



# Installation and Instruction Manual

## **Cascade System**

Model LT199NRX1 / LT199PRX1  
RTGR199N1 / RTGR199X1

**FOR YOUR SAFETY:** This product must be installed and serviced by a professional service technician, qualified in hot water heater installation and maintenance. Improper installation and/or operation could create carbon monoxide gas in flue gases which could cause serious injury, property damage, or death. Improper installation and/or operation will void the warranty.

### **⚠ WARNING**

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

#### **WHAT TO DO IF YOU SMELL GAS**

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a nearby phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency, or gas supplier.

### **⚠ AVERTISSEMENT**

Assurez-vous de bien suivre les instructions données dans cette notice pour réduire au minimum le risque d'incendie ou d'explosion ou pour éviter tout dommage matériel, toute blessure ou la mort.

Ne pas entreposer ni utiliser d'essence ou ni d'autres vapeurs ou liquides inflammables dans le à proximité de cet appareil ou de tout autre appareil.

#### **QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ:**

- Ne pas tenter d'allumer d'appareils.
- Ne touchez à aucun interrupteur. Ne pas vous servir des téléphones dans le bâtiment où vous vous trouvez.
- Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur.
- Si vous ne pouvez rejoindre le fournisseur de gaz, appelez le service des incendies.

L'installation et l'entretien doivent être assurés par un installateur ou un service d'entretien qualifié ou par le fournisseur de gaz.

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## SECTION 1 Piping

Multiple tankless water heaters can be connected via a cascade communication cable to create a bank of water heaters that work in tandem. Up to 2 water heaters can be controlled by a “Leader” unit with the others acting as “Followers”.

### A. General Plumbing Connection Guidelines

- Pipe material must be suitable to meet local codes and industry standards.
- The pipe must be cleaned and without blemish before any connections are made.
- Do not apply a torch within 12" of the bottom connections of the water heater. Doing so could damage the water heater. Such damages ARE NOT covered by product warranty.
- The pipe connections at each unit should be 3/4". When cascading multiple units are supplied through one water main pipe, Main water piping may need up-sizing to minimize pressure loss at peak flow demand.
- Isolation (shutoff valves) should be used to ease future servicing.
- All piping should be insulated.

### B. Install a Backflow Preventer

It may be recommended to use a back flow preventer – check local codes. If a back flow preventer or a check valve is used, a thermal expansion tank must be installed on the cold water supply between the water heater and check valve.

#### WARNING

To control thermal expansion, a thermal expansion tank should be installed in systems with an installed backflow preventer. Follow expansion tank manufacturer’s specifications to properly size an expansion tank to the installation. Failure to properly accommodate thermal expansion could result in property damage, severe personal injury, or death.

### C. Piping Diagrams for Cascaded Systems

The next two pages give examples of typical cascading water heater piping diagrams.

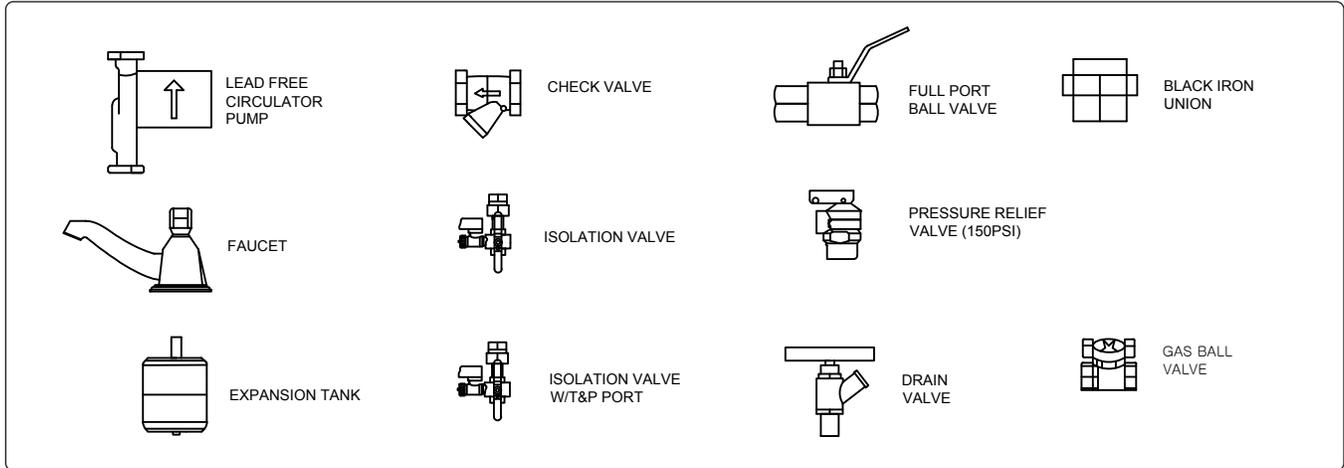
#### CAUTION

Use at least the MINIMUM pipe size for all water heater loop piping. This is to avoid the possibility of inadequate flow through the water heater. Using less than the required minimum pipe size could result in system problems, property damage, and premature water heater failure. Such problems ARE NOT covered by product warranty.

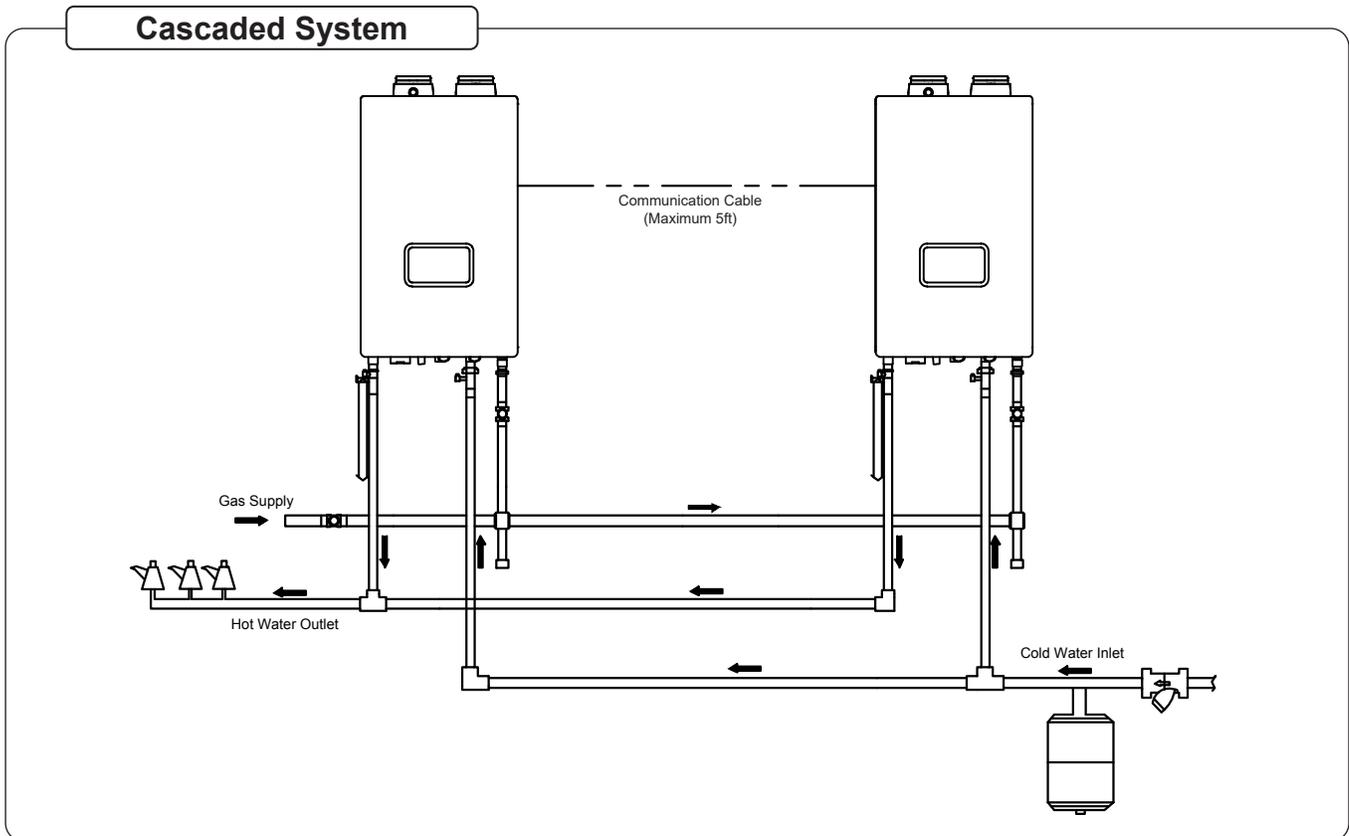
Use both thread tape and pipe dope to connect to the 3/4" CH domestic water inlet and outlet. Isolation valves between the city water supply and unit inlet are recommended for ease of service.

Quantity		1	2
Pipe Diameters	mm	20A	25A
	in	3/4	1

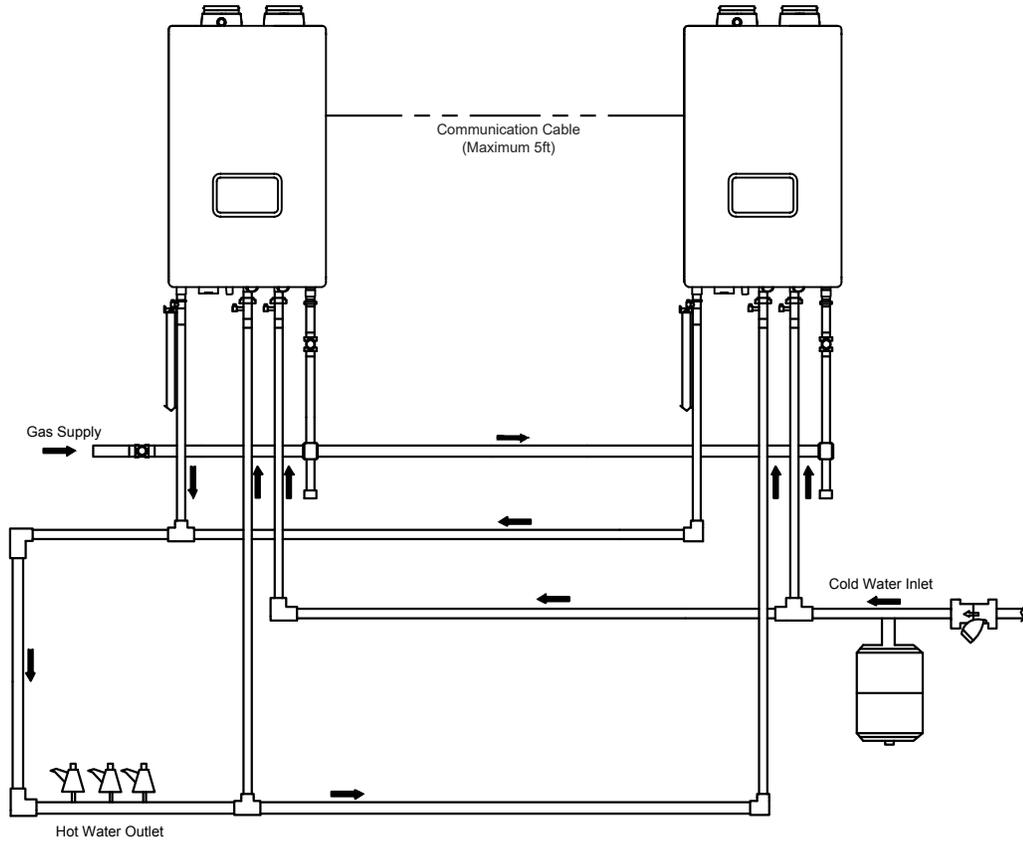
### C. Piping Diagrams for Cascaded Systems (continued)



Piping Symbol Legend



### Cascaded System - Recirculation



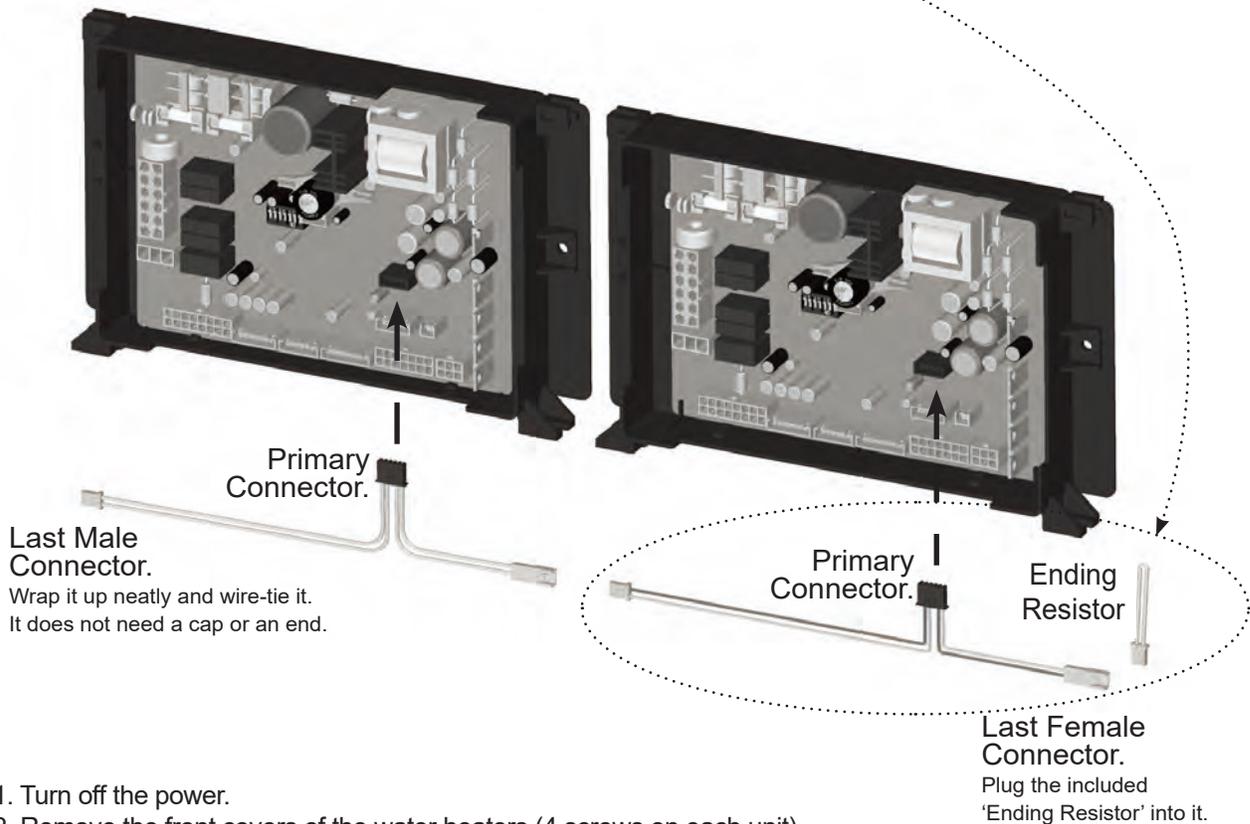
## SECTION 2 Electrical

### A. Wiring Connections for Cascade.

Components Needed :

FT1861: (1 per unit) Cascade Communication Cable with Ending Resistor.

Example. If you are cascading 2 tankless units, you will need **2 X communication cables** and you will only need one of the included ending resistors.



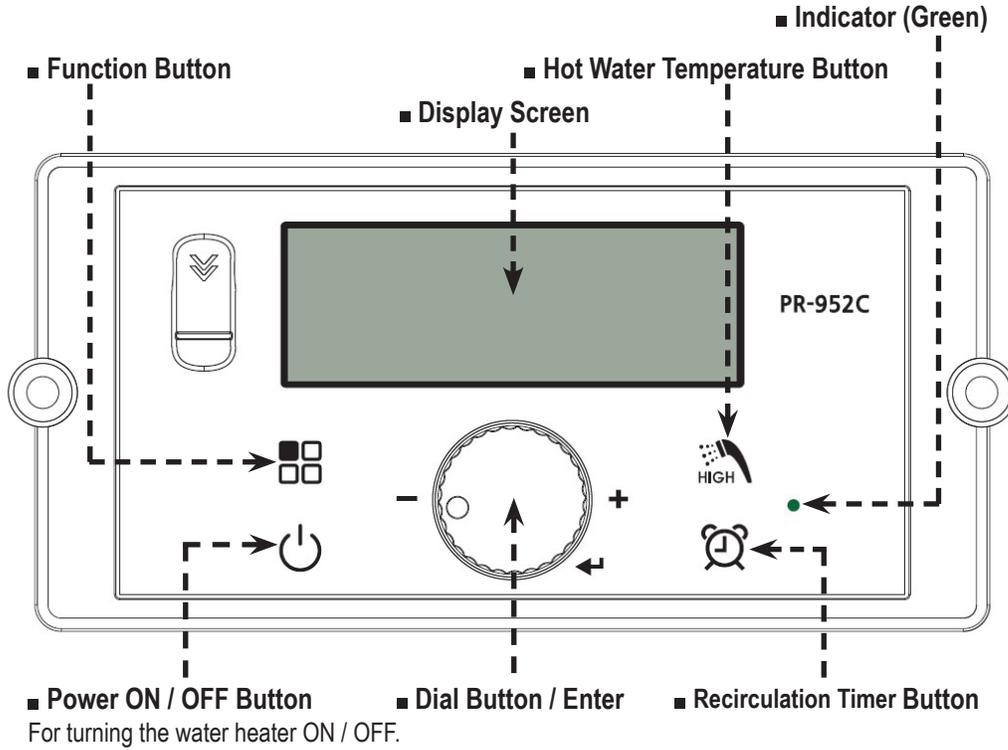
1. Turn off the power.
2. Remove the front covers of the water heaters (4 screws on each unit).
3. Connect the 'Cascade Communication Cables' to every unit (add the Resistor to the end of the last follower. Use the wiring throughway at the bottom of each unit.



4. Plug the primary connector on the cable (as shown) to the receptacle inside the unit.
5. Replace the front covers.
6. Turn on the power.

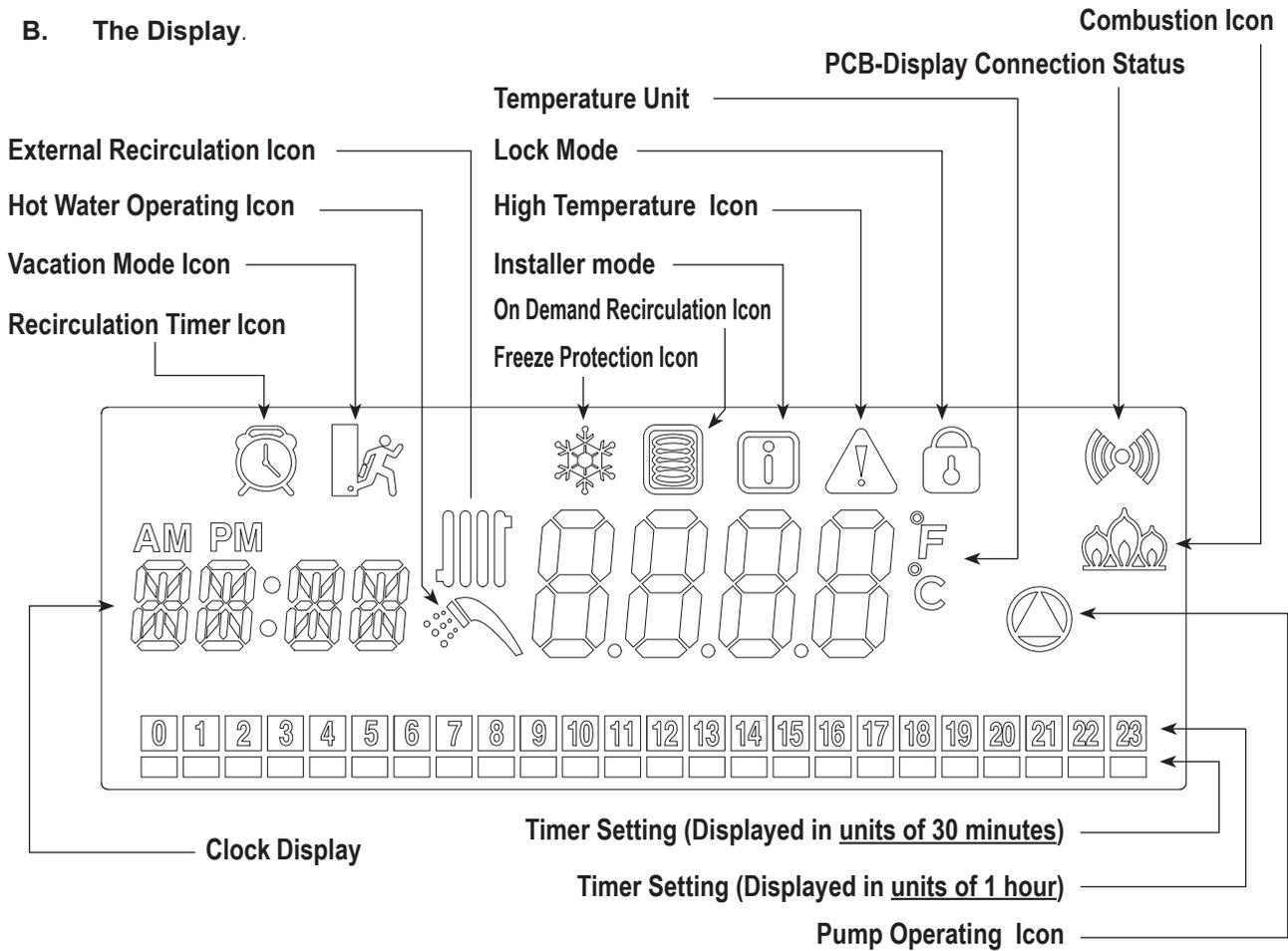
### SECTION 3 The Control Display

- A. **The Control Display** has a Control Dial, 4 buttons, and a Display. Section 3 will outline how to cascade. For all functions, please reference the Installation and Instruction Manual.

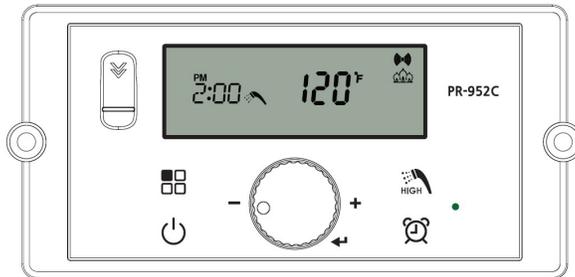


Buttons		Functionalities	
		PRESS (Tap)	PRESS and HOLD (5 seconds)
Power		Turns Control Display ON / OFF	N/A
Modes		Tap to return to menu	(If Display Power was On ) Status Display Mode (If Display Power was Off ) Installer Mode
Hot Water		DHW Set-Point LOW Range 100 - 120°F (38 - 49°C)	DHW Set-Point HIGH Range 125 - 140°F (51.5 - 60°C)
Timer		Recirculation Timer Setting	N/A
Scroll / Select		Turn to scroll, tap to select (clockwise or counterclockwise)	N/A

**B. The Display.**



**C. Start-Up Sequence.** After the Power is turned on, and/or the Control Display is turned on , the Control Display will go through a 'Start Up' checklist and briefly show a sequence of diagnostic codes before entering into the 'Operating Mode'. It will then display the following information.



Indicate	Example
Target DHW Temperature	120
If the flow is present	
If flame detected	
Temperature sign Celsius or Fahrenheit letter	F °C
Main PCB to Display Connection State (If symbol is shown connection status is connected)	
Current Time	PM 2:00

## D. Changing the DHW Set-Point

The tankless water heater has a built in water flow meter\* and will automatically adjust the flow rate up or down based on outlet temperature at the inlet side of the water heater. If the temperature drops below the setpoint, and the water heater is at full fire, the inlet flow to the heat exchanger will be reduced. Therefore, the outlet temperature will begin to rise to the desired setpoint. If the temperature begins to rise above the setpoint the flow will increase until full flow is reached. This feature ensures that the outlet water is always the ideal temperature for the user.

If this feature is not desired, then the 'over-ride' to this feature must be turned ON.

1. Turn off the power to the Control Display.
2. Move DIP switch 4 to the ON Position.

\*The Flow limiter must be activated in cascade systems to allow the leader to take priority. Otherwise demand priority will not be shared by all units evenly.

### ■ DHW Set Point Change Modes

The display shows the following information when changing water heating temperature set points.

Indicate	Example
Target DHW Temperature	120
When changing DHW setpoint, the DHW icon will flash	
When DHW set-point range is high : from 125°F (51.5°C) to 140°F (60.0°C)	
Temperature sign Celsius or Fahrenheit letter	F °C
Communication state indicate	
Current Time	PM 2:00

\* Default DHW set-point is 120°F (49°C)

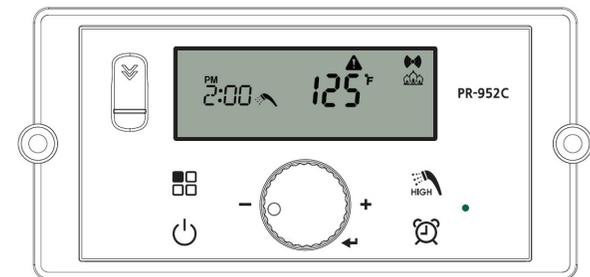
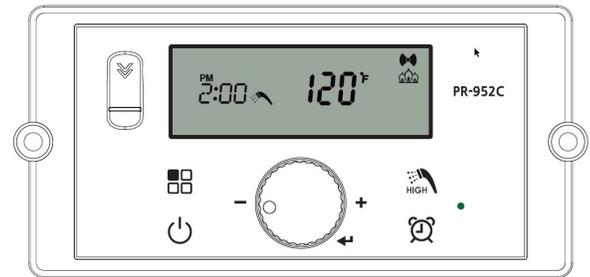
To change between Celsius and Fahrenheit, refer to section 5.4(Installation manual) status display mode, and change I:FC from Gal to Lit.

### • DHW 100-120°F (38 - 49°C) LOW range (Default)

- To change **LOW range**, press the  Button. The shower icon and current set point will flash (a flashing value means it can be changed).
- Turn dial clockwise to increase and counterclockwise to decrease until desired temperature is reached.
- Press dial to save setpoint changes.

### • DHW 125 - 140°F (51.5 - 60°C) HIGH range

- To change **HIGH range**, press and **HOLD** the  button for more than 5 seconds. The shower icon and current set point will flash (a flashing value means it can be changed).
- Turn dial clockwise to increase and counterclockwise to decrease until desired temperature is reached.
- Press dial to save setpoint changes and to Exit.



### DANGER

Scalding may occur within 5 seconds at a setting of 140°F (60°C). Water temperatures over 125°F can cause severe burns, or death from scalding. Children, disabled, and elderly are at highest risk of being scalded. Read all instructions before setting temperature at appliance. Feel water before bathing or showering.



## SECTION 4 Cascade Programming

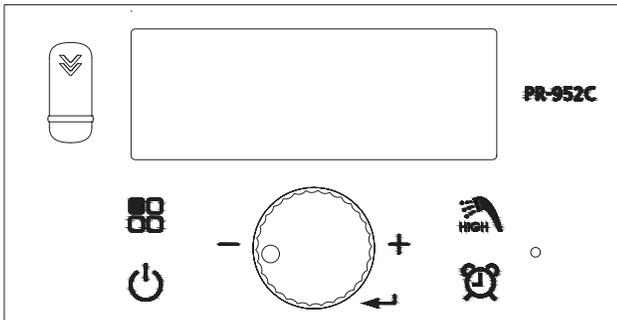
### A. To Program the Tankless Water Heater Leader:

Once all of the 'Connection Wires' are made and all units are powered on, there are 3 items that need to be programmed on the leader unit before moving on to the follower units.

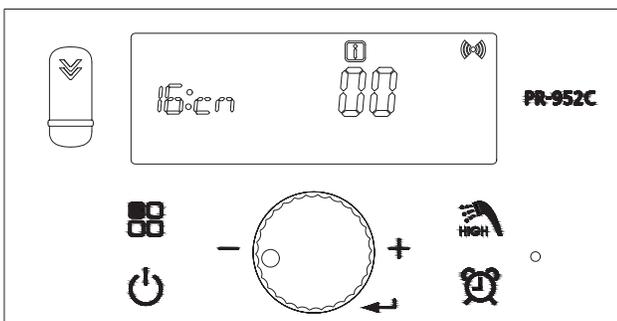
16:cn – **(NUMBER of THAT UNIT)** Sets Cascade Address. The Leader should always be addressed 01.

17:Eh - Common Vent Setting.

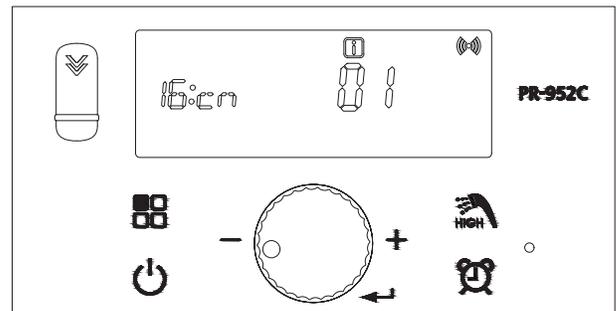
1. **START** by turning OFF the Power  to the Display Control of the LEAD Unit.
2. Then, with the display OFF, Press and HOLD (5 seconds) the  button to get into the Installer Mode.



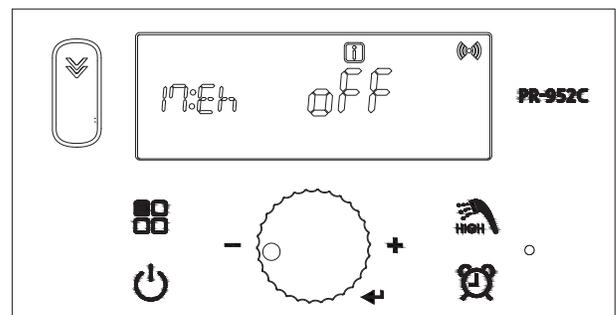
3. Rotate the Dial until you get to 16:cn. Tap the Dial to enter into that Parameter.



4. Adjust to 01 and then press (tap) the Dial to save and to Exit.



5. Rotate the Dial until you get to 17:Eh. Tap the Dial to enter into that Parameter.



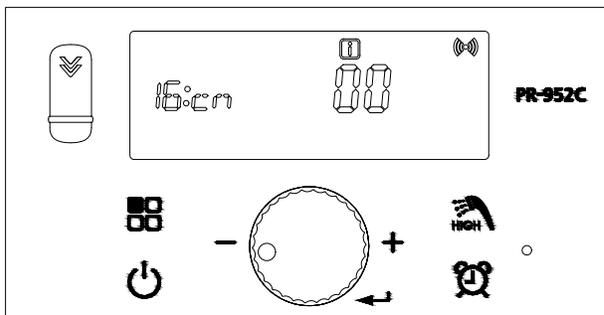
6. Finish by pressing the  button.

B. To Program the Tankless Water heater Followers:

Now move over to the first 'Following' unit and perform only 16:cn – (**NUMBER of THAT UNIT**) to each of the following units.

16:cn - (**NUMBER of THAT UNIT**) Sets Cascade Address. The Follower should always be addressed 02

1. Rotate the Dial back to 16:cn. Tap the Dial to enter into that Parameter.



2. Adjust to the 02 for cascaded following unit.

If you make a mistake in this setting mode, the LCD will show a "78" error code.

