXHUGR FRQ HO \*HSDUWPHQR RI (QHU) \ ('HSDUWPHQR GH (QHU)td). 7RGRV ORV DKRUURV GH \*HR6SULQJCE HVWV EDVDGRV HQ HO IXQLRQDPLHQWR HQ PRGR KEULGR HQ 135) (57) &).
- /DV UHJODFLRQH VH VHJULGD UHTXLHUHQ XQ FFRQJXUDFLYQ GH iEULFD GH 120f) D 125f) (49f & D 52f &) FRPR PIV LPR SDUD WRGRV ORV FDOHQWDGRUV GH DJXD QXHYR. 3RU OR WDQR, VL VX FDOHQWDGRU GH DJXD HVWV DFWXDOHQWH FRQJXUDGR HQ 130) (54) &) R PIV \ VX FDOHQWDGRU GH DJXD QXHYR HVWV LQVWDODGR FRQ XQ SRVFLYQ GH DMXVWH FRQJXUDGD GH iEULFD GH 120) (49) &), HV SRVLEOH TXH SDUH]FD TXH HO QXHYR FDOHQWDGRU GH DJXD EULQGD PHQRU FDSDFLDG TXH VX FDOHQWDGRU GH DJXD H[LVWH.
- (O VXVDLUR SRGUi DMXVWU OD FFRQJXUDFLYQ GH WHPSHUDWXUD SDUD FHEULU VX QHFHVLGDGHV. 6LHPSU OHD \ HQWLHQGD ODV LQVWUXFLRQH VHJULGD TXH JXUDQ HQ HO PDQDQD GHO VXVDLUR, DQWHV GH DMXVWU OD SRVFLYQ GH DMXVWH GH WHPSHUDWXUD.

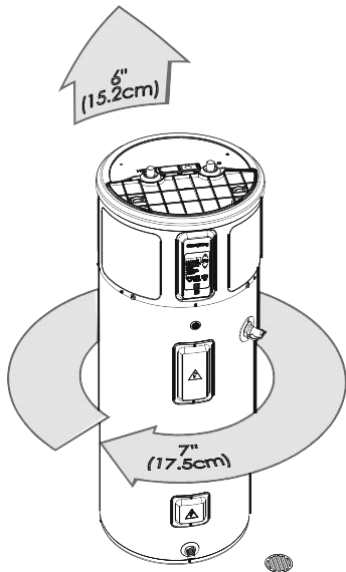
# Instrucciones de Instalación

## UBICACIÓN (CONT.)

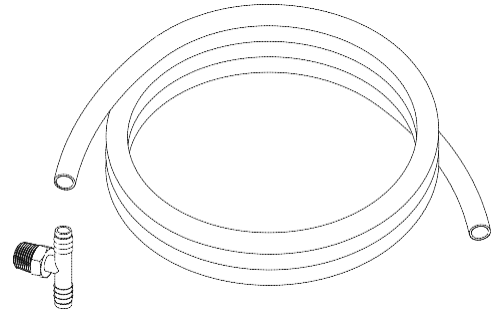
### Despejes requeridos:

'HEH KDEHU SRU OR PHQRV 7µ (17.5 FP.) GH HVSDFLR HQWUH FXDOTXLHU REMHWR \ ODV WSDSDV JURQWDO \ 7UDVHUD HQ FDVR GH VHU QHFHVVDULR UHDOLJDU HO VHUYLFLR WpFQLFR. 7DPELPQ VH UHFRPLHQGD XQ HVSDFLR PtQLPR GH 7µ (17.5 FP.) D DPERV ODGRV GHO FDOHQWDGRU GH DJXD, D ÷ Q GH FRQWDU FRQ DFFHVRSDUD HO VHUYLFLR WpFQLFR.

6H UHTXLHU XQ HVSDFLR PtQLPR GH 6µ (15.24 FP.) SDUD UHWLUDU HO ILOWUR SDUD VX OLPSLHJD. /D SORPHUtD \ ODV FRQH[LRQH V HO PFWULFDV GH DJXD FDLHQWH \ IUtD QR GHEHQ LQWHIHLULR FRQ HO UHWLUR GHO ILOWUR.



## PIEZAS NO ESTÁNDARES NECESARIAS:



7XEHUtD)OH[LEOH GH 1-3/8µ [ 6µ.  
7'HQWDGD ODFKR GH 137 1-3/8µ [ 3/8µ [ òµ.  
(DOJQRV PRGHORV)

## THERMAL EXPANSION

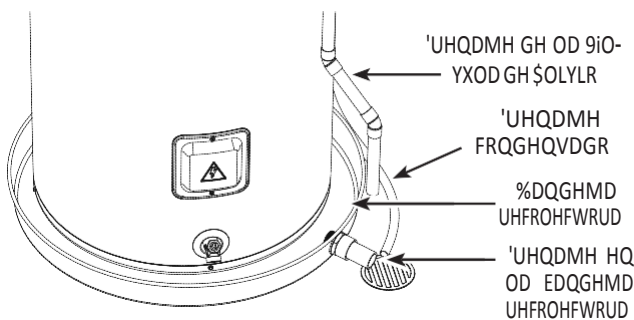
**Determine si la línea de agua interna cuenta con una válvula de control.** (V SRVLEOH TXH KD)D VLGR LQVWODGD HQ OD OtQHD GH DJXD IUtD HQ IRUPD VHSUDGD GH OD YIOYOD FRQWUD UHIOXMR, R HV SRVLEOH TXH VHD SDUWH GH XQD YIOYOD GH UHGFFLYQ GH SUHVLYQ, PHGLGRU GH DJXD R DEODQDGRU GH DJXD. 8QD YIOYOD GH FRQWURO XELFDG HQ OD OtQHD GH HQWUDGD GH DJXD IUtD SXHG FDXVU OR TXH VH OODPD 'sistema cerrado de aguaµ. 8QD OtQHD LQWHUQD GH DJXD IUtD VLQ YIOYOD GH FRQWURO R GLVSRVLWLYR GH SUHYHQFLYQ GH UHIOXMR VH OODPD VLVWHPD GH DJXD 'DELHUWRµ.

&XDQGR HO DJXD HV FDOHQWDGD, VH H[SDQGH HQ YROXPHQ \ FUHD XQ DXPHQWR GH SUHVLYQ GHQWUR GHO VLVWHPD GH DJXD. (VWD DFLYQ VH FRQFH FRPR 'expansión térmicaµ (XQ VLVWHPD GH DJXD 'DELHUWRµ, OD H[SDQFLYQ GH DJXD TXH VXSHUD OD FDSDFLGDG GHO FDOHQWDGRU GH DJXD YXHOYD IOXLU KDFLD OD FDXHUtD GH OD FLXGDG, GRQGH OD SUHVLYQ HV IIFLOPHQWH GLVSDGD.

6LQ HPEDUJR, XQ 'sistema cerrado de aguaµ LPSLGH TXH HO DJXD HQ H[SDQFLYQ YXHOYD IOXLU KDFLD HO VXPLQVWUR SULQFLSDO, \ HO UHVXOWDGR GH OD 'expansión térmicaµ SXHG FUHDU XQ LQFUHPHQWR GH SUHVLYQ UISLGR \ SHOLJURR HQ HO FDOHQWDGRU GH DJXD \ OD WXEHUtD GHO VLVWHPD. (VWH UISLGR LQFUHPHQWR GH SUHVLYQ SXHG DOFDQJDU UISLGDPHQWH OD FRQLXUDFLYQ GH VHJULGDG GH OD YIOYOD GH DOLYR, KDFLHQGR TXH IXQLRQH HQ FDGD FLFOR GH FDOHQWDLHQWR. /D H[SDQFLYQ WpUPLFD, \ OD UHVXOWDQWH H[SDQFLYQ \ FRQWUDFLYQ UISLGD \ UHSHWLDG GH ORV FRPSRQHWHV HQ HO FDOHQWDGRU GH DJXD \ HO VLVWHPD GH WXEHUtD, SXHG HQ RFDVLRQDU IDOODV SUHPDWXUDV GH OD YIOYOD GH DOLYR \ SRVLEOHPHQWH VREUH HO FDOHQWDGRU PLVPR. ESHHPSODJDU OD YIOYOD GH DOLYR QR FRUHHJLI HO SUREOHPD!

(O PpWRGR VXJHULGR SDUD FRQWURODU OD H[SDQFLYQ WpUPLFD HV LQVWODDU XQ WDQTXH GH H[SDQFLYQ HQ OD OtQHD GH DJXD IUtD, HQWUH HO FDOHQWDGRU GH DJXD \ OD YIOYOD GH FRQWURO (FRQVXOWH OD LOXVWUDFLYQ HQ OD SJLD 15). (O WDQTXH GH H[SDQFLYQ HV GLVHxDGR FRQ XQ FROFKYQ GH DLUH LQFRUSRUDGR TXH VH FRPSULPH DO LQFUHPHQWU OD SUHVLYQ GHO VLVWHPD, OLEHUDQGR GH HVWH PRGR OD SUHVLYQ H[FHVLYD \ HOLPLQDGR HO IXQLRQDPLHQWR UHSHWLDG GH OD YIOYOD GH DOLYR. 2WURV PpWRGRV SDUD FRQWURODU OD H[SDQFLYQ WpUPLFD WDELPQ HVWQ GLVSRQLEOHV. 3DUD PIV LQIRUPDFLYQ VREUH HVWH DVXQWR, FRPXQTXHVH FRQ VX LQVWODGRU, SURYHHGRU GH DJXD R LQVSHFWRU GH SORPHUtD.

## Instalación de la Bandeja de Recolección (6L VH UHTXLHUH)



**NOTA: La bandeja de recolección auxiliar DEBE cumplir con los códigos locales.** /RV .LWV GH %DQGHMDV GH 5HFROHFFLYQ HVWQ GLVSRQLEOHV HQ OD WLHQGD GRQGH HO FDOHQWDGRU GH DJXD IXH DGTXLULGR, XQD WLHQGD GH FRQWUXFFLYQ R XQ GLVWULEXLGRU GH FDOHQWDGRUHV GH DJXD. /D EDQGHMD UHFROHFWUD GHEHUtD VHU GH XQ PtQLPR GH 2µ (5.1 FP.) PIV JUDQGH TXH HO GLPHWUR GH OD EDV GHO &DOHQWDGRU GH DJXD. S ÷ Q GH HYLWU OD FRUURVLYQ \ PHMRUD HO DFFHVR DOD YIOYOD GH 'UHQDMH, VH UHFRPLHQGD TXH HO FDOHQWDGRU GH DJXD VHD XELFDGR HQ HVSDFLDGRUHV GHQWUR GH OD EDQGHMD UHFROHFWUD.

## Drenaje de condensación

/D XQLGDG FXHQWD FRQ XQ GUHQDMH GH FRQGHQVDFLYQ; SRU OR WDQWR, GHEHU KDEHU XQ GUHQDMH GLVSRQLEOH PX' FHUFD GH OD XQLGDG. (O GUHQDMH QR GHEHU VXSHUD ODV 36µ (91.4 FP.) GHVGH HO VXHOR (HO GUHQDMH GHEHU FXPSOLU FRQ ORV FyJLUR HVWDWDOHV \ ORFDOHV). 6L QR KD XQ GUHQDMH GLVSRQLEOH, HQWRQFHV VH GHEHU DGTXLULU XQD ERPED GH FRQGHQVDFLYQ FRP~Q FRQ FDSDFLGDG QR LQHULRU D 1 JDOYQ (3.8 /)/GtD, HQ OD WLHQGD GH FRQWUXFFLYQ ORFDO, \ GHEHU VHU LQVWODGR.

# Instrucciones de Instalación

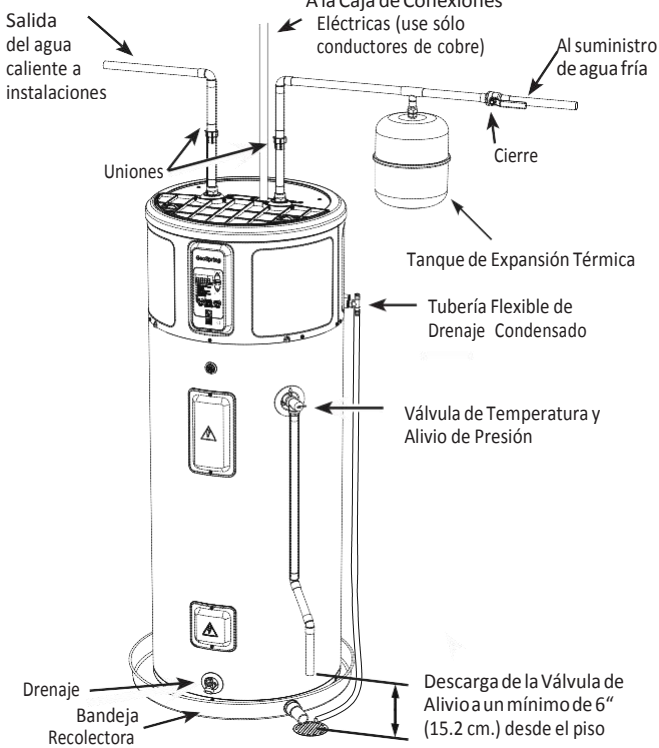
## CONEXIONES DEL SUMINISTRO DE AGUA

3DUD FRQRFHU OD LQVWDODFLYQ WtSLFD VXIHULGD, FRQVXOWH OD LOXWUDFLYQ TXH DSDUHFH D FRQWLQXDFLYQ, /DV FRQH[LRQH GH DJXD &\$/, (17(\ )SÉ\$ HWWIQFODUDPHQWHPDUFDGDV \ VRQG GH 137GHδμHQWRGRVORV PRGHORV. \$O UHDOJDU OD FRQH[LYQD ORV SXHUWRV GH HQWUDGD/VDOLGD, VH UHFRPLHQGDHOXVR GH DFFHVRULRVFYQLFR/KHPEUDFRQURVFDGH 3/4μ FRQ XVR GH VHOODGRU GH URVFDV. 6H UHFRPLHQGD OD LQVWDODFLYQ GH XQLRQH HQ ODV FRQH[LRQH GH DJXD FDOLHQWH \ IUtD, GH PRGR TXH HO FDOHQWDGRU GH DJXD SXHG VHU IIFLOPHQWH GHVFRQHFWDGR SDUD UHDOJDU HO VHUYLFLR WpFQLFR, HQ FDVR GH VHU QHFHVVDLR.

**NOTA:** QVWDOH XQD YIOYXOD GH FLHUH HQ OD OtQHD GH DJXD IUtD FHUFD GHO FDOHQWDGRU GH DJXD. (VWR SHUPLWLU HQ IIFLO VHUYLFLR WpFQLFR \ PDQWHLPLHQWR GH OD XQLGDG HQ IRUPD SRVWHULRU.

**IMPORTANTE:** No aplique calor a las conexiones de agua CALIENTE o FRÍA. Si se usan conexiones de soldadura blanda, suelde la tubería al adaptador antes de colocar el adaptador en las conexiones de agua fría del calentador. Cualquier calor aplicado a la conexión de agua caliente o fría dañará de forma permanente la línea plástica interna en estos puertos.

## INSTALACIÓN TÍPICA



## VÁLVULA DE ALIVIO

**⚠ ADVERTENCIA:** *Riesgo de daño sobre la unidad* - El índice de presión de la válvula de alivio no debe superar los 150 PSI (1.03 kPa), la máxima presión de funcionamiento del calentador de agua según VH LQGLFD HQ OD SODFD GH FDOL¿FDFLYQ.

6H VXPLQLVWUD XQD YIOYXOD GH FRPELQDFLYQ GH WHPSHUDWXUD \ DOLYLR GH SUHVLYQ, GH DFXHUGR FRQ HO (VWtQGDU SDUD ODV 9IOYXODV GH \$/LYLR \ 'LVSRLWLRYR GH &LHUH \$XWRPIWLFGR GH \*DV SDUD ORV 6LVWHPDV GH 6XPLQLVWUR GH \$JXD &DOLHQWH, \$16, =21.22, \ GHEH SHUPDQHUU LQVWDODGD HQ OD DSHUWXUD SURYLWVD \ PDUFDGD SDUD VX SURSYLWR HQ HO FDOHQWDGRU GH DJXD. 1LQXQD YIOYXOD GH QLQ~Q WLSR GHEHUtD VHU LQVWDODGD HQWUH OD YIOYXOD GH DOLYLR \ HO WDQTXH. 6H GHEHUtD FXPSOLU FRQ ORV FYGLJRV ORFDOHV HQ OD LQVWDODFLYQ GH ODV YIOYXODV GH DOLYLR.

/D FDOL¿FDFLYQ %78+ GH OD YIOYXOD GH DOLYLR QR GHEHU VHU LQIHULRU D OD FDOL¿FDFLYQ GH HQWUDGD GHO FDOHQWDGRU GH DJXD, GH DFXHUGR FRQ OR LQGLFDGR HQ OD HWLTXHD GH FDOL¿FDFLYQ XELFDGD HQ OD SDUWH IURQWDO GHO FDOHQWDGRU (1 ZDWW 3.412 %78+).

&RQHFWD OD VDOLGD GH OD YIOYXOD GH DOLYLR D XQ GUHQDMH DELHUWR DGHFXDGR, GH PRGR TXH HO DJXD GHVFDUJD QR SXHG WHQH FRQWDFWR FRQ ODV SDUWHV HOpFWULFDV DFWLYDV R SHUVRQDV \ SDUD HOLPLQDU SRVLEOHV GDxRV FRQ HO DJXD.

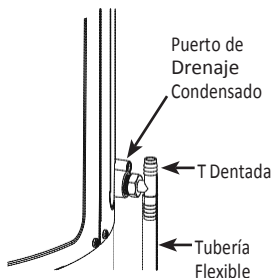
/D WXEHUtD XVDGD GHEHU VHU GH XQ WLSR DSUREDGR SDUD OD GLVWULEXFLYQ GH DJXD FDOLHQWH. /D OtQHD GH GHVFDUJD QR GHEHU VHU PIV SHTXHD TXH OD VDOLGD GH OD YIOYXOD \ VH GHEHU LQFOLQDU KDFLD DEDMR GHVGH OD YIOYXOD, D ¿Q GH SHUPLWLU XQ GUHQDMH FRPSOHR (SRU OD YUDYHG) GH OD YIOYXOD GH DOLYLR \ OD OtQHD GH GHVFDUJD. (O H[WUHPR GH OD OtQHD GH GHVFDUJD QR GHEHU HVWDU LQVHWDGR QL RFXOWR \ GHEHU HVWDU SURWHJLGR GHO FRQHODPLHQWR. 1LQXQD YIOYXOD GH QLQ~Q WLSR, VXMHFLYQ SDUD UHVVULFFLYQ R UHGXFFLYQ GHEHU VHU LQVWDODGD HQ OD OtQHD GH GHVFDUJD.

## ⚠ PRECAUCIÓN:

\$ ILQ GH UHGXFU HO ULHVJR GH SUHVLRQH \ WHPSHUDWXUDV H[FHVLYDV HQ HVWH FDOHQWDGRU GH DJXD, LQVWDOH HTXLSPLHQWRV SURWHFWRUHV GH WHPSHUDWXUD \ SUHVLYQ, UHTXHUJRV SRU ORV FYGLJRV ORFDOHV \ QR LQIHULRUHV D XQD YIOYXOD GH FRPELQDFLYQ GH WHPSHUDWXUD \ DOLYLR GH SUHVLYQ FHUWLILFDGRV SRU XQ ODERUDWRULR GH HYDOXDFLYQ UHFRQFLGR D QLYHO QDFLRQDO TXH PDQWHD LQVSHFLRQH SHULYGLFDV GH OD SURGXFFLYQ HTXLSPLHQWR \ PDWHULDOHV OLWWDGRV, FXPSOLHQGR FRQ ORV UHTXLVLRV GH 9IOYXODV GH \$OLYLR \ 'LVSRLWLRYR GH &LHUH GH \*DV \$XWRPIWLFGRV SDUD 6LVWHPDV GH 6XPLQLVWUR GH \$JXD &DOLHQWH, \$16, =21.22. (VWD YIOYXOD GHEHU FRQWDU FRQ XQ PDUFD GH SUHVLYQ P[LPD TXH QR VXSHUH OD SUHVLYQ GH WUDEDMR P[LPD GHO FDOHQWDGRU GH DJXD. QVWDOH OD YIOYXOD HQ XQ DEHUWXUD SURYLWVD \ PDUFDGD SDUD HVWH SURSYLWR HQ HO FDOHQWDGRU GH DJXD, \ RULHQWH OD PLVPD R EULGH XQD WXEHUtD, GH PRGR TXH FXDOTXLHU GHVFDUJD GH OD YIOYXOD VDOJD VYOR DUULED GH ORV 6 SLHV, R D FXDOTXLHU GLVWDQFLD LQIHULRU, HO SLVR HVWUXFWXUDO, \ TXH QR WHQD FRQWDFWR FRQ QLQXQD SDUWH HOpFWULFD DFWLYD. /D DEHUWXUD GH OD GHVFDUJD QR GHEHU VHU EORTXHDGD QL UHGXFLED GH WDPDxR, EDMR QLQXQD FLUFQVWDQFLD.

## TUBOS DE CONDENSACION DE DRENAJE

(VWD XQLGDG FXHQWD FRQ XQD EDQGHMD GH FRQGHQVDFLYQ. (O DJXD UHFRHFWDGD HQ OD EDQGHMD GUHQD SRU OD WXEHUtD TXH VDOH SRU HO FRVWDGR GH OD XQLGDG. (V LPSRUWDQWH LQVWODU XQD WXEHUtD GH GUHQDMH DO SXHUWR GH GUHQDMH SULQFSDO TXH VDOH GH OD SDUWH WUDVHUD GH OD XQLGDG. 6XMHWH XQ H[WUHPR GH XQD WXEHUtD PIV ODUD GH 6μ (1.8 P.) DO SXHUWR GH GUHQDMH LQIHULRU HQ OD SDUWH WUDVHUD GH OD XQLGDG, GHEDMR GH OD WSD WUDVHUD. WLMDO RWUR H[WUHPR D XQ GUHQDMH HQ HO SLVR R D XQD DOWXUD QR VXSHULRU D 3μ (0.9 P.) VREUH HO SLVR. 6L GLFKR GUHQDMH QR HVW GLVSRQLEOH, VH GHEHU DGTXLULU H LQVWODU XQD ERPED GH GUHQDMH GH FRQGHQVDFLYQ (QR SURYLWVD). /D WXEHUtD GH GUHQDMH GHEHU VHU GLULJGD GH PRGR TXH HO DJXD GHVFDUJD QR SXHG WHQH FRQWDFWR FRQ SDUWHV HOpFWULFDV DFWLYDV \ D ILQ GH HOLPLQDU SRVLEOHV GDxRV FRQ HO DJXD.





# Instrucciones de Instalación

## PARALENAR EL CALENTADOR DE AGUA

### ⚠ **ADVERTENCIA:** *Riesgo de daño*

**sobre la unidad - El tanque debe estar lleno de agua antes de encender el calentador. La garantía del calentador de agua no cubre daños ni fallas como resultado de un funcionamiento con el tanque vacío o parcialmente vacío.**

5VHJ~UHVH GH TXH OD YIOYXOD GH GUHQDMH HVWp FRPSOHWDPHQWH FHUUDGD.

5EUD OD YIOYXOD GH FLHUUH HQ OD OtQHD GH VXPQLVWUR GH DJXD IUtD.

5EUD WRGRV ORV JULIRV GH DJXD FDOLHQWH OHQWDPHQWH, D ¿Q GH SHUPLWLU TXH HO DLUH VH GHVFDUJXH GHVGH HO FDOHQWDGRU GH DJXD \ OD WXEHUtD.

8Q AXMR SDUHMGR GHVGH HO JULIR(V) GH DJXD FDOLHQWH LQGLFD TXH HO FDOHQWDGRU GH DJXD HVWi OOHQR.

&yGLJR GH IDOOD 11µ GXUDQWH OD LQVWODFLyQ: 6L OD XQLGDG HV HQFHQGLGD FXDQGR HO WDTXH QR HVWi OOHQR, VH YLVXDOL]DUi HO FyGLJR GH HUURU 11µ HQ OD SDQWDOOD. 5SDJXH HO HQFHQGLGR, OOHQR HO WDTXH FRQ DJXD (OH D PIV DUULED), \ OXHJR YXHOYD D HQFHQGHU HO FDOHQWDGRU.

## AVISO:

(YLWH UHDOL]DU ODV FRQH[LRQHV HOpFWULFDV HQ IRUPD HTXLYRFDGD. 6H GHEHUiQ DSOLFUDU 2409 \$ & R 208\$ & D WUDYpV GH ORV FDEOHV /1 \ /2, FRPR VH PXHVWUD HQ OD LOXVWUDFLyQ GH OD 'FDMD GH XQLyQ GH FDOHQWDGRU GH DJXDµ. 6L QR VH KDFH HVWR, OD JDUDQWtD TXHGDUi \$18/\$', \ FRPR UHVXOWDGR VH SRGUiQ DSOLFUDU 1209 DO FDOHQWDGRU GH DJXD, OR FXDO SRGUi GDxDU HO FRPSUHVRU X RWURV FRPSRQHQWHV HOpFWULFRV.

6L XQ FDEOH FRQ 4 FRQGXFWRUHV HV VXPQLVWUDGR DO FDOHQWDGRU GH DJXD, FXEUD HO QHXWUR, \ FRQHFWRV ORV FDEOHV UHVWUDQWHV FRPR VH PXHVWUD HQ OD LOXVWUDFLyQ.

127\$ 5(/\$ & 21\$' \$ & 21 /26 ' 6326,7926 '( 0\$1(-2 '( (1(5\*É\$ '( /26 6(59, & 26 30%/ , & 26 (\$ YHFHV OODPDGRV, QWHUUXSWRUHV GH SHGXFFLyQ GH 3LFRV GH & DUJD):

((LVWHQ DOJXQRV GLVSRVLWLYRV GH LQWHUUXSWRUHV GH PDQHMR GH HQHUUtD R LQFOXVR DOJXQRV LQWHUUXSWRUHV EIVLFRV GH WHPSRUL]DGRUHV TXH 5'(8 & (1 HO YROWDMH GH 2409 D 1209 GXUDQWH SHUFRGRV GH DOWD GHPDQGD GH HOHFULFLGDG. (VWRV GLVSRVLWLYRV GHEHQ VHU UHVLUDGRV GH FLUFXLWR TXH SURYHH FRUULHQWH DO FDOHQWDGRU GH DJXD, GHVGR DO SRVLEOH GDxR GH OD XQLGDG REVHUYDGR PIV DUULED.

6LQ HPEDUJR, ORV GLVSRVLWLYRV FRQ LQWHUUXSWRUHV TXH FRUWDQ OD FRUULHQWH GH 2409 D 09 HQ IRUPD SHULyGLFD VRQ DFHSWDEOHV.

**Código de falla "bAdlinE" durante la instalación:** 6L HQ OD SDQWDOOD VH YLVXDOL]D OD XQLGDG QR HVWi UHFLEHQGR HO YROWDMH FRUHFWR FRPR UHVXOWDGR GH XQ FDEOHGR LQFRUHFWR. 3DUD FRUULHU HVWD IDOOD, DSDJXH OD XQLGDG, FRUULMD HO SUREOHPD GH FDEOHGR \ OXHJR YXHOYD D DFWLyDU OD FRUULHQWH.

## CONEXIONES ELÉCTRICAS

8Q HOHFULFLWD FDOULFDGR GHEHUi LQVWODU XQ FLUFXLWR GHULYDGR LQGLyGXDO FRQ FRQGXFWRUHV GH FREUH, XQ GLVSRVLWLYR SDUD OD SURWHFFLyQ GH VREUHFDUJD \ XQ PHGLR DGHFxDGR GH GHVFRQH[LyQ.

7RGRV ORV FDEOHGRV GHEHUiQ FXPSOLU FRQ ORV FyGLJRV ORFDOHV R OD HGLFLyQ PIV UHFLEHQWH GH O & yGLJR 1DFLRQDO GH (OHFWULFLGDG \$16,/1)3\$ 70.

(O FDOHQWDGRU GH DJXD HVWi FRPSOHWDPHQWH FDEOHGR D OD FDMD GH FRQH[LRQHV HQ OD SDUWH VXSULRU GH FDOHQWDGRU GH DJXD. 6H EULQGD XQD DEHUWXUD GH 8µ SDUD DFHVRULRV HOpFWULFRV SDUD FRQH[LRQHV GH FDEOHGRV.

/RV UHTXLVWRV GH FDUJD GH YROWDMH \ YDWMH GH FDOHQWDGRU GH DJXD VRQ HVSHFLDFGRV HQ OD HWLTXHWD GH FDOULFDFLyQ, XELFDGR HQ OD SDUWH IURQWDO GH FDOHQWDGRU GH DJXD.

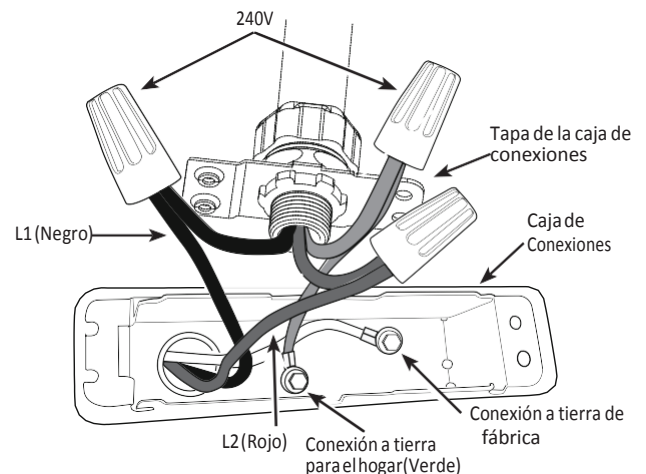
### El cableado de circuito derivado debería incluir:

1. &RQGXFWR PHWiOLFR R FDEOH PHWiOLFR HQIXQGDGR DSUREDGR SDUD VXVVR FRPR FRQGXFWRU GH FRQH[LyQ D WLHUUD \ VHU LQVWODGR FRQ DFHVRULRV DSUREDGRV SDUD GLFR SURSYVLWR.
2. /RV FDEOHV QR PHWiOLFRV HQIXQGDGRV, FRQGXFWRV PHWiOLFRV R FDEOHV PHWiOLFRV HQIXQGDGRV QR DSUREDGRV SDUD VXV FRPR FRQGXFWRU GH FRQH[LyQ D WLHUUD LQFOXLUiQ XQ FRQGXFWRU VHSUDGR SDUD OD FRQH[LyQ D WLHUUD. 'HEHUtD HVWUD DGMXQR D ODV WHUPLQDOHV GH FRQH[LyQ D WLHUUD GH FDOHQWDGRU GH DJXD \ OD FDMD GH GLVWULEXFLyQ HOpFWULFD.

3DUD FRQHFWRU OD FRUULHQWH DO FDOHQWDGRU GH DJXD:

1. 5SDJXH OD FRUULHQWH.
2. 5HWLUH HO WRUQLOOR/ WRUQLOOR TXH VRVWLHQH OD WDS VXSHULRU GH OD FDMD GH XQLyQ.
3. ,QVWDOH /1 D /1, /2 D /2 \ FRQHFWRV D WLHUUD DO FDEOH D WLHUUD YHUGH FRQHFWDGR D OD SDUWH LQIHULRU GH OD FDMD GH XQLyQ.

127\$: ,QVWDOH ODV FRQH[LRQHV HOpFWULFDV GH DFHXGR FRQ ORV FyGLJRV ORFDOHV R OD HGLFLyQ PIV UHFLEHQWH GH O & yGLJR 1DFLRQDO GH (OHFWULFLGDG \$16,/1)3\$ 70.



**⚠ ADVERTENCIA:** Es esencial que la conexión a tierra sea la adecuada. La presencia de agua en la tubería y el calentador de agua no brindan la conducción suficiente para la conexión a tierra. La tubería no metálica, uniones dieléctricas, conectores flexibles, etc., pueden hacer que el calentador de agua quede eléctricamente aislado. No desconecte la conexión a tierra de fábrica.

/D JDUDQWtD GHO IDEULFDQWH QR FXEUD QLQJ~Q GDxR R GHIHFWR RFDVLRQDGR SRU OD LQVWDODFLyQ, DGKHLVlyQ R XVR GH QLQJ~Q WLSR GH DKRUUR GH HQHUJtD X RWURV GLVSRVLWLYRV QR DSUREDGRV (GLIHUHQWHV DDTXHOORV DXWRUL]DGRV SRU HO IDEULFDQWH) HQ, VREUH R MXQWR FRQ HO FDOHQWDGRU GH DJXD. (O XVR GH GLVSRVLWLYRV GH DKRUUR GH HQHUJtD QR DXWRUL]DGRV SXHGHO DFRUWDU OD YLGD ~WLO GHO FDOHQWDGRU GH DJXD \ SRQHU HQ ULHVJR VX YLGD \ VX SURSLHGdG.

(O IDEULFDQWH TXHGd H[LPLGR GH WRGD UHVSROVDELOLGDG SRU GLFKD SpUJLGD R OHVlyQ UHVXOWDQWH GHO XVR GH WDOHV GLVSRVLWLYRV QR DXWRUL]DGRV.

6L ORV FyGLJRV ORFDOHV UHTXLHUHQ OD DSOLFDFlyQ H[WHUQD GH NLWV GH PDQWDV DLVODQWHV, ODV LQVWUXFLRQHV GHO IDEULFDQWH LQFOXGLGDV HQ HO NLW VH GHEHUIQ VHJLU FXLGDGRVDPHQWH.

**La aplicación de cualquier aislante externo, mantas o aislante de la tubería de agua sobre este calentador de agua requerirá especial cuidado sobre lo siguiente:**

- 1R FXEUD OD YIOYXOD GH WHPSHUDWXUD \ DOLYLR GH SUHVlyQ.
- 1R FXEUD ORV SDQHOHV GH DFFHVR D ORV HOHPHQWRV GH FDOHIDFFlyQ.
- 1R FXEUD OD FDMD GH XQlyQ HQPFWULFD GHO FDOHQWDGRU GH DJXD.
- 1R FXEUD ODV HWLTXHWDV GH IXQFLRQDPLHQWR R DGYHUWHQFLD GHO FDOHQWDGRU GH DJXD QL LQWHQWH UHXELFDU ODV PLVPDV HQ OD SDUWH H[WHULRU GH OD PDQWD DLVODQWH.
- 1R EORTXHH OD HQWUDGD/VDOLGD GH DLUH HQ ODV WDSDV VXSHULRUHV R WUDVHUDV GH OD XQLGDG.

**NOTA:** En esta guía se recomienda el tamaño mínimo del circuito derivado en base al Código Nacional de Electricidad. Para las conexiones de cableados, consulte los diagramas de cableados del manual.

## GUÍA DE TAMAÑOS PARACIRCUITOS DERIVADOS

Voltaje Total del Calentador de Agua	Protección Recomendada para Sobrecarga (FDOL]DFlyQ GH DPSHUDMH GH IXVLEOH R LQWHUUXSWRU GH FLUXLWRV)			
	208V	240V	277V	480V
3,000	20	20	15	15
4,000	25	25	20	15
<b>4,500</b>	<b>30</b>	<b>25</b>	<b>25</b>	<b>15</b>
5,000	30	30	25	15
5,500	35	30	25	15
6,000	40	35	30	20
8,000	50	45	40	25
9,000	–	50	45	25
10,000	–	–	50	30
11,000	–	–	50	30
12,000	–	–	–	35

Voltaje Total del Calentador de Agua	Tamaño del Cable de Cobre AWG Basado en la Tabla N.E.C. 310-16(167°F / 75°C).			
	208V	240V	277V	480V
3,000	12	12	14	14
4,000	10	10	12	14
<b>4,500</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>14</b>
5,000	10	10	10	14
5,500	8	10	10	14
6,000	8	8	10	12
8,000	8	8	8	10
9,000	–	8	8	10
10,000	–	–	8	10
11,000	–	–	8	10
12,000	–	–	–	8

# Instrucciones de Instalación

## LISTA DE CONTROL DE LA INSTALACIÓN

**1. Ubicación del Tanque:**

<sup>2</sup> 5HTXLHUH HO WDPDXR GH OD KDELWDFLyQ XQD SXHUWD GH FHORVtD R XQ WLSR GH YHQWLODFLyQ VLPLODU" 6H QHFHVLDW XQIUHD GH IOXMR GH DLUH GH 10µ [ 10µ [ 7µ (700 SLHV F~ELFRV) R 240 SXOJDGDV FXDGUDGDV (0.15 P2).  
<sup>2</sup> 3DUWH WUDVHUD GH OD XQLGDG **alejada de la pared** 7 SXOJDGDV (17.5 FP.), \ ORV FRVWDGRV SRU OR PHQRV DXQD GLVWDQFLD GH 7 SXOJDGDV (17.5 FP.).  
 – El **frente** GH OD XQLGDG HVWi OLEUH \ GHVSHMDGR.  
<sup>2</sup> 2(VWi HO FDOHQWGRU GH DJXD QLYHODGR" 6L QR HV DVt, DJUHJH FXxDV GHEDMR GH OD EDVH GH OD XQLGDG.

**2. Verifique que el Filtro de Aire esté instalado. (Ubicado en el embalaje).**

**3. Conexiones de plomería:**

<sup>2</sup> 1R LPSLGHQ OD HOLPLQDFLyQ GHO ILOWUR GH DLUH  
<sup>2</sup> 1R KD \ SpUGLGDV OXHJR GH OOHQDU HO WDQTXH GH DJXD, WDQWR FXDQGR HO DJXD HVWi IOX\HQGR FRPR FXDQGR QR.

**4. Las líneas de condensación están en su lugar:**

<sup>2</sup> 'UHQDMH 3ULQFLSDO ,QVWODGR

**5. La válvula de temperatura y alivio de presión** HVWi IXQFLRQDGR \ OD OtQHD GH GUHQDMH HVWi FRPSOHWD GH DFXHGR FRQ HO FyGLR ORFDO.

**6.** 9HULILDFLyQ **Eléctrica** 208/240 9S& D /1 \ /2 DO WDQTXH.

**7.** /D FRQH[LyQ **Eléctrica** QR LPSLGH OD HOLPLQDFLyQ GHO ILOWUR GH DLUH.

**8.** 9HULITXH ODV SDQWDOODV GHO **panel de control** HQ HO PRGR +\EULG (+tEULG) D 120f) (49f&). \$VLVWD DO XVXDULR HQ HO DMXVWH GH WHPSHUDWXUD \ PRGRV (FRQVXOWH OD VHFFLyQ 'SFHUFDF GH OD &RQLXUDFLyQ GH OD 7HPSHUDWXUD GHO \$JXDµ) HQ OD SiJLQD 54).

## QUÉ ESPERAR PARA UN “COMIENZO NORMAL” EN EL MODO HÍBRIDO

/XHJR GH LQVWDODU OD XQLGDG, KDELHQGR DVHJUDGR \ FRQWURODGR WRGDV ODV FRQH[LQHV HO pFWULFDV \ GH DJXD, VH GHEHI HQWRQFHV OOHQDU OD PLVPD FRQ DJXD (YHQWLOH HO WDQTXH DEULHQGR XQD FDQLOOD GH DJXD FDOLHQWH GH VX FDVD SDUD SHUPLWLU TXH HO WDQTXH VH OOHQH FRPSOHWDPHQWH GH DJXD). 8QD YH] TXH HO WDQTXH HVWp OOHQR \ OD FDUJD GH FRUULHQWH VHD FRPSOHWDGD, SRGUi H[SHULPHQWU OR VLXLHQWH:

Tiempo Transcurrido	Acciones HEWH	Comentarios
0 D 2 PLQXWRV	/D XQLGDG KDUD OD DXWRYHULIL FDFLRQ	(VWH WLHPSR DSDJDGR GH 2 PLQXWRV HYLWD GDxRV VREUH HO FRPSUHVRU
2 D 10 PLQXWRV	&RPSUHVRU \ YHQWLODGRU HQFHQGLGRV	(VWH SHUtRGR GH 8 PLQXWRV HV XVDGR SDUD DVHJX-UDU TXH HO WDQTXH HVWi OOHQR GH DJXD (DOJRULWPR GH SUHYHQFLyQ GH GLVSDUR HQ YDFtR).
10 D 30 PLQXWRV	&RPSUHVRU \ YHQWLODGRU DSDJDGRV, HOHPHQWRV GH FDOHQWDPHQWR HQ-FHQGLGRV SRU XQRV 20 PLQXWRV	3DUD EULQGDU UisLGDPHQWH OD FDQWLDGD LQLFLDO GH DJXD FDOLHQWH SDUD HO XVXDULR (XQRV 25 JD-ORQH/94.6 /)
30 PLQXWRV \ PiV	(O HOHPHQWR VXSHULRU VH DSDJD \ HO FRPSUHVRU VH YXHOYH D HQFHQGHU	8VDXQERPEHR GH FDORU HILFLHQWH GXUDQWH OD PD\RU SDUWH GHO FDOHQWDPHQWR

127\$: (O UDQR GH IXQFLRQDPLHQWR GH OD ERPED GH FDOHQWDPHQWR HV GH 45f) D 120f) (7f& D 49f&). 6L OD WHPSHUDWXUD DPELHQWH HVWi IXUD GHO UDQR, OD ERPED GH FDOHQWDPHQWR VH DSDJDUi \ ORV HOHPHQWRV HO pFWULFRV VHUiQ XVDGRV KDVVWD TXH OD WHPSHUDWXUD DPELHQWH UHJHVH DO UDQR GH IXQFLRQDPLHQWR.



§QWHV GH VROLFLWDU HO VHUFLR WpQLFR  
 £\$KRUUH WLHPSR \ GLQHUR! /HD SULPHUR HO FXDGUR TXH DSDUHFH D  
 FRQWLQXDLYQ \ HV SRVLEOH TXH QR QHFHVLWH VROLFLWDU UHSDUDLQRHV«

Problema	Causas Posibles	Qué Hacer
<b>El calentador de agua emite sonidos</b>	<b>Se está usando un ventilador para mover el aire a través del sistema.</b>	‡ &LHUWD FDQWLGDG GH VRQLGR GHQ YHQWLODGRU HV QRUPDO. 6L HVFXFKD XQ VRQLGR DWtSLFR R HO QLYHO GH VRQLGR SDUHFH LQXVXDOPHQWH IXHUWH, HQWRQFHV FRQWDFWH DO VHUFLR WpQLFR.
<b>El calentador de agua está haciendo descender la temperatura de la habitación</b>	<b>La habitación no es ventilada de forma adecuada o es demasiado pequeña</b>	‡ 6L HO WDPDxR GH OD KDELWDFLyQ HV LQIHULRU D 10' [ 10' [ 7' (3P [ 3P [ 2.1P), HQWRQFHV GHEHUi FRQWDU FRQ XQD SXHUWD GH FHORVtD X RWUR PHGLR TXH SHUPLWD HO UHFDPFLR GH DLUH FRQ ODV KDELWDFLRQHV FLUFXQGDQWHV.
	<b>El calor es retirado del aire para calentar el agua</b>	‡ eVVR HV QRUPDO
<b>Goteo de agua por fuera del calentador</b>	<b>El drenaje condensado está atascado.</b>	‡ 'HVSHMH FXDOTXLHU HVFRPEUR HQ HO SXHUWR GH GUHQDMH GH OD XQLGDG.
	<b>Las conexiones de agua Caliente/ Fría no están ajustadas.</b>	‡ \$MXVWH ODV FRQH[LRQHV LQWHUQDV \ H[WHUQDV GH OD WXEHUtD.
<b>Sin suficiente agua caliente o sin agua caliente</b>	<b>Es posible que la temperatura del agua esté configurada demasiado baja.</b>	‡ &RQVXOWH OD VHFFLyQ \$FHUFD GH OD &RQLXUDFLyQ GH OD 7HPSHDXUD GHQ §JXD.
	<b>(OSDWUyQ GH XVR GH OD) XDJD caliente supera la capacidad del calentador de agua en el modo actual</b>	‡ &DPELH D XQ PRGR GLIHUHQWH GH R PRGLTXH HO SDWUyQ GH XVR.
	<b>Es posible que el uso del agua haya superado la capacidad del calentador de agua.</b>	‡ (VSHUH D TXH HO FDOHQWDGRU GH DJXD VH UHFVSHUH OXHJR GH XQD GHPDQGD DQRUPDO.
	<b>/D WHPSHDXUD GHQ DPFLHQWH demasiado baja</b>	‡ §ILQ GH TXH HO FDOHQWDGRU GH DJXD IXQLRQH FRUHFWDPHQWH, VX XELDFLyQ GHEHUi WHQHU XQD WHPSHDXUD GH HQWUH 32° \ 150°) SDUD HO PRGR (OpFWULFR (VWiQGDU \ HQWUH 45° \ 120°) SDUD HO UHVVR GH ORV PRGRV.
	<b>Es posible que la temperatura del agua fría entrante sea más fría durante los meses de invierno.</b>	‡ (VVR HV QRUPDO. &XDQR Piv IUtD VHD HO DJXD HQWUDQWH, Piv. WLHPSR OH WRPDUi FDOHQWUWH
	<b>Grifos de agua caliente que gotean o están abiertos.</b>	‡ \$VHJ~UHVH GH TXH WRGRV ORV JULIRV HVWpQFHUUDGRV.
	<b>/DUJDV H[WHQLRQHV GH WXEHUtD expuesta, o tubería de agua caliente en pared externa.</b>	‡ \$tVOH OD WXEHUtD.
	<b>6LQ HVSDFLR VXILFLHQWH SDUD permitir que circule aire para la bomba del calentador.</b>	‡ \$VHJ~UHVH GH TXH OD XQLGDG HVWp D XQD GLVWDQFLD GH 7µGH OD SDUH.
	<b>(O WDPDxR GH OD KDELWDFLyQ QR es el apropiado para agua caliente.</b>	‡ 6L HO WDPDxR GH OD KDELWDFLyQ HV LQIHULRU D 10µ [ 10µ [ 7µ (700 SLHV F~ELFRV), LQVWDOH XQD SXHUWD GH FHORVtD R XQD YHQWLODFLyQ VLPLODU.
	<b>Se quemó un fusible o se desactivó el disyuntor.</b>	‡ 5HHPSODFH HO IXVLEOH R UHLQLFLH HO GLV\XQRU.
<b>Es posible que se haya interrumpido el servicio de electricidad en su hogar.</b>	‡ &RPXQtTXHVH FRQ VX SURYHHGRU ORFDO GHQ VHUFLR HOpFWULFR.	
<b>Cableado inadecuado</b>	‡ /HD OD VHFFLyQ GH ,QVUXFFLRQHV GH ,QVWODFLyQ.	
<b>Límite de reinicio manual (TCO).</b>	‡ &RQVXOWH OD VHFFLyQ &RQWURO GH 6HJXULGDG HQ OD SiJLQD 52.	
<b>/DV FRQH[LRQHV GH DJXD D OD unidad están invertidas.</b>	‡ &RQH[LRQHV GH WXEHUtDV FRUHFWDV.	
<b>Es posible que el suministro de electricidad esté desconectado.</b>	‡ \$VHJ~UHVH GH TXH ODV FRQH[LRQHV HOpFWULFDV HVWpQ FRQHFWDGDV FRUHFWDPHQWH \ GHVFRQFWH HO LQWHUUXSWRU; VL VH XVD, HVWi HQ OD SRVFLyQ 21 ((FHQGLGR).	

# Solución de Problemas..

Problema	Causas Posibles	Qué Hacer
<b>El agua está demasiado caliente</b>	La configuración de la temperatura del agua es demasiado alta.	‡ &RQVXOWH OD VHFfLyQ \$FHUFD GH OD &RQILJXUDFLyQ GH OD 7HPSHWDWXUD GH \$JXD.
	<b>⚠ PRECAUCIÓN:</b>	3DUD VX VHJXULGDG, 12 LQWHQWH UHSDUDU FDEOHDGRV HOpFWULFRV, FRQWUROHV, HOHPHQWRV GH FDOHQWDPHQWRX RWURV GLVSRVLWLYRV GH VHJXULGDG. 'HULYH ODV UHSDUDFLRQH V D SHUVRQDO FDOILFDGR GH VHUYFLR WpQLFR.
	<b>El control electrónico falló.</b>	‡ /ODPH DO VHUYFLR WpQLFR.
<b>Sonido ensordecedor</b>	Las condiciones del agua en su hogar ocasionaron una acumulación de sarro y depósitos minerales en los elementos de calentamiento.	‡ 5HWLUH \ OLPSLH ORV HOHPHQWRV GH FDOHQWDPHQWR. (VWR VyOR GHEHUtD VHU UHDOL]DGR SRU SHUVRQDO FDOILFDGR GH VHUYFLR WpQLFR.
<b>/D YiOYXOD GH DOLYLR produce un chisporroteo o drenaje</b>	<b>Acumulación de presión ocasionada por expansión térmica en un sistema cerrado.</b>	‡ eVWD HV XQD FRQGLFLyQ LQDFHSWDEOH \ GHEH VHU 3DUD REWHQHU LQIRUPDFLyQ VREUH FyPR FRPXQtTXHVH FRQ XQ SURYHHGRU GH DJXD R FRQ XQ FRQWUDWLVD GH SORPHUtD 1R HQFKXH OD ILFKD GH OD YiOYXOD
<b>El calentador está emitiendo un pitido y la pantalla indica F11</b>	El calentador de agua no fue llenado con agua antes de ser encendido. Encender el calentador sin agua dañará los calentadores eléctricos. La garantía del calentador de agua no cubre daños ni fallas como resultado de un funcionamiento con el tanque vacío o parcialmente vacío.	‡ /OHQH HO WDQTXH FRPSOHWDPHQWH FRQ DJXD. 3UHVLRQH <b>ENTER(Ingresar)</b> SDUD GHWHQHU OD DODUPD \ OXHJR SUHVLRQH <b>32:(5 ((QFHGHU))</b> FXDQGR HO WDQTXH KD \ D VLGR llenado.
<b>La luz del filtro está encendida.</b>	El filtro requiere una limpieza. Para un funcionamiento efectivo, es necesario que el filtro esté limpio.	‡ 6LJD ODV LQVWUXFFLRQH VREUH FyPR UHWLUDU \ OLPSLDU HO ILOWUR, HQ OD SiJLQD 59.
<b>El calentador está emitiendo un pitido y la pantalla indica "FA-F8"</b>	Existe un problema con el sistema de la bomba de calentamiento.	‡ /D XQLGDG FDPEDUi DXWRPiWLFDPHQWH D RWUR PRGR GLVSRQLEOH D ILQ GH DVHJXUDU TXH XVWHG FRQWLQ~H WHQLHQGR DJXD FDOHQWH. &RPXQtTXHVH LQPHGLDWDPHQWH FRQ HO VHUYFLR WpQLFR \ EULQGH ORV FyGLJRV TXH ILJUDQ HQ OD SDQWDOOD GH YLVXOL]DFLyQ.
<b>El calentador está emitiendo un sonido y en la pantalla titila un</b>	Existe un problema con el calentador de agua que requiere <b>atención inmediata.</b> (D PHQRV TXH HO FyGLJR GH <b>código de error</b> ERWyQFRQ	‡ (O FDOHQWDGRU SRGUi FDPEDU D RWUR PRGR GH GLVSRQLEOH. &RPXQtTXHVH GH IRUPD WpQLFR. \$ ILQ GH GHWHQHU HO SLWLGR HUURU VHD)2,-11R E\$GOLQ(),SUHVLRQH HO IOHFKD KDFLD DUULED R FRQ IOHFKD KDFLD DEDMR \ OD DODUPD VH GHWHQGUi \ OD SDQWDOOD UHJUHVDUi D OD YLVXOL]DFLyQ QRUPDO
<b>El calentador de agua está emitiendo un pitido y en la pantalla titila "bAd linE"</b>	/D XQLGDG QR HWVi UHFLELHQGR <b>240VAC</b> como se espera.	‡ \$SDJXH HO FDOHQWDGRU GH DJXD (JHQHUDOPHQWH HQ HO SDQHO GH GLV\XQRU). /XHJR OHD OD VHFfLyQ ' &RQH[LQRHV (OpFWULFDVµ HQ ,QVWUXFFLRQH GH ,QVWDODFLyQ, HQ OD SiJLQD 64. /XHJR, FRPXQtTXHVH FRQ HO LQVWDOGRU SDUD YHULIFDU OD HQWUDGD HOpFWULFD GH FDOHQWDGRU GH DJXD



Problema	Causas Posibles	Qué Hacer
<b>El Agua Caliente tiene RORU D KXHYR SRGULGR o azufre</b>	<b>Ciertos suministros de agua con alto contenido de sulfato reaccionarán con la varilla del ánodo que está presente en todos los calentadores de agua para la protección del tanque corrosión.</b>	‡ (O RORU SXHGH VHU SURGXFLGR R HOLPLQDGR HQ OD PD\RUTD GH ORV FDOHQWDGRUHV GH DJXD, UHHPSOD]DQGR OD YDULOOD GHQ iQRGR FRQ XQPDWHULDOGHYDULOODPHQRVDFWLYR.(QDOJXQRVFDVVRV,HV SRVLEOHTXH VHD QHFHVVDULR DJUHJDU HOSDVR GH FORUDU HO FDOHQWDGRU GH DJXD \ WRGDV ODV OtQHdV GH DJXD FDOHQWH <b>para la</b> SURWHFFLyQ GH OD FRUURVLYQ. 3DUD DFFHGHU D RSFLRQH V H LQVWUXFFLRQH, FRPXQtTXHVH FRQ VX SORPHUR R FRQ HO SURIHVLRQDO ORFDO VREUH HO DJXD 3DUD LQIRUPDFLyQ VREUH FyPR DGTXLULU HVVH UHHPSOD]R GH OD YDULOOD GHQ iQRGR, FRPXQtTXHVH D *( DO 1.888.4*(.+(:(+ (1.888.443.4394). 3HUVRQDO FDOILFDGR GHQ VHUYLFLR WpFQLFR R XQ SORPHUR GHEHUtDQ UHDOL]DU HVVH UHHPSOD]R. (O XVR GH XQD YDULOOD GH iQRGR QR DSUREDGD SRU *(, R HO XVR GHQ FDOHQWDGRU GH DJXD VLQ XQD YDULOOD GH iQRGR DSUREDGD SRU *( \$18/\$5É1 OD JDUDQWtD.

<b>La unidad no está produciendo sonidos QRUPDOHV.</b>	<b>Si la unidad utiliza elementos con resistencias, no producirá VRQLGRVGHYHQWLODGRURFRPSUHVRU.</b>	‡ &RQWUROH HO PRGR GH OD XQLGDG.
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**3DUD VROLFLWDU HO VHUYLFLR WpFQLFR, FRPXQtTXHVH DO 1.888.4\*(.+(:(+ (1.888.443.4394)**

## Códigos de falla. .

Código de Falla Exhibido	Condición	Acción
<b>FA</b>	74 1R 6XEH	/ODPH DO VHUYLFLR WpFQLFR
<b>FB</b>	7LHPSR GH 'HVFDUJD,QHVWDEOH	/ODPH DO VHUYLFLR WpFQLFR
<b>FC</b>	(O (YDSRUDGRU 1R (VWi /LEUH GH (VFDFKD	/ODPH DO VHUYLFLR WpFQLFR
<b>FD</b>	\$OWR 1LYHO GH &DORU 'HPDVLGR %DMR	/ODPH DO VHUYLFLR WpFQLFR
<b>FE</b>	7HPSHWDWXUD GH 'HVFDUJD 3RU (QFLPD GHQ /tPLWH	/ODPH DO VHUYLFLR WpFQLFR
<b>FF</b>	9iOYXOD GH ([SDQVLYQ (OHFWUyQLFD )XHUD GHQ 5DQJR	/ODPH DO VHUYLFLR WpFQLFR
<b>FG*</b>	&RQWURO GH 7HPSHWDWXUD \$PELHQWH 75	'DWRV GHQ VHUYLFLR WpFQLFR
<b>FH*</b>	3UXHED GH &DUJD GHQ &RPSUHVRU	'DWRV GHQ VHUYLFLR WpFQLFR
<b>FI*</b>	3UXHED GH SpJGLGDV GHQ UHIULJHUHQWH	/ODPH DO VHUYLFLR WpFQLFR
<b>F2</b>	)DOOD GHQ 6HQVRU GH 7HPSHWDWXUD GHQ 7DQTXH 72	/ODPH DO VHUYLFLR WpFQLFR
<b>F3</b>	)DOOD GHQ &RPSUHVRU	/ODPH DO VHUYLFLR WpFQLFR
<b>F4</b>	)DOOD GHQ 9HQWLODGRU	/ODPH DO VHUYLFLR WpFQLFR
<b>F5</b>	)DOOD GHQ 6HQVRU 73D (WHPSHWDWXUD GH HQWUDGD GHQ HYDSRUDGRU)	/ODPH DO VHUYLFLR WpFQLFR
<b>F6</b>	)DOOD GHQ 6HQVRU 73D (WHPSHWDWXUD GH VDOLGD GHQ HYDSRUDGRU)	/ODPH DO VHUYLFLR WpFQLFR
<b>F7</b>	)DOOD GHQ 6HQVRU 74 (VDOLGD GHQ FRPSUHVRU)	/ODPH DO VHUYLFLR WpFQLFR
<b>F8</b>	)DOOD GHQ 6HQVRU 75 (WHPSHWDWXUD DPELHQWH)	/ODPH DO VHUYLFLR WpFQLFR
<b>F9</b>	)DOOD GHQ (OHPHQWR GH &DOHQWDLPHQWR ,QIULRU	/ODPH DO VHUYLFLR WpFQLFR
<b>F10</b>	)DOOD GHQ (OHPHQWR GH &DOHQWDLPHQWR 6XSHULRU	/ODPH DO VHUYLFLR WpFQLFR
<b>F11</b>	)DOOD GHQ 7DQTXH GH 6HFDGR	/HD OD SiJLQD 64.
<b>bAd linE (F12)</b>	(O YROWDMH HV GHPDVLGR EDMR HQ HO HQFHQGLGR	/HD OD SiJLQD 64.
<b>F13</b>	)DOODSRU 7HFOD\$WRUDGD	/ODPH DO VHUYLFLR WpFQLFR
<b>Dirty Filter (F14)</b>	(O ¿OWUR HVWi VXFLR	/HD OD SiJLQD 59.
<b>F15</b>	)DOOD GH 'DWD)ODVK	/ODPH DO VHUYLFLR WpFQLFR

\* Algunos Modelos

**\* (+ \EULG :DWHU +HDWHU :DUUDQW\.**



\$OO ZDUUDQW\ VHUYLFH SURYLGHG E\ RXU \$XWKRUL]HG 6HUUYLFHU 1HWZRUN. 7R VFKHG XOH VHUYLFH, FDOO 888.4\* (.+(:+ (888.443.4394). 3OHDVH KDYH VHULDO QXPEHU DQG PRGHO QXPEHU DYDLODEOH ZKHQ FDOOLQJ IRU VHUYLFH.

6WDSOH \RXU UHFHLSW KHUH. 3URRI RI WKH RULJLQDO SXUFKDVH GDWH LV QHHGHG WR REWDLQ VHUYLFH XQGHU WKH ZDUUDQW\.

**]RU 7KH 3HULRG 2I: :H :LOO 5HSODFH:**

**2QH<HDU**  
 )URP WKH GDWH RI WKH RULJLQDO SXUFKDVH  
**\$Q\ SDUW** RI WKH +\EULG :DWHU +HDWHU ZKLFK IDLOV GXH WR D GHIHFW LQ PDWHULDOV RU ZRUNPDQVKLS. 'XULQJ WKLV **limited one-year warranty**, \*(ZLOO DOVR SURYLGH, **free of charge**, DOO ODERU DQG UHODWHG VHUYLFH WR UHSODFH WKH GHIHFWLYH SDUW.

**Second through 7HQWK<HDU**  
 )URP WKH GDWH RI WKH RULJLQDO SXUFKDVH  
**Any part** RI WKH +\EULG :DWHU +HDWHU ZKLFK IDLOV GXH WR D GHIHFW LQ PDWHULDOV RU ZRUNPDQVKLS. 'XULQJ WKLV **limited ten-year parts warranty**, ODERU DQG UHODWHG VHUYLFH WR UHSODFH WKH GHIHFWLYH SDUW DUH QRW LQFOXGHG.

**:KDW, V 1RW &RYHUHG:**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>↓ Service trips to your home to teach you how to use the product.</li> <li>↓ Improper installation, delivery or maintenance.</li> <li>↓ Failure of the product if it is abused, misused, altered, used commercially or used for other than the intended purpose.</li> <li>↓ Use of this product where water is microbiologically unsafe or of unknown quality, without adequate disinfection before or after the system.</li> <li>↓ Replacement of house fuses or resetting of circuit breakers.</li> <li>↓ Damage to the product caused by accident, lightning, fire, flood or acts of God.</li> <li>↓ Incidental or consequential damage caused by possible defects with this appliance, its installation or repair.</li> <li>↓ Product not accessible to provide required service in a safe manner. Attic installation must have flooring and accessible stairs.</li> <li>↓ If product removed from original installation location.</li> </ul> | <ul style="list-style-type: none"> <li>↓ Damages, malfunctions or failure caused by the use of repair service not approved by GE.</li> <li>↓ Damages, malfunctions or failure caused by the use of unapproved parts or components.</li> <li>↓ Damages, malfunctions or failure caused by operating the heat pump water heater with the anode rod removed.</li> <li>↓ Consumo y reemplazo de la varilla del ánodo.</li> <li>↓ Damages, malfunctions or failure resulting from operating the heat pump with an empty or partially empty tank.</li> <li>↓ Damages, malfunctions or failure caused by subjecting the tank to pressure greater than those shown on the rating label.</li> <li>↓ Damages, malfunctions or failure caused by operating the heat pump water heater with electrical voltage outside the voltage range listed on the rating label.</li> <li>↓ Water heater failure due to the water heater being operated in a corrosive atmosphere.</li> </ul> |
|--|---|

**(;&/86,212),03/,(':\$55\$17,(6<RXU VROHDQGH[FOXVLYH UHPHG\ LV SURGXFW UHSDLUDV SURYLGHG LQ tKLV/LPLWHG:DUUDQW\.\$Q\ LPSOLHG ZDUUDQWLHV, LQFOXGLQJ WKH LPSOLHG ZDUUDQWLHV RI PHUFKDQWDELOLW\ RU fitness for a particular purpose, are limited to one year or the shortest period allowed by law.**

7KLV ZDUUDQW\ LV H[WHQGIV WR WKH RULJLQDO SXUFKDVHU DQG DQ\ VXFFHGLQJ RZQHU IRU SURGXFWV SXUFKDVHG IRU KRPH XVH ZLWKLQ WKH 86\$, ,I WKH SURGXFW LV ORFDWHG LQ DQ DUHD ZKHUH VHUYLFH E\ D \*( \$XWKRUL]HG 6HUUYLFHU LV QRW DYDLODEOH, \RX PD\ EH UHVSQVLEOH IRU D WULS FKDUJH RU \RX PD\ EH UHTXLUHG WR EULQJ WKH SURGXFW WR DQ \$XWKRUL]HG \*( 6HUUYLFH ORFDWRQ IRU VHUYLFH. ,Q \$ODVND, WKH ZDUUDQW\ H[FOXGHV WKH FRVW RI VKLSSLQJ RU VHUYLFH FDOOV WR \RXU KRPH.

6RPH VWDWHV GR QRW DOORZ WKH H[FOXVLRQ RU OLPLDWRQ RI LQFLGHQWDO RU FRQVHTXHQWDO GDPDJHV. 7KLV ZDUUDQW\ JLYHV \RX VSHFLILF OHJDO ULJKWV, DQG \RX PD\ DOVR KDYH RWKHU ULJKWV ZKLFK YDU\ IURP VWDWH WR VWDWH. 7R NQRZ ZKDW \RXU OHJDO ULJKWV DUH, FRQVXOW \RXU ORFDO RU VWDWH FRQVXPHU DIIDLUV RIILFH RU \RXU VWDWH-V \$WWRUQH\ \*HQHUDO.

**]RU SURGXFW SXUFKDVHG RXWVLGH RI WKH 86, FRQWDFW \RXU GHDOHU IRU :DUUDQW\ DQG 6HUUYLFH LQIRUPDWRQ.**

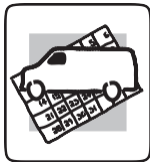
**:DUUDQWRU IRU 3URGXFWV 3XUFKDVHG LQ WKH 8QLWHG 6WDEWHV: \*HQHUDO (OHFWULF & RPSDQ\), /RXLVYLOOH, .<40225.**



## 3iJLQD :HE GH \*( \$SSOLDQFHV

GEAppliances.com

¢7LHQH DOJXQDSUHJXQWD VREUH VX HOHFWURGRppVWLFV" £3UXHEH OD SiJLQD :HE GH \*( \$SSOLDQFHV 24 KRUDV DO GtD, FXDOTXLHU GtD GHODxR! 3DUD PD\RU FRQYHQQLHQFLD \ VHUYLFLR Piv UisLGR, \DSXGHG GHVFDUJDU ORV ODQXDOHV GH ORV 3URSLHWDULRV R SHGLU SLHJVDV HQ OtQHD.



## 6ROLFLWH XQD UHSDUDFLyQ

GEAppliances.com

(O VHUYLFLR GH H[SHUWRV \*( HVWi D WDQ VyorXQ SDVR GH VX SXHUWD. 6ROLFLWH VX UHSDUDFLyQ FXDQGR OH YHQJD OODPDQGR DO 800.\*(&\$5(6 (800.432.2737) GXUDQWH KRUDV QRUPDOHV GH RILFLQD.



## 5HDO / LIH 'HVLJQ 6WXGLR ((VWXGLR GH GLVHxR SDUD OD YLGD UHDO)

GEAppliances.com

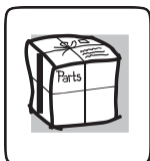
\*( DSR\D HO FRQFHSWR GH 'LVHxR 8QLYHUVDO<sup>3</sup>SURGXFWRV, VHUYLFLRV \ DPELHQWHV TXH SXHGHQ XVDU JHQWH GH WRGDV ODV HGDGHV, WDPDxRV \ FDSDFLGDGHV. 5HFRQRFHPRV OD QHFHVLGDG GH GLVHxR SDUD XQD JUDQJDPD GH KDELOLGDGHV \ GLILFXOWDGHV itVLFDV \ PHQWDOHV. 3DUD Piv GHWDOOHV FREUH ODV DSOLFDFLRQHV GH \*( 'LVHxR 8QLYHUVDO, LQFOX\HQGR LGHDV GH GLVHxR SDUD OD FRFLQD SDUD SHUVRQDV FRQ GLVDSDFLGDGHV, PLUH QXHVWUD SiJLQD :HE KR\ PLVPR. 3DUD SHUVRQDV FRQ GLILFXOWDGHV DXGLWLYDV, IDYRU GH OODPDU DO 800.7".\*(\$ (800.833.4322).



## \*DUDQWtDV DPSOLDGDV

GEAppliances.com

&RPSUH XQD JDUDQWtD DPSOLDGD \ REWHQJD GHWDOOHV VREUH GHVFXHQWRV HVSHFLDOHV GLVSRQLEOHV PLHQWUDV VX JDUDQWtD HVWi D~Q DFWLYD. 3XHG FRPSUDUD HQ OtQHD HQ FXDOTXLHU PRPHQWR, R OODPDU DO (800.626.2224) GXUDQWH KRUDV QRUPDOHV GH RILFLQD. \*( &RQVPHU +RPH 6HUYLFLV HVWDUi D~Q Dkt FXDQGR VX JDUDQWtD WHUPLQH.

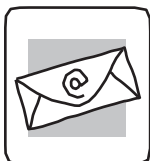


## 3LHJDV \ DFFHVRULRV

GEAppliances.com

\$TXHOORV LQGLYLGXRV FRQ OD FDOLILDFLyQ QHFHVDULD SDUD UHSDUDU VX SURSLRV HOHFWURGRppVWLFV SXHGHQ SHGLU TXH VH OHV PDQGHQ ODV SLHJDV R DFFHVRULRV GLUHFWDPHQWH D VXV KRJDUHV (DFHSDPRV ODV WDUMHWDV 9,6\$, ODVWHU&DUG \ 'LVFRYHU). +DJJ VX SHGLGR HQ OtQHD KR\, 24 KRUDV FDGD GtD R OODPDU SRU WHOPIRQR DO 800.626.2002 GXUDQWH KRUDV QRUPDOHV GH RILFLQD.

**Las instrucciones descritas en este manual cubren los procedimientos a seguir por cualquier usuario. Cualquier otra reparación debería, por regla general, referirse a personal calificado autorizado. Debe ejercerse precaución ya que las reparaciones incorrectas pueden causar condiciones de funcionamiento inseguras.**



## 3yQJDVH HQ FRQWDFWR FRQ QRVRWURV

GEAppliances.com

6L QR HVWi VDWLVIHFKR FRQ HO VHUYLFLR TXH UHFLEH GH \*(, SyQJDVH HQ FRQWDFWR FRQ QRVRWURV HQ QXHVWUD SiJLQD :HE LQGLFDQGR WRGRV ORV GHWDOOHV Dvt FRPR VX Q~PHUR GH WHOPIRQR R HVFUtEDQRV D:

\*HQHUDO ODQDJHU, &XVWRPHU 5HODWLRQV

\*( \$SSOLDQFHV, \$SSOLDQFH 3DUN

/RXLVYLOOH, < 40225



## 5HJLVWUH VX HOHFWURGRppVWLFV

GEAppliances.com

£5HJLVWUH VX QXHYR HOHFWURGRppVWLFV HQ OtQHD<sup>3</sup>FXDQGR XVWHG SUHILHUI! (O UHJLVWUDU VX SURGXFWR D WLHPSR OH SURSRUFLRQDUi, VL VXUJLHUD OD QHFHVLGDG, XQD PHMRU FRPXQLDFLyQ \ XQ VHUYLFLR Piv UisLGR EDMR ORV WpUPLQRV GH VX JDUDQWtD. 7DPELpQ SXHGH HQYLDU VX WDUMHWDV GH UHJLVWUR SUH-LPSUHVD TXH VH LQFOX\H HQ HO PDWHULDO GH HPEDODMH R UHFURWH \ VXH HO IRUPXODULR GH HVWH ODQXDO GH O 3URSLHWDULR.

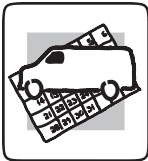
# Consumer Support.



## \*( \$\$\$OLDQFHV :HEVLWH

,Q WKH 8.6.: **GEAppliances.com**

+DYH D TXHVWLRQ RU QHHG DVVLVWDQFH ZLWK \RXU DSSOLDQFH" 7U\ WKH \*( \$\$\$OLDQFHV :HEVLWH 24 KRXUV D GD\, DQ\ GD\ RI WKH \HDU! )RU JUHDWHU FRQYHQHQFH DQG IDVWHU VHU\LFH, \RX FDQ QRZ GRZQORDG 2ZQH-U ODQXDOV, RUGHU SDUWV, RU HYHQ VFKHG\XOH VHU\LFH RQ-OLQH. ,Q &DQGD: ZZZ.\*(\$\$OLDQFHV.FD



## 6FKHG\XOH 6HU\LFH

,Q WKH 8.6.: **GEAppliances.com**

([SHUW \*( UHSDLU VHU\LFH LV RQO\ RQH VVHS DZD\ IURP \RXU GRRU. 6FKHG\XOH \RXU VHU\LFH DW \RXU FRQYHQHQFH E\ FDOOLQJ 800.\*(&\$5(6 (800.432.2737) GXULQJ QRUPDO EXVLQHVV KRXUV. ,Q &DQGD, FDOO 1.800.561.3344



## 5HDO / LIH 'HVLJQ 6WXGLR

,Q WKH 8.6.: **GEAppliances.com**

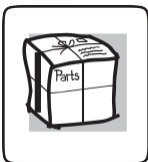
\*( VXSSRUWV WKH 8QLYHUVDQ 'HVLJQ FRQFHSW<sup>3</sup>SURGXFWV, VHU\LFHV DQG HQYLURQPHQWV WKDW FDQ EH XVHG E\ SHRSOH RI DOO DJHV, VL]HV DQG FDSDELOLWLV. :H UHFRLQJ\H WKH QHHG WR GHVLJQ IRU D ZLGH UDQJH RI SK\VLFDQ DQG PHQWDO DELOLWLV DQG LPSDLPHQWV. )RU GHWDLOV RI \*( -V 8QLYHUVDQ 'HVLJQ DSSOLFDWLRQV, LQFOXGLQJ NLWFKHQ GHVLJQ LGHDV IRU SHRSOH ZLWK GLVDELOLWLV, FKHFN RXW RXU :HEVLWH WRGD\ . )RU WKH KHDULQJ LPSDLUHG, SOHDVH FDOO 800.7" .\*( \$ & (800.833.4322). ,Q &DQGD, FRQWDFW: 0DQDJHU, &RQVXPHU 5HODWLRQV, ODEH &DQGD, QF. 6XLWH310, 1)DFWRU\ /DQH ORQFWRQ, 1%. (1 & 903



## ([WHQG\HG :DUUDQWLHV

,Q WKH 8.6.: **GEAppliances.com**

3XUFDVH D \*( H[WHQG\HG ZDUUDQW\ DQG OHDUQ DERXW VSHFDO GLVFRXQWV WKDW DUH DYDLODEOH ZKLOH \RXU ZDUUDQW\ LV VWLOO LQ HHHFW. <RX FDQ SXUFDVH LW RQ-OLQH DQ\WLPH, RU FDOO 800.626.2224 GXULQJ QRUPDO EXVLQHVV KRXUV. \*( &RQVXPHU +RPH 6HU\LFHV ZLOO VWLOO EH WKHUH DIWHU \RXU ZDUUDQW\ H[SLUHV. ,Q &DQGD, FDOO 1.888.261.2133



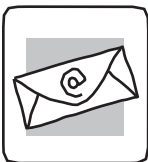
## 3DUWV DQG \$FFHVVRULHV

,Q WKH 8.6.: **GEAppliances.com**

,QGLYLGXDOV TXDOLHG WR VHU\LFH WKHLU RZQ DSSOLDQFHV FDQ KDYH SDUWV RU DFFHVVRULHV VHQW GLUHFWO\ WR WKHLU KRPHV (9,6\$, ODVWHU & DUG DQG 'LVFRYHU FDUGV DUH DFFHSWHG). 2UGHU RQ-OLQH WRGD\, 24 KRXUV HYHU\ GD\ RU E\ SKRQH DW 800.626.2002 GXULQJ QRUPDO EXVLQHVV KRXUV.

**,QVWUXFWLRQV FRQWDLQH LQ WKLV PDQXDO FRYHU SURFHGXUHV WR EH SHUIRUPHG E\ DQ\ XVHU. 2WKHU VHU\FLQJ JHQHUDOO\ VKRXOG EH UHIIUHUHG WR TXDOLHG VHU\LFH SHUVRQ\HO. &DXWLRQ PXVW EH H[HUFLVHG, VLQFH LPSURSHU VHU\FLQJ PD\ FDXVH unsafe operation.**

&XVWRPHUV LQ &DQGD VKRXOG FRQVXOW WKH \HOORZ SDJHV IRU WKH QHDUHVW ODEH VHU\LFH FHQWHU, RU FDOO 1.800.661.1616.



## &RQWDFW 8V

,Q WKH 8.6.: **GEAppliances.com**

,I \RX DUH QRW VDWLILHG ZLWK WKH VHU\LFH \RX UHFHLYH IURP \*(, FRQWDFW XV RQ RXU :HEVLWH ZLWK DOO WKH GHWDLOV LQFOXGLQJ \RXU SKRQH QXPEHU, RU ZULWH WR: \*HQHUDO 0DQDJHU, &XVWRPHU 5HODWLRQV \*( \$\$\$OLDQFHV, \$\$\$OLDQFH 3DUN /RXLVYLOOH, < 40225

,Q &DQGD: ZZZ.\*(\$\$OLDQFHV.FD, RU ZULWH WR: 'LUHFWRU, &RQVXPHU 5HODWLRQV, ODEH &DQGD, QF. 6XLWH310, 1)DFWRU\ /DQH ORQFWRQ, 1%. (1 & 903



## 5HJLVWHU <RXU \$\$\$OLDQFH

,Q WKH 8.6.: **GEAppliances.com**

5HJLVWHU \RXU QHZ DSSOLDQFH RQ-OLQH<sup>3</sup>DW \RXU FRQYHQHQFH! 7LPHO\ SURGXFW UHJLVWUDWLRQ ZLOO DOORZ IRU HQKDQFHG FRPPXQLFDWLRQ DQG SURPSW VHU\LFH XQGHU WKH WHUPV RI \RXU ZDUUDQW\, VKRXOG WKH QHHG DULVH. <RX PD\ DOVR PDLO LQ WKH SUH-SULQWHG UHJLVWUDWLRQ FDUG LQFOXGHG LQ WKH SDFNLQJ PDWHULDO, RU GHWDFK DQG XVH WKH IRUP LQ WKLV 2ZQH-U ODQXDO. ,Q &DQGD: ZZZ.\*(\$\$OLDQFHV.FD

## For Residential Fire Sprinkler Applications

Job Name \_\_\_\_\_

Contractor \_\_\_\_\_

Job Location \_\_\_\_\_

Approval \_\_\_\_\_

Engineer \_\_\_\_\_

Contractor's P.O. No. \_\_\_\_\_

Approval \_\_\_\_\_

Representative \_\_\_\_\_

# LEAD FREE\*

## RF PEX™ Residential Fire Tubing

Sizes: 3/4" – 1" (20 – 25mm)

RF PEX™ Tubing is used for residential fire PEX multipurpose piping systems used to support NFPA 13D, which is the standard covering the "Installation of Sprinkler Systems in One and Two-Family Dwellings and Manufactured Homes." RF PEX™ tubing's unique orange tracer stripe facilitates fire official's inspection.

### UL Listed Pressures and Temperatures

80psi (552 kPa) at 200°F (93.3°C)  
(If RF Tubing is used for Hot Water Lines,  
Not intended for Fire Suppression use)

100psi (689 kPa) at 180°F (82.2°C)  
(If RF Tubing is used for Hot Water Lines,  
Not intended for Fire Suppression use)

130psi (896 kPa) at 120°F (48.9°C)  
(Residential Fire Rating)

160psi (1103 kPa) at 73.4°F (23°C)  
(For Reference Only)

### Specifications

RF PEX™ Tubing is only to be used with RF PEX™ Fittings, RF PEX™ Sprinkler Fittings and Copper Crimp Rings™ all of which are UL 1821 listed. These products are designed for use with residential 13D multipurpose fire suppression piping and potable water plumbing applications. RF PEX™ tubing also has an orange tracer stripe to aid in identification.

\*The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight.



### Approvals

The below listings are solely based upon use of Watts UL 1821 listed RF PEX™ Tubing, RF PEX™ Fittings and Crimp Ring™ connections.



Manufactured in accordance with the American Society for Testing and Materials (ASTM) F-876 and F-877 to SDR-9 dimensional standards.

Tested and certified by NSF International to NSF/ANSI Standards 14 and 61 for use in potable water systems.

Labeled B137.5 which indicates that it is compliant to the CSA standards B137.5.

When not connected to the fire suppression system, Certified PEX5306 is acceptable for use in continuous hot water recirculation.

Can withstand up to 6 months of continuous UV exposure.

ASTM E-84 and CAN/ULC 102.2 smoke developed and flame spread classification.

Fire Resistance per CAN/ULC S101 and ASTM E119-08 AWWAC904.

UL 1821 listed for use in Residential Fire Sprinkler Systems per NFPA 13D.

## Dimensions – Weights

ModEl	noRMal Tubing sizE		coil/sTick lEngTh		bEnd Radius		Fluid caPaciTy PER 100°		Pkg.wEighT			
	ID	OD										
	in.	mm	in.	mm	ft.	cm	in.	mm	gals.	ltrs.	lbs.	kgs.
<b>coils</b>												
FPTC12-100W-0S	¾	20	7/8	22	100	3048	5.25	133	1.9	7.22	10.5	4.8
FPTC12-250W-0S	¾	20	7/8	22	250	7620	5.25	133	1.9	7.22	26.25	12
FPTC12-300W-0S	¾	20	7/8	22	300	9144	5.25	133	1.9	7.22	31	14.1
FPTC12-500W-0S	¾	20	7/8	22	500	15240	5.25	133	1.9	7.22	45	20.4
FPTC12-1000W-0S	¾	20	7/8	22	1000	30480	5.25	133	1.9	7.22	106	48
FPTC16-100W-0S	1	25	1 1/8	29	100	3048	6.75	171	3.10	11.78	18	8.2
FPTC16-300W-0S	1	25	1 1/8	29	300	9144	6.75	171	3.10	11.78	54	24.6
FPTC16-500W-0S	1	25	1 1/8	29	500	15240	6.75	171	3.10	11.78	90	41
<b>sTicks</b>												
FPTS12-10W-0S	¾	20	7/8	22	20	610	5.25	133	1.9	7.22	18	8.16
FPTS12-25W-0S	¾	20	7/8	22	20	610	5.25	133	1.9	7.22	45	20.4
FPTS16-5W-0S	1	25	1 1/8	29	20	610	6.75	171	3.10	11.78	50	22.7



A Watts Water Technologies Company



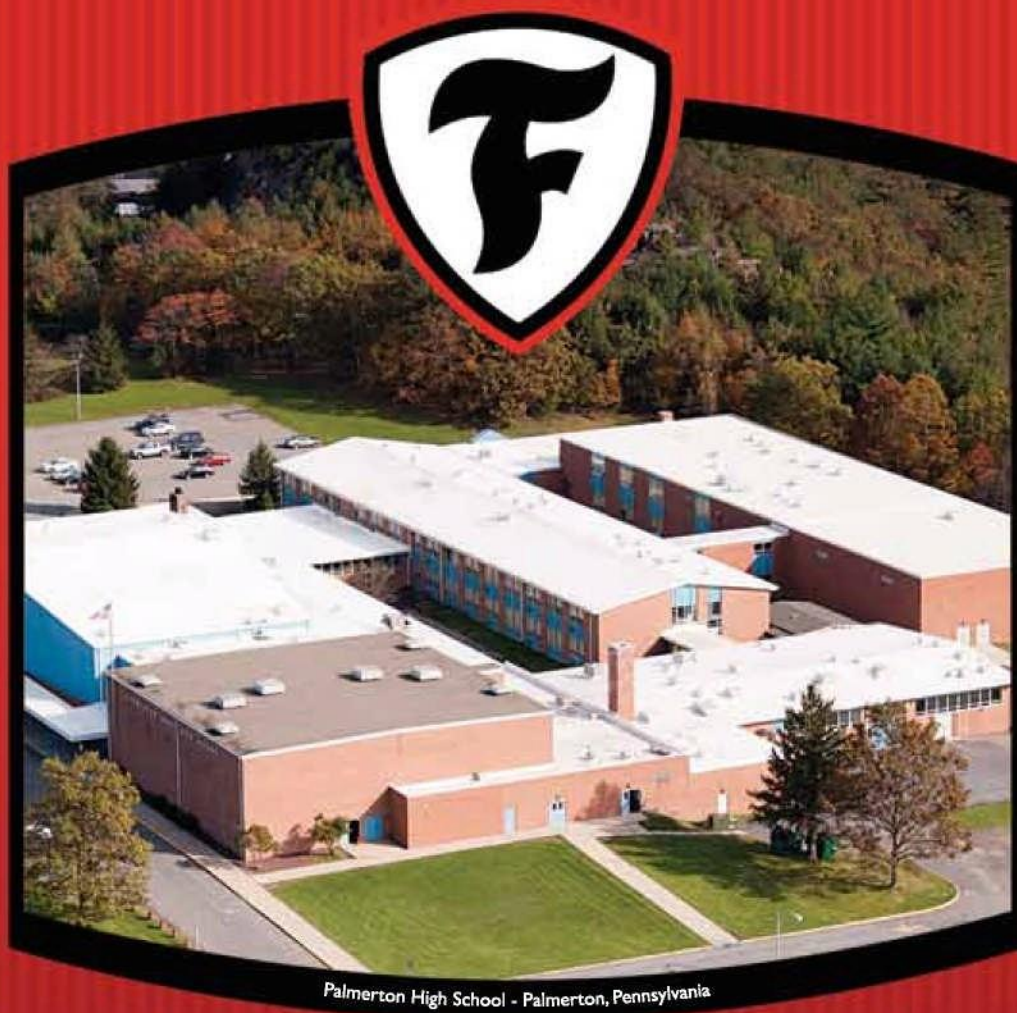
ISO 9001-2008  
CERTIFIED

USA: No. Andover, MA • Tel: (978) 688-1811 • Fax: (978) 794-1848 • www.watts.com  
Canada: Burlington, ON • Tel: (905) 332-4090 • Fax: (905) 332-7068 • www.wattscanada.ca



# FIRESTONE RUBBERGARD™ EPDM ROOFING SYSTEMS

BLACK OR WHITE, THE STANDARD IN EPDM ROOFING.



Palmerton High School - Palmerton, Pennsylvania

**Firestone**  
BUILDING PRODUCTS  
NOBODY COVERS YOU BETTER.™

When choosing an EPDM system,  
the choice is  
**B L A C K** and



Kellogg Company Plant and Bakery - Lancaster, Pennsylvania

With a traditional black RubberGard™ EPDM system, and its full line of accessories, any building can have a durable, recyclable roof. All from the company with 110 years of proven rubber technology and experience behind its name: Firestone.

**RUBBERGARD PLATINUM™ EPDM SYSTEM.**

Designed with the industry's most durable black EPDM membrane—90-mil of uninterrupted thickness—the Platinum EPDM System is quite simply our best roof.

**SOME ROOFS ARE JUST MADE TO LAST.  
FIRESTONE EPDM ROOFS ARE MADE TO OUTLAST.**

In addition to increased service life, Platinum EPDM membranes provide substantial annual savings in the cost of roof ownership. Its unsurpassed durability can extend the life of a building for many years. This makes the Platinum EPDM System especially suited for owners of educational institutions, hospitals and government buildings, or building authorities responsible for transportation centers, sports complexes and recreation centers.

**THE YEARS AND THE SAVINGS ADD UP.**

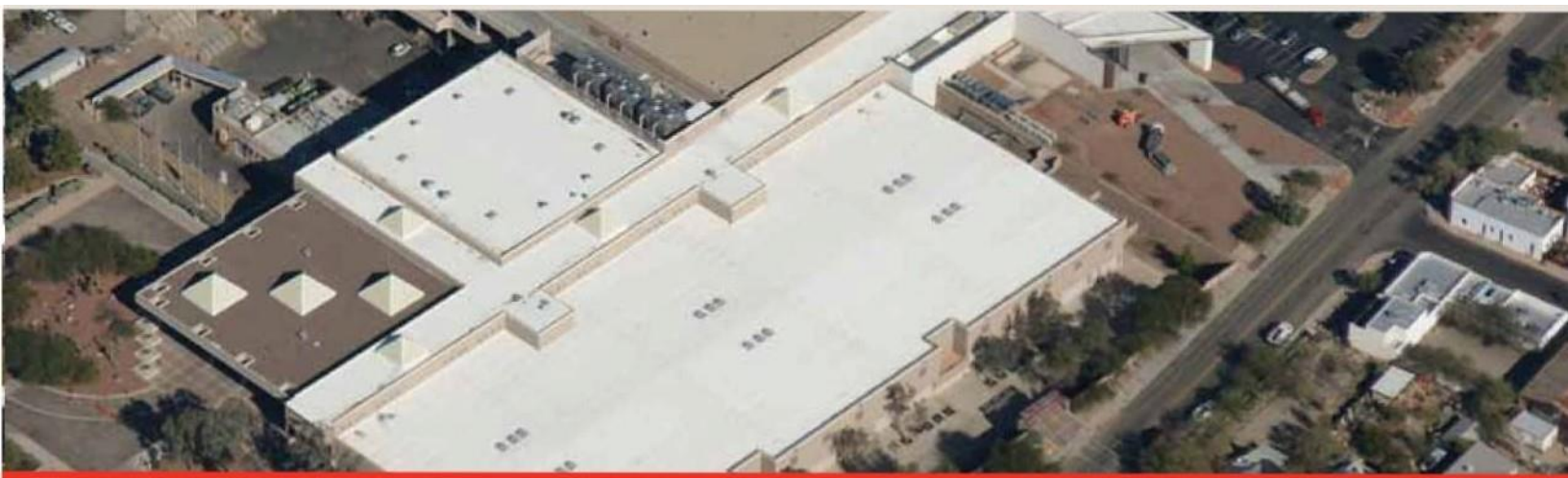
Both EcoWhite™ Platinum and RubberGard Platinum EPDM systems are backed by our Red Shield™ Warranty, the industry's most comprehensive guarantee: up to an unsurpassed 30-year warranty, with no dollar limit on warrantable repairs for up to 30 full years from date of installation. These weathertight warranties\* are also transferable from owner to owner.

\*Subject to the terms and conditions of the Red Shield Warranty.



D M r o o f n g s y s t e m ,  
c e s

d W H I T E



Tucson Convention Center - Tucson, Arizona

A bright innovation for traditional roofing, RubberGard™ EcoWhite™ EPDM membrane sets the industry standard for sustainable, white, reflective roofing and keeps you at the forefront of energy conservation.

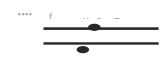
**RUBBERGARD ECOWHITE EPDM MEMBRANE.**

Keep rooftops cooler without sacrificing the high standards you have come to expect from Firestone Building Products. EcoWhite EPDM membrane is easy to handle, installs quickly, and is more flexible than thermoplastic single-ply membranes, making it ideal for year-round applications.

- The highest CRRC aged solar reflectance rating for white EPDM-measured at 0.72 versus the competitive product at 0.64
- Qualifies for the ENERGY STAR Program
- Contributes to LEED certification or RoofPoint™ audit
- Can provide significant energy savings

You'll be in good company when you choose Firestone RubberGard EcoWhite EPDM membrane. It is the fastest-growing single-ply Firestone roofing product-and building owners use Firestone single-ply roofing more than any other brand in America.

\*Buildings Magazine 2011 BrandAwareness. Use and Preference Study and Building Operating Management Magazine 2011 Brand Awareness. Use and Preference Study



RoofPOINT  
... O twoCF



Puncture: Covers incidental punctures  
 Puncture/hail: Covers punctures from hail of up to 2" in diameter  
 Puncture/hail/wind: Covers punctures, hail and wind damage up to 100 mph





Red Bull Park - Harrison, New Jersey

## The Benefits of RubberGard™ EPDM

For nearly 30 years, contractors, building owners, architects and specifiers have trusted Firestone Building Products for superior commercial roofing systems.

**SUPERIOR ROOFTOP PERFORMANCE AND LONGEVITY.** Based on a high-performance synthetic rubber compound, RubberGard EPDM membrane exhibits outstanding resistance to UV radiation, ozone and weathering, and offers excellent low temperature properties and longer service life.

**ENERGY SAVINGS.** Whether you choose black or white EPDM, the system's thermal performance can reduce energy consumption.

**SYSTEM OPTIONS.** Options include fully adhered, ballasted, and mechanically attached and can be applied above 40°F.

**SIMPLE AND ECONOMICAL TO INSTALL.** RubberGard EPDM membrane is available in widths from 5 to 50 feet and lengths of up to 200 feet, and can require fewer seams and less installation time compared to other single-ply membranes.

**SUPERIOR FLEXIBILITY AND HIGH STRENGTH.** RubberGard EPDM membrane easily contours to unusual roof shapes. EPDM membranes can elongate to over 300% of their original dimensions, exhibiting outstanding thermal expansion and contraction characteristics.

**LIGHTWEIGHT DESIGN FOR MORE VERSATILITY.** RubberGard EPDM membrane weighs less than a half pound per square foot.

fResola for black and white EPDM depend on location.



### FROM DECK TO DONE, FIRESTONE IS YOUR SINGLE SOURCE FOR COMPLETE ROOFING SYSTEMS.

A complete roofing system isn't always a *compatible roofing system*. When you get a membrane from one manufacturer, flashing from another, and insulation from yet another, you can't be sure how well everything will fit and function together. When the whole system comes from a single source, the components are optimized for performance. That's why the Firestone brand is on everything you need to assemble a complete roofing system—all the parts fit together and work together for optimum results.



Aragon High School - San Mateo, California

### QUICKSEAM™ ACCESSORIES

The QuickSeam tape system is the most advanced method of field seaming EPDM membrane. Contractors appreciate that QuickSeam Tape can be applied faster than other seaming methods, while specifiers recognize the performance, environmental and quality control advantages. In UL-observed tests, QuickSeam Tape products exhibited twice the seam strength of conventional splice adhesive. QuickSeam Tape is compatible with all RubberGard™ EPDM roofing membranes.

The self-adhering technology of QuickSeam SA Flashing was developed for both curbs and parapets in association with RubberGard EPDM roofing systems. QuickSeam SA Flashing consists of an 18-1/2 inch wide, 60-mil RubberGard EPDM membrane laminated to QuickSeam Tape.

Firestone's tested and proven, highly reflective, energy-saving EcoWhite™ QuickSeam Flashing accessories are in stock and ready to ship for your next EcoWhite roof installation. QuickSeam products have been hugely successful over the years due to their many benefits, including:

- Easier and faster installation which can significantly reduce labor costs
- Reduces VOCs on the jobsite
- Factory-Installed tape that yields higher quality seams
- Tested and proven quality and reliability



### LVOC BONDING ADHESIVES: OUTSTANDING PERFORMANCE, ENVIRONMENTALLY FRIENDLY

To reduce harmful ground level ozone, our Low Volatile Organic Compound (LVOC) products meet the stringent air quality requirements of California and the states that comply with the Ozone Transport Commission (OTC) regulations without sacrificing the quality you expect. Products include sealants, primers, tapes, and both Firestone single-ply LVOC and water-based bonding adhesives. Firestone also has a full line of standard bonding adhesives.

### RUBBERGARD EPDM PRE-TAPED MEMBRANES

Available with 3-inch or 6-inch tape, these membranes offer faster installation.

**EPDM LSEPT** - available in widths up to 30 feet and thicknesses of up to 90-mil, this membrane is designed for low slope applications and offers increased fire resistance.

**EPDM MAX PT** - for roofs with frequent service demands, RubberGard EPDM MAX PT membrane is available in widths of up to 10 feet and thicknesses of up to 75-mil. This membrane is reinforced to combat roof tears and punctures and provides superior resistance to wind forces.

**EcoWhite EPDM PT** - in addition to the outstanding solar reflectivity and durability of EcoWhite membranes, the EcoWhite EPDM PT membrane is eligible for a Platinum™ Warranty up to 30 years. Available in widths of up to 25 feet, and thicknesses of up to 90-mil, EcoWhite EPDM PT seam tape is cut flush with membrane to yield a more aesthetically pleasing finished product.





Mills High School - Millbrae, California



Warwick Middle School - Lititz, Pennsylvania



Meadowlands Exposition Center - Secaucus, New Jersey

**EPDM INNOVATIONS: WHAT WE'RE DOING, NOT JUST WHAT WE'VE DONE.**

True, we talk about "billions of square feet installed globally" because we believe our track record says something. But talk doesn't cover buildings. Complete systems cover buildings. Innovations cover buildings. And the only square feet you care about right now are on your next roofing project. That's why we're always developing new roofing system solutions.

**unra:rrtrrrr**

**ULTRABLEND™ ROOFING SYSTEM**

With the creation of our UltraBlend hybrid system, we've combined EcoWhite® EPDM membrane with Firestone UltraPly™ TPO membrane to create a better single solution for both horizontal and vertical roofing needs. The UltraBlend system offers both faster installation and lower installed cost using EcoWhite EPDM membrane and accessories for vertical surfaces such as parapets, walls, curbs and penetration details and UltraPly TPO membrane for horizontal roof surfaces.

**METAL ROOF RETROFIT**

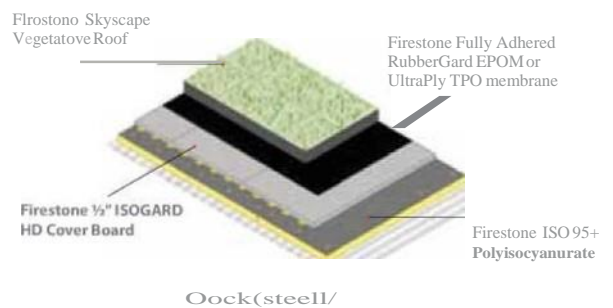
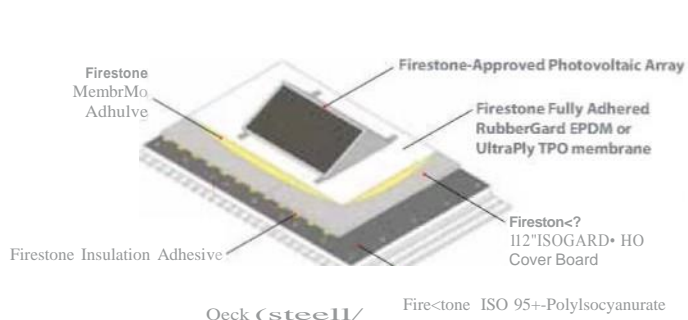
RubberGard EPDM or EcoWhite EPDM membranes, QuickSeam™ accessories, and energy saving insulation offer a solution that extends the life of an existing roof for 20 years or longer and can be installed over a worn metal roof.

**ENVIROREADY ROOFING SYSTEM**

The EnviroReady Roofing System and Warranty lets building owners install a high-quality conventional roof today and upgrade it with green roofing technology tomorrow. Firestone's Red Shield warranty keeps new EPDM systems "enviroready" for green roof or solar roof upgrades for up to 7 years after initial installation. This exclusive program covers inspections before and after installation of new green upgrades. Firestone has numerous EPDM system options available when the need arises.

EnviroReady Roofing Systems can play an important role in preparing your building to receive either a SkyScape Vegetative Roof System or a Firestone-approved photovoltaic system.

**EnviroReady Roofing System**



# Firestone RubberGuard™ EPDM

30+ years of high performance.  
**LOWER GLOBAL WARMING POTENTIAL. SUSTAINABLE. RECYCLABLE.**

## EPDM PERFORMANCE

EPDM significantly outperforms comparable roofing systems related to long-term environmental impact. A study of low slope roofing membranes conducted on behalf of the EPDM Roofing Association (ERA) by the GreenTeam, Inc., featured a life-cycle assessment of EPDM, TPO, PVC and SBS Modified Bitumen membranes. The study showed 60-mil fully adhered bilaminate, white or black EPDM membrane had the lowest global warming potential (GWP) and other membranes, such as PVC, would have to perform over three times longer to have an equivalent global warming potential as white EPDM. See chart below:

ROLE OF SERVICE LIFE

	MEMBRANE	SYSTEM	GLOBAL WARMING POTENTIAL (Kg.CO <sub>2</sub> e)	MIN. SERVICE LIFE TO ACHIEVE EQUIVALENCY
I: Q w	60-mil White	Adhered	22.4	15 Years
	60-mil Black		29.6	19.8 Years
O .....	60-mil White	Adhered	30.0	20.7 Years
U >	60-mil White	Adhered	73.1	49 Years
      	140-mil (unsurfaced)	Adhered	81.8	54.8 Years

[1] Using a comparative service life of 15 years for the lowest GWP system (fully adhered white EPDM). Source: Life Cycle Inventory and Assessment of Selected Low Slope Roofing Systems in North America. TEGNOS Research, Inc. (2009). Original study included ballasted and mechanically attached roofing membranes.

## EPDM-RENEWABLE AND RECYCLABLE

EPDM rubber is one of the world's most recyclable low slope roofing products. Since 2006, almost 11 million square feet of EPDM has been removed, transported and recycled from buildings all across North America and Canada, creating new and usable products such as rubber matting and artificial turf. With the reroofing market currently driving the low slope roofing business for installers, roofing contractors are doing most of the recycling work. Today, more and more architects are writing a recycling process into their new roof specifications. Specifiers and facility managers also will see roof recycling as an absolute necessity in the years to come, due to a growing number of codes that incorporate sustainability requirements. *For more information on the sustainability and recyclability of EPDM, visit [www.epdmroof.org](http://www.epdmroof.org).*



To build more value into your roofing systems, visit [www.firestonebpco.com/roofing/epdm](http://www.firestonebpco.com/roofing/epdm), call **800-428-4442**, or contact your local Firestone Sales Representative by using our website's *Find a Sales Rep* feature.

# 'F'irestone

BUILDING PRODUCTS

## NOBODY COVERS YOU BETTER.™

Firestone Building Products  
250 West 96th St Indianapolis, IN 46260  
Corporate Office: 800-428-4442 • 317-575-7000

### International Offices:

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Firestone Building Products Europe  
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+32 2 71 14450

Firestone Building Products Latin America  
8200 NW 52nd Terrace, Suite #107  
Miami, FL 33166  
305-471-0117

[www.firestonebpc.com](http://www.firestonebpc.com)

Note: This brochure is meant only to highlight Firestone's products and specifications. Information is subject to change without notice. All products and specifications are listed in applicable technical specifications and measurements. For complete product detail information, please refer to the appropriate Technical Manual. Firestone takes responsibility for furnishing quality materials which meet Firestone's published product specifications. As an authorized Firestone distributor, its representatives practice architecture. Firestone offers no opinion on, and expressly disclaims any liability for, the soundness of any structure on which its product may be applied. If questions arise as to the soundness of a structure or its ability to support a planned installation properly, the Owner should obtain opinions of competent architectural engineers before proceeding. Firestone accepts no liability for any structural failure or for resultant damages, and no Firestone Representative is authorized to vary this disclaimer.



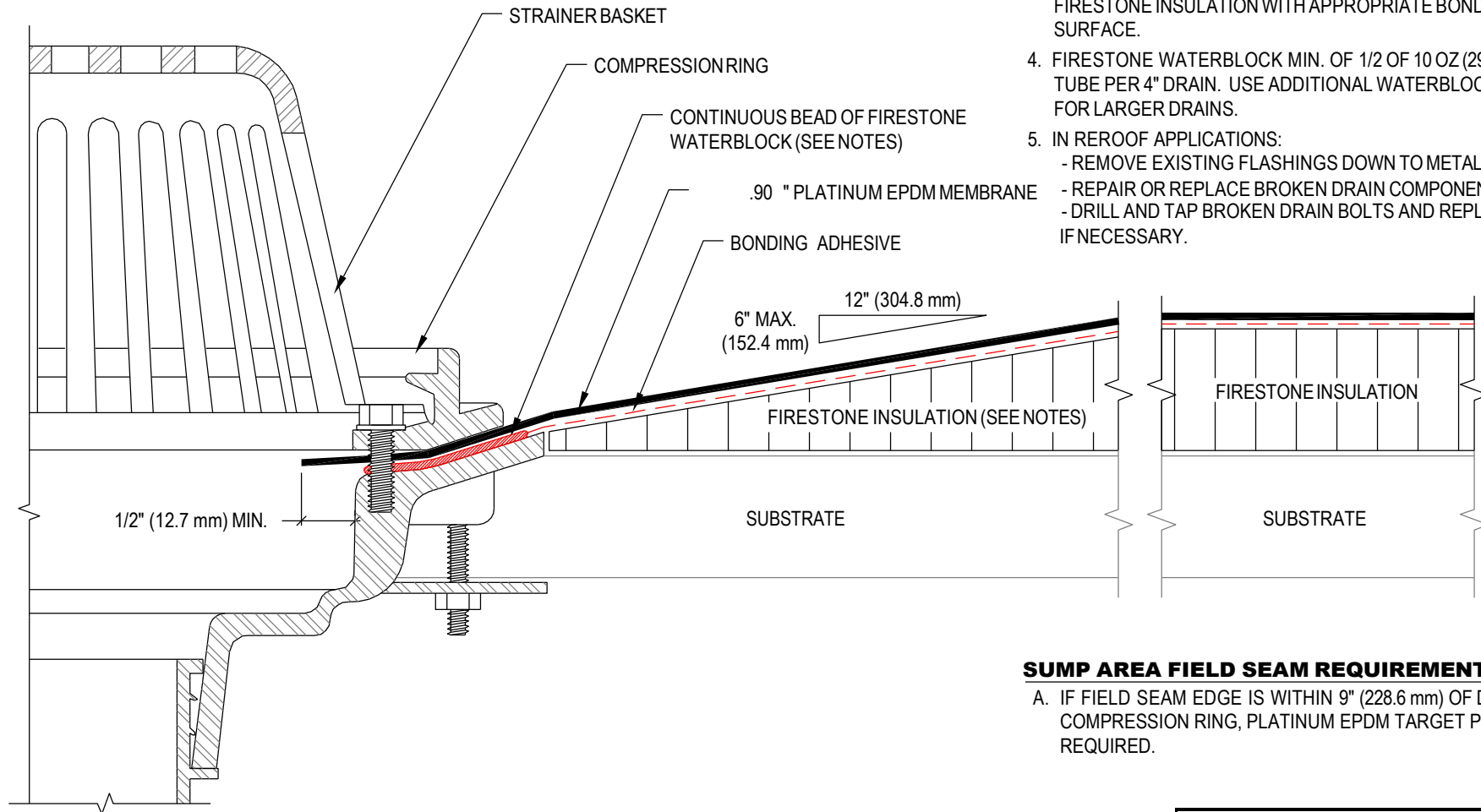
100% Green Power  
[www.firestonebpc.com](http://www.firestonebpc.com)



Supplied by Community Energy



Printed on Recycled Paper



- NOTES:
1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
  2. HOLE IN MEMBRANE SHOULD EXTEND A MINIMUM OF 1/2" (12.7 mm) BEYOND CLAMPING RING AND SHOULD NOT BE SMALLER THAN THE DIAMETER OF THE LEADER PIPE.
  3. INSULATION ADJACENT TO DRAIN TO BE APPROPRIATE FIRESTONE INSULATION WITH APPROPRIATE BONDING SURFACE.
  4. FIRESTONE WATERBLOCK MIN. OF 1/2 OF 10 OZ (295 ml) TUBE PER 4" DRAIN. USE ADDITIONAL WATERBLOCK FOR LARGER DRAINS.
  5. IN REROOF APPLICATIONS:
    - REMOVE EXISTING FLASHINGS DOWN TO METAL BOWL
    - REPAIR OR REPLACE BROKEN DRAIN COMPONENTS
    - DRILL AND TAP BROKEN DRAIN BOLTS AND REPLACE IF NECESSARY.

**SUMP AREA FIELD SEAM REQUIREMENTS:**

- A. IF FIELD SEAM EDGE IS WITHIN 9" (228.6 mm) OF DRAIN COMPRESSION RING, PLATINUM EPDM TARGET PATCH REQUIRED.

MAXIMUM WARRANTY: **30 YEARS**

**Firestone**  
 BUILDING PRODUCTS  
 NOBODY COVERS YOU BETTER.™  
 www.firestonebpco.com

**ROOF DRAIN**

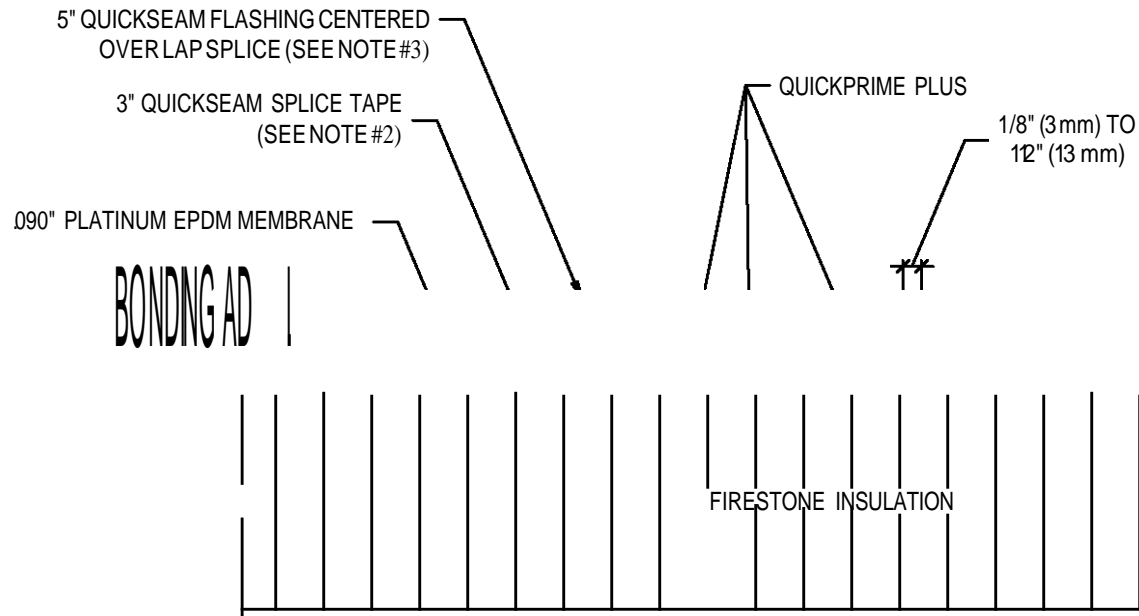
RubberGard™ Platinum

ACCEPTABLE SYSTEMS: PLATINUM

ISSUE / REVISION DATE:  
 1/1/2006

NOT TO SCALE

DETAIL NO.  
**PD-1**



**NOTE:**

1. REFER TO FIRESTONE WEBSITE FOR MOST CURRENT INFORMATION.
2. END LAPS OF QUICKSEAM SPLICE TAPE MUST OVERLAP A MINIMUM OF 1" (25 mm).
3. END LAPS OF 5" QUICKSEAM FLASHING MUST OVERLAP A MINIMUM OF 3" (76 mm). REFER TO PLS-5.

Nj

SUBSTRATE

MAXIMUM WARRANTY: 30 YEARS

**LAP SPLICE**

**f!!!**  
**NOBODY COVERS YOU BETTER.™**  
 www.firestonebpc.com

RUBBER3ARDTM

PLATINUM

ACCEPTABLE SYSTEMS: PLATINUM

ISSUE/REVISION  
 DATE:  
 6/16/2014

NOT TO SCALE

DETAIL NO.

**PLS-1**



# LSF-500CIG3

Compact Residential Package

90GPM @ 45PSI

## System Specifications

### Motor

- 5 horsepower electric
- 230 Volt, 21.5 Amp
- Single Phase
- 3450 RPM

### Pump

- High pressure cast iron volute
- Machined bronze impeller
- 2" Suction
- 1 1/4" Discharge
- 150 PSI Max Working Pressure

### Discharge Manifold

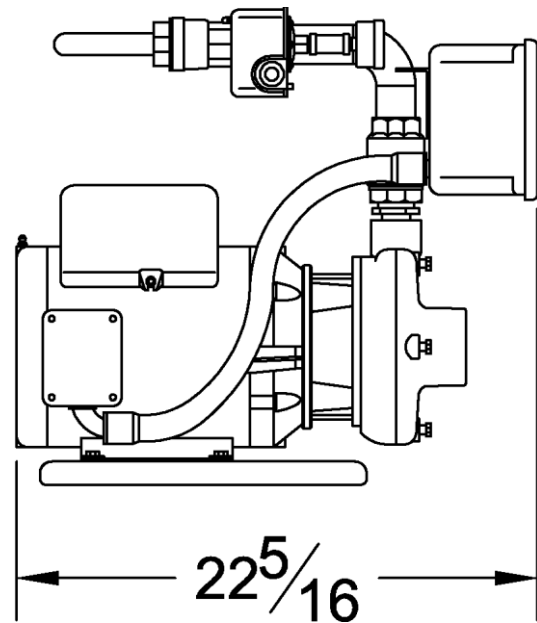
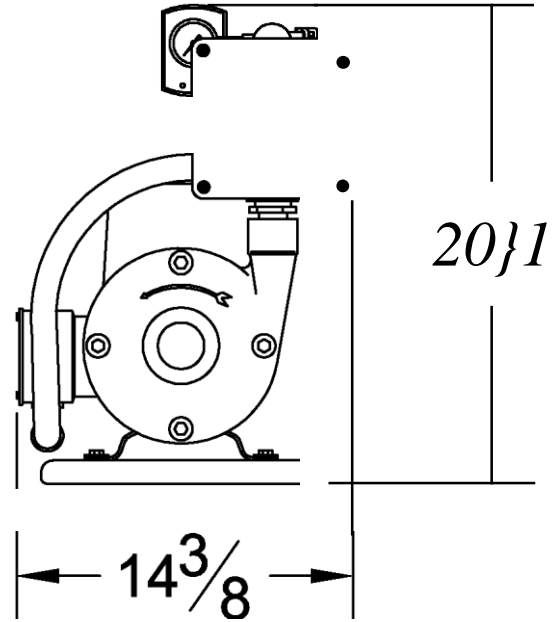
- Check Valve
- Zero to 100 PSI pressure gauge
- 40/60 pressure switch
- Isolation ball valve

### Controls

- 230 Volt
- Minimum run timer
- Pressure switch operated contactor
- HOA toggle switch (Hand, Off, Auto)

### Dimensions (approximate)

- 22 5/16" Length
- 20" Height
- 14 3/8" Width
- 135 pounds



## Performance

Performance values based on multiple pump tests. Not for certification purposes.

<b>GPM</b>	<b>0</b>	<b>40</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>80</b>	<b>90</b>	<b>100</b>
<b>PSI</b>	<b>61</b>	<b>58</b>	<b>56</b>	<b>54</b>	<b>52</b>	<b>49</b>	<b>46</b>	<b>43</b>


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## NSF Product and Service Listings

These Listings were Last Updated on **Thursday, December 18, 2008** at 4:15 AM Eastern Time. Please [contact NSF International](#) to confirm the status of any Listing, report errors, or make suggestions.

**Warning:** NSF is concerned about fraudulent downloading and manipulation of website text. If you have received this listing in hard copy, always confirm this certification/listing information by going directly to <http://www.nsf.org/Certified/PwsComponents/Listings.asp?Company=4U190&Standard=061&> for the latest most accurate information.

### NSF/ANSI STANDARD 61 Drinking Water System Components - Health Effects

**NOTE:** Unless otherwise indicated for Materials, Certification is only for the Water Contact Material shown in the Listing. Click here for a list of [Abbreviations used in these Listings](#).

#### THE VIKING CORPORATION

210 NORTH INDUSTRIAL PARK ROAD  
HASTINGS, MI 49058  
269-945-9501

**Facility :** HASTINGS, MI

#### Pipes and Related Products

Trade Designation	Size	Water Contact Temp	Water Contact Material
Fittings[1]			
VK425	1/2"	CLD 23	MLTPL
VK430	1/2"	CLD 23	MLTPL
VK432	1/2"	CLD 23	MLTPL
VK434	1/2"	CLD 23	MLTPL
VK435	1/2"	CLD 23	MLTPL
VK436	1/2"	CLD 23	MLTPL
VK438	1/2"	CLD 23	MLTPL
VK440	1/2"	CLD 23	MLTPL
VK442	1/2"	CLD 23	MLTPL
VK444	1/2"	CLD 23	MLTPL
VK450	1/2"	CLD 23	MLTPL

VK452	1/2"	CLD 23	MLTPL
VK453	1/2"	CLD 23	MLTPL
VK456	1/2"	CLD 23	MLTPL
VK457	1/2"	CLD 23	MLTPL
VK458	1/2"	CLD 23	MLTPL
VK460	1/2"	CLD 23	MLTPL
VK466	1/2"	CLD 23	MLTPL
VK468	1/2"	CLD 23	MLTPL
VK474	1/2"	CLD 23	MLTPL

[1] Certified to a maximum use of one sprinkler head for every eight feet of piping.

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Number of matching Manufacturers is 1

Number of matching Products is 20

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# TALCO Fire Systems

## RESIDENTIAL FIRE PUMP PRODUCTS



## RESIDENTIAL FIRE PROTECTION PRODUCTS

**The Home Hydrant** is a completely integrated fire riser, pump, and water storage tank system. Versatility, competitive pricing, and appliance-like good looks makes our flagship Home Hydrant the preferred choice of home owners and home builders alike.



**LSF Series** (*Limited Service Fire*) fire pump systems are suitable for applications using city water (booster service), private wells, or water storage tanks. The LSF's electric control system features a full voltage contactor and minimum run timer for safe and reliable operation.



**\*\*Flow Smart** (FS) series pumps are the industry's price leader. These simple, reliable pump systems are designed for tank use only and provide reliable and worry free operation for any homeowner.



**HOR** (*Heavy Duty Residential*) packaged fire pumps are designed for more demanding NFPA130 applications. These systems are built using heavy duty cast-iron bronze-fit pumps with UL listed residential controllers and fitted out as if they were NFPA13R fire pump systems.



**13-ULV** systems are based around UL/FM listed vertical inline fire pumps. These packages can be configured for either NFPA 130 or NFPA13R compliance depending on your project requirements. Jockey pumps are also available as an option.



**Tanks & Accessories** Talco Fire Systems offers a wide variety of water storage tanks as well as pump to tank connection hoses, auto-fill valves, bladder tanks, etc. many of which are not cataloged. Contact one of our friendly and knowledgeable fire system specialists for more options.



**\*\*Not intended for use with city water supply**

Talco's Home Hydrant (patent pending) is designed to save you money, time, and headaches. Combining a water storage tank, fire pump, controls, and our *Smart Riser* fire riser assembly, the Home Hydrant is the most complete and compact residential fire pump package on the market. Each Home Hydrant system ships completely assembled, tested for leaks, and includes a certified performance report.

## HOME HYDRANT3

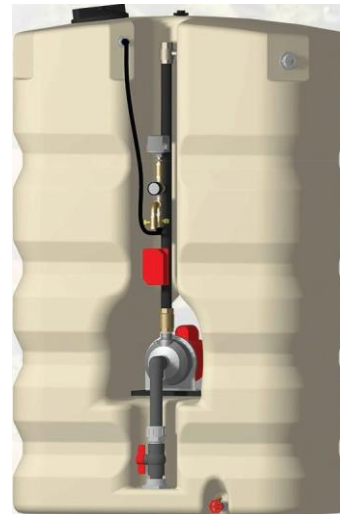
350 Gallon Water Storage Tank  
 230 Volt, Single-Phase Electric Motor  
 1.5 to 3HP

- Discharge Manifold/Fire Riser -
- Check Valve - Pressure Switch
  - Pressure Gauge - Test Connection
  - Flow Switch - System Drain

## 130 RESIDENTIAL FIRE PUMP SYSTEM

- Home Hydrant System Includes:
- 350 Gallon Water Tank
  - Fire Pump
  - Discharge Manifold/Fire Riser
  - Suction Manifold
  - Auto-Fill Valve
  - Overflow Fitting
  - Tank Drain

MODEL	HH3	HH3	HH3 150C	HH3 300C
GPM			PSI	PSI
CHURN			48	59
30			43	55
40			40	53
50			38	50
60				48



Home Hydrant installation is quick and easy -

- Place Home Hydrant
- Connect water supply to supplied Auto Fill Valve
- Connect drain pipe
- Attach discharge to sprinkler pipe
- Wire to pressure switch
- Fill tank
- Test system



## HGME HYDRANT4

450 Gallon Water Storage Tank  
 230 Volt, Single-Phase Electric Motor  
 1.5 to 3HP  
 Discharge Manifold/Fire Riser -  
 - Check Valve - Pressure Switch  
 - Pressure Gauge - Test Connection  
 - Flow Switch - System Drain



## 130 RESIDENTIAL FIRE PUMP SYSTEM

Home Hydrant System Includes:  
 450 Gallon Water Tank  
 Fire Pump  
 Discharge Manifold/Fire Riser  
 Suction Manifold  
 Auto-Fill Valve  
 Overflow Fitting  
 Tank Drain

	HH4	HH4	HH4	HH4 300C
MODEL				
GPM				PSI
CHURN				59
30				55
40				53
50				50
60				48

## FIRE SPRINKLER SYSTEMS & STANDARD WATER METERS

Our residential fire protection systems are all designed to work with standard water meters. Costs for water meters and water service can vary wildly depending on where you live. Standard water meters (5/8" or 3/4") may not provide enough water flow (GPM) to run fire sprinklers without a pump and tank system. Some water purveyors can provide a line specifically for fire sprinklers at little or no charge. For everyone else the costs for a larger water meter can be extremely prohibitive and a pump and tank system can save thousands of dollars.

Homes supplied by a well are in a similar situation. A larger well pump could supply both domestic water and provide for fire sprinklers but will cost significantly more to purchase, use more power, and may over-tax the aquafer. When costs get too high a pump and tank system is the obvious choice. We offer multiple models to cover nearly any design condition or project requirement.





## WHOLE HOUSE SYSTEMS

Combining residential fire sprinklers with domestic plumbing -

You may be required to supply water to the fire sprinklers and either part or all of the domestic plumbing system. Combined with a simple pressure tank, Talco Home Hydrant or the Flow Smart series pumps work perfectly in these applications. The pressure tank ensures efficient operation and long pump life.

We recommend the following:

For systems combining one toilet with the fire sprinklers install a pressure tank with at least 5 gallons capacity anywhere downstream of the discharge valve.

For systems where the fire pump supplies the sprinklers and the entire plumbing system install a pressure tank with a minimum capacity of 85 gallons anywhere downstream of the backflow preventer on the plumbing system side.

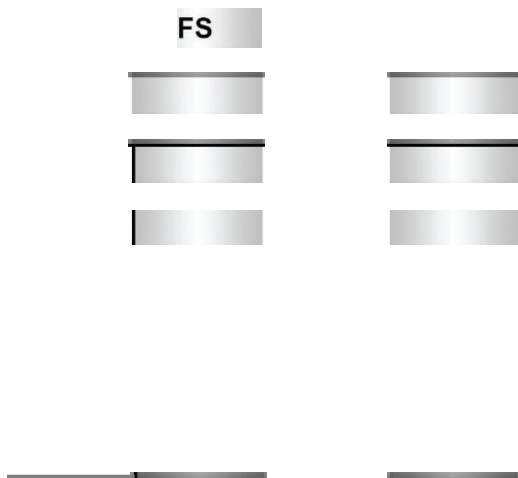
## FLOW SMART

230 Volt, Single-Phase Electric Motor

1.5 to 3HP

Discharge Manifold -

- Check Valve - Pressure Switch - Pressure Gauge



## 130 RESIDENTIAL FIRE PUMPS







Talco Heavy Duty Residential fire pump packages are intended for larger residential projects that don't require NFPA 13R code compliance or for situations where the greater expense and lead time for a UL listed pump could negatively impact project completion.

HOR packaged systems are built to the same standards as our NFPA13R systems and use many of the same components, the notable difference being the pump itself. HOR systems use carefully selected end suction pumps that do not carry a listing for fire protection. These readily available and cost effective systems are acceptable to many AHJs for NFPA 13R projects.

# HOR FIRE PUMP SYSTEMS

## CAST IRON/BRONZE FIT CENTRIFUGAL PUMP

### 230 Volt, Single-Phase

Controller -

Tornatech RPA - Listed Residential Fire Pump Controller  
(w/ Sensing Line per NFPA-20)

Suction Manifold -

Monitored Ball Valve - Pressure Gauge

Discharge Manifold -

Check Valve - Pressure Gauge - Relief Valve - Monitored Ball Valve

CHECK WITH AHJ FOR APPROVAL  
PRIOR TO ORDERING



**HDR-50**  
5 HP  
50GPM @ 65PSI

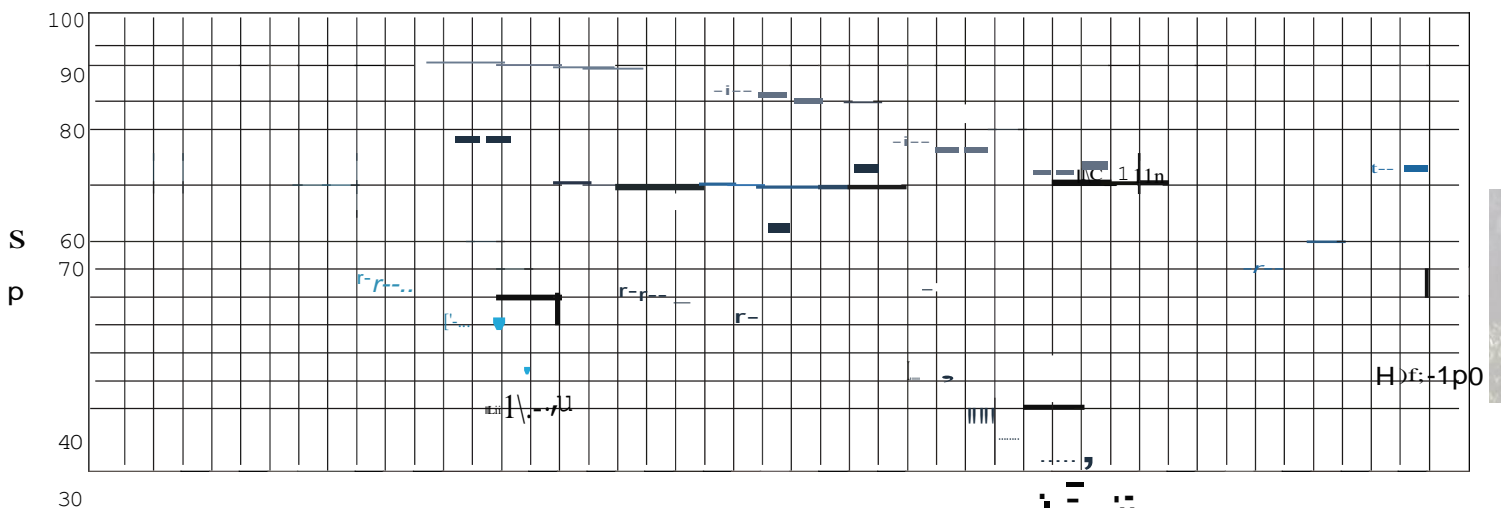
**HDR-75**  
7.5HP  
75GPM @ 70PSI

**HDR-100**  
10 HP  
100GPM @ 90PSI

**HDR-150**  
10 HP  
150GPM @ 65PSI



### HOR PERFORMANCE CURVES



20  
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230  
GPM

Talco 13ULV models can be configured for either NFPA 130 or NFPA 13R code compliance. These packages are designed for installations using single phase power. Based around UL/FM listed vertical inline fire pumps with either residential or limited service listed fire pump controllers these systems are designed specifically for NFPA 13R applications such as mixed use residential/commercial buildings, smaller apartment buildings, or assisted living centers.

13ULV-D models use a listed residential fire pump controller and therefore will require AHJ approval for use in NFPA 13R projects. 13ULV-R models, with their limited service controllers, are NFPA 20 compliant *for single phase applications*. Both models are fitted out per NFPA 20 including monitored valves listed for fire protection, hard copper sense lines, suction and discharge piping sized as per NFPA requirements, and wiring to NFPA 70. Talco 13ULV packages have near universal acceptance within the North America.

## 13UIV-0 VERTICAL INLINE FIRE PUMP SYSTEMS

UL/FM VERTICAL INLINE FIRE PUMP

230 Volt, Single-Phase

Controller -

Tornatech RPA - Residential Fire Pump Controller  
(w/ Sensing Line per NFPA-20)

Suction Manifold -

OS&Y Gate Valve - Pressure Gauge

Discharge Manifold -

Check Valve - Pressure Gauge - Relief Valve -

Monitored Butterfly Valves - Test Header Connection

Optional jockey pumps also available.



13ULV50-D  
10 HP

50GPM @ 95PSI

13ULV100-D  
10 HP

100GPM @ 90PSI

13ULV150-D  
10 HP

150GPM @ 60PSI

13ULV200-D  
10 HP

200GPM @ 50PSI

13ULV250-D  
10 HP

250GPM @ 40PSI

# 13UIV-R VERTICAL INLINE FIRE PUMP SYSTEMS

UL/FM VERTICAL INLINE FIRE PUMP

230 Volt, Single-Phase

Controller -

Tornatech GPL - Limited Service Fire Pump Controller  
(w/ Sensing Line per NFPA-20)

Suction Manifold -

OS&Y Gate Valve - Pressure Gauge

Discharge Manifold -

Check Valve - Pressure Gauge - Relief Valve -

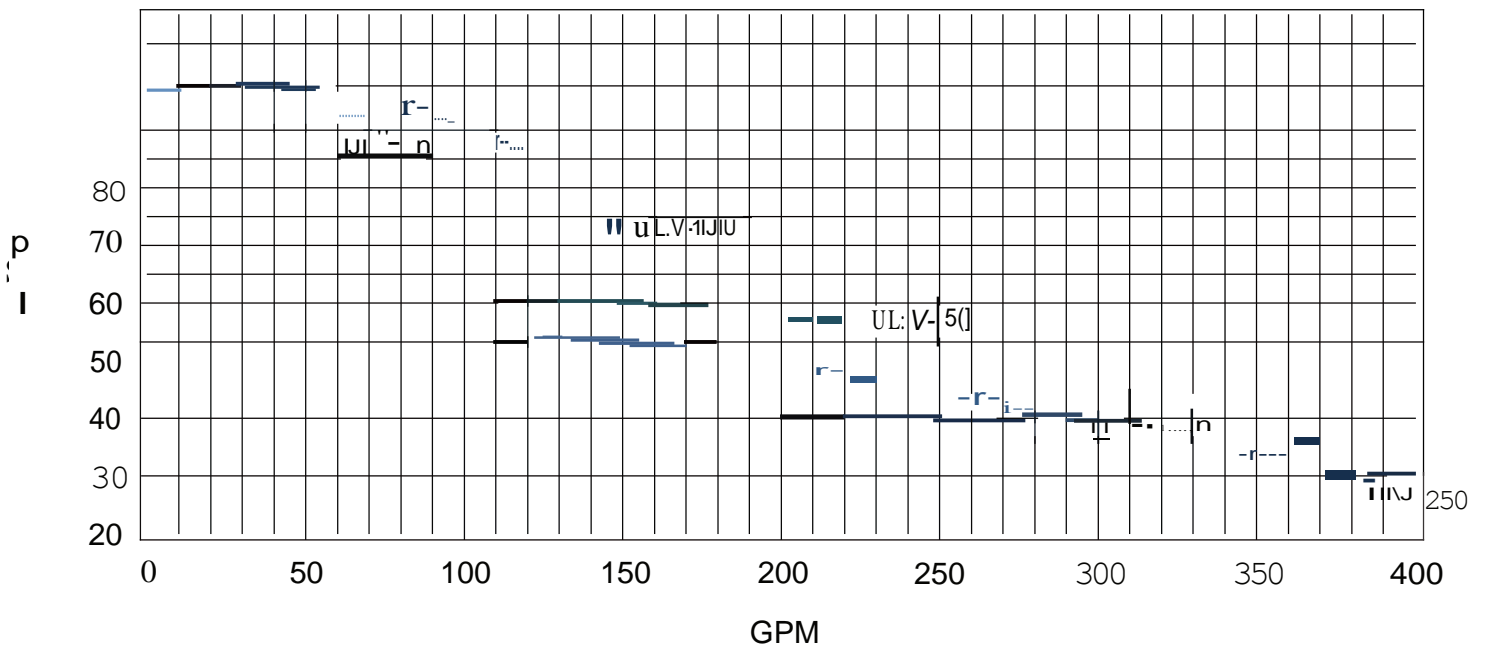
Monitored Butterfly Valves - Test Header Connection



Optional jockey pumps also available.

13ULV50-R	13ULV100-R	13ULV150-R	13ULV200-R	13ULV250-R
10 HP	10 HP	10 HP	10 HP	10 HP
50GPM @ 95PSI	100GPM @ 90PSI	150GPM @ 60PSI	200GPM @ 50PSI	250GPM @ 40PSI

## ULV PERFORMANCE CURVES



Talco offers a variety of water tanks and accessories to help complete your pump room. Our standard tank and fitting products are listed below, larger tanks from 500 to 15,000 gallons are also available. Contact one of our friendly and knowledgeable fire pump specialists for more options.

## POLY WATER STORAGE TANKS

-BARE TANKS- Tank fitting kits sold separately, see below

MODEL	CAPACITY	CONFIGURATION	DIMENSIONS	WEIGHT
300V	300 GAL.	VERTICAL ROUND	34.5" DIA X 78" H	100#
400V	400 GAL.	VERTICAL ROUND	42" DIA X 75" H	145#
500V	500 GAL.	VERTICAL ROUND	48" DIA X 75" H	150#
300R	300 GAL.	RECTANGLE	62" L X 29" W X 48" H	150#
400R	400 GAL.	RECTANGLE	62" L X 29" W X 64" H	180#



## WATER TANK FITTING KITS

-With 3/4" AutoFill, 1 1/2" or 2" NPT Outlet, 1" NPT Overflow Fitting, & Suction Hose Assembly

MODEL	HOSE SIZE
TF-1.5	1 1/2"
TF-2	2"

## SUCTION HOSE ASSEMBLY

-27" Overall Length With Hose Mender & Ball Valve

MODEL	HOSE SIZE
SH-1.5	1 1/2"
SH-2	2"



## FLOAT KIT

-AutoFill & 1" Overflow Fitting

MODEL	VALVE SIZE
FK-75	3/4"
FK-125	1 1/4"





For over thirty years Talco Fire Systems has been in the business of building premium quality fire pump systems and making our customers' lives easier. Our dual focus on attention to detail and excellent customer service has made us a market leader in both residential and commercial fire pump systems.

We are experts in fire pumps and the codes that govern them, with years of experience in pumps, controls, hydraulics, and the distribution supply chain. Our versatile in house product development and design team gives us the ability to respond quickly to customer feedback and deliver practical innovative products on time and when needed. We strive to make everything about dealing with fire pumps as simple and straight forward as possible so you can finish your current project and get on to the next one. Let us be your fire pump division.

At the core of these efforts are...

- Constant product and program development.
- Delivering value for the customer and distribution network.
- Reliability in our product and services.
- Dependable lead times.
- Helping you create new revenue streams.

This catalog contains the most complete line of Residential Fire Pump systems available today. The products shown here, built for systems designed and installed in accordance with NFPA-13D and NFPA-13R Residential Fire Sprinkler codes, will cover practically any residential fire pumping requirement you will encounter. We have also included information about where and why each type of system applies.

With a national distribution network, a worldwide presence, and innovative ground-breaking products like the Home Hydrant (patent pending) and our popular 13-ULV series units, **Talco has you covered.**

Please visit our website to see our innovative line of products and contact us for one of our wholesale distributors near you.

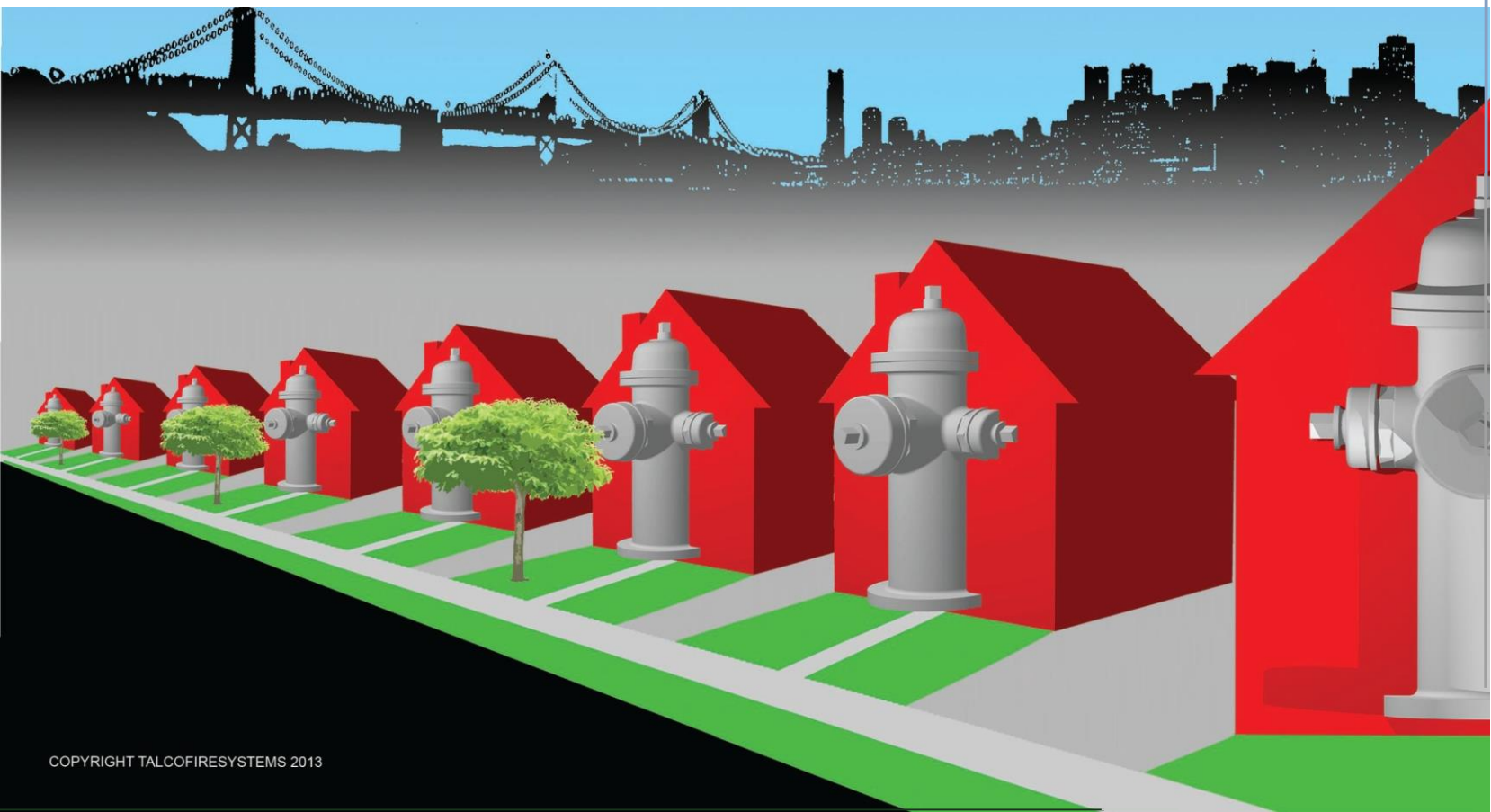
[www.talcofire.com](http://www.talcofire.com)





TALCO FIRE SYSTEMS  
6040 NE 112TH AVE  
PORTLAND, OR 97220

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1-800-878-8055  
503-688-1234 (FAX)









## TECHNICAL DATA

### FREEDOM® RESIDENTIAL CONCEALED PENDENT LEAD FREE SPRINKLER VK4570 (K4.9)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

#### 1. DESCRIPTION

Viking Freedom® Residential Concealed Pendent Lead Free\* Sprinkler VK4570 is a small high-sensitivity solder link and lever residential sprinkler designed for installation on concealed pipe systems where the appearance of a smooth ceiling is desired. The orifice design, with a K-Factor of 4.9 (70.6 metric†), allows the sprinkler's efficient use of available water supplies for the hydraulically designed fire-protection system. The operating element and special deflector characteristics meet the challenges of residential sprinkler standards.

The sprinkler is pre-assembled with a threaded adapter for installation with a low-profile small-diameter cover assembly installed flush to the ceiling. The two-piece design allows installation and testing of the sprinkler prior to installation of the cover plate. The "push-on", "thread-off" design of the concealed cover plate assembly allows easy installation of the cover plate after the system has been tested and the ceiling finish has been applied, while also providing up to ½" (12.7 mm) of vertical adjustment. The cover assembly can be removed and reinstalled, allowing temporary removal of ceiling panels without taking the sprinkler system out of service or removing the sprinkler.



\* Lead content complies with the definition of 'Lead Free' established in the Reduction of Lead in Drinking Water Act (S.3874) endorsed by AWWA's Water Utility Council, and California Assembly Bill #1953.

#### 2. LISTINGS AND APPROVALS



**UL Listed (C-UL-US-EU):** Category VKKW

**UL Classified to:** NSF/ANSI Standard 61, Drinking Water System Components and NSF 372 (MH48034).

Refer to the Approval Chart and Design Criteria for C-UL-US-EU Listing requirements that must be followed.

#### 3. TECHNICAL DATA

##### Specifications:

Available since 2011.

Minimum Operating Pressure: Refer to the Approval Chart.

Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).

Thread size: 1/2" (15 mm) NPT

Nominal K-Factor: 4.9 U.S. (70.6 metric†)

† Metric K-factor measurement shown is in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

##### Material Standards:

Sprinkler Body: Brass UNS-C89833

Deflector: Copper UNS-C51000

Deflector Pins: Stainless Steel UNS-S30200

Button: Brass UNS-C36000

Seat Assembly: Brass UNS-C64200

Compression Screw: Brass UNS-C36000

Fusible Element Assembly: Beryllium Nickel, coated with black acrylic paint

Levers: Stainless Steel UNS-S31600

Lever Bar: Copper Alloy UNS-C72500

Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape

Cover Adapter: Cold Rolled Steel UNS-G10080, Finish: Clear Chromate over Zinc Plating

Shipping Cap: Polyethylene

##### Cover Plate Materials:

Cover Plate Assembly: Copper UNS-C11000 and Brass UNS-C26800

Spring: Beryllium Nickel

Solder: Eutectic

**Ordering Information:** (Also refer to the current Viking price list.)

Viking Technical Data may be found on  
The Viking Corporation's Web site at  
<http://www.vikinggroupinc.com>.  
The Web site may include a more recent  
edition of this Technical Data Page.



## TECHNICAL DATA

### FREEDOM® RESIDENTIAL CONCEALED PENDENT LEAD FREE SPRINKLER VK4570 (K4.9)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Viking Freedom® Residential Concealed Pendent Sprinkler VK4570 and Cover Plate Assembly must be ordered separately:

**Sprinkler:** Part No. 16872AC (includes a 165 °F (74 °C) rated sprinkler with a protective plastic cap covering the unit).

**Cover Plate Assembly:** Base Part No. 13504 (2-3/4" diameter), Base Part No. 13642 (3-5/16" diameter), or Base Part No. 15394 (square cover plate, 3-5/16" diameter)

Specify finish and temperature rating of the cover plate assembly by first adding the appropriate suffix for the finish and then the appropriate suffix for the cover temperature rating to the base part number:

Finish Suffix: Polished Chrome = F, Brushed Chrome = F-/B, Bright Brass = B, Antique Brass = B-/A, Brushed Brass = B-/B, Brushed Copper = E-/B, Painted White = M-/SW1004, Painted Ivory = M-/SW1634, Painted Black = M-/SW1007

Temperature Suffix: 135 °F (57 °C) = A

For example, cover 13504 with a Polished Chrome finish and a 135 °F (57 °C) temperature rating = 13504FA.

**Available Finishes And Temperature Ratings:** Refer to Table 1.

**Accessories:** (Also refer to the "Sprinkler Accessories" section of the Viking data book.)

#### Sprinkler Wrenches\*\*:

A. Heavy Duty Part No. 13623W/B (available since 2006), or

B. Head Cabinet Wrench Part No. 13619\*\*\* (available since 2006)

C. Optional Concealed Cover Plate Installer Tool Part No. 14412 (available since 2007)

D. Optional Large Concealed Cover Plate Installer Tool Part No. 14867 (available since 2007)

\*\*Requires a 1/2" ratchet (not available from Viking). \*\*\*Also optional for removal of the protective cap. Ideal for sprinkler cabinets.

**Sprinkler Cabinet:** Part No. 01731A, Capacity: five (5) sprinklers (available since 1971)

#### 4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

#### 5. OPERATION

During fire conditions, when the temperature around the sprinkler approaches its operating temperature, the cover plate detaches, releasing the deflector. Continued heating of the exposed sprinkler causes the fusible element to disengage releasing the sealing assembly. Water flowing through the sprinkler orifice strikes the deflector, forming a uniform spray pattern over a specific area of coverage determined by the water supply pressure at the sprinkler to extinguish or control the fire.

#### 6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

#### 7. AVAILABILITY

Viking Sprinkler Model VK4570 is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

#### 8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

**TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES**

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating <sup>1</sup>	Maximum Ambient Ceiling Temperature <sup>2</sup>	Temperature Rating of the Cover Assembly (Required)	Cover Plate Base Part Number <sup>3</sup>	Large Cover Plate Base Part Number <sup>3</sup>	Square Cover Plate Base Part Number <sup>3</sup>
Ordinary	165 °F (74 °C)	100 °F (38 °C)	135 °F (57 °C)	13504	13642	15394

**Cover Plate Finishes:** Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black

#### Footnotes

<sup>1</sup> The sprinkler temperature rating is stamped on the deflector.

<sup>2</sup> Based on NFPA-13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

<sup>3</sup> Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.



## TECHNICAL DATA


## FREEDOM® RESIDENTIAL CONCEALED PENDENT LEAD FREE SPRINKLER VK4570 (K4.9)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

### Approval Chart Viking VK4570, 4.9 K-Factor Residential Concealed Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to NFPA 13, 13R or 13D 2013 Editions

Sprinkler Base Part Number <sup>1</sup>	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure		
		Inches	mm	U.S.	metric <sup>2</sup>			
16872A	VK4570	1/2	15	4.9	70.6	175 psi (12 bar)		
Max. Coverage Area <sup>6</sup> Width X Length Ft. X Ft. (m X m)	Ordinary Temp Rating (165 °F/74 °C)		Deflector to Ceiling	Installation Type	Listings and Approvals <sup>3</sup>			Minimum Spacing Ft. (m)
	Flow <sup>6</sup> GPM (L/min)	Pressure <sup>6</sup> PSI (bar)			 <sup>4</sup>	NYC	NSF <sup>8</sup>	
12 X 12 (3.7 X 3.7)	13 (49.2)	7.0 (0.48)	Refer to Figure	Concealed with Cover Plate Assembly	See Foot- note 7 and 10	See Foot- note 5	See Foot- note 7 and 10	8 (2.4)
14 X 14 (4.3 X 4.3)	13 (49.2)	7.0 (0.48)						
16 X 16 (4.9 X 4.9)	13 (49.2)	7.0 (0.48)						
18 X 18 (5.5 X 5.5)	17 (64.4)	12.0 (0.83)						
20 X 20 (6.1 X 6.1)	20 (75.7)	16.7 (1.15)						

#### Footnotes

<sup>1</sup> Part number shown is the base part number. For complete part number, refer to current Viking price schedule.

<sup>2</sup> Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

<sup>3</sup> This chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals. Refer also to Design Criteria.

<sup>4</sup> Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.

<sup>5</sup> Meets New York City requirements, effective July 1, 2008.

<sup>6</sup> For areas of coverage smaller than shown, use the "Flow" and "Pressure" for the next larger area listed. Flows and pressures listed are per sprinkler. The distance from sprinklers to walls shall not exceed one-half the sprinkler spacing indicated for the minimum "Flow" and "Pressure" used.

<sup>7</sup> Cover Temperature Rating is 135 °F (57 °C). Cover Part No. 13504<sup>1</sup>, 13642<sup>1</sup> (large diameter), or 15394<sup>1</sup> (square cover plate).

<sup>8</sup> UL Classified to: NSF/ANSI Standard 61, Drinking Water System Components and NSF 372 (MH48034).

<sup>9</sup> Other paint colors are available on request with the same listings as the standard finish colors. Listings and approvals apply for any paint manufacturer. Contact Viking for additional information. Custom colors are indicated on a label inside the cover assembly. Refer to Figure 3.

<sup>10</sup> Accepted Cover Plate Finishes are: Polished Chrome, Brushed Chrome, Bright Brass, Antique Brass, Brushed Brass, Brushed Copper, Painted White, Painted Ivory, or Painted Black <sup>9</sup>.



**TECHNICAL DATA**

**FREEDOM® RESIDENTIAL  
CONCEALED PENDENT  
LEAD FREE SPRINKLER  
VK4570 (K4.9)**

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058  
 Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

**DESIGN CRITERIA**

(Also refer to the Approval Chart on page 147w.)

**UL Listing Requirements (C-UL-US-EU):**

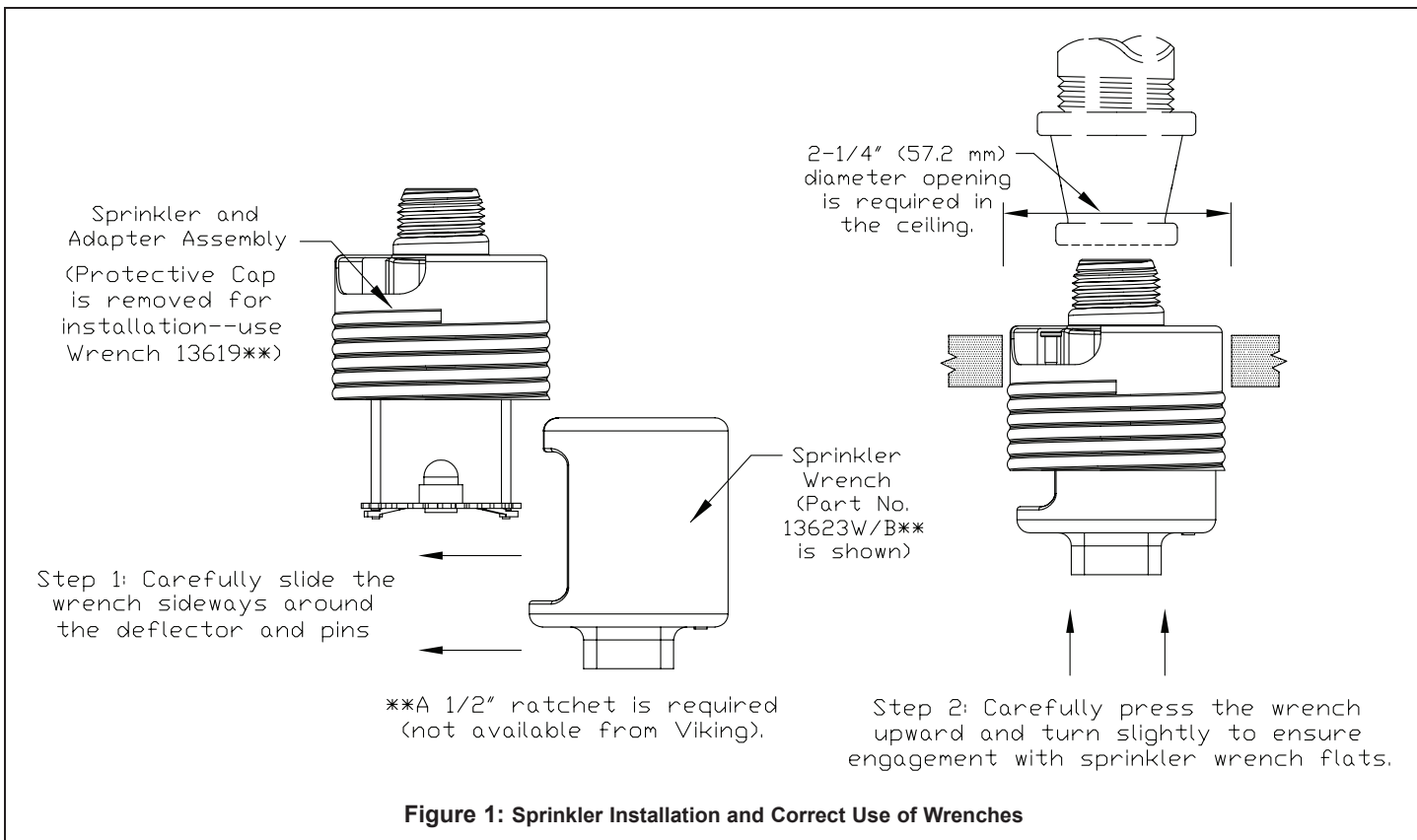
When using Viking Residential Concealed Pendent Lead Free Sprinkler VK4570 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart.

For systems designed to NFPA 13: The number of design sprinklers is to be the four contiguous most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in the Approval Chart for NFPA 13D and NFPA 13R applications for each listed area of coverage, **or**
- Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the “design area” in accordance with sections 8.5.2.1 or 8.6.2.1.2 of NFPA 13.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

**NOTE: Concealed sprinklers must be installed in neutral or negative pressure plenums only.**

**IMPORTANT: Always refer to Bulletin Form No. F\_091699 - Care and Handling of Sprinklers. Also refer to pages RES1-17 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA and any other similar Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. Final approval and acceptance of all residential sprinkler installations must be obtained from the Authorities Having Jurisdiction.**



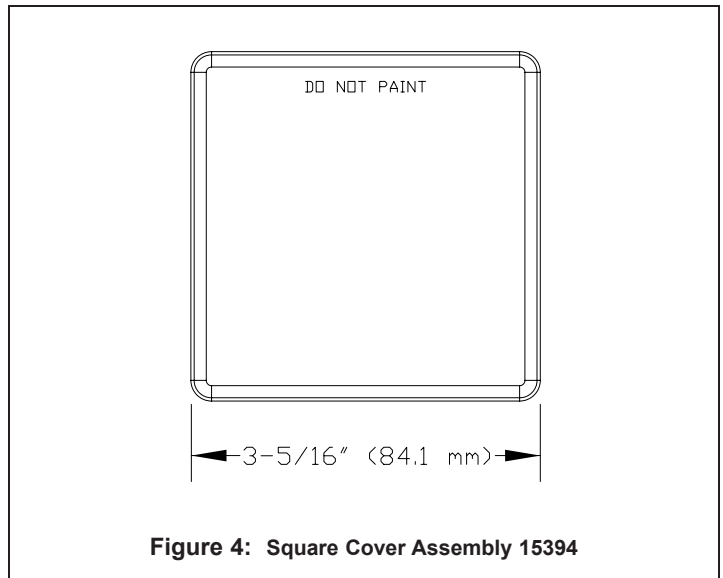
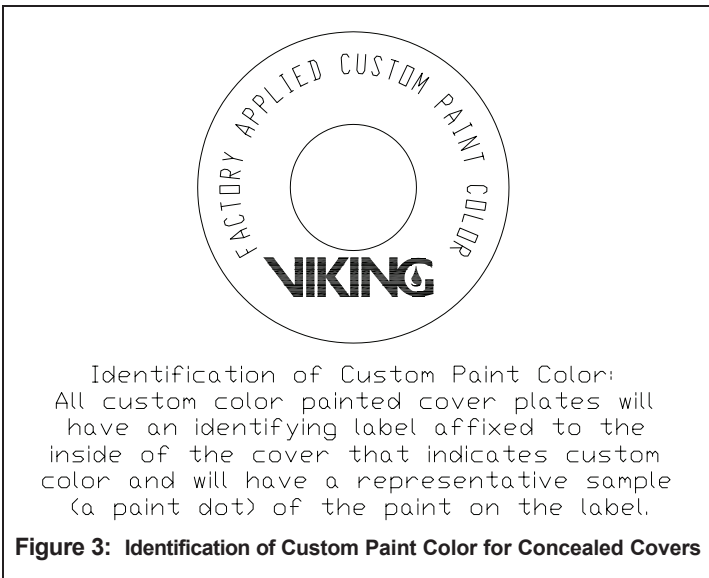
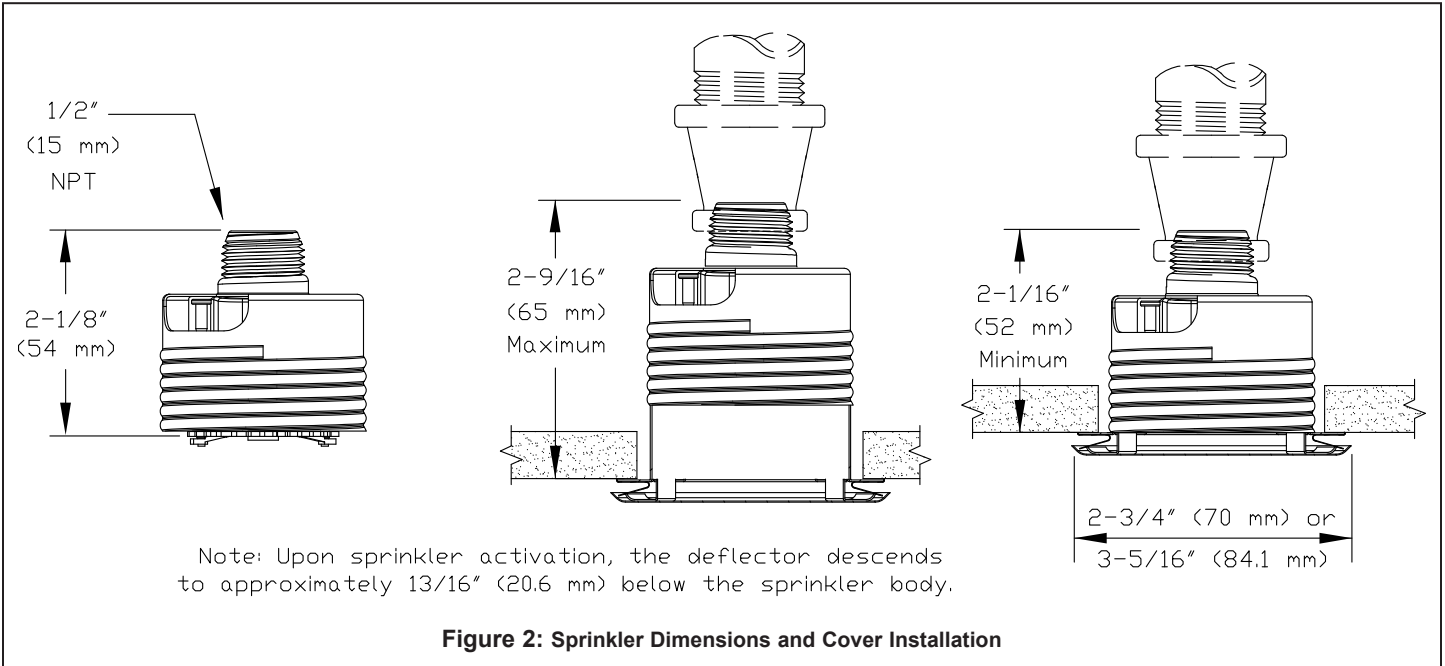


TECHNICAL DATA

**FREEDOM® RESIDENTIAL  
CONCEALED PENDENT  
LEAD FREE SPRINKLER  
VK4570 (K4.9)**

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com



FIRESTONE RUBBERGARD EPDM  
APPLICATION GUIDE

March, 2013

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## 2.01 GENERAL

This section of Firestone's Technical Database provides instructions for the installation of Firestone's RubberGard EPDM Roof Systems. Reference to the Design Guide, Technical Information Sheets (T.I.S.), and other sections of Firestone's Technical Database and Manual is necessary to ensure that the finished roof system is installed in compliance with Firestone requirements.

15, 20, 25 and 30 year warranties and wind warranties in excess of 55 mph, may require special considerations with regards to fasteners, plates, insulations, membrane gauge, and attachment requirements. Refer to the System Design Guide of this Technical Database for specific requirements.

NOTE: IF A PROPOSED APPLICATION FALLS OUTSIDE OF THIS SPECIFICATION, CONTACT FIRESTONE ROOF SYSTEM SOLUTIONS GROUP FOR ADDITIONAL INFORMATION.

## 2.02 JOB SITE CONSIDERATIONS (CAUTION AND WARNINGS)

### A. SAFETY:

1. Comply with all applicable regulatory safety regulations.
2. Keep all adhesives, sealants and cleaning materials away from ALL ignition sources (i.e., flames, fire, sparks, etc.). Do not smoke while using these materials.
3. Consult container labels, Material Safety Data Sheets and Technical Information Sheets for specific safety instructions for all products used on the project.
4. Care must be used when installing fasteners to avoid possible conduits and other piping in and under the deck.
5. Fumes from adhesive solvents may be drawn into the building during installation through rooftop intakes. Refer to Firestone's Technical Information Sheet "Recommended Guidelines for Application of Roofing Materials to an Occupied Building".
6. Do not use heat guns or open flames to dry adhesives and primers.

### B. CAUTIONS:

1. Store Firestone RubberGard EPDM membranes in the original undisturbed plastic wrap in a manner to protect it from becoming damaged. Insulation must be properly stored and protected from ignition sources, moisture and damage. Consult container labels, Material Safety Data Sheets and Technical Information Sheets for specific safety, use and storage instructions for all products used on the project.
2. Do not use oil-base or bituminous-base roof cement with Firestone RubberGard EPDM membrane.
3. Store Firestone Insulations properly protected from ignition sources, moisture and damage.

### C. COLD WEATHER:

1. When the outside temperature is below 40 °F (4.4 °C), certain combinations of temperature and humidity may cause condensation on the surface of solvent-based adhesives and primers. If this condition occurs, discontinue the application. When the ambient air conditions no longer cause condensation on adhesive surfaces, and the

membrane is clean and dry, then re-apply additional adhesive or primer.

2. The consistency of sealants, adhesives and primers will begin to thicken as the temperature drops. To minimize this, the following is recommended:
  - a) Start work with sealants, adhesives and primers that have been stored between 60 F and 80F (15.5 C and 26.7 C). Insulated and heated boxes may be helpful.
  - b) Complete test areas to determine if conditions will cause problems such as condensation with the application of the material.
  - c) Stop the operation or change to another warm container when material becomes too thick to properly apply.
3. Do not use heat guns or open flames to dry adhesives and primers.
4. No-fold or single fold panels are easier to apply in cold weather and are recommended for fully adhered systems.
5. When the outside temperature is below 40 F (4.4 C), installation of the Firestone RubberGard EPDM System requires additional application procedures:
  - Ensure that the roof surface is dry. Moisture may cause poor adhesion, and may lead to moisture entrapment within the roofing system.
  - Use of temporary roofs should be considered when roof applications must occur in cold or potentially wet weather to permit continued interior construction or roof-top work to proceed.
  - Use of heat guns to warm flashing material should be considered to increase flashing flexibility if flashing material is difficult to form.
6. If using Water-Based Bonding Adhesive (WBBA), temperatures and substrate must be at least 40° F (4.4° C) and rising for the material to be applied and perform as designed. Longer drying times should be expected for lower temperatures and higher humidity.
7. When ambient temperature is below 60° F (16° C), Firestone EcoWhite EPDM membrane must be washed with Firestone Splice Wash SW-100 prior to the application of Single-Ply QuickPrime Primer and the installation of EcoWhite Flashings.

## 2.03 ROOF SUBSTRATE PREPARATION

**It is the roofing contractor's responsibility for ensuring that the substrate is acceptable for the Firestone roof system.**

### **A. CORRECT SUBSTRATE DEFECTS:**

1. Defects that need to be corrected before work can commence should be brought to the attention of the General Contractor or Owner in writing and addressed by them.
2. For re-roofing applications, remove existing roof system components as specified by the project designer. If components are discovered during installation that could be detrimental to the performance of the new roof system, they should be brought to the attention of the project designer for corrective action.
3. If soundness and integrity of the existing roof system cannot be verified, good roofing practice requires a complete tear-off to the structural deck. However, recovering an existing roof system is an alternative to removing existing roof components. Non-destructive testing, in conjunction with core cuts, must be completed to determine the condition of the existing roof system and decking.

4. The building owner or project designer is responsible for assuring that all wet insulation and/or wet substrate materials are removed in a re-roofing application. The best diagnostic technique is taking and evaluating a series of roof cuts. There are three other techniques that are currently available to make this determination by indirect means: These are:

- nuclear moisture detection,
- infrared thermograph
- electric capacitance.

These techniques provide measurement of factors that can be associated with the presence of moisture, which can then be verified with the use of roof core cuts to confirm the results of the non-destructive testing.

5. In the absence of a design professional, the roofer should coordinate with the building owner to assure conditions are satisfactory to commence with the project as designed.

**B. REMOVE MOISTURE:**

1. Ponded water, snow, frost and/or ice, present in more than trace amounts must be removed from the work surface(s) prior to installing the RubberGard EPDM Roofing System.

**C. PREPARE SURFACE:**

1. Acceptable substrates to which the RubberGard EPDM Roofing System is installed must be properly prepared prior to roof system installation. The surface must be relatively even, clean, dry, smooth, free of sharp edges, fins, loose or foreign materials, oil, grease and other materials that may damage the roof system. Rough surfaces that could cause damage to the membrane must be overlaid with insulation.

**D. FILL VOIDS:**

1. All surface voids of the immediate membrane substrate greater than 1/4" (6 mm) wide must be filled with insulation.

## **2.04 WOOD NAILER LOCATION AND INSTALLATION**

Wood nailers must be installed as specified by the project designer or as noted in Firestone Details and the EPDM System Design Guide. Install wood nailers as follows:

Firestone Building Products no longer requires the use of treated wood nailers. This is due to the new EPA requirements that have caused treated lumber to have more corrosive properties than the previous generation of wood treatments.

**If architectural specifications require the use of treated wood nailers, the following Firestone requirements apply:**

- Refer to the Firestone Design Guide for the appropriate Firestone fastener to be used for securing membrane into wood nailers.
- Nails penetrating treated wood nailers must be hot-dipped galvanized, meeting ASTM A153, Class D or as currently recommended by industry associations.
- Aluminum fasteners, flashings and accessory products must not make direct contact

- with treated wood nailers.
- Uncoated metal and painted metal flashing and accessories, except for 300-series stainless steel, must not make direct contact with treated wood nailers.
- When in doubt of the type of treatment of the wood nailer or its compatibility with a metal component, use EPDM membrane as a separator.

Because of recent EPA regulations regarding treated wood, new treatments for lumber may be highly corrosive to fasteners. Contact the fastener manufacturer for their recommendations on fasteners if attaching nailers that have been treated with corrosive materials.

**A. WOOD NAILER GRADE:**

1. When wood nailers are used, Firestone specifications require the use of wood that is kiln-dried (Southern Pine, Douglas Fir) structural grade #2 or better, unless otherwise noted. While being stored on the roof, properly elevate and cover non-treated wood to protect from the weather and keep dry. Nailers must be properly anchored to provide secure attachment through the warranty term. Nailers are not covered by the Firestone warranty

**B. SIZE OF NAILER**

1. Nailers shall be a minimum thickness of 2" x 4" nominal (1-1/2" (38 mm) x 3-1/2" (89 mm)) and exceed the width of any metal flange attached to it by a minimum of 1/2" (13 mm).

**C. POSITION WOOD NAILER**

1. Total wood nailer height must match the total thickness of insulation being used and should be installed with a 1/8" (3 mm) gap between each length and each change of direction. When more than one nailer thickness is used end joints should be staggered a minimum of 12" (305 mm) from the prior layer in straight runs.

**D. SECURE WOOD NAILER**

1. Wood nailers must be firmly fastened to the deck or building. Mechanically fasten wood nailers to resist a minimum force of 200 lb/f (890 N) in any direction. Defer to attachment requirements of the roofing system as specified by the project designer if greater than 200 lbf (890 N).

**E. TAPER WOOD NAILER**

1. The wood nailer must be tapered (if applicable) so that it will always be flush at the point of contact with the insulation (refer to Firestone Details).

**F. POURED-IN-PLACE DECKS**

1. For new construction over poured-in-place decks or fill, and all recover projects, a waterproof separator membrane shall be placed between the non-treated lumber and the deck.

**G. INSTALLATION OF WOOD NAILERS BY OTHERS**

1. Make these specifications and details available when nailers are to be installed by others. Work that compromises the integrity of the roof system may jeopardize the roof warranty.

**H. FOR ADDITIONAL INFORMATION**

1. Please consult the NRCA Special Report, "Use of Treated Wood in Roof Assemblies." This Technical Bulletin is also posted on the Firestone website at

## 2.05 AIR OR VAPOR BARRIER INSTALLATION

### A. INSTALL VAPOR RETARDER (WHEN SPECIFIED):

1. Install a vapor retarder as specified by the project designer or as required by Firestone.

### B. INSTALL AIR BARRIER (WHEN SPECIFIED)

1. Install an air barrier as specified by the project designer or as required by Firestone.

## 2.06 INSULATION INSTALLATION

**WHERE A BASE SHEET IS REQUIRED PRIOR TO INSULATION INSTALLATION, USE THE FOLLOWING GUIDELINES AND REFER TO THE DESIGN SECTION OF FIRESTONE SPECIFICATIONS FOR SUITABLE SUBSTRATES AND TECHNICAL INFORMATION SHEETS FOR PRODUCT INFORMATION.**

### A. INSULATION BASE SHEETS

1. General
  - a) Starting at the low point of the roof, align the base sheet, unroll and allow the sheet to relax prior to attaching. After allowing to relax, adhere or attach to the substrate with appropriate materials as indicated below.
  - b) Roofing base ply shall never touch roofing single ply, even at roof edges, laps, tapered edge strips, and cants. Cut out fish-mouths/side laps, which are not completely sealed; patch. Fully adhered base sheets which are not fully and continuously bonded shall be replaced.
2. Hot Asphalt Attachment of Base Sheet
  - a) The Firestone base sheet may be attached using a solid mopping of Firestone SEBS mopping asphalt or ASTM D 312 Type III or IV hot steep asphalt. Priming of substrate may be required with ASTM D 41 and is determined by specification.
  - b) The substrate must be suitable for asphalt attachment (structural concrete, base sheet, coverboard, etc.). Refer to the Firestone EPDM Design section of this manual for suitable substrates and the Technical Information Sheets for additional information on specific Firestone base sheets.
  - c) The asphalt shall be at the manufacturer's stated EVT at point of installation.
  - d) Align subsequent rolls, shingling the laps with or along the flow of water, maintaining a minimum 2" (51 mm) side lap and minimum 6" (152 mm) end lap and repeat the application.
  - e) Firestone recommends that a half sheet be used as the first roll to ensure that the base sheet laps and the cap sheet laps are not aligned. Half length sheets may be required, depending on the roof slope
  - f) Refer to the Design section for slope limitations.
  - g) Starting at the low point of the roof, align the Firestone base sheet and unroll into a solid mopping of hot asphalt.

- h) With a stiff push broom, immediately broom the Firestone base sheet to ensure full contact with the asphalt.

### 3. Mechanical Attachment

- a) Starting at the low point of the roof, align the base sheet, unroll and allow the sheet to relax prior to attaching. After allowing sheet to relax, begin attachment at one end and work towards the other end, keeping the roll tight and wrinkle free. Align subsequent rolls, shingling the laps, maintaining a minimum 3" (76 mm) side lap and minimum 6" (152 mm) end lap and repeat the application. Stagger all end laps.
- b) Fasten Base Sheet Using Firestone Insulation Plates and Fasteners: Structural Concrete, Plywood or OSB
- c) Using Firestone Insulation Plates and Fasteners, base sheets may be attached directly to poured in place concrete, wood, or through a smooth surfaced built-up or modified bitumen roof system. Refer to the Design Guide Section of this manual for information on fasteners for a particular deck type.
  - 1. Firestone compatible base and cap sheets used as base sheets must be mechanically attached 12" (305 mm) o.c. in the side and end laps and 18" (457 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 13" (330 mm) (approx.) in from the sides of the sheet. See Attachment Guide for diagrams.
  - 2. 36" (914 mm) wide Firestone compatible base sheets must be mechanically attached 18" (457 mm) o.c. in the side and end laps and 36" (914 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (305 mm) (approx.) in from the sides of the base sheet. See Attachment Guide for diagrams.
- d) Fasten Base Sheet Using Firestone LWC Fasteners: Gypsum, Tectum and LWC
  - 1. Using Firestone LWC fasteners, base sheets may be attached to Gypsum, Tectum and LWC. The base sheet must be mechanically attached with Firestone LWC's at 9" (229 mm) o.c. in the side and end laps and 18" (457 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (305 mm) (approx.) in from the sides of the base sheet.
- e) Fasten Firestone base sheets using cap nails: plywood, OSB and wood plank decks
  - 1. 1" (25 mm) diameter cap nails with steel heads shall be used to attaché base sheets to plywood, wood plank, and oriented strand board decks. The base sheet must be mechanically attached with cap nails at 9" (229 mm) o.c. in the side and end laps and 18" (457 mm) o.c. in two staggered rows in the field of the sheet. Each row shall be 12" (305 mm) (approx.) in from the sides of the base sheet. Cap nails cannot be used to attach insulation, attach a base sheet through an existing insulated roof, attach a base sheet over a gravel surfaced built-up roof, or through a smooth surfaced un-insulated built up roof over 1/2" (13 mm) thick. The fasteners used to attach base sheet must be manufactured for the particular deck type and be Factory Mutual Approved.
  - 2. This attachment pattern applies to all 36" (914 mm) and 1 meter (39.4") wide Firestone compatible base sheets and cap sheets used as base sheets.

### 4. Base Sheet

#### Laps

- a) Hot steep asphalt applied Base sheets must be lapped a minimum of 2" (51 mm) for side laps
- b) End laps must be minimum 6" (152 mm).

- c) In all cases, an offset of 12" (305 mm) minimum must be maintained between the side and end laps of the base sheet and the cap sheet.
- d) Seal all base sheet laps with hot asphalt or hot air welded.

## **B. INSULATION INSTALLATION:**

**Ballasted systems are not allowed when the membrane is installed directly over or onto a hard surface, such as HailGard, ISOGard HD, DensDeck®, SECUROCK®, OSB or concrete.**

**Ballasted systems are not allowed when the membrane is installed directly to a layer of insulation, which has been mechanically attached.**

**Adhesive attachment of insulation is acceptable for Ballasted systems, if required.**

1. Install Insulation
  - a) Install only as much insulation as can be covered with roofing membrane and completed before the end of the day's work or before the onset of inclement weather.
  - b) Form continuous insulation joints over deck flange. Do not cantilever insulation edges over deck ribs. Minimum bearing surface: 1" (25 mm).
  - c) When installing multiple layers of insulation, all joints between layers should be staggered 6" (152 mm) minimum.
2. Fit Insulation:
  - a) Neatly fit insulation to all penetrations, projections, and nailers. Insulation should be loosely fitted, with no gaps greater than 1/4" (6 mm) filled with acceptable insulation.
  - b) On metal decks, the edge of the board parallel with the roof deck flutes should be completely supported by the flute. The membrane should not be left unsupported over a space greater than 1/4" (6 mm).
  - c) Tapered insulation with acceptable facers for bonding must be installed around roof drains so as to provide proper slope for drainage as shown in Firestone Details.
3. Attach Insulation
  - a) Mechanical Attachment:
    1. Insulation must be attached using Firestone Insulation Plates and Fasteners. HailGard™ Fasteners can be used to attach HailGard™ insulation without insulation plates.
    2. If installing on a metal deck (where allowed by specification), the edge of the board parallel with the roof deck should be completely supported and fasteners must penetrate the top rib of the deck the required depth.
    3. When installing fasteners, care should be taken to avoid penetration of conduits and other piping below or encased in the deck.
    4. For attachment, refer to the Technical Information Sheets that references the specific insulation being used. Attachment patterns and fastening rates of that insulation will vary depending on performance required.
    5. For specific deck penetration requirements refer to the Technical Information Sheet that references the specific fastener being used.
    6. When installing a multi-layer insulation assembly, the fastening rate and pattern

is determined by the type and thickness of the top layer of insulation.

7. Ensure that the fasteners are fully seated, but not overdriven. A properly adjusted clutch or a depth sensing drill attachment should be used to prevent over-driving or under-driving fasteners.
8. Multiple layers may be installed using a common fastener.

**b) Asphalt Attachment:**

1. The substrate may require priming prior to installing the insulation. Refer to the Design Guide for specific information.
2. The insulation should be no larger than 4' X 4' (1.2 m X 1.2 m) panels.
3. Insulation may be attached using a solid mopping of Firestone SEBS Asphalt (as required by warranty term) or ASTM D 312 Type III or Type IV asphalt. RESISTA and ISOGard HD cannot be attached with hot asphalt.
4. Top insulation board shall be installed without displacing asphalt to the top of the seam where it can contact the RubberGard membrane.
5. The asphalt shall be at the manufacturer's stated EVT less ~ 25° F at the point of installation. Enough asphalt must be installed (approximately 25-30# /100 ft<sup>2</sup> (1.2 – 1.4 kg/m<sup>2</sup>)) to ensure that complete adhesion is achieved.
6. It is necessary to "walk" boards in to ensure complete adhesion to the substrate.
7. Additional layers of insulation may be installed in the same fashion.

**c) Adhesive Attachment:**

1. Insulation may be attached using I.S.O.Stick™, I.S.O. Twin Pack™, I.S.O.FIX™, I.S.O.SPRAY™ or Hot Asphalt. RESISTA and ISOGard HD cannot be attached with hot asphalt.
2. Apply the adhesive in strict accordance with the instructions provided with the product and the Technical Information Sheets that are a part of the Firestone Technical Database and Technical Manual.
3. It may be necessary to prime the substrate prior to installing the insulation adhesive. Consult the specific TIS of the Adhesive selected.
4. If installing on a metal deck (where allowed by specification), the edge of the board parallel with the roof deck flutes must be completely supported.
5. The insulation should be no larger than 4' X 4' (1.2 m X 1.2 m). DensDeck and SECUROCK products may be 4' x 8' (1.2 m x 2.4 m)
6. It is necessary to "walk" boards in and weight down to ensure complete adhesion to the insulation and substrate.

## 2.07 MEMBRANE INSTALLATION

This section contains information for Firestone RubberGard™ membranes systems. Read all of the information to ensure that it is the correct system and application. For RubberGard Platinum™ systems refer to Platinum Application Guide.

QuickSeam RPF Strip

Membrane installations may require the use of a QuickSeam™ Reinforced



Perimeter Fastening Strip (QSRPFS) resulting in coordination with the layout and installation of membrane system. This process should be addressed early in the roofing process.

The additional securement details for the membrane (base tie-in) will occur at all locations where the membrane goes through an slope change greater than 1" (25 mm) in 12" (305 mm) (i.e., roof edges, curbs, interior walls, etc.) And other areas as details indicate. See additional information in Section 2.12.A.

RubberGard™ LSFR PT (Pre Taped) and RubberGard Max PT Panels

Firestone RubberGard and RubberGard Max PT Panels method of installation requires that the rolls be staged correctly for unrolling in order for the laps to shed water correctly.

#### **A. FULLY ADHERED SYSTEM**

1. Membrane Placement:
  - a) The RubberGard EPDM Adhered Systems must be installed so that the seams shed or run parallel to the flow of water.
  - b) Place membrane panel, unroll without stretching, over the acceptable substrate leaving sufficient membrane for tie-ins, roof edges and seaming; allow membrane to relax for a minimum of 30 minutes before attaching or splicing. During cold weather application, it is recommended that the smallest panels be used to minimize folds (larger panels have factory folds which may take longer to relax during cold weather).
  - c) Placement of additional rolls of membrane shall provide for sufficient overlaps for seaming of membranes. See standard lap splice details.
2. Fold the Membrane Back:
  - a) After making sure the sheet is placed in its final position allowing for the minimum lap width per Firestone specifications, fold it back evenly onto itself without wrinkles to expose the underside mating surface of the sheet.
3. Remove Dusting Agent and Dirt:
  - a) Sweep the mating surfaces with a stiff broom to remove any dusting agent or dirt that may have accumulated.
4. Apply the Bonding Adhesive:
  - a) Apply bonding adhesive with either a 9" (229 mm) wide solvent-resistant paint roller, power roller or a commercial-grade adhesive sprayer. Adhesive must be applied in a relatively uniform thickness to both surfaces at approximately the same time. If adhesive is spray-applied, it must be back-rolled with a paint roller to assure proper contact and uniform coverage. Refer to Firestone Technical Information Sheets and container labels for specific application instructions and information on spray equipment.
  - b) Apply bonding adhesive at specified coverage rate refer to the container label and Technical Information Sheet for specific application requirements and coverage rates.

#### **Stop Bonding Adhesive Short of membrane Seam Area**

**Care must be taken not to apply bonding adhesive over an area that is to be later spliced to another sheet or flashing. All bonding adhesives must be completely removed from the seam area.**

5. Test Bonding Adhesive for Readiness (Touch-Push Test)
  - a) Allow the bonding adhesive to flash-off. Touch the adhesive surface in several places with a clean, dry finger to be certain that the adhesive does not stick or string. As you are touching the adhesive, push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, the adhesive is not ready for mating. Flash-off time will vary depending on ambient conditions of temperature and humidity.
6. Bond the Membrane to the Substrate:
  - a) Starting at the fold, roll the previously coated portion of the membrane into the coated substrate slowly and evenly to prevent wrinkles.
  - b) Broom the membrane to assure proper contact, compress the bonded half of the membrane to the substrate with a stiff push broom.
7. Repeat Procedure:
  - a) Complete the membrane installation fold the un-adhered half of the membrane back onto itself, and repeat the procedure.
8. Splice the Laps
  - a) Splice the outside edge of the top sheet as specified in SECTION 2.09 using a QuickPrime™ Plus product and QuickSeam™ Splice Tape. Refer to Lap Splice Details.
  - b) Apply "T" patches at all 3-way sheet intersections and at all factory laps that intersect another sheet. Refer to Lap Splice detail series. Apply Seam Edge Treatment as required.

**B. MECHANICALLY ATTACHED SYSTEMS (B.I.T.S. WITH RUBBERGARD AND RUBBERGARD MAX USING BATTEN STRIPS)**

**Firestone recommends that when installing mechanically attached membranes over steel decks, the field attachment should run perpendicular to the deck panels. If a project is Factory Mutual insured or specified, per FM 1-29 for Global Loss Prevention Data Sheets, attachment must run perpendicular.**

1. Place Membrane and Allow to Relax:
  - a) Place membrane panel and unroll without stretching, over the acceptable substrate leaving sufficient membrane for tie-ins, roof edges and seaming. Allow to relax for a minimum of 30 minutes before attaching or splicing.
  - b) Position subsequent membrane sheets in the same manner, overlapping the ends of adjoining sheets a minimum of 3" (76 mm) and side laps a minimum of 6" (152 mm).
  - c) Perimeter and Field Panel widths are determined by using the Wind Design attachment Guide section of the Firestone Technical Database.
2. Layout Firestone Batten Strips:
  - a) Install Firestone batten strips continuously within the 6" (152 mm) side lap area. Center the batten strip 3" (76 mm) in from the edge of the lower panel. Refer to Firestone Lap Splice Details for specifics.
3. Secure Batten Strips:

- a) Place the Firestone fastener starting 1" (25 mm) in from the end of the Firestone Batten Strip, then every 12" (305 mm) o.c. maximum (unless a more frequent fastener spacing is required per wind/application design guide) using the pre-punched holes in the battens. Round the end of each batten and remove all burrs created by cutting, when required. Where field drilling of battens is necessary, use a 1/4" (6.35 mm) diameter drill bit.
  - b) Start fastening the Firestone batten strip from one end only. Install 2" (51 mm) diameter EPDM pads beneath the battens at batten terminations as shown in Firestone Details. Refer to EPDM system specific details.
  - c) Install fasteners so that it is properly engaged in the deck and seat the head flush with the batten strip surface. Use caution not to overdrive the fastener as this will cause the batten strip to buckle between the fasteners.
  - d) Use a common fastener to anchor overlapping Firestone Batten Strips using a common hole.
  - e) Do not lap corners and "T" joints. Do not overlap the Firestone Batten Strips at corners or "T" joints. Keep battens from the edge of intersecting splices as shown in Firestone Details.
4. Splice the Lap:
- a) Splice the outside edge of the top sheet as specified in Section 2.09 QuickSeam Splice Tape. Refer to Lap Splice Details located in the technical database.

**C. MECHANICALLY ATTACHED SYSTEMS (RUBBERGARD MAX USING V PLATES)**

RubberGard MAX Mechanically Attached Systems.

1. Place Membrane and Allow to Relax:
- a) Place the membrane panels without stretching, over the acceptable substrate, and allow membrane to relax for a minimum of 30 minutes prior to attachment.
  - b) Position subsequent membrane sheets in the same manner, overlapping the ends of adjoining sheets a minimum of 3" (76 mm) and side laps a minimum of 6" (152 mm).
  - c) Perimeter and Field Panel attachment is determined by using the Wind Design attachment Guide section of the Firestone Technical Database.
2. Layout Firestone V-Plates:
- a) Install Firestone V-Plate every 12" (305 mm) o.c. min. or as required by the specification within side lap area. Center of the V-Plate 3" (76 mm) in from the edge of the lower panel. Refer to Firestone Details for specifics.
  - b) Secure V-Plates: Install each fastener so that it is properly engaged in the deck and the head is seated in the V-Plate. Use caution not to overdrive the fastener.
3. Splice the Lap:
- a) Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickSeam Splice Tape. Refer to Lap Splice Details.

**D. MECHANICALLY ATTACHED SYSTEM (MAS USING BATTEN STRIPS)**

1. Place Membrane and Allow to Relax: Place the membrane, without stretching, over the acceptable substrate, and allow it to relax for a minimum of 30 minutes prior to attachment. Position subsequent membrane sheets in the same manner, overlapping a minimum of 4" (102 mm).

2. Splice the Lap: Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickPrime and QuickSeam Splice Tape. Refer to Lap Splice Details.
3. Layout Firestone Batten Strips: Place the batten strips over the membrane in the designated pattern as outlined in the Wind Design Guide in the Firestone Technical Database.
4. Place the Firestone fastener starting 1" (25 mm) in from the end of the Firestone Batten Strip, then every 12" (305 mm) (unless a smaller fastener spacing is required) using the pre-punched holes in the battens.
  - a) Start fastening the Firestone Batten Strip from one end only. Do not start from both ends as this will buckle the batten.
  - b) Install Fasteners: install each fastener so that it is properly engaged in the deck and the bottom of the head is flush with the batten strip surface. Use caution not to overdrive the fastener as this will cause the batten strip to buckle between the fasteners.
  - c) Lap Field Runs of Firestone Batten Strips: Use a common fastener to anchor overlapping Firestone Batten Strips using a common hole.

When batten strips must be field cut, round the cut end. Assure that all burrs created by cutting are removed. Where field drilling of metal battens is necessary, use a 1/4" (6.35 mm) diameter drill bit. Refer to Detail LS-3

- d) Do not lap corners and "T" joints: do not overlap the Firestone Batten Strips at corners or "T" joints. Keep battens from the edge of intersecting splices as shown in Firestone Install 2" (51 mm) diameter EPDM pads beneath the battens at batten termination's and where two battens are joined to form a corner as shown in Firestone Details.
- e) Install QuickSeam Batten Cover Strips: All batten strips must be covered prior to the end of the workday. Should inclement weather strike before the batten cover strip is installed, ensure that the batten bar and the membrane surface beneath the bar is dry. As an option in unpredictable climates, a 3/8" (10 mm) bead of Lap Sealant may be installed beneath the batten bar at the fastener to reduce moisture migration into the roof system in the event of inclement weather before the batten cover is installed. After applying Firestone Single-Ply QuickPrime Primer to the membrane, apply the QuickSeam Batten Cover per Firestone Detail Lap Splice-3.

#### **E. BALLASTED SYSTEM**

1. Place Membrane and Allow to relax:
  - a) Place membrane panel, without stretching, over the acceptable substrate and allow membrane to relax for a minimum of 30 minutes before splicing or attaching. The RubberGard EPDM Ballasted System must be installed so that the splices shed the flow of water.
2. Move Membrane to its Final Position:
  - a) Move the membrane panel to its final position allowing for a minimum 4" (102 mm) field seam onto adjacent panels and sufficient membrane for proper membrane terminations.
3. Splice the Lap:
  - A) Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickSeam Splice Tape. Refer to Lap Splice Details.
4. Ballast installation:

**A) Firestone Ballast Paver System**

1. Install all Firestone Ballast Paver System Accessories, Paver Clips, AP Sealant, Metal Termination Bars and Protection Mat, as required in proper sequence for Paver system performance.
2. Place Firestone Ballast Paver System in accordance with Firestone Ballast Paver Installation Guide for the appropriate system requirement as determined by the design professional.

**B) Stone Ballast**

1. Spread Ballast: The ballast shall be spread over the completed Firestone System at the rate specified by the project designer but never less than 10 lb (4.5 kg)/sq. ft. using ASTM #4 stone. Refer to the system Design Guide of this Database for Ballast type and size requirements. Ballast must be spread over the membrane using soft rubber tired ballast buggies. Spread ballast around penetrations by hand.
2. Protect Membrane and Insulation at Ballast Loading Areas: At staging areas where ballast is loaded, protect the membrane and underlying insulation using insulation and/or plywood over an additional layer of Firestone protective membrane. Remove and replace all materials damaged from ballasting operation.
3. Distribute Ballast Around Walkway Pads: Any ballast displaced by a walkway should be distributed around the pad to maintain the specified average ballast rate.
4. Do not place a walkway and pads within 10' (3.0 m) of a roof edge. If needed around mechanical equipment, use appropriate ballast pavers.

## 2.08 MEMBRANE ATTACHMENT AT PERIMETERS FOR MAS SYSTEMS

Perimeters may be adhered or mechanically attached. When mechanically attaching a perimeter, the batten layout must be as specified in the Firestone Wind Design Guide as a minimum, or as required by the designer or local building codes. Should a fully adhered perimeter be chosen, the area of the adhered perimeter is the same as if the perimeter were mechanically attached.

**A. ADHERED PERIMETER:**

1. Follow Fully Adhered, Section 2.07.A for this method as required for perimeter plus the following added steps.
2. Terminate the Membrane at the Perimeter: After the perimeter sheets are adhered to the substrate, they must be terminated along the roof edge using an appropriate Firestone roof edge detail or base tie-in detail which is included as part of this specification.
3. Install Perimeter Isolation Batten Strip: Install Firestone Batten Strips continuously along the inside edge of the adhered perimeter sheet.
4. Splice the Lap and do detail work: Splice the outside edge of the top sheet as specified in SECTION 2.09 using QuickSeam Splice Tape. Complete required detail work such as transition and T-patches per Firestone details.

**B. MECHANICALLY ATTACHED PERIMETER - BATTEN STRIPS OR V-PLATES:**

As an alternative to the adhered membrane perimeter, Firestone's Reinforced Mechanically Attached, and Mechanically Anchored Systems may be installed using Firestone batten

strips or V-Plates as shown in Firestone's Wind Design Guide.

1. Batten Strips:

- a) Proceed to install as outlined in Section 2.07.D

2. V-Plates:

- a) Proceed to install V-Plates as outlined in Section 2.07.C.

**C. QUICKSEAM R.M.A. STRIP (QSRMA STRIP):**

- a) Secure the QSRMA Strip, center the fastening system (Firestone Batten Strips, 2" Seam Plates or V Plates) on the QSRMA Strip, a maximum of 4" (102 mm) from the end of the QSRMA Strip and fasten a maximum of 12 inches (305 mm) O.C. (unless a more frequent fastener spacing is required). If using battens, place the first fastener 1" (25 mm) in from the end of the batten strip, using the pre-punched holes in the battens.

- b) QSRMA Strip Intersections:

- 1. Do not intersect QSRMA Strips at "T" intersections or corner intersections. Do not overlap QSRMA Strips. A fastener and batten strip or plate must be placed starting and ending a maximum of 4 inches (102 mm) from the end of each QSRMA Strip.
- 2. Start Fastening Batten Strips From One End Only:
- 3. When fastening batten strips, start at one end and work towards the other. Fastening the two ends of the batten strip at the same time may cause buckling between fasteners.
- 4. Install Fastener.

**When using batten strips, Firestone AP Sealant must be applied over the fastener heads per Firestone details.**

Do not remove the release paper from the tape until all cleaning and priming has been completed and the membrane is in place

- 5. Use caution not to overdrive the fasteners as this will cause the batten strip to buckle between the fasteners or may cause the QSRMA Strip to wrinkle.

2. Membrane Installation (QSRMA Strip)

- a) Place membrane panel, without stretching, over the installed QSRMA Strip and allow to relax for a minimum of 30 minutes before splicing or attaching

Note: Do not allow field seams to be centered over the QSRMA Strip.

- b) After making sure the sheet is placed in its final position allowing for the minimum lap width per Firestone specifications, fold it back evenly onto itself without wrinkles to expose the underside mating surface of the sheet.

Note: It will assist in the application if the area of the membrane that will be mated to the QSRMA Strip is marked as the membrane is folded back.

- c) Apply Firestone Single-Ply QuickPrime Primer to the center of the QSRMA Strip, over the plates and fasteners, and the membrane where it will mate with the QuickSeam Tape on the QSRMA Strip using the Firestone QuickScrubber Plus. Allow Single-Ply QuickPrime Primer to dry.
- d) After the surfaces have dried properly, as determined by using the touch-push test, remove the release paper from the QSRMA Strip and roll the membrane into place and broom with a stiff push broom.
- e) Roll the membrane over the QSRMA Strip with:
  - 1. A 1-1/2"- 2" (38 mm – 51 mm) wide silicone roller or across the tape and then along its length covering the width in several passes.
  - or
  - Starting in the center of the strip, roll the QSRMA Strip with the Firestone QuickRoller in a back and forth motion along the length of the QSRMA Strip, not to exceed 3 feet (0.9 meter ) maximum at a time.
  - 2. Do not use metal rollers or power rollers over the QSRMA Strip

## 2.09 MEMBRANE SEAMING

When using RubberGard Max membrane, Firestone Seam Edge Treatment must be applied to all splice or detail edges where reinforcing scrim is exposed. Refer to Detail LS-9 using seaming using SA-1065 adhesive and Lap Sealant.

### A. SEAMING PROCEDURES

Firestone RubberGard LSFR PT (Pre Taped) and RubberGard MAX PT need to be positioned with the rolls in the correct location and orientation to unroll and have the tape located for the seaming of the laps.

PT rolls are marked with the tape location and direction of unroll. Panels need only to be marked to guide the application of QuickPrime Products to one sheet for side laps. Roll end laps require standard application of QuickPrime and QuickSeam Tapes.

1. Position and Fold Back the Lap Edge:
  - a) Position the membrane at the seam area by overlapping membrane 4" (102 mm) for 3" (76 mm) QuickSeam Tape, 7" (178 mm) for 6"(152 mm) QuickSeam Tape. Once the membrane is in place, mark the bottom membrane 1/2" (13 mm) to 3/4" (19 mm) from the edge of the top membrane every 4' (1.2 m) to 6' (1.8 m) using the marking crayon provided with the QuickSeam Tape.
  - b) Tack the membrane back with Single-Ply QuickPrime Primer as necessary to hold back the membrane at the splicing area.
2. Apply Single-Ply QuickPrime Primer to Seam Area:
  - a) Remove excess amounts of dusting agent on the membrane and at factory splices using a stiff push broom. In the case of adhered systems make sure there is no contamination of bonding adhesive in the tape area.
  - b) Stir Single-Ply QuickPrime Primer thoroughly before and frequently during use. Dip the





- c)** Broom the entire length of the seam at a 45° angle as the release paper is being removed.
  - d)** The QuickRoller may not be used to set the seams on any system that has mechanical attachments in the seam area such as battens or plates. It may only be used with fully adhered, ballasted, QuickSeam RMA and QuickSeam RPF assemblies.
- 6.** Roll the Seam
  - a)** Roll the seam as appropriate, using the Firestone QuickRoller and 2'-3' strokes working from one side of the seam to the other along the seam length, or a 1-1/2" to 2" (39 mm 51 mm) wide silicone hand roller, first across the width of the seam and then along the entire length and width of the seam.
- 7.** Special Considerations (Factory laps, End Laps, "T" Joints, transition patches, and others.)
  - a)** End Laps of tape - When the seam is greater in length than the tape, the adjoining QuickSeam Splice Tape must be overlapped a minimum of 1" (25 mm) and detailed per

LS Details.

- b) Trim QuickSeam Splice Tape at "T" Joints - Trim QuickSeam Splice Tape so that the edge of QuickSeam Splice Tape and the edge of the membrane are flush beneath the "T" Joint area. Per LS Details.
- c) "T" Joints - Apply a section of Firestone QuickSeam Flashing or QuickSeam Joint Cover over the "T" joint area per LS Detail.
- d) Use of 6" or 7" QuickSeam Splice Tape with Cured EPDM as Flashing - If cured EPDM is used as flashing, apply a 9" (229 mm) long section of QuickSeam Splice Tape and cover with primed Membrane or a 9" (229 mm) section of QuickSeam Joint Cover over the intersection of the flashing and field seams per LS Details.
- e) When using RubberGard Max membrane, Firestone Seam Edge Treatment must be applied to all splice edges where reinforcing scrim is exposed. Refer to detail Is-9.

## **B. FLASHING SPLICES USING SA-1065 ADHESIVE (REPAIRS ONLY)**

Where splice adhesive is allowed by Firestone Details, use the following procedure for completing the seams:

1. Clean the flashing and roof membrane area to be seamed using clean natural fiber cloths with Firestone Splice Wash to remove all dusting agent, dirt, and other contaminants that will affect the finished seam and allow drying. Additional cleaning may be required to ensure that the membrane is completely cleaned. Additional cleaning at factory seams is required to remove accumulations of dusting agent. Natural fiber cloths must be discarded as they become dirty and replaced with clean ones to assure proper cleaning. Proper cleaning has been achieved when the membrane surface is uniformly black in color and no streaking is evident. FormFlash does not require cleaning unless it has been contaminated.
2. As an option, Single-Ply QuickPrime Primer may be used in lieu of the cleaning procedure described above. Refer to the QuickSeam Splice Tape Section of this specification and Firestone's Technical Information Sheet for proper application techniques of Single-Ply QuickPrime Primer.
3. Thoroughly stir Firestone's Splice Adhesive before and during use. Apply the Splice Adhesive using a Firestone Splice Adhesive Brush or a 3" to 4" (76 mm to 101 mm) wide 1/2" (13 mm) thick, solvent-resistant paint brush in a smooth, even coat with long brush strokes, such that brush marks bleed out, yielding a smooth, glossy adhesive surface. Apply Splice Adhesive to both mating surfaces at about the same time.
  - a) Do not use circular motions for applying Splice Adhesive. Do not use paint rollers, spray equipment or mechanical equipment for the application of splice adhesive. Do not use long handles on splice adhesive brushes to apply splice adhesive.
4. Test the splice adhesive for readiness by using the Touch-Push Test. Touch the adhesive surface in the thickest area with a clean dry finger to be certain that the adhesive does not stick or string. As you are touching the adhesive, push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, the adhesive is not ready for mating. Flash-off time will vary depending on ambient conditions.
5. After the splice adhesive has dried properly, mate the flashing to the mating area.

6. To complete the splice between the flashing and roof membrane, cut the flashing membrane down to each corner of the curb. Work the flashing membrane into the angle change as tightly as possible, and then allow the remainder of the flashing membrane to fall into place.
7. Roll the splice with a 1-1/2" to 2" (38 mm x 51 mm) silicone roller in both directions along the splice edge.

## 2.10 SEAM EDGE TREATMENT

SEAM EDGE TREATMENT (S.E.T.) IS REQUIRED WHEN USING SPLICE ADHESIVE AS SHOWN ON FIRESTONE DETAILS AND AT CUT EDGES OF RUBBERGARD MAX MEMBRANE. See Detail LS-9.

### **A. APPLY SPLICE ADHESIVE TO SEAM EDGE:**

1. Using a Splice Adhesive brush, apply SA-1065 Splice Adhesive a minimum of 1" (25 mm) on either side of the seam edge. Allow the Splice Adhesive to dry. If the seam edge has become contaminated, it will be necessary to clean the edge with Firestone Splice Wash prior to applying the adhesive.

### **B. APPLY THE LAP SEALANT TO SEAM EDGE:**

1. Apply a continuous bead of Lap Sealant, approximately 3/8" x 1/4" (10 mm x 6 mm) 20-22 lineal feet (6 m - 6.7 m) per 10 oz. (295 cc) tube centered over the seam edge using a standard caulking nozzle. Using the Firestone supplied Lap Sealant tool, feather the Lap Sealant immediately, taking care to leave a mound of sealant directly over the seam edge (refer to Lap Splice Details). Alternately, Lap Sealant may be applied using the plastic nozzle applicator supplied by Firestone, assuring the applicator is centered at the seam edge.

## 2.11 QUICKSEAM BATTEN COVER INSTALLATION FOR M.A.S SYSTEMS

### **A. CLEAN AND PRIME BATTEN STRIP AREA:**

1. Using Firestone QuickScrubber or QuickScrubber Plus, apply Single-Ply QuickPrime Primer to the membrane and batten area so that the prime extends 1/2" to 1" (13 mm to 25 mm) beyond the area to be covered with the Batten Cover Strip. Additional cleaning at factory splices and areas of excessive dusting agent is required. Allow Single-Ply QuickPrime Primer to flash-off.

### **B. PLACE QUICKSEAM BATTEN COVER ROLL:**

1. Place the roll of QuickSeam Batten Cover on the roof a few feet ahead of the application starting point, positioned so that it unrolls from the top of the roll (release paper will be on top).

### **C. INSTALL QUICKSEAM BATTEN COVER:**

1. Starting a minimum of 4" (102 mm) prior to the start of the EPDM protection pad under the end of the batten strip, center the QuickSeam Batten Cover and apply to the cleaned and primed surface.

**D. ADVANCE THE ROLL:**

1. Advance the roll along the batten strip, peeling away the release paper as the QuickSeam Batten Cover is applied using the perforations in the release paper as a guide.

**E. CUT THE QUICKSEAM BATTEN COVER:**

1. Cut the QuickSeam Batten Cover and release paper to extend 4" (102 mm) beyond the end of the EPDM protection pad.

**F. APPLY PRESSURE AND ROLL THE SPLICE:**

1. Apply hand pressure along the entire length of the QuickSeam Batten Cover to completely mate the two surfaces. Using a 1-1/2" to 2" (38 mm to 51 mm) wide silicone hand roller, roll the entire batten cover with positive pressure towards the outside edge and then along the entire length of the batten cover.

**G. INSTALL QUICKSEAM FLASHING AT END LAPS:**

1. Apply Single-Ply QuickPrime Primer to the overlap of the QuickSeam Batten Cover as necessary and allow to flash-off. Install a 12" (305 mm) long section of QuickSeam Flashing over the end lap. Roll the QuickSeam Flashing with a 1 1/2" to 2" (38 mm to 51 mm) wide silicone hand roller. Apply Splice Adhesive to edges of the QuickSeam Flashing and apply Lap Sealant as shown in Firestone Details.

Note: Intersections of QuickSeam Batten Covers must be completely covered at the intersecting T-Joints with a 12" (305 mm) long section of QuickSeam Flashing.

## 2.12 ADDITIONAL MEMBRANE SECUREMENT AND BASE TIE-IN FLASHING

Secure the membrane at all locations where the membrane goes through an angle change greater than 1" (25 mm) in 12" (305 mm) (i.e., roof edges, curbs, interior walls, etc.).

**A. USING QUICKSEAM REINFORCED PERIMETER FASTENING STRIP (QSRPF)**

1. Attach the QSRPF Strip to the penetration, parapet wall or deck using Firestone 2" (51 mm) Seam Plates or Firestone Batten Strips fastened a maximum of 12" (305 mm) o.c. Roll the membrane into place and then fold back, exposing the underside of the membrane and the QSRPF Strip. When using batten strips, apply Firestone All Purpose Sealant over each fastener head, assuring that the fastener head is completely covered.
2. Apply Single-Ply QuickPrime Primer to the membrane where it will mate with the QuickSeam Splice Tape and allow to dry. Apply Firestone Bonding Adhesive to the back half of the QSRPF, to the membrane that is to be bonded to the penetration or wall, and to the penetration or wall itself.
3. After the surfaces have dried properly as determined by using the Touch-Push Test, remove the release paper from the QuickSeam Reinforced Perimeter Fastening Strip and roll the membrane into place, assuring a tight fit into the transition between the horizontal and vertical surfaces. Continue to roll the membrane up the wall and broom in place with a stiff push broom. Roll the membrane over the QuickSeam Tape with a 1-1/2" to 2" (38 mm to 51 mm) wide silicone roller or QuickRoller across the tape and then along its length.
4. Complete vertical laps seams as described in the lap splice section of this specification. Install a T-Joint Cover over any vertical lap splices that go through an angle change (Refer to Firestone Details).

## **B. USING FIRESTONE BATTEN STRIP**

1. Install the RubberGard Membrane per Firestone Details and attach to the vertical substrate using Firestone Batten Strips a maximum of 12" (305 mm) o.c. (Polymer Battens may only be used over wood or metal substrates). Apply Firestone All Purpose Sealant over each fastener head, assuring that the fastener head is completely covered.
2. Cut a piece of flashing from RubberGard Membrane or QuickSeam Curb Flashing large enough to completely cover the substrate of the wall or curb and extend onto the roof membrane a minimum of 3" (76 mm). Complete the splice between flashing and the main roof membrane using QuickSeam Splice Tape before adhering flashing to the vertical surface. Provide lap seams in accordance with Firestone Details.
3. Apply bonding adhesive at about the same time to both the flashing and the surface to which it is being bonded so as to allow approximately the same flash-off time. Apply bonding adhesive evenly to avoid puddles.
4. After the bonding adhesive has dried properly as determined by the Touch-Push Test, roll the flashing into the adhesive evenly and carefully so as to minimize wrinkles. Broom the flashing to the substrate with a stiff push broom to assure proper contact.

## 2.13 FLASHING – PENETRATIONS

### **A. GENERAL:**

1. Remove all loose existing flashing (i.e. metal, bituminous materials, mastic, etc.).
2. Flash all penetrations passing through the membrane.
3. The flashing seal must be made directly to the penetration.

### **B. PIPES, ROUND SUPPORTS, STRUCTURAL STEEL TUBING, ETC.:**

1. Flash penetrations with Firestone EPDM Pre-Molded QuickSeam Pipe Flashing, Conduit Flashings or Quick Seam Penetration Pockets wherever possible. Do not cut or patch EPDM Pre-Molded Pipe Flashings to assist in their installation except where noted on instructions.
2. Flash penetrations using FormFlash when the use of Pre-Molded EPDM Pipe Flashings or Penetration Pockets is not possible.
3. Refer to Firestone's Technical Information Sheets for minimum and maximum pipe diameters that can be successfully flashed with Pre-Molded EPDM Pipe Flashings.
4. Structural Steel Tubing: Use a field-fabricated pipe flashing detail when the corner radius is greater than 1/4" (6 mm) and the longest side of the tube does not exceed 4" (102 mm). When the tube exceeds 4" (102 mm), use a standard curb detail including base-tie in and suitable termination.

### **C. ROOF DRAINS:**

The following applies for installation of cast iron drains only. For all other drain types contact Firestone Roofing Solutions Group.

1. Remove existing clamping ring. Remove any broken clamping hardware and replace.
2. Remove all existing flashing (including lead flashing), roofing materials and cement from the existing drain in preparation for membrane and Water Block Seal.
3. Provide a clean even finish on the mating surfaces between the clamping ring and the drain

bowl.

4. Install insulation, flat and tapered, with suitable bonding surfaces around the drain to provide a smooth transition from the roof surface to the drain. Slope into drain cannot be greater than 4 in 12 for standard membrane and 1 in 12 for reinforced membrane.
5. Position the membrane and cut a hole for the roof drain allowing a 1/2" (12.7 mm) to 3/4" (19.1 mm) of membrane inside the clamping ring. Make round holes in the membrane to align with clamping bolts (a paper punch may be used). Do not cut the membrane back to the bolt holes.
6. Install Firestone Water Block Seal on the clamping ring seat flange below the membrane. Use a minimum of one half of a 10 oz. (295 cc) tube for a 10" (254 mm) drain.
7. Install the roof drain clamping ring and all clamping bolts. Tighten the clamping bolts to achieve constant compression

#### **D. INSERT DRAINS**

Firestone 3" & 4" (76 mm and 102 mm) Insert Drains are intended for installation when existing drains are deteriorated and not suitable for reuse. For other conditions outside of these, contact Firestone Roofing Solutions Group.

1. Remove existing clamping ring. Remove any broken clamping hardware and debris.
2. Install wood blocking as required to support, level and square drain with new insulation sump.
3. Install Firestone Insert drain, securing to a solid substrate in accordance with instructions, in preparation to receive the roof membrane.
4. Install insulation, flat and tapered, with suitable bonding surfaces around the drain to provide a smooth transition from the roof surface to the drain. Slope into drain cannot be greater than 4 in 12 for standard membrane and 1 in 12 for reinforced membrane.
5. Position the membrane and cut a hole for the roof drain allowing a 1/2" (13 mm) to 3/4" (19 mm) of membrane inside the clamping ring. Make round holes in the membrane to align with clamping bolts (a paper punch may be used). Do not cut the membrane back to the bolt holes.
6. Install Firestone Water Block Seal on the clamping ring seat flange below the membrane. Use a minimum of one half of a 10 oz. (295 cc) tube for a 10" (254 mm) strainer basket/clamping ring.
7. Install Firestone roof membrane as prescribed and secure with strainer basket and bolt assembly.

#### **E. PIPE CLUSTERS AND UNUSUAL SHAPED PENETRATIONS:**

1. Install Firestone molded Penetration Pockets per instructions. Allow a minimum clearance of 1" (25 mm) between the penetration(s) and all sides of the Penetration Pocket.
2. Flash detail with shop made penetration pockets to allow a minimum clearance of 1" (25 mm) between the penetration(s) and all sides.
3. Secure penetration pockets and flash per Firestone Details.
4. Fill penetration pockets with Firestone Pourable Sealer and mound to shed water. Pourable Sealer must be a minimum of 2" (51 mm) deep and 1" (25 mm) thick around the penetrations.

#### **F. HOT PIPES:**

1. Protect the RubberGard EPDM components from direct contact with steam or heat sources when the in-service temperature is in excess of 180 °F (60 °C). In all such cases flash to an

intermediate "cool" sleeve with hood. See penetration details.

**G. FLEXIBLE PENETRATIONS**

1. Provide a weather-tight gooseneck set in Water Block Seal and secured to the deck. Flash in accordance with Firestone Details.

**H. SCUPPERS:**

1. Provide and install a new welded watertight sleeve.
2. Set welded watertight scupper in Water Block Seal and secure scupper to the structure.
3. Flash in accordance with Firestone Details.

**I. EXPANSION JOINTS:**

1. Install where specified by the project designer. Install expansion joints in accordance with Firestone details.
2. Ensure joints are sized to accommodate all anticipated movements and make logical transitions to other joint materials at roof perimeter.

**2.14 FLASHING - WALLS, PARAPETS, MECHANICAL EQUIPMENT CURBS, ETC.**

**A. GENERAL:**

1. Using the largest pieces of QuickSeam Curb Flashing or RubberGard EPDM membrane practical, flash all walls, parapets, curbs, etc., to the height as specified by the project designer.

**B. EVALUATE SUBSTRATE:**

1. The following substrates require an overlay of 1/2" (13 mm) Dens-Deck Prime®, 1/2"(13 mm) Dens-Deck® or 5/8" (16 mm) exterior grade or "Wolmanized" plywood mechanically fastened in accordance with project designer's requirements.
  - a) DensGlass Gold®
  - b) Interior Gypsum board
  - c) Stucco
  - d) Cobblestone
  - e) Textured masonry
  - f) Corrugated metal panels
  - g) Other uneven substrates
  - h) All loose existing flashing must be removed.
2. Install Additional Membrane Securement at Curbs, Penetrations, Walls, etc.:
3. Provide Termination:

Provide termination directly to the vertical substrate as shown in Firestone Details where indicated.
4. Provide Intermediate Attachment:

- a) Intermediate attachment of membrane is required at 36" (914 mm) intervals in accordance with Firestone Details unless:
  - 1. The wall surface is smooth, without noticeable high spots or depressions (i.e., plywood, poured or pre-cast concrete, or hollow core block or masonry walls where joints are flush with masonry surface),
  - AND
  - 2. The termination is either a Termination Bar or membrane has been installed underneath a coping or fascia on the outer parapet edge, over the top to the outside edge and turned down to lap any nailer substrate parting line.

## 2.15 EDGE METALS

### A. FIRESTONE FASCIA AND COPING

- 1. Ensure membrane roof system extends enough to terminate per Firestone details at roof edge condition.
- 2. Install prefabricated Firestone perimeter metal edge treatment per instructions and details.

### B. GRAVEL STOPS OR ROOF EDGE METALS

- 1. Flash Gravel Stops or shop made Roof Edge Metals using Firestone QuickSeam Flashing:
  - a) Clean the Membrane and Metal Edge:
    - 1. Remove excess amounts of dusting agent by brooming. Apply Single-Ply QuickPrime Primer to the metal edging and membrane as described in Firestone Specifications. Allow the Single-Ply QuickPrime Primer to flash-off.
  - b) Apply QuickSeam Flashing:
    - 1. Place the roll of QuickSeam Flashing on the roof a few feet prior to the application starting point, positioned so that it unrolls from the top of the roll (release paper will be on top). Remove approximately 2' to 3' (0.6 m to 0.9 m) of release paper and apply to the metal flange and RubberGard Membrane. Lap adjacent rolls of QuickSeam Flashing a minimum of 1" (25 mm). Refer to Roof Edge Details.
  - c) Roll the QuickSeam Flashing:
    - 1. With a 1-1/2" to 2" (38 mm to 51 mm) wide silicone hand roller, roll the QuickSeam Flashing to assure proper adhesion. Additional attention must be given to factory seam intersections and to any change in plane.
  - d) Special Considerations (End Laps, "T" Joints, etc.):
    - 1. Apply 6" (152 mm) length of QuickSeam Flashing, a QuickSeam Joint Cover or 6" x 6" (152 mm x 152 mm) FormFlash to the inside edge of the QuickSeam Flashing at all overlaps. Refer to Roof Edge Details.
    - 2. Apply 6" (152 mm) length of QuickSeam Flashing, a QuickSeam Joint Cover or 6" x 6" (152 mm x 152 mm) FormFlash at all intersections between the QuickSeam Flashing and field-fabricated seams. Refer to Roof Edge Details.
    - 3. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, an additional piece of QuickSeam Flashing must be applied over the metal lap to the top of the gravel stop, after the initial application of QuickSeam



Flashing. Seam Edge Treatment shall be applied at the intersections of the two flashing sections.

**C. OPTIMAL APPLICATION:**

1. The optimal use of QuickSeam Flashing is where a 3" (76 mm) edge metal flange is being used. This will provide the minimum 2" (51 mm) seam to the RubberGard Membrane, with the remaining 3" (76 mm) of the material completely covering the metal flange.
2. If a flange wider than 3" (76 mm) is used, the joints of the sheet metal edge must be flashed using QuickSeam Flashing and Single-Ply QuickPrime Primer, after the primary flashing is complete. In addition, it is recommended that 3" (76 mm) QuickSeam Splice Tape be placed in the sheet metal laps to help seal the metal edge. Refer to Roof Edge Details.

**D. SPECIAL CONSIDERATIONS FOR COPPER EDGING:**

1. Copper may be weathered or coated with an anti-tarnish lacquer which makes adhesion difficult. Therefore, cleaning techniques must be used to prepare the copper surface to receive the QuickSeam Flashing. Firestone requires that the copper be scrubbed with acetone or lacquer thinner, using clean cotton cloths. Cleaning before installation is recommended, however, cleaning can take place after metal is attached if care is taken not to allow the solvents to come into contact with the membrane. After the cleaner dries, apply Single-Ply QuickPrime Primer and QuickSeam Flashing per Firestone Specifications.

## 2.16 MEMBRANE REPAIR

**A. REPAIR CUTS/PUNCTURES IN THE MEMBRANE OR WRINKLES WITHIN 18" (458 MM) OF A SEAM:**

1. A wrinkle running toward a seam or within 18" (457 mm) of a seam must be repaired.
  - a) The wrinkle must be cut out so that the membrane lays flat and patched with a piece of EPDM membrane having no factory seams that extends a minimum of 3" (76 mm) beyond the boundaries of the cut in all directions. If the wrinkle occurs through QuickSeam Flashing or FormFlash, like material must be used for repair. QuickSeam Flashing or FormFlash may not extend onto the roof surface more than 6" (152 mm). QUICKSEAM FLASHING OR FORMFLASH CANNOT BE USED TO REPAIR CURED MEMBRANE. If repairing of the same wrinkle must continue, then EPDM membrane must be used. Install the EPDM repair membrane first, and round all corners of the repair piece.
2. Repair a cut or puncture in the EPDM membrane with EPDM membrane. The repair must extend a minimum of 3" (76 mm) beyond the boundary of the affected area in all directions. Round all corners of the repair piece (Example: a pinhole will require a minimum 6" x 6" (152 mm x 152 mm) EPDM patch).

**B. CLEAN THE MEMBRANE:**

1. When repairing membrane which has been in service, it is necessary to remove accumulated dirt. Proper membrane preparation is made by scrubbing the membrane with a scrub brush and warm soapy water, rinsing with clear water and drying with clean cotton cloths. Clean the area using clean cotton cloths with Firestone Splice Wash. Additional cleaning using Firestone Splice Wash is often necessary.
2. As an alternative, Firestone Membrane PreWash can be used to clean existing membrane. Spray Membrane PreWash on the membrane and allow to sit for approximately ten minutes. Remove PreWash with power washer and allow membrane to dry before any repair activity. Additional applications of PreWash may be required. Refer to Technical Information Sheet

for Membrane PreWash for more detailed instructions.

**C. INSTALL REPAIR MATERIAL:**

1. Repairs must be made with SA-1065 Splice Adhesive. Refer to the Flashing Seam Details found in the Technical Database for application requirements of Splice Adhesive.

## 2.17 TEMPORARY CLOSURE

**A. TEMPORARY CLOSURES-TIE INS**

1. Temporary closures or tie-ins which assure that moisture does not damage any completed section of the new roofing system are the responsibility of the licensed applicator. This is not warranted in any Firestone warranty. Completion of flashings, terminations and temporary closures is required to provide a watertight condition.
2. See the V-Force Membrane Technical Information Sheet for more information.

## 2.18 ACRYLITOP PC-100 COATING

**A. ACRYLITOP PC-100 APPLICATION**

1. AcryliTop PC-100 can be applied to the RubberGard membrane or flashing to offer a reflective surface, and add to its service life. In addition, AcryliTop PC-100 can be applied to existing RubberGard EPDM roofs under warranty, helping extend the membrane life. Should the coating of an existing roof be considered, the roof system should first be inspected by a Firestone licensed contractor to ensure that the system itself is not in need of repair prior to applying AcryliTop PC-100.

**B. REFER TO THE TECHNICAL INFORMATION SHEETS AND MATERIAL SAFETY DATA SHEETS FOR ACRYLITOP**

1. PC-100, AcryliTop PC-100 Base Coat and Membrane PreWash for additional information on application, storage and safety.

**C. CLEAN MEMBRANE SURFACE:**

1. Before applying the AcryliTop PC-100, the RubberGard membrane must be cleaned using Firestone's Membrane PreWash. Clean the roof of debris, as needed, with a broom or leaf air blower. Remove any leaves or large pieces of debris, such as stones, branches, etc.
2. Apply Membrane PreWash at a rate of 300 to 500 square feet of membrane surface (27.8 sq. m to 46.5 sq. m) using a 2 to 3 gallon (7.6 L to 11.4 L) agricultural tank sprayer and allow to dry for 5 to 10 minutes (application rates may vary depending on the cleanliness of the membrane). Ensure that tank sprayer has a pressure relief valve. Do not allow PreWash to come in contact with other surfaces.
3. Using a 3000 to 4000 psi (20.7 mPa to 27.6 mPa) pressure washer that provides a minimum of 4 gallons (15.1 L) per minute, remove the PreWash working first away from the drains or gutters, then back towards them. A 40° fan spray nozzle for pressure washing should be used.
4. Should deposits of dirt and dusting agent remain, additional cleaning with the pressure washer is required. (Caution: Do not allow the spray wand to be closer than 12 inches (305 mm) from the membrane to prevent damage).

**D. APPLY ACRYLITOP PC-100 BASE COAT (ONLY REQUIRED WHEN USING A ROLLER**

**APPLICATION):**

1. After the membrane has dried, apply Firestone AcryliTop PC-100 Base Coat at a rate of approximately 200 square feet (18.5 sq. m) per gallon (3.8 L) using a 3/8" (9.5 mm) nap paint roller. At this rate, membrane may be slightly visible through the base coat. Allow Base Coat to dry thoroughly before applying the AcryliTop PC-100 top coat.

**E. APPLY ACRYLITOP PC-100:**

1. ROLLER APPLICATION:

- a) Using a 3/8" (10 mm) nap paint roller, apply the AcryliTop PC-100 coating at a 90° angle to the AcryliTop PC-100 Base Coat at a rate of approximately 200 square feet (18.5 sq. m) per gallon (3.8 L) or as necessary to assure complete coverage of the AcryliTop PC-100 Base Coat. The finished dry mil thickness shall be a minimum of 10 mils total.

2. SPRAYER APPLICATION:

- a) Once the membrane is properly cleaned, apply AcryliTop PC-100 at a rate of approximately 100 square feet (9.3 sq. m) per gallon (3.8 L), resulting in a minimum 10 mil dry film thickness. The sprayer used for application of the AcryliTop PC-100 shall be a 30:1 ratio pump using a pressure of 90-100 psi (621 kPa to 690 kPa) at a rate of 125 cubic feet (3.5 cu. m) per minute.

## 2.19 ROOF WALKWAYS

**A. LAY OUT FIRESTONE RUBBERGARD QUICKSEAM WALKWAY PADS:**

1. Install walkway pads in locations as specified by the project designer and in accordance with the System Design Guide Section of this Technical Database. Layout Firestone RubberGard QuickSeam Walkway Pads so that the flat surface is over the completed RubberGard Membrane, spacing each pad a minimum of 1" (25 mm) and a maximum of 3" (76 mm) from each other to allow for drainage.
2. If Firestone RubberGard Walkway Pads must be installed over field-fabricated seams or within 6" (152 mm) of a seam edge, install QuickSeam Flashing over the seam edge. The QuickSeam Flashing must extend beyond the walkway pad a minimum of 6" (152 mm) on either side.

**B. ATTACH FIRESTONE RUBBERGARD QUICKSEAM WALKWAY PADS TO THE MEMBRANE:**

1. Clean the Membrane:
  - a) Clean the membrane using Firestone Single-Ply QuickPrime Primer where the QuickSeam Splice Tape will contact the membrane.
2. Place Walkpad:
  - a) Remove the release paper from the QuickSeam Splice Tape. Turn the walkpad over and place it on the primed membrane.
3. Apply Pressure:
  - a) Walk on the pad to press in place assuring proper adhesion.

**C. RED SHIELD WALKWAY SYSTEMS:**

- a) Install Red Shield Walkway systems as instructed with supplied materials.

## 2.20 EQUIPMENT SUPPORTS

### A. RED SHIELD PIPE SUPPORTS:

1. Install Firestone Red Shield Pipe and equipment supports systems were specified. Follow manufactures installation instructions.

## 2.21 SHEET METAL WORK

- For specific installation instructions for Firestone Sheet Metal, refer to the System Design Guide and Technical Information Section of this Technical Database and Manual.
- For sheet metal work not supplied by Firestone, refer to fabrication and installation requirements specified by the project designer, as well as industry standards.

- END OF SECTION -



# Geospring™ Hybrid Electric Residential Water Heaters

*Important Safety Information*...2-4

*Operating Instructions*

Control Panel ..... 5

Powering Unit ..... 6

Temperature Setting ..... 7

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Frequently Asked Questions (FAQ) .. 9

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\*ENERGY STAR® labeled product



As an ENERGY STAR® partner, GE has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

*Write the model and serial numbers here:*

Model # \_\_\_\_\_

Serial # \_\_\_\_\_

You can find them on the rating label on the front side of your water heater.

*Owner's Manual &  
Installation Instructions*  
**GEH50DEED**

## Chauffe-eau résidentiel hybride électrique

*Manuel d'utilisation  
et d'installation*

*La section française commence à la page 24*

## Calentadores de agua residenciales eléctricos híbridos

*Manual del propietario  
e instalación*

*La sección en español empieza en la página 48*

# IMPORTANT SAFETY INFORMATION. READ ALL INSTRUCTIONS BEFORE USING.

## ⚠️ WARNING!

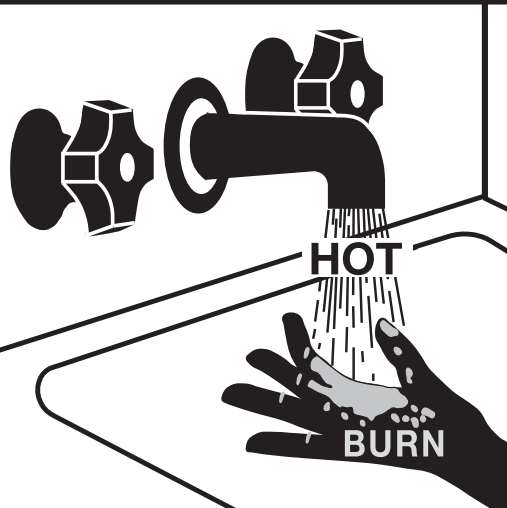
For your safety, the information in this manual must be followed to minimize the risk of fire or explosion, electric shock, or to prevent property damage, personal injury, or loss of life.

Be sure to read and understand the entire Owner's Manual before attempting to install or operate this water heater. It may save you time and cost. Pay particular attention to the Safety Instructions. Failure to follow these warnings could result in serious bodily injury or death. Should you have problems understanding the instructions in this manual, or have any questions, STOP and get help from a qualified service technician or the local electric utility.

### WATER TEMPERATURE ADJUSTMENT

Safety and energy conservation are factors to be considered when selecting the water temperature setting via the water heater's user interface. Water temperatures above 125°F can cause severe burns or death from scalding. Be sure to read and follow the warnings outlined on the label pictured below. This label is also located on the water heater near the top of the tank.

⚠️ DANGER



**Water temperature over 125°F can cause severe burns instantly or death from scalds.**

**The electronic temperature control setting usually approximates tap water temperature. However, factors could cause water temperature to reach 160°F regardless of the control setting. Always feel water before bathing and showering.**

**Children, disabled and elderly are at highest risk of being scalded.**

**See instruction manual before setting temperature at water heater.**

**Feel water before bathing or showering.**

**Temperature limiting valves are available; see manual.**

Mixing valves for reducing point-of-use water temperature by mixing hot and cold water in branch water lines are available. Contact a licensed plumber or the local plumbing authority for further information.

#### Time/Temperature Relationship in Scalds

Temperature	Time to Produce a Serious Burn
120°F (49°C)	More than 5 minutes
125°F (52°C)	1-1/2 to 2 minutes
130°F (54°C)	About 30 seconds
135°F (57°C)	About 10 seconds
140°F (60°C)	Less than 5 seconds
145°F (63°C)	Less than 3 seconds
150°F (66°C)	About 1-1/2 seconds
155°F (68°C)	About 1 second

Table courtesy of Shriners Burn Institute

The chart shown above may be used as a guide in determining the proper water temperature for your home.

Thermostat has been set at the factory to 120°F (49°C) to reduce the risk of scald injury.

*NOTE: Households with small children, disabled or elderly persons may require a 120°F (49°C) or lower thermostat setting to prevent contact with "HOT" water.*

**⚠️ DANGER:** *There is a Hot Water SCALD Potential if the control water temperature is set too high.*

***IMPORTANT SAFETY INFORMATION.  
READ ALL INSTRUCTIONS BEFORE USING.***

*GEAppliances.com*

***⚠ CAUTION!***

*Risk of Fire - Hydrogen gas* can be produced in a hot water system served by this water heater that has not been used for a long period of time (generally two weeks or more). HYDROGEN GAS IS EXTREMELY FLAMMABLE!! To dissipate such gas and to reduce risk of injury, it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. If hydrogen is present, there will be an unusual sound such as air escaping through the pipe as the water begins to flow. Do not smoke or use an open flame near the faucet at the time it is open.

***⚠ WARNING!***

*Risk of Fire* - DO NOT store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. Keep rags and other combustibles away.

***⚠ FOR INSTALLATIONS  
IN THE STATE OF CALIFORNIA***

California Law requires that residential water heaters must be braced, anchored or strapped to resist falling or horizontal displacement due to earthquake motions. For residential water heaters up to 52 gallon (236.4 L) capacity, a brochure with generic earthquake bracing instructions can be obtained from: Office of the State Architect, 400 P Street, Sacramento, CA 95814 or you may call 916.324.5315 or ask a water heater dealer.

Applicable local codes shall always govern installation. For residential water heaters of a capacity greater than 52 gallons (236.4 L) consult the local building jurisdiction for acceptable bracing procedures.

*California Proposition 65 Warning:* This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

# **IMPORTANT SAFETY INFORMATION.**

## **READ ALL INSTRUCTIONS BEFORE USING.**

---

### **⚠ WARNING:**

*If the water heater has been subjected to flood, fire, or physical damage, turn off power and water to the water heater.*

Do not operate the water heater again until it has been thoroughly checked by qualified service personnel.

### **Safety Precautions**

- A. Do** turn off power to water heater if it has been subjected to overheating, fire, flood or physical damage.
- B. Do Not** turn on water heater unless it is filled with water.
- C. Do Not** turn on water heater if cold water supply shut-off valve is closed.

**NOTE:** *Flammable vapors may be drawn by air currents from surrounding areas to the water heater.*

- D.** If there is any difficulty in understanding or following the Operating Instructions or the Care and Cleaning section, it is recommended that a qualified person or serviceman perform the work.

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### **Safety Controls**

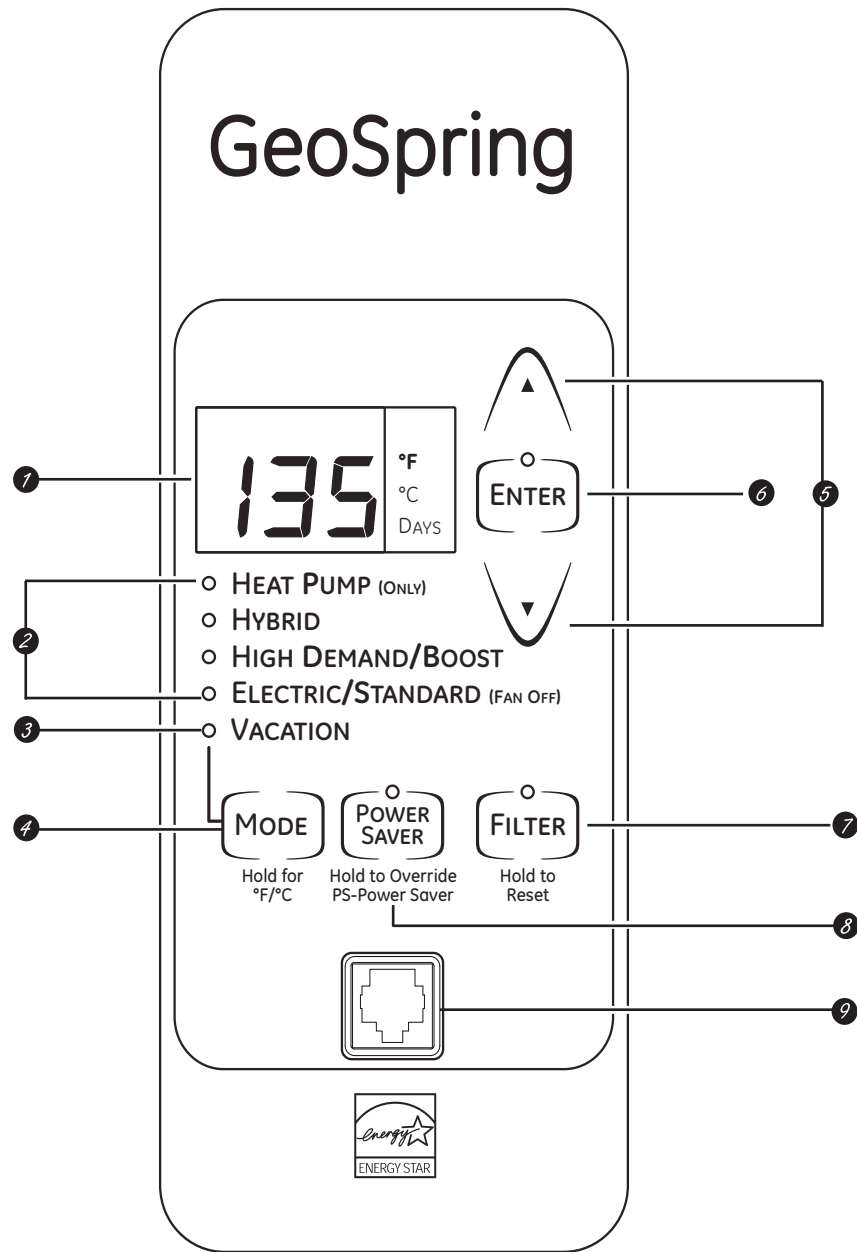
The water heater is equipped with a temperature-limiting control (TCO) that is located above the heating element in contact with the tank surface. If for any reason the water temperature becomes excessively high, the temperature-limiting control (TCO) breaks the power circuit to the heating element. Once the control opens, it must be reset manually. Resetting of the temperature limiting controls should be done by a qualified service technician.

**⚠ CAUTION:** *The cause of the high temperature condition must be investigated by a qualified service technician and corrective action must be taken before placing the water heater in service again.*

### **To reset the temperature-limiting control:**

- 1. Turn off the power to the water heater.
- 2. Remove the jacket access panel(s) and insulation. The thermostat protective cover should not be removed.
- 3. Press the red RESET button.
- 4. Replace the insulation and jacket access panel(s) before turning on the power to the water heater.





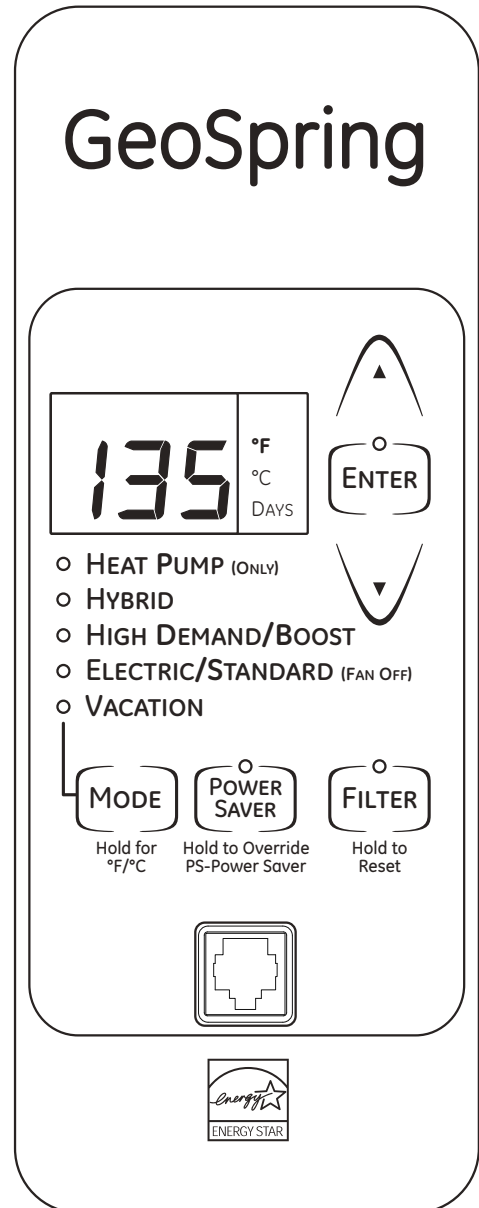
## Control Features

- 1** *Display*
- 2** *Operating Modes*  
(See page 8 for description)
- 3** *Vacation*  
(See page 8 for description)
- 4** *Mode Selector*  
Use this button to alternate between available modes.
- 5** *Arrow Pads*  
Use these buttons to adjust the temperature setting.
- 6** *Enter Key*
- 7** *Filter Reset*  
The filter is dirty and requires cleaning when the Red light is illuminated. Filter is located on top of the water heater. Press button and hold for 5 seconds to reset filter alarm.
- 8** *Power Saver Override*  
For use with ACM module. Press and hold to bring unit out of Power Saver mode. Once pressed and Power Saver mode is cancelled, unit will remain out of Power Saver for the next 18 hours.
- 9** *Appliance Communication Module Port*  
For use with optional ACM module (see page 10 for details).

## Turning on the water heater.

There is no power button for this unit. Once the water heater is wired and power is supplied, it will be on. The display will show the current water temperature setting. Current operating mode for the water heater is illuminated.

To comply with safety regulations, the controls are factory preset to 120°F (49°C) and Hybrid Mode. It is recommended that the unit be set to Heat Pump (only) mode to maximize energy savings. Operating in Hybrid mode provides a balance of energy savings and hot water use convenience. Reported energy consumption is based on operating the unit in Hybrid mode at a temperature setting of 135°F (57°C), and operation at lower temperature settings or in Heat Pump (only) mode will provide even greater energy savings.



### Temperature setpoint:

Safety, energy conservation and hot water capacity are factors to be considered when selecting the water temperature setting of the water heater. To comply with safety regulations, the water temperature setpoint is factory set at 120°F (49°C). This is the recommended starting temperature setting.

**NOTE:** According to US Dept of Energy, the average residential water heater in the US is set at 135°F (57°C). GE GeoSpring™ Hybrid Water Heater's energy savings claims are based on a 135°F (57°C) temperature setting. The water temperature setpoint can be raised from the factory setting of 120°F to 135°F (49°C to 57°C) without sacrificing the claimed energy savings. If a lower temperature setting than 135°F (57°C) is used, greater savings in energy and operating costs may be achieved.

See "To Adjust the Temperature" section to change the water heater's temperature.

### Hot water capacity:

If more hot water capacity is desired, increasing the temperature from 120°F to 135°F (49°C to 57°C) will enable the same tank of hot water to last about 25% longer because more cold water is mixed in at the shower or faucet.

### Time/Temperature Relationship in Scalds

Temperature	Time to Produce a Serious Burn
120°F (49°C)	More than 5 minutes
125°F (52°C)	1-1/2 to 2 minutes
130°F (54°C)	About 30 seconds
135°F (57°C)	About 10 seconds
140°F (60°C)	Less than 5 seconds
145°F (63°C)	Less than 3 seconds
150°F (66°C)	About 1-1/2 seconds
155°F (68°C)	About 1 second

Table courtesy of Shriners Burn Institute

### Risk of Scalding Reminder:

Water temperatures above 125°F (52°C) can cause severe burns or death from scalding. Be sure to read and follow the warnings outlined in this manual and on the label on the water heater. This label is located on the water heater near the upper element access panel.

See "Time/Temperature Relationship in Scalds" below as a guide in determining the proper water temperature for your home.

### Mixing-valves:

Mixing valves for reducing point-of-use water temperature by mixing hot and cold water in branch water lines are available. Contact a licensed plumber or the local plumbing authority for further information.

**⚠ DANGER:** There is a hot water scald potential if the water temperature is set too high. Households with small children, disabled, or elderly persons may require a 120°F (49°C) or lower thermostat setting to prevent contact with HOT water.

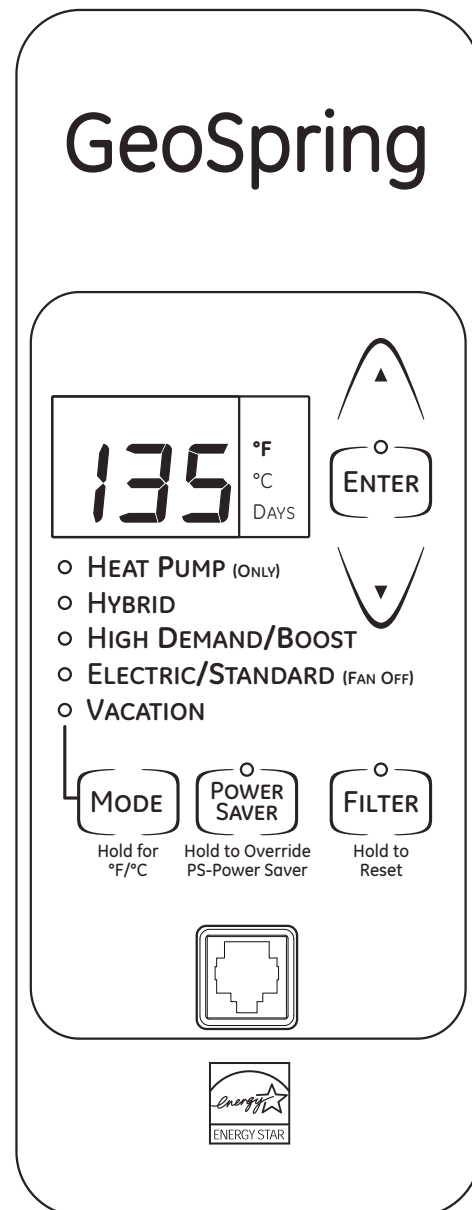
### To Adjust the Temperature

Follow these steps:

1. Press the UP or DOWN arrow on the control panel key pad to desired temperature.
2. Press ENTER to accept the new setting.

**Note:** To change between °F and °C, press and hold MODE.

**⚠ DANGER:** There is a Hot Water scald Potential if the water temperature is set too high. 120°F (49°C) is the recommended starting point for water temperature setting, but it can be adjusted to any temperature between 100°F and 140°F (38°C and 60°C).



## *Operational Modes.*

---

This water heater defaults to the Hybrid operating mode. Available modes are listed below and can be selected using the MODE button.

### ***Heat Pump (only) Mode***—RECOMMENDED FOR MAXIMUM SAVINGS

Heat Pump (only) is the most energy-efficient mode for this water heater. It takes heat from the surrounding air to heat the water. The time it takes to heat the water is longer in this mode, so it may not be sufficient if you have a high-demand situation such as a large household or company.

### ***Hybrid Mode***

Hybrid mode combines the energy efficiency of Heat Pump (only) with the recovery speed and power of the Electric (Fan off)/Standard (Fan off) mode in most water usage situations. Hybrid mode will allow the unit to perform like a standard electric water heater while providing significant energy savings.

**NOTE:** Reported unit performance, energy consumption and savings are based on Hybrid Mode operation at a temperature setting of 135°F (57°C).

### ***High Demand/Boost***

This mode may be necessary if your household has a higher-than-average water usage or the unit is undersized for the household water demands. In this mode, the unit will use the electric heating elements only when the water demand rate is high. When using the heating elements, the water temperature will recover at a faster rate but it will use more energy to heat it. Unlike Electric/Standard (Fan off) mode, it will use the heating elements only when needed, and use the heat pump when water demand rates are lower.

**NOTE:** The difference between Hybrid mode and High Demand/Boost mode is that in High Demand/Boost mode the heating resistive elements are activated sooner than in the Hybrid mode.

### ***Electric (Fan off)/Standard (Fan off) Mode***

This mode uses only the upper and lower heating resistance elements to heat the water. The time it takes to heat the water is less in this mode, but it is the LEAST energy-efficient mode.

**NOTE:** In this mode the green LED light will flash after 48 hours as an indication that the unit is not operating in the most energy efficient mode. The unit will continue to operate in this mode and does not indicate an operating issue.

### ***Vacation***

This feature is used when you will be away from the home for an extended period of time and hot water is not needed. In this mode, the unit will drop the water temperature down to 50°F (10°C) and will use the most efficient heating mode to conserve energy while the heater is sitting idle. The unit will automatically resume heating one day before your return, so that hot water will be available.

For example if you will be gone 14 days, follow these steps:

1. Select VACATION by using the Mode button
2. Input total days you will be gone (in this example, 14) by pressing the UP arrow button (the default is 7 days)
3. Press ENTER.

The unit will drop the water temperature down to 50°F (10°C) for one day less than you will be gone (in this example, for 13 days). At the end of the day before you return (in this example, the 13th day), it will automatically return to the previous operating mode and heat the water to the original temperature setting so hot water is available upon your return.

### ***To access any of these modes:***

1. Press the MODE button on the control to the desired operating mode.
2. The green light will be illuminated on the chosen mode.

### *Filter:*

Q: Why is there a filter?

A: In Hybrid and Heat Pump (only) the unit moves air through the system. The filter protects the unit from dirt. A clean air filter improves efficiency.

Q: How to clean the filter?

A: Leave power on and remove filter from top of unit. Filter can be vacuumed clean or rinsed with warm water. A dirty filter will reduce water heater efficiency!

### *Modes:*

Q: What is Heat Pump (only)?

A: Heat Pump (only) is the most-efficient mode. It takes heat from the air to heat water, thereby cooling the surrounding air. Slower recovery but most-efficient mode.

Q: What is Hybrid?

A: The Hybrid mode combines benefits of Heat Pump (only) with the speed and power of Standard Electric. This provides great performance with less energy.

Q: What is High Demand/Boost?

A: High Demand/Boost can be used when hot water usage is higher than normal. The unit will be less efficient but will heat water faster in response to long water draws. For all normal draws, the unit will still use the efficient Heat Pump the majority of the time.

Q: What is Vacation mode?

A: If you are gone for an extended period, this mode lowers the water temperature to reduce energy used. Unit will switch to the previous mode one day before you get back.

Q: What is Electric/Standard (Fan off) ?

A: Electric/Standard (Fan off) mode uses only the resistance heaters to heat the water. This gives faster hot water recovery than Hybrid mode, but uses more energy. This mode operates without the fan, stopping the cool air normally discharged during heat pump operation.

Q: Why does the Electric/Standard (Fan off) green LED flash ?

A: In this mode the green LED light will flash after 48 hours as an indication that the unit is not operating in the most energy efficient mode.

### *Operation:*

Q: Why can I hear the unit run?

A: In the most energy-efficient modes, Heat Pump (only), Hybrid, and High Demand/Boost, the method used to heat the water uses a fan that can be heard while running.

Q: The heat pump is not running its normal length of time. What causes this?

A: Under some conditions, the GeoSpring™ Hybrid Water Heater will operate using the electric elements instead of the heat pump to protect your unit and ensure hot water is available to you. These conditions include extreme cold ambient temperature (<45°F), extreme hot ambient temperatures (>120°F), or very low voltage conditions. The unit will return to normal operation when conditions permit.

# Appliance Communication Module (where installed).

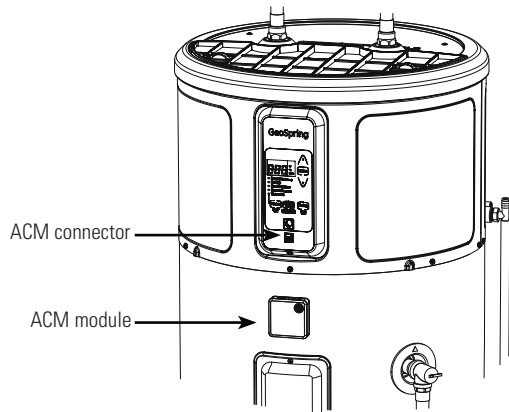
The Hybrid Electric heat pump water heater is compatible with the **GE Smart Appliance communication module (ACM)** which can be purchased separately. Contact your local utility or visit [www.GEAppliances.com/Smart-Appliance](http://www.GEAppliances.com/Smart-Appliance) to see if your area is using **ACM** technology. Applying the ACM allows the unit to respond to utility signals or to join a home network.

The following demand response features may be available as part of a pilot test program with the local utility company to help consumers reduce peak electricity usage in the home.

## INSTALLATION

The ACM module is equipped with magnets in the base of the module that will enable it to be attached to the painted metal exterior of the heat pump water heater.

Details on how to connect the cables to the module are in the instructions that come with the module.



Once the cable from the ACM module is plugged into the water heater's connection, follow the power-up directions included with the ACM module. As soon as the ACM module is operating, the heat pump water heater is ready to receive the ACM signals.

## QUICK GUIDE

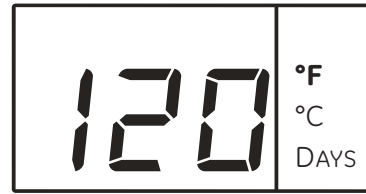
If your local utility company is utilizing ACM technology, the ACM module will receive the signals sent from your utility company. One of four signals will be sent:

- "Low" (represents lowest energy cost rate is available)
- "Medium" (represents increased energy cost rate)
- "High" (represents increased energy cost rate)
- "Critical" (represents "peak rate" energy cost rate)

A heat pump water heater equipped with a ACM module will automatically recognize what energy cost rate is available and adjust its mode and temperature setting to use less energy when rates are medium, high and critical. When the heat pump water heater responds to these signals, the LED light above the Power Saver button will be on, indicating energy pricing periods are in effect, and the letters PS will be displayed on the LED if the user attempts to change the temperature without first pressing the Power Saver override button.

When the signal is low or when no ACM module is connected, the unit runs as normal. The following steps show how the unit reacts to Medium, High and Critical signal levels.

When the ACM signal is **Medium**, the control will operate in Heat Pump (only) Mode and the water temperature will remain at the current user setting. If the current user temperature setting is 120°F the screen will display:



When the ACM signal is **High**, the control will operate in Heat Pump (only) mode, with a water temperature setting of 110°F, and the screen will display:



When the ACM signal is **Critical**, the control will operate in Heat Pump (only) mode, with a water temperature setting of 100°F, and the screen will display:



**Notice:** Appliance ACM connection carries voltage not compatible to computers or accessories. Do NOT plug laptops, modems, routers, etc into the Appliance RJ45 ACM connector. Use only with designated GE Appliance Accessories. Connection to computers and accessories may result in product damage.

When unit is operating in medium, high or critical, the LCD above the Power Saver button will be lit. If at any time you want to change the temperature setpoint while the unit is in Power Saver mode, press and hold the Power Saver button to override the Power Saver mode, then use the arrow buttons to change to the desired setting. Override will be in place for 18 hours. If you try to change the temperature without overriding the powersaver function, the letters PS will show on the display, indicating it is still in Powersaver mode.



## Routine Preventive Maintenance

**▲ DANGER:** Risk of Scald - Before manually operating the relief valve, make certain no one will be exposed to the danger of coming in contact with the hot water released by the valve. The water may be hot enough to create a scald hazard. The water should be released into a suitable drain to prevent injury or property damage.

**NOTE:** If the temperature and pressure-relief valve on the hot water heater discharges periodically, this may be due to thermal expansion in a closed water system. Contact the water supplier or your plumbing contractor on how to correct this. Do not plug the relief valve outlet.

Properly maintained, your water heater will provide years of dependable trouble-free service.

It is suggested that a routine preventive maintenance program be established and followed by the user.

### Temperature and Pressure-Relief Valve:

At least once a year, lift and release the lever handle on the temperature and pressure-relief valve, located on the front-right side of the water heater, to make certain the valve operates freely. Allow several gallons to flush through the discharge line to an open drain.

### Periodic Inspection (once a year):

It is further recommended that a periodic inspection of the operating controls, heating elements and wiring should be made by service personnel qualified in electric appliance repair.

Most electrical appliances, even when new, make some sound when in operation. If the hissing or singing sound level increases excessively, the electric heating element may require cleaning. Contact a qualified installer or plumber for inspection.

### Flushing Tank:

A water heater's tank can act as a settling basin for solids suspended in the water. It is therefore not uncommon for hard water deposits to accumulate in the bottom of the tank. To clean the tank of these deposits, follow these steps:

1. Attach a garden hose to the drain valve located at the bottom of the unit and direct that hose to a drain.
2. Open the drain valve with a flat screwdriver.
3. Once a few quarts of water have been drained, close the drain valve.

This should be done with the cold water supply open such that water removed through drain valve is replaced, and water supply flow helps to remove sediment.

## Draining the Water Heater

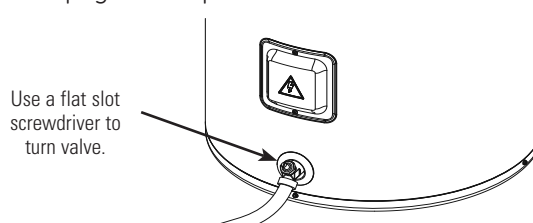
**▲ CAUTION:** Risk of Shock - Shut off power to the water heater before draining water.

**▲ DANGER:** Risk of Scald - Before manually operating the relief valve, make certain no one will be exposed to the hot water released by the valve. The water drained from the tank may be hot enough to present a scald hazard and should be directed to a suitable drain to prevent injury or damage.

To drain the water heater, follow these steps:

1. Attach a garden hose to the drain valve located at the bottom of the unit and direct that hose to a drain.
2. Turn off the cold water supply.
3. Admit air to the tank by opening a hot water faucet or lifting the handle on the relief valve
4. Open the drain valve with a flat screwdriver.

Note: See page 15 for product schematic.



## Extended Shutdown Periods or Vacations Exceeding Vacation Mode Options

If the water heater is to remain idle for an extended period of time, the power and water to the appliance should be turned off to conserve energy and prevent a buildup of dangerous hydrogen gas. This unit has no power button, power can only be shut off at the circuit breaker or disconnect switch.

The water heater and piping should be drained if they might be subjected to freezing temperatures.

After a long shutdown period, the water heater's operation and controls should be checked by qualified service

personnel. Make certain the water heater is completely filled again before placing it in operation.

**NOTE:** Refer to the Hydrogen Gas Caution in the Operating Instructions (see page 3).

# Care and cleaning of the water heater.

## Cleaning the Filter

In the Hybrid, Heat Pump (only) and High Demand/Boost modes, the heater moves air through the system and out the back of the unit. The filter is in place to protect the evaporator from dirt and dust.

A clean air filter is important to get the highest efficiency. Occasionally this filter will need to be cleaned (minimum once per year). When the filter requires cleaning, the Red light above the Filter button will be illuminated and an audible beep will sound.

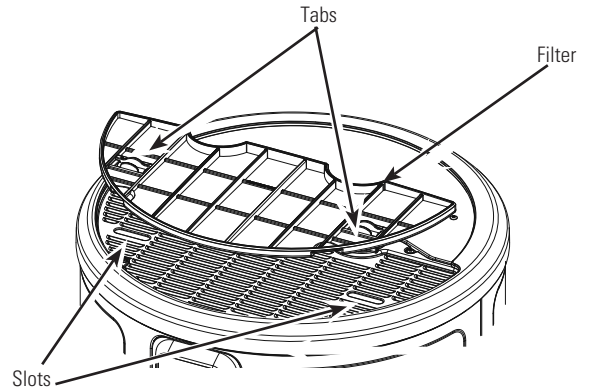
**NOTE:** If the filter gets too dirty, the unit will automatically switch to Electric (Fan off)/Standard (Fan off) mode and energy savings will be lost.

Leave the power on. Remove the filter from the top of the unit. Squeeze two tabs and lift to remove the air filter. Once it has been removed, the filter can be vacuumed or wiped clean with a damp cloth or rinsed with warm water.

Once the filter has been cleaned and dried, it can be replaced by aligning it into the slots in the top of the unit and pushing it down into place.

After the clean filter has been reinstalled, press and hold the **FILTER** button. If a heating cycle is on when the filter fault is reset, it will continue in electric mode to finish the cycle. After that, it will automatically revert to the mode it was in prior to being switched.

**IMPORTANT:** Filter must be cleaned when the alarm is displayed. A dirty filter will make the system work harder and result in a reduction of efficiency and possible damage to the system. In order to get the best energy efficiency available, make sure your filter is clean.

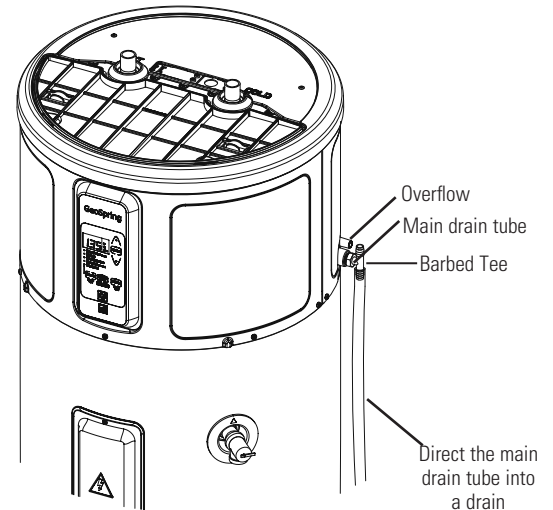


## Clearing the Condensation Drain Tube

The main drain is intended to carry all condensate away. If it is clogged, the condensate will exit the overflow drain tube and onto the floor. This is intended as a notification to the user that the primary drain is clogged. Remove the barbed tee and drain tube, clear any debris and reattach.

Periodically inspect the drain lines and clear any debris that may have collected in the lines.

See Installation Instructions for more information.



## Exterior Surfaces

Hand wash with warm water only.

## Anode Rod

The anode rod should be removed from the water heater's tank and inspected after a maximum of 3 years service, then annually thereafter, and replaced when more than 6" (15.2 cm) of core wire is exposed at either end of the rod.

**NOTE:** Artificially softened water requires that the anode rod be inspected annually.

Due to shock hazard and to prevent accidental water leaks, this inspection should be done by a qualified servicer or plumber, and

requires that the electric power and cold water supply be turned off before servicing the anode rod.

**NOTICE:** Do not remove the anode rod from the water heater's tank except for inspection and/or replacement, as operation with the anode rod removed will shorten the life of the glass-lined tank and will void warranty coverage.

The anode rod consumption and replacement are not covered by warranty.



## ⚠ CAUTION - IMPORTANT SAFETY NOTICE

This information is intended to use by individuals possessing adequate background of electrical, electronic and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

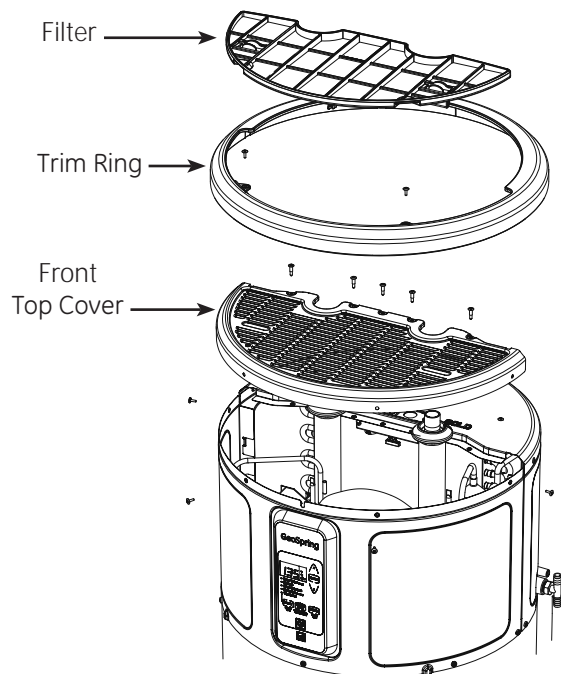
### Tools needed:

- T20 Torx Screwdriver
- Slot Screwdriver
- Tape
- Socket Wrench
- Socket Extension 12" long
- 1 1/16" Socket
- Softset Sealant
- Anode Rod, if needed

\* See page 72 for part ordering instructions

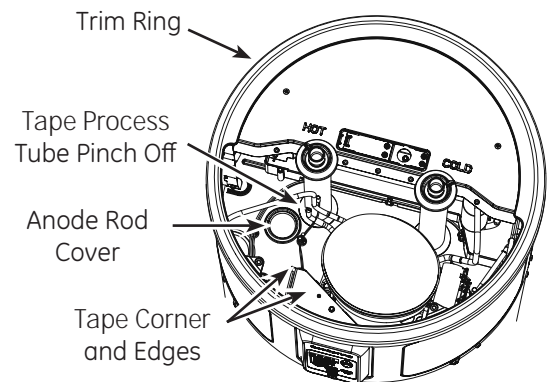
### To service the Anode Rod:

1. Disconnect power, shut off the water supply, and partially drain one or two gallons from the water heater through the lower drain valve.
2. Remove the filter, trim ring, and front top cover as show in **Illustration A**.



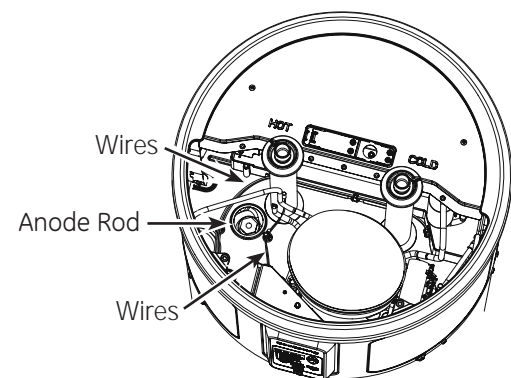
**Illustration A**

3. Reinstall the trim ring, place a protective layer of tape on sheet metal edges, and remove the anode rod cover as show in **Illustration B**.



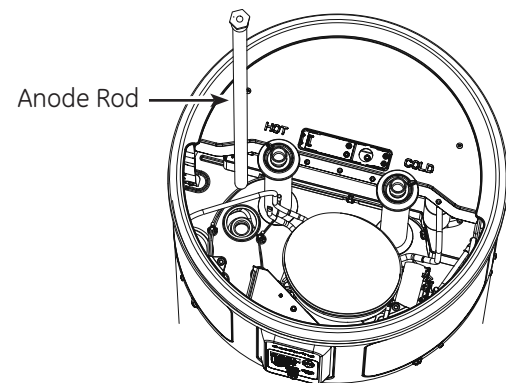
**Illustration B**

4. Using a slot screwdriver and ensuring to avoid damage to exposed wires, remove foam to uncover the anode rod as show in **Illustration C**.



**Illustration C**

5. Using a 1 1/16" socket and extension, unscrew the anode rod, then lift out to inspect as show in **Illustration D**.



**Illustration D**

6. To install the anode rod, seal the threads with soft set sealant, thread into the port and using the torque wrench tighten to 50 ± 5 ft-lbs of torque. Reinstall the anode rod cover.
7. Turn water supply on, open a tap to remove any air in plumbing system, inspect for leaks, then turn the power on and reassemble the unit in reverse order as show in **Illustration A**.

# Installation Instructions

The location chosen for the water heater must take into consideration the following:

## LOCAL INSTALLATION REGULATIONS

This water heater must be installed in accordance with these instructions, local codes, utility codes, utility company requirements or, in the absence of local codes, the latest edition of the National Electrical Code. It is available from some local libraries or can be purchased from the National Fire Prevention Association, Batterymarch park, Quincy, MA 02169 as booklet ANSI/NFPA 70.

## POWER REQUIREMENTS

Check the markings on the rating plate of the water heater to be certain the power supply corresponds to the water heater requirements. **NOTE:** 208V installations may experience lower performance.

## LOCATION

Locate the water heater in a clean dry area as near as practical to the area of greatest heated water demand. Long uninsulated hot water lines can waste energy and water. Unit must be installed in a level location.

**NOTE:** This unit is designed for any common indoor installation including: garage, utility room, attic, closet, etc. With the installation of a louvered door, it can be installed in rooms smaller than 10' x 10' x 7' (700 cu.ft.). Louvers should be 240 square inches (0.15 m<sup>2</sup>) or greater. If two louvers are used one should be near the top of the door.

Place the water heater in such a manner that the air filter, cover, trim ring and front panels can be removed to permit inspection and servicing, such as removal of elements or cleaning of the filter.

The water heater and water lines should be protected from freezing temperatures and *high-corrosive atmospheres*. Do not install the water heater in outdoor, unprotected areas.

**⚠ CAUTION: Risk of Property Damage -** The water heater should not be located in an area where leakage of the tank or connections will result in damage to the area adjacent to it or to lower floors of the structure. Where such areas cannot be avoided, it is recommended that a suitable catch pan, adequately drained, be installed under the water heater. Attic installations require adequate flooring and access stairs.

**NOTE:** The heat pump operating range is 45°F to 120°F (7°C to 49°C). If the ambient temperature is outside of this range, the heat pump will turn off and the electric elements will be used until the ambient temperature returns to within the operating range.

## LOCATION (CONT.)

### WATER HEATER SIZING INFORMATION - READ BEFORE INSTALLING:

#### For existing home replacements:

- **Replacing an existing tank water heater?** If your current water heater has provided adequate hot water, and no other plumbing changes and/or renovations that would require additional hot water demand are in process or planned, then:
  - The GeoSpring™ Hybrid Water Heater can replace an equivalent size or smaller standard electric water heater.
  - If switching from gas to electric, the GeoSpring™ Hybrid Water Heater may replace the next size smaller gas tank type water heater.

#### For new construction installation:

Residential Water Heater Sizing Guide			
Family Size	Demand *	Gallon Capacity Recommended	
		Electric or GeoSpring™	Gas
5+	High	100 (378.5 L)	75 (283.9 L)
	Avg or Low	80 (302.8 L)	50 (189.3 L)
3 to 4	High	80 (302.8 L)	50-75 (189.3-283.9 L)
	Avg or Low	50 (189.3 L)	40 (151.4 L)
2 to 3	High	50 (189.3 L)	40-50 (151.4-189.3 L)
	Avg or Low	40 (151.4 L)	40 (181.8 L)
1 to 2	High	40-50 (151.4-189.3 L)	40-50 (151.4-189.3 L)
	Avg or Low	30 (113.6 L)	30 (113.6 L)

\*Assumptions for Avg or Low Demand household:

- Use of standard or low flow shower heads (2.5 gpm/11.4 L per minute or less)
- No showers with multiple shower heads and/or body jets.
- Standard bathtub (no oversized/jetted tubs)

#### Water Heater Temperature Setpoint:

The water heater temperature setting strongly impacts the amount of usable hot water available for showers and baths.

- Energy consumption/savings and efficiency testing of water heaters, including the GeoSpring™, is performed at a 135°F (57°C) setting, the average water heater setting according to the Department of Energy. All savings for GeoSpring™ are based on hybrid mode operation at 135°F (57°C).
- Safety regulations require a factory setting of 120°F to 125°F (49°C to 52°C) max for all new water heaters. Therefore, if your water heater is currently set at 130°F (54°C) or above and your new water heater is installed with a factory set setpoint of 120°F (49°C), the new water heater may seem to provide lower capacity than your existing water heater.
- The user can adjust the temperature setting to meet their needs. Always read and understand the safety instructions contained in the users manual before adjusting the temperature setpoint.

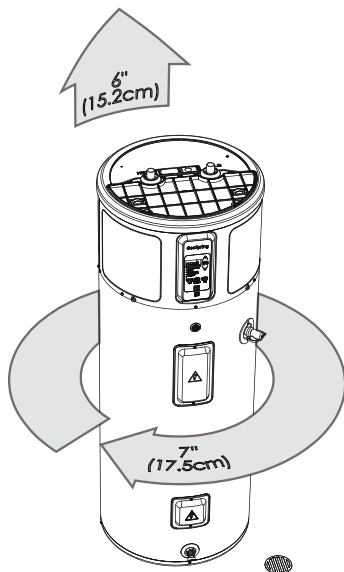
# Installation Instructions

## LOCATION (CONT.)

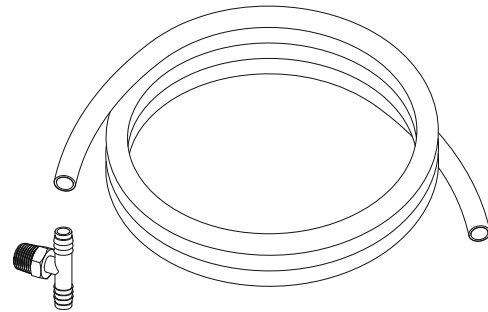
### Required clearances:

There must be a 7" (17.5 cm) clearance between any object and the Front and Rear covers in the event service is needed. A minimum of 7" (17.5 cm) clearance with the sides of the water heater is also recommended for service access.

A 6" (15.2 cm) minimum clearance is required to remove the filter for cleaning. The hot and cold water plumbing and electrical connections must not interfere with the removal of the filter.



## NONSTANDARD PARTS NEEDED:



- 1 - 3/8" x 6' Flexible Tubing
- 1 - 3/8" x 3/8" x 1/2" NPT Male Barbed Tee (supplied on some models)

## THERMAL EXPANSION

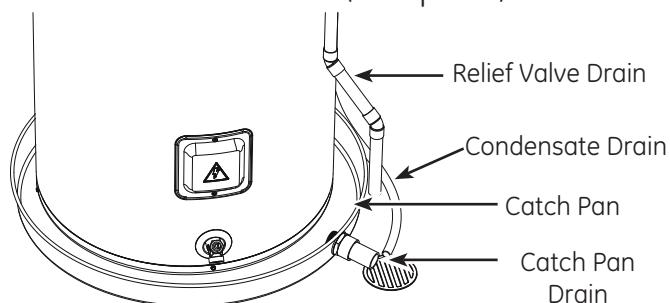
**Determine if a check valve exists in the inlet water line.** It may have been installed in the cold water line as a separate backflow preventer, or it may be part of a pressure-reducing valve, water meter or water softener. A check valve located in the cold water inlet line can cause what is referred to as a "**closed water system.**" A cold water inlet line with no check valve or backflow prevention device is referred to as an "open" water system.

As water is heated, it expands in volume and creates an increase in the pressure within the water system. This action is referred to as "**thermal expansion.**" In an "open" water system, expanding water which exceeds the capacity of the water heater flows back into the city main where the pressure is easily dissipated.

A "**closed water system,**" however, prevents the expanding water from flowing back into the main supply line, and the result of "**thermal expansion**" can create a rapid and dangerous pressure increase in the water heater and system piping. This rapid pressure increase can quickly reach the safety setting of the relief valve, causing it to operate during each heating cycle. Thermal expansion, and the resulting rapid and repeated expansion and contraction of components in the water heater and piping system, can cause premature failure of the relief valve, and possibly the heater itself. Replacing the relief valve **will not** correct the problem!

The suggested method of controlling thermal expansion is to install an expansion tank in the cold water line between the water heater and the check valve (refer to the illustration on page 15). The expansion tank is designed with an air cushion built in that compresses as the system pressure increases, thereby relieving the over-pressure condition and eliminating the repeated operation of the relief valve. Other methods of controlling thermal expansion are also available. Contact your installing contractor, water supplier or plumbing inspector for additional information regarding this subject.

## Catch Pan Installation (If required)



**NOTE:** Auxiliary catch pan MUST conform to local codes. Catch Pan Kits are available from the store where the water heater was purchased, a builder store or any water heater distributor. The catch pan should be 2" (5.1 cm) minimum larger than the Water Heater base diameter. To prevent corrosion and improve Drain Valve access it is recommended that the water heater be placed on spacers inside the catch pan.

### Condensation drain

The unit has a condensate drain; therefore a drain must be available in close proximity to the unit. The drain must be no higher than 36" (91.4 cm) above the floor (drain must meet state and local codes). If no drain is available, then a common condensate pump with a capacity no less than 1 gallon (3.8 L)/day must be purchased from a local builder supply store and installed.

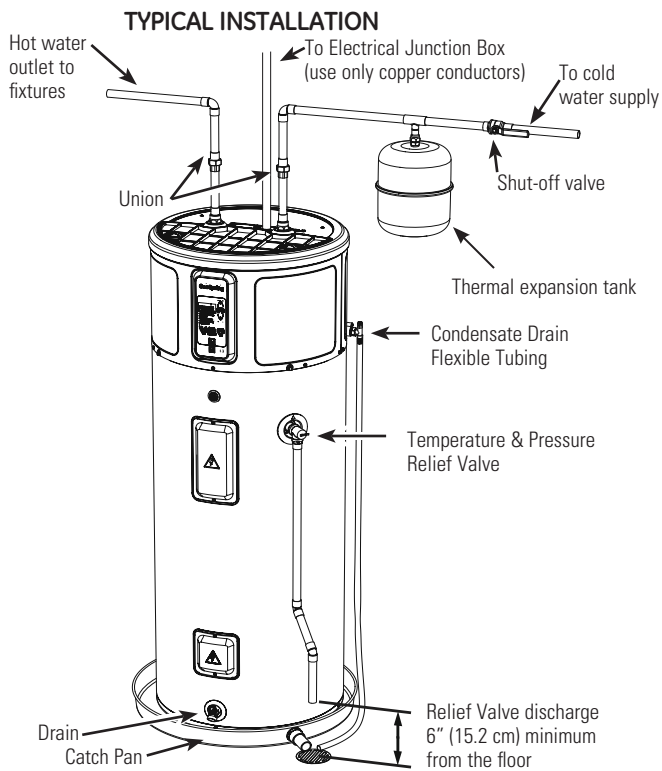
# Installation Instructions

## WATER SUPPLY CONNECTIONS

Refer to the illustration below for suggested typical installation. The HOT and COLD water connections are clearly marked and are 3/4" NPT on all models. When connecting to the inlet/outlet ports, the use of 3/4" female NPT tapered thread fittings with use of thread sealant is recommended. The installation of unions is recommended on the hot and cold water connections so that the water heater may be easily disconnected for servicing if necessary.

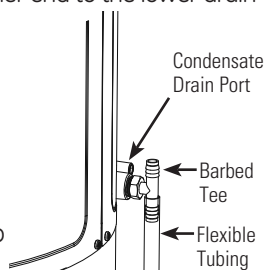
**NOTE:** Install a shut-off valve in the cold water line near the water heater. This will enable easier service or maintenance of the unit later.

**IMPORTANT:** Do not apply heat to the HOT or COLD water connections. If sweat connections are used, sweat tubing to adapter before fitting the adapter to the cold water connections on heater. Any heat applied to the hot or cold water connection will permanently damage the internal plastic lining in these ports.



## CONDENSATION DRAIN CONNECTION

This unit has a condensation tray. The water collected in the tray drains out of the side of the unit. It is important to install a barbed tee and drain hose to the primary drain port coming off the side of the unit. Direct the other end to the lower drain port on the side of the unit. Plumb the other end to a drain in the floor or no higher than 3' (0.9 m) above the floor. If such drain is unavailable, a condensate drain pump (not provided) must be purchased and installed. The drain tube should be routed so that the discharge water cannot contact live electrical parts to eliminate potential water damage.



## RELIEF VALVE

**⚠ WARNING:** *Risk of Unit Damage* - The pressure rating of the relief valve must not exceed 150 PSI (1.03 kPa), the maximum working pressure of the water heater as marked on the rating plate.

A new combination temperature and pressure-relief valve, complying with the Standard and pressure-relief valve, and Automatic Gas Shut-Off Devices for Hot Water Supply Systems, ANSI Z21.22, is supplied and must remain installed in the opening provided and marked for the purpose on the water heater. No valve of any type should be installed between the relief valve and the tank. Local codes shall govern the installation of relief valves.

The BTUH rating of the relief valve must not be less than the input rating of the water heater as indicated on the rating label located on the front of the heater (1 watt=3.412 BTUH).

Connect the outlet of the relief valve to a suitable open drain so that the discharge water cannot contact live electrical parts or persons and to eliminate potential water damage.

Piping used should be of a type approved for hot water distribution. The discharge line must be no smaller than the outlet of the valve and must pitch downward from the valve to allow complete drainage (by gravity) of the relief valve and discharge line. The end of the discharge line should not be threaded or concealed and should be protected from freezing. No valve of any type, restriction or reducer coupling should be installed in the discharge line.

## ⚠ CAUTION:

To reduce the risk of excessive pressures and temperatures in this water heater, install temperature and pressure protective equipment required by local codes and no less than a combination temperature and pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22. This valve must be marked with a maximum set pressure not to exceed the marked maximum working pressure of the water heater. Install the valve into an opening provided and marked for this purpose in the water heater, and orient it or provide tubing so that any discharge from the valve exits only within 6 inches above, or at any distance below, the structural floor, and does not contact any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstances.



# Installation Instructions

## TO FILL THE WATER HEATER

**⚠ WARNING:** *Risk of Unit Damage* - The tank must be full of water before heater is turned on. The water heater warranty does not cover damage or failure resulting from operation with an empty or partially empty tank.

Make certain the drain valve is completely closed.  
Open the shut-off valve in the cold water supply line.  
Open each hot water faucet slowly to allow the air to vent from the water heater and piping.  
A steady flow of water from the hot water faucet(s) indicates a full water heater.

**F11" fault code during installation:** If the unit is powered on without a full tank, the error code "F11" will show in the display. Turn off the power, fill the tank with water (see above), then turn the power back on.

## NOTICE:

Do not mis-wire electrical connections. 240V AC or 208AC must be applied across L1 and L2 wires as shown in 'Water heater junction box' illustration. Failure to do so will VOID the warranty, and can result in 120V applied to water heater, which may damage the compressor or other electrical components.

If 4-conductor wire is supplied to the water heater, cap the neutral, and connect the remaining wires as illustrated.

NOTE REGARDING UTILITY POWER-MANAGEMENT DEVICES (Sometimes called Peak Load Reduction Switches):

Some power-management switching devices or even some basic timer switches exist that REDUCE voltage from 240V to 120V during high-electricity-demand periods. These devices must be removed from the circuit providing power to the water heater because of the potential unit damage noted above.

However, switching devices which cut power from 240V to 0V on a periodic basis are acceptable.

**"bAd linE" fault code during installation:** If "bAd linE" is shown on the display, the unit is not receiving the correct voltage as a result of incorrect wiring. To correct this fault, turn the power off to the unit, correct the wiring issue, then turn the power back on.

## ELECTRICAL CONNECTIONS

A separate branch circuit with copper conductors, overcurrent protective device and suitable disconnecting means must be provided by a qualified electrician.

All wiring must conform to local codes or latest edition of National Electrical Code ANSI/NFPA 70.

The water heater is completely wired to the junction box at the top of the water heater. An opening for 1/2" electrical fitting is provided for field wiring connections.

The voltage requirements and wattage load for the water heater are specified on the rating label on the front of the water heater.

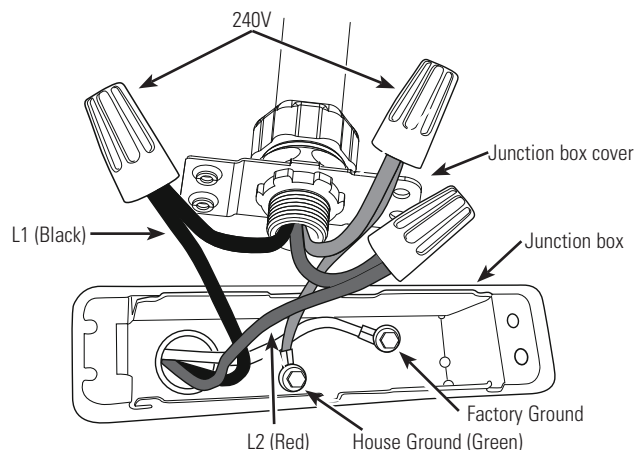
### The branch circuit wiring should include either:

1. Metallic conduit or metallic sheathed cable approved for use as a grounding conductor and installed with fittings approved for the purpose.
2. Nonmetallic sheathed cable, metallic conduit or metallic sheathed cable not approved for use as a ground conductor shall include a separate conductor for grounding. It should be attached to the ground terminals of the water heater and the electrical distribution box.

To connect power to the water heater:

1. Turn the power off.
2. Remove the screw/screws holding the junction box top cover.
3. Install L1 to L1, L2 to L2 and ground to the green ground wire connected to the bottom of the junction box.

NOTE: Install electric connections according to local codes or latest edition of National Electrical Code ANSI/NFPA 70.



**⚠ WARNING:** Proper ground connection is essential. The presence of water in the piping and water heater does not provide sufficient conduction for a ground. Nonmetallic piping, dielectric unions, flexible connectors, etc., can cause the water heater to be electrically isolated. Do not disconnect factory ground.

# Installation Instructions

The manufacturer's warranty does not cover any damage or defect caused by installation, attachment or use of any type of energy-saving or other unapproved devices (other than those authorized by the manufacturer) into, onto or in conjunction with the water heater. The use of unauthorized energy-saving devices may shorten the life of the water heater and may endanger life and property.

The manufacturer disclaims any responsibility for such loss or injury resulting from the use of such unauthorized devices.

If local codes require external application of insulation blanket kits, the manufacturer's instructions included with the kit must be carefully followed.

**Application of any external insulation, blankets or water pipe insulation to this water heater will require careful attention to the following:**

- Do not cover the temperature and pressure-relief valve.
- Do not cover access panels to the heating elements.
- Do not cover the electrical junction box of the water heater.
- Do not cover the operating or warning labels attached to the water heater or attempt to relocate them on the exterior of the insulation blanket.
- Do not block the air inlet/outlets in the top covers or rear of the unit.

**NOTE: This guide recommends minimum branch circuit sizing based on the National Electric Code. Refer to wiring diagrams in this manual for field wiring connections.**

## BRANCH CIRCUIT SIZING GUIDE

Total Water Heater Wattage	Recommended Over-Current Protection (fuse or circuit breaker amperage rating)			
	208V	240V	277V	480V
3,000	20	20	15	15
4,000	25	25	20	15
<b>4,500</b>	<b>30</b>	<b>25</b>	<b>25</b>	<b>15</b>
5,000	30	30	25	15
5,500	35	30	25	15
6,000	40	35	30	20
8,000	50	45	40	25
9,000	-	50	45	25
10,000	-	-	50	30
11,000	-	-	50	30
12,000	-	-	-	35

Total Water Heater Wattage	Copper Wire Size AWG Based on N.E.C. Table 310-16 (167°F/75°C.)			
	208V	240V	277V	480V
3,000	12	12	14	14
4,000	10	10	12	14
<b>4,500</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>14</b>
5,000	10	10	10	14
5,500	8	10	10	14
6,000	8	8	10	12
8,000	8	8	8	10
9,000	-	8	8	10
10,000	-	-	8	10
11,000	-	-	8	10
12,000	-	-	-	8

# Installation Instructions

## INSTALLATION CHECKLIST

- 1. Tank location:**
  - Does room size require louvered door or similar ventilation? 10' x 10' x 7' (700 cu. ft.) or 240 square inches (0.15 m<sup>2</sup>) air-flow area needed.
  - Back of unit **away from wall** by 7 inches (17.5 cm), and sides have at least 7 inches (17.5 cm) clearance.
  - **Front** of unit is free and clear.
  - Is the water heater **level**? If no, add shims under the base of the unit.
- 2. Verify Air Filter** is installed. (Located in packaging).
- 3. Plumbing connections:**
  - Does not prevent **air filter** removal.
  - No leaks after **filling** the tank with water, either when water is flowing or not.
- 4. Condensate lines are in place:**
  - Main Drain flexible tubing installed.
- 5. Temperature and pressure-relief valve** is working and drain line completed per local code.
- 6. Electrical** verify 208/240 VAC to L1 and L2 at tank.
- 7. Electrical** connection does not prevent air filter removal.
- 8. Verify control panel** displays 120°F (49°C) Hybrid mode. Assist user in how to adjust temperature and modes (see "About the Water Temperature Setting" section on page 7).

## WHAT TO EXPECT FOR "NORMAL STARTUP" IN HYBRID MODE

After the unit has been installed, with all electrical and water connections secure and checked, then the unit should be filled with water (vent tank by opening a hot water faucet somewhere in home to allow tank to fully fill with water). Once tank is full and power is energized, you may experience the following:

Elapsed Time	HEWH Actions	Comments
0 to 2 minutes	Unit will go through self-check.	This 2-minute off-time prevents compressor damage.
2 to 10 minutes	Compressor and fan turn on	This 8-minute period is used to ensure the tank is full of water (Dry-fire prevention algorithm).
10 to 30 minutes	Compressor and fan turn off, heating elements turn on for about 20 minutes	To quickly provide initial amount of hot water for user (about 25 gallons/94.6 L)
30 minutes and beyond	Upper element turns off and compressor turns back on	Uses efficient heat pump for majority of heating

NOTE: The heat pump operating range is 45°F to 120°F (7°C to 49°C). If the ambient temperature is outside of this range, the heat pump will turn off and the electric elements will be used until the ambient temperature returns to within the operating range.

# Troubleshooting...



Before you call for service...  
Save time and money! Review the chart below first and you may not need to call for service.

Problem	Possible Causes	What To Do
<i>Water heater makes sounds</i>	<b>A fan is used to move air through the system.</b>	<ul style="list-style-type: none"> <li>Some amount of fan sound is normal. If you hear an abnormal sound or the sound level seems unusually loud, then contact service.</li> </ul>
<i>Water heater is making the room cooler</i>	<b>Room is not vented properly or is too small.</b>	<ul style="list-style-type: none"> <li>If the room is smaller than 10' x 10' x 7' (3m x 3m x 2.1m), then it must have a louvered door or other means to allow air exchange with surrounding rooms.</li> </ul>
	<b>Heat is removed from the air to heat the water</b>	<ul style="list-style-type: none"> <li>This is normal</li> </ul>
<i>Water dripping down the outside of the heater.</i>	<b>Condensate drain is clogged.</b>	<ul style="list-style-type: none"> <li>Clear out any debris in the drain port on the unit.</li> </ul>
	<b>Hot/Cold water connections are not tightened.</b>	<ul style="list-style-type: none"> <li>Tighten the inlet and outlet pipe connections.</li> </ul>
<i>Not enough or no hot water</i>	<b>Water temperature may be set too low.</b>	<ul style="list-style-type: none"> <li>See <i>About the Water Temperature Setting</i> section.</li> </ul>
	<b>Hot water usage pattern exceeds the capability of the water heater in current mode</b>	<ul style="list-style-type: none"> <li>Change to different mode</li> </ul>
	<b>Water usage may have exceeded the capacity of the water heater.</b>	<ul style="list-style-type: none"> <li>Wait for the water heater to recover after an abnormal demand</li> </ul>
	<b>Ambient temperature is too low</b>	<ul style="list-style-type: none"> <li>For the water heater to work properly, its location needs to have a temperature of 32° to 150°F for Standard Electric mode and 45° to 120°F for all other modes.</li> </ul>
	<b>Cold water inlet temperature may be colder during the winter months.</b>	<ul style="list-style-type: none"> <li>This is normal. The colder inlet water takes longer to heat.</li> </ul>
	<b>Leaking or open hot water faucets.</b>	<ul style="list-style-type: none"> <li>Make sure all faucets are closed.</li> </ul>
	<b>Long runs of exposed pipe, or hot water piping on outside wall.</b>	<ul style="list-style-type: none"> <li>Insulate piping.</li> </ul>
	<b>Not enough clearance to allow air to circulate for the heater pump.</b>	<ul style="list-style-type: none"> <li>Make sure unit is 7" away from the wall.</li> </ul>
	<b>Room size is not appropriate for water heater.</b>	<ul style="list-style-type: none"> <li>If room size is less than 10' x 10' x 7' (700 cu. ft.), install louvered door or similar ventilation.</li> </ul>
	<b>A fuse is blown or a circuit breaker tripped.</b>	<ul style="list-style-type: none"> <li>Replace fuse or reset circuit breaker.</li> </ul>
	<b>Electric service to your home may be interrupted.</b>	<ul style="list-style-type: none"> <li>Contact the local electric utility.</li> </ul>
	<b>Improper wiring.</b>	<ul style="list-style-type: none"> <li>See the <i>Installation Instructions</i> section.</li> </ul>
	<b>Manual reset limit (TCO).</b>	<ul style="list-style-type: none"> <li>See the <i>Safety Control</i> section, see page 4.</li> </ul>
	<b>Water connections to unit reversed.</b>	<ul style="list-style-type: none"> <li>Correct piping connections.</li> </ul>
<b>Electric supply may be off.</b>	<ul style="list-style-type: none"> <li>Make sure electric supply to water heater is correct disconnect switch, if used, are in the ON position.</li> </ul>	



Problem	Possible Causes	What To Do
<i>Water is too hot</i>	<p>Water temperature is set too high.</p> <p><b>⚠ CAUTION:</b> For your safety, DO NOT attempt repair of electrical wiring, controls, heating elements or other safety devices. Refer repairs to qualified service personnel.</p> <p>Electronic control has failed.</p>	<ul style="list-style-type: none"> <li>• See <i>About the Water Temperature Setting</i> section.</li> <li>• Call for service.</li> </ul>
<i>Rumbling noise</i>	<p>Water conditions in your home caused a buildup of scale or mineral deposits on the heating elements.</p>	<ul style="list-style-type: none"> <li>• Remove and clean the heating elements. This should only be done by a qualified service personnel.</li> </ul>
<i>Relief valve producing popping sound or draining</i>	<p>Pressure buildup caused by thermal expansion to a closed system.</p>	<ul style="list-style-type: none"> <li>• This is an unacceptable condition and must be corrected. See Thermal Expansion Information on page 15. Do not plug the relief valve outlet. Contact a plumbing contractor to correct this.</li> </ul>
<i>The heater is beeping and the display says F11</i>	<p>The water heater has not been filled with water before powering up. Powering up the heater without water will damage the electric heaters. The water heater warranty does not cover damage or failure resulting from operation with an empty or partially empty tank.</p>	<ul style="list-style-type: none"> <li>• Fill the tank completely with water. Press <i>ENTER</i> to stop the alarm and then press <i>POWER</i> when the tank has been filled.</li> </ul>
<i>The filter light is on.</i>	<p>The filter requires cleaning. A clean filter is necessary for effective operation.</p>	<ul style="list-style-type: none"> <li>• Follow the instructions on how to remove and clean the filter on page 12.</li> </ul>
<i>The heater is beeping and the screen says "FA-F8"</i>	<p>There is an issue with the heat pump system.</p>	<ul style="list-style-type: none"> <li>• The unit will automatically switch to another available mode to ensure you continue to have hot water. Contact service immediately and give them the codes listed on the display screen.</li> </ul>
<i>The heater is beeping and the screen flashes an error code</i>	<p>There is an issue with the water heater that requires immediate attention.</p>	<ul style="list-style-type: none"> <li>• The heater may switch to another available heating mode. Contact service immediately. To stop the beeping noise (unless error code F2, F11 or bAd linE) press either the UP or down arrow button and the alarm will stop and the display will go back to normal (set temperature).</li> </ul>
<i>The water heater is beeping and the screen flashes, "bAd linE"</i>	<p>Unit is not receiving 240VAC as intend.</p>	<ul style="list-style-type: none"> <li>• Turn off power to water heater (generally at the breaker panel). Then read "Electrical Connections" section of Installation Instructions, see page 17. Then, contact the installer to verify electrical input to the water heater.</li> </ul>
<i>Hot Water has a rotten egg or sulfur smell</i>	<p>Certain water supplies with high sulfate content will react with the anode rod that is present in all water heaters for corrosion protection of the tank.</p>	<ul style="list-style-type: none"> <li>• The odor can be reduced or eliminated in most water heaters by replacing the anode rod with less-active material rod. In some cases, an added step of chlorinating the water heater and all hot water lines may be necessary, contact your local water professional or plumber for options and instructions. Call GE at 1.888.4GE.HEWH (1.888.443.4394) to learn how to purchase this replacement anode rod. A qualified servicer or plumber should do this replacement. Use of a non-GE approved anode rod, or operating the water heater without a GE approved anode rod will VOID the warranty.</li> </ul>
<i>Unit is not making normal sounds</i>	<p>If unit is using electric resistance elements, it will not make fan or compressor sounds.</p>	<ul style="list-style-type: none"> <li>• Check mode of unit.</li> </ul>

*For Service, please call 1.888.4GE.HEWH (1.888.443.4394)*

## *Fault codes.*

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<b>Fault Code Displayed</b>	<b>Condition</b>	<b>Action</b>
<b>F-A</b>	T4 Not Rising	Call service
<b>F-B</b>	Discharge Temp Not Stable	Call service
<b>F-C</b>	Evaporator Not Frost Free	Call service
<b>F-D</b>	Superheat Too Low	Call service
<b>F-E</b>	Discharge Temperature Above Limit	Call service
<b>F-F</b>	Electronic Expansion Valve Out of Range	Call service
<b>FG*</b>	T5 Ambient Temperature Check	Technician service data
<b>FH*</b>	Compressor Load Test	Technician service data
<b>FI*</b>	Refrigerant Leak Test	Call service
<b>F2</b>	T2 Tank Temperature Sensor Failure	Call service
<b>F3</b>	Compressor Failure	Call service
<b>F4</b>	Fan Failure	Call service
<b>F5</b>	T3a Sensor (Evap inlet temperature) Failure	Call service
<b>F6</b>	T3b Sensor (Evap outlet temperature) Failure	Call service
<b>F7</b>	T4 Sensor (Compressor outlet) Failure	Call service
<b>F8</b>	T5 Sensor (ambient temperature) Failure	Call service
<b>F9</b>	Lower Heating Element Failure	Call service
<b>F10</b>	Upper Heating Element Failure	Call service
<b>F11</b>	Dry Tank Fault	See page 17
<b>bAd linE (F12)</b>	The voltage is too low at power-up	See page 17
<b>F13</b>	Stuck Key Fault	Call service
<b>Dirty Filter (F14)</b>	Filter is dirty	See page 12
<b>F15</b>	DataFlash Fault	Call service

\* Some Models



All warranty service provided by our Authorized Servicer Network. To schedule service, call 888.4GE.HEWH (888.443.4394). Please have serial number and model number available when calling for service.

Staple your receipt here. Proof of the original purchase date is needed to obtain service under the warranty.

**For The Period Of: We Will Replace:**

<p><b>One Year</b> From the date of the original purchase</p>	<p><b>Any part</b> of the Hybrid Water Heater which fails due to a defect in materials or workmanship. During this <b>limited one-year warranty</b>, GE will also provide, <b>free of charge</b>, all labor and related service to replace the defective part.</p>
<p><b>Second through Tenth Year</b> From the date of the original purchase</p>	<p><b>Any part</b> of the Hybrid Water Heater which fails due to a defect in materials or workmanship. During this <b>limited ten-year parts warranty</b>, labor and related service to replace the defective part are not included.</p>

**What Is Not Covered:**

- Service trips to your home to teach you how to use the product.
- Improper installation, delivery or maintenance.
- Failure of the product if it is abused, misused, altered, used commercially or used for other than the intended purpose.
- Use of this product where water is microbiologically unsafe or of unknown quality, without adequate disinfection before or after the system.
- Replacement of house fuses or resetting of circuit breakers.
- Damage to the product caused by accident, lightning, fire, flood or acts of God.
- Incidental or consequential damage caused by possible defects with this appliance, its installation or repair.
- Product not accessible to provide required service in a safe manner. Attic installation must have flooring and accessible stairs.
- If product removed from original installation location.
- Damages, malfunctions or failure caused by the use of repair service not approved by GE.
- Damages, malfunctions or failure caused by the use of unapproved parts or components.
- Damages, malfunctions or failure caused by operating the heat pump water heater with the anode rod removed.
- Anode Rod consumption and replacement.
- Damages, malfunctions or failure resulting from operating the heat pump with an empty or partially empty tank.
- Damages, malfunctions or failure caused by subjecting the tank to pressure greater than those shown on the rating label.
- Damages, malfunctions or failure caused by operating the heat pump water heater with electrical voltage outside the voltage range listed on the rating label.
- Water heater failure due to the water heater being operated in a corrosive atmosphere.

**EXCLUSION OF IMPLIED WARRANTIES—Your sole and exclusive remedy is product repair as provided in this Limited Warranty. Any implied warranties, including the implied warranties of merchantability or fitness for a particular purpose, are limited to one year or the shortest period allowed by law.**

This warranty is extended to the original purchaser and any succeeding owner for products purchased for home use within the USA. If the product is located in an area where service by a GE Authorized Servicer is not available, you may be responsible for a trip charge or you may be required to bring the product to an Authorized GE Service location for service. In Alaska, the warranty excludes the cost of shipping or service calls to your home.

Some states do not allow the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. To know what your legal rights are, consult your local or state consumer affairs office or your state's Attorney General.

*For product purchased outside of the US, contact your dealer for Warranty and Service information.*

*Warrantor for Products Purchased in the United States: General Electric Company, Louisville, KY 40225.*

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*Inscrivez les numéros de modèle  
et de série ici :*

*N° de modèle* \_\_\_\_\_

*N° de série* \_\_\_\_\_

Vous trouverez ces numéros sur l'étiquette  
apposée à l'avant de votre chauffe-eau.

# INFORMATION IMPORTANTE SUR LA SÉCURITÉ.

## LISEZ TOUTES LES INSTRUCTIONS AVANT L'UTILISATION

www.electromenagersqe.ca

### ⚠️ AVERTISSEMENT!

Pour votre sécurité, vous devez suivre les instructions contenues dans ce manuel pour réduire les risques d'incendie ou d'explosion, d'électrocution ou pour prévenir les dommages matériels, les blessures ou la mort.

Assurez-vous de lire et de comprendre tout le manuel de l'utilisateur avant de tenter d'installer ou de faire fonctionner ce chauffe-eau. Vous sauvez du temps et de l'argent. Accordez une attention toute particulière aux directives de sécurité.

Tout manquement à ces avertissements peut occasionner des blessures graves ou la mort. Si vous avez de la difficulté à comprendre les instructions contenues dans ce manuel ou si vous avez des questions, ARRÊTEZ et demandez de l'aide à un technicien qualifié ou à votre fournisseur d'électricité.

### RÉGLAGE DE LA TEMPÉRATURE DE L'EAU

La sécurité et la conservation de l'énergie sont des facteurs à considérer lors du réglage de la température de l'eau à l'aide de l'interface utilisateur du chauffe-eau. Une température de l'eau supérieure à 52 °C (125 °F) peut causer des brûlures graves ou la mort par ébullition. Assurez-vous de lire et de suivre les avertissements exposés sous l'image de l'étiquette ci-dessous. Cette étiquette est également sur le chauffe-eau près du dessus du réservoir.

**⚠️ DANGER**



**L'eau à une température supérieure à 52 °C (125 °F) peut causer instantanément des brûlures graves ou la mort par ébullition.**

**Le réglage de la commande électronique de température est habituellement proche de la température de l'eau au robinet. Toutefois, certains facteurs peuvent causer une hausse de la température de l'eau pouvant aller jusqu'à 71 °C, peu importe le réglage de la commande. Touchez toujours l'eau avant de vous baigner ou de prendre votre douche.**

**Les enfants et les personnes handicapées ou âgées sont plus à risque de s'ébouillanter.**

**Consultez les instructions contenues dans ce manuel avant de régler la température du chauffe-eau.**

**Touchez l'eau avant de vous baigner ou de prendre votre douche.**

**Des valves de limitation de la température sont vendues; consultez ce manuel.**

Il se vend des mélangeurs qui réduisent la température de l'eau au point d'utilisation en mélangeant de l'eau froide à l'eau chaude dans les canalisations de distribution. Communiquez avec un plombier certifié ou l'autorité en plomberie pour plus d'information.

#### Relation température/temps pour les brûlures

Température	Temps pour produire une brûlure grave
49 °C (120 °F)	Plus de 5 minutes
52 °C (125 °F)	1-1/2 à 2 minutes
54 °C (130 °F)	Environ 30 secondes
57 °C (135 °F)	Environ 10 secondes
60 °C (140 °F)	Moins de 5 secondes
63 °C (145 °F)	Moins de 3 secondes
66 °C (150 °F)	Environ 1-1/2 seconde
68 °C (155 °F)	Environ 1 seconde

Tableau courtoisie du Shriners Burn Institute

Vous pouvez utiliser le tableau ci-dessus comme pour déterminer la bonne température de l'eau pour votre maison.

**REMARQUE :** Les ménages avec des petits enfants ou des personnes handicapées ou âgées peuvent nécessiter un réglage du thermostat à 49 °C (120 °F) ou moins pour prévenir le contact avec de l'eau TROP CHAUDE.

**⚠️ DANGER :** Il existe une possibilité de S'ÉBOUILLANTER si le chauffe-eau est réglé à une température trop élevée.

CONSERVEZ CES INSTRUCTIONS

# ***INFORMATION IMPORTANTE SUR LA SÉCURITÉ. LISEZ TOUTES LES INSTRUCTIONS AVANT L'UTILISATION.***

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**⚠ *AVERTISSEMENT!*** *Risque d'incendie* - L'essence ainsi que d'autres substances et liquides inflammables (adhésifs, solvants, etc.) et les émanations qu'ils produisant sont extrêmement dangereux. NE PAS manipuler, utiliser ou entreposer de l'essence ou d'autres substances inflammables ou combustibles près d'un chauffe-eau. L'arc électrique à l'intérieur de la commande du chauffe-eau peut allumer ces émanations. Le manquement à cette directive peut entraîner des dommages matériels, des blessures ou la mort.

## **⚠ *AVERTISSEMENT!***

Risque d'incendie - NE stockez PAS et N'utilisez PAS d'essence ou d'autres vapeurs et liquides inflammables à proximité de cet appareil ou de tout autre. Gardez les chiffons et combustibles à l'écart.

## **⚠ *POUR INSTALLATIONS DANS L'ÉTAT DE CALIFORNIE***

Les lois de la Californie exigent que les chauffe-eau résidentiels soient fixés, ancrés ou attachés pour qu'ils ne tombent pas et qu'ils résistent aux mouvements horizontaux causés par les tremblements de terre. Pour les chauffe-eau résidentiels d'une capacité inférieure à 197 litres (52 gallons), vous pouvez vous procurer une brochure avec des instructions génériques de fixation pour les tremblements de terre en vous adressant à : Office of the State Architect, 400 P Street, Sacramento, CA 95814 ou vous pouvez téléphoner au 916.324.5315 ou demander à un distributeur de chauffe-eau.

Cependant, ce sont les codes municipaux applicables qui régissent l'installation. Pour les chauffe-eau résidentiels d'une capacité supérieure à 197 litres (52 gallons), adressez-vous aux autorités municipales pour connaître les procédures de fixation acceptables.

*Avertissement en vertu de la Proposition 65 de la Californie* : Ce produit contient des produits chimiques connus dans l'État de Californie comme causant le cancer, les malformations et autres défauts de naissance.

# **INFORMATION IMPORTANTE SUR LA SÉCURITÉ.**

## **LISEZ TOUTES LES INSTRUCTIONS AVANT L'UTILISATION**

[www.electromenagersqe.ca](http://www.electromenagersqe.ca)

### **⚠ AVERTISSEMENT :**

*Si le chauffe-eau a été soumis à une inondation, un incendie ou à des dommages matériels, coupez l'alimentation du chauffe-eau en électricité et en eau.*

Ne pas utiliser le chauffe-eau tant qu'il n'a pas été complètement vérifié par un technicien de service qualifié.

### **Précautions de sécurité**

- A. Coupez** l'alimentation au chauffe-eau si celui-ci a été soumis à une surchauffe, un incendie, une inondation ou des dommages physiques.
- B. Ne rallumez pas** le chauffe-eau s'il n'est pas rempli pas d'eau.
- C. Ne rallumez pas** le chauffe-eau si le robinet d'alimentation d'eau froide est fermé.

**REMARQUE :** *Des vapeurs inflammables provenant des zones environnantes peuvent être amenées par des courants d'air jusqu'au chauffe-eau.*

- D.** Si vous éprouvez des difficultés à comprendre les instructions d'utilisation suivantes ou la section d'entretien et nettoyage, nous vous suggérons de faire appel à une personne qualifiée pour accomplir le travail. the work.

### **Commandes de sécurité**

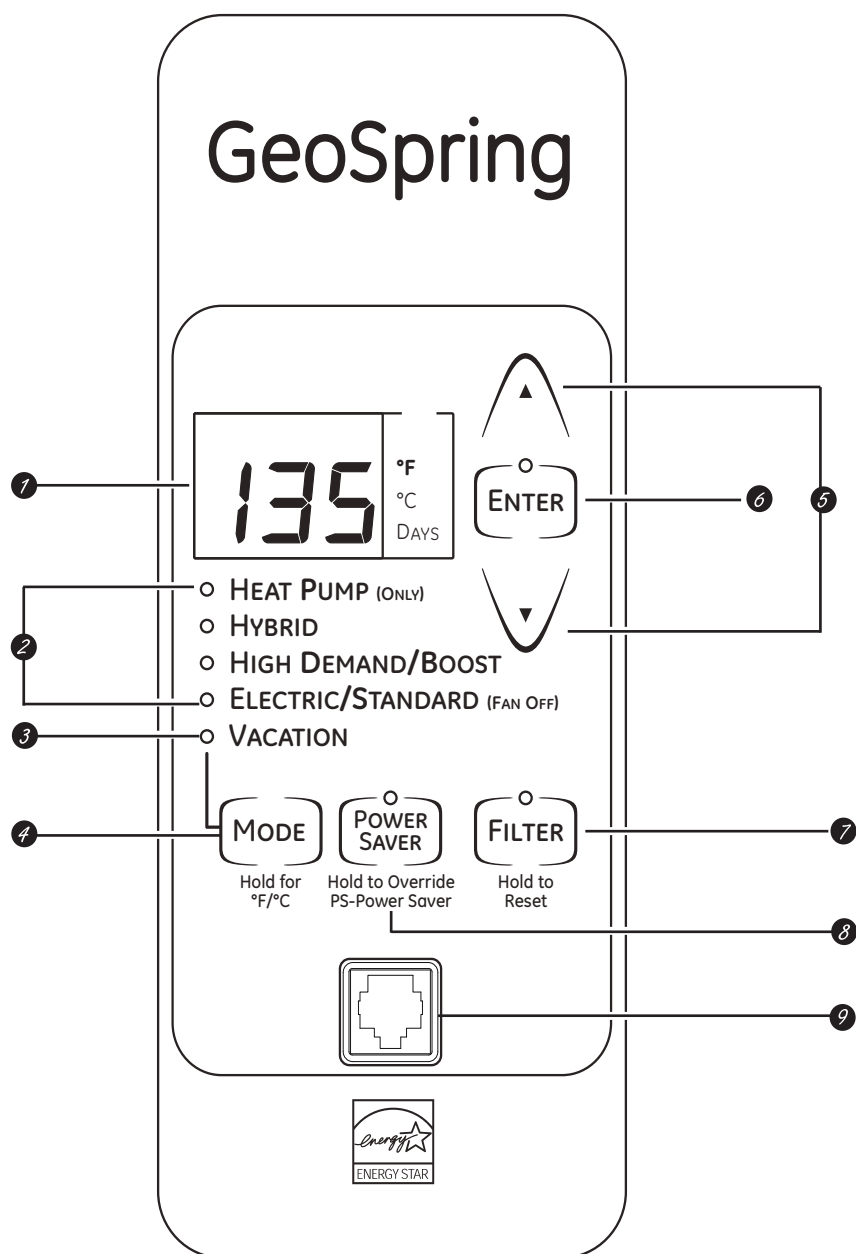
Le chauffe-eau est équipé de deux commandes de limitation de température (CLT) qui sont situées au-dessus de l'élément chauffant en contact avec la surface du réservoir. Si pour une raison quelconque, la température de l'eau devient excessivement chaude, la commande de limitation de température (CLT) coupe l'alimentation électrique de l'élément chauffant. Lorsque la commande se déclenche, elle doit être réinitialisée manuellement. La réinitialisation de la commande de limitation de température doit être effectuée par un technicien de service qualifié.

**⚠ MISE EN GARDE:** *La cause de la température élevée doit être déterminée par un technicien qualifié et des mesures de correction doivent être prises avant la remise en service du chauffe-eau.*

### **Pour réinitialiser la commande de limitation de température:**

- 1.** Coupez l'alimentation électrique du chauffe-eau.
- 2.** Retirez le(s) panneau(x) d'accès et l'isolation.  
Le couvercle de protection du thermostat ne doit pas être retiré.
- 3.** Appuyez sur le bouton rouge marqué RESET (réinitialiser).
- 4.** Replacez l'isolant et le/les panneau(x) d'accès avant de reconnecter le chauffe-eau à l'alimentation électrique.





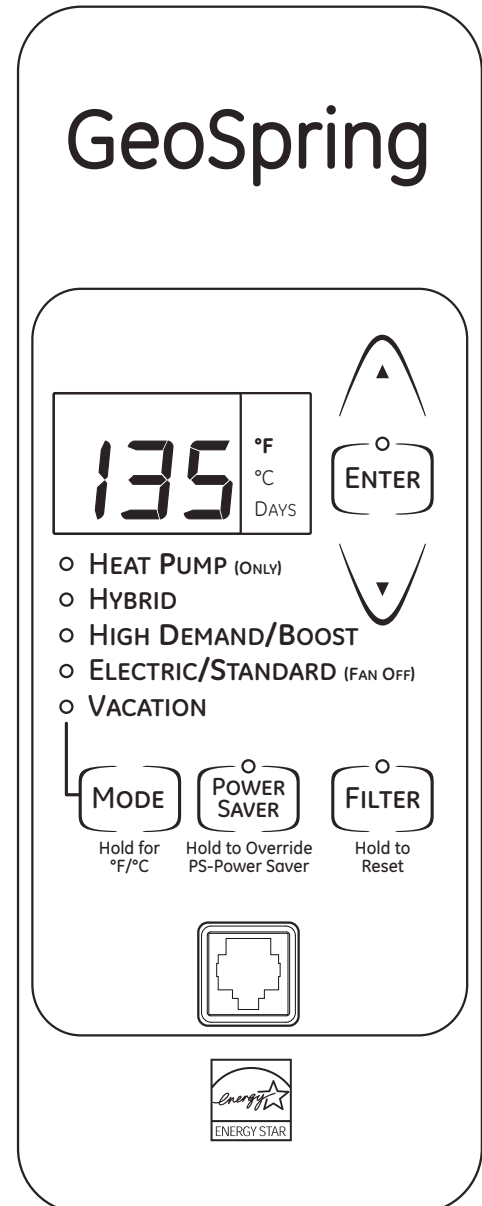
## Commandes Fonctions

- 1 Affichage**
- 2 Modes de fonctionnement**  
(Voir page 8 pour la description)
- 3 Vacation (Vacances)**  
(Voir page 8 pour la description)
- 4 Sélection du mode**  
Utilisez cette touche pour passer d'un mode à un autre.
- 5 Flèches**  
Utilisez ces touches pour régler la température.
- 6 Touche Enter**
- 7 Réinitialisation du filtre**  
Le filtre est sale et nécessite un nettoyage lorsque le témoin rouge est allumé. Le filtre est situé sur le dessus du chauffe-eau. Appuyez et maintenez appuyée cette touche pendant 5 secondes pour réinitialiser l'alarme de filtre.
- 8 Interrupteur de fonction d'économie d'énergie**  
Pour une utilisation avec le module MCA. Appuyez sur cette touche et maintenez-la enfoncée pour sortir l'appareil du mode Économie d'Énergie. Après avoir enfoncé cette touche et lorsque le mode Économie d'Énergie a été désactivé, l'unité restera hors du mode Économie d'Énergie pendant 18 heures.
- 9 Port du module de communication de l'appareil**  
Pour une utilisation avec le module ACM en option (voir page 10 pour plus d'informations).



Cet appareil n'a pas d'interrupteur. Une fois le chauffe-eau installé et l'alimentation électrique branchée, il sera allumé. L'écran affichera le réglage de la température d'eau. Le mode de fonctionnement en cours pour le chauffe-eau est allumé.

Pour se conformer aux règlements de sécurité, les commandes sont pré-réglées en usine à 120°F (49°C) et au mode Hybrid (Hybride). Il est recommandé que l'appareil soit mis sur le mode Thermopompe (uniquement) pour favoriser les économies d'énergie. Le fonctionnement en mode hybride permet d'équilibrer les économies d'énergie avec le confort de l'eau chaude. La consommation énergétique indiquée est basée sur le fonctionnement de l'appareil en mode Hybride à une température de 135°F (57°C). Un réglage à une température inférieure ou une utilisation de la thermopompe (uniquement) permettra une économie d'énergie encore plus importante.



## Au sujet du réglage de la température de l'eau.

### Point de consigne de la température :

La sécurité, la conservation d'énergie et la capacité de production d'eau chaude sont des facteurs dont vous devez tenir compte lors de la sélection de la température d'eau par le biais de l'interface utilisateur du chauffe-eau. Pour se conformer aux règlements de sécurité, la température de l'eau est réglée en usine à 120°F (49°C). Cette température est celle recommandée pour commencer.

**REMARQUE :** Selon Département de l'Énergie des États-Unis, le chauffe-eau résidentiel moyen aux États-Unis est réglé à 135°F (57°C). Les économies d'énergie potentielles du chauffe-eau hybride GE GeoSpring™ sont basées sur un réglage de la température à 135°F (57°C). La température de l'eau peut donc être augmentée du point réglé en usine de 120°F à 135°F (49°C à 57°C) sans sacrifier les économies d'énergie calculées. Si la température est réglée à une température inférieure à 135°F (57°C), des économies d'énergie et de fonctionnement légèrement supérieures peuvent être atteintes.

Consultez le paragraphe « Réglage de la température » ci-dessous pour modifier la température de l'eau.

### Capacité en eau chaude :

Si vous souhaitez obtenir une plus grande capacité d'eau, le fait d'augmenter la température de 120 à 135°F (49°C à 57°C) permet au même réservoir d'eau de durer environ 25 % plus longtemps, car davantage d'eau froide est mélangée au robinet.

### Relation température/temps pour les brûlures

Température	Temps pour produire une brûlure grave
49°C (120°F)	Plus de 5 minutes
52°C (125°F)	1-1/2 à 2 minutes
44°C (130°F)	Environ 30 secondes
57°C (135°F)	Environ 10 secondes
60°C (140°F)	Moins de 5 secondes
63°C (145°F)	Moins de 3 secondes
66°C (150°F)	Environ 1-1/2 secondes
68°C (155°F)	Environ 1 seconde

Tableau courtoisie du Shriners Burn Institute

### Rappel concernant le risque de brûlure:

Une eau à une température supérieure à 125°F (52°C) peut provoquer de graves brûlures pouvant entraîner la mort. Assurez-vous d'avoir lu et suivi les avertissements donnés sur les étiquettes ainsi que ceux présentés dans ce manuel. Cette étiquette est également située sur le chauffe-eau près du panneau d'accès de l'élément supérieur.

Consultez le paragraphe « Relation entre le temps d'exposition et la température de l'eau concernant les brûlures » ci-dessous pour déterminer la température de l'eau appropriée pour votre domicile.

### Robinets mélangeurs:

Des robinets mélangeurs qui réduisent la température de l'eau au point d'utilisation en mélangeant l'eau des conduites d'eau chaude et d'eau froide sont disponibles. Contactez un plombier certifié ou une compagnie de plomberie locale pour obtenir de plus amples renseignements.

**⚠ DANGER:** Il existe une possibilité de s'ébouillanter si le chauffe-eau est réglé à une température trop élevée. Les ménages avec des petits enfants ou des personnes handicapées ou âgées peuvent nécessiter un réglage du thermostat à 49 °C (120 °F) ou moins pour prévenir le contact avec de l'eau TROP CHAUDE.

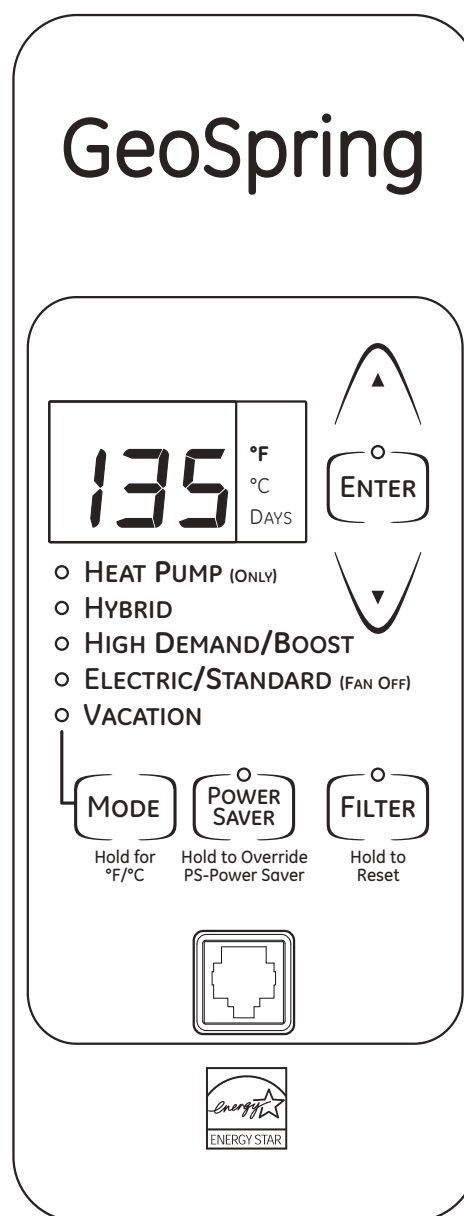
### Pour régler la température de l'eau

Veillez suivre les étapes suivantes:

1. Appuyez sur les flèches vers le Haut ou vers le Bas sur le clavier de commande pour arriver à la température désirée.
2. Appuyez sur ENTER (Entrée) pour accepter la nouvelle valeur.

**Remarque :** Pour passer de °F à °C, appuyez sur la touche **MODE** et maintenez-la enfoncée

**⚠ DANGER:** Il existe un risque de brûlure par l'eau chaude si le thermostat est réglé à une température trop élevée. La température de 120°F (49°C) est celle recommandée pour commencer, mais elle peut être ajustée à une température entre 100 et 140°F (38 et 60°C).



Ce chauffe-eau revient par défaut au mode de fonctionnement hybride. Les différents modes sont donnés ci-dessous et peuvent être sélectionnés grâce à la touche MODE.

**Mode Thermopompe (uniquement)** - RECOMMANDE POUR DES ECONOMIES D'ENERGIE MAXIMALES

La thermopompe (uniquement) est le mode de fonctionnement le plus d'économique pour ce chauffe-eau. Il extrait la chaleur de l'air ambiant pour chauffer l'eau. Le temps de chauffage dans ce mode est plus long, donc il pourrait ne pas suffire dans une situation de demande importante (famille nombreuse ou visiteurs).

### Mode Hybride

Le mode Hybride associe l'efficacité énergétique de la Thermopompe (uniquement) à la vitesse de récupération et d'alimentation du mode électrique standard (Ventilateur éteint) adapté pour la majorité des utilisations d'eau. Le mode hybride permettra à l'appareil de fonctionner comme un chauffe-eau électrique standard tout en offrant des économies d'énergie significatives.

**REMARQUE:** La performance, la consommation et les économies énergétiques sont basées sur un fonctionnement en mode hybride à un réglage de la température de 135°F (57°C).

### Demande élevée/Demande optimale

Ce mode est seulement nécessaire si vous consommez plus que la moyenne des gens ou si l'unité est sous-dimensionnée pour la demande en eau chaude. Dans ce mode, l'unité utilise les éléments chauffants électriques seulement lorsque la demande en eau est plus importante qu'à la normale. Avec l'utilisation des éléments chauffants, la température d'eau remontera plus rapidement, mais la consommation d'énergie sera plus importante. Contrairement au mode Électrique/Standard (ventilateur éteint), les éléments chauffants seront utilisés uniquement si nécessaire. La thermopompe sera utilisée si la demande en eau est plus faible.

**REMARQUE:** La différence entre le mode Hybride et le mode Demande élevée/Boost est que dans le mode à Demande élevée/Boost, les éléments chauffants sont mis en marche plus rapidement que dans le mode hybride.

### Mode Électrique (Ventilateur éteint)/Standard (Ventilateur éteint)

Ce mode utilise uniquement les éléments chauffants supérieurs et inférieurs pour chauffer l'eau. Le temps nécessaire pour chauffer l'eau est moindre dans ce mode, mais ce mode est le plus énergivore.

**REMARQUE:** Dans ce mode le voyant vert clignotera après 48 heures pour signaler que l'appareil ne fonctionne pas dans le mode le plus éconergétique. L'appareil continuera de fonctionner dans ce mode et il n'indique pas un problème de fonctionnement.

### Vacances

Cette fonction est utilisée lorsque vous êtes absent de votre domicile pour une durée prolongée et l'eau chaude n'est pas nécessaire. Dans ce mode, la température de l'eau descendra à 50°F (10°C) et l'appareil utilise le mode de chauffage le plus efficace pour économiser l'énergie lorsque le chauffe-eau est au repos. L'appareil se remettra automatiquement à chauffer l'eau un jour avant votre retour, de sorte que vous ayez une réserve d'eau chaude à votre retour.

Par exemple, si vous êtes absent pendant 14 jours, suivez les étapes suivantes:

1. Sélectionnez VACANCES en utilisant la touche Mode
2. Entrez le nombre de jours d'absence (dans cet exemple, 14) en appuyant sur la flèche vers le HAUT (la valeur par défaut est de 7 jours)
3. Appuyez sur ENTER (Entrée).

Le chauffe-eau conservera la température de l'eau à 50°F (10°C) pendant la durée de votre absence moins 1 jour (dans cet exemple, pendant 13 jours). A la fin du jour précédent votre retour (dans cet exemple, le 13ème jour), le chauffe-eau revient automatiquement au mode de fonctionnement précédent et chauffe l'eau à la température d'origine afin que de l'eau chaude soit disponible dès votre retour

### Pour accéder à un de ces modes:

1. Appuyez sur la touche MODE (Mode) pour sélectionner le mode de fonctionnement approprié.
2. Le voyant lumineux vert s'allumera sur le mode sélectionné.

## Foire aux questions.

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### Filtere:

Q: Pourquoi y a-t-il un filtre?

A: En mode Hybride et Thermopompe (uniquement), l'appareil fait circuler de l'air dans le système. Le filtre protège l'appareil contre la saleté. Un filtre à air propre améliore l'efficacité du chauffe-eau.

Q: Comment nettoyer le filtre?

A: Ne coupez pas l'alimentation et retirez le filtre du haut de l'appareil. Le filtre peut être nettoyé avec un aspirateur ou rincé à l'eau tiède. Un filtre sale réduit l'efficacité du chauffe-eau.

### Modes:

Q: Qu'est-ce que le mode Thermopompe (uniquement)?

A: Le mode Thermopompe (uniquement) est le mode le plus efficace. Il extrait la chaleur de l'air ambiant pour chauffer l'eau, refroidissant du même coup l'air alentour. Ce mode prend plus de temps à chauffer l'eau mais il est également le mode le plus efficace.

Q: Qu'est-ce que le mode Hybride?

A: Le mode Hybride combine les avantages du mode Thermopompe (uniquement) avec la vitesse et la puissance du mode Électrique Standard. Il offre d'excellentes performances tout en consommant moins d'énergie.

Q: Qu'est-ce que le mode Demande élevée?

A: Le mode Demande Élevée/Boost peut être utilisé lorsque la consommation d'eau chaude est plus élevée qu'à la normale. L'appareil sera moins efficace mais chauffera l'eau plus rapidement après une consommation importante. Pour une consommation normale, l'appareil continuera d'utiliser la thermopompe la plupart du temps.

Q: Qu'est-ce que le mode de Vacances ?

A: Si vous êtes absent pendant une période prolongée, ce mode réduit la température de l'eau pour réduire la consommation d'énergie. L'appareil revient au mode précédent le jour qui précède votre retour.

Q: Qu'est-ce que le mode Électrique/Standard (ventilateur éteint) ?

A: Le mode Électrique/Standard (ventilateur éteint) utilise uniquement la résistance pour chauffer l'eau. Cela permet de chauffer l'eau plus rapidement qu'en mode Hybride, mais accroît également la consommation. Ce mode fonctionne sans ventilateur, arrêtant la production d'air frais normalement rejeté pendant le fonctionnement de la thermopompe.

Q: Pourquoi le voyant vert Électrique/Standard (ventilateur éteint) clignote-t-il?

A: Dans ce mode, le voyant vert clignotera après 48 heures pour signaler que l'appareil ne fonctionne pas dans le mode le plus éconergétique.

### Fonctionnement:

Q: Pourquoi puis-je entendre le fonctionnement de l'appareil ?

A: Aux modes les plus éco énergétiques (Thermopompe, Hybride et Demande élevée/Boost), la méthode utilisée pour chauffer l'eau utilise un ventilateur qui produit un certain bruit.

Q: La thermopompe ne fonctionne pas aussi longtemps que prévu. Pourquoi ?

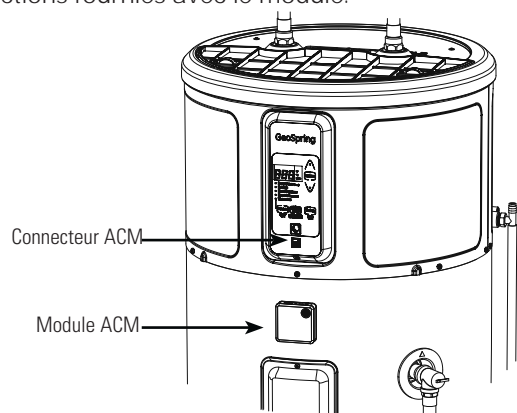
A: Dans certaines conditions, le chauffe-eau hybride GeoSpring™ va fonctionner en utilisant les éléments électriques au lieu de la pompe à chaleur pour protéger votre appareil et s'assurer que de l'eau chaude est disponible. Ces conditions incluent une température ambiante extrêmement basse (<45°F) ou extrêmement élevée (>120°F) ou encore une très basse tension. L'appareil reprendra son fonctionnement normal dès que les conditions atmosphériques ou d'alimentation le permettent.

Le chauffe-eau électrique hybride à thermopompe est compatible avec le module de communication **GE Smart Appliance (ACM)** qui peut être acheté séparément. Pour savoir si la technologie **ACM** est offerte dans votre région, contactez vos services publics locaux ou consultez le site [www.GEAppliances.com/Smart-Appliance](http://www.GEAppliances.com/Smart-Appliance). L'utilisation de l'**ACM** permet à l'appareil de répondre aux signaux de vos services publics locaux ou d'adhérer à un réseau domestique.

Les fonctions de distribution à la demande sont offertes dans le cadre d'un projet pilote organisé par les services publics de votre localité afin d'aider les consommateurs à diminuer leur consommation d'électricité en période de pointe.

## MONTAGE

Le module ACM est équipé d'aimants dans sa base qui lui permet d'être fixé à la partie métallique peinte extérieure du chauffe-eau à thermopompe. Les détails relatifs au branchement des câbles au module sont donnés dans les instructions fournies avec le module.



Lorsque le câble du module ACM est branché au chauffe-eau, suivez les instructions de mise en marche comprises avec le module ACM. Dès que le module ACM est en marche, le chauffe-eau à thermopompe est prêt à recevoir les signaux ACM.

## GUIDE RAPIDE

Si les services publics de votre localité utilisent la technologie ACM, le module ACM recevra les signaux transmis par les services publics. Un des quatre signaux suivants sera envoyé :

- « Faible » (indique que le plus faible coût énergétique est disponible)
- « Moyen » (indique un coût énergétique croissant)
- « Élevé » (indique un coût énergétique croissant)
- « Critique » (indique un coût énergétique maximal)

Un chauffe-eau à thermopompe doté d'un module ACM reconnaît automatiquement le coût énergétique disponible et adapte son mode et le réglage de sa température pour utiliser moins d'énergie lors de la transmission des signaux Moyen, Élevé et Critique. Lorsque le chauffe-eau à thermopompe répond à ces signaux, le LED au-dessus du bouton d'Économie d'Énergie sera allumé indiquant les coûts d'électricité en vigueur. Les lettres « PS » s'affichent si l'utilisateur essaie de modifier la température sans avoir appuyé sur le bouton pour désactiver la fonction Économie d'Énergie.

Lorsque le signal ACM est Moyen, la commande fonctionne en mode Thermopompe (uniquement) et la température de l'eau reste au réglage en vigueur fait par l'utilisateur. L'écran affiche le message suivant (où xxx est le réglage de la température actuel):



Lorsque le signal ACM est Élevé, la commande fonctionne en mode Thermopompe (uniquement) et la température de l'eau réglée à 110°F (43°C) et l'écran affiche le message suivant:



Lorsque le signal ACM est Critique, la commande fonctionne en mode Thermopompe (uniquement) et la température de l'eau réglée à 100°F (38°C) et l'écran affiche le message suivant :



**A noter :** La tension du courant qui circule dans une connexion ACM n'est pas compatible avec les ordinateurs et les périphériques. NE BRANCHEZ PAS des modems, routeurs, etc. d'ordinateurs portatifs dans la prise RJ45 ACM pour appareils électroménagers. Ne l'utilisez uniquement qu'avec des accessoires d'électroménagers GE. La connexion à des ordinateurs et autres accessoires peuvent endommager le produit.

Lorsque l'appareil fonctionne aux coûts énergétiques moyen, élevé ou critique, l'écran LCD au dessus du bouton Économie d'Énergie sera allumé. Si, à tout moment, vous souhaitez modifier la température de consigne alors que l'appareil est en mode Économie d'Énergie, appuyez et maintenez enfoncée la touche Économie d'Énergie pour annuler la fonction Économie d'Énergie, puis utilisez les flèches pour modifier le réglage. Cette fonction sera désactivée pendant 18 heures. Si vous essayez de modifier la température sans désactiver la fonction Économie d'Énergie, les lettres PS s'affichent à l'écran, indiquant qu'il est encore en mode d'Économie d'Énergie.

# Entretien et nettoyage.

## Entretien préventif

**▲ DANGER:** *Risque de brûlure - Avant d'utiliser la soupape de sécurité, assurez-vous que personne ne sera exposé à l'eau chaude dégagée par cette soupape. L'eau peut être assez chaude pour créer un risque de brûlure. L'eau doit être envoyée vers une bonde de vidange pour éviter toutes blessures ou tous dommages matériels.*

**REMARQUE :** *Si une soupape de sécurité du chauffe-eau s'ouvre régulièrement, il s'agit peut-être d'une expansion thermique dans un circuit d'alimentation d'eau fermé. Contactez votre fournisseur d'eau ou votre plombier pour savoir comment corriger cette situation. Ne bouchez pas la soupape de sécurité.*

Correctement entretenu, votre chauffe-eau vous fournira des années de service sans tracas.

Nous vous suggérons de suivre un programme d'entretien préventif.

### **Soupape de sécurité (température et pression):**

Au moins une fois par an, soulevez et relâchez la poignée de la soupape de sécurité sur le côté droit à l'avant du chauffe-eau afin de vous assurer qu'elle fonctionne librement. Laissez s'écouler quelques litres d'eau par la canalisation de vidange jusqu'à une bonde de vidange ouverte.

## Vidange du chauffe-eau

**▲ MISE EN GARDE :** *Risque de décharge électrique - Coupez l'alimentation au chauffe-eau avant de vider l'eau.*

**▲ DANGER:** *Risque de brûlure - Avant d'utiliser la soupape de sécurité, assurez-vous que personne ne sera exposé à l'eau chaude vidangée par la soupape. L'eau vidangée du réservoir peut être suffisamment chaude pour présenter un risque de brûlure et doit être envoyée vers une bonde de vidange pour éviter toutes blessures ou tous dommages matériels.*

## Fermeture pour vacances ou absence prolongée dépassant la durée de l'option Vacances

Si le chauffe-eau n'a pas à être utilisé pendant une période prolongée, l'alimentation en électricité et en eau à l'appareil devrait être coupée afin de réduire la consommation et d'empêcher l'accumulation de gaz hydrogène dangereux. Cet appareil n'est pas équipé d'un bouton de mise en marche, l'alimentation électrique peut uniquement être coupée par le disjoncteur ou l'interrupteur principal.

Le chauffe-eau et la tuyauterie devraient être vidangés s'il y a risque de gel.

### **Inspection périodique** (une fois par an):

De plus, il est recommandé de faire effectuer une inspection périodique des commandes, des éléments chauffants et du câblage par un technicien qualifié dans la réparation d'appareils électroménagers électriques.

La plupart des appareils électriques, même neufs, font du bruit lorsqu'ils sont en marche. Si les sifflements ou le niveau sonore augmentent de manière excessive, il est peut-être nécessaire de nettoyer l'élément chauffant. Contactez un installateur qualifié ou un plombier pour une inspection.

### **Vidange du réservoir :**

Un réservoir de chauffe-eau peut agir comme un décanteur pour les solides en suspension dans l'eau. Il n'est donc pas rare de voir s'accumuler des dépôts d'eau dure dans le fond du réservoir. Pour éliminer ces dépôts du réservoir, suivez ces étapes:

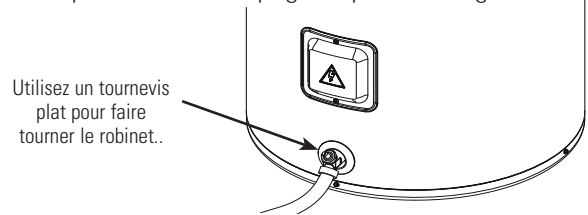
1. Fixez un tuyau d'arrosage au robinet de vidange situé au bas de l'appareil et dirigez-le vers une bonde.
2. Ouvrez le robinet de vidange à l'aide d'un tournevis à tête plate.
3. Après avoir vidangé quelques litres d'eau, fermez le robinet de vidange.

Ceci doit être fait avec l'alimentation en eau froide ouverte de façon à ce que l'eau vidangée par le robinet de vidange soit remplacée. Le débit d'eau aidera à éliminer les sédiments.

Pour vidanger le chauffe-eau, suivez les étapes suivantes :

1. Fixez un tuyau d'arrosage au robinet de vidange situé au bas de l'appareil et dirigez-le vers une bonde.
2. Fermez l'alimentation en eau froide.
3. Laissez entrer de l'air dans le réservoir en ouvrant un robinet d'eau chaude ou soulevant la poignée du robinet de vidange.
4. Ouvrez le robinet de vidange à l'aide d'un tournevis à tête plate.

Remarque : Consultez la page 15 pour un diagramme du produit.





## Nettoyage du filtre

Dans les modes Hybride (uniquement), Thermopompe et Demande élevée, le chauffe-eau déplace l'air dans le système et le fait ressortir à l'arrière de l'appareil. Le filtre est en place pour protéger l'évaporateur de la saleté et la poussière.

Un filtre à air propre est nécessaire pour une meilleure efficacité. Parfois, ce filtre devra être nettoyé (au minimum une fois par an). Lorsque le filtre doit être nettoyé, le témoin rouge au-dessus de la touche Filtre s'allume et un signal sonore est émis.

**REMARQUE:** Si le filtre est trop sale, l'appareil passe automatiquement au mode Électrique (Ventilateur éteint)/ Standard (Ventilateur éteint) et les économies d'énergie seront perdues.

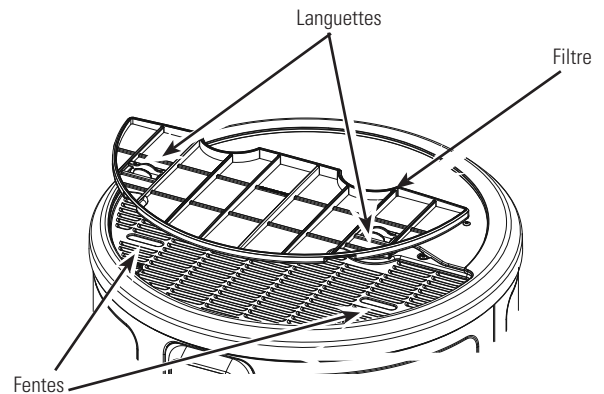
Ne coupez pas l'alimentation. Retirez le filtre par le dessus de l'appareil. Appuyez sur les deux languettes et soulevez pour retirer le filtre à air. Après avoir été retiré, le filtre peut être nettoyé avec un aspirateur, essuyé avec un chiffon humide ou rincé à l'eau tiède.

Lorsque le filtre a été nettoyé et séché, il peut être remis en place en l'alignant dans les fentes sur le dessus de l'appareil et en le poussant vers le bas pour l'enclencher.

Après avoir remis le filtre propre en place, appuyez sur le bouton FILTER (filtre) et maintenez-le appuyé pendant 3 secondes.

Si un cycle de chauffage est en marche lorsque l'alarme du filtre est acceptée, ce cycle va continuer en mode électrique pour terminer le cycle. Après cela, il reviendra automatiquement au mode précédent le nettoyage du filtre.

**IMPORTANT:** Le filtre doit être nettoyé lorsque l'alarme s'affiche. Un filtre sale rend plus difficile le travail du système et peut entraîner une réduction de l'efficacité, voire endommager le système. Afin d'obtenir le meilleur rendement éco énergétique, assurez-vous que le filtre est propre.

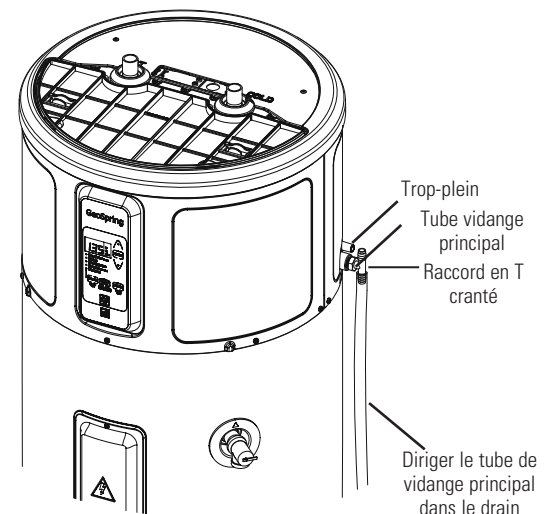


## Débouchage du tuyau de vidange de la condensation

Le tuyau de vidange principal est destiné à éliminer toute la condensation. S'il est bouché, le condensat sera éliminé par le tuyau de trop-plein et s'écoulera au sol. Ceci est conçu pour prévenir l'utilisateur que le tuyau de vidange principal est bouché. Retirez le raccord en T cranté et le tube de vidange, nettoyez les débris et remettez-le en place.

Inspectez régulièrement les tuyaux de vidange et nettoyez tous les débris qui auraient pu s'y accumuler.

Consultez les instructions d'installation pour de plus amples informations.



## Surfaces Extérieures

Laver à la main avec de l'eau tiède seulement.

## Tige d'anode

La tige de l'anode doit être retirée du réservoir du chauffe-eau et inspectée après un maximum de 3 ans de service, chaque année ensuite, et remplacée lorsque plus de 15,2 cm (6 po) de l'âme sont exposés à l'une ou l'autre des extrémités de la tige.

**REMARQUE :** L'eau adoucie artificiellement exige que la tige de l'anode soit inspectée annuellement.

En raison des risques de choc électrique, et pour éviter toute fuite d'eau accidentelle, cette inspection devrait être effectuée par un

technicien ou plombier qualifié. De plus, elle exige la coupure de l'alimentation en eau avant le retrait de la tige d'anode.

**A NOTER :** Ne retirez pas la tige d'anode du réservoir à e d'autres moments que pendant une inspection ou un remplacement, puisqu'une utilisation sans tige d'anode réduit la durée utile du réservoir à revêtement de verre et annule la garantie.

La consommation et le remplacement de la tige d'anode ne sont pas couverts par la garantie.

# Entretien et réparation de la tige d'anode.

## ⚠ ATTENTION-CONSIGNES DE SÉCURITÉ IMPORTANTES

Cette information est destinée aux personnes qui possèdent une compétence adéquate en électricité, électronique et mécanique. Toute tentative de réparer un gros appareil peut causer des blessures corporelles et des dommages aux biens. Le fabricant ou le vendeur ne peuvent être tenus responsables de l'interprétation ou de l'utilisation de cette information.

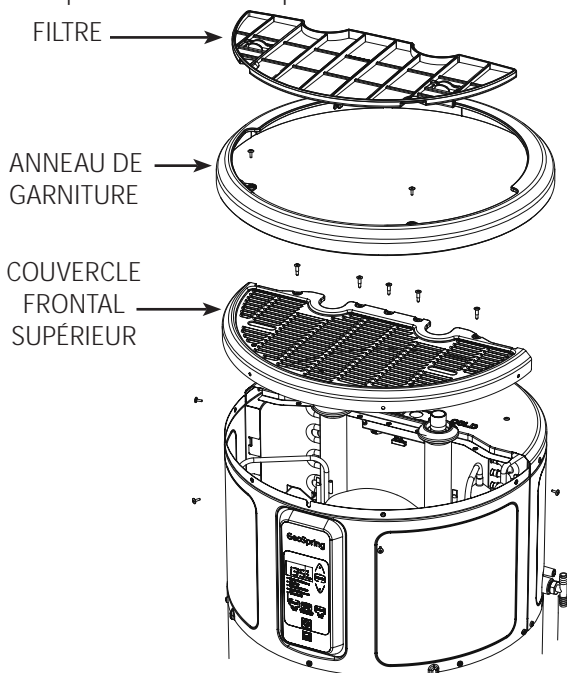
### Outils requis :

- Tournevis Torx T20.
- Tournevis à lame plate.
- Ruban.
- Clé à douille.
- Rallonge de douille 12 po.
- 1 douille.
- Scellant Softset.
- Tige d'anode si nécessaire.

\* Voir la page 72 pour la commande de pièces.

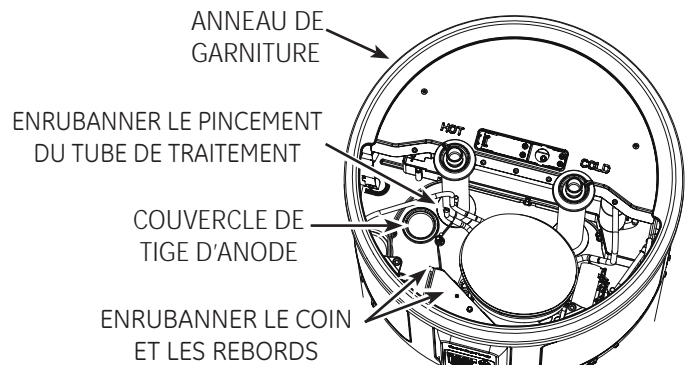
### Pour réparer la tige d'anode:

1. Coupez l'alimentation électrique, fermez l'alimentation d'eau et vidangez un ou deux gallons du chauffe-eau par le robinet de drainage inférieur.
2. Retirez le filtre, l'anneau de garniture et le couvercle frontal supérieur comme indiqué à l'illustration A.



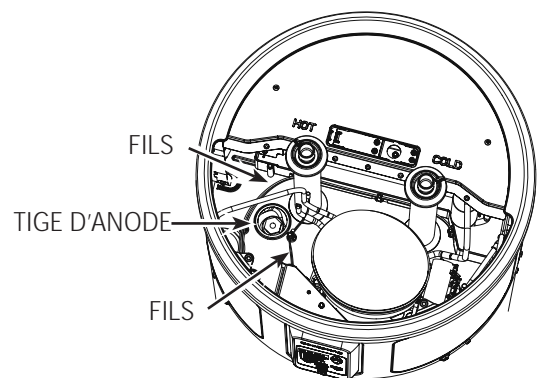
**Illustration A**

3. Réinstallez l'anneau de garniture, placez une couche de ruban protectrice sur les bords métalliques et retirez le couvercle de la tige d'anode comme indiqué à l'illustration B.



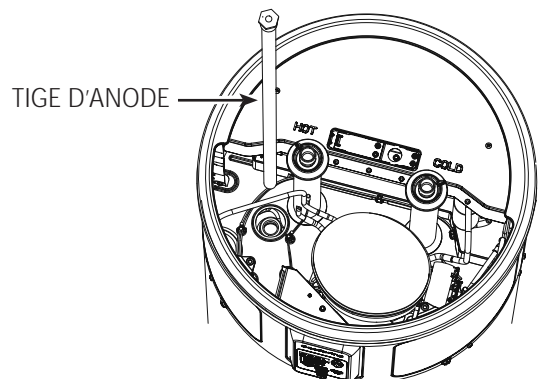
**Illustration B**

4. À l'aide d'un tournevis à lame plate et veillant à ne pas endommager les fils exposés, retirez la mousse qui recouvre la tige d'anode comme indiqué à l'illustration C.



**Illustration C**

5. À l'aide d'une douille 1 1/16 po et d'une rallonge, dévissez la tige d'anode, puis soulevez-la pour inspecter de la manière indiquée à l'illustration D.



**Illustration D**

6. Pour installer une tige d'anode, scellez les filetages à l'aide du scellant Soft Set, vissez dans le réceptacle et utilisez une clé dynamométrique pour serrer au couple de  $50 \pm 5$  lb-pi. Réinstallez le couvercle de la tige d'anode.
7. Ouvrez l'alimentation d'eau, ouvrez un robinet pour évacuer l'air de la plomberie, vérifiez qu'il n'y a pas de fuites, rétablissez l'alimentation électrique et réassemblez l'appareil en ordre inverse comme indiqué à l'illustration A.



L'emplacement choisi pour le chauffe-eau doit prendre en considération les éléments suivants:

## RÈGLEMENTS MUNICIPAUX RELATIFS AUX INSTALLATIONS

Ce chauffe-eau doit être installé conformément à ces instructions, aux codes municipaux, aux codes des services publics, selon les exigences de la compagnie ou, en l'absence de réglementation municipale, conformément au Code national de l'électricité. Il est disponible dans certaines librairies ou peut être acheté auprès de l'association nationale de la prévention d'incendie (Batterymarch park, Quincy, MA 02169, USA, comme feuillet ANSI/NFPA 70).

## EXIGENCES EN MATIÈRE D'ALIMENTATION ELECTRIQUE

Check the markings on the rating plate of the water heater to Vérifiez les informations sur la plaque signalétique du chauffe-eau afin de vous assurer que l'alimentation correspond aux besoins du chauffe-eau. REMARQUE : Les installations à 208V peuvent avoir des performances moindres.

## EMPLACEMENT

Localisez le chauffe-eau dans un endroit propre et sec aussi proche que possible de la zone de plus forte demande en eau chaude. De longues conduites d'eau chaude non isolées vont gaspiller de l'énergie et l'eau. L'appareil doit être installé dans un endroit de niveau.

REMARQUE : Cet appareil est conçu pour toute installation intérieure normale, y compris : garage, buanderie, grenier, placard, etc.... Avec l'installation d'une porte à persiennes, il peut être installé dans des endroits d'une surface inférieure à 10pi x 10pi x 7pi (700 pi<sup>3</sup>). Les persiennes devrait être de 240 po<sup>2</sup> (0,15 m<sup>2</sup>) ou plus. Si deux persiennes sont utilisées, une d'entre elles doit être située près du haut de la porte.

Positionnez le chauffe-eau de manière à ce que le filtre à air, le couvercle et les panneaux avant puissent être retirés pour permettre l'inspection et l'entretien, comme le retrait des éléments ou le nettoyage du filtre.

Le chauffe-eau et les conduites d'eau doivent être protégés du gel et des atmosphères hautement corrosives. N'installez pas le chauffe-eau en extérieur ou dans des zones exposées.

**⚠ MISE EN GARDE : Risque de dommage matériel** - Le chauffe-eau doit être placé dans un endroit où les fuites d'eau provenant du réservoir ou des raccords n'endommageront pas la zone autour de l'appareil ou les étages inférieurs. Lorsque que de tels emplacements ne peuvent être évités, il est recommandé d'installer un bac de récupération d'eau avec un système d'évacuation approprié en dessous de l'appareil. Les installations dans un grenier nécessitent un plancher approprié et un accès par des escaliers.

REMARQUE : La plage de fonctionnement de la thermopompe est de 45°F à 120°F (7°C à 49°C). Si la température ambiante est en dehors de cette fourchette, la thermopompe s'éteint et les éléments chauffants seront utilisés jusqu'à ce que la température ambiante revienne dans la plage de fonctionnement normal.

## EMPLACEMENT (SUITE)

### INFORMATIONS RELATIVES AU DIMENSIONNEMENT DU CHAUFFE-EAU - LIRE AVANT L'INSTALLATION :

Pour le remplacement de systèmes domestiques existants:

- **Vous remplacez un chauffe-eau existant ?** Si votre chauffe-eau actuel fournit suffisamment d'eau chaude et qu'aucune autre modification ou rénovation de la plomberie n'est effectuée ou planifiée qui pourrait augmenter la demande en eau chaude, alors:
  - Le chauffe-eau hybride GeoSpring™ peut remplacer un chauffe-eau électrique standard de taille équivalente ou inférieure
  - Si vous passez d'une alimentation au gaz à une alimentation électrique, le chauffe-eau hybride GeoSpring™ peut remplacer un chauffe-eau d'une taille immédiatement inférieure.

Pour les nouvelles installations:

Guide de sélection de la taille d'un chauffe-eau domestique			
Taille de la famille	Demande*	Capacité recommandée (gallons)	
		Électrique or GeoSpring™	Gaz
5+	Élevée	100 (378.5 L)	75 (283.9 L)
	Moyenne ou Faible	80 (302.8 L)	50 (189.3 L)
3 à 4	Élevée	80 (302.8 L)	50-75 (189.3-283.9 L)
	Moyenne ou Faible	50 (189.3 L)	40 (151.4 L)
2 à 3	Élevée	50 (189.3 L)	40-50 (151.4-189.3 L)
	Moyenne ou Faible	40 (151.4 L)	40 (181.8 L)
1 à 2	Élevée	40-50 (151.4-189.3 L)	40-50 (151.4-189.3 L)
	Moyenne ou Faible	30 (113.6 L)	30 (113.6 L)

\*Hypothèses pour une maison à faible demande ou à demande moyenne.

- Utilisation de pommes de douche standard ou à débit réduit (2,5 gal/min - 11,4 L/min ou moins).
- Aucune douche munie de plus d'une pomme de douche et/ou de jets pour le corps.
- Baignoire standard (pas de baignoire surdimensionnée ou à remous).

### Point de réglage de la température:

Le point de réglage de la température du chauffe-eau influence grandement sur la quantité d'eau chaude disponible pour les douches et les bains.

- La consommation et les économies d'énergie calculées des chauffe-eau, y compris du chauffe-eau GeoSpring™, sont effectuées à un réglage de 135°F (57°C) qui est le réglage moyen d'un chauffe-eau selon le ministère de l'Énergie. Les économies énergétiques du GeoSpring™ sont basées sur un fonctionnement en mode hybride avec un réglage de la température de 135°F (57°C).
- Les normes de sécurité exigent un réglage en usine de 120°F à 125°F (49°C à 52°C) maximum pour tous les nouveaux chauffe-eau. Par conséquent, si votre chauffe-eau est actuellement réglé sur 130°F (54°C) ou au-dessus et que votre nouveau chauffe-eau est installé avec le point de réglage d'usine de 120°F (49°C), le nouveau chauffe-eau semblera offrir une capacité moindre que votre chauffe-eau existant.
- L'utilisateur peut régler la température de manière à répondre à ses besoins. Veuillez toujours lire et comprendre les consignes de sécurité figurant dans le manuel de l'utilisateur avant d'ajuster la température.

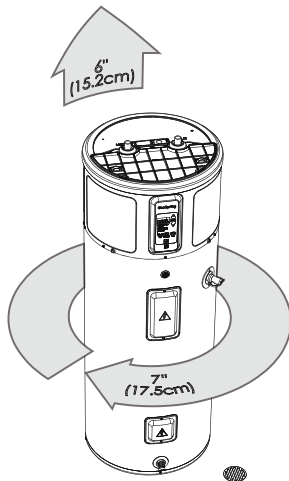
# Instructions d'installation

## EMPLACEMENT (SUITE)

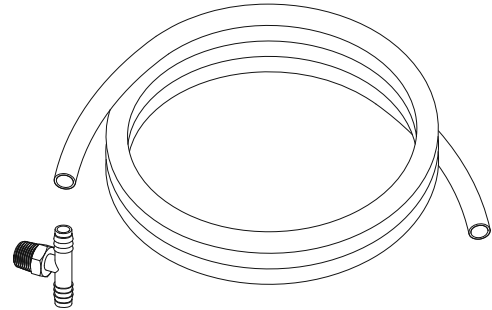
### Dégagements nécessaires:

Il doit y avoir un dégagement minimal de 7 po (17,5 cm) entre tout objet et les couvercles avant et arrière advenant le cas où un entretien serait requis. Un dégagement minimal de 7 po (17,5 cm) avec les parois du chauffe-eau est également recommandé pour faciliter l'accès en cas d'entretien.

Un dégagement de 6po (15,2 cm) est également requis pour retirer le filtre à des fins de nettoyage. La plomberie d'eau chaude et froide et les connexions électriques ne doivent pas interférer avec le retrait du filtre.



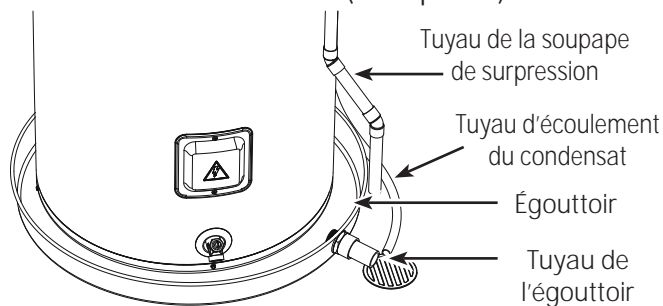
## PIÈCES NON STANDARD REQUISES:



Flexible 1 3/8 po x 6 pi

Raccord en T cranté mâle NPT 1 3/8 x 3/8 x 1/2 po  
(certains modèles)

## Catch Pan Installation (If required)



**REMARQUE :** Le bac de récupération de l'eau doit être conforme aux codes municipaux. Des nécessaires d'installation de bac de récupération sont disponibles auprès du détaillant où le chauffe-eau a été acheté, un magasin de matériaux de construction ou un revendeur de chauffe-eau. L'égouttoir doit être d'une largeur supérieure de 5,1 cm (2 po), au minimum, par rapport au diamètre de la base du chauffe-eau. Pour prévenir la corrosion et améliorer l'accès à la soupape de surpression, il est recommandé de placer le chauffe-eau sur des espaceurs à l'intérieur de l'égouttoir.

### Tuyau de vidange du condensat

L'appareil est équipé d'un tuyau de vidange des condensats. Ainsi une bonde d'évacuation doit être disponible à proximité de l'appareil. La bonde ne doit pas être à une hauteur supérieure à 36 po (91,4 cm) au-dessus du sol (les codes nationaux et municipaux doivent être respectés). Si aucune bonde n'est disponible, alors une pompe ordinaire pour le condensat d'une capacité minimale de 1 gallon (3,8 L) par jour doit être achetée auprès d'un magasin de matériaux de construction et installée.

## EXPANSION THERMIQUE

Déterminez s'il y a un clapet antiretour dans la conduite d'admission d'eau. Il peut avoir été installé dans la conduite d'eau froide pour empêcher les retours d'eau ou il peut être inclus dans une soupape de réduction de pression, un compteur d'eau ou un adoucisseur d'eau. Un clapet anti-retour dans la ligne d'admission d'eau froide peut provoquer ce qu'on appelle un « circuit d'eau fermé ». Un tuyau d'admission d'eau froide sans clapet anti-retour ou sans dispositif anti-refoulement est considéré comme un système d'eau « ouvert ».

Lorsque l'eau est chauffée, elle prend du volume et provoque une augmentation de la pression dans le système d'eau. Cette action est appelée « expansion thermique ». Dans un système « ouvert », l'eau en expansion qui dépasse la capacité du chauffe-eau reflue vers le système d'alimentation municipal où la pression est facilement dissipée.

Toutefois, un « système d'eau fermé », empêche l'eau en expansion de refluer vers la conduite principale d'alimentation. Cette expansion thermique peut provoquer une augmentation rapide et dangereuse de la pression dans le chauffe-eau et dans la tuyauterie du système. Cette augmentation rapide de la pression peut rapidement atteindre le point de réglage de la soupape de sécurité de sorte qu'elle s'active à chaque cycle de chauffage. L'expansion thermique et l'expansion et la contraction rapides et répétées des composants du chauffe-eau et de la tuyauterie peuvent entraîner l'usure prématurée de la soupape de sécurité et possiblement du chauffe-eau lui-même. Le remplacement de la soupape de sécurité ne résout pas le problème !

La méthode proposée de contrôle de l'expansion thermique est d'installer un réservoir d'expansion dans la ligne d'eau froide entre le chauffe-eau et le clapet anti-retour (se reporter à l'illustration page 15). Le réservoir d'expansion est conçu avec un coussin d'air intégré qui se comprime avec l'augmentation de la pression du système, éliminant ainsi la surpression et le fonctionnement continu de la soupape. D'autres méthodes de contrôle d'expansion thermique sont également disponibles. Contactez votre installateur, fournisseur d'eau ou inspecteur de plomberie pour des informations supplémentaires concernant ce sujet.

# Instructions d'installation

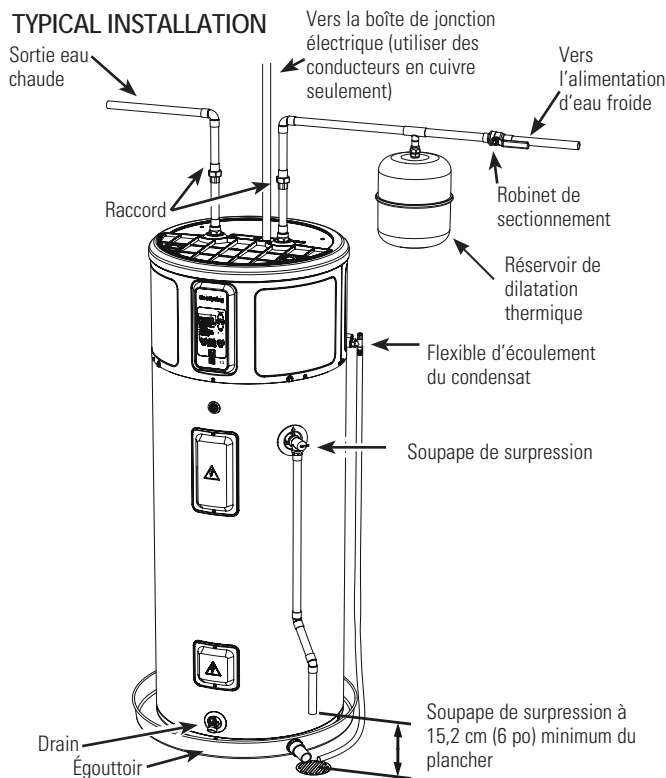
## WATER SUPPLY CONNECTIONS

Reportez-vous à l'illustration ci-dessous pour une suggestion d'installation. Les raccords d'eau CHAUDE (Hot) et FROIDE (Cold) sont clairement identifiés et mesurent 3/4 po NPT sur tous les modèles. Lors du raccordement sur les orifices d'entrée ou de sortie, l'utilisation de raccords à filetage conique femelles 3/4 po NPT avec scellant à filetage est recommandé. L'installation de raccords-unions est recommandée pour le raccordement à l'eau chaude et froide de façon à pouvoir débrancher le chauffe-eau aisément dans l'éventualité d'une réparation.

**REMARQUE:** Installez un robinet d'arrêt dans la conduite d'alimentation d'eau froide près du chauffe-eau. Ceci permettra plus tard de faciliter l'entretien ou la maintenance de l'appareil.

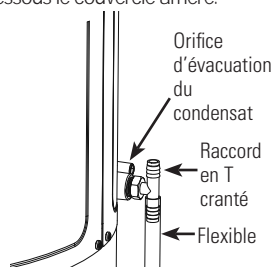
**IMPORTANT:** N'appliquez pas de chaleur aux raccords d'eau FROIDE ou CHAUDE. Si des raccords soudés à l'étain sont utilisés, soudez le tuyau à l'adaptateur avant de fixer l'adaptateur aux raccords d'eau froide sur le chauffe-eau. Toute application de chaleur sur les raccords d'eau froide ou chaude peut endommager de façon permanente le revêtement interne en plastique des ces orifices.

### TYPICAL INSTALLATION



## TUYAU DE VIDANGE DU CONDENSAT

Cet appareil est équipé d'un bac de condensation. L'eau recueillie dans le bac s'écoule du tuyau sortant sur le côté de l'appareil. Il est important d'installer un tuyau de vidange à l'orifice de vidange primaire à l'arrière de l'appareil. Raccordez une extrémité d'un tuyau plus long de 6pi (1,8 m) à l'orifice de vidange inférieur à l'arrière de l'appareil, en dessous le couvercle arrière. Dirigez l'autre extrémité vers une bonde au sol ou à une hauteur inférieure à 3pi (0,9 m). Si une telle bonde n'est pas disponible, une pompe d'évacuation des condensats (non fournie) doit être achetée et installée. Le tuyau de vidange doit être acheminé de telle façon que l'eau évacuée ne puisse entrer en contact avec les parties électriques ou des personnes et de façon à éliminer tout dégât d'eau potentiel.



## SOUPAPE DE SECURITE

**⚠ Avertissement:** *Risque de dommage pour l'appareil* - La pression nominale de la soupape de sécurité ne doit pas dépasser 150 lb/po<sup>2</sup> (1,03 kPa), la pression de fonctionnement maximale du chauffe-eau indiquée sur la plaque signalétique.

Une nouvelle soupape de sécurité de pression et de température, conforme aux normes Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems (ANSI Z21.22) est fournie. Elle doit être installée dans l'orifice prévue à cet effet sur le chauffe-eau. Aucune soupape de quelque nature que ce soit ne doit être installée entre la soupape de sécurité et le réservoir. Les codes municipaux doivent toujours régir l'installation de soupapes de sécurité.

La valeur Btu/h de la soupape de sécurité ne doit pas être inférieure à la valeur nominale d'entrée du chauffe-eau, comme ceci est inscrit sur l'étiquette à l'avant du chauffe-eau (1 watt = 3,412 Btu/h).

Branchez la sortie de la soupape de sécurité à une bonde ouverte de telle façon que l'eau évacuée ne puisse entrer en contact avec les parties électriques ou des personnes et de façon à éliminer tout dégât d'eau potentiel.

La tuyauterie utilisée doit être agréée pour la distribution d'eau chaude. Le tuyau de vidange ne doit pas être d'une dimension inférieure à la sortie de la soupape et doit être incliné vers la bonde pour assurer une vidange complète (par gravité) de la soupape et du tuyau de vidange. L'extrémité du tuyau de vidange ne doit pas être filetée ou dissimulée et doit être protégée contre le gel. Aucune soupape, restricteur ou réducteur ne doit jamais être installé sur le tuyau de vidange.

## ⚠ MISE EN GARDE:

Pour réduire les risques de pression et de température excessives dans ce chauffe-eau, installez l'équipement de protection de température et de pression exigé par les codes municipaux et, au moins, une soupape de sécurité (pression et température) certifiée par un laboratoire d'essai indépendant reconnu à l'échelle nationale et qui effectue des inspections périodiques de l'équipement ou des matériaux inscrits qui disent se conformer aux exigences relatives aux Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems (ANSI Z21.22). Cette soupape doit être marquée avec une pression maximale qui ne doit pas dépasser la pression maximale de fonctionnement indiquée pour le chauffe-eau. Installez la soupape dans l'ouverture prévue à cet effet sur le chauffe-eau et orientez-la (ou ajoutez un tuyau) de manière à ce que tout liquide soit évacué par la soupape à une hauteur maximale de 6 po (15,2 cm) du plancher, et qu'il n'entre en contact avec aucune partie électrique. En aucune circonstance, l'ouverture pour l'évacuation ne doit pas être bouchée ou de taille réduite.

# Instructions d'installation

## REPLISSAGE DU CHAUFFE-EAU

**⚠ AVERTISSEMENT:** *Risque de dommage pour l'appareil* - Le réservoir doit être plein d'eau avant de mettre le chauffe-eau en marche. La garantie de chauffe-eau ne couvre pas les dommages ou défaillances résultant d'un fonctionnement avec un réservoir vide ou partiellement vide.

Assurez-vous que le robinet de vidange est complètement fermé. Ouvrez le robinet sur la conduite d'alimentation en eau froide.

Ouvrez chaque robinet d'eau chaude doucement pour permettre à l'air de s'évacuer du chauffe-eau et des tuyauteries.

Un débit d'eau constant du/des robinet(s) d'eau chaude indique un chauffe-eau plein.

**Code d'erreur F11 lors de l'installation :** Si l'appareil est mis en marche sans un réservoir rempli, le code d'erreur « F11 » s'affiche à l'écran. Coupez l'alimentation électrique, remplissez le réservoir d'eau (voir ci-dessus), puis rallumez-le.

## A NOTER :

Ne faites pas d'erreur de raccordements électriques. Une tension de CA de 240V ou 208V doit être appliquée aux fils L1 et L2 comme indiqué sur diagramme « boîte de jonction du chauffe-eau ». Le non-respect de cette consigne ANNULE la garantie, et peut conduire à une tension de 120V utilisée sur le chauffe-eau, qui peut endommager le compresseur ou d'autres composants électriques.

Si un câble à 4 fils est amené au chauffe-eau, isolez le neutre et branchez les autres fils comme indiqué.

**NOTE RELATIVE AUX DISPOSITIFS DE GESTION D'ALIMENTATION** (Parfois appelé Interrupteur de réduction en demande maximale):

Certains dispositifs de gestion de l'alimentation ou même certaines minuterie peuvent RÉDUIRE la tension de 240 V à 120 V pendant des périodes de demande importante d'électricité. Ces dispositifs doivent être retirés du circuit alimentant le chauffe-eau en raison des dommages potentiels mentionnés ci-dessus.

Toutefois, les dispositifs de commutation qui, de temps en temps, réduisent la tension de 240V à 0V sont acceptables.

**Code d'erreur "bAd linE" lors de l'installation.** Si « bAd linE » s'affiche à l'écran, l'appareil ne reçoit pas la bonne tension en raison d'erreurs de câblage. Pour corriger cette erreur, coupez l'alimentation électrique, corrigez les erreurs de câblage, puis rallumez le chauffe-eau.

## RACCORDEMENTS ÉLECTRIQUES

Un circuit de dérivation distinct avec des conducteurs en cuivre, un dispositif de protection contre les surtensions et des moyens appropriés pour déconnecter le chauffe-eau doivent être fournis par un électricien qualifié.

Le câblage doit être conforme aux codes et règlements municipaux ou, en leur absence, à la dernière édition du Code national de l'électricité, ANSI/NFPA 70.

Le chauffe-eau est complètement raccordé à la boîte de jonction par le dessus du chauffe-eau. Une ouverture pour un raccord électrique d'1/2 po est fournie pour les connexions à faire sur place.

Les besoins en tension et puissance du chauffe-eau sont précisées sur l'étiquette signalétique apposée sur le devant du chauffe-eau.

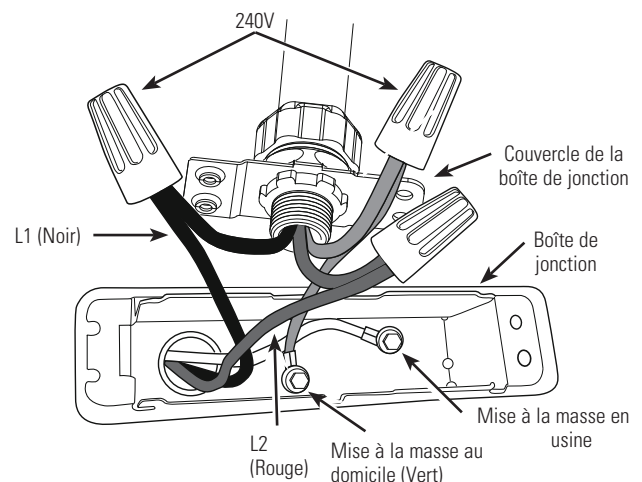
### Le câblage du circuit de dérivation doit inclure:

1. Un conduit métallique ou un câble métallique gainé approuvé pour une utilisation comme conducteur de mise à la masse et installé avec des raccords adaptés à cet usage.
2. Un câble gainé non métallique, un conduit métallique ou un câble gainé métallique non approuvé pour une utilisation comme conducteur de mise à la masse doit comprendre un conducteur distinct de mise à la masse. Il doit être raccordé aux bornes de mise à la masse du chauffe-eau et à la boîte de distribution électrique.

Branchement de l'alimentation électrique au chauffe-eau:

1. Coupez l'alimentation.
2. Retirez le(s) vis maintenant le couvercle de la boîte de jonction.
3. Fixez L1 à L1, L2 à L2 et mettez à la masse le fil de terre vert relié à la base de la boîte de jonction.

**REMARQUE :** Faites les raccordements électriques conformément aux codes et règlements municipaux ou, en leur absence, à la dernière édition du Code national de l'électricité, ANSI/NFPA 70.



**⚠ AVERTISSEMENT:** Un bon raccordement à la terre est essentiel. La présence d'eau dans les tuyauteries et le chauffe-eau ne fournit pas une conduction suffisante pour une masse adéquate. La tuyauterie non métallique, les raccords diélectriques ou flexibles, etc., peuvent isoler électriquement le chauffe-eau. Ne déconnectez pas la mise à la terre faite en usine.

La garantie du fabricant ne couvre pas les dommages ou défauts causés par l'installation, le branchement ou l'utilisation de tout dispositifs d'économie d'énergie ou d'autres dispositifs non autorisés (autres que ceux autorisés par le fabricant) avec le chauffe-eau. L'utilisation de dispositifs d'économie d'énergie non autorisés peut réduire la durée de vie du chauffe-eau et peut mettre en danger la vie et provoquer des dommages matériels.

Le fabricant décline toute responsabilité en cas de pertes ou blessures résultant de l'utilisation de ces dispositifs non autorisés.

Si les codes municipaux exigent la pose extérieure de couvertures isolantes, les instructions du fabricant fournies avec le nécessaire d'isolation doivent être suivies à la lettre.

**La pose de tout isolant externe, de couverture ou d'isolant à tuyauterie avec ce chauffe-eau doit être effectuée en portant une attention particulière aux points suivants :**

- Ne couvrez pas la soupape de sécurité (température et pression)
- Ne couvrez pas les panneaux d'accès aux éléments chauffants.
- Ne couvrez pas la boîte de jonction du chauffe-eau.
- Ne couvrez pas les étiquettes d'utilisation ou de mise en garde apposées au chauffe-eau. N'essayez pas de les déplacer sur l'extérieur de la couverture isolante.
- N'obstruez pas les entrées/sorties d'air dans les couvercles supérieurs et sous ces derniers.

**REMARQUE :** Ce guide recommande un circuit de dérivation minimal basé sur le Code national de l'électricité.

Reportez-vous aux schémas de câblage dans ce manuel pour les raccordements à effectuer sur place

## GUIDE DE DIMENSIONNEMENT DE CIRCUIT DE DÉRIVATION

Puissance totale du chauffe-eau	Protection de surintensité recommandée (capacité du fusible ou du disjoncteur)			
	208V	240V	277V	480V
3,000	20	20	15	15
4,000	25	25	20	15
<b>4,500</b>	<b>30</b>	<b>25</b>	<b>25</b>	<b>15</b>
5,000	30	30	25	15
5,500	35	30	25	15
6,000	40	35	30	20
8,000	50	45	40	25
9,000	-	50	45	25
10,000	-	-	50	30
11,000	-	-	50	30
12,000	-	-	-	35

Puissance totale du chauffe-eau	Calibre de fil de cuivre, basé sur tableau N.E.C. 310-16 (167°F/75°C).			
	208V	240V	277V	480V
3,000	12	12	14	14
4,000	10	10	12	14
<b>4,500</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>14</b>
5,000	10	10	10	14
5,500	8	10	10	14
6,000	8	8	10	12
8,000	8	8	8	10
9,000	-	8	8	10
10,000	-	-	8	10
11,000	-	-	8	10
12,000	-	-	-	8



# Instructions d'installation

## LISTE DE VÉRIFICATION D'INSTALLATION

- 1. **Emplacement du réservoir:**
  - La taille de la pièce nécessite-t-elle des portes à persiennes ou une ventilation similaire ? 10pi x 10pi x 7pi (700 pi<sup>3</sup>) ou 240 pouces carrés (0,15 m<sup>2</sup>) de surface de ventilation nécessaire.
  - Éloignez l'appareil du mur de 7 po (17,5 cm.) et dégagez les parois d'au moins 7 po (17,5 cm.)
  - Le devant de l'appareil est libre et dégagé.
  - Le chauffe-eau est-il de niveau ? Sinon, ajoutez des cales sous la base de l'appareil.
- 2. **Vérifiez que le filtre d'air est installé.** (Situé dans l'emballage):
- 3. **Raccords de plomberie :**
  - N'empêchent pas le retrait du filtre à air
  - Aucune fuite après le remplissage du réservoir, avec ou sans débit.
- 4. **Tuyaux pour les condensats sont en place:**
  - Tuyau de vidange principal installé
- 5. **La soupape de sécurité (température et pression) fonctionne correctement et le tuyau de vidange est installé conformément au code municipal.**
- 6. **Le branchement électrique** correspond à du 208/240 VCA à L1 et L2 au réservoir.
- 7. **Le branchement électrique** n'empêche pas le retrait du filtre à air.
- 8. Assurez-vous que le **panneau de commande** affiche 120°F (49°C) et mode Hybride. Aidez l'utilisateur à régler la température (se reporter à la rubrique « À propos du réglage de la température » à la page 30).

## À QUOI S'ATTENDRE POUR UNE « MISE EN MARCHÉ NORMALE » EN MODE HYBRIDE

Après installation de l'appareil et après que tous les branchements électriques et de plomberie aient été effectués et vérifiés, l'appareil doit être rempli d'eau (évacuez l'air du réservoir en ouvrant un robinet d'eau chaude, quelque part dans la maison pour permettre au réservoir de se remplir entièrement d'eau). Une fois que le réservoir est plein et que l'appareil est sous tension, vous rencontrerez peut-être ceci :

Temps écoulé	Actions HEWH	Remarques
0 à 2 minutes	L'appareil passera par un autodiagnostic	Cette période d'arrêt de 2 minutes empêche d'endommager le compresseur.
2 à 10 minutes	Le compresseur et le ventilateur se mettent en marche	Cette période de 8 minutes est utilisée pour s'assurer que le réservoir est plein d'eau (algorithme de prévention d'incendie à sec).
10 à 30 minutes	Le compresseur et le ventilateur s'arrêtent et les éléments chauffants se mettent en marche pendant environ 20 minutes	Pour fournir rapidement une première quantité d'eau chaude pour l'utilisateur (environ 25 gallons/94,6 L).
30 minutes et plus	L'élément supérieur s'éteint et le compresseur se rallume	Utilisation d'une thermopompe efficace pour la majorité du chauffage

REMARQUE : La plage de fonctionnement de la thermopompe est de 45°F à 120°F (7°C à 49°C). Si la température ambiante est en dehors de cette fourchette, la thermopompe s'éteint et les éléments chauffants seront utilisés jusqu'à ce que la température ambiante revienne dans la plage de fonctionnement normal.



Avant d'appeler à un technicien...  
Économisez du temps et de l'argent ! Consultez d'abord le tableau ci-dessous pour peut-être éviter de faire appel à un technicien.

Problème	Causes Possibles	Solution
<i>Le chauffe-eau est bruyant le système</i>	Un ventilateur est utilisé pour faire circuler l'air dans	<ul style="list-style-type: none"> <li>Un certain niveau sonore du ventilateur est normal. Si vous entendez un bruit anormal ou si le niveau sonore semble, anormalement élevé puis contactez le service après-vente.</li> </ul>
<i>Le chauffe-eau rend la pièce trop froide</i>	La pièce est mal ventilée ou est trop petite.	<ul style="list-style-type: none"> <li>Si les dimensions de la pièce sont inférieures à 10 pi x 10pi x 7pi (3m x 3m x 2,1 m), cette pièce doit être dotée de porte à persiennes ou d'un autre moyen pour permettre un échange d'air avec les pièces avoisinantes.</li> </ul>
	Le chauffe-eau extrait la chaleur de l'air ambiant pour chauffer l'eau.	<ul style="list-style-type: none"> <li>Ceci est normal.</li> </ul>
<i>De l'eau coule sur les parois extérieures du chauffe-eau.</i>	Le tuyau d'évacuation du condensat est bouché.	<ul style="list-style-type: none"> <li>Nettoyez les débris au niveau de l'orifice de vidange sur l'appareil.</li> </ul>
	Les raccords eau chaude/eau froide ne sont pas bien serrés.	<ul style="list-style-type: none"> <li>Serrez les raccords d'entrée et de sortie.</li> </ul>
<i>Quantité insuffisante d'eau ou pas d'eau chaude</i>	La température de réglage de l'eau est peut-être trop basse.	<ul style="list-style-type: none"> <li>Voir la section Réglage de la température de l'eau.</li> </ul>
	L'usage de l'eau chaude dépasse la capacité du mode actuel du chauffe-eau.	<ul style="list-style-type: none"> <li>Essayer un autre mode ou modifier les habitudes d'usage.</li> </ul>
	La quantité d'eau demandée peut dépasser la capacité du chauffe-eau.	<ul style="list-style-type: none"> <li>Attendre que le chauffe-eau rétablisse la température après une demande anormalement élevée.</li> </ul>
	La température ambiante est trop basse.	<ul style="list-style-type: none"> <li>Pour que le chauffe-eau puisse fonctionner correctement, la température de son emplacement en mode électrique doit se situer entre 0 et 65 °C (32 et 150 °F) ou entre 7 et 49 °C (45 et 120 °F) pour tous les autres modes.</li> </ul>
	La température d'entrée de l'eau peut être plus froide pendant la saison hivernale.	<ul style="list-style-type: none"> <li>Ceci est normal. Une eau très froide est plus longue à réchauffer.</li> </ul>
	Robinets d'eau chaude qui fuient ou sont ouverts.	<ul style="list-style-type: none"> <li>S'assurer que tous les robinets sont fermés.</li> </ul>
	Des parcours longs de tuyauterie d'eau chaude sont exposés ou sont à l'extérieur du mur.	<ul style="list-style-type: none"> <li>Isoler la tuyauterie.</li> </ul>
	Espace libre insuffisant ne permettant pas la circulation d'air de la thermopompe.	<ul style="list-style-type: none"> <li>S'assurer que l'appareil est situé à au moins 18 cm (7 po) du mur.</li> </ul>
	La dimension de la pièce n'est pas adéquate pour le chauffe-eau.	<ul style="list-style-type: none"> <li>Installer une porte à persiennes ou autre système de ventilation semblable si la dimension de la pièce est inférieure à 3 x 3 x 2 m (10 x 10 x 7 pi) (20 m<sup>2</sup> [700 pi<sup>2</sup>]).</li> </ul>
	Un fusible est brûlé ou un disjoncteur est déclenché.	<ul style="list-style-type: none"> <li>Remplacer le fusible ou enclencher le disjoncteur.</li> </ul>
	Une panne de courant à votre domicile.	<ul style="list-style-type: none"> <li>Communiquer avec le fournisseur local d'électricité.</li> </ul>
	Câblage inadéquat.	<ul style="list-style-type: none"> <li>Voir la section Instructions d'installation.</li> </ul>
	Limite de réinitialisation manuelle.	<ul style="list-style-type: none"> <li>Voir la section Commandes sécuritaires à la page 4.</li> </ul>
	Raccords d'eau vers l'appareil inversés.	<ul style="list-style-type: none"> <li>Corriger les raccords de tuyauterie.</li> </ul>
L'alimentation électrique est peut-être hors tension.	<ul style="list-style-type: none"> <li>S'assurer que les connexions électriques sont correctement câblés et que l'interrupteur, si utilisé, est à la position ON (sous tension).</li> </ul>	

## Dépannage...

Problème	Causes Possibles	Solution
<i>L'eau est trop chaude</i>	Le réglage de la température est trop élevé. <b>⚠ MISE EN GARDE :</b> Pour votre propre sécurité, N'ESSAYEZ PAS de réparer le câblage électrique, les commandes, les éléments chauffants et autres dispositifs de sécurité. Faites effectuer les réparations par un technicien qualifié. Défaillance de la commande électronique.	<ul style="list-style-type: none"> <li>Consultez la section portant sur le réglage de la température de l'eau.</li> <li>Appelez un technicien.</li> </ul>
<i>Grondement</i>	Les conditions de l'eau dans votre maison entraîne l'accumulation de tartre ou de minéraux sur les éléments chauffants.	<ul style="list-style-type: none"> <li>Retirez et nettoyez les éléments chauffants. Ceci doit uniquement être effectué par un technicien qualifié.</li> </ul>
<i>La soupape de vidange produit des bruit d'éclatement ou se met en marche</i>	Augmentation de pression causée par une expansion thermique dans un système fermé.	<ul style="list-style-type: none"> <li>Il s'agit d'un état inacceptable qui doit être corrigée. Voir l'information sur la dilatation thermique à la page 38. Ne bouchez pas la soupape de sécurité. Communiquez avec un plombier pour corriger cette situation.</li> </ul>
<i>Le chauffe-eau émet un signal sonore et l'écran affiche F11</i>	Le chauffe-eau n'a pas été rempli d'eau avant la mise en marche. La mise en marche d'un chauffe-eau sans eau endommagera les éléments électriques. La garantie de chauffe-eau ne couvre pas les dommages ou défaillances résultant d'un fonctionnement avec un réservoir vide ou partiellement vide.	<ul style="list-style-type: none"> <li>Remplissez complètement le réservoir d'eau. Appuyez sur ENTER (Entrée) pour arrêter l'alarme, ensuite appuyez sur POWER lorsque le réservoir est plein.</li> </ul>
<i>Le voyant du filtre est allumé.</i>	Le filtre doit être nettoyé. Un filtre propre est nécessaire pour un fonctionnement efficace.	<ul style="list-style-type: none"> <li>Suivez les instructions sur le retrait et le nettoyage du filtre à la page 35.</li> </ul>
<i>Le chauffe-eau émet un signal sonore et l'écran affiche « FA-F8 »</i>	Il y a un problème avec la thermopompe.	<ul style="list-style-type: none"> <li>L'appareil passe automatiquement à un autre mode disponible pour assurer la fourniture d'eau chaude. Contactez immédiatement le service après-vente pour leur donner les codes affichés à l'écran.</li> </ul>
<i>Le chauffe-eau émet un signal sonore et l'écran affiche un code d'erreur</i>	Il y a un problème avec le chauffe-eau qui exige une action immédiate	<ul style="list-style-type: none"> <li>Le chauffe-eau passera peut-être à un autre mode de chauffage de l'eau. Contactez immédiatement le service après-vente. Pour interrompre le signal sonore (sauf pour codes d'erreur F2, F-11 ou bAdLinE), appuyez sur l'une des flèches vers le haut ou le bas et le signal s'arrêtera et l'afficheur retournera à la normale (réglage température).</li> </ul>
<i>Le chauffe-eau émet un signal sonore et l'écran affiche un code "bAd linE"</i>	L'appareil ne reçoit pas de 240V AC comme prévu.	<ul style="list-style-type: none"> <li>Coupez l'alimentation électrique du chauffe-eau (généralement au niveau du disjoncteur). Ensuite, lisez la section « Raccordements électriques » des instructions d'installation en page 40. Puis, contactez l'installateur pour vérifier l'alimentation électrique du chauffe-eau.</li> </ul>
<i>Le chauffe-eau dégage une odeur d'œufs pourris ou de soufre</i>	Certaines eaux avec une concentration élevée de soufre réagissent avec la tige d'anode qui est présente dans tous les chauffe-eau pour la protection contre la corrosion du réservoir.	<ul style="list-style-type: none"> <li>L'odeur peut être réduite ou éliminée dans la plupart des chauffe-eau en remplaçant la tige d'anode avec une tige en un matériau moins réactif. Dans certains cas, une étape supplémentaire de chloration du chauffe-eau et de toutes les tuyauteries d'eau chaude peut être nécessaire. Contactez votre compagnie des eaux locale ou un plombier pour connaître les options qui s'offrent à vous ainsi que des instructions. Appelez GE au 1.888.4GE.HEWH (1.888.443.4394) pour savoir où acheter cette anode de remplacement. Un réparateur qualifié ou un plombier doit effectuer ce remplacement. L'utilisation d'une tige d'anode non approuvée par GE, ou l'utilisation du chauffe-eau sans une tige d'anode approuvée par GE ANNULE la garantie.</li> </ul>
<i>L'appareil n'émet pas les bruits habituels</i>	Si l'appareil utilise les résistances électriques, le ventilateur et le compresseur ne feront pas de bruit sounds.	<ul style="list-style-type: none"> <li>Vérifiez le mode de fonctionnement.</li> </ul>

Pour obtenir un service, appelez le 1.888.4GE.HEWH (1.888.443.4394.)



Code d'erreur affiché	Condition	Action
FA	T4 n'augmente pas	Appelez un technicien
FB	Temp. sortie instable	Appelez un technicien
FC	Évaporateur givré	Appelez un technicien
FD	Surchauffe trop faible	Appelez un technicien
FE	Température de sortie au dessus de la limite	Appelez un technicien
FF	Détendeur électronique hors des	Appelez un technicien
FG*	Vérification temp. ambiante T5	Données du technicien en réparation
FH*	Test de charge du compresseur	Données du technicien en réparation
FI*	Test de fuite de réfrigérant	Appelez un technicien
F2	T2 Panne de la sonde thermique du réservoir	Appelez un technicien
F3	Panne de compresseur	Appelez un technicien
F4	Panne de ventilateur	Appelez un technicien
F5	Panne du capteur T3a (température d'entrée de l'évaporateur)	Appelez un technicien
F6	Panne du capteur T3b (température d'entrée de l'évaporateur)	Appelez un technicien
F7	Panne du capteur T4 (sortie du compresseur)	Appelez un technicien
F8	Panne du capteur T5 (température ambiante)	Appelez un technicien
F9	Panne d'élément chauffant inférieur	Appelez un technicien
F10	Panne d'élément chauffant supérieur	Appelez un technicien
F11	Erreur Réservoir à sec	Consultez la page 40
bAd linE (F12)	La tension est trop basse au démarrage	Consultez la page 40
F13	Erreur Touche Bloquée	Appelez un technicien
Dirty Filter (F14)	Le filtre est sale	Appelez un technicien
F15	Erreur DataFlash	Voir page 35

\* Certains modèles

# Garantie du chauffe-eau hybride GE.



Toutes les réparations sur garantie sont fournies par notre Réseau de service autorisé. Pour planifier une visite de service, appelez le 888.4GE.HEWH (888.443.4394). Veuillez avoir le numéro de série et le numéro de modèle sous la main lorsque vous appelez le service de réparation.

Agrafez le reçu d'achat ici. Pour obtenir le service sous garantie, vous devrez fournir la preuve de l'achat original.

## Pour la période d': Nous remplacerons:

<b>Un An</b> À partir de la date d'achat initiale	<b>Toute pièce</b> du Chauffe-Eau Hybride qui ne fonctionne pas à cause d'un vice de matériau ou de main-d'œuvre Pendant la validité de la présente <b>garantie limitée d'un an</b> , GE fournira également gratuitement la main-d'œuvre et le service sur place pour réparer la pièce défectueuse.
<b>De la Deuxième à la Dixième année</b> À partir de la date d'achat initiale	<b>Toute pièce</b> du Chauffe-Eau Hybride qui ne fonctionne pas à cause d'un vice de matériau ou de main-d'œuvre. Pendant cette <b>garantie limitée de dix ans</b> sur les pièces, la main-d'œuvre et le service liés au remplacement de la pièce défectueuse ne sont pas inclus.

## Ce qui n'est pas compris:

- Les déplacements à votre domicile pour vous expliquer l'utilisation de ce produit.
- Une installation, livraison ou maintenance défectueuse.
- Une panne du produit par abus d'utilisation, par mauvaise utilisation, par modification, par utilisation commerciale ou s'il a été utilisé dans un but autre que celui pour lequel il a été fabriqué.
- L'utilisation de ce produit avec une eau microbiologiquement insalubre ou de qualité inconnue sans désinfection adéquate en amont ou en aval du système.
- Le remplacement des fusibles ou le réenclenchement du disjoncteur du domicile.
- Tout dommage causé par accident, par la foudre, par un incendie, par inondation ou par une catastrophe naturelle.
- Les dommages directs et indirects, causés par des défaillances possibles de l'appareil, de son installation ou de sa réparation.
- Tout produit auquel il n'est pas possible d'accéder pour effectuer les réparations nécessaires. Les installations dans un grenier nécessitent un plancher approprié et un accès par des escaliers.
- Si le produit est retiré de son emplacement original.
- Les dommages, les dysfonctionnements ou les pannes causés par l'utilisation d'un service de réparation non approuvé par GE.
- Les dommages, les dysfonctionnements ou les pannes causés par l'utilisation de pièces ou de composants non autorisés.
- Consommation et remplacement de la tige d'anode.
- Les dommages, les dysfonctionnements ou les pannes causés par l'utilisation du chauffe-eau à thermopompe sans tige d'anode.
- Les dommages, les dysfonctionnements ou les pannes causés par l'utilisation de la thermopompe avec un réservoir vide ou partiellement vide.
- Les dommages, les dysfonctionnements ou les pannes causés par des pressions dans le réservoir supérieures à celles indiquées sur la plaque signalétique.
- Les dommages, les dysfonctionnements ou les pannes causés par l'utilisation du chauffe-eau à thermopompe avec des tensions dépassant les tensions inscrites sur la plaque signalétique
- Une défaillance du chauffe-eau en raison de l'utilisation de l'appareil dans une atmosphère corrosive.

**EXCLUSION DE GARANTIES IMPLICITES – Votre seul et unique recours est la réparation du produit selon les dispositions de cette Garantie limitée. Toutes les garanties implicites, incluant les garanties de commercialité et d'adéquation à un usage spécifique, sont limitées à une année ou à la période la plus courte autorisée par la législation.**

Cette garantie s'étend à l'acheteur initial et à tout propriétaire ultérieur pour les appareils achetés pour un usage au Canada ou aux États-Unis. Si le produit est installé dans une région où ne se trouve aucun réparateur autorisé GE, vous devrez peut-être assumer les frais de transport ou apporter/expédier le produit à un centre de service autorisé GE. En Alaska, cette garantie exclut le coût d'expédition ou les appels de service à votre site.

Certains États ou provinces n'autorisent pas l'exclusion ou la restriction des dommages directs ou indirects. La présente garantie vous donne des droits juridiques particuliers, mais vous pouvez avoir d'autres droits qui varient d'un État ou d'une province à l'autre. Pour connaître vos droits, appelez le bureau de la protection du consommateur de votre localité, de votre État ou de votre province ou le procureur général de votre État.

*En cas de produit acheté en dehors des États-Unis, contacter le lieu d'achat pour des renseignements de réparation et de garantie.*

Garant pour les produits achetés aux États-Unis : General Electric Company, Louisville, KY 40225.

## Soutien au consommateur.

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### *Site Web appareils électroménagers GE* [www.electromenagersge.ca](http://www.electromenagersge.ca)

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Vous avez une question ou vous avez besoin d'aide pour votre appareil électroménager? Contactez-nous par Internet au site [www.electromenagersge.ca](http://www.electromenagersge.ca) 24 heures par jour, tous les jours de l'année.



### *Service de réparations*

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**1.800.561.3344**

Service de réparations GE est tout près de vous.  
Pour faire réparer votre électroménager GE, il suffit de nous téléphoner.



### *Studio de conception réaliste*

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Sur demande, GE peut fournir une brochure sur l'aménagement d'une cuisine pour les personnes à mobilité réduite.

Écrivez: Directeur, Relations avec les consommateurs, Mabe Canada Inc.  
Bureau 310, 1 Factory Lane  
Moncton, N.B. E1C 9M3

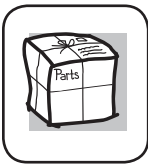


### *Prolongation de garantie*

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[www.electromenagersge.ca](http://www.electromenagersge.ca)

Achetez un contrat d'entretien GE avant que votre garantie n'expire et bénéficiez d'un rabais substantiel. Ainsi le service après-vente GE sera toujours là après expiration de la garantie.  
Visitez notre site Web ou appelez-nous au 1.888.261.2133.



### *Pièces et accessoires*

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Ceux qui désirent réparer eux-mêmes leurs électroménagers peuvent recevoir pièces et accessoires directement à la maison (cartes VISA, MasterCard et Discover acceptées).

**Les directives stipulées dans le présent manuel peuvent être effectuées par n'importe quel utilisateur. Les autres réparations doivent généralement être effectuées par un technicien qualifié. Soyez prudent, car une réparation inadéquate peut affecter le fonctionnement sécuritaire de l'appareil.**

Vous trouverez dans les pages jaunes de votre annuaire le numéro du Centre de service Mabe le plus proche. Autrement, appelez-nous au 1.800.661.1616.



### *Contactez-nous*

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Si vous n'êtes pas satisfait du service après-vente dont vous avez bénéficié :

**Premièrement**, communiquez avec les gens qui ont réparé votre appareil.

**Ensuite**, si vous n'êtes toujours pas satisfait envoyez tous les détails—numéro de téléphone compris—au  
Directeur, Relations avec les consommateurs, Mabe Canada Inc.  
Bureau 310, 1 Factory Lane  
Moncton, N.B. E1C 9M3



### *Inscrivez votre appareil électroménager* [www.electromenagersge.ca](http://www.electromenagersge.ca)

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Inscrivez votre appareil électroménager en direct, aussitôt que possible. Cela améliorera nos communications et notre service après-vente. Vous pouvez également nous envoyer par la poste le formulaire d'inscription joint à votre documentation.

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*Escriba los números de modelo  
y de serie aquí:*

*Modelo #* \_\_\_\_\_

*Serie #* \_\_\_\_\_

Los podrá encontrar en la etiqueta de  
detalles técnicos en la parte frontal de  
su calentador de agua.

# INFORMACIÓN IMPORTANTE DE SEGURIDAD. LEA TODAS LAS INSTRUCCIONES ANTES DE USAR.

GEAppliances.com

## ⚠ ¡ADVERTENCIA!

Para su seguridad, siga las instrucciones de este manual a fin de minimizar riesgos de incendio o explosión, descargas eléctricas, o para evitar daños en su propiedad, lesiones personales o la muerte.

Asegúrese de leer y entender el Manual del Propietario en su totalidad antes de intentar instalar o usar este calentador de agua. Es posible que le ahorre tiempo y gastos. Preste especial atención a las Instrucciones de Seguridad. Si no se siguen estas advertencias, se podrán producir lesiones graves o la muerte. En caso de tener problemas para entender las instrucciones de este manual, o si desea realizar alguna pregunta, DETÉNGASE y solicite ayuda a un técnico del servicio calificado o al servicio eléctrico local.

## AJUSTE DE LA TEMPERATURA DEL AGUA

La seguridad y conservación de la energía son factores que se deben tener en consideración al seleccionar la configuración de la temperatura del agua a través de la interface del usuario del calentador de agua. Las temperaturas del agua superiores a los 125° F puede ocasionar quemaduras graves o la muerte por quemaduras. Asegúrese de leer y seguir las advertencias detalladas en la etiqueta que aparece a continuación. Esta etiqueta también está ubicada en el calentador de agua, cerca de la parte superior del tanque.

**⚠ PELIGRO**



**CALIENTE**

**QUEMADURAS**

**Las temperaturas de agua superiores a 125°F pueden provocar quemaduras graves en forma instantánea o la muerte por quemaduras.**

**La configuración del control electrónico de temperatura normalmente aproxima la temperatura del agua de grifo. Sin embargo, ciertos factores pueden hacer que la temperatura alcance los 160°F a pesar de la configuración del control. Siempre pruebe el agua antes de bañarse o ducharse.**

**Los niños, los discapacitados y las personas mayores corren un riesgo mayor de sufrir una quemadura.**

**Consulte el manual de instrucciones antes de configurar la temperatura del calentador de agua.**

**Pruebe el agua antes de bañarse o ducharse.**

**Se encuentran disponibles válvulas limitadoras de temperatura; consulte el manual.**

Están disponibles válvulas mezcladoras para reducir la temperatura del agua en el lugar de uso, las cuales mezclan agua caliente y fría en las líneas de agua derivadas. Para más información, comuníquese con un plomero matriculado o con la autoridad de plomería local.

### Relación de Tiempo/ Temperatura en Quemaduras

Temperatura	Tiempo para Producir una Quemadura Grave
120°F (49°C)	Más de 5 minutos
125°F (52°C)	1-1/2 a 2 minutos
130°F (54°C)	Aproximadamente 30 segundos
135°F (57°C)	Aproximadamente 10 segundos
140°F (60°C)	Menos de 5 segundos
145°F (63°C)	Menos de 3 segundos
150°F (66°C)	Aproximadamente 1-1/2 segundos
155°F (68°C)	Aproximadamente 1 segundo

La tabla es cortesía de Shriners Burn Institute

El cuadro que se muestra a continuación podrá ser usado como guía para determinar la temperatura del agua apropiada para su hogar.

El termostato fue configurado en la fábrica a 120° F (49° C) a fin de reducir el riesgo de lesiones por quemaduras.

**NOTA:** Los hogares donde haya niños pequeños, personas incapacitadas o mayores podrán requerir una configuración del termostato de 120° F (49° C) o inferior, a fin de evitar el contacto con el agua "CALIENTE".

**⚠ PELIGRO:** Existe la posibilidad de que se produzca una QUEMADURA con Agua Caliente si el control de temperatura del agua está configurado demasiado alto.

**GUARDE ESTAS INSTRUCCIONES**

## **INFORMACIÓN IMPORTANTE DE SEGURIDAD. LEA TODAS LAS INSTRUCCIONES ANTES DE USAR.**

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### **⚠ ¡PRECAUCIÓN!**

**Riesgo de incendio** - Se puede producir *gas hidrógeno* en un sistema de agua caliente abastecido por este calentador de agua, el cual fue usado por un período de tiempo prolongado (generalmente dos semanas o más). ¡EL GAS HIDRÓGENO ES EXTREMADAMENTE INFLAMABLE! Para disipar dicho gas y reducir el riesgo de lesiones, se recomienda que el grifo de agua caliente quede abierto durante varios minutos en el lavabo de la cocina, antes de usar cualquier artefacto eléctrico conectado al sistema de agua caliente. Si hay hidrógeno presente, habrá un sonido atípico tal como aire que escapa a través de la tubería cuando el agua comience a circular. No fume ni encienda una llama cerca del grifo en el momento en que éste se abra.

### **⚠ ¡ADVERTENCIA!**

**Riesgo de Incendio** - No guarde ni use gasolina u otros vapores inflamables y líquidos cerca de éste ni de otros electrodomésticos. Mantenga los tapetes y otros materiales combustibles alejados.

### **⚠ PARA INSTALACIONES EN EL ESTADO DE CALIFORNIA**

La Ley de California requiere que los calentadores de agua residenciales sean sujetos, apuntalados o amarrados a fin de resistir caídas o desplazamientos horizontales debido a movimientos por terremotos. Para los calentadores de agua residenciales de hasta 52 galones (236.4 L) de capacidad, se podrá acceder a un catálogo con instrucciones genéricas para sujeción en caso de terremoto en: Office of the State Architect (Oficina del Arquitecto Estatal), 400 P Street, Sacramento, CA 95814 o se puede comunicar al 916.324.5315 o solicitar la asistencia de un vendedor de calentadores de agua.

Los códigos locales aplicables siempre determinarán la instalación. Para calentadores de agua residenciales de una capacidad superior a 52 galones (236.4 L) consulte sobre procedimientos de sujeción aceptables en la jurisdicción de construcción local .

Advertencia de la Proposición 65 de California: Este producto contiene químicos que el Estado de California entiende que producen cáncer, defectos en el nacimiento u otros daños reproductivos.

# INFORMACIÓN IMPORTANTE DE SEGURIDAD. LEA TODAS LAS INSTRUCCIONES ANTES DE USAR.

GEAppliances.com

## **⚠ ADVERTENCIA:**

*Apague el suministro de energía del calentador de agua si éste sufrió daños físicos o una inundación.*

No utilice el calentador de agua nuevamente hasta que haya sido controlado en su totalidad por personal calificado del servicio técnico.

## *Precauciones de Seguridad*

A. *Apague* el suministro de energía del calentador de agua si éste sufrió un sobrecalentamiento, incendio, inundación o daño físico.

B. *No* encienda el calentador de agua a menos que esté lleno de agua.

C. *No* encienda el calentador de agua si la válvula de cierre del suministro de agua fría está cerrada.

**NOTA: Podrán ser emitidos vapores inflamables por Corrientes de aire en áreas circundantes al calentador de agua.**

D. En caso de existir dificultad para entender o seguir las Instrucciones de Funcionamiento o la sección de Cuidado y Limpieza, se recomienda que una persona calificada o personal del servicio técnico realicen el trabajo.

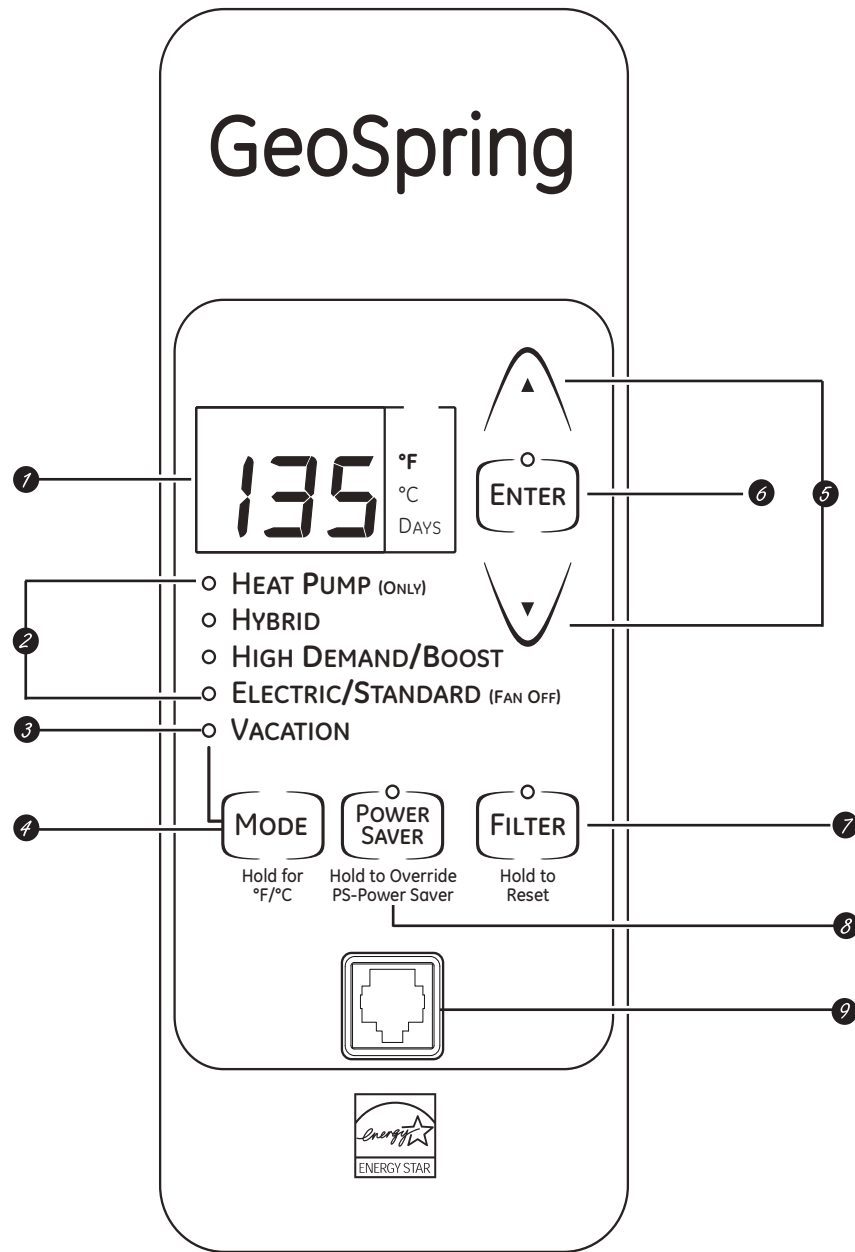
## *Controles de Seguridad*

El calentador de agua está equipado con un control de límite de temperatura (TCO) que está ubicado sobre el elemento de calentamiento en contacto con la superficie del tanque. Si por alguna razón la temperatura del agua se vuelve excesivamente alta, el control de límite de temperatura interrumpe el circuito de energía hacia el elemento de calentamiento. Una vez que el control se abre, debe ser reiniciado de forma manual. El reinicio de los controles de límite de temperatura deberán ser realizados por un técnico calificado del servicio.

**⚠ PRECAUCIÓN:** *La causa de la condición de temperatura alta deberá ser investigada por un técnico calificado del servicio o se deberá realizar una acción correctiva antes de volver a poner en uso el calentador de agua.*

## *Para reiniciar el control de límite de temperatura:*

1. Apague la corriente del calentador de agua.
2. Retire el panel(es) de acceso y el aislante del revestimiento. La tapa protectora del termostato deberá ser retirada.
3. Presione el botón rojo de REINICIO.
4. Reemplace el panel(es) de acceso y el aislante del revestimiento antes de encender la corriente del calentador de agua.



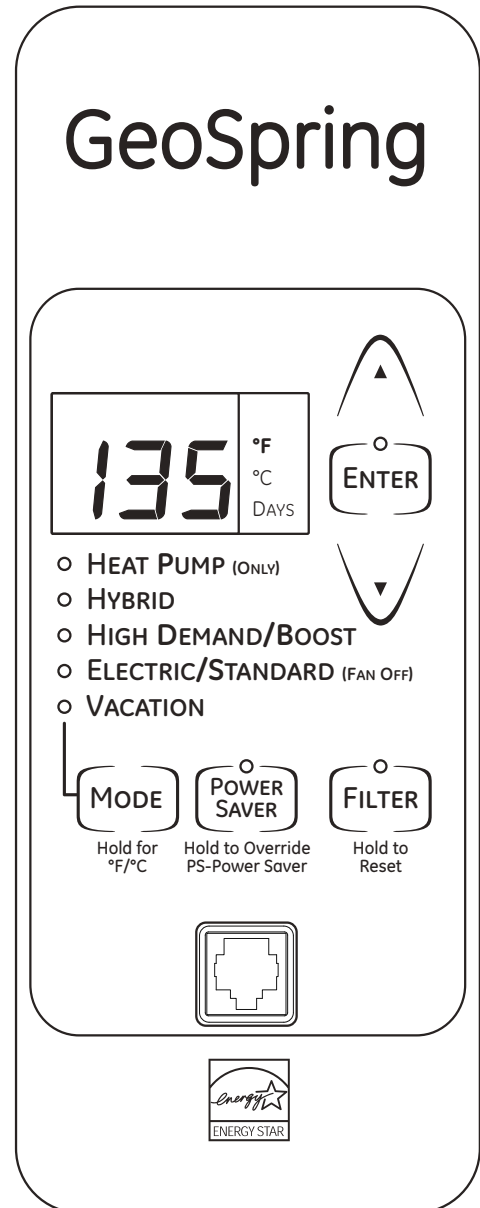
## Controles Funciones

- 1 Pantalla**
- 2 Modos de Funcionamiento**  
(Para acceder a una descripción, consulte la página 8)
- 3 Vacaciones**  
(Para acceder a una descripción, consulte la página 8)
- 4 Selector de Modo**  
Use este botón para alternar entre los modos disponibles.
- 5 Teclas con Flechas**  
Use este botón para ajustar la configuración de temperatura
- 6 Tecla de Ingreso**
- 7 Reinicio del Filtro**  
El filtro está sucio y requiere una limpieza cuando la luz Roja está iluminada. El filtro está ubicado en la parte superior del calentador de agua. Mantenga presionado el botón durante 5 segundos para reiniciar la alarma del filtro.
- 8 Anulación del Ahorro de Energía**  
Para uso con el módulo ACM. Mantenga presionado para anular el modo de Ahorro de Energía en la unidad. Una vez presionado y cuando se haya cancelado el modo de Ahorro de Energía, la unidad permanecerá sin Ahorro de Energía por las siguientes 18 horas.
- 9 Puerto del Módulo de Comunicación del Artefacto**  
Para uso con un módulo ACM opcional (para más detalles, consulte la página 10).



Esta unidad no cuenta con un botón de encendido. Una vez que el calentador de agua es enchufado y haya suministro de corriente, estará encendido. La pantalla mostrará la configuración actual de la temperatura del agua. El modo de funcionamiento actual del calentador de agua aparecerá iluminado.

Para cumplir con las regulaciones de seguridad, los controles están preconfigurados de fábrica en 120° F (49° C) y en Hybrid Mode (Modo Híbrido). Se recomienda que la unidad esté configurada en Heat Pump (only) (Bomba de Calentamiento solamente), a fin de maximizar el ahorro de energía. El funcionamiento en Hybrid Mode (Modo Híbrido) brinda equilibrio en el ahorro de energía y en el uso conveniente del agua caliente. El consumo de energía informado está basado en el funcionamiento de la unidad en Hybrid Mode (Modo Híbrido) en una configuración de temperatura de 135° F (57° C), y el funcionamiento en configuraciones de temperatura baja o en el modo Heat Pump (only) (Bomba de Calentamiento solamente) brindarán incluso mayores ahorros de energía.



## Acerca de la configuración de la temperatura del agua.

### Posición de Ajuste de Temperatura:

La seguridad, la conservación de la energía y la capacidad del agua caliente son factores que se deben considerar al seleccionar la configuración de la temperatura del agua caliente en el calentador de agua. A fin de cumplir con las regulaciones de seguridad, la posición de ajuste de temperatura del agua está configurada previamente en la fábrica a 120° F (49° C). Ésta es la configuración de temperatura inicial recomendada.

**NOTA:** De acuerdo con el US Dept of Energy (Departamento de Energía de EE.UU.), el calentador de agua residencial promedio en EE.UU. está configurado en 135° F (57° C). Las indicaciones de ahorro de Energía del Calentador de Agua Híbrido GE GeoSpring™ Hybrid están basadas en una configuración de temperatura de 135°F (57°C). La posición de ajuste de temperatura del agua puede ser elevada con relación a la configuración de fábrica de 120° F a 135° F (49° C a 57° C), sin sacrificar los ahorros de energía indicados. Si se usa una configuración de temperatura inferior a 135° F (57° C), se podrán lograr mayores ahorros de energía y de costos operativos.

Consulte "Para Ajustar la Temperatura" sección a continuación para cambiar la temperatura del calentador de agua.

### Capacidad del agua caliente:

Si se desea una mayor capacidad de agua caliente, incrementar la temperatura de 120° F a 135° F (49° a 57° C) permitirá que el mismo tanque de agua caliente dure aproximadamente un 25% más, ya que mayor cantidad de agua fría es mezclada en la ducha o grifo.

### Relación de Tiempo/ Temperatura en Quemaduras

Temperatura	Tiempo para Producir una Quemadura Grave
49°C (120°F)	Más de 5 minutos
52°C (125°F)	1-1/2 a 2 minutos
44°C (130°F)	Aproximadamente 30 segundos
57°C (135°F)	Aproximadamente 10 segundos
60°C (140°F)	Menos de 5 segundos
63°C (145°F)	Menos de 3 segundos
66°C (150°F)	Aproximadamente 1-1/2 segundos
68°C (155°F)	Aproximadamente 1 segundo

La tabla es cortesía de Shriners Burn Institute

### Recordatorio de Riesgo de Quemaduras:

Las temperaturas con agua superiores a los 125° F pueden ocasionar quemaduras graves o la muerte por quemaduras. Asegúrese de leer y seguir las advertencias detalladas en este manual y en la etiqueta del calentador de agua. Esta etiqueta está ubicada en el calentador de agua, cerca del panel de acceso del elemento superior.

Consulte "Relación de Tiempo/ Temperatura en Quemaduras" a continuación como guía para determinar la temperatura apropiada del agua para su hogar.

### Válvulas de mezcla:

Están disponibles válvulas mezcladoras para reducir la temperatura del agua en el lugar de uso, las cuales mezclan agua caliente y fría en las líneas de agua derivadas. Para más información, comuníquese con un plomero matriculado o con la autoridad de plomería local.

**⚠ PELIGRO:** Existe la posibilidad de que se produzca una quemadura con agua caliente si la temperatura del agua es demasiado alta. Los hogares donde haya niños pequeños, personas incapacitadas o mayores podrán requerir una configuración del termostato de 120° F (49° C) o inferior, a fin de evitar el contacto con el agua CALIENTE.

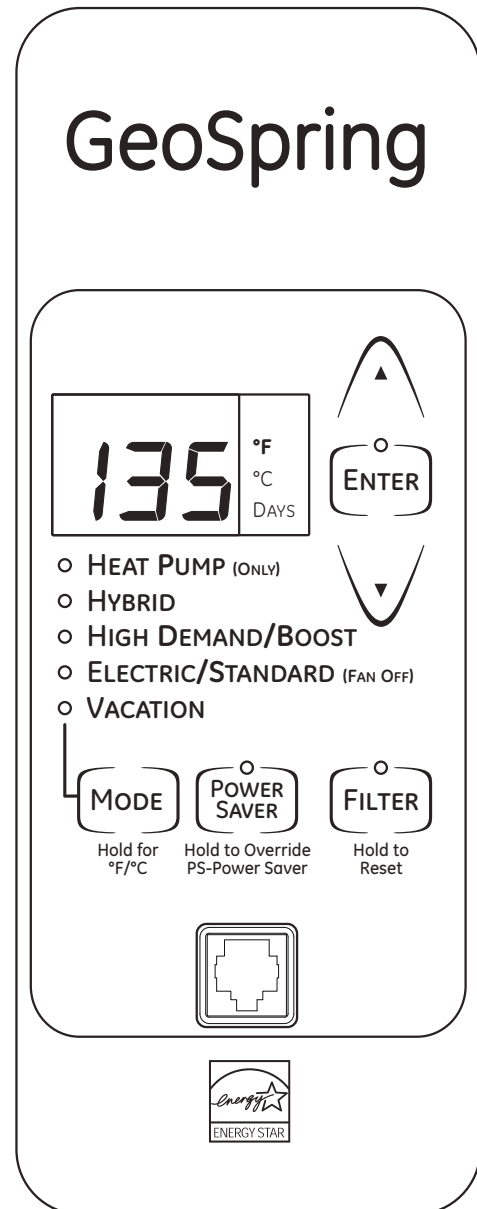
### Para Ajustar la Temperatura

Siga estos pasos:

1. Presione la flecha hacia ARRIBA o ABAJO en la tecla del panel de control hasta la temperatura deseada.
2. Presione ENTER (Ingresar) para aceptar la nueva configuración.

**Nota:** Para cambiar de °F a °C, mantenga presionada la tecla MODE (Modo).

**⚠ PELIGRO:** Existe la posibilidad de que se produzca una quemadura con Agua Caliente si la temperatura del agua está configurada demasiado alta. Se recomienda un punto de ajuste de temperatura del agua de 120°F (49°C), pero podrá ser ajustado a cualquier temperatura entre 100°F y 140°F (38°C y 60°C).



Este calentador de agua funciona por defecto en el modo de funcionamiento Híbrido. Los modos disponibles figuran a continuación y pueden ser seleccionados usando el botón MODE (Modo).

### **Modo Heat Pump (only) (Bomba de Calentamiento solamente)**—RECOMENDADO PARA UN MÁXIMO AHORRO

Heat Pump (only) (Bomba de Calentamiento solamente) es el modo más eficiente de uso de la energía en este calentador de agua. Toma calor del aire circundante para calentar el agua. El tiempo que toma calentar es agua es más prolongado en este modo, de manera que podrá no ser suficiente si tiene una situación de alta demanda tal como un hogar o empresa grande.

### **Modo Híbrido**

Hybrid Mode (Modo Híbrido) combina la eficiencia de la energía de la Bomba de Calentamiento (solamente) con la velocidad y energía de recuperación del modo Electric (Fan off)/ Standard (Fan off) (Eléctrico con ventilador apagado/ Estándar con ventilador apagado) en la mayoría de las situaciones de uso del agua. Hybrid Mode (Modo Híbrido) permitirá que la unidad funcione como un calentador de agua eléctrico estándar, mientras brinda significativos ahorros de energía.

**NOTA:** El rendimiento de la unidad, el consumo y ahorro de energía informados están basados en el funcionamiento en Hybrid Mode (Modo Híbrido) en una configuración de temperatura de 135° F (57° C).

### **Alta Demanda/ Incremento**

Este modo puede ser necesario si el uso de agua en su hogar supera el nivel promedio o si el rendimiento de la unidad es inferior a las demandas de agua de su hogar. En este modo, la unidad usará los elementos de calentamiento eléctricos sólo cuando el nivel de demanda de agua sea alto. Al usar los elementos de calentamiento, la temperatura del agua se recuperará en un nivel más alto pero usará más energía para calentar la misma. A diferencia del modo Eléctrico/ Estándar (Ventilador apagado), éste usará los elementos de calefacción sólo cuando sea necesario, y usará la bomba de calentamiento cuando los niveles de demanda de agua sean inferiores.

**NOTA:** La diferencia entre Hybrid Mode (Modo Híbrido) y Alta Demanda/ Incremento es que en este último los elementos de resistencia del calor son activados antes que en el Modo Híbrido.

### **Modo Eléctrico/ Estándar (Ventilador apagado)**

Este modo utiliza sólo los elementos de resistencia de calor superior e inferior para calentar el agua. El tiempo que toma calentar el agua es inferior en este modo, pero es el modo de MENOR eficiencia de energía.

**NOTA:** En este modo, la luz de LED verde titilará luego de 48 horas como indicación de que la unidad no está funcionando en el modo de energía más eficiente. La unidad continuará operando en este modo y no indica un problema de funcionamiento.

### **Vacaciones**

Esta función es usada cuando estará fuera del hogar por un período de tiempo prolongado y el agua caliente no es necesaria. En este modo, la unidad hará que la temperatura del agua descienda a 50° F (10° C) y usará el modo de calentamiento más eficiente para conservar la energía mientras el calentador queda en desuso. La unidad reiniciará el calentamiento de forma automática un día antes de su regreso, de modo que haya agua caliente disponible.

Por ejemplo: si estará fuera durante 14 días, siga estos pasos:

1. Seleccione VACATION (Vacaciones) utilizando el botón Mode (modo).
2. Ingrese el total de días que no estará (en este ejemplo, 14) presionando el botón con la flecha hacia ARRIBA (por omisión es 7 días).
3. Presione ENTER (Ingresar).

La unidad hará que la temperatura del agua descienda a 50° F (10° C) por un día menos que aquellos que no estará (en este ejemplo: por 13 días). Al final del día antes de su regreso (en este ejemplo, el día 13°), automáticamente regresará al modo de funcionamiento previo y calentará el agua en la configuración de temperatura original, de modo que haya agua disponible cuando regrese.

### **Para acceder a cualquiera de estos modos::**

1. Presione el botón MODE (Modo) en el control hasta el modo de funcionamiento deseado.
2. La luz verde estará iluminada en el modo elegido.

## Preguntas Frecuentes.

---

### Filtro:

P: ¿Por qué hay un filtro?

R: En los modos Híbrido y Bomba de Calentamiento (solamente), la unidad mueve aire a través del sistema. El filtro protege la unidad de la suciedad. El filtro de aire limpio mejora el rendimiento.

P: ¿Cómo se limpia el filtro?

R: Deje el encendido activado y retire el filtro de la parte superior de la unidad. El filtro puede ser aspirado o enjuagado con agua tibia. ¡Un filtro sucio reducirá el rendimiento del agua caliente!

### Modos:

P: ¿Qué es Bomba de Calentamiento (solamente)?

R: Bomba de Calentamiento (solamente) es el modo más eficiente. Toma calor del aire para calentar el agua, por consiguiente enfriando el aire circundante. Recuperación más lenta pero modo más eficiente.

P: ¿Qué es Híbrido?

R: El modo Híbrido combina beneficios de la Bomba de Calentamiento (solamente) con la velocidad y energía del modo Eléctrico Estándar. Esto brinda gran rendimiento con menor cantidad de energía.

P: ¿Qué es Alta Demanda/ Incremento?

R: Alta Demanda/ Incremento se puede utilizar cuando el uso de agua caliente sea superior al normal. La unidad será menos eficiente pero calentará agua más rápido en respuesta a entregas de agua prolongadas. Para todas las entregas normales, la unidad aún usará la Bomba de Calentamiento eficiente la mayor parte del tiempo.

P: ¿Qué es el modo Vacaciones?

R: Si no estará por un período prolongado, este modo reduce la temperatura del agua a fin de reducir la energía usada. La unidad cambiará al modo previo un día antes de su regreso.

P: ¿Qué es Eléctrico/ Estándar (Ventilador apagado)?

R: El modo Eléctrico/ Estándar (Ventilador Apagado) usa solamente la resistencia para calentar el agua. Esto brinda una recuperación de agua caliente más rápida que el modo Híbrido, pero usa más energía. Este modo funciona sin el ventilador, deteniendo el aire frío normalmente descargado durante el funcionamiento de la bomba de calentamiento.

P: ¿Por qué titila el LED verde Eléctrico/ Estándar (Ventilador apagado)?

R: En este modo, la luz LED verde titilará luego de 48 horas como indicación de que la unidad no está funcionando en el modo de energía más eficiente

### Funcionamiento:

P: ¿Por qué puedo escuchar la unidad funcionar?

R: En los modos de mayor eficiencia de la energía, Heat Pump (only) (Bomba de Calentamiento solamente), y High Demand/ Boost (Alta Demanda/ Incrementar), el método utilizado para calentar el agua usa un ventilador que se puede escuchar mientras funciona.

P: La bomba de calentamiento no está funcionando durante el período de tiempo normal. ¿Qué ocasiona esto?

R: Bajo ciertas condiciones, el Calentador de Agua Híbrido GeoSpring™ funcionará usando los elementos eléctricos en lugar de la bomba de calentamiento, a fin de proteger la unidad y asegurar que usted cuente con agua caliente. Estas condiciones incluyen una temperatura ambiente extremadamente fría (<45° F), temperatura ambiente extremadamente caliente (<120° F), o condiciones con nivel de voltaje muy bajo. La unidad regresará al funcionamiento normal cuando las condiciones lo permitan

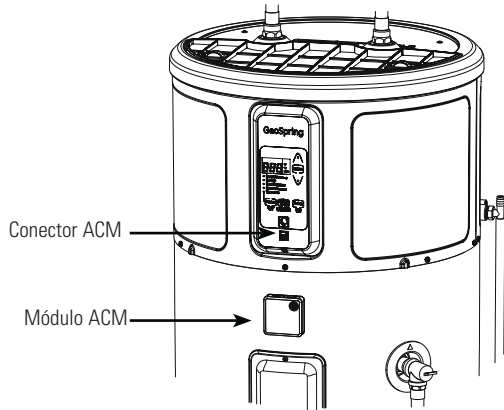
El calentador de agua Híbrido Eléctrico con bomba de calentamiento es compatible con *el módulo de comunicación del Artefacto Inteligente de GE*, el cual puede ser adquirido en forma aparte. Comuníquese con su servicio local o visite [www.GEAppliances.com/Smart-Appliance](http://www.GEAppliances.com/Smart-Appliance) para verificar si en su área se está utilizando la tecnología *ACM*. Aplicar el ACM permite que la unidad responda a señales del servicio o que se adhiera a una red hogareña.

Las siguientes características de respuesta a demandas podrán estar disponibles como parte de un programa de evaluación piloto, donde la compañía local de servicios públicos ayuda a los consumidores a reducir el riesgo de picos de electricidad en el uso hogareño.

### INSTALACIÓN

El módulo ACM está equipado con imanes en la base del módulo, los cuales permitirán que esté adherido al exterior metálico pintado del calentador de agua de la bomba de calentamiento.

Los detalles sobre cómo conectar los cables al módulo se encuentran en las instrucciones incluidas con el módulo.



Una vez que el cable del módulo ACM está enchufado a la conexión del calentador de agua, siga las instrucciones de conexión incluidas con el módulo ACM. Tan pronto como el módulo ACM esté en funcionamiento, el calentador de agua de la bomba de calentamiento estará listo para recibir las señales de ACM.

### GUÍA RÁPIDA

Si su empresa local de servicios públicos está utilizando tecnología ACM, el módulo ACM recibirá las señales enviadas de su empresa de servicios públicos. Una de las cuatro señales será enviada:

- “Bajo” (representa el nivel de costo de energía más bajo disponible)
- “Medio” (representa el nivel de costo de energía incrementado)
- “Alto” (representa el nivel de costo de energía incrementado)
- “Crítico” (representa el nivel de costo de energía “pico”)

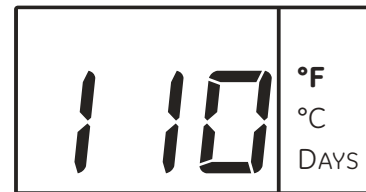
Un calentador de agua con bomba de calentamiento equipado con un módulo ACM reconocerá de forma automática qué nivel de costo de energía está disponible y ajustará su configuración de modo y temperatura, a fin de usar menos energía cuando los índices sean medio, alto y crítico. Cuando el calentador de agua de la bomba de calentamiento responde a estas señales, la luz de LED sobre el botón Power Saver (Ahorro de Energía) estará encendida, indicando que los períodos de precios de energía tienen efecto, y las letras PS aparecerán en la pantalla de LED si el usuario intenta cambiar la temperatura sin presionar primero el botón para anular Power Saver (Ahorro de Energía).

Cuando la señal esté baja o cuando no haya ningún módulo ACM conectado, la unidad funcionará normalmente. Los siguientes pasos muestran cómo la unidad reacciona a los niveles de señal Medio, Alto y Crítico.

Cuando la señal de ACM esté en *Medium (Medio)*, el control funcionará en el Modo Heat Pump (only) (Bomba de Calentamiento solamente) y la temperatura del agua permanecerá en la configuración de usuario normal. Si la configuración de temperatura actual del usuario es de 120° F, la pantalla exhibirá:



Cuando la señal ACM esté en *High (Alto)*, el control funcionará en Heat Pump (only) Bomba de Calentamiento solamente, con una configuración de temperatura del agua de 110° F (43° C) y en la pantalla se visualizará:



Cuando la señal ACM esté en *Critical (Crítico)*, el control funcionará en Heat Pump (only) (Bomba de Calentamiento solamente), con una configuración de temperatura del agua de 100° F (38° C) y en la pantalla se visualizará:



**Aviso:** La conexión ACM del artefacto cuenta con voltaje no compatible con computadoras o accesorios. NO enchufe laptops, modems, routers, etc. en el conector ACM del Electrodoméstico RJ45. Use sólo con los Accesorios del Artefacto de GE designados. La conexión a computadoras y accesorios podrá resultar en daños sobre el producto.

Cuando la unidad esté funcionando en medio, alto o crítico, la pantalla de LCD sobre el botón Power Saver (Ahorro de Energía) estará iluminada. Si en cualquier momento desea cambiar el punto de ajuste de la temperatura mientras la unidad se encuentra en el modo Power Saver (Ahorro de Energía), mantenga presionado el botón Ahorro de Energía para anular dicho modo; luego use los botones con flechas para cambiar a la configuración deseada. La anulación se aplicará durante 18 horas. Si intenta cambiar la temperatura sin anular la función de ahorro de energía, se visualizarán las letras PS en la pantalla, indicando que aún se encuentra en el modo de ahorro de energía.

## Cuidado y limpieza.

### Rutina de Mantenimiento Preventivo

**▲ PELIGRO:** Riesgo de quemaduras - Antes de utilizar manualmente la válvula de alivio, asegúrese de que nadie esté expuesto al peligro de tener contacto con el agua caliente liberada por la válvula. Es posible que el agua esté lo suficientemente caliente como para crear riesgo de quemaduras. El agua debería ser liberada a través de un drenaje adecuado, a fin de evitar lesiones o daños sobre la propiedad.

**NOTA:** Si la válvula de temperatura y liberación de presión en el calentador de agua caliente se descarga periódicamente, esto se podrá deber a la expansión térmica en un sistema de agua cerrado. Para obtener información sobre cómo corregir esto, comuníquese con un proveedor de agua o con un contratista de plomería. No enchufe la ficha de la válvula de alivio.

Si se mantiene correctamente, el calentador de agua brindará años de servicio sin problemas.

Se sugiere que el usuario establezca y siga un programa de mantenimiento preventivo en forma rutinaria.

#### Válvula de Temperatura y Alivio de Presión:

Por lo menos una vez al año, levante y libere la manija de la palanca de la válvula de temperatura y alivio de presión, ubicada en el área frontal derecha, a fin de asegurar que la válvula funcione libremente. Deje que corran varios galones a través de la línea de descarga hasta un drenaje abierto.

#### Inspección Periódica (una vez por año):

Incluso se recomienda una inspección periódica de los controles de funcionamiento, elementos de calentamiento y cableado por parte de personal calificado del servicio técnico en reparaciones del artefacto eléctrico.

La mayoría de los artefactos eléctricos, incluso cuando son nuevos, realizan ciertos sonidos cuando están en funcionamiento. Si el nivel de sonido de siseo o canto se incrementa de forma excesiva, es posible que se requiera una limpieza del elemento de calentamiento eléctrico. Comuníquese con un instalador o plomero calificado para que se realice una inspección.

#### Purga del Tanque:

El tanque de un calentador de agua puede funcionar como un depósito de sedimentación para sólidos suspendidos en el agua. Por lo tanto, no es extraño que se acumulen depósitos de agua dura en el fondo del tanque. Para eliminar dichos depósitos del tanque, siga estos pasos:

1. Adjunte una manguera de jardín a la válvula de drenaje ubicada en la parte inferior de la unidad y dirija dicha manguera hasta el drenaje.
2. Abra la válvula de drenaje con un destornillador plano.
3. Una vez que varios cuartos de agua hayan sido drenados, cierre la válvula de drenaje.

Esto debería ser realizado con el suministro de agua fría abierto, de modo que el agua eliminada a través de la válvula de drenaje sea reemplazada, y que el flujo del suministro de agua ayude a eliminar sedimentos.

### Drenaje del Calentador de Agua

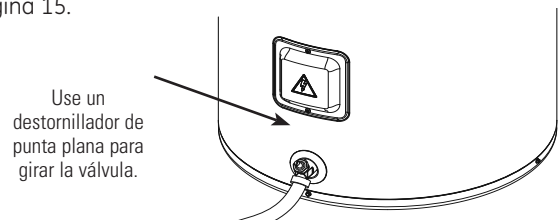
**▲ PRECAUCIÓN:** Riesgo de descarga - Cierre el encendido del calentador de agua antes de drenar el agua.

**▲ PELIGRO:** Riesgo de quemaduras - Antes de utilizar manualmente la válvula de alivio, asegúrese de que nadie esté expuesto al peligro de tener contacto con el agua caliente liberada por la válvula. El agua drenada del tanque podrá estar lo suficientemente caliente como para presentar un riesgo de quemadura y debería ser dirigida a un drenaje adecuado a fin de evitar lesiones o daños.

Para drenar el calentador de agua, siga estos pasos:

1. Adjunte una manguera de jardín a la válvula de drenaje ubicada en la parte inferior de la unidad y dirija dicha manguera hasta el drenaje.
2. Cierre el suministro de agua fría.
3. Permita el ingreso de aire al tanque abriendo un grifo de agua caliente o levantando la manija de la válvula de alivio.
4. Abra la válvula de drenaje con un destornillador plano.

Nota: Para conocer el diseño esquemático del producto, consulte la página 15.



### Opciones de Períodos de Cierre Extendidos o Vacaciones que Superan el Modo de Vacaciones

Si el calentador de agua permanecerá inactivo por un período de tiempo extendido, el encendido y el agua hacia el electrodoméstico deberían ser apagados para conservar la energía y evitar la acumulación de gas hidrógeno peligroso. La unidad no cuenta con un botón de encendido; sólo puede ser apagada con el disyuntor o la ficha de desconexión.

El calentador de agua y la tubería deberían ser drenados en caso de que pudieran estar sujetas a temperaturas bajo cero.

Luego de un período de cierre prolongado, el funcionamiento y los controles del calentador de agua deberían ser controlados

por personal calificado del servicio técnico. Asegúrese de que el calentador de agua se llene en su totalidad nuevamente antes de ponerlo en funcionamiento.

**NOTA:** Consulte las Precauciones sobre el Gas Hidrógeno en la Instrucciones de Funcionamiento (lea la página 3).



## Limpieza del Filtro

En los modos Hybrid (Híbrido), Heat Pump (only) (Bomba de Calentamiento solamente) y High Demand/Boost (Alta Demanda/Incrementar), el calentador mueve aire a través del sistema y hacia afuera por la parte trasera de la unidad. El filtro está ubicado para proteger al evaporador de la suciedad y el polvo.

Es importante contar con un filtro de aire limpio para obtener el mayor nivel de eficiencia. Ocasionalmente, este filtro deberá ser limpiado (mínimamente una vez por año). Cuando se requiera una limpieza del filtro, la luz Roja sobre el botón Filter (Filtro) estará iluminada y sonará un pitido.

**NOTA:** Si el filtro está demasiado sucio, la unidad pasará automáticamente al modo Electric (Fan off)/ Standard (Fan off) (Eléctrico con ventilador apagado/ Estándar con ventilador apagado) y los ahorros de energía se perderán.

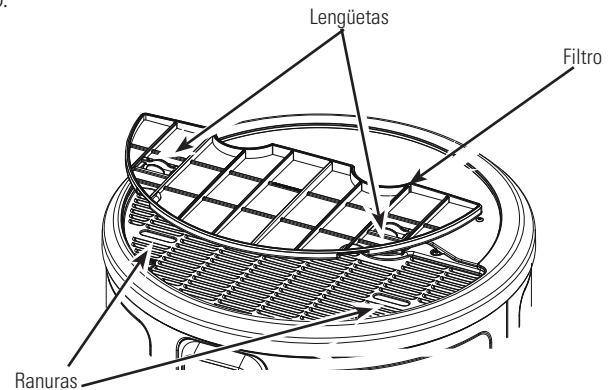
Deje el encendido activado. Retire el filtro de la parte superior de la unidad. Presione dos lengüetas y levante las mismas para retirar el filtro de aire. Una vez retirado, el filtro podrá ser aspirado o limpiado con una tela húmeda o enjuagado con agua caliente.

Una vez que el filtro fue limpiado y secado, podrá ser reemplazado alineando el mismo en las ranuras en la parte superior de la unidad y

presionando el mismo hacia abajo hasta su ubicación.

Una vez que el filtro limpio fue reinstalado, mantenga presionado el botón **FILTER (Filtro)**. Si el ciclo de calentamiento está activado cuando se reinicia el filtro, se continuará en el modo eléctrico hasta finalizar el ciclo. Luego de esto, se pasará de forma automática al modo en el cual estaba antes de ser cambiado.

**IMPORTANTE:** El filtro deberá ser limpiado cuando se muestre la alarma. Si el filtro está sucio, hará que el sistema se fuerce, se reducirá el rendimiento y es posible que el sistema se dañe. A fin de contar con la mejor eficiencia energética posible, asegúrese de que su filtro esté limpio.

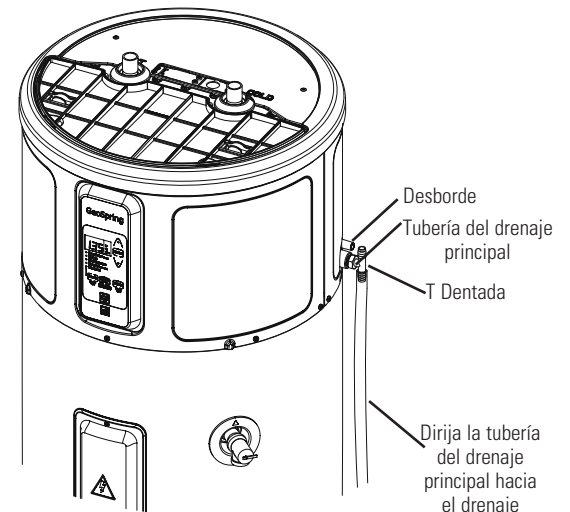


## Limpieza de la Tubería de Drenaje de Condensación

La función del drenaje principal es eliminar toda la condensación. Si está obstruido, la condensación se desbordará por el tubo de drenaje y hacia el piso. Esto cumple la función de notificar al usuario de que el drenaje principal está atascado. Retire el drenaje, limpie cualquier escombros presente y vuelva a colocar el mismo.

De forma periódica, inspeccione las líneas de drenaje y limpie cualquier escombros que se haya recolectado en las líneas.

Para más información, consulte las Instrucciones de Instalación.



## Superficies Exteriores

Lávese las manos sólo con agua caliente.

## Varilla del Ánodo

La varilla del ánodo debería ser retirada del tanque del calentador de agua y ser inspeccionada luego de un máximo de 3 años de servicio, luego anualmente desde ese momento, y debería ser reemplazada cuando más de 6" (15.2 cm) de cable del centro queden expuestas en cada extremo de la varilla.

**NOTA:** El agua ablandada de forma artificial requiere que la varilla del ánodo sea inspeccionada de forma anual.

Debido a riesgos de descargas y a fin de evitar goteos de agua accidentales, esta inspección debería ser realizada por un técnico

calificado o plomero, y se requiere que el suministro de agua fría esté apagado antes de retirar la varilla del ánodo.

**AVISO:** No retire la varilla del ánodo del tanque del calentador de agua, excepto para su inspección y/o reemplazo, ya que el funcionamiento sin la varilla del ánodo acortará la vida útil del tanque vitrificado y anulará la cobertura de la garantía.

El consumo y reemplazo de la Varilla del Ánodo no están cubiertos por la garantía.

# Mantenimiento y Servicio Técnico de la Varilla del Ánodo

## ⚠ PRECAUCIÓN - AVISO DE SEGURIDAD IMPORTANTE

Se espera que esta información sea usada por individuos que posean una experiencia adecuada a nivel eléctrico, electrónico y mecánico. Cualquier intento de reparar un electrodoméstico grande podrá producir como resultado lesiones personales y daños sobre la propiedad. El fabricante o vendedor no serán responsables por la interpretación de esta información, ni asumirán cualquier responsabilidad en conexión con su uso.

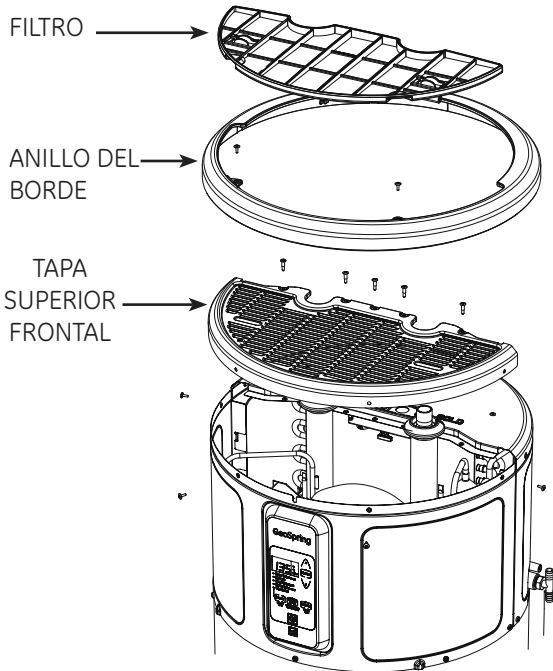
### Herramientas que necesitará:

- Destornillador Plano T20
- Destornillador plano
- Cinta
- Llave para Tomacorriente
- Extensión de Tomacorriente de 12" de longitud
- Tomacorriente de 11/16"
- Sellador Softset
- Varilla del Ánodo si es necesaria

\*Para acceder a instrucciones para ordenar piezas, consulte la página 72.

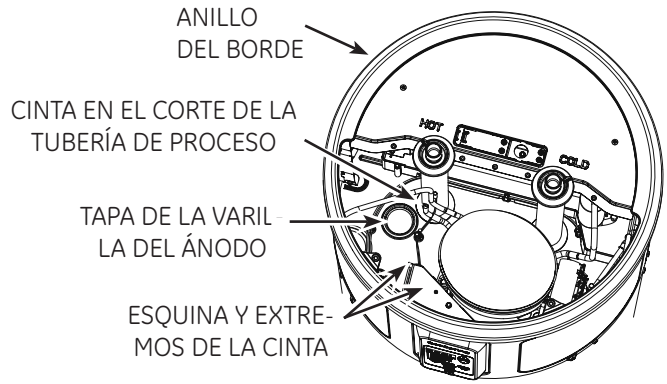
### To service the Anode Rod:

1. Desconecte la corriente, cierre el suministro de agua, y parcialmente drene uno o dos galones del calentador de agua a través de la válvula de drenaje inferior.
2. Retire el Filtro, el Anillo del Borde, y la Tapa Superior Frontal como se muestra en la **Ilustración A**.



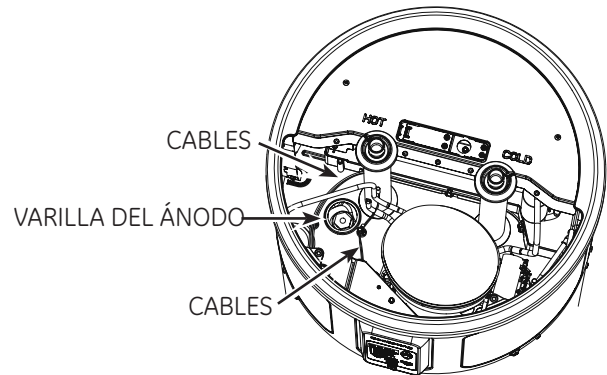
**Ilustración A**

3. Reinstale el Anillo del Borde, coloque una capa protectora de cinta en los extremos de la hoja metálica, y retire la Tapa de la Varilla del Ánodo, como se muestra en la **Ilustración B**.



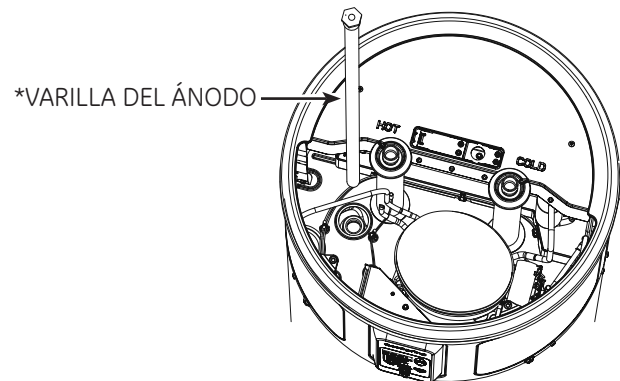
**Ilustración B**

4. Utilizando un destornillador plano y asegurando evitar daños sobre cables expuestos, retire la gomaespuma para destapar la Varilla del Ánodo, como se muestra en la **Ilustración C**.



**Ilustración C**

5. Utilizando un tomacorriente de 11/16" y una extensión, destornille la Varilla del Ánodo, luego levante la misma para inspeccionar, como se muestra en la **ilustración D**.



**Ilustración D**

6. Para instalar la Varilla del Ánodo, selle las roscas con Sellador Soft Set, enrosque en el puerto y use una llave dinamo-métrica para ajustar a  $50 \pm 5$  pies por libras de giro. Reinstale la Tapa de la Varilla del Ánodo.
7. Abra el suministro de agua, abra un grifo para retirar cualquier aire que pueda haber en el sistema de plomería, inspeccione que no haya pérdidas, luego encienda la corriente y vuelva a ensamblar la unidad en orden inverso, como se muestra en la **Ilustración A**.



Al elegir la ubicación del calentador de agua se deberá tener en cuenta lo siguiente:

## REGULACIONES DE INSTALACIÓN LOCALES

Este calentador de agua deberá ser instalado de acuerdo con estas instrucciones, códigos locales, códigos de servicios públicos, requisitos de la empresa de servicios públicos o, en ausencia de códigos locales, la edición más reciente del Código Nacional de Electricidad. El mismo está disponible en algunas librerías locales, o se puede adquirir a través de National Fire Prevention Association (Asociación Nacional de Prevención de Incendios), Batterymarch park, Quincy, MA 02169 en cuadernillo ANSI/NFPA 70.

## REQUISITOS DE ELECTRICIDAD

Controle las marcas en la placa de calificación del calentador de agua para estar seguro de que el suministro de corriente es consecuente con los requisitos del calentador de agua. NOTA: Las instalaciones de 208V podrán experimentar un rendimiento inferior.

## UBICACIÓN

Ubique el calentador de agua en un área seca y limpia, tan cerca como sea práctico del área de mayor demanda del calentador de agua. Las líneas de agua caliente largas y no aisladas podrán generar desperdicios de energía y agua. La unidad deberá ser instalada en una ubicación a nivel.

NOTA: Esta unidad fue diseñada para cualquier instalación interior común, incluyendo: garaje, lavadero, desván, armario, etc. Con la instalación de una puerta de celosía, se puede instalar en habitaciones de tamaño inferior a 10" x 10" x 7" (700 pies cúbicos). Las celosías deberían ser de 240 pulgadas cuadradas (0.15 m<sup>2</sup>) o más grandes. Si se usan dos celosías, una debería estar cerca de la parte superior de la puerta.

Coloque el calentador de agua de modo tal que el filtro de agua, la tapa, el anillo del borde y los paneles frontales se puedan retirar, a fin de permitir su inspección y servicio técnico, tal como el retiro de elementos o limpieza del filtro.

El calentador de agua y las líneas de agua deberían estar protegidos de las temperaturas bajo cero y atmósferas altamente corrosivas. No instale el calentador de agua en áreas al aire libre y desprotegidas.

**⚠ PRECAUCIÓN:** *Riesgo de daño sobre la propiedad* - El calentador de agua no se debería ubicar en un área donde los goteos del tanque o las conexiones resulten en daños sobre el área adyacente a éste o a pisos inferiores de la estructura. Donde dichas áreas no puedan ser evitadas, se recomienda la instalación de una bandeja de recolección, con un drenaje adecuado, debajo del calentador de agua. Las instalaciones en desvanes requieren pisos y escaleras de acceso adecuados.

NOTA: El rango de funcionamiento de la bomba de calentamiento es de 45°F a 120°F (7°C a 49°C). Si la temperatura ambiente está fuera del rango, la bomba de calentamiento se apagará y los elementos eléctricos serán usados hasta que la temperatura ambiente regrese al rango de funcionamiento.

## UBICACIÓN (CONT.)

### INFORMACIÓN DEL TAMAÑO DEL CALENTADOR DE AGUA – LEA ANTES DE INSTALAR:

#### Para reemplazos en viviendas existentes:

- Reemplazará el tanque de un calentador de agua existente? Si su calentador de agua actual le brindaba agua caliente en forma apropiada, y ningún cambio de plomería y/o renovaciones que requerirían demandas de agua caliente adicional están en proceso o planificadas, entonces:
- El Calentador de Agua Híbrido de GeoSpring™ puede reemplazar un calentador de agua eléctrico estándar de tamaño equivalente o menor.
- Si se pasa de un sistema de gas a uno eléctrico, el Calentador de Agua Híbrido de GeoSpring™ se podrá reemplazar por el siguiente calentador de agua con tanque de gas más pequeño.

#### Para instalaciones en construcciones nuevas:

Guía de Tamaño del Calentador de Agua Residencial			
Tamaño Familiar	Demanda*	Capacidad de Galón Recomendada	
		Eléctrico o GeoSpring™	Gas
5+	Alto	100 (378.5 L)	75 (283.9 L)
	Prom. o Bajo	80 (302.8 L)	50 (189.3 L)
3 a 4	Alto	80 (302.8 L)	50-75 (189.3-283.9 L)
	Prom. o Bajo	50 (189.3 L)	40 (151.4 L)
2 a 3	Alto	50 (189.3 L)	40-50 (151.4-189.3 L)
	Prom. o Bajo	40 (151.4 L)	40 (181.8 L)
1 a 2	Alto	40-50 (151.4-189.3 L)	40-50 (151.4-189.3 L)
	Prom. o Bajo	30 (113.6 L)	30 (113.6 L)

\*Estimaciones para viviendas con Demanda Promedio o Baja:

- Uso de cabezales de ducha estándar o bajo (2.5 gpm/ 11.4L por minuto o menos)
- No hay duchas con cabezales múltiples y/o columnas de hidromasaje.
- Bañeras estándar (no muy grandes/ sin columnas de hidromasajes)

### Posición de Ajuste de la Temperatura del Calentador de Agua:

La configuración de la temperatura del calentador de agua tiene un gran impacto sobre la cantidad de agua caliente disponible para duchas y bañeras.

- El consumo/ ahorro de energía y evaluaciones de eficiencia de los calentadores de agua, incluyendo el GeoSpring™, es realizado en una configuración de 135°F (57°C), la configuración promedio del calentador de agua de acuerdo con el Department of Energy (Departamento de Energía). Todos los ahorros de GeoSpring™ están basados en el funcionamiento en modo híbrido en 135°F (57°C).
- Las regulaciones de seguridad requieren una configuración de fábrica de 120°F a 125°F (49°C a 52°C) como máximo para todos los calentadores de agua nuevos. Por lo tanto, si su calentador de agua está actualmente configurado en 130° F (54° C) o más y su calentador de agua nuevo está instalado con una posición de ajuste configurada de fábrica de 120° F (49° C), es posible que parezca que el nuevo calentador de agua brinda menor capacidad que su calentador de agua existente.
- El usuario podrá ajustar la configuración de temperatura para cubrir sus necesidades. Siempre lea y entienda las instrucciones de seguridad que figuran en el manual del usuario, antes de ajustar la posición de ajuste de temperatura.

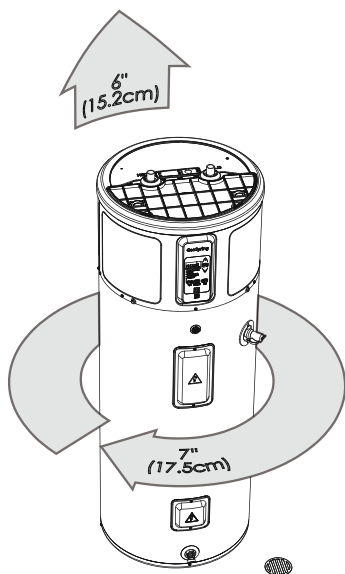
# Instrucciones de Instalación

## UBICACIÓN (CONT.)

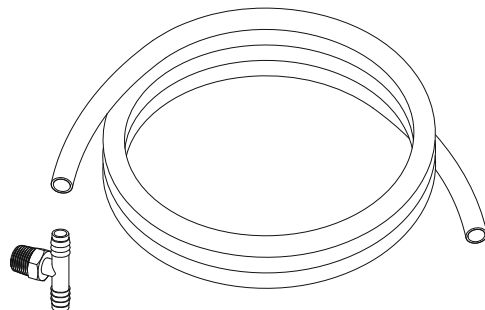
### Despejes requeridos:

Debe haber por lo menos 7" (17.5 cm.) de espacio entre cualquier objeto y las tapas Frontal y Trasera en caso de ser necesario realizar el servicio técnico. También se recomienda un espacio mínimo de 7" (17.5 cm.) a ambos lados del calentador de agua, a fin de contar con acceso para el servicio técnico.

Se requiere un espacio mínimo de 6" (15.2 cm.) para retirar el filtro para su limpieza. La plomería y las conexiones eléctricas de agua caliente y fría no deben interferir con el retiro del filtro.



## PIEZAS NO ESTÁNDARES NECESARIAS:



Tubería Flexible de 1-3/8" x 6".  
T Dentada Macho de NPT 1-3/8" x 3/8" x 1/2".  
(algunos modelos)

## THERMAL EXPANSION

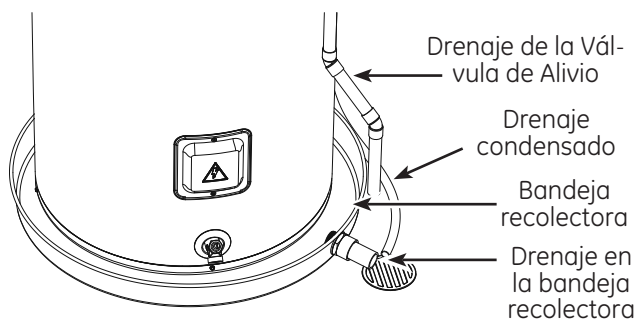
Determine si la línea de agua interna cuenta con una válvula de control. Es posible que haya sido instalada en la línea de agua fría en forma separada de la válvula contra reflujo, o es posible que sea parte de una válvula de reducción de presión, medidor de agua o ablandador de agua. Una válvula de control ubicada en la línea de entrada de agua fría puede causar lo que se llama "sistema cerrado de agua". Una línea interna de agua fría sin válvula de control o dispositivo de prevención de reflujo se llama sistema de agua "abierto".

Cuando el agua es calentada, se expande en volumen y crea un aumento de presión dentro del sistema de agua. Esta acción se conoce como "expansión térmica." En un sistema de agua "abierto", la expansión de agua que supera la capacidad del calentador de agua vuelve a fluir hacia la cañería de la ciudad, donde la presión es fácilmente disipada.

Sin embargo, un "sistema cerrado de agua" impide que el agua en expansión vuelva a fluir hacia el suministro principal, y el resultado de la "expansión térmica" puede crear un incremento de presión rápido y peligroso en el calentador de agua y la tubería del sistema. Este rápido incremento de presión puede alcanzar rápidamente la configuración de seguridad de la válvula de alivio, haciendo que funcione en cada ciclo de calentamiento. La expansión térmica, y la resultante expansión y contracción rápida y repetida de los componentes en el calentador de agua y el sistema de tubería, pueden ocasionar fallas prematuras de la válvula de alivio y posiblemente sobre el calentador mismo. ¡Reemplazar la válvula de alivio no corregirá el problema!

El método sugerido para controlar la expansión térmica es instalar un tanque de expansión en la línea de agua fría, entre el calentador de agua y la válvula de control (consulte la ilustración en la página 15). El tanque de expansión está diseñado con un colchón de aire incorporado que se comprime al incrementar la presión del sistema, liberando de este modo la presión excesiva y eliminando el funcionamiento repetido de la válvula de alivio. Otros métodos para controlar la expansión térmica también están disponibles. Para más información sobre este asunto, comuníquese con su instalador, proveedor de agua o inspector de plomería.

## Instalación de la Bandeja de Recolección (Si se requiere)



**NOTA:** La bandeja de recolección auxiliar DEBE cumplir con los códigos locales. Los Kits de Bandejas de Recolección están disponibles en la tienda donde el calentador de agua fue adquirido, una tienda de construcción o un distribuidor de calentadores de agua. La bandeja recolectora debería ser de un mínimo de 2" (5.1 cm.) más grande que el diámetro de la base del Calentador de Agua. A fin de evitar la corrosión y mejorar el acceso a la Válvula de Drenaje, se recomienda que el calentador de agua sea ubicado en espaciadores dentro de la bandeja recolectora.

### Drenaje de condensación

La unidad cuenta con un drenaje de condensación; por lo tanto, deberá haber un drenaje disponible muy cerca de la unidad. El drenaje no deberá superar las 36" (91.4 cm.) desde el suelo (el drenaje deberá cumplir con los códigos estatales y locales). Si no hay un drenaje disponible, entonces se deberá adquirir una bomba de condensación común con capacidad no inferior a 1 galón (3.8 L)/día, en la tienda de construcción local, y deberá ser instalado.

# Instrucciones de Instalación

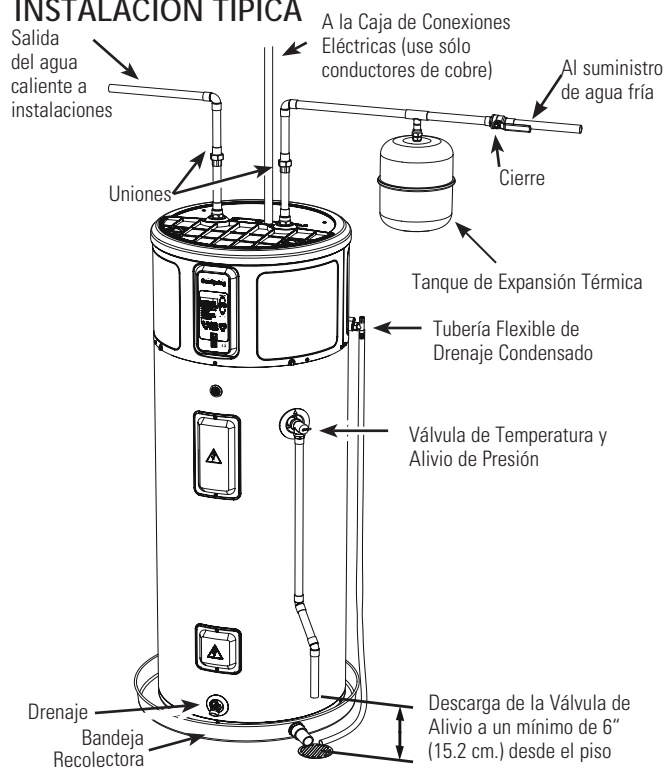
## CONEXIONES DEL SUMINISTRO DE AGUA

Para conocer la instalación típica sugerida, consulte la ilustración que aparece a continuación. Las conexiones de agua CALIENTE y FRÍA están claramente marcadas y son de NPT de 3/4" en todos los modelos. Al realizar la conexión a los puertos de entrada/ salida, se recomienda el uso de accesorios cónicos hembra con rosca de 3/4" con uso de sellador de roscas. Se recomienda la instalación de uniones en las conexiones de agua caliente y fría, de modo que el calentador de agua pueda ser fácilmente desconectado para realizar el servicio técnico, en caso de ser necesario.

**NOTA:** Instale una válvula de cierre en la línea de agua fría cerca del calentador de agua. Esto permitirá un fácil servicio técnico y mantenimiento de la unidad en forma posterior.

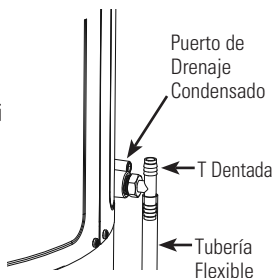
**IMPORTANTE:** No aplique calor a las conexiones de agua CALIENTE o FRÍA. Si se usan conexiones de soldadura blanda, suelde la tubería al adaptador antes de colocar el adaptador en las conexiones de agua fría del calentador. Cualquier calor aplicado a la conexión de agua caliente o fría dañará de forma permanente la línea plástica interna en estos puertos.

## INSTALACIÓN TÍPICA



## TUBOS DE CONDENSACIÓN DE DRENAJE

Esta unidad cuenta con una bandeja de condensación. El agua recolectada en la bandeja drena por la tubería que sale por el costado de la unidad. Es importante instalar una tubería de drenaje al puerto de drenaje principal que sale de la parte trasera de la unidad. Sujete un extremo de una tubería más larga de 6" (1.8 m.) al puerto de drenaje inferior en la parte trasera de la unidad, debajo de la tapa trasera. Dirija el otro extremo a un drenaje en el piso o a una altura no superior a 3" (0.9 m.) sobre el piso. Si dicho drenaje no está disponible, se deberá adquirir e instalar una bomba de drenaje de condensación (no provista). La tubería de drenaje deberá ser dirigida de modo que el agua descargada no pueda tener contacto con partes eléctricas activas ni personas, y a fin de eliminar posibles daños con el agua.



## VÁLVULA DE ALIVIO

**⚠ ADVERTENCIA:** *Riesgo de daño sobre la unidad* - El índice de presión de la válvula de alivio no debe superar los 150 PSI (1.03 kPa), la máxima presión de funcionamiento del calentador de agua según se indica en la placa de calificación.

Se suministra una válvula de combinación de temperatura y alivio de presión, de acuerdo con el Estándar para las Válvulas de Alivio y Dispositivos de Cierre Automático de Gas para los Sistemas de Suministro de Agua Caliente, ANSI Z21.22, y debe permanecer instalada en la apertura provista y marcada para su propósito en el calentador de agua. Ninguna válvula de ningún tipo debería ser instalada entre la válvula de alivio y el tanque. Se deberá cumplir con los códigos locales en la instalación de las válvulas de alivio.

La calificación BTUH de la válvula de alivio no deberá ser inferior a la calificación de entrada del calentador de agua, de acuerdo con lo indicado en la etiqueta de calificación ubicada en la parte frontal del calentador (1 watt = 3.412 BTUH).

Conecte la salida de la válvula de alivio a un drenaje abierto adecuado, de modo que el agua descargada no pueda tener contacto con las partes eléctricas activas o personas y para eliminar posibles daños con el agua.

La tubería usada deberá ser de un tipo aprobado para la distribución de agua caliente. La línea de descarga no deberá ser más pequeña que la salida de la válvula y se deberá inclinar hacia abajo desde la válvula, a fin de permitir un drenaje completo (por la gravedad) de la válvula de alivio y la línea de descarga. El extremo de la línea de descarga no deberá estar insertado ni oculto y deberá estar protegido del congelamiento. Ninguna válvula de ningún tipo, sujeción para restricción o reducción deberán ser instaladas en la línea de descarga.

## ⚠ PRECAUCIÓN:

A fin de reducir el riesgo de presiones y temperaturas excesivas en este calentador de agua, instale equipamientos protectores de temperatura y presión, requeridos por los códigos locales y no inferiores a una válvula de combinación de temperatura y alivio de presión certificados por un laboratorio de evaluación reconocido a nivel nacional que mantenga inspecciones periódicas de la producción equipamiento y materiales listados, cumpliendo con los requisitos de Válvulas de Alivio y Dispositivos de Cierre de Gas Automáticos para Sistemas de Suministro de Agua Caliente, ANSI Z21.22. Esta válvula deberá contar con una marca de presión máxima que no supere la presión de trabajo máxima del calentador de agua. Instale la válvula en una abertura provista y marcada para este propósito en el calentador de agua, y oriente la misma o brinde una tubería, de modo que cualquier descarga de la válvula salga sólo arriba de los 6 pies, o a cualquier distancia inferior, el piso estructural, y que no tenga contacto con ninguna parte eléctrica activa. La abertura de la descarga no deberá ser bloqueada ni reducida de tamaño, bajo ninguna circunstancia.

# Instrucciones de Instalación

## PARA LLENAR EL CALENTADOR DE AGUA

**⚠ ADVERTENCIA:** *Riesgo de daño sobre la unidad* - El tanque debe estar lleno de agua antes de encender el calentador. La garantía del calentador de agua no cubre daños ni fallas como resultado de un funcionamiento con el tanque vacío o parcialmente vacío.

Asegúrese de que la válvula de drenaje esté completamente cerrada.

Abra la válvula de cierre en la línea de suministro de agua fría.

Abra todos los grifos de agua caliente lentamente, a fin de permitir que el aire se descargue desde el calentador de agua y la tubería.

Un flujo parejo desde el grifo(s) de agua caliente indica que el calentador de agua está lleno.

Código de falla F11" durante la instalación: Si la unidad es encendida cuando el tanque no está lleno, se visualizará el código de error "F11" en la pantalla. Apague el encendido, llene el tanque con agua (lea más arriba), y luego vuelva a encender el calentador.

## AVISO:

Evite realizar las conexiones eléctricas en forma equivocada. Se deberán aplicar 240V AC o 208AC a través de los cables L1 y L2, como se muestra en la ilustración de la "caja de unión del calentador de agua". Si no se hace esto, la garantía quedará ANULADA, y como resultado se podrán aplicar 120V al calentador de agua, lo cual podrá dañar el compresor u otros componentes eléctricos.

Si un cable con 4 conductores es suministrado al calentador de agua, cubra el neutro, y conecte los cables restantes como se muestra en la ilustración.

NOTA RELACIONADA CON LOS DISPOSITIVOS DE MANEJO DE ENERGÍA DE LOS SERVICIOS PÚBLICOS (A veces llamados Interruptores de Reducción de Picos de Carga):

Existen algunos dispositivos de interruptores de manejo de energía o incluso algunos interruptores básicos de temporizadores que REDUCEN el voltaje de 240V a 120V durante períodos de alta demanda de electricidad. Estos dispositivos deben ser retirados del circuito que provee corriente al calentador de agua, debido al posible daño de la unidad observado más arriba.

Sin embargo, los dispositivos con interruptores que cortan la corriente de 240V a 0V en forma periódica son aceptables.

**Código de falla "bAd linE" durante la instalación:** Si en la pantalla se visualiza la unidad no está recibiendo el voltaje correcto como resultado de un cableado incorrecto. Para corregir esta falla, apague la unidad, corrija el problema del cableado y luego vuelva a activar la corriente.

## CONEXIONES ELÉCTRICAS

Un electricista calificado deberá instalar un circuito derivado individual con conductores de cobre, un dispositivo para la protección de sobrecarga y un medio adecuado de desconexión.

Todos los cableados deberán cumplir con los códigos locales o la edición más reciente del Código Nacional de Electricidad ANSI/NFPA 70.

El calentador de agua está completamente cableado a la caja de conexiones en la parte superior del calentador de agua. Se brinda una abertura de ½" para accesorios eléctricos para conexiones de cableados.

Los requisitos de carga de voltaje y vataje del calentador de agua son especificados en la etiqueta de calificación ubicada en la parte frontal del calentador de agua.

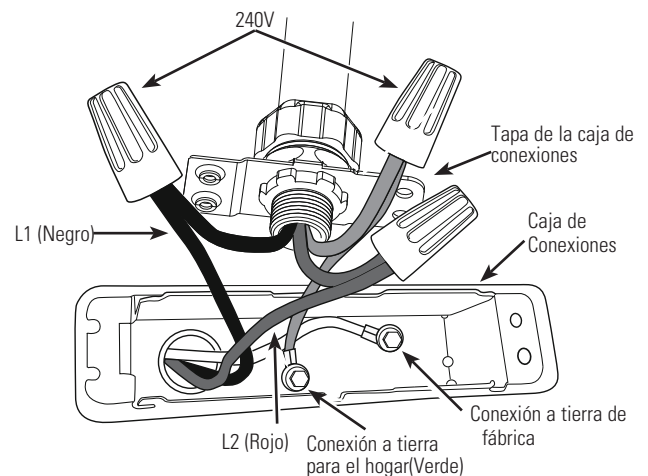
### El cableado de circuito derivado debería incluir:

1. Conducto metálico o cable metálico enfundado aprobado para su uso como conductor de conexión a tierra y ser instalado con accesorios aprobados para dicho propósito.
2. Los cables no metálicos enfundados, conductos metálicos o cables metálicos enfundados no aprobados para uso como conductor de conexión a tierra incluirán un conductor separado para la conexión a tierra. Debería estar adjunto a las terminales de conexión a tierra del calentador de agua y la caja de distribución eléctrica.

Para conectar la corriente al calentador de agua:

1. Apague la corriente.
2. Retire el tornillo/ tornillos que sostienen la tapa superior de la caja de unión.
3. Instale L1 a L1, L2 a L2 y conecte a tierra al cable a tierra verde conectado a la parte inferior de la caja de unión.

NOTA: Instale las conexiones eléctricas de acuerdo con los códigos locales o la edición más reciente del Código Nacional de Electricidad ANSI/NFPA 70.



**⚠ ADVERTENCIA:** Es esencial que la conexión a tierra sea la adecuada. La presencia de agua en la tubería y el calentador de agua no brindan la conducción suficiente para la conexión a tierra. La tubería no metálica, uniones dieléctricas, conectores flexibles, etc., pueden hacer que el calentador de agua quede eléctricamente aislado. No desconecte la conexión a tierra de fábrica.



La garantía del fabricante no cubre ningún daño o defecto ocasionado por la instalación, adhesión o uso de ningún tipo de ahorro de energía u otros dispositivos no aprobados (diferentes a aquellos autorizados por el fabricante) en, sobre o junto con el calentador de agua. El uso de dispositivos de ahorro de energía no autorizados pueden acortar la vida útil del calentador de agua y poner en riesgo su vida y su propiedad.

El fabricante queda eximido de toda responsabilidad por dicha pérdida o lesión resultante del uso de tales dispositivos no autorizados.

Si los códigos locales requieren la aplicación externa de kits de mantas aislantes, las instrucciones del fabricante incluidas en el kit se deberán seguir cuidadosamente.

**La aplicación de cualquier aislante externo, mantas o aislante de la tubería de agua sobre este calentador de agua requerirá especial cuidado sobre lo siguiente:**

- No cubra la válvula de temperatura y alivio de presión.
- No cubra los paneles de acceso a los elementos de calefacción.
- No cubra la caja de unión eléctrica del calentador de agua.
- No cubra las etiquetas de funcionamiento o advertencia del calentador de agua ni intente reubicar las mismas en la parte exterior de la manta aislante.
- No bloquee la entrada/ salida de aire en las tapas superiores o traseras de la unidad.

**NOTA:** En esta guía se recomienda el tamaño mínimo del circuito derivado en base al Código Nacional de Electricidad. Para las conexiones de cableados, consulte los diagramas de cableados del manual.

## GUÍA DE TAMAÑOS PARA CIRCUITOS DERIVADOS

Voltaje Total del Calentador de Agua	Protección Recomendada para Sobrecarga (calificación de amperaje de fusible o interruptor de circuitos)			
	208V	240V	277V	480V
3,000	20	20	15	15
4,000	25	25	20	15
<b>4,500</b>	<b>30</b>	<b>25</b>	<b>25</b>	<b>15</b>
5,000	30	30	25	15
5,500	35	30	25	15
6,000	40	35	30	20
8,000	50	45	40	25
9,000	-	50	45	25
10,000	-	-	50	30
11,000	-	-	50	30
12,000	-	-	-	35

Voltaje Total del Calentador de Agua	Tamaño del Cable de Cobre AWG Basado en la Tabla N.E.C. 310-16 (167° F/ 75° C).			
	208V	240V	277V	480V
3,000	12	12	14	14
4,000	10	10	12	14
<b>4,500</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>14</b>
5,000	10	10	10	14
5,500	8	10	10	14
6,000	8	8	10	12
8,000	8	8	8	10
9,000	-	8	8	10
10,000	-	-	8	10
11,000	-	-	8	10
12,000	-	-	-	8

# Instrucciones de Instalación

## LISTA DE CONTROL DE LA INSTALACIÓN

- 1. **Ubicación del Tanque:**
  - ¿Requiere el tamaño de la habitación una puerta de celosía o un tipo de ventilación similar? Se necesita un área de flujo de aire de 10" x 10" x 7" (700 pies cúbicos) o 240 pulgadas cuadradas (0.15 m2).
  - Parte trasera de la unidad **alejada de la pared** 7 pulgadas (17.5 cm.), y los costados por lo menos a una distancia de 7 pulgadas (17.5 cm.).
  - El **frente** de la unidad está libre y despejado.
  - ¿Está el calentador de agua nivelado? Si no es así, agregue cuñas debajo de la base de la unidad.
- 2. **Verifique que el Filtro de Aire esté instalado. (Ubicado en el embalaje).**
- 3. **Conexiones de plomería:**
  - No impiden la eliminación del filtro de aire
  - No hay pérdidas luego de llenar el tanque de agua, tanto cuando el agua está fluyendo como cuando no.
- 4. **Las líneas de condensación están en su lugar:**
  - Drenaje Principal Instalado
- 5. La **válvula de temperatura y alivio de presión** está funcionando y la línea de drenaje está completa de acuerdo con el código local.
- 6. Verificación **Eléctrica** 208/240 VAC a L1 y L2 al tanque.
- 7. La conexión **Eléctrica** no impide la eliminación del filtro de aire.
- 8. Verifique las pantallas del **panel de control** en el modo Hybrid (Híbrido) a 120°F (49°C). Asista al usuario en el ajuste de temperatura y modos (consulte la sección "Acerca de la Configuración de la Temperatura del Agua") en la página 54).

## QUÉ ESPERAR PARA UN "COMIENZO NORMAL" EN EL MODO HÍBRIDO

Luego de instalar la unidad, habiendo asegurado y controlado todas las conexiones eléctricas y de agua, se deberá entonces llenar la misma con agua (ventile el tanque abriendo una canilla de agua caliente de su casa para permitir que el tanque se llene completamente de agua). Una vez que el tanque esté lleno y la carga de corriente sea completada, podrá experimentar lo siguiente:

Tiempo Transcurrido	Acciones HEWH	Comentarios
0 a 2 minutos	La unidad hara la autoverificación	Este tiempo apagado de 2 minutos evita daños sobre el compresor
2 a 10 minutos	Compresor y ventilador encendidos	Este período de 8 minutos es usado para asegurar que el tanque está lleno de agua (algoritmo de prevención de disparo en vacío).
10 a 30 minutos	Compresor y ventilador apagados, elementos de calentamiento encendidos por unos 20 minutos	Para brindar rápidamente la cantidad inicial de agua caliente para el usuario (unos 25 galones/94.6 L)
30 minutos y más	El elemento superior se apaga y el compresor se vuelve a encender	Usa un bombeo de calor eficiente durante la mayor parte del calentamiento

NOTA: El rango de funcionamiento de la bomba de calentamiento es de 45°F a 120°F (7°C a 49°C). Si la temperatura ambiente está fuera del rango, la bomba de calentamiento se apagará y los elementos eléctricos serán usados hasta que la temperatura ambiente regrese al rango de funcionamiento.



Antes de solicitar el servicio técnico...  
¡Ahorre tiempo y dinero! Lea primero el cuadro que aparece a continuación y es posible que no necesite solicitar reparaciones...

Problema	Causas Posibles	Qué Hacer
<i>El calentador de agua emite sonidos</i>	Se está usando un ventilador para mover el aire a través del sistema.	<ul style="list-style-type: none"> <li>Cierta cantidad de sonido del ventilador es normal. Si escucha un sonido atípico o el nivel de sonido parece inusualmente fuerte, entonces contacte al servicio técnico.</li> </ul>
<i>El calentador de agua está haciendo descender la temperatura de la habitación</i>	La habitación no es ventilada de forma adecuada o es demasiado pequeña	<ul style="list-style-type: none"> <li>Si el tamaño de la habitación es inferior a 10' x 10' x 7' (3m x 3m x 2.1m), entonces deberá contar con una puerta de celosía u otro medio que permita el recambio de aire con las habitaciones circundantes.</li> </ul>
	El calor es retirado del aire para calentar el agua	<ul style="list-style-type: none"> <li>Ésto es normal</li> </ul>
<i>Goteo de agua por fuera del calentador</i>	El drenaje condensado está atascado.	<ul style="list-style-type: none"> <li>Despeje cualquier escombros en el puerto de drenaje de la unidad.</li> </ul>
	Las conexiones de agua Caliente/ Fría no están ajustadas.	<ul style="list-style-type: none"> <li>Ajuste las conexiones internas y externas de la tubería.</li> </ul>
<i>Sin suficiente agua caliente o sin agua caliente</i>	Es posible que la temperatura del agua esté configurada demasiado baja.	<ul style="list-style-type: none"> <li>Consulte la sección Acerca de la Configuración de la Temperatura del Agua.</li> </ul>
	El patrón de uso del agua caliente supera la capacidad del calentador de agua en el modo actual	<ul style="list-style-type: none"> <li>Cambie a un modo diferente de o modifique el patrón de uso.</li> </ul>
	Es posible que el uso del agua haya superado la capacidad del calentador de agua.	<ul style="list-style-type: none"> <li>Espere a que el calentador de agua se recupere luego de una demanda anormal.</li> </ul>
	La temperatura del ambiente demasiado baja	<ul style="list-style-type: none"> <li>A fin de que el calentador de agua funcione correctamente, su ubicación deberá tener una temperatura de entre 32° y 150° F para el modo Eléctrico Estándar y entre 45° y 120° F para el resto de los modos.</li> </ul>
	Es posible que la temperatura del agua fría entrante sea más fría durante los meses de invierno.	<ul style="list-style-type: none"> <li>Esto es normal. Cuanto más fría sea el agua entrante, más tiempo le tomará calentarse</li> </ul>
	Grifos de agua caliente que gotean o están abiertos.	<ul style="list-style-type: none"> <li>Asegúrese de que todos los grifos estén cerrados.</li> </ul>
	Largas extensiones de tubería expuesta, o tubería de agua caliente en pared externa.	<ul style="list-style-type: none"> <li>Aísle la tubería.</li> </ul>
	Sin espacio suficiente para permitir que circule aire para la bomba del calentador.	<ul style="list-style-type: none"> <li>Asegúrese de que la unidad esté a una distancia de 7" de la pared.</li> </ul>
	El tamaño de la habitación no es el apropiado para agua caliente.	<ul style="list-style-type: none"> <li>Si el tamaño de la habitación es inferior a 10" x 10" x 7" (700 pies cúbicos), instale una puerta de celosía o una ventilación similar.</li> </ul>
	Se quemó un fusible o se desactivó el disyuntor.	<ul style="list-style-type: none"> <li>Reemplace el fusible o reinicie el disyuntor.</li> </ul>
	Es posible que se haya interrumpido el servicio de electricidad en su hogar.	<ul style="list-style-type: none"> <li>Comuníquese con su proveedor local del servicio eléctrico.</li> </ul>
	Cableado inadecuado	<ul style="list-style-type: none"> <li>Lea la sección de Instrucciones de Instalación.</li> </ul>
	Límite de reinicio manual (TCO).	<ul style="list-style-type: none"> <li>Consulte la sección Control de Seguridad en la página 52.</li> </ul>
	Las conexiones de agua a la unidad están invertidas.	<ul style="list-style-type: none"> <li>Conexiones de tuberías correctas.</li> </ul>
Es posible que el suministro de electricidad esté desconectado.	<ul style="list-style-type: none"> <li>Asegúrese de que las conexiones eléctricas estén conectadas correctamente y desconecte el interruptor; si se usa, está en la posición ON (Encendido).</li> </ul>	

## Solución de Problemas...

Problema	Causas Posibles	Qué Hacer
<i>El agua está demasiado caliente</i>	La configuración de la temperatura del agua es demasiado alta.	<ul style="list-style-type: none"> <li>Consulte la sección Acerca de la Configuración de la Temperatura del Agua.</li> </ul>
	<p><b>⚠ PRECAUCIÓN:</b> Para su seguridad, NO intente reparar cableados eléctricos, controles, elementos de calentamiento u otros dispositivos de seguridad. Derive las reparaciones a personal calificado del servicio técnico.</p> <p>El control electrónico falló.</p>	<ul style="list-style-type: none"> <li>Llame al servicio técnico.</li> </ul>
<i>Sonido ensordecedor</i>	Las condiciones del agua en su hogar ocasionaron una acumulación de sarro y depósitos minerales en los elementos de calentamiento.	<ul style="list-style-type: none"> <li>Retire y limpie los elementos de calentamiento. Esto sólo debería ser realizado por personal calificado del servicio técnico.</li> </ul>
<i>La válvula de alivio produce un chisporroteo o drenaje</i>	Acumulación de presión ocasionada por expansión térmica en un sistema cerrado.	<ul style="list-style-type: none"> <li>Ésta es una condición inaceptable y debe ser corregida. Para obtener información sobre cómo corregir esto, comuníquese con un proveedor de agua o con un contratista de plomería. No enchufe la ficha de la válvula de alivio.</li> </ul>
<i>El calentador está emitiendo un pitido y la pantalla indica F11</i>	El calentador de agua no fue llenado con agua antes de ser encendido. Encender el calentador sin agua dañará los calentadores eléctricos. La garantía del calentador de agua no cubre daños ni fallas como resultado de un funcionamiento con el tanque vacío o parcialmente vacío.	<ul style="list-style-type: none"> <li>Llene el tanque completamente con agua. Presione <b>ENTER (Ingresar)</b> para detener la alarma y luego presione <b>POWER (Encender)</b> cuando el tanque haya sido llenado.</li> </ul>
<i>La luz del filtro está encendida.</i>	El filtro requiere una limpieza. Para un funcionamiento efectivo, es necesario que el filtro esté limpio.	<ul style="list-style-type: none"> <li>Siga las instrucciones sobre cómo retirar y limpiar el filtro, en la página 59.</li> </ul>
<i>El calentador está emitiendo un pitido y la pantalla indica "FA-F8"</i>	Existe un problema con el sistema de la bomba de calentamiento.	<ul style="list-style-type: none"> <li>La unidad cambiará automáticamente a otro modo disponible a fin de asegurar que usted continúe teniendo agua caliente. Comuníquese inmediatamente con el servicio técnico y brinde los códigos que figuran en la pantalla de visualización.</li> </ul>
<i>El calentador está emitiendo un sonido y en la pantalla titila un</i>	Existe un problema con el calentador de agua que requiere atención inmediata. <i>código de error</i>	<ul style="list-style-type: none"> <li>El calentador podrá cambiar a otro modo de calentamiento disponible. Comuníquese de forma inmediata con el servicio técnico. A fin de detener el pitido (a menos que el código de error sea F2, F-11 o bAd linE), presione el botón con flecha hacia arriba o con flecha hacia abajo y la alarma se detendrá y la pantalla regresará a la visualización normal (temporizador configurado).</li> </ul>
<i>El calentador de agua está emitiendo un pitido y en la pantalla titila "bAd linE"</i>	<b>La unidad no está recibiendo 240VAC como se espera.</b>	<ul style="list-style-type: none"> <li>Apague el calentador de agua (generalmente en el panel del disyuntor). Luego lea la sección "Conexiones Eléctricas" en Instrucciones de Instalación, en la página 64. Luego, comuníquese con el instalador para verificar la entrada eléctrica del calentador de agua.</li> </ul>



Problema	Causas Posibles	Qué Hacer
<i>El Agua Caliente tiene olor a huevo podrido o azufre</i>	Ciertos suministros de agua con alto contenido de sulfato reaccionarán con la varilla del ánodo que está presente en todos los calentadores de agua para la protección del tanque corrosión.	<ul style="list-style-type: none"> <li>El olor puede ser producido o eliminado en la mayoría de los calentadores de agua, reemplazando la varilla del ánodo con un material de varilla menos activo. En algunos casos, es posible que sea necesario agregar el paso de clorar el calentador de agua y todas las líneas de agua caliente para la protección de la corrosión. Para acceder a opciones e instrucciones, comuníquese con su plomero o con el profesional local sobre el agua Para información sobre cómo adquirir este reemplazo de la varilla del ánodo, comuníquese a GE al 1.888.4GE.HEWH (1.888.443.4394). Personal calificado del servicio técnico o un plomero deberían realizar este reemplazo. El uso de una varilla de ánodo no aprobada por GE, o el uso del calentador de agua sin una varilla de ánodo aprobada por GE ANULARÁN la garantía.</li> </ul>
<i>La unidad no está produciendo sonidos normales.</i>	<i>Si la unidad utiliza elementos con resistencias, no producirá sonidos de ventilador o compresor.</i>	<ul style="list-style-type: none"> <li>Controle el modo de la unidad.</li> </ul>

**Para solicitar el servicio técnico, comuníquese al 1.888.4GE.HEWH (1.888.443.4394)**

## Códigos de falla. .

Código de Falla Exhibido	Condición	Acción
FA	T4 No Sube	Llame al servicio técnico
FB	Tiempo de Descarga Inestable	Llame al servicio técnico
FC	El Evaporador No Está Libre de Escarcha	Llame al servicio técnico
FD	Alto Nivel de Calor Demasiado Bajo	Llame al servicio técnico
FE	Temperatura de Descarga Por Encima del Límite	Llame al servicio técnico
FF	Válvula de Expansión Electrónica Fuera del Rango	Llame al servicio técnico
FG*	Control de Temperatura Ambiente T5	Datos del servicio técnico
FH*	Prueba de Carga del Compresor	Datos del servicio técnico
FI*	Prueba de pérdidas del refrigerante	Llame al servicio técnico
F2	Falla del Sensor de Temperatura del Tanque T2	Llame al servicio técnico
F3	Falla del Compresor	Llame al servicio técnico
F4	Falla del Ventilador	Llame al servicio técnico
F5	Falla del Sensor T3a (temperatura de entrada del evaporador)	Llame al servicio técnico
F6	Falla del Sensor T3a (temperatura de salida del evaporador)	Llame al servicio técnico
F7	Falla del Sensor T4 (salida del compresor)	Llame al servicio técnico
F8	Falla del Sensor T5 (temperatura ambiente)	Llame al servicio técnico
F9	Falla del Elemento de Calentamiento Inferior	Llame al servicio técnico
F10	Falla del Elemento de Calentamiento Superior	Llame al servicio técnico
F11	Falla del Tanque de Secado	Lea la página 64.
bAd linE (F12)	El voltaje es demasiado bajo en el encendido	Lea la página 64.
F13	Falla por Tecla Atorada	Llame al servicio técnico
Dirty Filter (F14)	El filtro está sucio	Lea la página 59.
F15	Falla de DataFlash	Llame al servicio técnico

\* Algunos Modelos

# GE Hybrid Water Heater Warranty.



All warranty service provided by our Authorized Servicer Network. To schedule service, call 888.4GE.HEWH (888.443.4394). Please have serial number and model number available when calling for service.

Staple your receipt here. Proof of the original purchase date is needed to obtain service under the warranty.

## For The Period Of: We Will Replace:

<p><b>One Year</b> From the date of the original purchase</p>	<p><b>Any part</b> of the Hybrid Water Heater which fails due to a defect in materials or workmanship. During this <i>limited one-year warranty</i>, GE will also provide, <i>free of charge</i>, all labor and related service to replace the defective part.</p>
<p><b>Second through Tenth Year</b> From the date of the original purchase</p>	<p><b>Any part</b> of the Hybrid Water Heater which fails due to a defect in materials or workmanship. During this <i>limited ten-year parts warranty</i>, labor and related service to replace the defective part are not included.</p>

## What Is Not Covered:

- Service trips to your home to teach you how to use the product.
- Improper installation, delivery or maintenance.
- Failure of the product if it is abused, misused, altered, used commercially or used for other than the intended purpose.
- Use of this product where water is microbiologically unsafe or of unknown quality, without adequate disinfection before or after the system.
- Replacement of house fuses or resetting of circuit breakers.
- Damage to the product caused by accident, lightning, fire, flood or acts of God.
- Incidental or consequential damage caused by possible defects with this appliance, its installation or repair.
- Product not accessible to provide required service in a safe manner. Attic installation must have flooring and accessible stairs.
- If product removed from original installation location.
- Damages, malfunctions or failure caused by the use of repair service not approved by GE.
- Damages, malfunctions or failure caused by the use of unapproved parts or components.
- Damages, malfunctions or failure caused by operating the heat pump water heater with the anode rod removed.
- Consumo y reemplazo de la varilla del ánodo.
- Damages, malfunctions or failure resulting from operating the heat pump with an empty or partially empty tank.
- Damages, malfunctions or failure caused by subjecting the tank to pressure greater than those shown on the rating label.
- Damages, malfunctions or failure caused by operating the heat pump water heater with electrical voltage outside the voltage range listed on the rating label.
- Water heater failure due to the water heater being operated in a corrosive atmosphere.

**EXCLUSION OF IMPLIED WARRANTIES—Your sole and exclusive remedy is product repair as provided in this Limited Warranty. Any implied warranties, including the implied warranties of merchantability or fitness for a particular purpose, are limited to one year or the shortest period allowed by law.**

This warranty is extended to the original purchaser and any succeeding owner for products purchased for home use within the USA. If the product is located in an area where service by a GE Authorized Servicer is not available, you may be responsible for a trip charge or you may be required to bring the product to an Authorized GE Service location for service. In Alaska, the warranty excludes the cost of shipping or service calls to your home.

Some states do not allow the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. To know what your legal rights are, consult your local or state consumer affairs office or your state's Attorney General.

**For product purchased outside of the US, contact your dealer for Warranty and Service information.**

**Warrantor for Products Purchased in the United States: General Electric Company, Louisville, KY 40225.**



### *Página Web de GE Appliances*

*GEAppliances.com*

¿Tiene alguna pregunta sobre su electrodoméstico? ¡Pruebe la página Web de GE Appliances 24 horas al día, cualquier día del año! Para mayor conveniencia y servicio más rápido, ya puede descargar los Manuales de los Propietarios o pedir piezas en línea.



### *Solicite una reparación*

*GEAppliances.com*

El servicio de expertos GE está a tan sólo un paso de su puerta. Solicite su reparación cuando le venga llamando al 800.GE.CARES (800.432.2737) durante horas normales de oficina.



### *Real Life Design Studio (Estudio de diseño para la vida real)*

*GEAppliances.com*

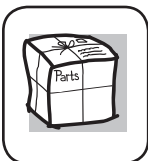
GE apoya el concepto de Diseño Universal—productos, servicios y ambientes que pueden usar gente de todas las edades, tamaños y capacidades. Reconocemos la necesidad de diseñar para una gran gama de habilidades y dificultades físicas y mentales. Para más detalles sobre las aplicaciones de GE Diseño Universal, incluyendo ideas de diseño para la cocina para personas con discapacidades, mire nuestra página Web hoy mismo. Para personas con dificultades auditivas, favor de llamar al 800.TDD.GEAC (800.833.4322).



### *Garantías ampliadas*

*GEAppliances.com*

Compre una garantía ampliada y obtenga detalles sobre descuentos especiales disponibles mientras su garantía está aún activa. Puede comprarla en línea en cualquier momento, o llamar al (800.626.2224) durante horas normales de oficina. GE Consumer Home Services estará aún ahí cuando su garantía termine.



### *Piezas y accesorios*

*GEAppliances.com*

Aquellos individuos con la calificación necesaria para reparar sus propios electrodomésticos pueden pedir que se les manden las piezas o accesorios directamente a sus hogares (aceptamos las tarjetas VISA, MasterCard y Discover). Haga su pedido en línea hoy, 24 horas cada día o llamar por teléfono al 800.626.2002 durante horas normales de oficina.

Las instrucciones descritas en este manual cubren los procedimientos a seguir por cualquier usuario. Cualquier otra reparación debería, por regla general, referirse a personal calificado autorizado. Debe ejercerse precaución ya que las reparaciones incorrectas pueden causar condiciones de funcionamiento inseguras.



### *Póngase en contacto con nosotros*

*GEAppliances.com*

Si no está satisfecho con el servicio que recibe de GE, póngase en contacto con nosotros en nuestra página Web indicando todos los detalles así como su número de teléfono o escríbanos a:

General Manager, Customer Relations  
GE Appliances, Appliance Park  
Louisville, KY 40225



### *Registre su electrodoméstico*

*GEAppliances.com*

¡Registre su nuevo electrodoméstico en línea—cuando usted prefiera! El registrar su producto a tiempo le proporcionará, si surgiera la necesidad, una mejor comunicación y un servicio más rápido bajo los términos de su garantía. También puede enviar su tarjeta de registro pre-impresa que se incluye en el material de embalaje o recorte y use el formulario de este Manual del Propietario.

## Consumer Support.

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### GE Appliances Website

In the U.S.: **GEAppliances.com**

Have a question or need assistance with your appliance? Try the GE Appliances Website 24 hours a day, any day of the year! For greater convenience and faster service, you can now download Owner's Manuals, order parts, or even schedule service on-line. In Canada: [www.GEAppliances.ca](http://www.GEAppliances.ca)



### Schedule Service

In the U.S.: **GEAppliances.com**

Expert GE repair service is only one step away from your door. Schedule your service at your convenience by calling 800.GE.CARES (800.432.2737) during normal business hours.

In Canada, call 1.800.561.3344



### Real Life Design Studio

In the U.S.: **GEAppliances.com**

GE supports the Universal Design concept—products, services and environments that can be used by people of all ages, sizes and capabilities. We recognize the need to design for a wide range of physical and mental abilities and impairments. For details of GE's Universal Design applications, including kitchen design ideas for people with disabilities, check out our Website today. For the hearing impaired, please call 800.TDD.GEAC (800.833.4322).

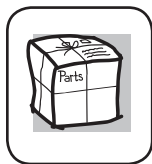
In Canada, contact: Manager, Consumer Relations, Mabe Canada Inc.  
Suite 310, 1 Factory Lane  
Moncton, N.B. E1C 9M3



### Extended Warranties

In the U.S.: **GEAppliances.com**

Purchase a GE extended warranty and learn about special discounts that are available while your warranty is still in effect. You can purchase it on-line anytime, or call 800.626.2224 during normal business hours. GE Consumer Home Services will still be there after your warranty expires. In Canada, call 1.888.261.2133



### Parts and Accessories

In the U.S.: **GEAppliances.com**

Individuals qualified to service their own appliances can have parts or accessories sent directly to their homes (VISA, MasterCard and Discover cards are accepted). Order on-line today, 24 hours every day or by phone at 800.626.2002 during normal business hours.

**Instructions contained in this manual cover procedures to be performed by any user. Other servicing generally should be referred to qualified service personnel. Caution must be exercised, since improper servicing may cause unsafe operation.**

Customers in Canada should consult the yellow pages for the nearest Mabe service center, or call 1.800.661.1616.



### Contact Us

In the U.S.: **GEAppliances.com**

If you are not satisfied with the service you receive from GE, contact us on our Website with all the details including your phone number, or write to:

General Manager, Customer Relations  
GE Appliances, Appliance Park  
Louisville, KY 40225

In Canada: [www.GEAppliances.ca](http://www.GEAppliances.ca), or write to: Director, Consumer Relations, Mabe Canada Inc.  
Suite 310, 1 Factory Lane  
Moncton, N.B. E1C 9M3



### Register Your Appliance

In the U.S.: **GEAppliances.com**

Register your new appliance on-line—at your convenience! Timely product registration will allow for enhanced communication and prompt service under the terms of your warranty, should the need arise. You may also mail in the pre-printed registration card included in the packing material, or detach and use the form in this Owner's Manual. In Canada: [www.GEAppliances.ca](http://www.GEAppliances.ca)

# TALCO Fire Systems

## RESIDENTIAL FIRE PUMP PRODUCTS





## RESIDENTIAL FIRE PROTECTION PRODUCTS

**The Home Hydrant** is a completely integrated fire riser, pump, and water storage tank system. Versatility, competitive pricing, and appliance-like good looks makes our flagship Home Hydrant the preferred choice of home owners and home builders alike.



**LSF Series** (*Limited Service Fire*) fire pump systems are suitable for applications using city water (booster service), private wells, or water storage tanks. The LSF's electric control system features a full voltage contactor and minimum run timer for safe and reliable operation.



**\*\*Flow Smart (FS)** series pumps are the industry's price leader. These simple, reliable pump systems are designed for tank use only and provide reliable and worry free operation for any homeowner.



**HDR** (*Heavy Duty Residential*) packaged fire pumps are designed for more demanding NFPA13D applications. These systems are built using heavy duty cast-iron bronze-fit pumps with UL listed residential controllers and fitted out as if they were NFPA13R fire pump systems.



**13-ULV** systems are based around UL/FM listed vertical inline fire pumps. These packages can be configured for either NFPA13D or NFPA13R compliance depending on your project requirements. Jockey pumps are also available as an option.



**Tanks & Accessories** Talco Fire Systems offers a wide variety of water storage tanks as well as pump to tank connection hoses, auto-fill valves, bladder tanks, etc. many of which are not cataloged. Contact one of our friendly and knowledgeable fire system specialists for more options.



**\*\*Not intended for use with city water supply**



Talco's Home Hydrant (patent pending) is designed to save you money, time, and headaches. Combining a water storage tank, fire pump, controls, and our *Smart Riser* fire riser assembly, the Home Hydrant is the most complete and compact residential fire pump package on the market. Each Home Hydrant system ships completely assembled, tested for leaks, and includes a certified performance report.

# HOME HYDRANT3

**350 Gallon Water Storage Tank**  
**230 Volt, Single-Phase Electric Motor**  
**1.5 to 3HP**

**Discharge Manifold/Fire Riser -**

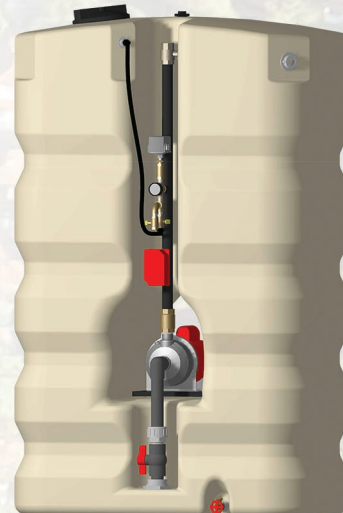
- Check Valve - Pressure Switch
- Pressure Gauge - Test Connection
- Flow Switch - System Drain

# 13D RESIDENTIAL FIRE PUMP SYSTEM

Home Hydrant System Includes:

- 350 Gallon Water Tank
- Fire Pump
- Discharge Manifold/Fire Riser
- Suction Manifold
- Auto-Fill Valve
- Overflow Fitting
- Tank Drain

MODEL	HH3 200W	HH3 150SP	HH3 150C	HH3 300C
GPM	PSI	PSI	PSI	PSI
CHURN	49	56	48	59
30	45	52	43	55
40	42	48	40	53
50	36	45	38	50
60		38		48



**Home Hydrant installation is quick and easy -**

- Place Home Hydrant
- Connect water supply to supplied Auto Fill Valve
- Connect drain pipe
- Attach discharge to sprinkler pipe
- Wire to pressure switch
- Fill tank
- Test system



## HOME HYDRANT4

**450 Gallon Water Storage Tank**  
**230 Volt, Single-Phase Electric Motor**  
**1.5 to 3HP**

### Discharge Manifold/Fire Riser -

- Check Valve - Pressure Switch
- Pressure Gauge - Test Connection
- Flow Switch - System Drain



## 13D RESIDENTIAL FIRE PUMP SYSTEM

Home Hydrant System Includes:

- 450 Gallon Water Tank
- Fire Pump
- Discharge Manifold/Fire Riser
- Suction Manifold
- Auto-Fill Valve
- Overflow Fitting
- Tank Drain

MODEL	HH4 200W	HH4 150SP	HH4 150C	HH4 300C
GPM	PSI	PSI	PSI	PSI
CHURN	49	56	48	59
30	45	52	43	55
40	42	48	40	53
50	36	45	38	50
60		38		48

## FIRE SPRINKLER SYSTEMS & STANDARD WATER METERS

Our residential fire protection systems are all designed to work with standard water meters. Costs for water meters and water service can vary wildly depending on where you live. Standard water meters (5/8" or 3/4") may not provide enough water flow (GPM) to run fire sprinklers without a pump and tank system. Some water purveyors can provide a line specifically for fire sprinklers at little or no charge. For everyone else the costs for a larger water meter can be extremely prohibitive and a pump and tank system can save thousands of dollars.

Homes supplied by a well are in a similar situation. A larger well pump could supply both domestic water and provide for fire sprinklers but will cost significantly more to purchase, use more power, and may over-tax the aquifer. When costs get too high a pump and tank system is the obvious choice. We offer multiple models to cover nearly any design condition or project requirement.



## WHOLE HOUSE SYSTEMS

Combining residential fire sprinklers with domestic plumbing -

You may be required to supply water to the fire sprinklers and either part or all of the domestic plumbing system. Combined with a simple pressure tank, Talco Home Hydrant or the Flow Smart series pumps work perfectly in these applications. The pressure tank ensures efficient operation and long pump life.

We recommend the following:

For systems combining one toilet with the fire sprinklers install a pressure tank with at least 5 gallons capacity anywhere downstream of the discharge valve.

For systems where the fire pump supplies the sprinklers and the entire plumbing system install a pressure tank with a minimum capacity of 85 gallons anywhere downstream of the backflow preventer on the plumbing system side.

## FLOW SMART

230 Volt, Single-Phase Electric Motor  
1.5 to 3HP

Discharge Manifold -

- Check Valve - Pressure Switch - Pressure Gauge

MODEL	FS 200W	FS 150SP	FS 150C	FS 300C
GPM	PSI	PSI	PSI	PSI
CHURN	49	56	48	59
30	45	52	43	55
40	42	48	40	53
50	36	45	38	50
60		38		48

## 13D RESIDENTIAL FIRE PUMPS

Flow Smart Fire Pumps are intended for tank fed applications only.  
**NOT FOR BOOSTER USE**  
For booster applications see our LSF Fire Pumps









Talco **Heavy Duty Residential** fire pump packages are intended for larger residential projects that don't require NFPA 13R code compliance or for situations where the greater expense and lead time for a UL listed pump could negatively impact project completion.

HDR packaged systems are built to the same standards as our NFPA13R systems and use many of the same components, the notable difference being the pump itself. HDR systems use carefully selected end suction pumps that do not carry a listing for fire protection. These readily available and cost effective systems are acceptable to many AHJs for NFPA 13R projects.

# HDR FIRE PUMP SYSTEMS

## CAST IRON/BRONZE FIT CENTRIFUGAL PUMP

### 230 Volt, Single-Phase

#### Controller -

Tornatech RPA - Listed Residential Fire Pump Controller  
(w/ Sensing Line per NFPA-20)

#### Suction Manifold -

Monitored Ball Valve - Pressure Gauge

#### Discharge Manifold -

Check Valve - Pressure Gauge - Relief Valve - Monitored Ball Valve

CHECK WITH AHJ FOR APPROVAL  
PRIOR TO ORDERING



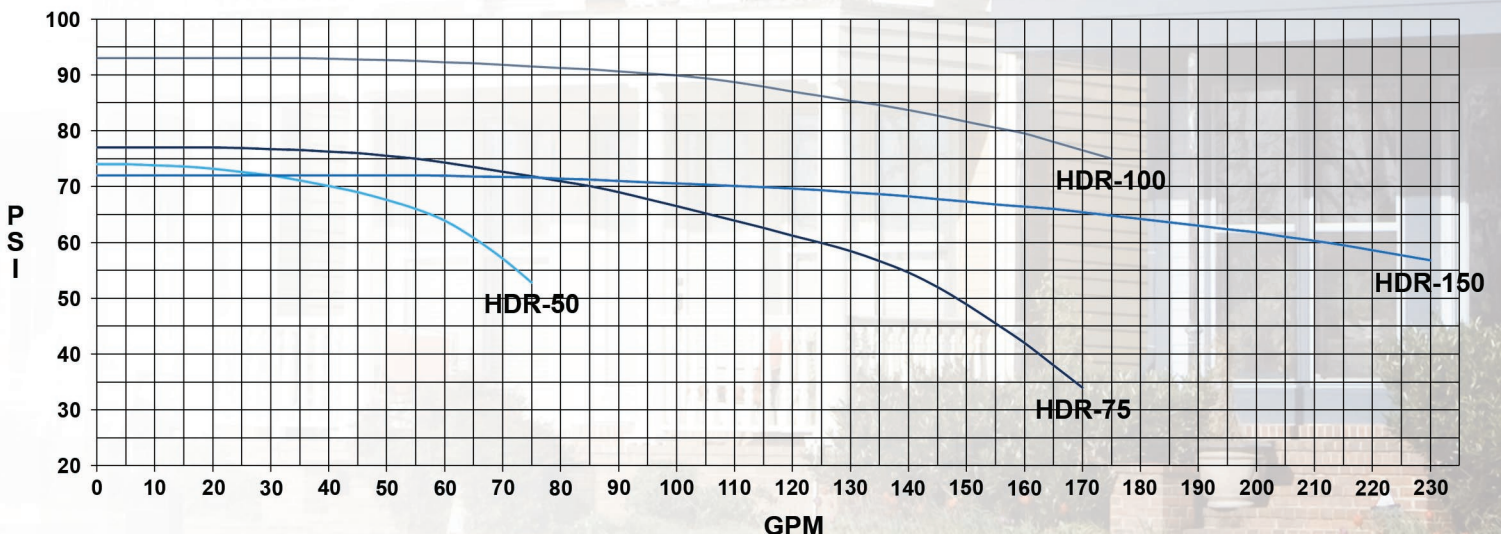
**HDR-50**  
5 HP  
50GPM @ 65PSI

**HDR-75**  
7.5HP  
75GPM @ 70PSI

**HDR-100**  
10 HP  
100GPM @ 90PSI

**HDR-150**  
10 HP  
150GPM @ 65PSI

### HDR PERFORMANCE CURVES





Talco 13ULV models can be configured for either NFPA 13D or NFPA 13R code compliance. These packages are designed for installations using single phase power. Based around UL/FM listed vertical inline fire pumps with either residential or limited service listed fire pump controllers these systems are designed specifically for NFPA 13R applications such as mixed use residential/commercial buildings, smaller apartment buildings, or assisted living centers.

13ULV-D models use a listed residential fire pump controller and therefore will require AHJ approval for use in NFPA 13R projects. 13ULV-R models, with their limited service controllers, are NFPA 20 compliant *for single phase applications*. Both models are fitted out per NFPA 20 including monitored valves listed for fire protection, hard copper sense lines, suction and discharge piping sized as per NFPA requirements, and wiring to NFPA 70. Talco 13ULV packages have near universal acceptance within the North America.

## 13ULV-D VERTICAL INLINE FIRE PUMP SYSTEMS

### UL/FM VERTICAL INLINE FIRE PUMP

**230 Volt, Single-Phase  
Controller -**

Tornatech RPA - Residential Fire Pump Controller  
(w/ Sensing Line per NFPA-20)

### **Suction Manifold -**

OS&Y Gate Valve - Pressure Gauge

### **Discharge Manifold -**

Check Valve - Pressure Gauge - Relief Valve -  
Monitored Butterfly Valves - Test Header Connection

Optional jockey pumps also available.



**13ULV50-D**

10 HP

50GPM @ 95PSI

**13ULV100-D**

10 HP

100GPM @ 90PSI

**13ULV150-D**

10 HP

150GPM @ 60PSI

**13ULV200-D**

10 HP

200GPM @ 50PSI

**13ULV250-D**

10 HP

250GPM @ 40PSI



# 13ULV-R VERTICAL INLINE FIRE PUMP SYSTEMS

## UL/FM VERTICAL INLINE FIRE PUMP

230 Volt, Single-Phase

### Controller -

Tornatech GPL - Limited Service Fire Pump Controller  
(w/ Sensing Line per NFPA-20)

### Suction Manifold -

OS&Y Gate Valve - Pressure Gauge

### Discharge Manifold -

Check Valve - Pressure Gauge - Relief Valve -

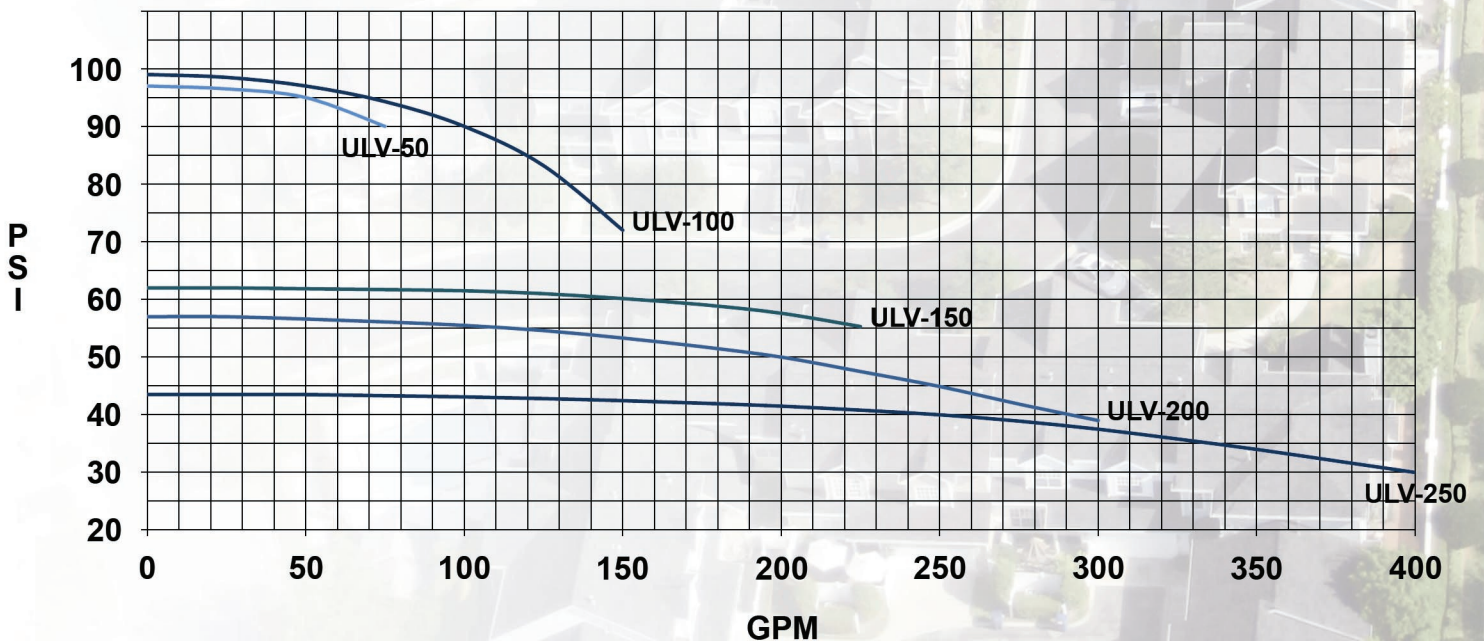
Monitored Butterfly Valves - Test Header Connection



Optional jockey pumps also available.

<b>13ULV50-R</b>	<b>13ULV100-R</b>	<b>13ULV150-R</b>	<b>13ULV200-R</b>	<b>13ULV250-R</b>
10 HP	10 HP	10 HP	10 HP	10 HP
50GPM @ 95PSI	100GPM @ 90PSI	150GPM @ 60PSI	200GPM @ 50PSI	250GPM @ 40PSI

## ULV PERFORMANCE CURVES





Talco offers a variety of water tanks and accessories to help complete your pump room. Our standard tank and fitting products are listed below, larger tanks from 500 to 15,000 gallons are also available. Contact one of our friendly and knowledgeable fire pump specialists for more options.

## POLY WATER STORAGE TANKS

**-BARE TANKS-** Tank fitting kits sold separately, see below

MODEL	CAPACITY	CONFIGURATION	DIMENSIONS	WEIGHT
300V	300 GAL.	VERTICAL ROUND	34.5" DIA X 78" H	100#
400V	400 GAL.	VERTICAL ROUND	42" DIA X 75" H	145#
500V	500 GAL.	VERTICAL ROUND	48" DIA X 75" H	150#
300R	300 GAL.	RECTANGLE	62" L X 29" W X 48" H	150#
400R	400 GAL.	RECTANGLE	62" L X 29" W X 64" H	180#



## WATER TANK FITTING KITS

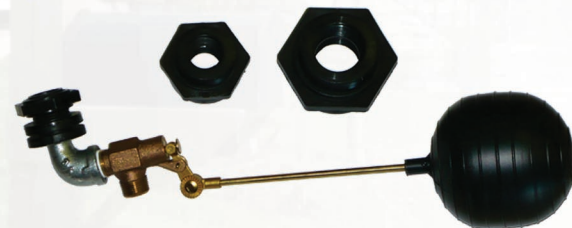
-With 3/4" AutoFill, 1 1/2" or 2" NPT Outlet, 1" NPT Overflow Fitting, & Suction Hose Assembly

MODEL	HOSE SIZE
TF-1.5	1 1/2"
TF-2	2"

## SUCTION HOSE ASSEMBLY

-27" Overall Length With Hose Mender & Ball Valve

MODEL	HOSE SIZE
SH-1.5	1 1/2"
SH-2	2"

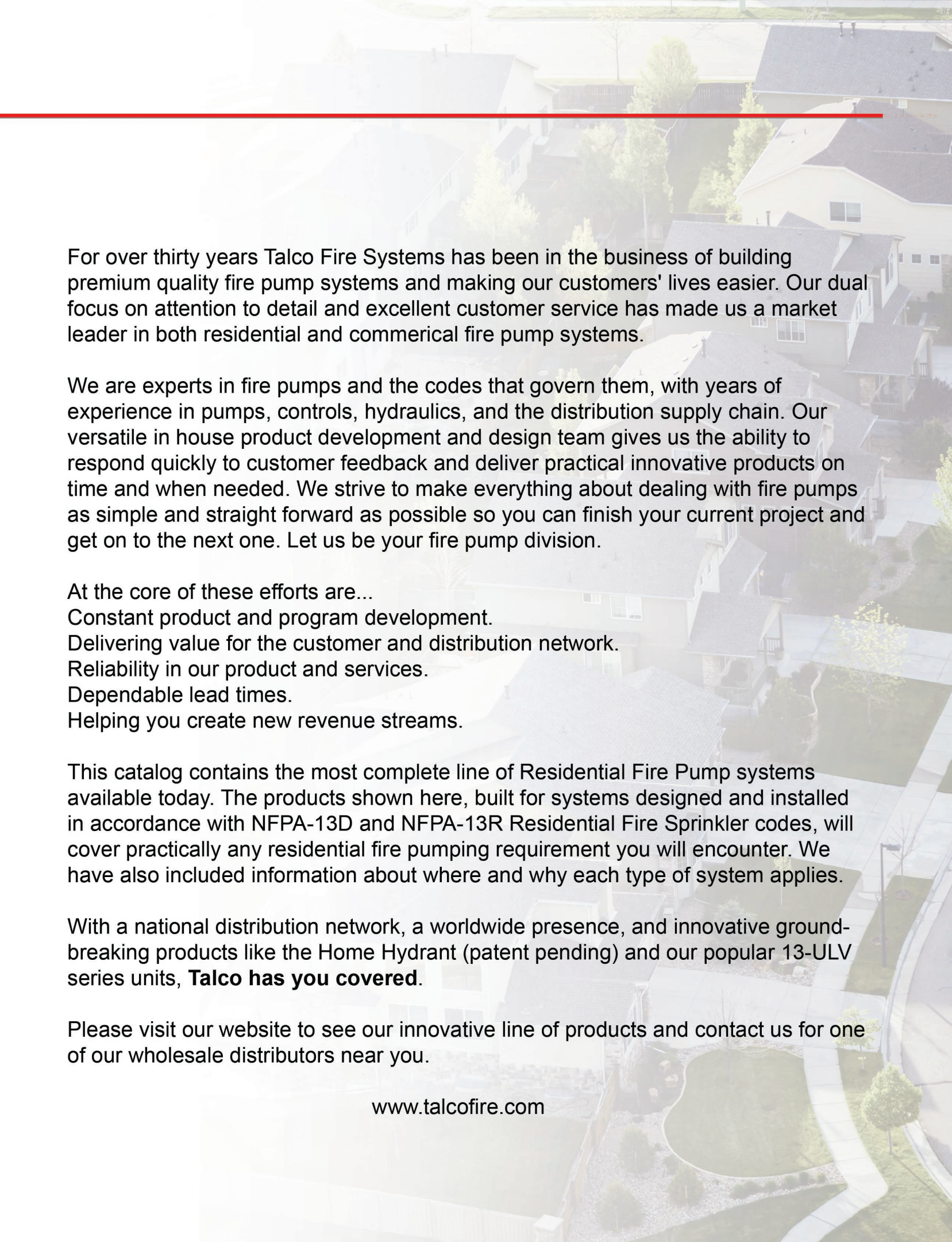


## FLOAT KIT

-AutoFill & 1" Overflow Fitting

MODEL	VALVE SIZE
FK-75	3/4"
FK-125	1 1/4"





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For over thirty years Talco Fire Systems has been in the business of building premium quality fire pump systems and making our customers' lives easier. Our dual focus on attention to detail and excellent customer service has made us a market leader in both residential and commercial fire pump systems.

We are experts in fire pumps and the codes that govern them, with years of experience in pumps, controls, hydraulics, and the distribution supply chain. Our versatile in house product development and design team gives us the ability to respond quickly to customer feedback and deliver practical innovative products on time and when needed. We strive to make everything about dealing with fire pumps as simple and straight forward as possible so you can finish your current project and get on to the next one. Let us be your fire pump division.

At the core of these efforts are...

Constant product and program development.

Delivering value for the customer and distribution network.

Reliability in our product and services.

Dependable lead times.

Helping you create new revenue streams.

This catalog contains the most complete line of Residential Fire Pump systems available today. The products shown here, built for systems designed and installed in accordance with NFPA-13D and NFPA-13R Residential Fire Sprinkler codes, will cover practically any residential fire pumping requirement you will encounter. We have also included information about where and why each type of system applies.

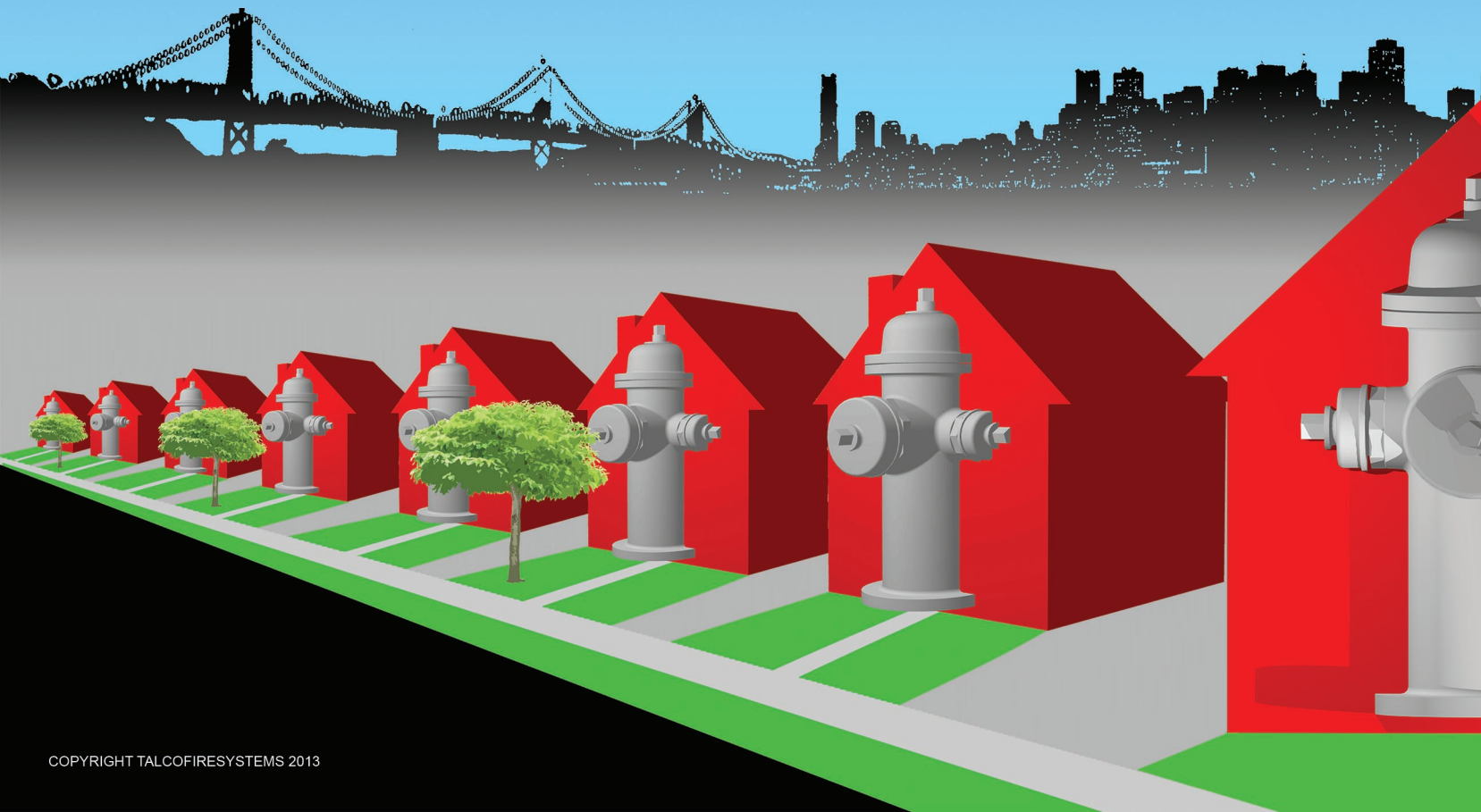
With a national distribution network, a worldwide presence, and innovative groundbreaking products like the Home Hydrant (patent pending) and our popular 13-ULV series units, **Talco has you covered.**

Please visit our website to see our innovative line of products and contact us for one of our wholesale distributors near you.

[www.talcofire.com](http://www.talcofire.com)

TALCO FIRE SYSTEMS  
6040 NE 112TH AVE  
PORTLAND, OR 97220

WWW.TALCOFIRE.COM  
1-800-878-8055  
503-688-1234 (FAX)






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## NSF Product and Service Listings

These Listings were Last Updated on **Thursday, December 18, 2008** at 4:15 AM Eastern Time. Please [contact NSF International](#) to confirm the status of any Listing, report errors, or make suggestions.

**Warning:** NSF is concerned about fraudulent downloading and manipulation of website text. If you have received this listing in hard copy, always confirm this certification/listing information by going directly to <http://www.nsf.org/Certified/PwsComponents/Listings.asp?Company=4U190&Standard=061&> for the latest most accurate information.

### NSF/ANSI STANDARD 61 Drinking Water System Components - Health Effects

**NOTE:** Unless otherwise indicated for Materials, Certification is only for the Water Contact Material shown in the Listing. Click here for a list of [Abbreviations used in these Listings](#).

#### THE VIKING CORPORATION

210 NORTH INDUSTRIAL PARK ROAD  
HASTINGS, MI 49058  
269-945-9501

**Facility :** HASTINGS, MI

#### Pipes and Related Products

Trade Designation	Size	Water Contact Temp	Water Contact Material
Fittings[1]			
VK425	1/2"	CLD 23	MLTPL
VK430	1/2"	CLD 23	MLTPL
VK432	1/2"	CLD 23	MLTPL
VK434	1/2"	CLD 23	MLTPL
VK435	1/2"	CLD 23	MLTPL
VK436	1/2"	CLD 23	MLTPL
VK438	1/2"	CLD 23	MLTPL
VK440	1/2"	CLD 23	MLTPL
VK442	1/2"	CLD 23	MLTPL
VK444	1/2"	CLD 23	MLTPL
VK450	1/2"	CLD 23	MLTPL

VK452	1/2"	CLD 23	MLTPL
VK453	1/2"	CLD 23	MLTPL
VK456	1/2"	CLD 23	MLTPL
VK457	1/2"	CLD 23	MLTPL
VK458	1/2"	CLD 23	MLTPL
VK460	1/2"	CLD 23	MLTPL
VK466	1/2"	CLD 23	MLTPL
VK468	1/2"	CLD 23	MLTPL
VK474	1/2"	CLD 23	MLTPL

[1] Certified to a maximum use of one sprinkler head for every eight feet of piping.

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Number of matching Manufacturers is 1

Number of matching Products is 20

Processing time was 0 seconds

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# LSF-500CIG3

Compact Residential Package

90GPM @ 45PSI

## System Specifications

### Motor

- 5 horsepower electric
- 230 Volt, 21.5 Amp
- Single Phase
- 3450 RPM

### Pump

- High pressure cast iron volute
- Machined bronze impeller
- 2" Suction
- 1¼" Discharge
- 150 PSI Max Working Pressure

### Discharge Manifold

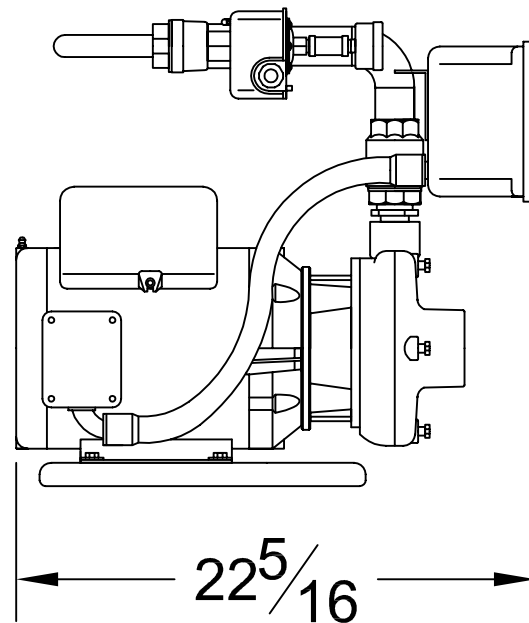
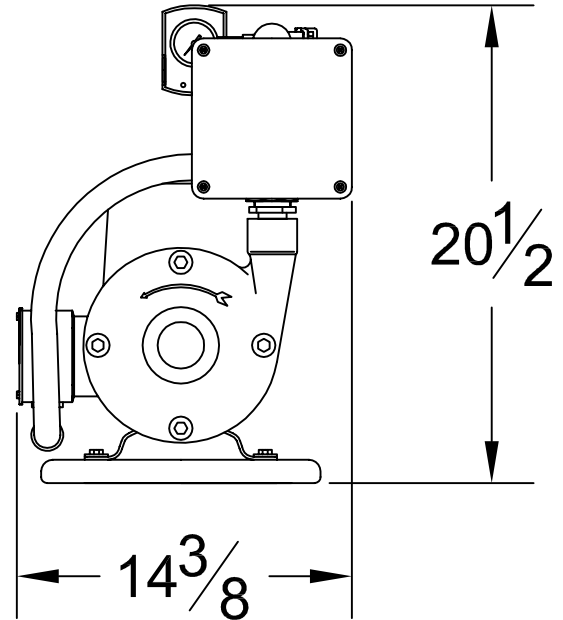
- Check Valve
- Zero to 100 PSI pressure gauge
- 40/60 pressure switch
- Isolation ball valve

### Controls

- 230 Volt
- Minimum run timer
- Pressure switch operated contactor
- HOA toggle switch (Hand, Off, Auto)

### Dimensions (approximate)

- 22<sup>5</sup>/<sub>16</sub>" Length
- 20<sup>1</sup>/<sub>2</sub>" Height
- 14<sup>3</sup>/<sub>8</sub>" Width
- 135 pounds



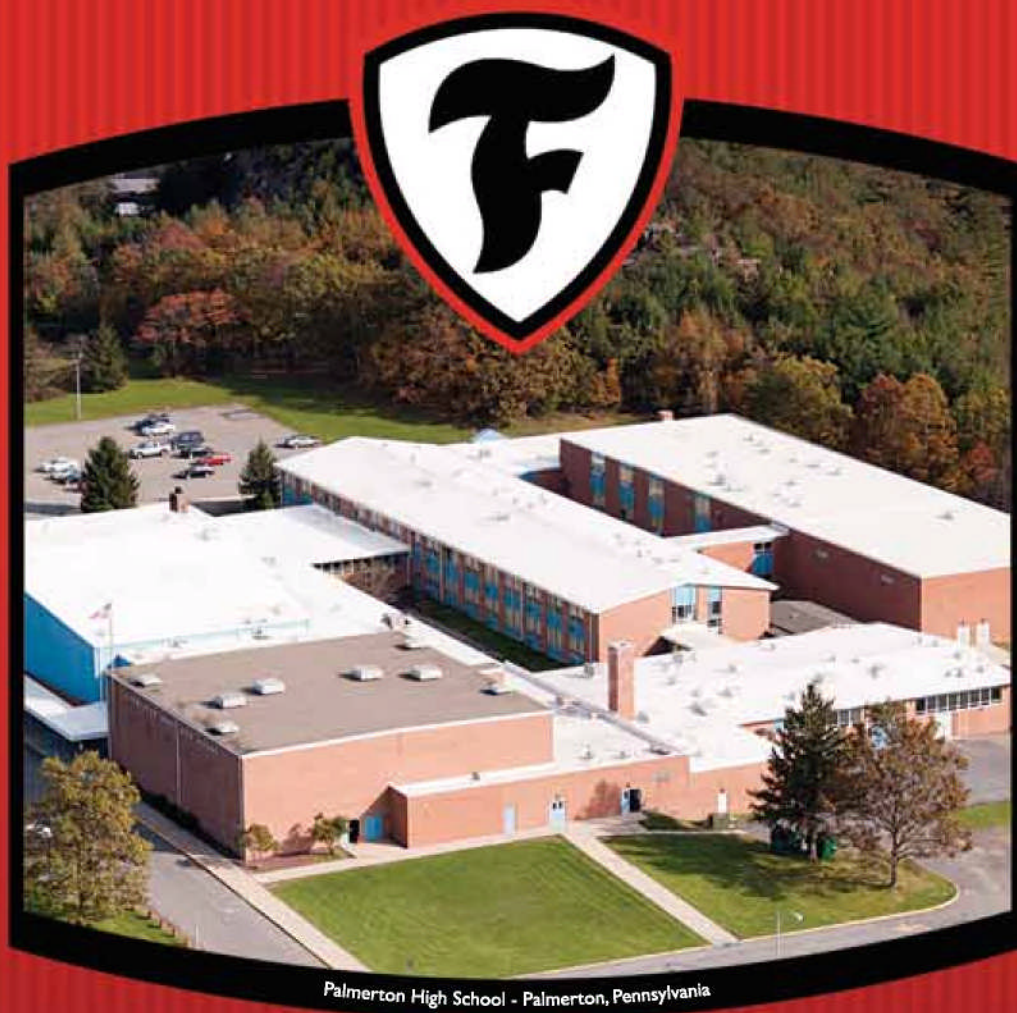
## Performance

Performance values based on multiple pump tests. Not for certification purposes.

GPM	0	40	50	60	70	80	90	100
PSI	61	58	56	54	52	49	46	43

# FIRESTONE RUBBERGARD™ EPDM ROOFING SYSTEMS

BLACK OR WHITE, THE STANDARD IN EPDM ROOFING.



Palmerton High School - Palmerton, Pennsylvania

**Firestone**  
**BUILDING PRODUCTS**  
**NOBODY COVERS YOU BETTER.™**



When choosing an EPDM  
the choice is  
**BLACK** and



Kellogg Company Plant and Bakery - Lancaster, Pennsylvania

With a traditional black RubberGard™ EPDM system, and its full line of accessories, any building can have a durable, recyclable roof. All from the company with 110 years of proven rubber technology and experience behind its name: Firestone.

#### RUBBERGARD PLATINUM™ EPDM SYSTEM.

Designed with the industry's most durable black EPDM membrane—90-mil of uninterrupted thickness—the Platinum EPDM System is quite simply our best roof.

#### SOME ROOFS ARE JUST MADE TO LAST. FIRESTONE EPDM ROOFS ARE MADE TO OUTLAST.

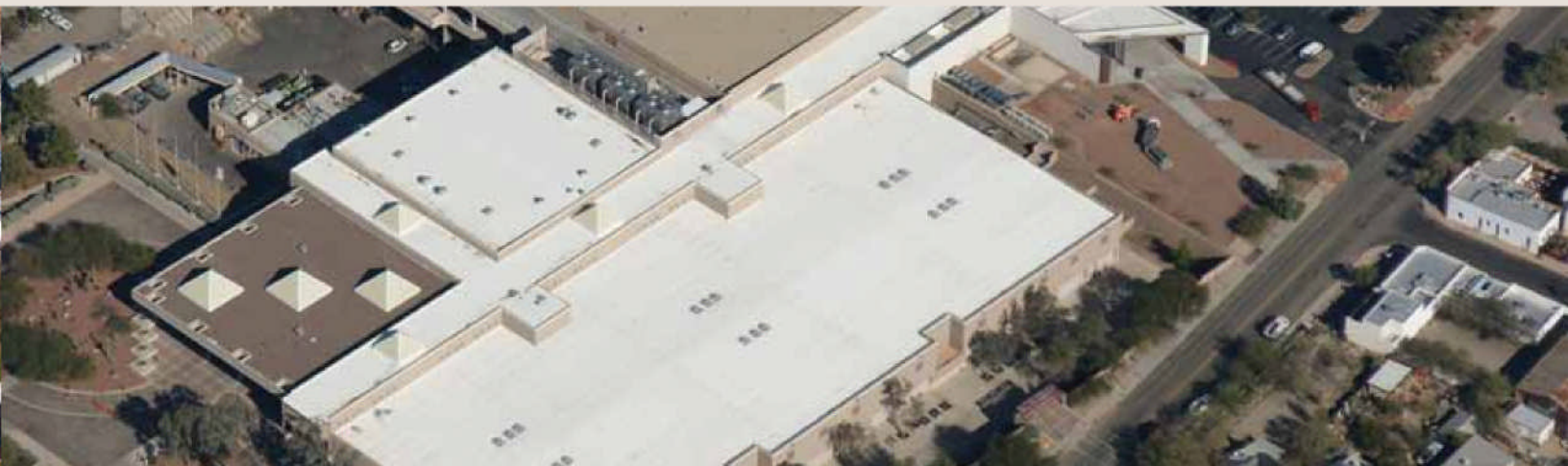
In addition to increased service life, Platinum EPDM membranes provide substantial annual savings in the cost of roof ownership. Its unsurpassed durability can extend the life of a building for many years. This makes the Platinum EPDM System especially suited for owners of educational institutions, hospitals and government buildings, or building authorities responsible for transportation centers, sports complexes and recreation centers.

#### THE YEARS AND THE SAVINGS ADD UP.

Both EcoWhite™ Platinum and RubberGard Platinum EPDM systems are backed by our Red Shield® Warranty, the industry's most comprehensive guarantee: up to an unsurpassed 30-year warranty, with no dollar limit on warrantable repairs\* for up to 30 full years from date of installation. These weathertight warranties\* are also transferable from owner to owner.

\*Subject to the terms and conditions of the Red Shield Warranty.

D M roofing system,  
ice is  
d **W H I T E**



Tucson Convention Center - Tucson, Arizona

A bright innovation for traditional roofing, RubberGard™ EcoWhite™ EPDM membrane sets the industry standard for sustainable, white, reflective roofing and keeps you at the forefront of energy conservation.

**RUBBERGARD ECOWHITE EPDM MEMBRANE.**

Keep rooftops cooler without sacrificing the high standards you have come to expect from Firestone Building Products. EcoWhite EPDM membrane is easy to handle, installs quickly, and is more flexible than thermoplastic single-ply membranes, making it ideal for year-round applications.

- The highest CRRC aged solar reflectance rating for white EPDM—measured at 0.72 versus the competitive product at 0.64
- Qualifies for the ENERGY STAR® Program
- Contributes to LEED® certification or RoofPoint™ credit
- Can provide significant energy savings

You'll be in good company when you choose Firestone RubberGard EcoWhite EPDM membrane. It is the fastest-growing single-ply Firestone roofing product—and building owners use Firestone single-ply roofing more than any other brand in America.\*

\*Buildings Magazine 2011 Brand Awareness, Use and Preference Study and Building Operating Management Magazine 2011 Brand Awareness, Use and Preference Study



ROOFPOINT  
ELEVATING ENVIRONMENT ALPERFORMANCE



- Puncture: Covers incidental punctures
- Puncture/hail: Covers punctures from hail of up to 2" in diameter
- Puncture/hail/wind: Covers punctures, hail and wind damage up to 100 mph







Red Bull Park - Harrison, New Jersey

## The Benefits of RubberGard™ EPDM

For nearly 30 years, contractors, building owners, architects and specifiers have trusted Firestone Building Products for superior commercial roofing systems.

**SUPERIOR ROOFTOP PERFORMANCE AND LONGEVITY.** Based on a high-performance synthetic rubber compound, RubberGard EPDM membrane exhibits outstanding resistance to UV radiation, ozone and weathering, and offers excellent low temperature properties and longer service life.

**ENERGY SAVINGS.** Whether you choose black or white EPDM, the system's thermal performance can reduce energy consumption.\*

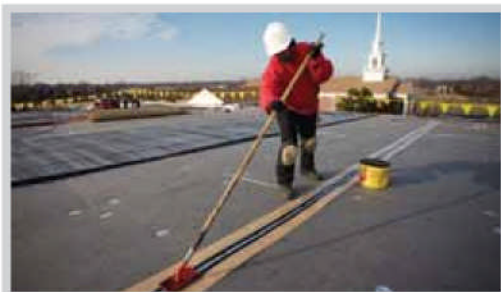
**SYSTEM OPTIONS.** Options include fully adhered, ballasted, and mechanically attached and can be applied above 40°F.

**SIMPLE AND ECONOMICAL TO INSTALL.** RubberGard EPDM membrane is available in widths from 5 to 50 feet and lengths of up to 200 feet, and can require fewer seams and less installation time compared to other single-ply membranes.

**SUPERIOR FLEXIBILITY AND HIGH STRENGTH.** RubberGard EPDM membrane easily contours to unusual roof shapes. EPDM membranes can elongate to over 300% of their original dimensions, exhibiting outstanding thermal expansion and contraction characteristics.

**LIGHTWEIGHT DESIGN FOR MORE VERSATILITY.** RubberGard EPDM membrane weighs less than a half pound per square foot.

\*Results for black and white EPDM depend on location.



### FROM DECK TO DONE, FIRESTONE IS YOUR SINGLE SOURCE FOR COMPLETE ROOFING SYSTEMS.

A complete roofing system isn't always a *compatible roofing system*. When you get a membrane from one manufacturer, flashing from another, and insulation from yet another, you can't be sure how well everything will fit and function together. When the whole system comes from a single source, the components are optimized for performance. That's why the Firestone brand is on everything you need to assemble a complete roofing system—all the parts fit together and work together for optimum results.





Aragon High School - San Mateo, California

### QUICKSEAM™ ACCESSORIES

The QuickSeam tape system is the most advanced method of field seaming EPDM membrane. Contractors appreciate that QuickSeam Tape can be applied faster than other seaming methods, while specifiers recognize the performance, environmental and quality control advantages. In UL-observed tests, QuickSeam Tape products exhibited twice the seam strength of conventional splice adhesive. QuickSeam Tape is compatible with all RubberGard™ EPDM roofing membranes.

The self-adhering technology of QuickSeam SA Flashing was developed for both curbs and parapets in association with RubberGard EPDM roofing systems. QuickSeam SA Flashing consists of an 18-inch wide, 60-mil RubberGard EPDM membrane laminated to QuickSeam Tape.

Firestone's tested and proven, highly reflective, energy-saving EcoWhite™ QuickSeam Flashing accessories are in stock and ready to ship for your next EcoWhite roof installation. QuickSeam products have been hugely successful over the years due to their many benefits, including:

- Easier and faster installation which can significantly reduce labor costs
- Reduces VOCs on the jobsite
- Factory-installed tape that yields higher quality seams
- Tested and proven quality and reliability



### LVOC BONDING ADHESIVES: OUTSTANDING PERFORMANCE, ENVIRONMENTALLY FRIENDLY

To reduce harmful ground level ozone, our Low Volatile Organic Compound (LVOC) products meet the stringent air quality requirements of California and the states that comply with the Ozone Transport Commission (OTC) regulations without sacrificing the quality you expect. Products include sealants, primers, tapes, and both Firestone single-ply LVOC and water-based bonding adhesives. Firestone also has a full line of standard bonding adhesives.

### RUBBERGARD EPDM PRE-TAPED MEMBRANES

Available with 3-inch or 6-inch tape, these membranes offer faster installation.

**EPDM LSFRT PT**—available in widths up to 30 feet and thicknesses of up to 90-mil, this membrane is designed for low slope applications and offers increased fire resistance.

**EPDM MAX PT**—for roofs with frequent service demands, RubberGard EPDM MAX PT membrane is available in widths of up to 10 feet and thicknesses of up to 75-mil. This membrane is reinforced to combat roof tears and punctures and provides superior resistance to wind forces.

**EcoWhite EPDM PT**—in addition to the outstanding solar reflectivity and durability of EcoWhite membranes, the EcoWhite EPDM PT membrane is eligible for a Platinum™ Warranty up to 30 years. Available in widths of up to 25 feet, and thicknesses of up to 90-mil, EcoWhite EPDM PT seam tape is cut flush with membrane to yield a more aesthetically pleasing finished product.





Mills High School - Millbrae, California



Warwick Middle School - Lititz, Pennsylvania



Meadowlands Exposition Center - Secaucus, New Jersey

### EPDM INNOVATIONS: WHAT WE'RE DOING, NOT JUST WHAT WE'VE DONE.

True, we talk about "billions of square feet installed globally" because we believe our track record says something. But talk doesn't cover buildings. Complete systems cover buildings. Innovations cover buildings. And the only square feet you care about right now are on your next roofing project. That's why we're always developing new roofing system solutions.

#### ULTRABLEND™ ROOFING SYSTEM

With the creation of our UltraBlend hybrid system, we've combined EcoWhite™ EPDM membrane with Firestone UltraPly™ TPO membrane to create a better single solution for both horizontal and vertical roofing needs. The UltraBlend system offers both faster installation and lower installed cost, using EcoWhite EPDM membrane and accessories for vertical surfaces such as parapets, walls, curbs and penetration details and UltraPly TPO membrane for horizontal roof surfaces.

#### METAL ROOF RETROFIT

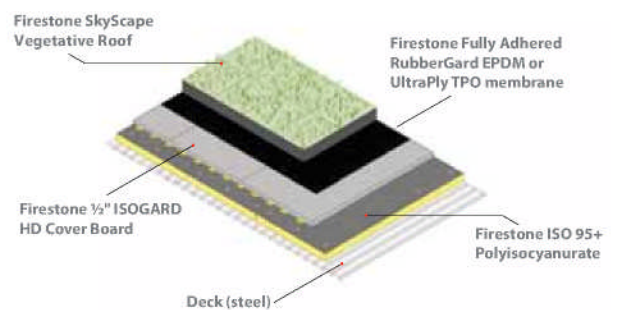
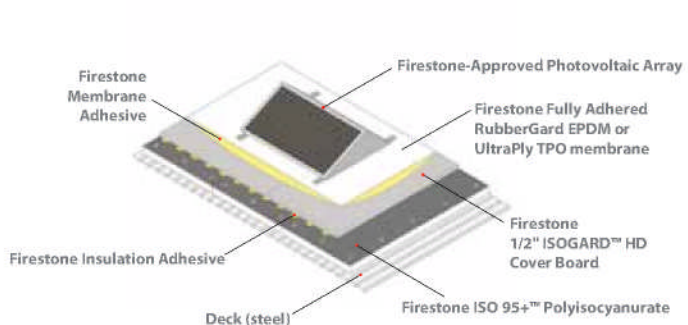
RubberGard EPDM or EcoWhite EPDM membranes, QuickSeam™ accessories, and energy saving insulation offer a solution that extends the life of an existing roof for 20 years or longer and can be installed over a worn metal roof.

#### ENVIROREADY ROOFING SYSTEM

The EnviroReady Roofing System and Warranty lets building owners install a high-quality conventional roof today and upgrade it with green roofing technology tomorrow. Firestone's Red Shield® Warranty keeps new EPDM systems "enviroready" for green roof or solar roof upgrades for up to 7 years after initial installation. This exclusive program covers inspections before and after installation of new green upgrades. Firestone has numerous EPDM system options available when the need arises.

EnviroReady Roofing Systems can play an important role in preparing your building to receive either a SkyScape Vegetative Roof System or a Firestone-approved photovoltaic system.

**UltraBlend™**



# Firestone RubberGard™ EPDM

30+ years of high performance.  
LOWER GLOBAL WARMING POTENTIAL. SUSTAINABLE. RECYCLABLE.

## EPDM PERFORMANCE

EPDM significantly outperforms comparable roofing systems related to long-term environmental impact. A study of low slope roofing membranes conducted on behalf of the EPDM Roofing Association (ERA) by the GreenTeam, Inc., featured a life-cycle assessment of EPDM, TPO, PVC and SBS Modified Bitumen membranes. The study showed 60-mil fully adhered bilaminate, white or black EPDM membrane had the lowest global warming potential (GWP) and other membranes, such as PVC, would have to perform over three times longer to have an equivalent global warming potential as white EPDM. See chart below:

ROLE OF SERVICE LIFE

	MEMBRANE	SYSTEM	GLOBAL WARMING POTENTIAL (Kg. CO <sub>2</sub> )	MIN. SERVICE LIFE TO ACHIEVE EQUIVALENCY <sup>1</sup>
EPDM	60-mil White	Adhered	22.4	15 Years
	60-mil Black		29.6	19.8 Years
TPO	60-mil White	Adhered	30.0	20.7 Years
PVC	60-mil White	Adhered	73.1	49 Years
SBS	140-mil (unsurfaced)	Adhered	81.8	54.8 Years

[1] Using a comparative service life of 15 years for the lowest GWP system (fully adhered white EPDM)  
Source: LifeCycle Inventory and Assessment of Selected Low Slope Roofing Systems in North America. TEGNOS Research, Inc. (2009).  
Original study also included ballasted and mechanically attached roofing membranes.

## EPDM – RENEWABLE AND RECYCLABLE

EPDM rubber is one of the world's most recyclable low slope roofing products. Since 2006, almost 11 million square feet of EPDM has been removed, transported and recycled from buildings all across North America and Canada, creating new and usable products such as rubber matting and artificial turf. With the reroofing market currently driving the low slope roofing business for installers, roofing contractors are doing most of the recycling work. Today, more and more architects are writing a recycling process into their new roof specifications. Specifiers and facility managers also will see roof recycling as an absolute necessity in the years to come, due to a growing number of codes that incorporate sustainability requirements. For more information on the sustainability and recyclability of EPDM, visit [www.epdmroofs.org](http://www.epdmroofs.org).



To build more value into your roofing systems, visit [www.firestonebpc.com/roofing/epdm](http://www.firestonebpc.com/roofing/epdm), call 800-428-4442, or contact your local Firestone Sales Representative by using our website's Find a Sales Rep feature.

**Firestone**  
**BUILDING PRODUCTS**  
**NOBODY COVERS YOU BETTER.™**

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Miami, FL 33166  
305-471-0117

[www.firestonebpco.com](http://www.firestonebpco.com)

Note: This brochure is meant only to highlight Firestone's products and specifications. Information is subject to change without notice. All products and specifications are listed in approximate weights and measurements. For complete product and detail information, please refer to the appropriate Technical Manual. Firestone takes responsibility for furnishing quality materials which meet Firestone's published product specifications. As neither Firestone itself nor its representatives practice architecture, Firestone offers no opinion on, and expressly disclaims any responsibility for, the soundness of any structure on which its products may be applied. If questions arise as to the soundness of a structure or its ability to support a planned installation properly, the Owner should obtain opinions of competent structural engineers before proceeding. Firestone accepts no liability for any structural failure or for resultant damages, and no Firestone Representative is authorized to vary this disclaimer.



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## For Residential Fire Sprinkler Applications

Job Name \_\_\_\_\_

Contractor \_\_\_\_\_

Job Location \_\_\_\_\_

Approval \_\_\_\_\_

Engineer \_\_\_\_\_

Contractor's P.O. No. \_\_\_\_\_

Approval \_\_\_\_\_

Representative \_\_\_\_\_

# LEAD FREE\*

## RF PEX™ Residential Fire Tubing

Sizes: 3/4" – 1" (20 – 25mm)

RF PEX™ Tubing is used for residential fire PEX multipurpose piping systems used to support NFPA 13D, which is the standard covering the "Installation of Sprinkler Systems in One and Two-Family Dwellings and Manufactured Homes." RF PEX™ tubing's unique orange tracer stripe facilitates fire official's inspection.

### UL Listed Pressures and Temperatures

80psi (552 kPa) at 200°F (93.3°C)  
(If RF Tubing is used for Hot Water Lines,  
Not intended for Fire Suppression use)

100psi (689 kPa) at 180°F (82.2°C)  
(If RF Tubing is used for Hot Water Lines,  
Not intended for Fire Suppression use)

130psi (896 kPa) at 120°F (48.9°C)  
(Residential Fire Rating)

160psi (1103 kPa) at 73.4°F (23°C)  
(For Reference Only)

### Specifications

RF PEX™ Tubing is only to be used with RF PEX™ Fittings, RF PEX™ Sprinkler Fittings and Copper CrimpRings™ all of which are UL 1821 listed. These products are designed for use with residential 13D multipurpose fire suppression piping and potable water plumbing applications. RF PEX™ tubing also has an orange tracer stripe to aid in identification.

**\*The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight.**



RF PEX

### Approvals

The below listings are solely based upon use of Watts UL 1821 listed RF PEX™ Tubing, RF PEX™ Fittings and CrimpRing™ connections.



Manufactured in accordance with the American Society for Testing and Materials (ASTM) F-876 and F-877 to SDR-9 dimensional standards.

Tested and certified by NSF International to NSF/ANSI Standards 14 and 61 for use in potable water systems.

Labeled B137.5 which indicates that it is compliant to the CSA standards B137.5.

When not connected to the fire suppression system, Certified PEX5306 is acceptable for use in continuous hot water recirculation.

Can withstand up to 6 months of continuous UV exposure.

ASTM E-84 and CAN/ULC 102.2 smoke developed and flame spread classification.

Fire Resistance per CAN/ULC S101 and ASTM E119-08 AWWA C904.

UL 1821 listed for use in Residential Fire Sprinkler Systems per NFPA 13D.

## Dimensions – Weights

MODEL	NORMAL TUBING SIZE		COIL/STICK LENGTH		BEND RADIUS		FLUID CAPACITY PER 100°		PKG. WEIGHT			
	ID <i>in.</i> <i>mm</i>	OD <i>in.</i> <i>mm</i>	<i>ft.</i> <i>cm</i>	<i>in.</i> <i>mm</i>	<i>gals.</i> <i>ltrs.</i>	<i>lbs.</i> <i>kgs.</i>						
<b>COILS</b>												
FPTC12-100W-OS	¾	20	7/8	22	100	3048	5.25	133	1.9	7.22	10.5	4.8
FPTC12-250W-OS	¾	20	7/8	22	250	7620	5.25	133	1.9	7.22	26.25	12
FPTC12-300W-OS	¾	20	7/8	22	300	9144	5.25	133	1.9	7.22	31	14.1
FPTC12-500W-OS	¾	20	7/8	22	500	15240	5.25	133	1.9	7.22	45	20.4
FPTC12-1000W-OS	¾	20	7/8	22	1000	30480	5.25	133	1.9	7.22	106	48
FPTC16-100W-OS	1	25	1 1/8	29	100	3048	6.75	171	3.10	11.78	18	8.2
FPTC16-300W-OS	1	25	1 1/8	29	300	9144	6.75	171	3.10	11.78	54	24.6
FPTC16-500W-OS	1	25	1 1/8	29	500	15240	6.75	171	3.10	11.78	90	41
<b>STICKS</b>												
FPTS12-10W-OS	¾	20	7/8	22	20	610	5.25	133	1.9	7.22	18	8.16
FPTS12-25W-OS	¾	20	7/8	22	20	610	5.25	133	1.9	7.22	45	20.4
FPTS16-5W-OS	1	25	1 1/8	29	20	610	6.75	171	3.10	11.78	50	22.7



A Watts Water Technologies Company



**ISO 9001-2008  
CERTIFIED**

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Canada: Burlington, ON • Tel: (905) 332-4090 • Fax: (905) 332-7068 • www.wattscanada.ca





Julie Duviver, Duviv Gardens, San Francisco

## How To Use the Florafelt Vertical Gardening System

- TIPS AND ADVICE
- PRODUCT SPEC SHEETS
- INSTALLATION DIAGRAMS

by Chris Bribach

[www.Florafelt.com](http://www.Florafelt.com)



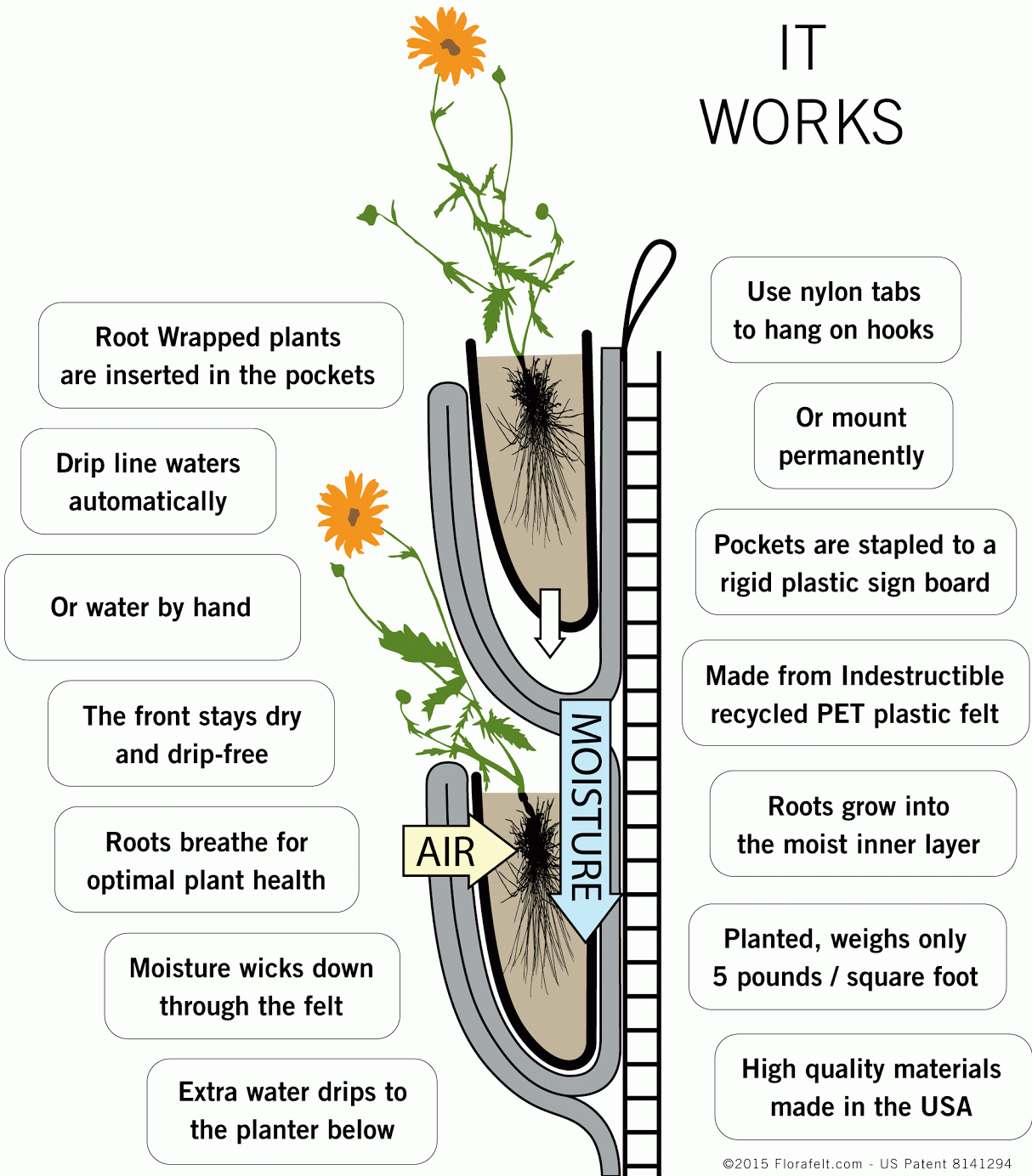
Florafelt 12-Pocket Planter





Florafelt Recirc-33 Vertical Garden.

# HOW IT WORKS







# INSTALLATION GUIDE

By Chris Bribach

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# LIVING ARCHITECTURE FOR EVERYONE

## HEALTHY SPACES

A number of studies have shown that plants in the workplace reduce sick days and increase productivity, and everyone knows that greenery always makes a home more inviting. Aside from being pleasant to look at, plants fill our rooms with fresh oxygen. Also, greenery symbolizes food, health and life, which we feel deep in our subconscious. Since most of us work and live in urban areas and we spend the vast majority of our time indoors, barren interiors can be softened and reinvigorated by the feeling of abundance offered by plants.



## CLEANER AIR

Walls provide an exciting new platform to fill with plants. The creative possibilities are endless. You can create a variety of illusions such as glimpsing a jungle, enjoying the views of a cliffside lush with foliage, or of sitting near a formal garden. And that feeling of freshness is not just a pleasant sensation. It is measurable. Plants not only transform carbon to oxygen, but the soil removes toxins from the air. Millions of active organisms in every scoop of soil neutralize toxins when the microbiology converts VOC's into nitrogen, which is vital for plants. Using this ancient symbiosis to improve our modern world keeps us thriving and healthy.

## URBAN OASIS

In a beautiful irony, cities and urban areas provide more surface area per square foot to grow plants than even our majestic countrysides. Inside and out, our walls can be filled with plants, creating a complex and biodiverse oasis in even the most densely populated areas. Native birds and animals will flock to join us in our urban centers, reconnecting us with nature in thousands of ways. Edible plants and fruits will be plentiful, a harvest at arm's reach.

Photo: Custom Recirculating Florafelt Vertical Garden by Pasi Lindberg, Zengrow, Helsinki, Finland





Florafelt Vertical Garden by Chris Bribach, Plants On Walls. CBRE Office Towers, Downtown San Francisco.



# FLORAFELT MAKES VERTICAL GARDENS EASY



CBRE Office Tower, Downtown San Francisco, California. Designer: Chris Bribach, Plants On Walls.

## FLORAFELT VERTICAL PLANTERS

Growing a living wall is easy with Florafelt Vertical Garden Planters. Our hand-made planters are designed to use the micro fibers in PET felt to water plants equally. The felt is made from recycled plastic bottles, a nylon and non-toxic fiber that is practically indestructible. This amazing material provides a safe growing medium that is pH neutral and non-reactive, so you can garden organically right on your wall. It's even safe for vegetables and herbs! Roots grow right into the felt, which comes alive thanks to the microbiology in the soil.



## ROOT WRAPPERS

Florafelt planters come with our custom Root-Wrapping system. It lets you change and rearrange your living wall at will, while maintaining the integrity of every plant in its own soil.



## **FLORAFELT** MAKES VERTICAL GARDENS EASY

Growing in synthetic felt allows unlimited possibilities. In the 1970's, a famous Parisian designer planted some of the longest-living, largest and most gorgeous living walls to date, which are still thriving. They grow in synthetic felt, which is ideal for breathability and allows for fully mature root development. Florafelt has taken this concept and added pockets created from the same material for ease of installation and plant replacement.



Conservatory of Flowers, San Francisco, California. Designer: Chris Bribach, Plants On Walls.

### **USING A LITTLE SOIL MAKES VERTICAL GARDENING MUCH EASIER**

We created the pockets to accommodate a handful of soil. The soil balances pH and introduces microbiology to let nature do its work and bring the felt alive. It is crucial to use synthetic materials that don't dissolve.

### **WHAT'S WRONG WITH SMALL COMPARTMENTS OR PLANTER BOXES**

Hard or non-breathable plastic systems restrict root growth and eventually kill plants. Our felt pockets encourage root growth for a full life cycle.

# FLORAFELT MAKES VERTICAL GARDENS EASY

## VERY LARGE VERTICAL GARDENS

With a bolted attachment, our Florafelt planters can be used at any height. Florafelt is made from recycled PET and is virtually indestructible. Once it is planted and has time to grow, the root material makes it a permanent living membrane.

## PET PLASTICS AND TOXICITY

Not all plastics are the same. PET plastic is a non-reactive, non-toxic plastic, which is why it is used for anything from milk jugs to water bottles. Trace amounts of toxins are known to emerge from PET, but soil microbes break down those complex molecules long before they reach plant roots. We chose 100% recycled PET felt fibers for our Florafelt, turning unused water bottles into something useful. Additionally, plants grown in this material absorb carbon from the atmosphere, making Florafelt a 'carbon absorbing' product over its lifetime.

## VERTICAL GARDENS THAT EVOLVE

It is very important for the vertical garden to be interactive so that it can be modified as needed. Like any garden, there are unpredictable changes in climate, exposure, pests, or plant disease. Root-wrapped plants are easy to change out when the need arises.



### SLIT-AND-STAPLE METHOD

The major drawback of the slit-and-staple method for vertical gardens is that large planted areas often do not take. It is very difficult to add new plants to fill in these spaces.

### PLEATED-POCKET DESIGN

The Florafelt pleated-pocket design makes it very easy for any gardener to remove the problem plants and tuck healthy starts into the existing pockets. It also allows caretakers to replace the dead foliage with the plant types that are thriving. Starting with a bio-diverse selection allows you to experiment with many plants and minimize the failures. You simply add more of what works.



## VERTICAL GARDEN DESIGN TIPS AND ADVICE



Private residence, Beverly Hills, California. Designer: Chris Bribach, Plants On Walls.

### NATURAL LIGHT

Bright indirect light is an indoor tropical favorite. The plants will reach for the light and align their leaves to the source, making a perfect display. Direct light can be workable if it is limited to a few hours a day.

### INDOOR LIGHTING

Low-light tropical plants require a minimum of 150 foot-candles of illumination, which is best achieved with a track lighting system. Halogen is ideal for many plants because it provides a wide spectrum of light. Metal halide and fluorescent lights are also excellent. New LED lights may also work for some situations.

### OUTDOORS

A deck with full day of sun is perfect for growing herbs and vegetables and flowers. Partial sun is great for lettuce, ferns, succulents and most other plants. Ferns also do well on shady walls.



# VERTICAL GARDEN DESIGN TIPS AND ADVICE

## LIGHT METER

A light meter should be part of your tool kit. They are easy and inexpensive. Indoor tropical plants need a minimum of 150 foot-candles to thrive. Direct sun provides 10,000 foot candles and will burn most indoor plants, while herbs and vegetables flourish in such conditions. Test the area you want to plant and add supplemental lighting or shade if necessary. Explore the internet to learn more about which plants you should choose for your installation.

## MOISTURE

Florafelt planters are intended for water-safe areas. Generally, water will remain within the unit, but there is always the chance of some dripping. Use common sense when placing the unit and follow instructions carefully.

## REGULAR WATERING

Daily watering along the top row is normally required when using Florafelt planters. For most situations, we recommend connecting the planters to an automatic irrigation system. A simple drip tube across the top which is set to water twice daily for 30 minutes will provide adequate

moisture for most situations. Recirculating systems are more water-efficient, with a tank, pump and timers set to run once-a-day for 30 minutes for most situations.



## FERTILIZE

We highly recommend light fertilizing for vertical gardens. We suggest using an organic-based fertilizer (we prefer Maxsea) to minimize salt buildup and promote active microbiology. You can easily install an injector to your irrigation system, or you can fertilize by hand with a sprayer. For recirculating systems simply add fertilizer when you top off the water tanks.

## SEASONAL PLANTINGS

Flowering annuals are an excellent choice for seasonal plantings. In early spring, Florafelt pockets can be planted with small starts, seeds and cuttings for a dazzling display of color all summer long. When growing season has ended, the Root Wrapped plants can be removed, cleaned and stored for next year, along with the lightweight Florafelt panels.

# VERTICAL GARDEN DESIGN TIPS AND TRICKS

## WINTER EXPOSURE

Most plants will go dormant in the winter. Planted in the ground, they are protected from extreme freezing temperatures. In walls, as with planters, only certain rugged natives will survive a hard freeze. Consult with a local nursery for advice on specific plants that can make it through winter - you'll find that they love to talk about plants and will be happy to make recommendations.

## CHILDREN AND PETS

Florafelt can be damaged by claws, teeth and beaks. Use caution, as some plants are toxic. The Recirc unit can tip if it is destabilized by climbing children or jumping pets. Use common sense and be selective about placement.

## PLANT SELECTION

Full sun, part shade, or full shade are standard considerations when you select plants, but your local environment is also important. For example, some indoor tropicals require a certain amount of shade, and won't respond well to abrupt temperature changes. Once again, talk to someone at your local nursery.

## BIO-DIVERSE LIVING WALL

It's fun to try many different types of plants to learn what does best in your environment. It's a quick and interesting way to grow a garden that is exquisitely refined for both your sense of beauty and your room. Simply remove the failures and replace with the species that are thriving.

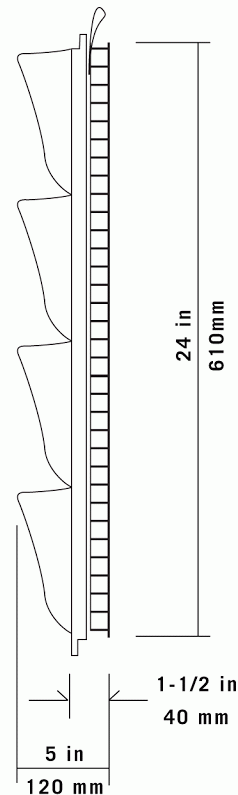
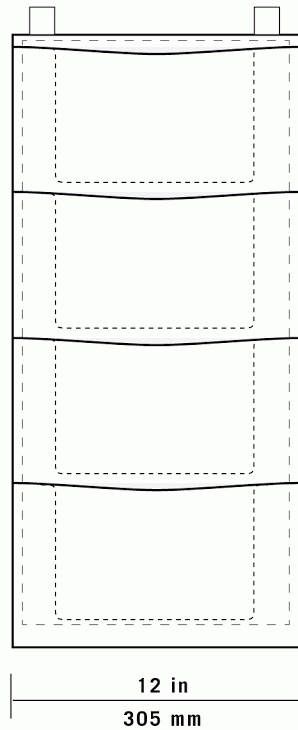
## COMBINE PLANTS

Each pocket can be home to many plants clustered together. Use Root Wrappers to create a mini-garden in each pocket. Add cuttings, bulbs and seeds and enjoy seeing what emerges. You might be surprised to discover what thrives in your specific conditions!



**FLORAFELT 4-POCKET VERTICAL GARDEN PLANTER**

**F4**



**100% RECYCLED P.E.T. PLASTIC FELT POCKETS MOUNTED TO RIGID PLASTIC PANELS**

**MATERIALS CONTENT**

- LIGHTWEIGHT - 1.5 LBS/SF (.68 KGS/SM)
- PLANTED WEIGHT: APROX. 5 LBS/SF (2.4 KGS/SM)
- MADE FROM INDESTRUCTIBLE, RECYCLED P.E.T. PLASTIC FELT
- EASY-TO-MOUNT WALL GARDENING SOLUTION
- VERSATILE - MOVE AND CHANGE PLANTS AT WILL

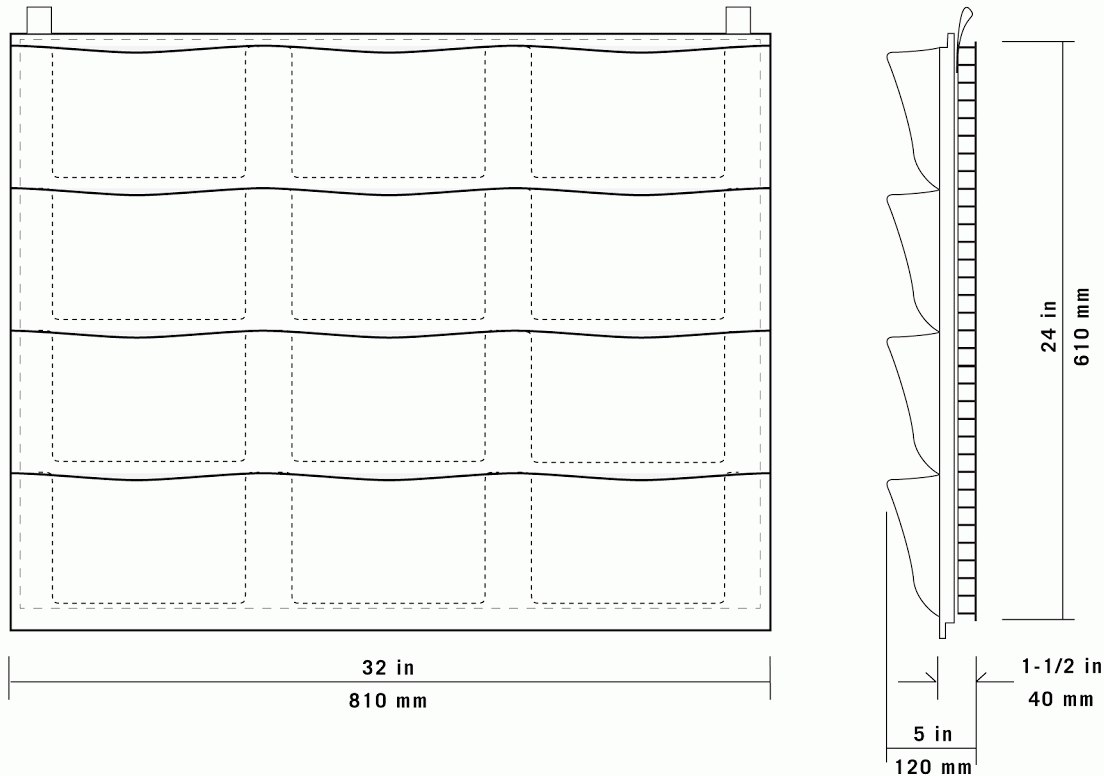
**POCKET SIZE**  
10 in x 6 in x 3 in  
250 mm x 150 mm x 80 mm

**FELT POCKETS** - High tensile strength and resiliency. Superior thermal insulation and acoustical properties (0.66 noise reduction coefficient) - Will not break down or bottom out - Hypo-allergenic - moth-proof; mildew and odor-resistant - contains no irritants or carcinogens. - lightweight and formable. Passes FMVSS 302.

**BACKING BOARD** - The backing board is a sturdy plastic sheeting extruded from polyethylene (HDPE). Its fluted ribs support both surfaces, making it lightweight, tough and abuse resistant. Additionally, it is both chemical and water resistant, and recyclable.

**FLORAFELT 12-POCKET VERTICAL GARDEN PLANTER**

**F12**



**100% RECYCLED P.E.T. PLASTIC FELT POCKETS MOUNTED TO RIGID PLASTIC PANELS**

**MATERIALS CONTENT**

- LIGHTWEIGHT - 1.5 LBS/SF (.68 KGS/SM)
- PLANTED WEIGHT: APROX. 5 LBS/SF (2.4 KGS/SM)
- MADE FROM INDESTRUCTIBLE, RECYCLED P.E.T. PLASTIC FELT
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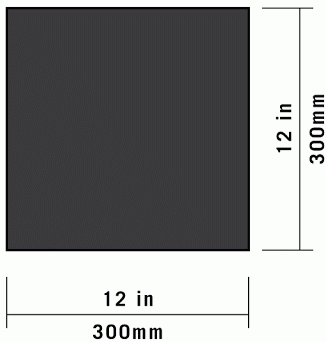
# ROOT WRAPPERS MESS-FREE VERTICAL GARDENING



Florafelt Root Wrappers are made from 100% recycled non-toxic non-reactive food safe PET Plastic. Designed to wick water from the Grow Felt. Soil is contained for mess-free gardening. Roots grow into the moist felt layers.

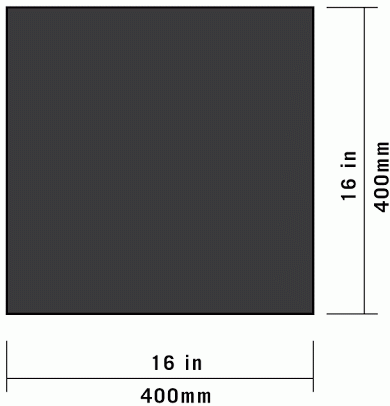
## Florafelt Root Wrapper 12-inch

Sized for use with the Florafelt Vertical Garden Planters and 4" Wire Grid Pro Systems.

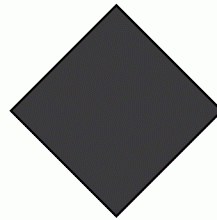


## Florafelt Root Wrapper 16-inch

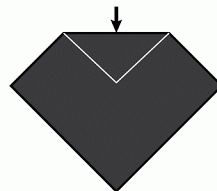
Sized for use with the Florafelt 6" Wire Grid Pro Systems.



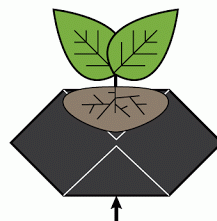
## HOW TO USE ROOT WRAPPERS



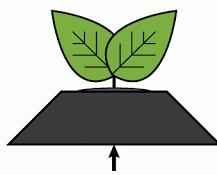
Start with a diamond shape.



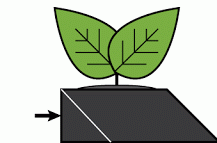
Fold the top corner down to create your top soil line.



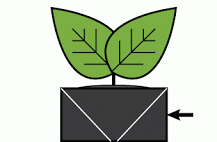
Place your plant facing forward and spread the root ball.



Fold the bottom corner up.



Fold the bottom edge up.



Hold down the edge and fold the left corner over.



Hold down the edge and fold the right corner over.

Use a rubber band to hold it together.

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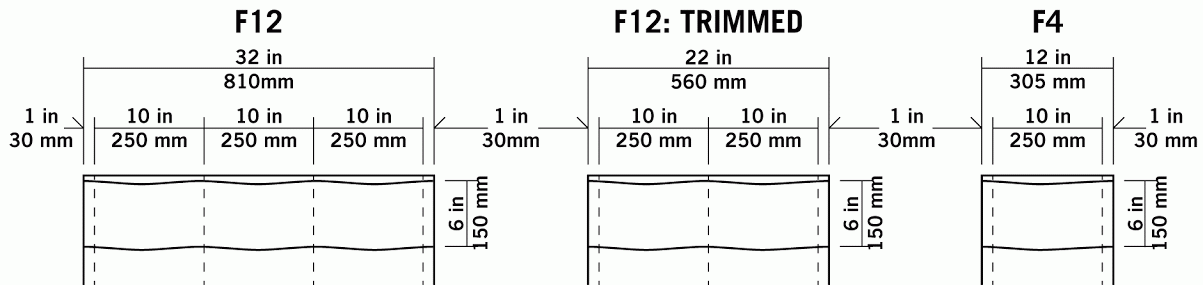


# CUSTOM SIZING GUIDE TRIM TO SIZE



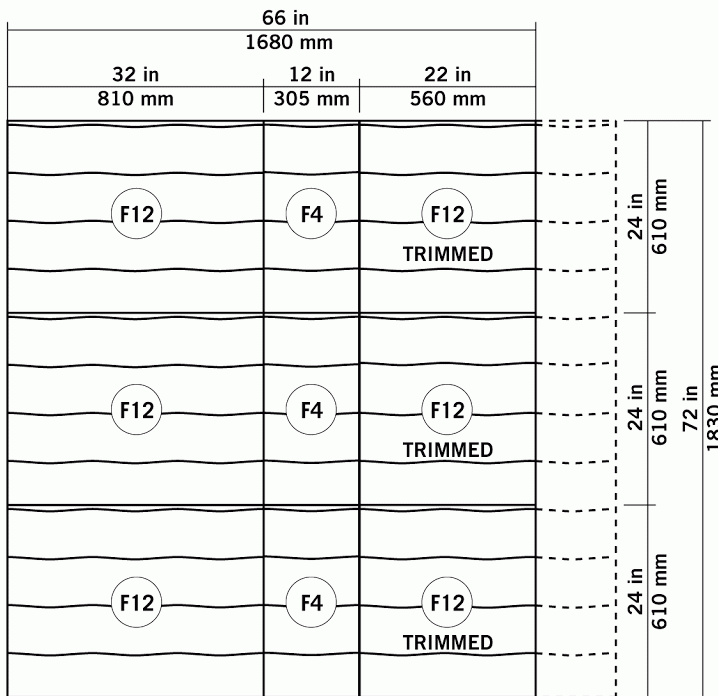
## HOW TO MAKE ANY SIZE LIVING WALL

Florafelt vertical garden planters come in standard sizes that can be tiled to exact specifications to closely fit any width. The panels can also be trimmed for custom sizes. Our standard pocket size is 10 in wide x 6 in high (.254 m x .152 m). Allow an additional 1 in (.025 m) to each side for attachment staples.



### TRIM AND TILE TO CREATE CUSTOM SIZES

Use combinations of the panels to create custom sizes as in the example below.

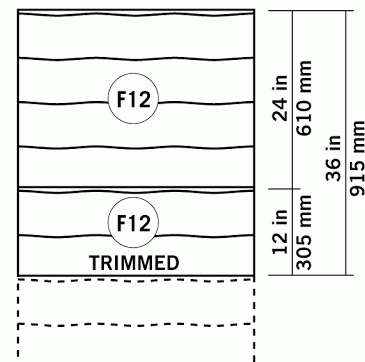


### USE A UTILITY KNIFE TO TRIM TO SIZE

Florafelt Vertical Garden Planters can be cut with a utility knife and sharp scissors:

- Place panel felt side down.
- Use a straight edge and utility knife to cut plastic backing board.
- Trim felt using sharp scissors or multiple cuts with a utility knife.

Panels can also be trimmed vertically every 6 in (.125 m) to create more custom sizes.



# MOUNTING METHODS



## SIMPLY HANG ON HOOKS

### Use Mounting Tabs to Hang Planters from Hooks

A grid of hooks on the wall is a simple way to mount Florafelt Vertical Garden Planters to a wall.

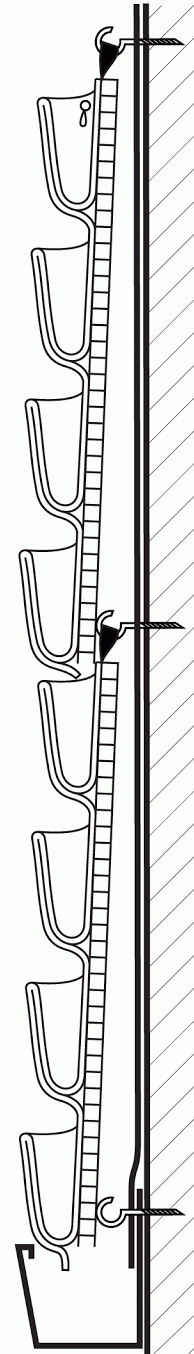
Hooks are screwed into framing or a solid wall to create a regular grid. Planters are then shingled on the wall by hanging them by their nylon mounting tabs.

The air gap keeps the back dry, while the planters shingle down so that the water drips into the lower felt. Simply water the top row only and the liquid will spread evenly down the wall.

It's an ideal method for outdoors - on fences and walls where water is not an issue. For extra safety indoors, use rubber pond liner on the wall. Be sensible. Consult with a licensed architect for structural advice for a large installation and when you are concerned about moisture sensitive areas.

Stuff pockets with Root-Wrapped plants to create your living design. Plants will grow out a foot or more, and eventually the felt pockets will simply disappear behind your living wall.

1. Choose a rigid backing like masonry wall, wood fence, or plywood facing.
2. Waterproofing is not necessary for exterior rated surfaces. However, for interior surfaces glue a rubber EDPM pond liner to the wall first.
3. Measure and mark a grid pattern spaced 32 inches across and 24 inches high for each Florafelt 12-Pocket planter. You can vary the width using the Florafelt 4-Pocket planters, which are 12" wide.
4. Install sturdy hooks on the grid marks. If needed, use rubberized sealant where the hook penetrates the rubber membrane.
5. Use the nylon tabs on the top of the Florafelt planters to create the shingle pattern. Adjacent planters can share the hook.
5. Install a drip line in the top row of pockets only. Water will slowly drip down and wick evenly throughout. Connect to an automatic watering timer that runs 30 minutes, twice daily. Adjust as needed.
6. Excess water will drip from the bottom, which can water a planter below or be directed, using a rain gutter, to a nearby drain or collection tank to recirculate.
7. (Optional) Build a frame to finish the edges. Leave pond liner long at the edges to make the edges watertight too. Bend up and trim at the frame's front edge.



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LOCAL BUILDING CODES MAY APPLY

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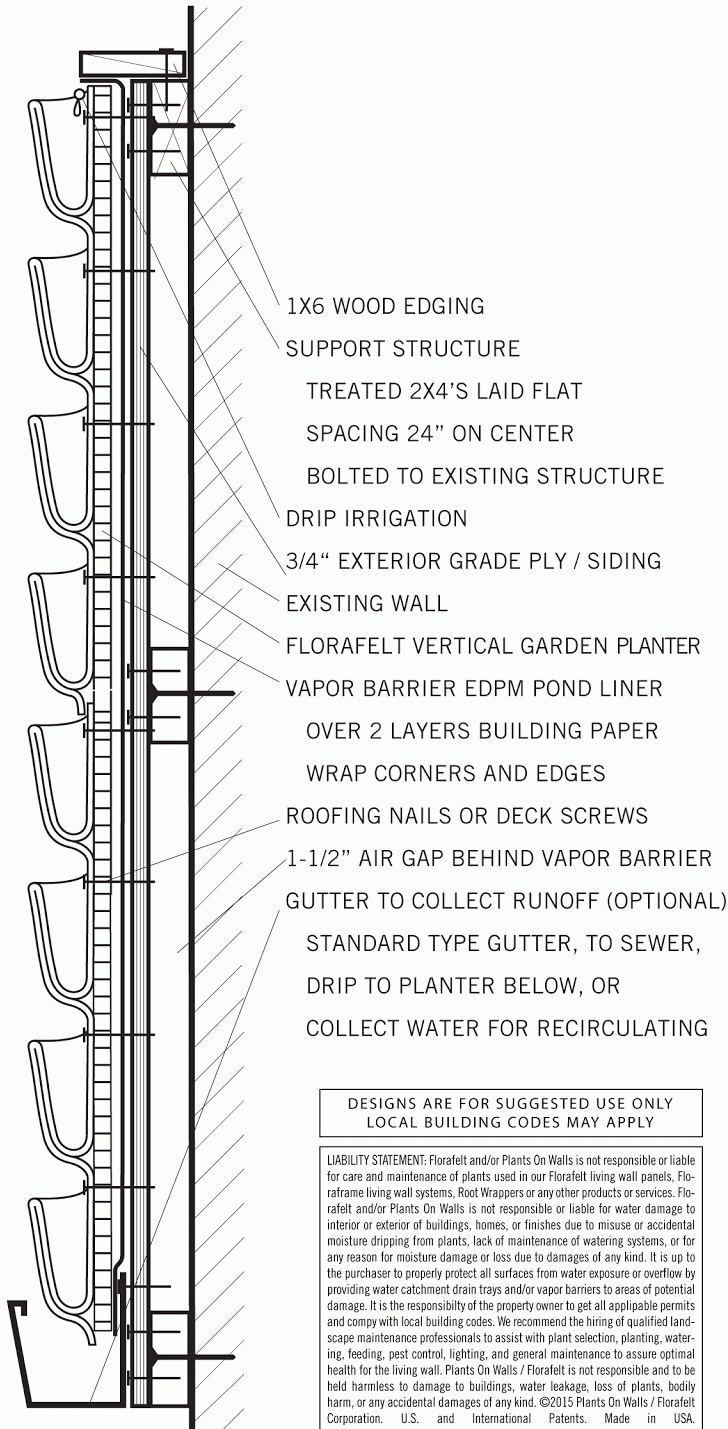
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# MOUNTING METHODS

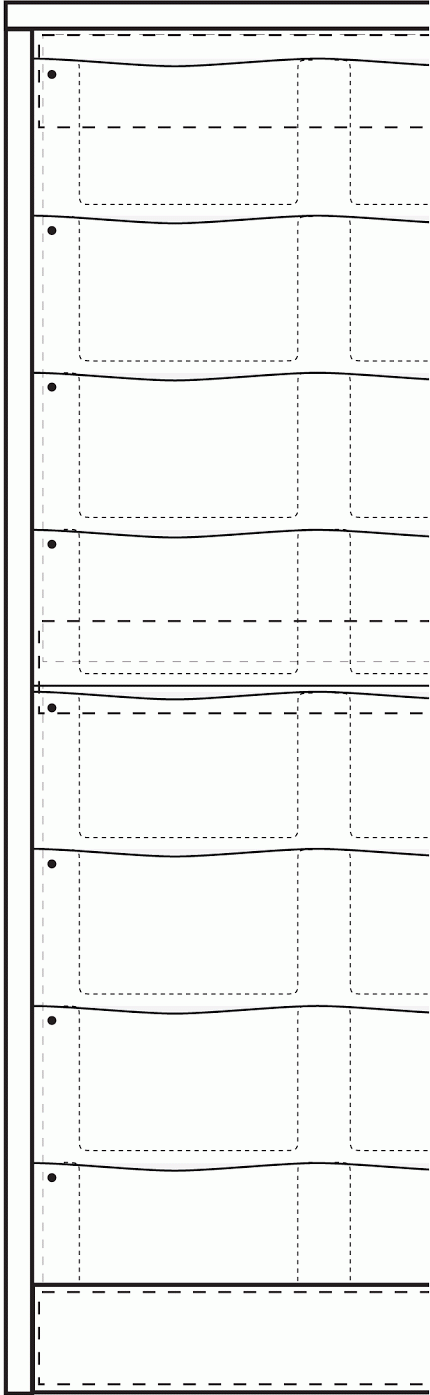


## WOOD FRAMED VERTICAL GARDEN



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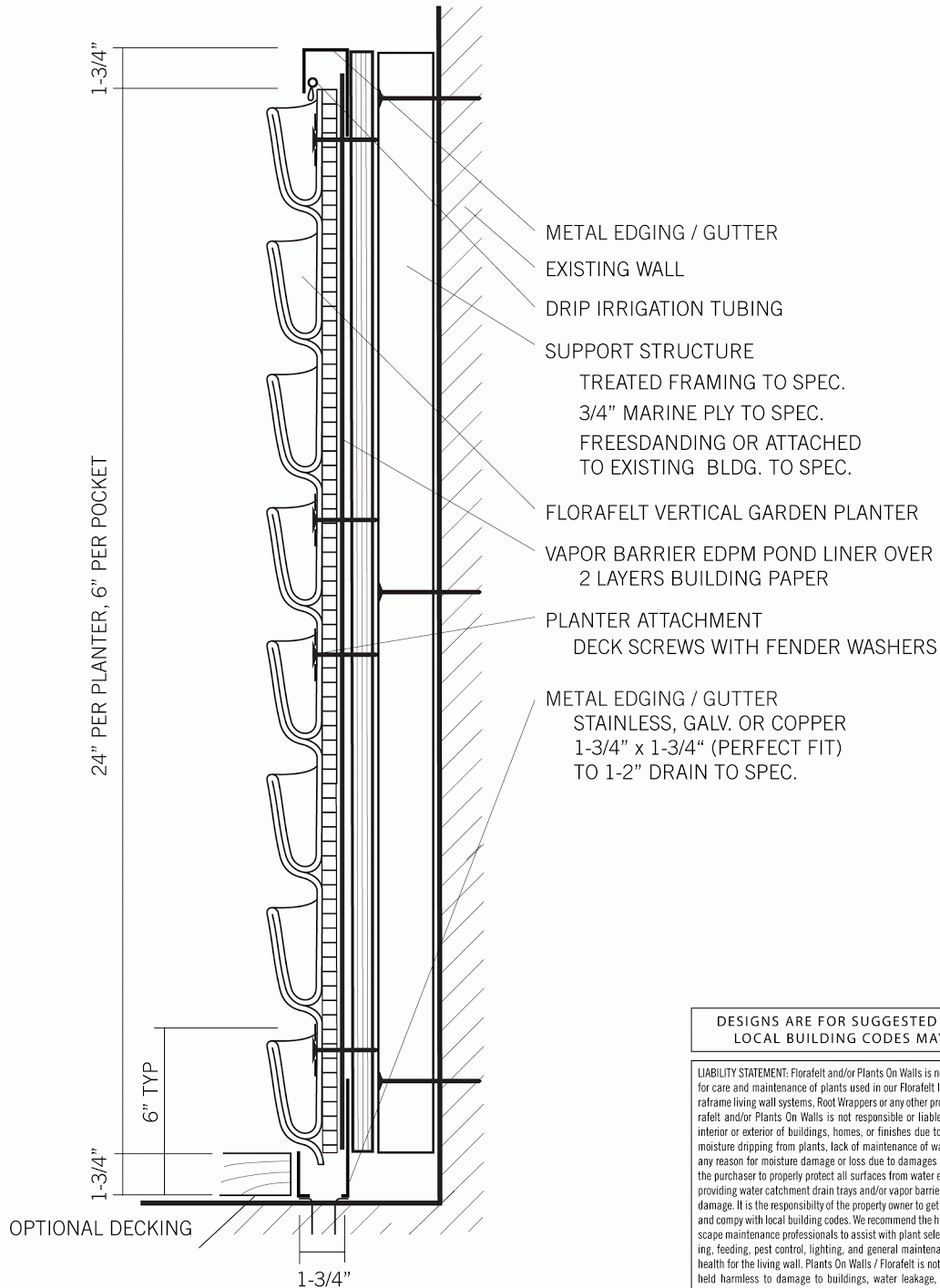


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# MOUNTING METHODS



## METAL FRAMED VERTICAL GARDEN



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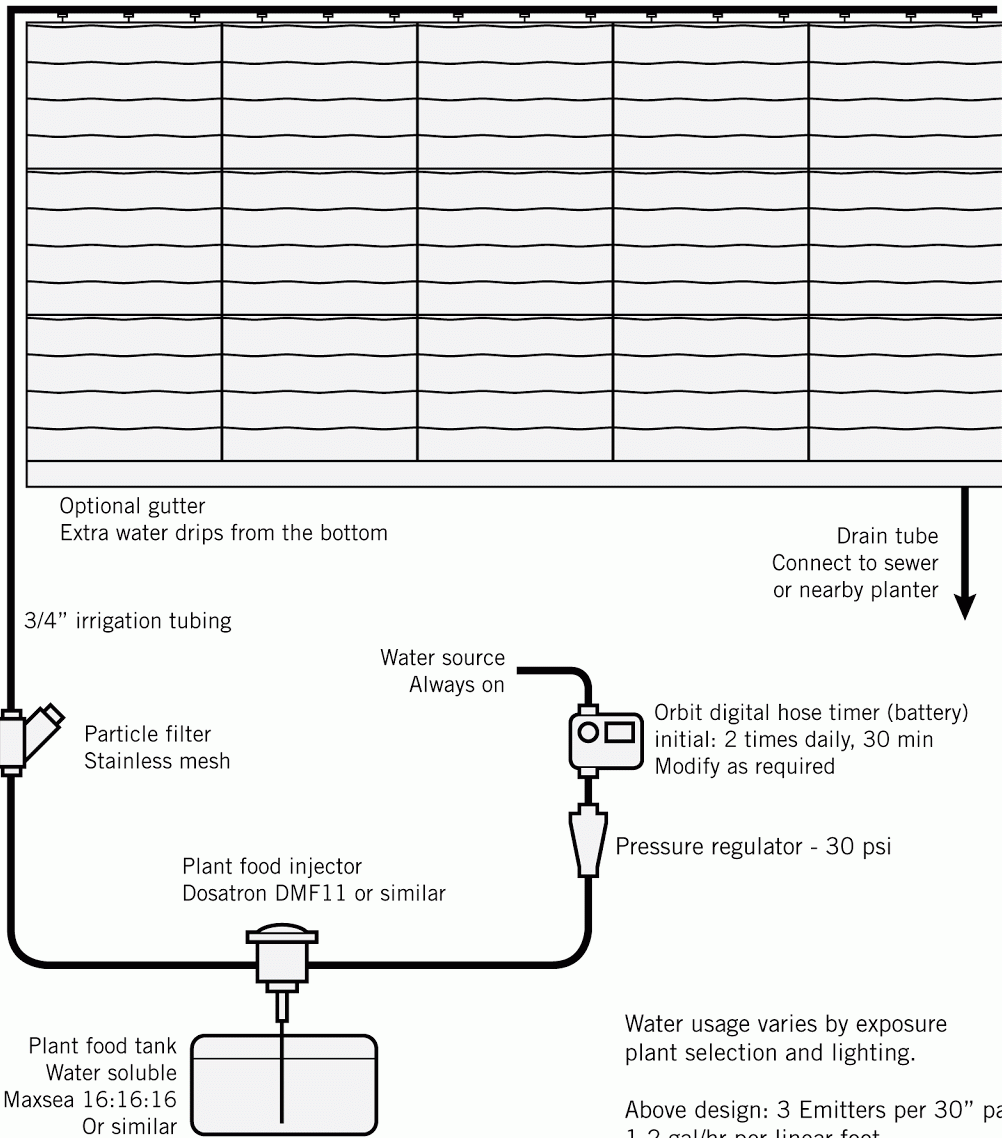
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# IRRIGATION DRAIN AWAY



## DRAIN AWAY IRRIGATION STANDARD DRIP WITH FOOD INJECTOR

3/4" irrigation tubing with 1/2 gal/hr button emitters - 3 per 32" panel (1 each pocket).  
**important: irrigate from top row only.** Water will wick all the way down and drip from bottom.  
 Note: small drip lines included in panel are not adequate for large walls. Please remove.



Water usage varies by exposure  
plant selection and lighting.

Above design: 3 Emitters per 30" panel  
1.2 gal/hr per linear foot

Estimated daily run time: Twice, 1/2 hr/day

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LOCAL BUILDING CODES MAY APPLY

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# IRRIGATION DRAIN AWAY



## LARGE VERTICAL GARDEN IRRIGATION DESIGN

- BACKFLOW PREVENTER
- ZONE VALVE AND REGULATOR 30PSI TYP
- IRRIGATION TUBING BUTTON DRIP EMITTER EACH POCKET COLUMN 1/2 GAL/HR EACH
- GUTTERS AT EACH LEVEL
- FLORAFELT 24-POCKET VERTICAL GARDEN PLANTERS

### LARGE VERTICAL GARDENS

Very large vertical gardens are divided into smaller sections so watering cycles can be adjusted for varying elevations.

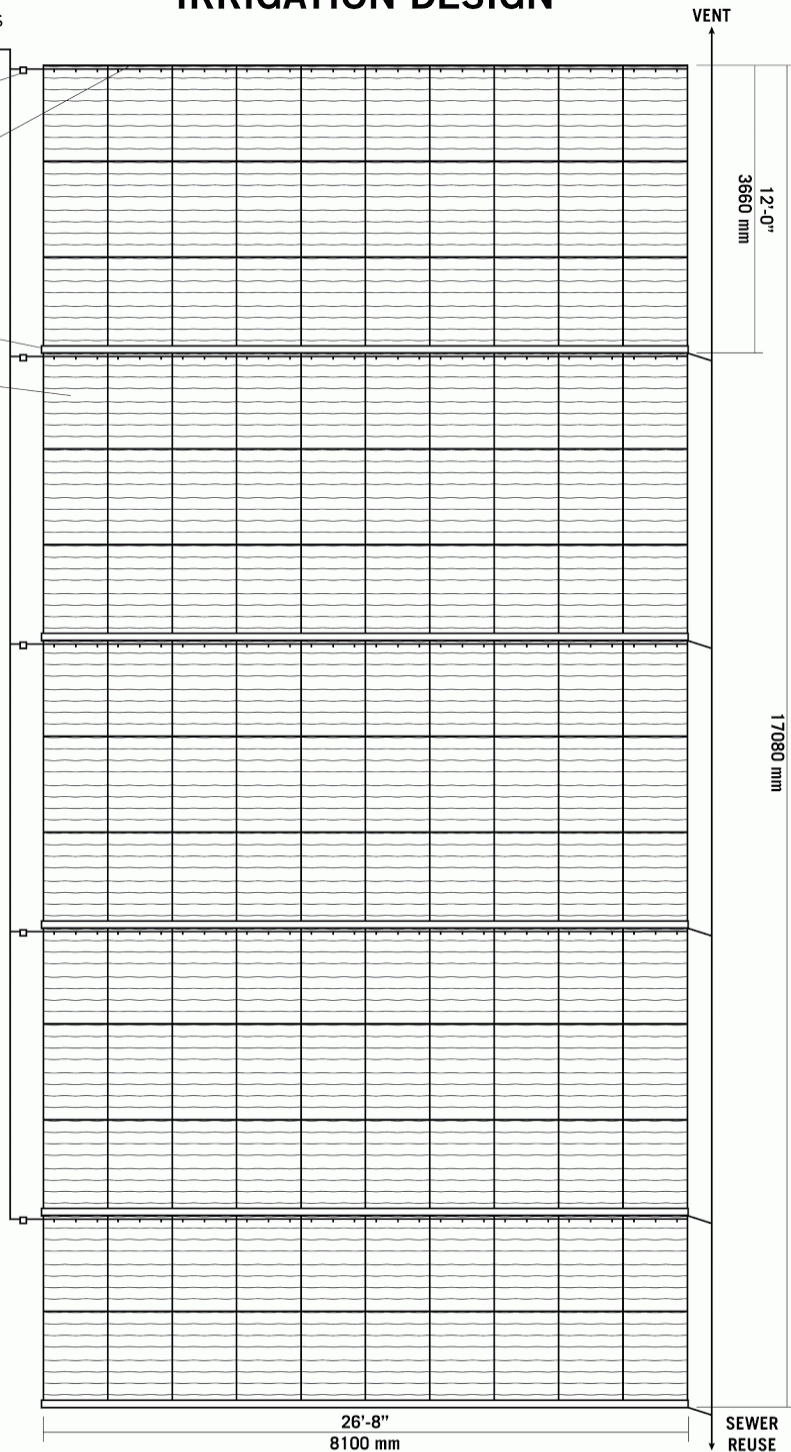
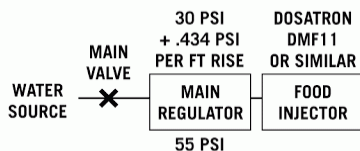
Use of the larger Florafelt 24-pocket planters makes installation more efficient.

Gutters at the base of each level provide greater control of moisture levels at each elevation.

Use of a plumbing engineer is highly recommended for proper pipe sizing and pressure regulation.

DESIGNS ARE FOR SUGGESTED USE ONLY  
LOCAL BUILDING CODES MAY APPLY

**LIABILITY STATEMENT:** Florafelt and/or Plants On Walls is not responsible or liable for care and maintenance of plants used in our Florafelt living wall panels, Florafelt living wall systems, Root Wrappers or any other products or services. Florafelt and/or Plants On Walls is not responsible or liable for water damage to interior or exterior of buildings, homes, or finishes due to misuse or accidental moisture dripping from plants, lack of maintenance of watering systems, or for any reason for moisture damage or loss due to damages of any kind. It is up to the purchaser to properly protect all surfaces from water exposure or overflow by providing water catchment drain trays and/or vapor barriers to areas of potential damage. It is the responsibility of the property owner to get all applicable permits and comply with local building codes. We recommend the hiring of qualified landscape maintenance professionals to assist with plant selection, planting, watering, feeding, pest control, lighting, and general maintenance to assure optimal health for the living wall. Plants On Walls / Florafelt is not responsible and to be held harmless to damage to buildings, water leakage, loss of plants, bodily harm, or any accidental damages of any kind. ©2015 Plants On Walls / Florafelt Corporation, U.S. and International Patents. Made in USA.



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# IRRIGATION DRAIN AWAY

## PARTS

Most of these parts (or similar) are available at your local pro landscape supplier, Lowes or Home Depot, or online through Google Search and Amazon.com.



**Hose Splitter** - Connect the hose splitter to your faucet. This allows you to have access to your water but also provides an 'always on' connection to your water timer. Be sure the faucet and splitter valve remain open to ensure consistent watering. Consider covering the valves using stretch wrap to prevent accidental shut off.

**Digital Hose Timer** -The timer uses 2 AA batteries. The Orbit Digital Hose Timer (shown) works best for this application since it allows for 1 minute run times, which reduce water waste. It also allows for 6 hour intervals so you can water 4 times a day, if necessary. We recommend that each living wall has on independant battery-operated timer for reliable and easy-to-adjust watering cycles.

**Food Injector** - The Dosatron DM11F is a water operated unit that adds a specific concentration of food to the system with each watering cycle. It uses water pressure to operate and is designed for low water flow. Venturi injectors can be used for large, high flow systems. Liquid food tanks can be made from 6 inch ABS tube for a thin profile that will be completely hidden among the plants.

**Particle Filter** - A mesh filter prevents clogs in drip lines. Inline stainless filters provide long service and can be easily flushed clean on a regular schedule. Make sure your particle filter is downstream from your food injector to prevent plant food from clogging your drippers.

**Pressure Regulator** - The pressure regulator keeps the water pressure low to prevent hose connection blow-outs, and slows the watering rate. Slower watering allows plants to absorb the water, reducing waste. 30 PSI is common for most irrigation applications.

**Tubing** -  $\frac{3}{4}$  inch irrigation tubing is inexpensive and easy to use. This common type of irrigation is standard for most landscape applications. Slip connectors are quick and easy to install. Garden hose with threaded connectors are extremely easy to use.



## IRRIGATION DRAIN AWAY

**Button Drip Emitters** - Button emitters come standard in ½ gallon per hour. Barbed connectors are easily punched into the ¾ inch irrigation tubing. Place one 1/2 gallon per hour button emitter at the very top of each pocket row. Make the drip visible for ease of inspection and replacement. If the top edge is sloped, pressure compensating emitters will maintain a consistent drip from top to bottom. Use irrigation emitters at the top row only. Water will wick down the entire wall. Longer and slower watering times allow for more complete water absorption and less waste.

**Drain Tray** - Extra water will drip from the bottom edge. You can simply let it drain into a planter or garden below, or you can use a small drip tray (2 x 2 inches) to direct the water to a sewer connection, or into a floor drain. Allow the water to drain completely by keep the bottom pocket clear of the bottom of the tray. Tuck the bottom flap into the tray to prevent drips.

**Plant Food** - We recommend using MaxSea 16:16:16 Seaweed Based Fertilizer. It is a gentle food that can be used for hydroponic feeding and is mostly made from organic nutrients. Organic nutrients are preferred because they encourage active microbiology in the soil and reduce the problem of salt build-up from chemical fertilizers.



**Custom Irrigation Designs** - Using various fittings the entire system can be enclosed in a stainless steel utility box.

# IRRIGATION DRAIN AWAY

## MAINTENANCE SCHEDULE

### Daily

- Observe the plants
- Notice if plants look wilted
- Or if they have faded leaves
- Or show rotting bases or browned leaves
- Also notice if they have new buds or have made new roots

### Monthly

- Add plant food to the Feeder (Maxsea)
- Observe plant health and adjust water timing if necessary
- Remove dead leaves
- Remove dead plants and replace
- Clear drain of any debris

### Every 3 Months

- Clean the filter
- Use ladder to visually check drip emitters

### Every Year

- Change the timer battery
- Change out the drip lines

### Tip: Use your E-Calendar

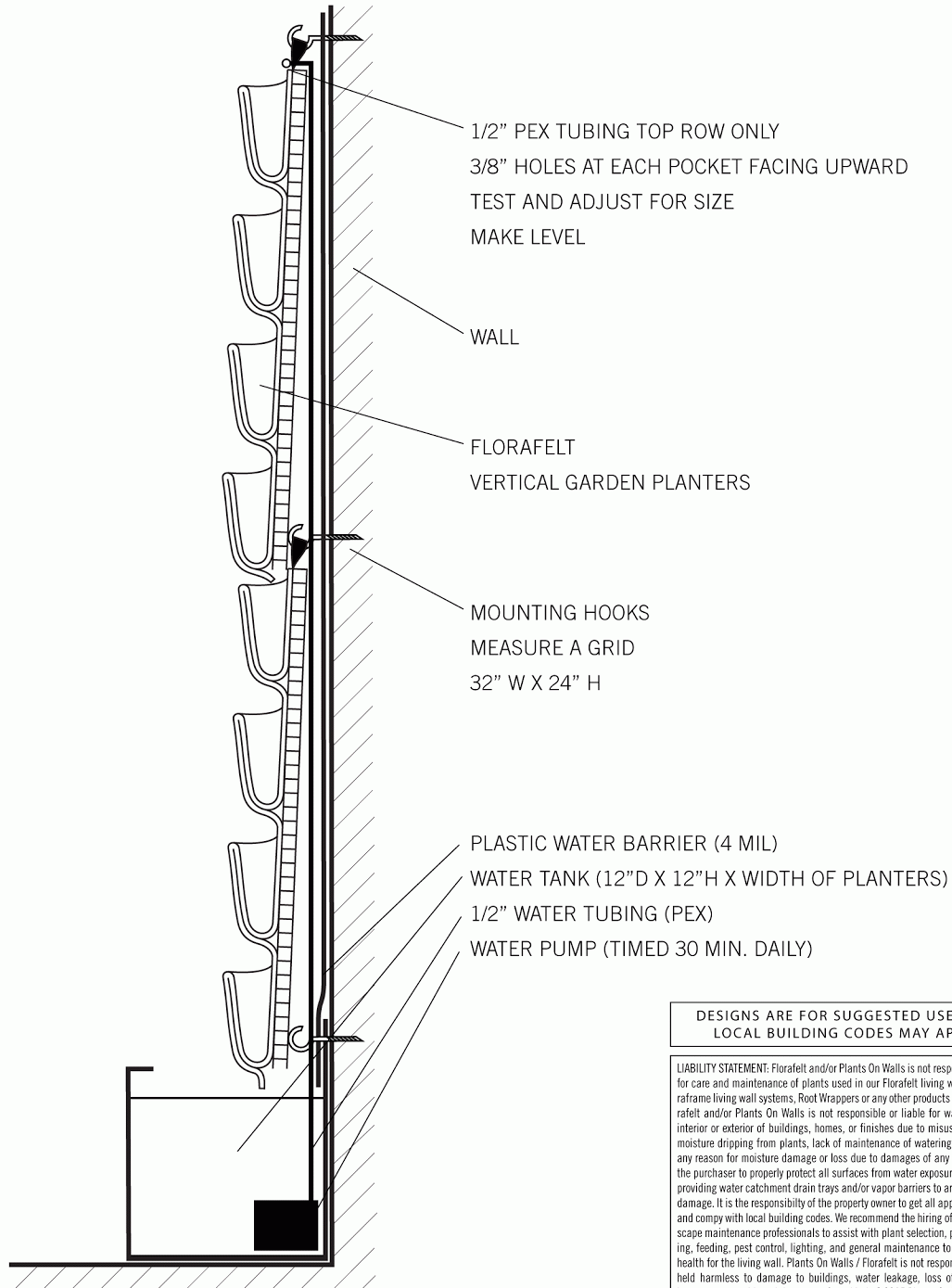
- Add these events to your electronic calendar and use the repeated events feature with reminders.
- Copy and paste this info for each frequency listed.



# IRRIGATION RECIRCULATING SYSTEMS



## RECIRCULATING SYSTEM WITH BASE TANK



DESIGNS ARE FOR SUGGESTED USE ONLY  
LOCAL BUILDING CODES MAY APPLY

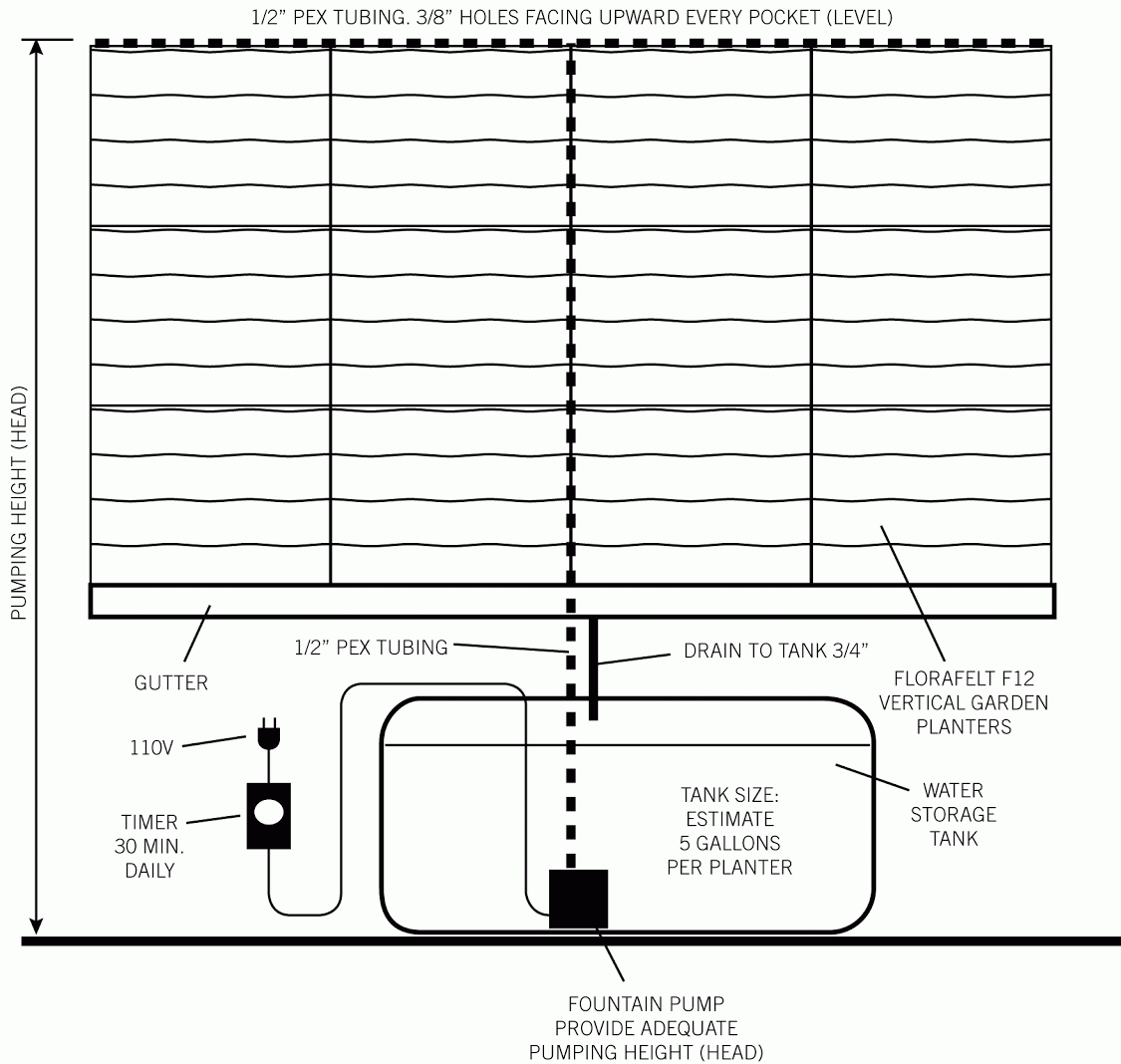
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# IRRIGATION RECIRCULATING SYSTEMS



## RECIRCULATING SYSTEM WITH HIDDEN TANK



**TIPS:**

- Recirculating systems are required when water source or drain connections are not available.
- Water tanks can be along the bottom of the vertical garden or hidden out of sight.

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# IRRIGATION RECIRCULATING SYSTEMS

## MAINTENANCE SCHEDULE

The water tank should be checked weekly and topped off. Do not add water while the unit is on since water will continue to drip from the planter and cause overflow. Wait one hour after the pump cycle or when all water has drained from the felt planter. Tank draining and water replacement is recommended every 4 to 6 months to prevent salt buildup from fertilizers.

### Daily

- Observe the plants
- Notice if plants look wilted
- Or if they have faded leaves
- Or show rotting bases or browned leaves
- Also notice if they have new buds or have made new roots

### Weekly

- Top off water tank. Do not add water while pump is running.
- Add plant food to the tank (1/4 tsp Maxsea)

### Monthly Tasks

- Observe plant health and adjust water timing if necessary
- Remove dead leaves
- Remove dead plants and replace

### Every 3 Months

- Empty tanks and replace water
- Clean pump and check water flow

### Tip: Use your E-Calendar

- Add these events to your electronic calendar and use the repeated events feature with reminders.
- Copy and paste this info for each frequency listed.

## ABOUT THE INVENTOR CHRIS BRIBACH



Chris Bribach planting a fully filled in fern wall for a private home in Los Altos Hills, California.

I graduated from SCI-ARC in 1992, one of the world's most prestigious architectural schools. The school was located blocks from Frank Gehry's office, a focal point for progressive design ideas.

I was excited about an organic future in architecture and created chaos sculptures connected in free-form structures. I assembled the pieces in what seemed random and turbulent designs, but were actually a redundantly efficient organic space frame. The assembly became a process that organically helped create the scope and shape, not unlike a bird building a nest. I later explored spontaneous design - or performance architecture - where the audience created their own experience and built form.

Creating a living space with the materials at hand, quickly and efficiently, is how most people built dwellings throughout history. People needed very little to build their homes, because they lived in harmony with their environment. By passing down this knowledge, a rich architecture evolved that was sensitive to the environment and made efficient use of local materials.

## ABOUT THE INVENTOR CHRIS BRIBACH

The massive industrial urban centers of today are plagued with paved and roofed surfaces that require enormous amounts of energy to create and maintain. I wondered why buildings can't be covered with living foliage to cool interiors, prevent decay and even grow food.

In 2008 I turned to the work of the visionary artist Patric Blanc who began growing vertically in the 1970s using his home fish aquarium. Replicating the natural growth along cliffs and sloping surfaces, he created beautiful vertical gardens using nutrient water that flows over synthetic felt. Excited by the potential, I explored the slit-and-staple method Patric offered in his book *The Vertical Garden* where he removes almost all the soil when planting. It quickly became clear that a mastery of botany would be required to provide proper water and nutrients hydroponically. Finding this far too difficult for the rest of us, I simplified the concept by pleating the felt and stapling it to a lightweight non-toxic plastic board to create easily plantable pockets. I wrote and was granted a patent for the 'Vertical Garden Panel' filed Sep. 2, 2010.

I am committed to the use of sustainable manufacturing methods that I learned from William McDonough's book *Cradle To Cradle* so I worked with manufacturers to develop a synthetic growing medium I called Florafelt. Made from 100% recycled P.E.T. plastic bottles, it is considered food-safe and will not only last indefinitely but can be re-melted to create other products.

Florafelt Vertical Planters are proudly made in the USA from materials also made in the USA. Our team assembles planters and systems for customers throughout the world.

There's nothing like the joy you feel when you fill a wall with plants.

- Chris Bribach

- Inventor of the Vertical Garden Panel, US Patent 8141294
- CEO and Founder of Florafelt Corporation and Plants On Walls

To learn more and get inspired visit: <http://www.Florafelt.com>

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**Chris Bribach**

VERTICAL GARDEN INNOVATOR

Millions of us find ourselves surrounded by sterile structures. We have become alienated from our natural origins.

Our health and life depend on thriving plants for food and oxygen. It is crucial for us to reconnect with plants and bring them back into our lives.

I created a vertical gardening system for everyone with a practical and environmentally-friendly approach:

- At modular system made from recycled materials that does not deteriorate.
- Lightweight so it can easily be applied to existing buildings.
- Includes some soil to avoid complicated hydroponics.
- Irrigates with existing or easy off-the-shelf equipment.
- Changeable so you can easily move plants to adapt to variable conditions.

To learn more, visit:  
[www.Florafelt.com](http://www.Florafelt.com)



# HOW IT WORKS

Made from Indestructible recycled PET plastic felt

Pockets are stapled to a rigid plastic sign board

Root Wrapped plants are inserted in the pockets

Drip line waters automatically

Or water by hand

Moisture wicks down through the felt

Roots grow into the moist inner layer

Roots breathe for optimal plant health

The front stays dry and drip-free

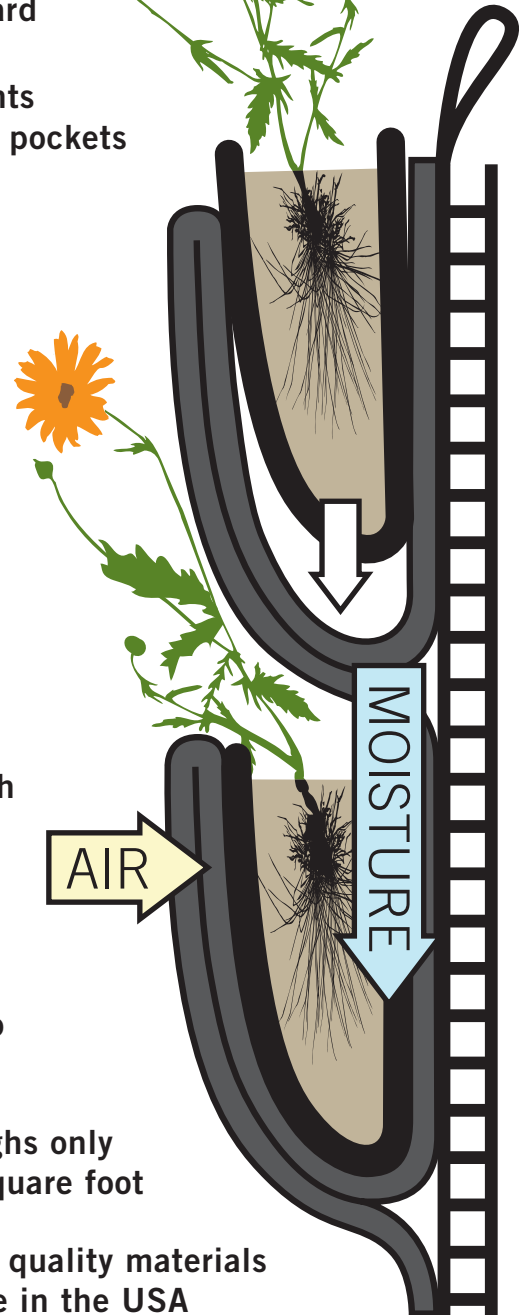
Extra water drips to the planter below

Planted, weighs only 5 pounds / square foot

High quality materials made in the USA

Use nylon tabs to hang on hooks

Or mount permanently



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VERTICAL PLANTERS  
RECIRC UNITS  
PRO SYSTEMS  
GROW FELT



## Bison Innovative Products

1975 W. 13<sup>th</sup> Ave.  
P.O. Box 40246  
Denver, CO 80204  
[www.BisonIP.com](http://www.BisonIP.com)

Phone 303-892-0400  
Toll Free 800-333-4234  
Fax 303-825-5988  
info@BisonIP.com

February 2012



### Bison Wood Tiles for use with Bison Deck Supports Specification SECTION 07760 DECK PEDESTALS

Ideal for use with Bison Deck Supports, Wood tiles can be laid in a parquet pattern or mixed with other paving stones for a unique look. These woods give warmth, excellent resistance to weather and architectural charm to roof decks and more. All Bison Wood Tiles are made from tropical hardwoods and are the ideal long-lasting, low maintenance decking alternative.

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Wood Tiles for use with Adjustable Deck Pedestals or traditional joist systems.

##### 1.2 RELATED SECTIONS

- A. Section 06150 - Wood Decking.
- B. Section 07500 - Membrane Roofing.
- C. Section 07720 - Roof Walkways.
- D. Section 07760 - Roof Pavers.
- E. Section 09690 - Access Flooring.

##### 1.3 REFERENCES

##### 1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Storage and handling requirements and recommendations.
  - 2. Installation methods.
- C. Shop Drawings: Submit shop drawings detailing the installation methods. Coordinate placement with locations noted on the Contract Drawings.

##### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
  - 1. All primary products specified in this section will be supplied by a single manufacturer with a minimum of five (5) years experience.
- B. Installer Qualifications:
  - 1. The installer must have a minimum of two (2) years proven construction experience, be capable of estimating and building from blueprint plans and details, determine elevations, and properly handle materials. All Work must comply with the Bison installation application procedures for deck support work specified herein.
- C. Special Considerations:
  - 1. The contractor assumes the responsibility for and must take into consideration the structural capability and adequacy of the structure to carry the dead and live load weight(s) involved, and when appropriate that the density of any insulation is satisfactory to resist crushing and damaging the waterproofing membrane.
- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship is approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.

##### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store Bison Wood Tiles and system components with labels intact and legible.
- B. Inspect all delivered materials to insure they are undamaged and in good condition.
- C. Store and dispose of solvent-based materials such as construction adhesive, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

##### 1.7 PROJECT CONDITIONS

- A. There are no temperature restriction guidelines prescribed by Bison Innovative Products that limit deck installation work other than the practical considerations of working in unsafe or inclement weather.
- B. Bison wood tiles and deck supports listed in this section are for use with pedestrian traffic only.

##### 1.8 WARRANTY

- A. At project closeout and upon request, Bison Deck Supports can provide to the Owner or Owners Representative, an executed copy of the manufacturer's standard document outlining the terms, conditions and limitations of their limited warranty against manufacturing defect for a period of three (3) years.
- B. The Contractor warrants that his work will remain free from defects of labor and materials used in conjunction with his work in accordance with the General Conditions for this project or a maximum of three (3) years.
- C. It is the responsibility of the Contractor installing the product listed in this section to coordinate warranty requirements with any related sections or adjacent Work. Notify the Architect immediately of any potential lapses or limitations in warranty coverage.





- D. Bison Ipê Wood Tiles are covered by a limited three year warranty. Bison Ipê Wood Tiles are warranted to the original owner to be free of defects in material and workmanship for the period of three years from the date of purchase. This warranty also extends to defects caused by wood rot and insect infestation for the same period. Defects are defined as imperfections that impair the utility of the product. This warranty applies to conditions of normal use, and does not apply to damage resulting from abuse, excess weight or acts of nature. Bison Ipê Wood Tiles are for pedestrian use only. Use of wheeled or motorized traffic voids the warranty. This warranty does not apply to non-structural surface cracks or to variations in wood color due to weathering. If a tile is deemed defective within the terms of the warranty, Bison Deck Supports may make repairs or provide for repair services at no cost to the customer. If a repair cannot be made, a replacement tile will be furnished at no cost to the customer. Bison Deck Supports must approve all warranty related repairs, and unauthorized repairs void this warranty. This warranty does not cover shipping damage. Shipping damage must be reported directly to Bison Deck Supports immediately upon receipt of products. Please save all product packaging for a short period of time in the event that return shipping is required.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Wood Tile Manufacturer: Bison Innovative Products; 1975 W. 13<sup>th</sup> Ave, P.O. Box 40246, Denver, CO 80204. Toll Free 888-412-4766. Phone 303-628-7950. Fax 303-825-5988. Email: Sales@BisonIP.com. Web: www.BisonIP.com.
- B. Acceptable Pedestal Manufacturer: Bison Innovative Products; 1975 W. 13<sup>th</sup> Ave, P.O. Box 40246, Denver, CO 80204. Toll Free 888-412-4766. Phone 303-628-7950. Fax 303-825-5988. Email: Sales@BisonIP.com. Web: www.BisonIP.com.
- C. Substitutions: Not permitted.
- D. Requests for substitutions will be considered in accordance with provisions of Section 01600.

### 2.2 APPLICATIONS/SCOPE

- A. Furnish and install a wood tile deck system over adjustable pedestals or joist/plank installation.
- B. Wood tiles are not designed for supporting decks that carry vehicular traffic or equipment including but not limited to snow removal equipment, ATV's, forklifts, or any motorized vehicles.
- C. Decks must be restrained by perimeter blocking or walls on all sides. Lateral movement greater than 3/16 inch is unacceptable and will be rejected.
- D. Consult the Manufacturer and/or an Engineer regarding the following:
1. When design requires spacing between Bison Wood Tiles other than the standard spacing required by the manufacturer.
  2. When considering use for other than a raised decks (e.g. interior floors, stairs, etc.).
  3. When load capacity exceeds the maximums listed in this section
  4. When using Bison Wood Tiles pedestals on grade (soil).

### 2.3 BISON WOOD TILES: Weight Bearing Capacity 1,250 lbs./ per tile FS:3

1. Model:WT-IPE-24RIBBED Ipê Wood Tile
  - a. Dimensions: 23 7/8" x 23 7/8" x 1.69"
  - b. Weight per tile: 24 lbs Weight per square foot: 6 lbs.
  - c. Fire Rating: Class A – meets & exceeds ASTM E108-07a Spread of Flame Test
  - d. Color: Brown Note: Tiles are a natural product and have variations in color and grain.
  - e. Surface: Ribbed
2. Model:WT-IPE-24SMOOTH Ipê Wood Tile
  - a. Dimensions: 23 7/8" x 23 7/8" x 1.69"
  - b. Weight per tile: 24 lbs Weight per square foot: 6 lbs.
  - c. Fire Rating: Class A – meets & exceeds ASTM E108-07a Spread of Flame Test
  - d. Color: Brown Note: Tiles are a natural product and have variations in color and grain.
  - e. Surface: Smooth
3. Model:WT-IPE-48 Ipê Wood Tile
  - a. Dimensions: 47 7/8" x 23 7/8" x 1.69"
  - b. Weight per tile: 48 lbs Weight per square foot: 6 lbs.
  - c. Fire Rating: Class A – meets & exceeds ASTM E108-07a Spread of Flame Test
  - d. Color: Brown (Note: Tiles are a natural product and have variations in color and grain.)
  - e. Surface: Ribbed, Smooth by Special Order
4. Model: WT-FSC-MAS -24 Massaranduba Wood Tile (FSC Certified SCS-COC-002585)
  - a. Dimensions: 23 7/8" x 23 7/8" x 1.69"
  - b. Weight per tile: 24 lbs Weight per square foot: 6 lbs..
  - c. Fire Rating: Class A – meets & exceeds ASTM E108-07a Spread of Flame Test
  - d. Color: Reddish Brown (Note: Tiles are a natural product and have variations in color and grain.)
  - e. Surface: Ribbed
5. Model: WT-FSC-IPE -24 Ipe Wood Tile (FSC Certified SCS-COC-002585)
  - a. Dimensions: 23 7/8" x 23 7/8" x 1.69"
  - b. Weight per tile: 25 lbs Weight per square foot: 6.25 lbs.
  - c. Fire Rating: Class A – meets & exceeds ASTM E108-07a Spread of Flame Test
  - d. Color: Reddish Brown (Note: Tiles are a natural product and have variations in color and grain.)
  - e. Surface: Smooth
6. Model:FS-1 Fastening Kit for Bison Wood Tile Wood Tile Fastening Kit:
  - a. Model: FS1 Fastening Kit REQUIRED for use with Bison Pedestals and Bison Wood Tiles ONLY.
  - b. Materials: FS1 Washer (Patent Pending) and FS1 Pedestal Screw Fastens Wood tiles to the pedestals without penetrating or damaging wood.

## CARE & MAINTENANCE OF WOOD TILES:

1. Bison Wood Tiles are a natural material and can absorb or loose moisture in different climates.
2. Wood Characteristics: Bison Wood Tiles are made of Ipê and Massanduba hardwoods which contain a rich variety of graining and coloration and are exceptionally dense and resistant to insects. The natural shading, coloration and graining variations add to the architectural character and overall visual appeal of the finished product.
3. Storage: Keep product out of direct sunlight until it is ready to be installed. Wood tiles should not be stored tightly wrapped in plastic. Bison wood tiles will adjust to the climate where they are installed and may have or develop some slight cracking or checking.
4. General Safety Precautions when working with Bison Wood Tiles: Wear safety glasses with side shields when handling, cutting, sanding, or grinding this material. Use a face shield for processes that may generate excessive dusts and splinters. Wear puncture resistant work gloves, such as leather when handling. Respirators must be worn if the ambient concentration of airborne contaminants exceeds prescribed exposure limits. Dust masks may be worn to avoid the inhalation of nuisance dust. Dust masks are not adequate protection in environments above the occupational exposure limit. Cutting, Grinding, or Sanding should be done outdoors or in a well-ventilated area. Refer to product MSDS for more information.
5. Cutting: Carbide or diamond tipped blades are highly recommended. Bison wood tiles have a very high density and a slower feed rate is recommended when cutting tiles. In order to minimize checking (small cracks) the installer must seal any cut ends with Anchorseal® or other equivalent product. Apply sealer with a foam brush to the cut ends only, being very careful to not get any on the top surface of the wood. Reassembly: To reassemble tiles after cutting, the installer must pre-drill holes from the bottom, using a carbide drill bit designed to extract stock during drilling. Exercise caution to not drill through the top surface. In addition, use only stainless steel screws which are durable and provide maximum fastening power.
6. Fastening: Bison strongly recommends the use of Bison Deck Supports and the FS1 Fastening Kit\* (\*patent pending) when installing Bison Wood Tiles. The Bison pedestal/wood tile system installs quickly and securely and allows for removal later if required. The FS1 Fastening Kit, available exclusively from Bison, fastens wood tiles to the pedestals without penetrating or damaging the wood.
7. Cleaning & Sealing: If desired, Bison Wood Tiles can be periodically cleaned and sealed. Wood stabilizers or sealants can help mitigate the loss of moisture on the top of the boards and minimize checking and splitting. The installer can lightly wax the ends of the wood if desired. *Note: small checks and splits are normal and a natural part of the wood.* The following manufacturers offer cleaning and sealing products specifically designed for use with exotic hardwoods: Cabots, Penofin, Messmers. *Important: Bison Innovative Products recommends that you test any cleaners or sealants in an inconspicuous area first before applying them to the installed deck.*
8. Sanding: If you plan to seal your deck and desire a more uniform appearance, a light sanding is highly recommended. Use 80 grit sandpaper to lightly sand the wood tiles and thus reduce the appearance of any minor marks, scratches or surface imperfections. After sanding, sweep the tiles and use water to rinse away any remaining dust and allow to dry thoroughly before applying sealer. Exercise caution when sanding wood with the scuff resistant surface. *Important: Always test any product you apply in an inconspicuous place to make sure it performs as you expect.* Maintaining Tile Color: To better maintain the rich coloration of the tiles, you can apply a penetrating oil finish with UV blocker. These products offer UV protection as well as mold and mildew protection. Before applying any finish, first clean and remove any residue from the wood tile as described above. After your initial coat is applied, an annual maintenance coat will help keep the coloration vibrant for years to come. *Important: Always test any product you apply in an inconspicuous place to make sure it performs as you expect.*
9. Natural Aging: Left to weather naturally and, depending on climatic conditions, Bison wood tiles will develop a silvery-gray patina. If you prefer this look, Bison recommends that a coat of wood stabilizer be applied after installation. Some products provide UV protection, allowing your wood tiles to acclimate more uniformly as weather and environmental conditions season the deck. *Note: each board has unique characteristics and will weather at different rates. The amount of direct and indirect sunlight, temperature, humidity, moisture and other local conditions will factor into the time and shading of the deck.*
10. Periodic Cleaning: Commercial Cleaning Products: Bison recommends using a deck cleaning product which safely cleans the wood and also kills mold spores. The deck tiles are ready to re-seal once they are cleaned. *Important: Always test any product you apply in an inconspicuous place to make sure it performs as you expect.*
11. Pressure Washing: You may also use a pressure washer to remove built-up dirt, mold or mildew from your wood tiles. *Caution: use the lowest PSI for the species of wood you are cleaning. A maximum of 1200 PSI is suggested for Bison Wood Tiles. Bison also recommends using a professional deck cleaning contractor. Important: Test an inconspicuous area first and be careful to use the wand in even strokes to avoid lap marks.*

### PART 3 EXECUTION

- A. Wood Tile Fastening Kit:
  1. Model: FS1 Fastening Kit REQUIRED for use with Bison Deck Supports and Bison Wood Tiles ONLY.
  2. Install one at each corner of 4 tiles to fastens Wood tiles to the pedestals without penetrating or damaging wood.
  3. Materials: FS1 Washer (Patent Pending) and FS1 Pedestal Screw
- B. Joist and Plank Installation
  1. On Pedestals: Use Bison Model JT, Joist Top Attachment for Level.it or Versadjust Pedestals
  2. Attach wood tiles to joists using Model FS1 Fastening Kit.
- C. Cutting & Installing Bison Wood Tiles
  1. Fasteners: If needed use high grade stainless or coated fasters. Always pre-drill holes.
  2. Tools: Carbide tip saw blades, Titanium Drill Bits
- D. Safety
  1. Always use proper safety equipment, such as gloves, safety glasses, hearing protection (if using power tools) and dust masks. It is always recommended to wear a mask and safety glasses when working around saw dust and have good ventilation.

### 3.2 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify all elevations and deck dimensions before commencing work.

### 3.3 PREPARATION

- A. Establish accurate lines, levels, pattern, and perimeter containment.
- B. The substrate surface that will receive the deck supports must be well compacted (on grade) and structurally capable of carrying the dead and live loads anticipated.
- C. The substrate must be clean and free of projections and debris that could impair the performance of the pedestals or the total deck system.

3.4 INSTALLATION

1. Installation on Adjustable Pedestals. Refer to Bison Level.it or Bison Versadjust Pedestal Specification for pedestal installation specifications.
2. Installation on Joist Systems: Install in accordance with Engineer’s design and manufacturer’s instructions

3.5 FIELD QUALITY CONTROL

- A. Inspect often during installation to assure that lines are being maintained in a straight and consistent pattern and that deck panels or pavers are level and not rocking.
- B. Unless otherwise specified in writing to allow for expansion, inspect to assure that all paver spacing between tiles and at perimeter walls does not exceed 3/16 inch width. Particular attention should be made to assure that all pedestrian entry or access points to the deck are level and that the deck surface tiles are not randomly raised or uneven creating a tripping or safety hazard.

3.6 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.7 IMMEDIATELY FOLLOWING INSTALLATION








The Owner, or the Owner’s Agent, shall carefully inspect the deck system to be positive that:

1. The new deck system is adequately blocked on all sides to contain the surface decking and related components.
2. There is no more than 3/16 inch width spacing between any deck panels and at all sides of the deck perimeter.
3. There is no ballasting rock is used to fill in any perimeter voids.
4. There is no ‘rocking’ of deck panels as foot traffic is applied to the surface decking.
5. When used, all required spacer tabs are in place and visible.

3.8 ROUTINE MAINTENANCE AND CARE

Installer and/or Architect has a duty to instruct the deck owner about performing routine maintenance of the deck. Check for rocking deck panels and adjust or shim immediately. Failure to do so can cause a tripping hazard. Periodically check spacer tabs and immediately replace broken tabs to limit deck movement. Make sure the edge restraint stays intact and structurally sound.

**END OF SECTION**

<p style="text-align: center;"><b>IPÊ</b> WT-IPE-24</p> 	<p><b>WT-IPE-24RIBBED</b> Or <b>WT-IPE-24SMOOTH</b></p> <p>Dimensions: 23<sup>7</sup>/<sub>8</sub>" x 23<sup>7</sup>/<sub>8</sub>" x 1.69" Tile Weight: 24 lbs Weight PSF: 6 lbs Color: Brown Class A: ASTM E108-07a</p>	<p style="text-align: center;"><b>IPÊ</b> WT-IPE-48</p> 	<p><b>WT-IPE-48RIBBED</b> Or <b>WT-IPE-48SMOOTH</b> (Special Order Only)</p> <p>Dimensions: 47<sup>7</sup>/<sub>8</sub>" x 23<sup>7</sup>/<sub>8</sub>" x 1.69" Tile Weight: 48 lbs Weight PSF: 6 lbs Color: Brown Class A: ASTM E108-07a</p>	<p style="text-align: center;"><b>FS1</b> Wood Tile Fastening Kit* *Patent Pending</p> 
<p style="text-align: center;"> The mark of responsible forestry</p> <p style="text-align: center;"><b>IPÊ</b> WT-FSC-IPE-24</p> 	<p style="text-align: center;"><b>WT-FSC-IPE-24</b></p> <p>Dimensions: 23<sup>7</sup>/<sub>8</sub>" x 23<sup>7</sup>/<sub>8</sub>" x 1.69" Tile Weight: 25 lbs Weight PSF: 6.25 lbs Color: Brown Class A: ASTM E108-07a</p>	<p style="text-align: center;"> The mark of responsible forestry</p> <p style="text-align: center;"><b>Massaranduba</b> WT-FSC-MASS-24</p> 	<p style="text-align: center;"><b>WT-FSC-Mass-24</b> Ribbed Surface</p> <p>Dimensions: 23<sup>7</sup>/<sub>8</sub>" x 23<sup>7</sup>/<sub>8</sub>" x 1.69" Tile Weight: 24 lbs Weight PSF: 6 lbs Color: Brown Class A: ASTM E108-07a</p>	



# Understanding The Versadjust Patent and Patent Improvements Pending

The Versadjust, adjustable V-Series line reaches heights from 2 ¼ inches to 36 inches, has a 1250 pound (FS3) weight bearing capacity and contains built in slope compensation from 0 – one half inch per foot slope. Precise spacer tabs allow for deck drainage, and the screw-to-adjust height setting assures a perfectly straight and level deck. The Bison Versadjust pedestal has a broad footprint that provides stability, is impervious to freeze thaw cycles, and offers a range of heights suited to almost any application. Made in the USA.

Versadjust Quick Clip Coupler © (patent pending) increases the speed and efficiency installing pedestals at heights over 9 inches. Accessories are available to compensate for additional slope and accommodate heights from 1/8 inch to 2 ¼ inches.

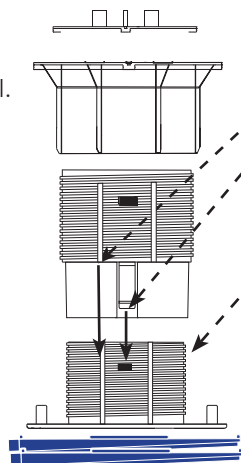
Use of Versadjust Pedestals with Bison Brace System for Excess Height Installations from 24"-36" in height or for installations requiring additional stability.

## V Tab

Specify 1/8" or 3/16"  
Place Spacer Tab on top of pedestal.  
To remove tabs:  
strike with hammer from above

## V Top

Comes screwed into V Base Unit.  
Unscrew top until indicator bumps are felt and heard. DO NOT extend beyond bumps EXCEPT to add a VC2 Coupler to Model V4.



## VC2 Coupler (Works with Model V4 Only)

To Assemble:  
Align lines on coupler and base  
Align tab with Quick Connect slot.  
Slide together until tab locks into place.

To Separate:  
Hook C2 Coupler Release Tool into slots on the side of the coupler, detach tool & pull apart.

## V Base

Comes screwed into V Top Unit. Unscrew top until Thread indicators are felt and heard. DO NOT extend beyond indicators EXCEPT to add an VC2 Coupler to Model V4.

## VB Leveller Base

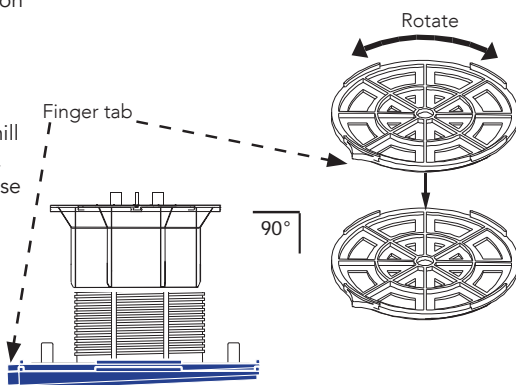
Built-in base 0 - ½" (4%) slope compensation.

## Built In Slope Base Compensation

Each V-Series pedestal comes with base slope compensation for up to 1/2" per foot (4%) slope.

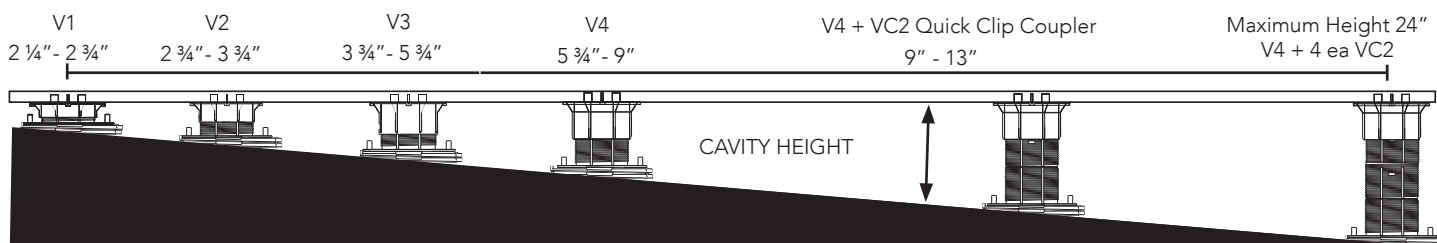
Slope Adjustment:  
Point each finger tab downhill for 1/2" per foot (4%) slope.  
Rotate base pieces for precise slope compensation.

To Create a Flat Base:  
Position finger tabs opposite one another.



To Remove VB Base Leveller:  
Slide pedestal base out of VB base leveller

For additional slope compensation:  
A maximum of two (2) Model LD4 base levellers can be used with the V-Series adding an additional 1/2" per foot (4%) slope for a total of 1 inch per foot (0-8%) slope. Each LD4 adds an 3/8" to the overall height of the pedestal.



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**VERSADJUST**

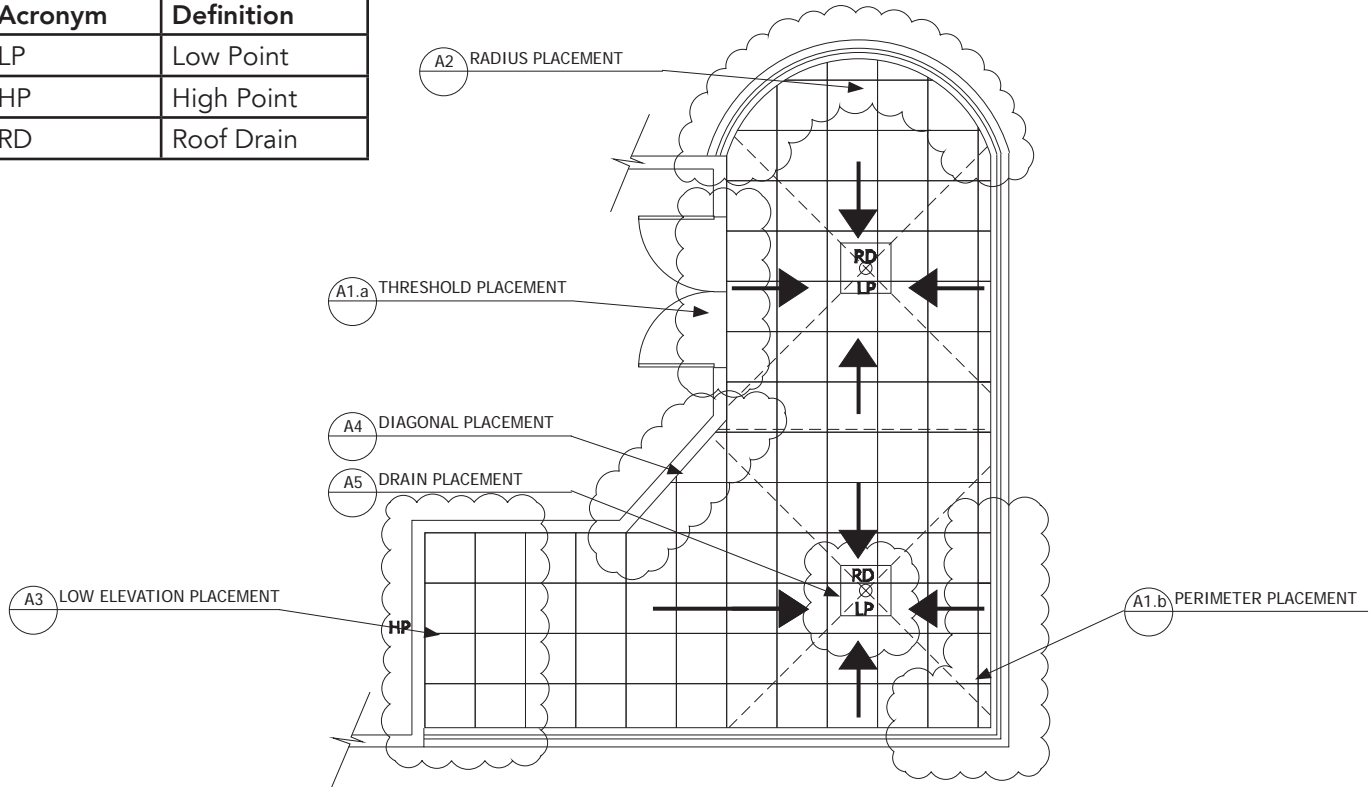
Adjustable Deck Supports

Installation Details

May 2013

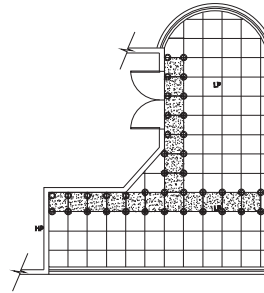
# Advanced Layout and Pedestal Placement

Acronym	Definition
LP	Low Point
HP	High Point
RD	Roof Drain



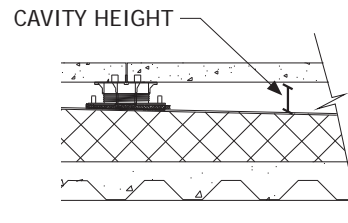
## "T" Method Installation

1. Determine cavity height at all thresholds, drains and high points.
2. Deduct thickness of decking material.
3. Mark top of pedestal elevation around deck with laser level
4. Plan paver/pedestal layout pattern
5. Install "T" shaped portion of deck starting from threshold or high point
6. Adjust to correct height and level.
7. Installation on both sides of the "T" can proceed.



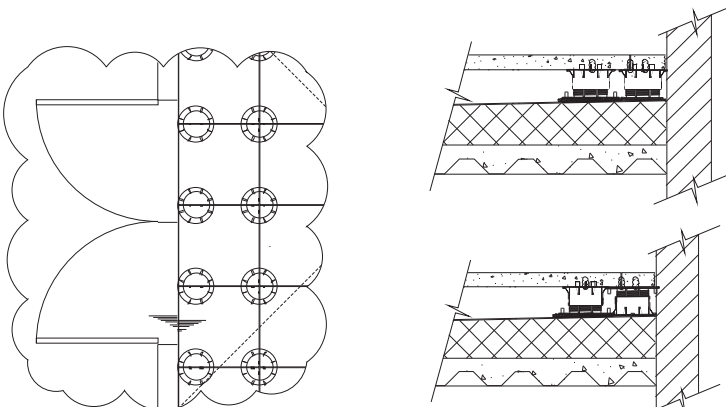
## Determining Cavity Height

- The cavity height is the space between the top of the roofing membrane, and the bottom of the decking material.
- Use of a laser level or chalk line may assist.
- Also refer to the detachable measuring device printed on the box.



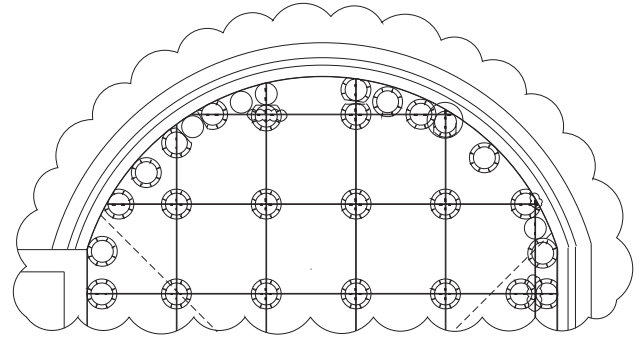
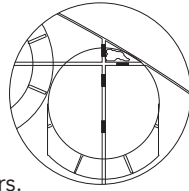
## A1 (a) Threshold and (b) Perimeter Placement

- Remove tabs as necessary to inset edge pedestals.
- Turn pedestal upside-down or trim the base for tight fits.
- Never allow more than 1/8" width between the decking material and edge containment.
- Tabs may be adhered into place with construction adhesive to ensure spacing when "normal" tab placement is not possible.



## A2 Radius Placement

- Use extra pedestals under triangular pieces to support small pieces.
- Never allow more than 1/8" width between the decking material and edge containment.
- Add an extra pedestal at perimeter bends.
- Remove extra tabs to inset pedestals.
- Adhere small pavers to top of pedestal with construction adhesive.
- Turn pedestal upside-down or trim pedestal base as needed to fit around perimeter.
- Use removed tabs to maintain spacing between pavers.



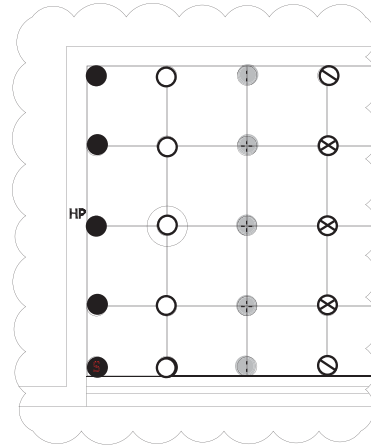
## A3 Low Elevation Placement

For low elevations the following pedestals are available:

### LOW HEIGHT PEDESTALS

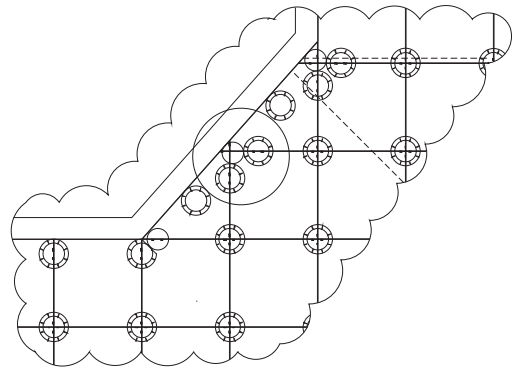
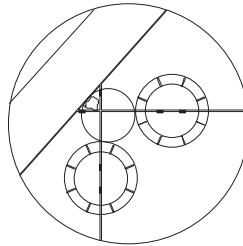
Model:		Height:
VT18 or VT316	●	1/8"
HD25-18 or HD25-316	○	1/4"
HD50-18 or HD50-316	●	1/2"
HD75-18 or HD75-316	⊗	3/4"
LO-18 or LO-316	⊗	1¼ - 2"

Shims can also be used to accommodate variations in height, in either 1/8" (PS1) or 1/16" (B11) increments.



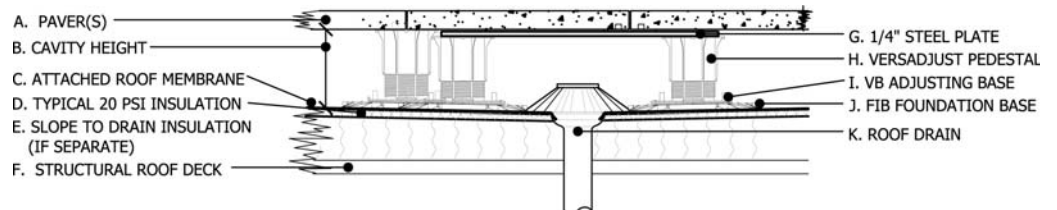
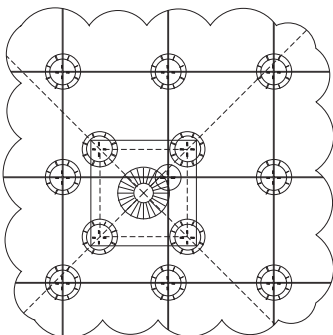
## A4 Diagonal Placement

- Use extra pedestals under triangular pieces to support small pieces.
- Never allow more than 1/8" width between the decking material and edge containment.
- Remove extra tabs to inset pedestals.
- Adhere small pavers to top of pedestal with construction adhesive.
- Trim pedestal base as needed to fit around perimeter.
- Use removed tabs to maintain spacing between pavers.



## A5 Drain Placement

- Elevate a steel plate or paver above the drain, but below the deck itself.
- Use that elevated plate or paver to support a pedestal where you need for the deck above.

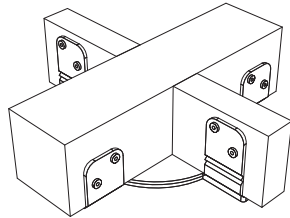


# Working with Wood

## JT Wood Joist Top

Center Joist Top on BISON Pedestal. Using a screwdriver, insert Bison Screw (provided) into the hole in the center of the Joist Top & hand tighten to attach. Works both with 2 x and 4 x lumber. Attach joist to Joist Top using #8 Deck Screws (NOT provided)

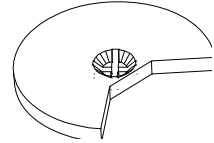
**IMPORTANT:** When attaching to the pedestal - DO NOT OVER-TIGHTEN SCREW



As Shown Above Joist Top with 2x and 4x Joists.

## FS-1 Wood Tile Fastening Kit

Place washer between the bottom rail of the tile and the upper slat. Screw FS1 screw through the FS1 washer, into center hole of spacer tabs and into pedestal.

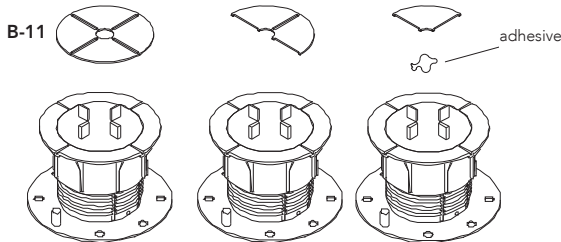


Make sure that washer clamps all corners of wood tiles and then tighten. To remove a wood tile: Loosen screw and using screwdriver, rotate washer to release wood tile.

# Working with Shims

## B-11 (1/16") or PS-1 (1/8") Shims

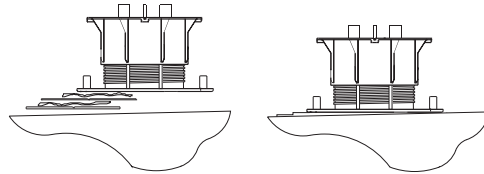
B11's or PS1s may be placed on top of pedestals to accommodate for minor leveling of pavers with thickness variations. Use no more than 2 shims. If using only 1/4 segment, adhere it to the pedestal with construction adhesive.



## Shims Under Pedestals

Place shims (whole or in segments) under the pedestal in a stairstep fashion to compensate for sloping substrates.

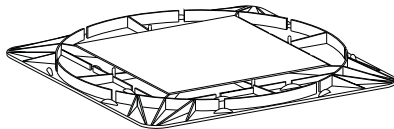
- Use only B11 shims for this application.
- Use no more than four (4) shims.



# Pedestal Base Pads

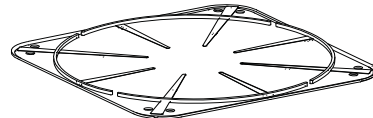
## Floating Insulation Base (FIB)

If common roof insulation is installed immediately below the membrane, the type and density of the insulation is of utmost importance. For roofing systems having "common" insulations with a medium density of 20 psi Bison recommends using the Bison Floating Insulation Base (FIB). FIBs are installed immediately below the Bison Deck Support pedestals to disperse the deck load. Please refer to specifications for proper use.



## Floating Foundation Base (FFB)

Bison Floating Foundation Bases (FFB) are recommended for use beneath all on grade Bison Deck Support decks. Level the surface and set directly on grade as a base.



# Maintenance Guide

Routine maintenance of your paver deck system will enhance the beauty, reduce major repairs, and prolong the life of your deck. Below is a list of maintenance guidelines that should be performed on a regular basis:

1. Check for "rocking" pavers. If you notice pavers rocking back and forth while walking on the deck simply lift paver up and shim 1 or more corners until paver is level on all four corners. To ensure pedestal stability, make sure "indicator bumps" are engaged. Bison B11 (1/16") or PS1 (1/8") shims can be ordered and shipped.
2. Depending on substrate materials some settling and or deflection can occur. Remove paver and adjust the pedestal until level height is achieved. You may need to do this on more than one pedestal to level out an area.
3. Clean drains and scuppers on a regular basis. Water should completely drain off roof deck within 48 hours after rainfall, under ambient drying conditions. Standing or "ponding" water can be detrimental to some waterproofing systems.
4. Periodically check spacer tabs between pavers and replace broken spacer tabs immediately. Loss of spacer tabs can cause unsafe deck movement.
5. Make sure the edge restraint remains intact. There should not be room around perimeters of the deck in excess of 1/8" width which could cause lateral movement of pavers, and create an unsafe condition.
6. Follow paver manufacturers' suggestions for upkeep and maintenance of pavers.