

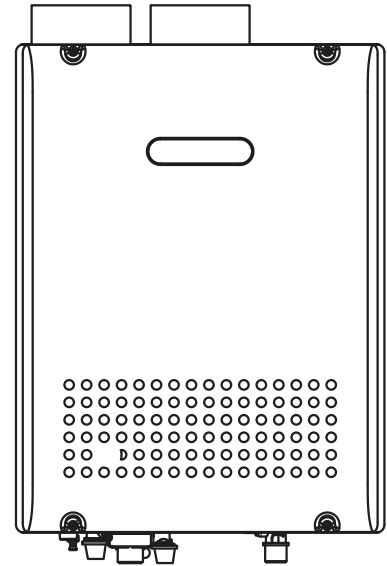
GQ-2457WS (-FFA) US [NR83 (-DVC, -OD)]  
 GQ-C2857WS (-FF) US [NRC98 (-DV, -OD)]  
 GQ-C3257WX (-FF) US [NRC111 (-DV, -OD)]  
 GQ-C3257WZ (-FF) US [NCC199 (-DV,-OD)]  
 GQ-2857WX (-FFA,-F) US [NR98 (-DVC,-OD,-SV)]  
 GQ-2857WZ (-FFA) US [NC199 (-DVC,-OD)]

Rev: March, 2018

## Service Manual

- Refer to this manual whenever performing service or maintenance on this appliance.
- This manual will be used for service technician training seminars.
- The specifications and descriptions in this manual may be changed without prior notice.
- For further assistance, contact Noritz Technical Support at 1-866-766-7489.

**Do not short circuit any safety device on this appliance**



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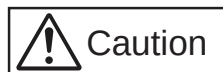
# Important Safety Information

To prevent damage to property and injury to the user, the icons below warn of varying levels of risk.

|                                                                                                  |                                                                                     |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  <b>Warning</b> | Ignoring this indication will cause an immediate danger of death or serious injury. |
|  <b>Caution</b> | Ignoring this indication may result in death or serious injury.                     |
|                 | Prohibited.                                                                         |

## 1. Safety Tips for Service

- Wear the appropriate clothing and protective gear:



- In order to prevent injury or accident, wear a protective helmet, safety boots and a lifting belt whenever necessary.

- Use only the appropriate tools and parts:



- Only use replacement parts manufactured by Noritz for this model as listed in the Installation Manual Parts List for service on this unit. Use appropriate tools.

- Modification of the unit is prohibited:



- Do not attempt to modify or alter the unit. This will cause a fire hazard and a risk of electrical shock.

- When servicing:



- Disconnect the power supply during maintenance and repairs to reduce the risk of electric shock. If it is necessary to have the electricity connected during repairs, use extreme caution not to touch parts that may cause a shock.

- Do not short circuit any safety device on this appliance:



- If a safety device is not functioning properly, replace the part. Do not under any circumstances short circuit the part.

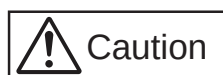
- Exhaust and gas leakage caution:



- Always check for leaks when installing or modifying the exhaust vent or gas piping.

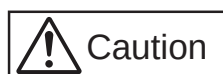
## 2. Post-Service Checks

- Check parts for leaks:



- Confirm that there are no gas, water, or exhaust leaks regardless of whether the service performed could have caused them.
- If the unit is installed indoors, check that the flue collar and vent pipe are installed correctly and that they are in good condition. Confirm that there are no gas, water or exhaust leaks regardless of whether the service performed could have caused them.

- Check for combustibles:



- After service or maintenance is completed, check that there are no combustibles in the vicinity of the unit.

- Check insulation resistance:



- After service or maintenance is completed, measure the resistance between the electrical wires and ground. If it is less than 10MΩ, there is a risk of electrical shock.

- Properly reconnect the power supply:



- Confirm that the power supply has been reconnected properly after service or maintenance is completed. Also confirm that there is no dust or other obstacles that might cause an electric shock or a fire hazard.

# 1. Features

## 1. Quick Connect Multi System

- Allows the simple installation of up to 2 units linked together using a Quick Connect Cord

CCP Valve  
System controller } Not required

## 2. Maximum Remote Controller Length (Only one remote controller can be connected.)

- Remote controller (1 unit): Cord can be extended up to 300' with 18AWG wire.

\* Note: In a Quick Connect Multi-System, only one remote controller will be installed.

## 3. Temperature Lockout Function

- The remote controller can be set to restrict the maximum allowable temperature setting for added safety.  
See "Changing Default Temperature Setting" section for details.

## 4. Elevation Adjustment

- The water heater can be quickly configured for installations above 2000' by simply adjusting dip switches inside of the unit. No additional equipment or adjustments are necessary. See the "Installation Manual" for details.

## 2. Specifications/Performance Table

### Specifications

#### GQ-2457WS(-FFA) US [NR83(DVC/OD)]

| Item                                    |                    | Specification                                                                                                                             |                                             |
|-----------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Model Name                              |                    | GQ-2457WS-FFA US (NR83DVC)                                                                                                                | GQ-2457WS US (NR83OD)                       |
| Type                                    | Installation       | Indoor Wall Mounted                                                                                                                       | Outdoor Wall Mounted                        |
|                                         | Air Supply/Exhaust | Power Vented                                                                                                                              |                                             |
| Ignition                                |                    | Direct Ignition                                                                                                                           |                                             |
| Operating Pressure                      |                    | 15-150 psi                                                                                                                                |                                             |
| Minimum Flow Rate                       |                    | 0.5 GPM (2 L/min.)                                                                                                                        |                                             |
| Dimensions (Height) x (Width) x (Depth) |                    | 23.6" (600mm) x 13.8" (350mm) x 9.4" (240mm)                                                                                              |                                             |
| Weight                                  |                    | 49 lbs.                                                                                                                                   |                                             |
| Water Holding Capacity                  |                    | 0.2 Gallon (0.95L)                                                                                                                        |                                             |
| Connection Sizes                        | Water Inlet        | 3/4"                                                                                                                                      |                                             |
|                                         | Hot Water Outlet   | 3/4"                                                                                                                                      |                                             |
|                                         | Gas Inlet          | 3/4"                                                                                                                                      |                                             |
| Power Supply                            | Supply             | 120 VAC (60Hz)                                                                                                                            |                                             |
|                                         | Consumption        | NG : 82W LP : 90W<br>Freeze Prevention 161W                                                                                               | NG : 67W LP : 69W<br>Freeze Prevention 161W |
| Materials                               | Casing             | Zincified Steel Plate/Polyester Coating                                                                                                   |                                             |
|                                         | Flue Collar        | Stainless Steel                                                                                                                           |                                             |
|                                         | Heat Exchanger     | Copper Sheeting, Copper Tubing                                                                                                            |                                             |
| Safety Devices                          |                    | Flame Rod, Thermal Fuse, Lightning Protection Device (ZNR), Overheat Prevention Device, Freezing Prevention Device, Fan Rotation Detector |                                             |
| Accessories                             |                    | Anchoring Screws                                                                                                                          |                                             |

#### GQ-C2857WS(-FF) US [NRC98(DV/OD)]

| Item                                    |                          | Specification                                                                                                                             |                                             |
|-----------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Model Name                              |                          | GQ-C2857WS-FF US (NR98DV)                                                                                                                 | GQ-C2857WS US (NRC98OD)                     |
| Type                                    | Installation             | Indoor Wall Mounted                                                                                                                       | Outdoor Wall Mounted                        |
|                                         | Air Supply/Exhaust       | Power Vented                                                                                                                              |                                             |
| Ignition                                |                          | Direct Ignition                                                                                                                           |                                             |
| Operating Pressure                      |                          | 15-150 psi                                                                                                                                |                                             |
| Minimum Flow Rate                       |                          | 0.5 GPM (2 L/min.)                                                                                                                        |                                             |
| Dimensions (Height) x (Width) x (Depth) |                          | 24.2" (615mm) x 18.3" (464mm) x 9.4" (240mm)                                                                                              |                                             |
| Weight                                  |                          | 58 lbs.                                                                                                                                   | 57 lbs.                                     |
| Water Holding Capacity                  |                          | 0.5 Gallon (1.8L)                                                                                                                         |                                             |
| Connection Sizes                        | Water Inlet              | 3/4"                                                                                                                                      |                                             |
|                                         | Hot Water Outlet         | 3/4"                                                                                                                                      |                                             |
|                                         | Gas Inlet                | 3/4"                                                                                                                                      |                                             |
|                                         | Condensate Drain         | 1/2" Threaded                                                                                                                             |                                             |
| Power Supply                            | Supply                   | 120 VAC (60Hz)                                                                                                                            |                                             |
|                                         | Consumption              | NG : 73W LP : 78W<br>Freeze Prevention 213W                                                                                               | NG : 64W LP : 68W<br>Freeze Prevention 203W |
| Materials                               | Casing                   | Zincified Steel Plate/Polyester Coating                                                                                                   |                                             |
|                                         | Flue Collar              | PVC                                                                                                                                       | Stainless Steel                             |
|                                         | Primary Heat Exchanger   | Copper Sheeting, Copper Tubing                                                                                                            |                                             |
|                                         | Secondary Heat Exchanger | Stainless Steel Sheeting, Stainless Steel Tubing                                                                                          |                                             |
| Safety Devices                          |                          | Flame Rod, Thermal Fuse, Lightning Protection Device (ZNR), Overheat Prevention Device, Freezing Prevention Device, Fan Rotation Detector |                                             |
| Accessories                             |                          | Remote Controller, Remote Controller Cord, Anchoring Screws                                                                               |                                             |



■ GQ-C3257WX (-FF) US [NRC111(DV/OD)] / GQ-C3257WZ (-FF) US [NCC199 (DV/OD)]

| Item                   |                    | Specification                                                                                                                      |                                                      |
|------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Model Name             |                    | GQ-C3257WX-FF US (NRC111DV)<br>GQ-C3257WZ-FF US (NCC199DV)                                                                         | GQ-C3257WX US (NRC111OD)<br>GQ-C3257WZ US (NCC199OD) |
| Type                   | Installation       | Indoor,<br>Wall Mounted                                                                                                            | Outdoor,<br>Wall Mounted                             |
|                        | Air Supply/Exhaust | Power Vented                                                                                                                       |                                                      |
| Ignition               |                    | Direct Ignition                                                                                                                    |                                                      |
| Operating Pressure     |                    | 15-150 psi                                                                                                                         |                                                      |
| Minimum Flow Rate      |                    | 0.5 GPM (2 L/min.)                                                                                                                 |                                                      |
| Dimensions             |                    | 24.4"(Height) x 18.3"(Width) x 9.4"(Depth) (NRC111DV/OD)<br>24.4"(619mm) x 18.4"(468mm) x 9.4"(240mm) (NRC199DV/OD)                |                                                      |
| Weight                 |                    | 68 lbs.                                                                                                                            | 66 lbs.                                              |
| Water Holding Capacity |                    | 0.5 Gallon (2 L)                                                                                                                   |                                                      |
| Connection Size        | Water Inlet        | NPT 3/4"                                                                                                                           |                                                      |
|                        | Hot Water Outlet   | NPT 3/4"                                                                                                                           |                                                      |
|                        | Gas Inlet          | NPT 3/4"                                                                                                                           |                                                      |
|                        | Condensate Drain   | 1/2" Threaded (NRC199 DV/OD only)                                                                                                  |                                                      |
| Power Supply           | Supply             | 120 VAC (60Hz)                                                                                                                     |                                                      |
|                        | Consumption        | NG : 81W                                                                                                                           | NG : 78W                                             |
|                        |                    | LP : 83W                                                                                                                           | LP : 80W                                             |
|                        |                    | Freeze Prevention 223W                                                                                                             |                                                      |
| Materials              | Casing             | Zincified Steel Plate/Polyester Coating (NRC111DV/OD)                                                                              |                                                      |
|                        |                    | Stainless Steel (NCC199DV/OD)                                                                                                      |                                                      |
|                        | Flue Collar        | PVC                                                                                                                                | Stainless Steel                                      |
|                        | Heat Exchanger     | Copper Sheetting, Copper Tubing                                                                                                    |                                                      |
| Safety Devices         |                    | Flame Rod, Thermal Fuse, Lightning Protection Device (ZNR), Overheat Prevention, Freezing Prevention Device, Fan Rotation Detector |                                                      |
| Accessories            |                    | Remote Controller, Remote Controller Cord, Anchoring Screws, Drain hose With clamp (NCC199DV only)                                 |                                                      |

■ GQ-2857WX (-FF) US [NR98 (SV/OD/DVC)] / GQ-2857WZ (-FF) US [NC199 (OD/DVC)]

| Item                   |                    | Specification                                                                                                                             |                                               |                             |
|------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------|
| Model Name             |                    | GQ-2857WX US (NR98OD)                                                                                                                     |                                               | GQ-2857WX-FFA US (NR98DVC)  |
|                        |                    | GQ-2857WZ US (NC199OD)                                                                                                                    | GQ-2857WX-F US (NR98SV)                       | GQ-2857WZ-FFA US (NC199DVC) |
| Type                   | Installation       | Outdoor,<br>Wall Mounted                                                                                                                  | Indoor,<br>Wall Mounted                       |                             |
|                        | Air Supply/Exhaust | Power Vented                                                                                                                              |                                               |                             |
| Ignition               |                    | Direct Ignition                                                                                                                           |                                               |                             |
| Operating Pressure     |                    | 15-150 psi                                                                                                                                |                                               |                             |
| Minimum Flow Rate      |                    | 0.5 GPM (2L/min)                                                                                                                          |                                               |                             |
| Dimensions             |                    | 23.6"(600mm) x 13.8"(350mm) x<br>9.4"(240mm)                                                                                              | 23.6"(600mm) x 13.8"(350mm) x<br>11.0"(280mm) |                             |
| Weight                 |                    | 54 lbs.                                                                                                                                   | 58 lbs.                                       |                             |
| Water Holding Capacity |                    | 0.2 Gallon (1.0L)                                                                                                                         |                                               |                             |
| Connection Sizes       | Water Inlet        | 3/4"                                                                                                                                      |                                               |                             |
|                        | Hot Water Outlet   | 3/4"                                                                                                                                      |                                               |                             |
|                        | Gas Inlet          | 3/4"                                                                                                                                      |                                               |                             |
| Power Supply           | Supply             | 120 VAC (60Hz)                                                                                                                            |                                               |                             |
|                        | Consumption        | NG : 65W                                                                                                                                  | NG : 65W                                      | NG : 80W                    |
|                        |                    | LP : 67W                                                                                                                                  | LP : 69W                                      | LP : 83W                    |
|                        |                    | Freeze Prevention 161W                                                                                                                    | Freeze Prevention 193W                        |                             |
| Materials              | Casing             | Zincified Steel Plate/Polyester Coating                                                                                                   |                                               |                             |
|                        | Flue Collar        | Stainless Steel                                                                                                                           |                                               |                             |
|                        | Heat Exchanger     | Copper Sheetting, Copper Tubing                                                                                                           |                                               |                             |
| Safety Devices         |                    | Flame Rod, Thermal Fuse, Lightning Protection Device (ZNR), Overheat Prevention Device, Freezing Prevention Device, Fan Rotation Detector |                                               |                             |
| Accessories            |                    | Remote Controller, Remote Controller Cord, Anchoring Screws                                                                               |                                               |                             |

## Performance

| Item                        |                     | GQ-2457WS-FFA US<br>[NR83DVC]                                                        | GQ-2457WS US<br>[NR83OD] |
|-----------------------------|---------------------|--------------------------------------------------------------------------------------|--------------------------|
| Gas Consumption             | Maximum Performance | NG : 180,000 btuh LP : 180,000 btuh                                                  |                          |
|                             | Minimum Performance | NG : 18,000 btuh LP : 18,000 btuh                                                    |                          |
| Maximum Hot Water Capacity  | 45°F (25°C ) Rise   | 6.7 GPM (25.4 L/min.)                                                                |                          |
| Capacity Range              |                     | 0.5-8.3 GPM (2-31.4 L/min.)                                                          |                          |
| Temperature Settings        | °F Mode:            | 115-140°F (In 5°F intervals) (6 Options)                                             |                          |
|                             | °C Mode:            | 46,47,48,50,55,60°C (6 Options)                                                      |                          |
| Default Temperature Options |                     | 120°F (50°C), 125°F (52°C), 130°F (54°C), 140°F (60°C)<br>(Original is 120°F (50°C)) |                          |

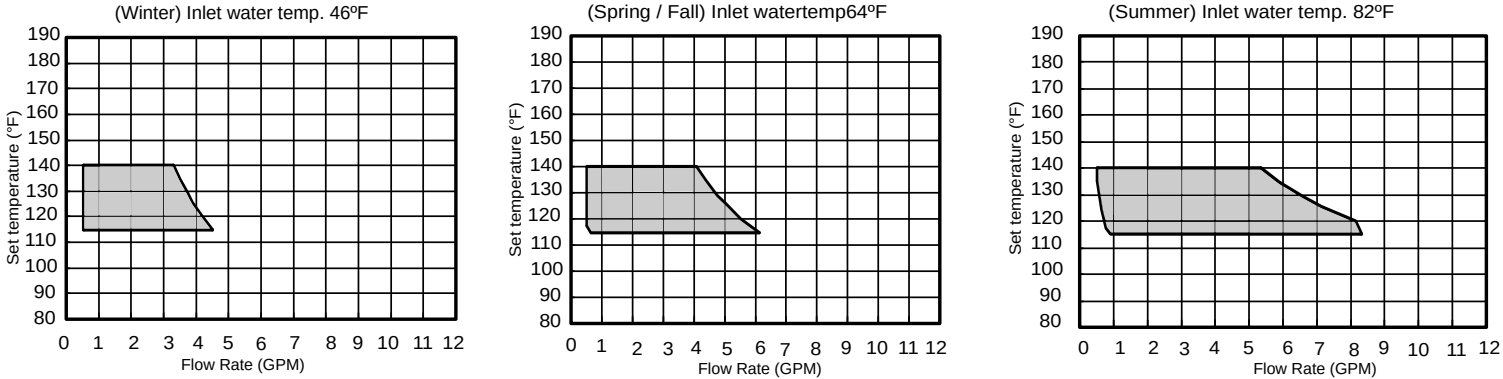
| Item                        |                     | GQ-C2857WS-FF US<br>[NRC98DV]                                                        | GQ-C2857WS US<br>[NRC98OD] |
|-----------------------------|---------------------|--------------------------------------------------------------------------------------|----------------------------|
| Gas Consumption             | Maximum Performance | NG : 180,000 btuh LP : 180,000 btuh                                                  |                            |
|                             | Minimum Performance | NG : 16,000 btuh LP : 16,000 btuh                                                    |                            |
| Maximum Hot Water Capacity  | 45°F (25°C) Rise    | 7.5 GPM (28.2 L/min.)                                                                |                            |
| Capacity Range              |                     | 0.5-9.8 GPM (2-37.0 L/min.)                                                          |                            |
| Temperature Settings        | °F Mode:            | 115-140°F (In 5°F intervals) (6 Options)                                             |                            |
|                             | °C Mode:            | 46,47,48,50,55,60°C (6 Options)                                                      |                            |
| Default Temperature Options |                     | 120°F (50°C), 125°F (52°C), 130°F (54°C), 140°F (60°C)<br>(Original is 120°F (50°C)) |                            |

| Item                        |                     | GQ-C3257WX-FF US<br>[NRC111DV]                                                      | GQ-C3257WX US<br>[NRC111OD] | GQ-C3257WZ-FF US<br>[NCC199DV]                                                     | GQ-C3257WZ US<br>[NCC199OD] |
|-----------------------------|---------------------|-------------------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------|-----------------------------|
| Gas Consumption             | Maximum Performance | NG : 199,900 btuh LP : 199,900 btuh                                                 |                             |                                                                                    |                             |
|                             | Minimum Performance | NG : 16,000 btuh LP : 16,000 btuh                                                   |                             |                                                                                    |                             |
| Maximum Hot Water Capacity  | 45°F (25°C ) Rise   | 8.4 GPM (32 L/min.).                                                                |                             |                                                                                    |                             |
| Capacity Range              |                     | 0.5-11.1 GPM (2-42 L/min.).                                                         |                             |                                                                                    |                             |
| Temperature Settings        | °F Mode:            | 100 - 140°F (In 5°F intervals) (9 Options)                                          |                             | 100 - 150°F (In 5°F intervals),<br>160, 170, 185°F (14 Options)                    |                             |
|                             | °C Mode:            | 37-48°C (In 1°C intervals),<br>50,55,60°C (In 5°C intervals) (15 Options)           |                             | 37-48°C (In 1°C intervals),<br>50-85°C (In 5°C intervals) (20 Options)             |                             |
| Default Temperature Options |                     | 120°F (50°C), 125°F (52°C), 130°F (54°C),<br>140°F (60°C) (Original is 120°F(50°C)) |                             | 120°F (50°C),130°F (54°C),140°F (60°C),<br>185°F (85°C) (Original is 120°F (50°C)) |                             |

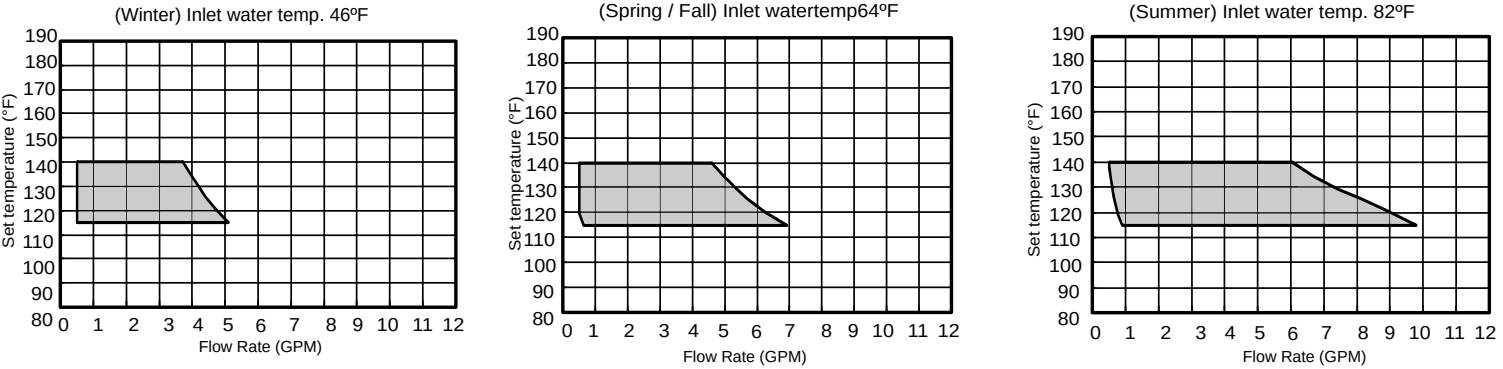
| Item                        |                     | GQ-2857WX (-FFA,-F) US<br>[NR98DVC/OD/SV]                                               | GQ-2857WZ-FFA US<br>[NC199DVC] | GQ-2857WZ US<br>[NC199OD]                                                             |
|-----------------------------|---------------------|-----------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------|
| Gas Consumption             | Maximum Performance | NG : 199,900 btuh LP : 199,900 btuh                                                     |                                |                                                                                       |
|                             | Minimum Performance | NG : 16,000 btuh LP : 16,000 btuh                                                       |                                |                                                                                       |
| Maximum Hot Water Capacity  | 45°F (25°C ) Rise   | 7.5 GPM (28.2L/min.)                                                                    |                                |                                                                                       |
| Capacity Range              |                     | 0.5-9.8 GPM (2-37 L/min.)                                                               |                                |                                                                                       |
| Temperature Settings        | °F Mode:            | 100-140°F (In 5°F intervals) (9 Options)                                                |                                | 100-150°F (In 5°F intervals),<br>160, 170, 185°F (14 Options)                         |
|                             | °C Mode:            | 37-48°C (In 1°C intervals),<br>50,55,60°C (In 5°C intervals) (15 Options)               |                                | 37-48°C (In 1°C intervals),<br>50-85°C (In 5°C intervals) (20 Options)                |
| Default Temperature Options |                     | 120°F (50°C), 125°F (52°C), 130°F (54°C),<br>140°F (60°C)<br>(Original is 120°F (50°C)) |                                | 120°F (50°C),130°F (54°C),140°F (60°C),<br>185°F (85°C)<br>(Original is 120°F (50°C)) |

■ Hot Water Supply Capabilities

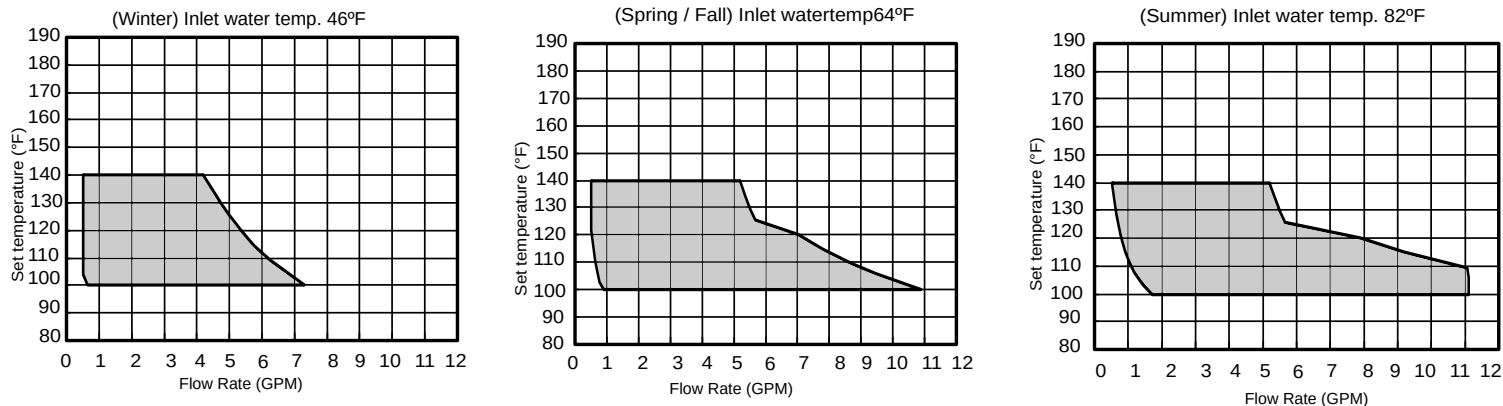
GQ-2457WS (-FFA) US [NR83 (DVC/OD)]



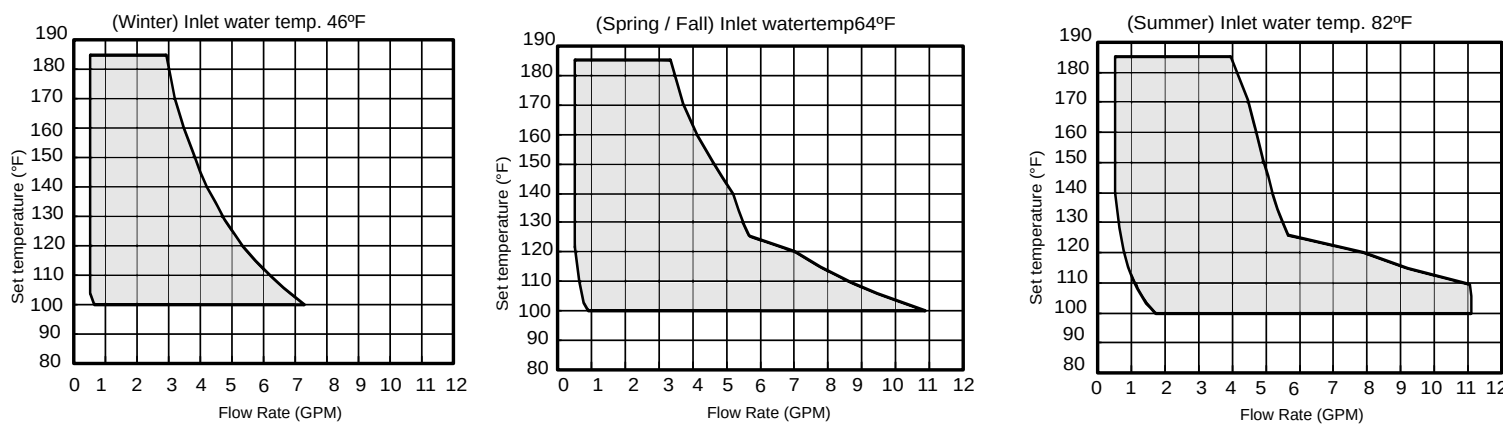
GQ-C2857WS (-FF) US [NRC98 (DV/OD)]



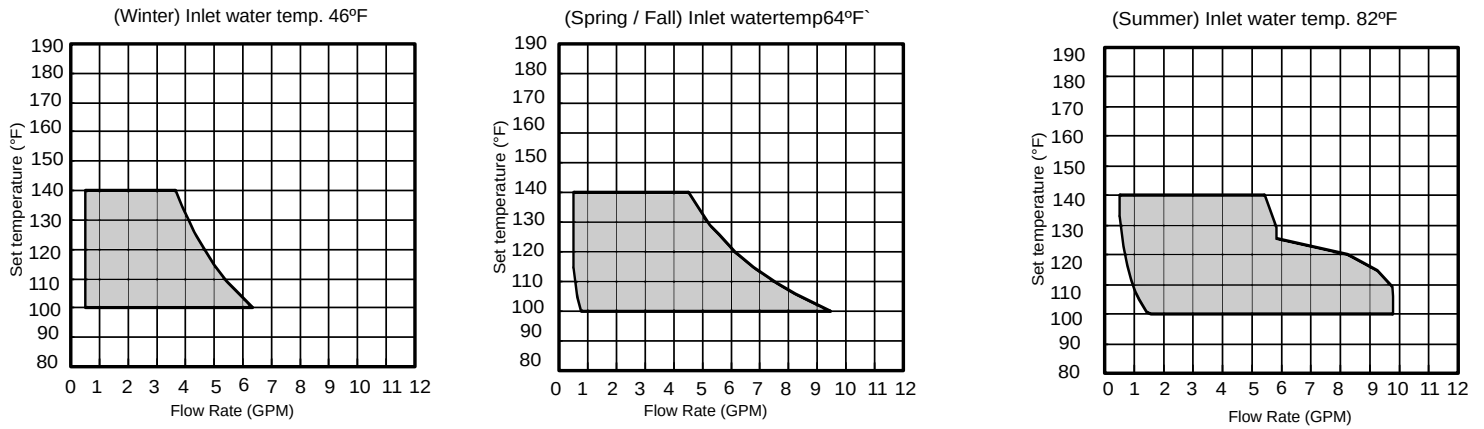
GQ-C3257WX (-FF) US [NRC111 (DV/OD)]



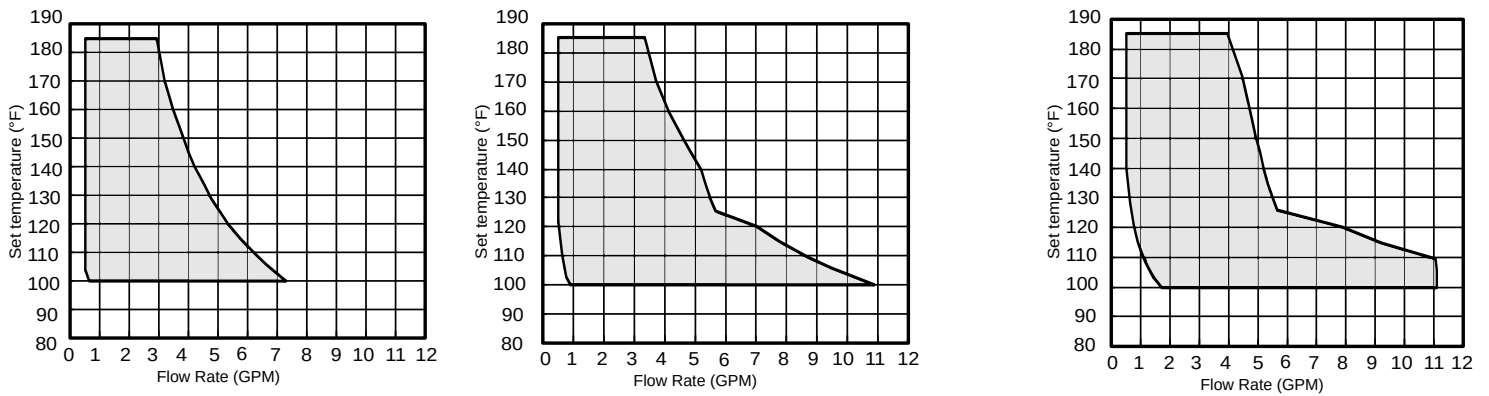
GQ-C3257WZ (-FF) US [NCC199 (DV/OD)]



## GQ-2857WX (-FFA,-F) US [NR98 (DVC/OD/SV)]

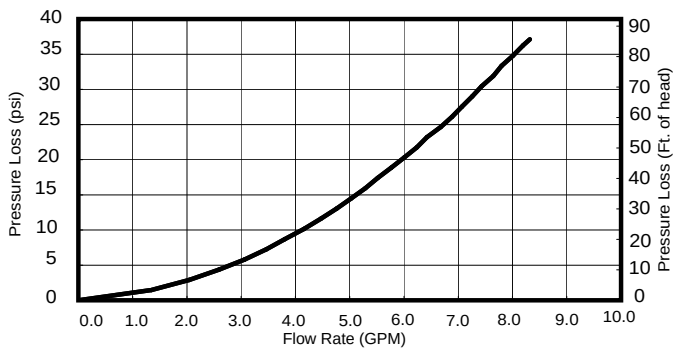


## GQ-2857WZ (-FFA) US [NC199 (DVC/OD)]

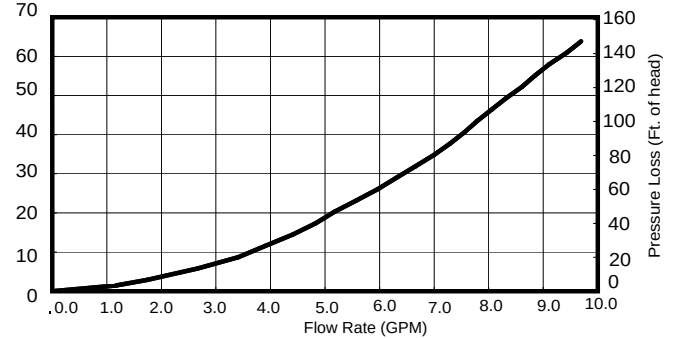


## ■ Pressure Loss Characteristics

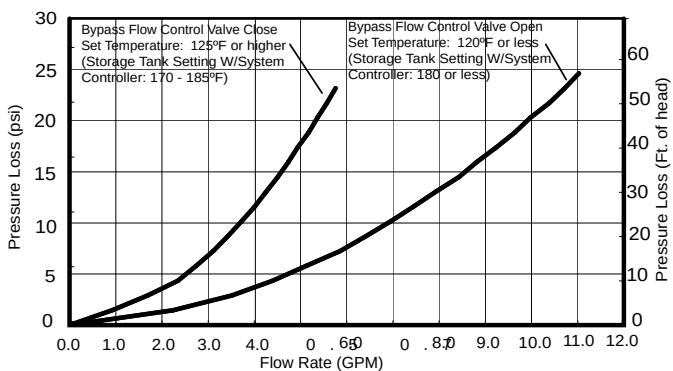
### GQ-2457WS (FFA) US [NR83 (DVC/OD)]



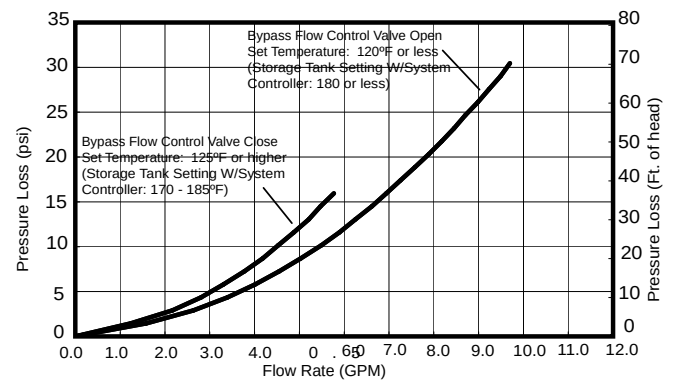
### GQ-C2857WS (-FF) US [NRC98 (DV/OD)]



### GQ-C3257WX (-FF) US [NRC111(DV/OD)] GQ-C3257WZ (-FF) US [NCC199(DV/OD)]



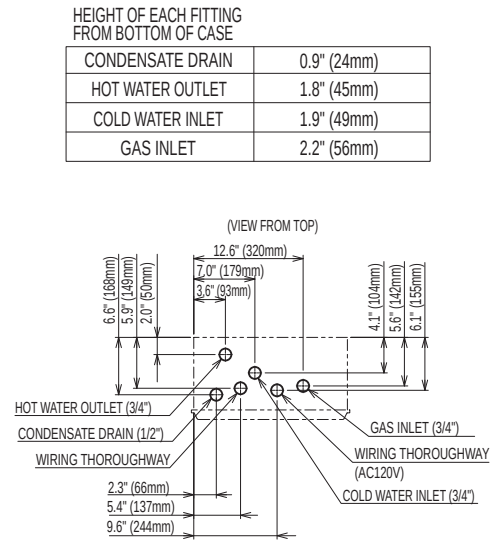
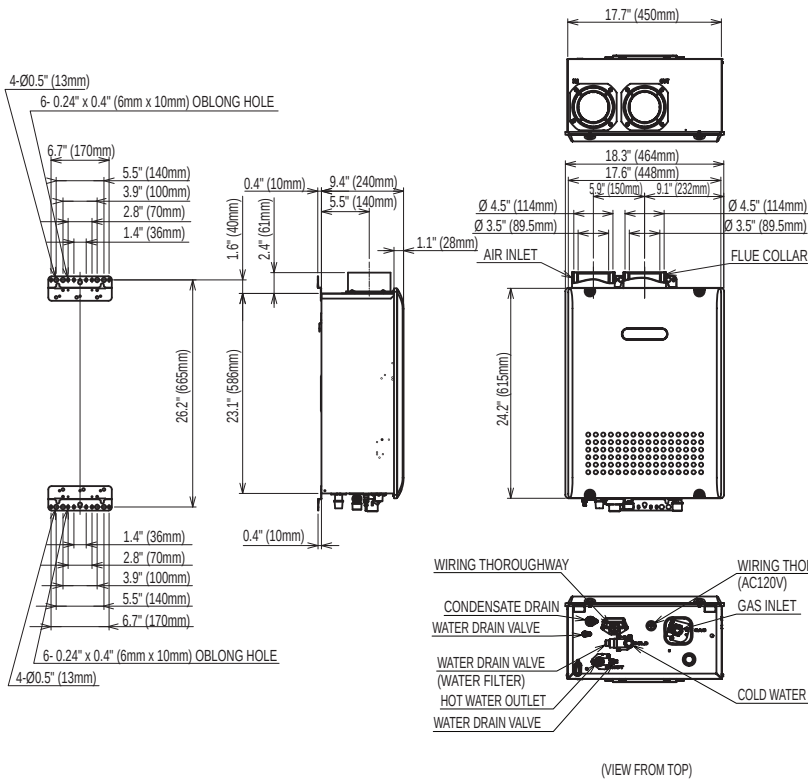
### GQ-2857WX (-FFA) US [NR98 (DVC/OD/SV)] GQ-2857WZ (-FFA) US [NC199 (DVC/OD)]



### 3. Dimensions

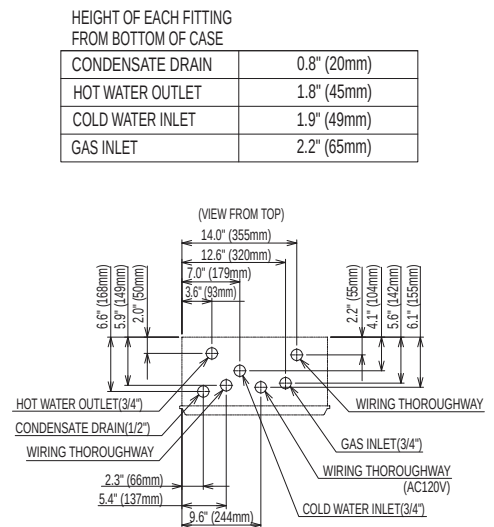
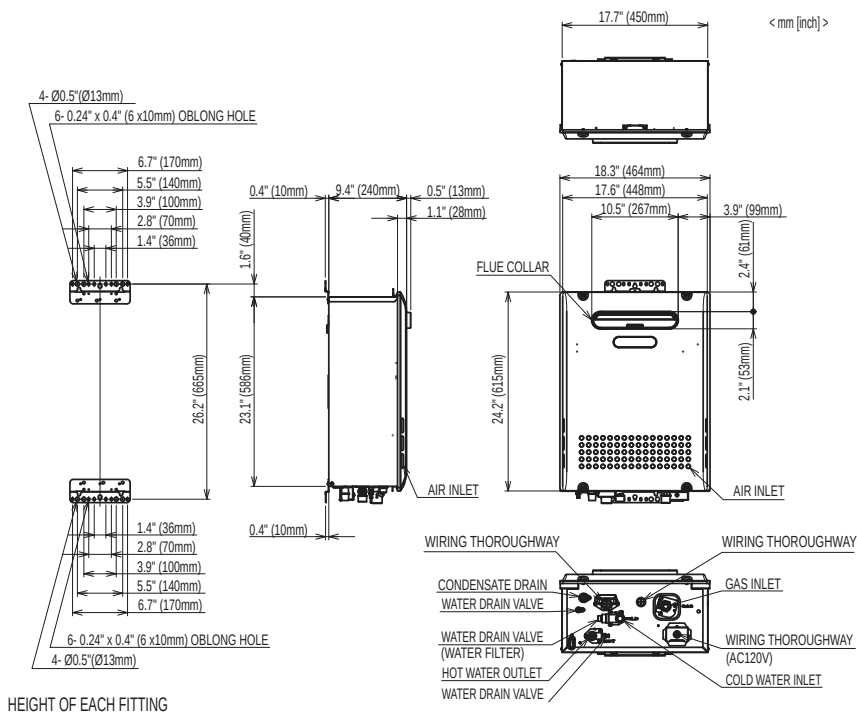
#### GQ-C2857WS-FF US (NRC98DV)

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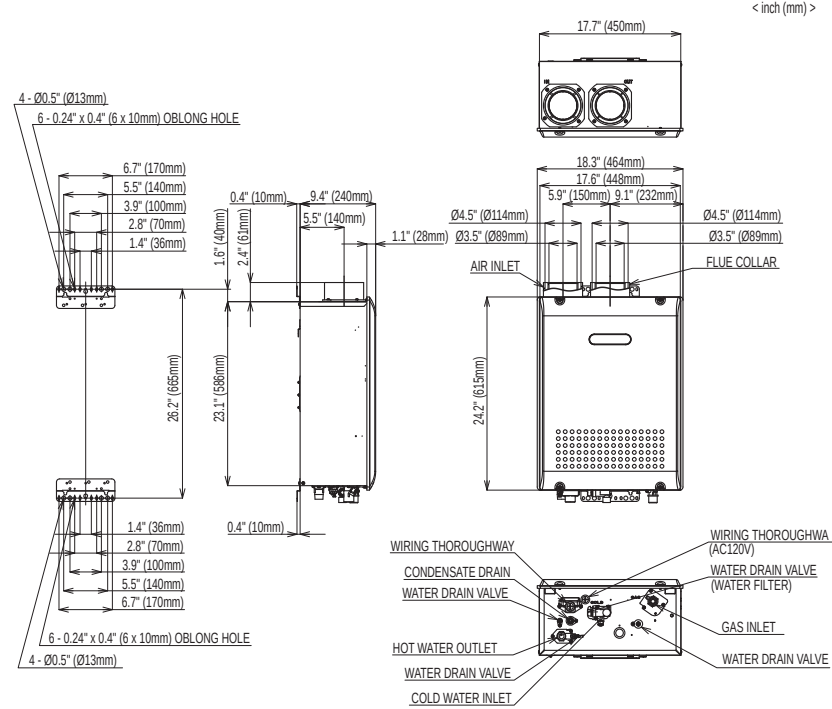


#### GQ-C2857WS US (NRC98OD)

< mm [inch] >

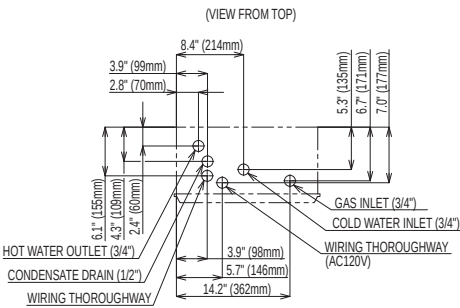


GQ-C3257WX-FF US (NRC111DV)

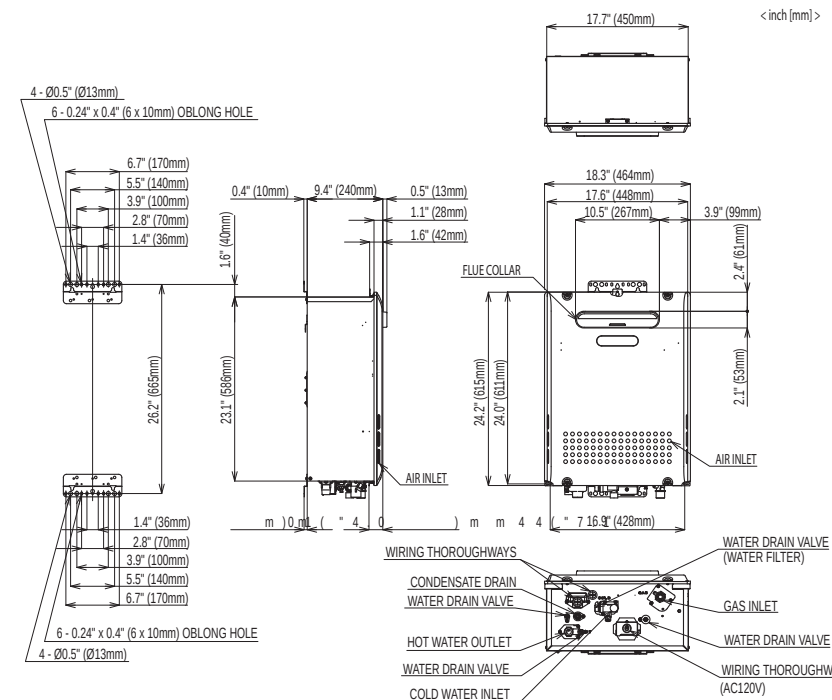


HEIGHT OF EACH FITTING  
FROM BOTTOM OF CASE

|                  | NRC111-DV   |
|------------------|-------------|
| CONDENSATE DRAIN | 0.8" (20mm) |
| HOT WATER OUTLET | 1.7" (44mm) |
| COLD WATER INLET | 2.2" (55mm) |
| GAS INLET        | 2.2" (56mm) |

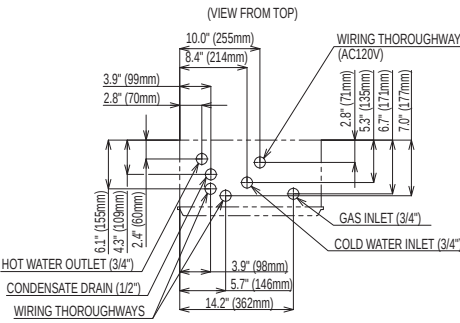


GQ-C3257WX US (NRC111OD)

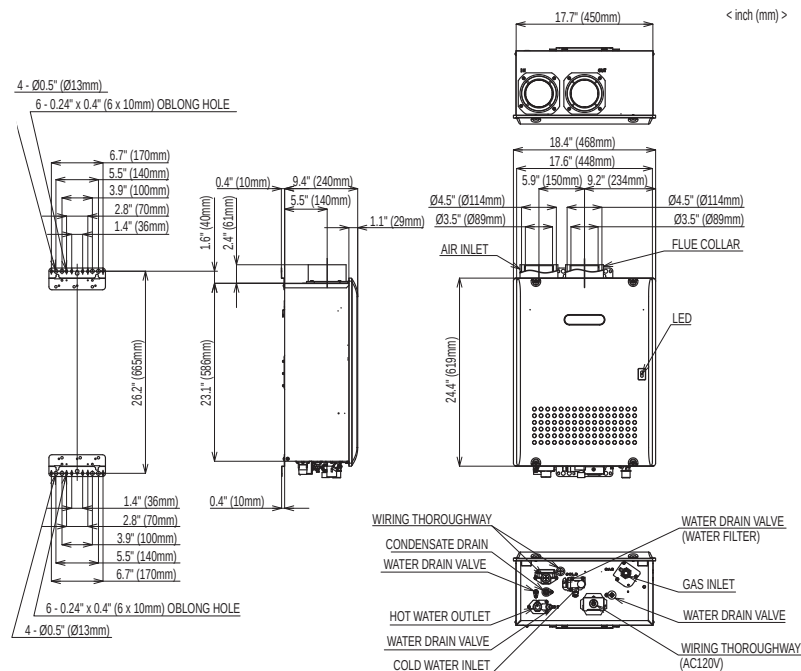


HEIGHT OF EACH FITTING  
FROM BOTTOM OF CASE

|                  | NRC111-OD   |
|------------------|-------------|
| CONDENSATE DRAIN | 0.8" (20mm) |
| HOT WATER OUTLET | 1.7" (44mm) |
| COLD WATER INLET | 2.2" (55mm) |
| GAS INLET        | 2.2" (56mm) |

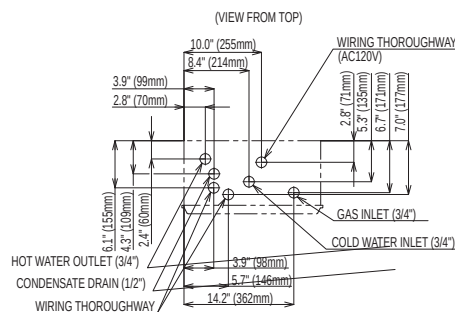


## GQ-C3257WZ-FF US (NCC199DV)

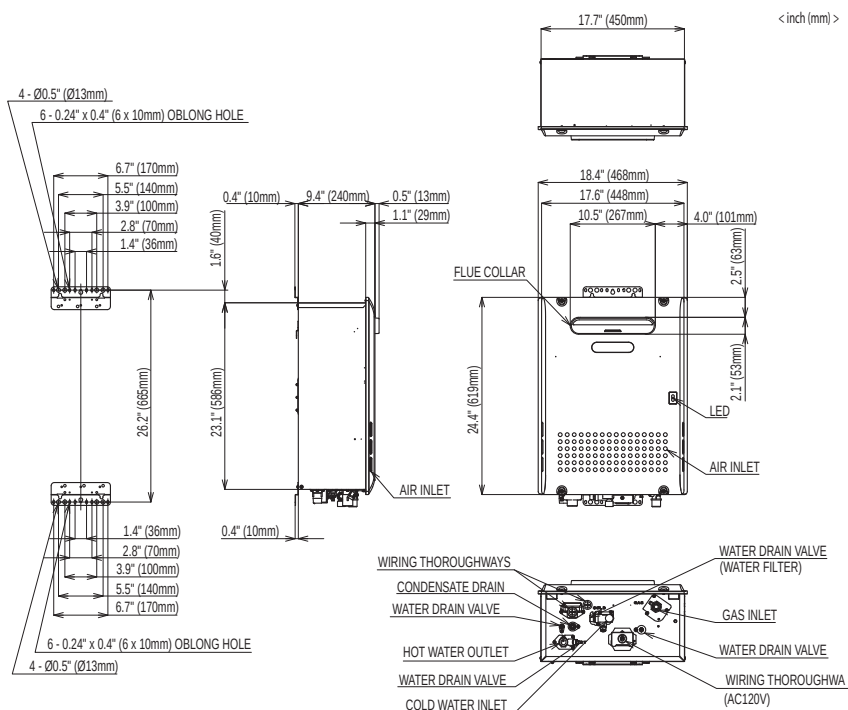


HEIGHT OF EACH FITTING  
FROM BOTTOM OF CASE

|                  | NCC1991-DV  |
|------------------|-------------|
| CONDENSATE DRAIN | 0.8" (20mm) |
| HOT WATER OUTLET | 1.7" (44mm) |
| COLD WATER INLET | 2.2" (55mm) |
| GAS INLET        | 2.2" (56mm) |

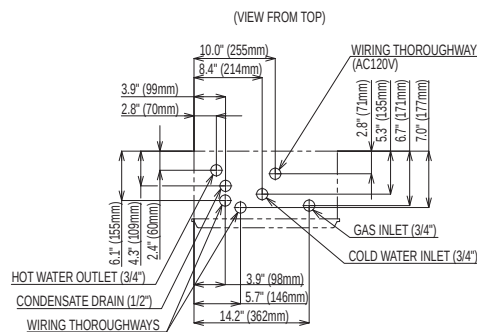


## GQ-C3257WZ US (NCC199OD)

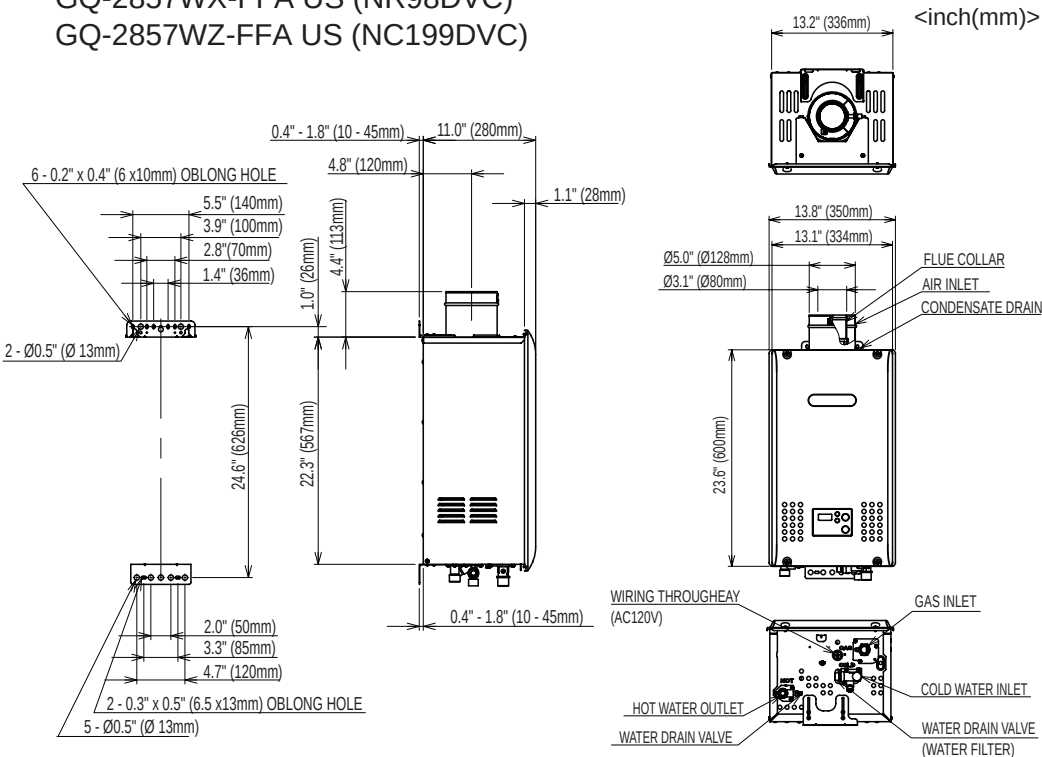


HEIGHT OF EACH FITTING  
FROM BOTTOM OF CASE

|                  | NCC1991-OD  |
|------------------|-------------|
| CONDENSATE DRAIN | 0.8" (20mm) |
| HOT WATER OUTLET | 1.7" (44mm) |
| COLD WATER INLET | 2.2" (55mm) |
| GAS INLET        | 2.2" (56mm) |

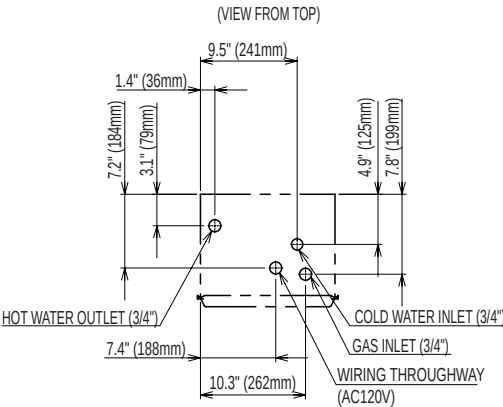


GQ-2857WX-FFA US (NR98DVC)  
 GQ-2857WZ-FFA US (NC199DVC)

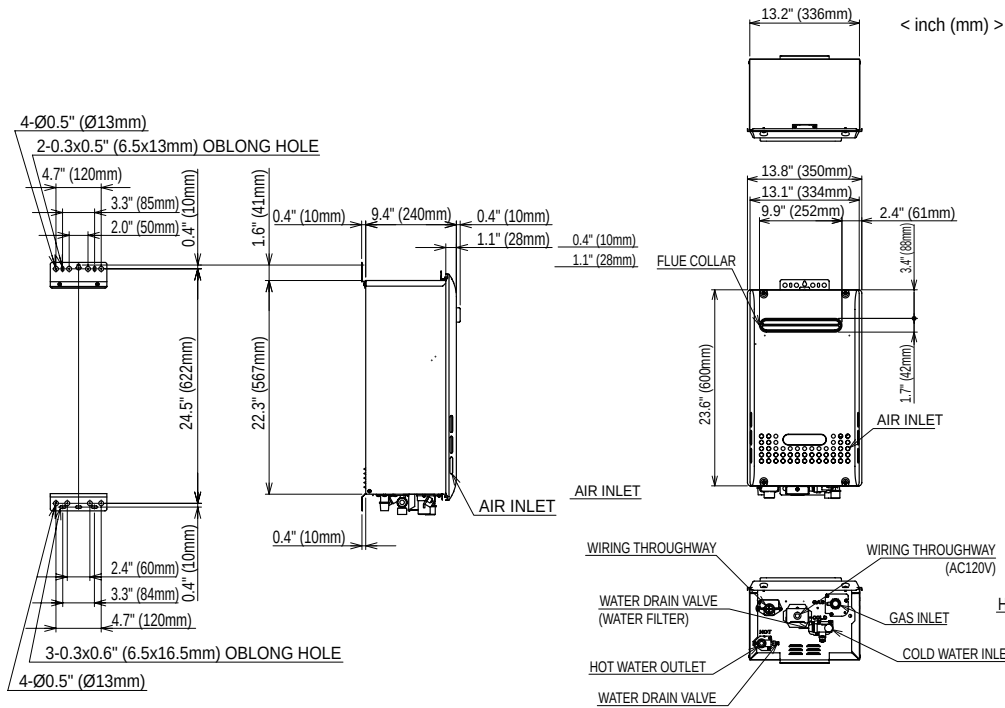


HEIGHT OF EACH FITTINGS FROM BOTTOM OF CASE

|                  |             |
|------------------|-------------|
| HOT WATER OUTLET | 1.8" (45mm) |
| COLD WATER INLET | 2.2" (55mm) |
| GAS INLET        | 2.2" (56mm) |

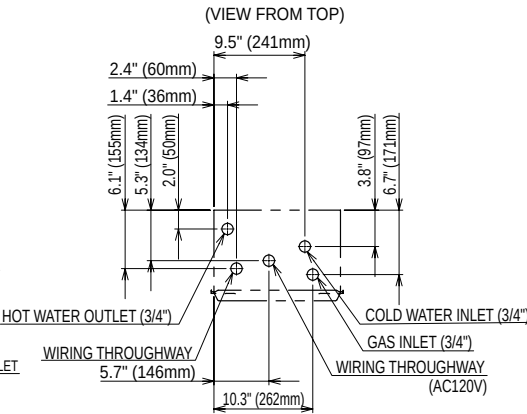


GQ-2857WX US (NR98OD)  
 GQ-2857WZ US (NC199OD)



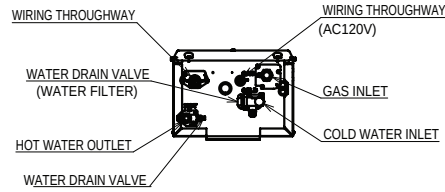
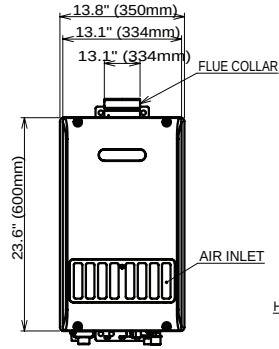
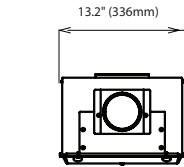
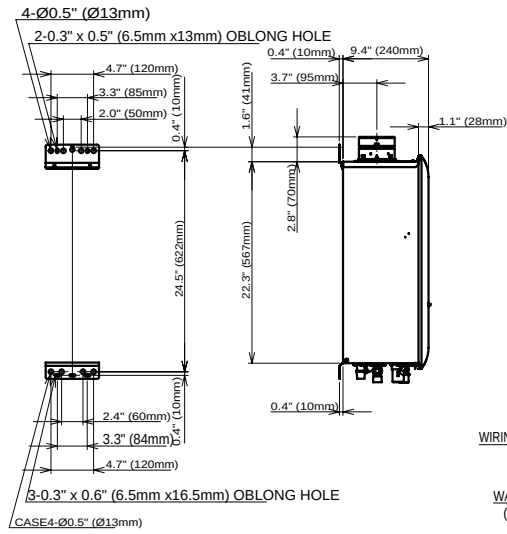
HEIGHT OF EACH FITTINGS FROM BOTTOM OF CASE

|                  |             |
|------------------|-------------|
| HOT WATER OUTLET | 1.8" (45mm) |
| COLD WATER INLET | 2.2" (55mm) |
| GAS INLET        | 2.2" (56mm) |





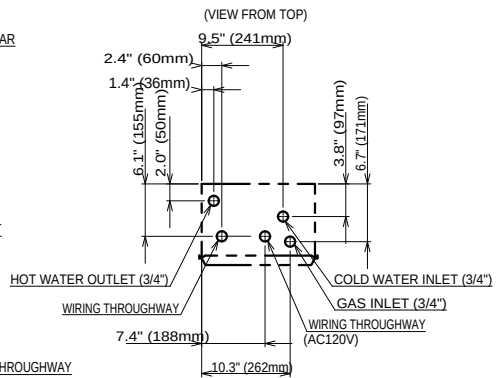
## GQ-2857WX-F US (NR98SV)



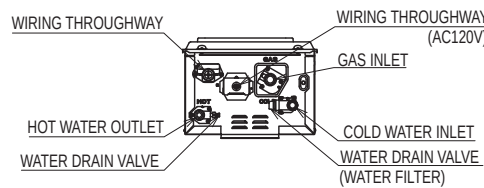
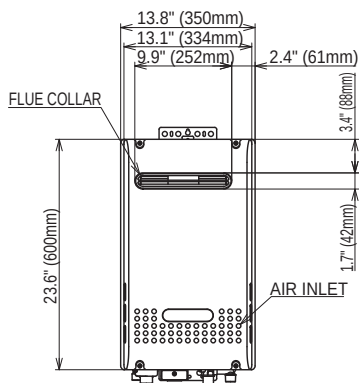
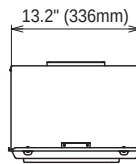
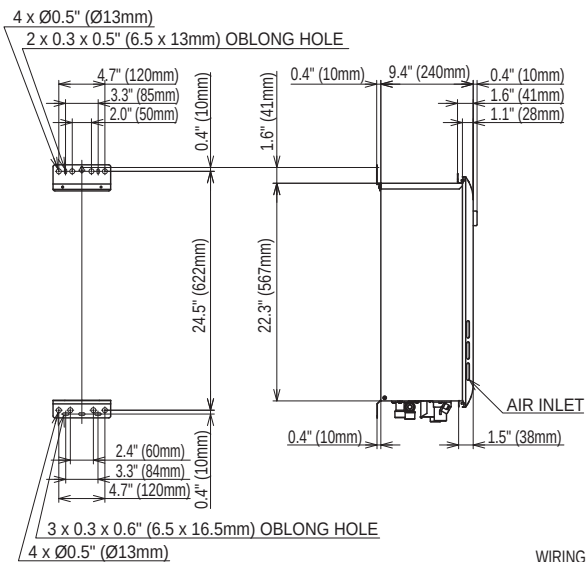
(AC120V)

HEIGHT OF EACH FITTINGS  
FROM BOTTOM OF CASE

|                  |             |
|------------------|-------------|
| HOT WATER OUTLET | 1.8" [45mm] |
| COLD WATER INLET | 2.2" [55mm] |
| GAS INLET        | 2.2" [56mm] |



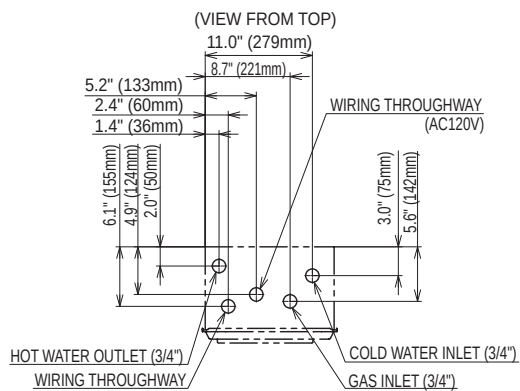
## GQ-2457WS US (NR83OD)



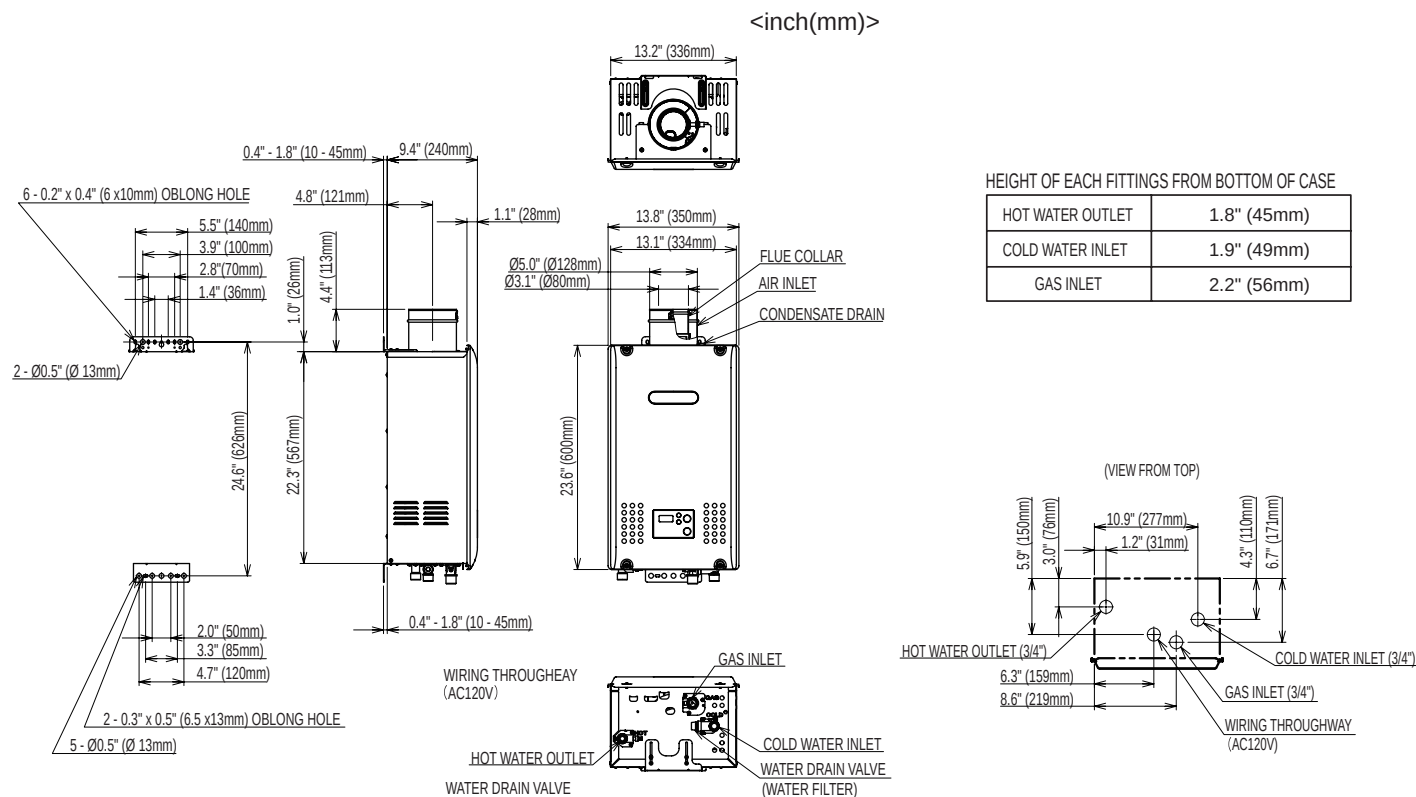
< inch (mm) >

HEIGHT OF EACH FITTINGS  
FROM BOTTOM OF CASE

|                  |             |
|------------------|-------------|
| HOT WATER OUTLET | 1.8" (45mm) |
| COLD WATER INLET | 1.9" (49mm) |
| GAS INLET        | 2.2" (56mm) |

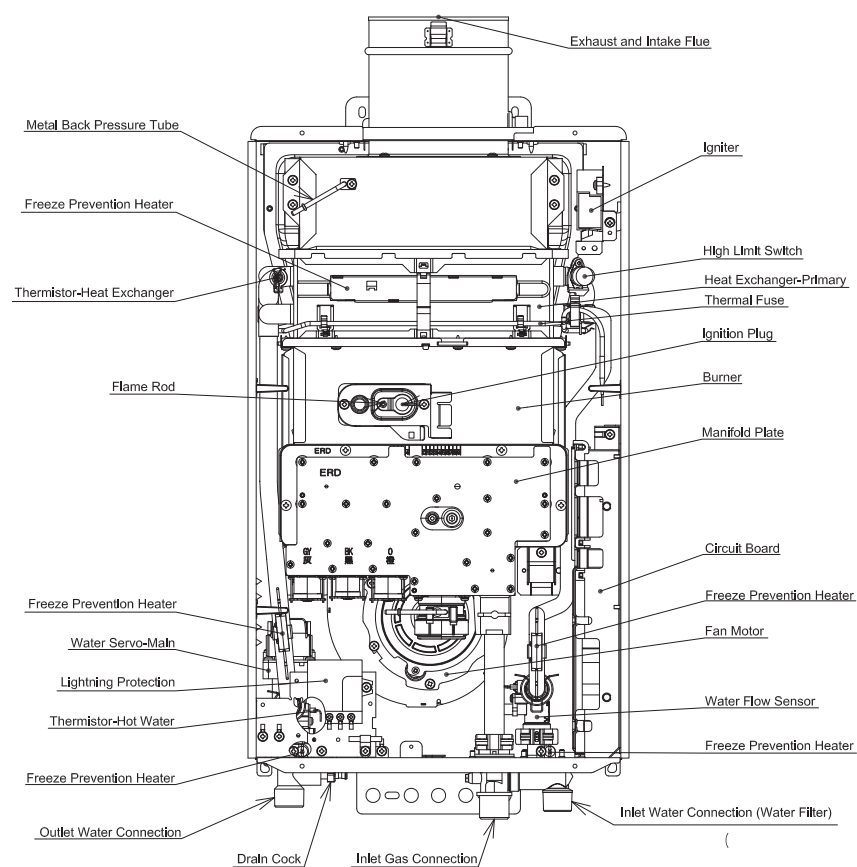


GQ-2457WS-FFA US (NR83DVC)

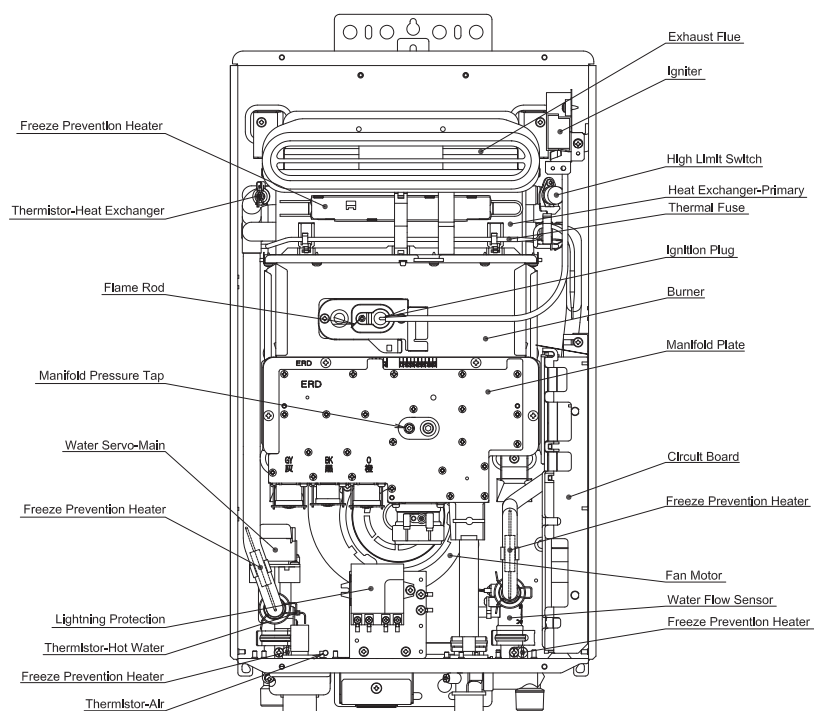


4. Components

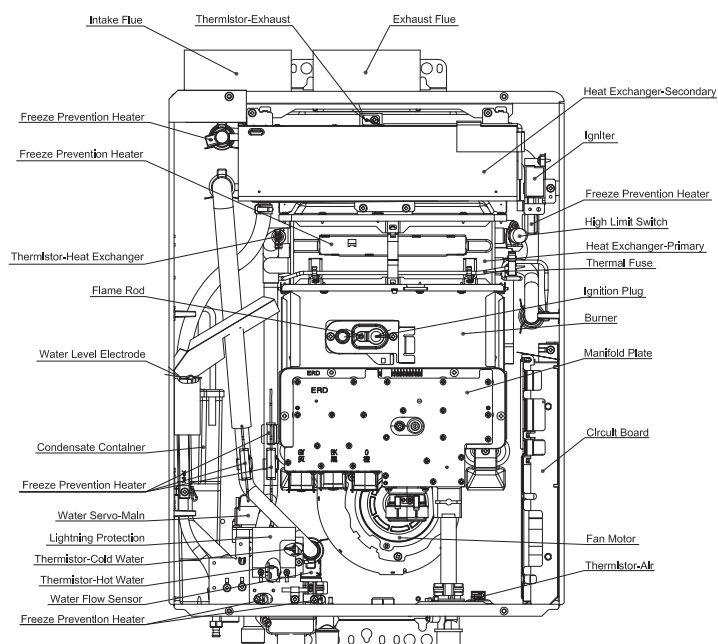
GQ-2457WS-FFA US (NR83DVC)



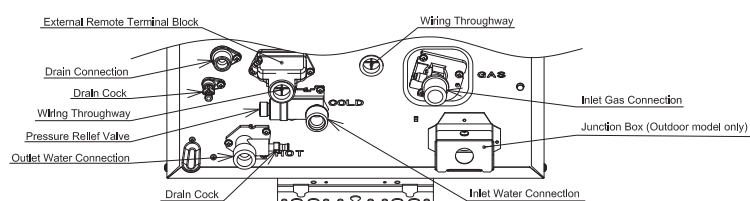
## GQ-2457WS US (NR830D)



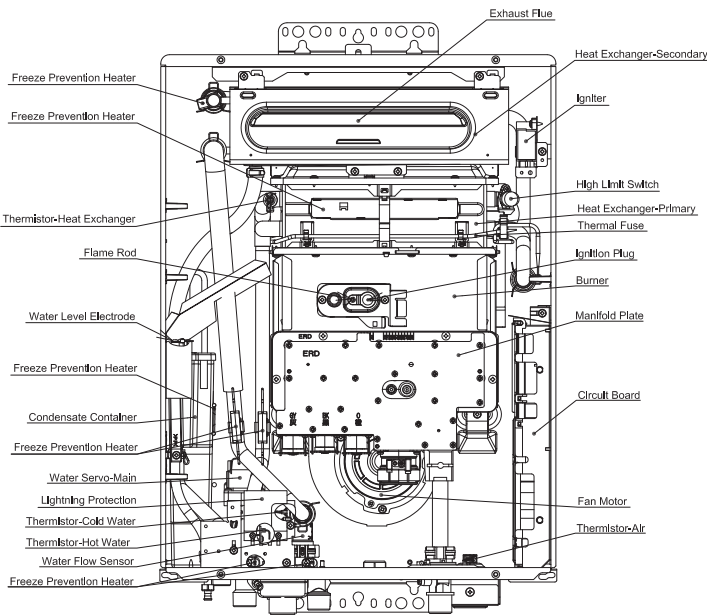
## GQ-C2857WS-FF US (NRC98DV)



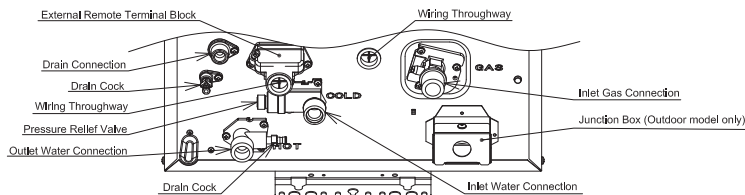
### ◆ Bottom View



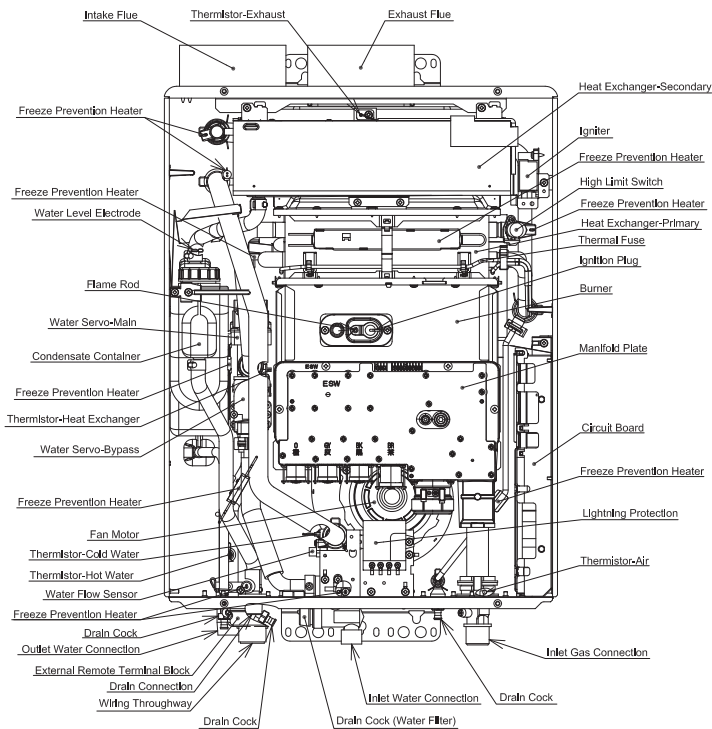
GQ-C2857WS US (NRC980D)



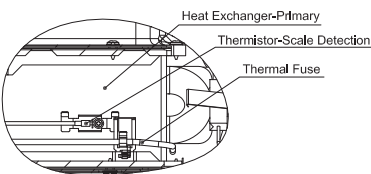
◆ Bottom View



GQ-C3257WX-FF US (NRC111DV)  
GQ-C3257WZ-FF US (NCC199DV)

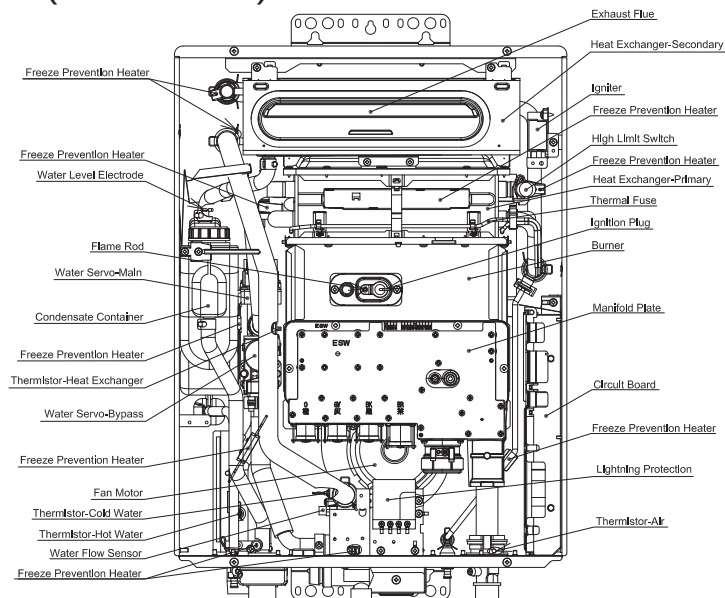


◆ Sectional View of Back Side (Heat Exchanger - Primary)

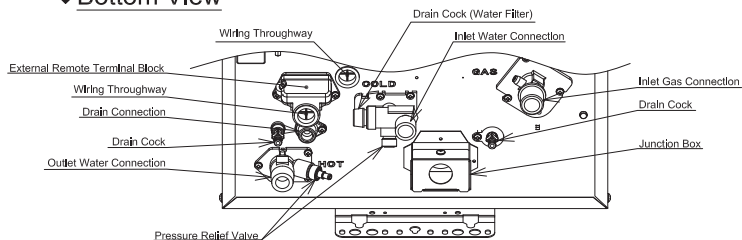


GQ-C3257WX US (NRC1110D)

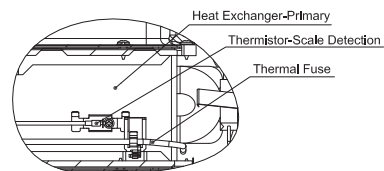
GQ-C3257WZ US (NCC1990D)



◆ Bottom View

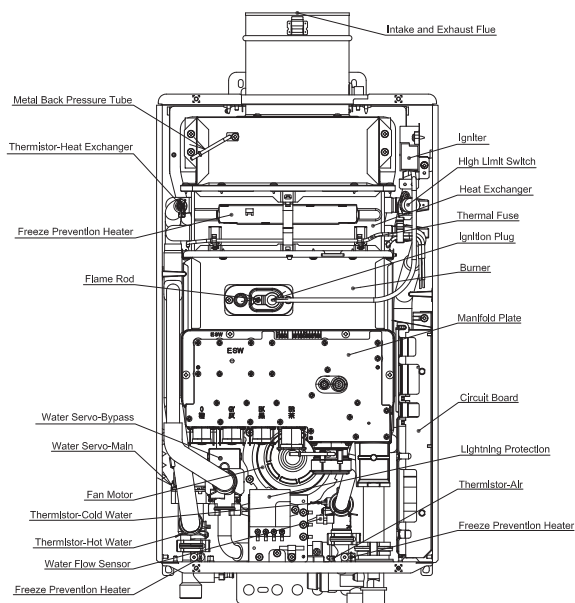


◆ Sectional View of Back Side (Heat Exchanger - Primary)

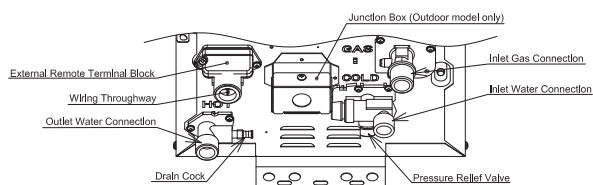


GQ-2857WX-FFA US (NR98DVC)

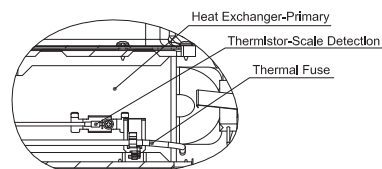
GQ-2857WZ-FFA US (NC199DVC)



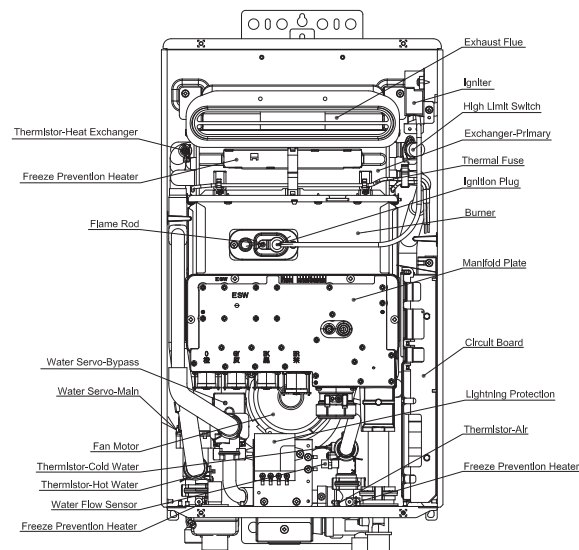
◆ Bottom View



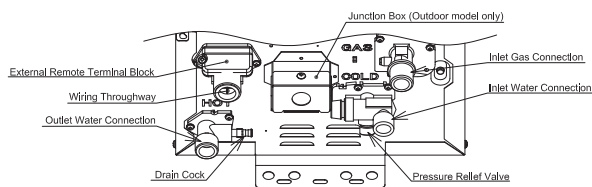
◆ Sectional View of Back Side (Heat Exchanger - Primary)



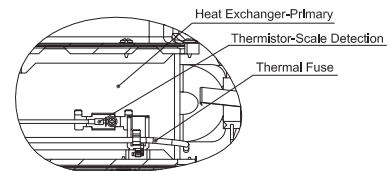
GQ-2857WX US (NR98OD)  
GQ-2857WZ US (NC199OD)



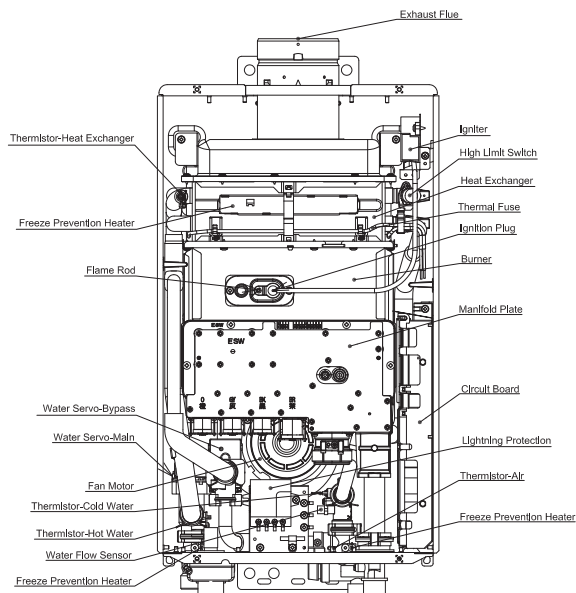
◆ Bottom View



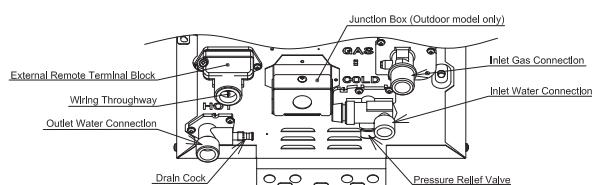
◆ Sectional View of Back Side (Heat Exchanger - Primary)



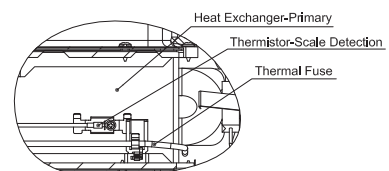
GQ-2857WX-F US (NR98SV)



◆ Bottom View



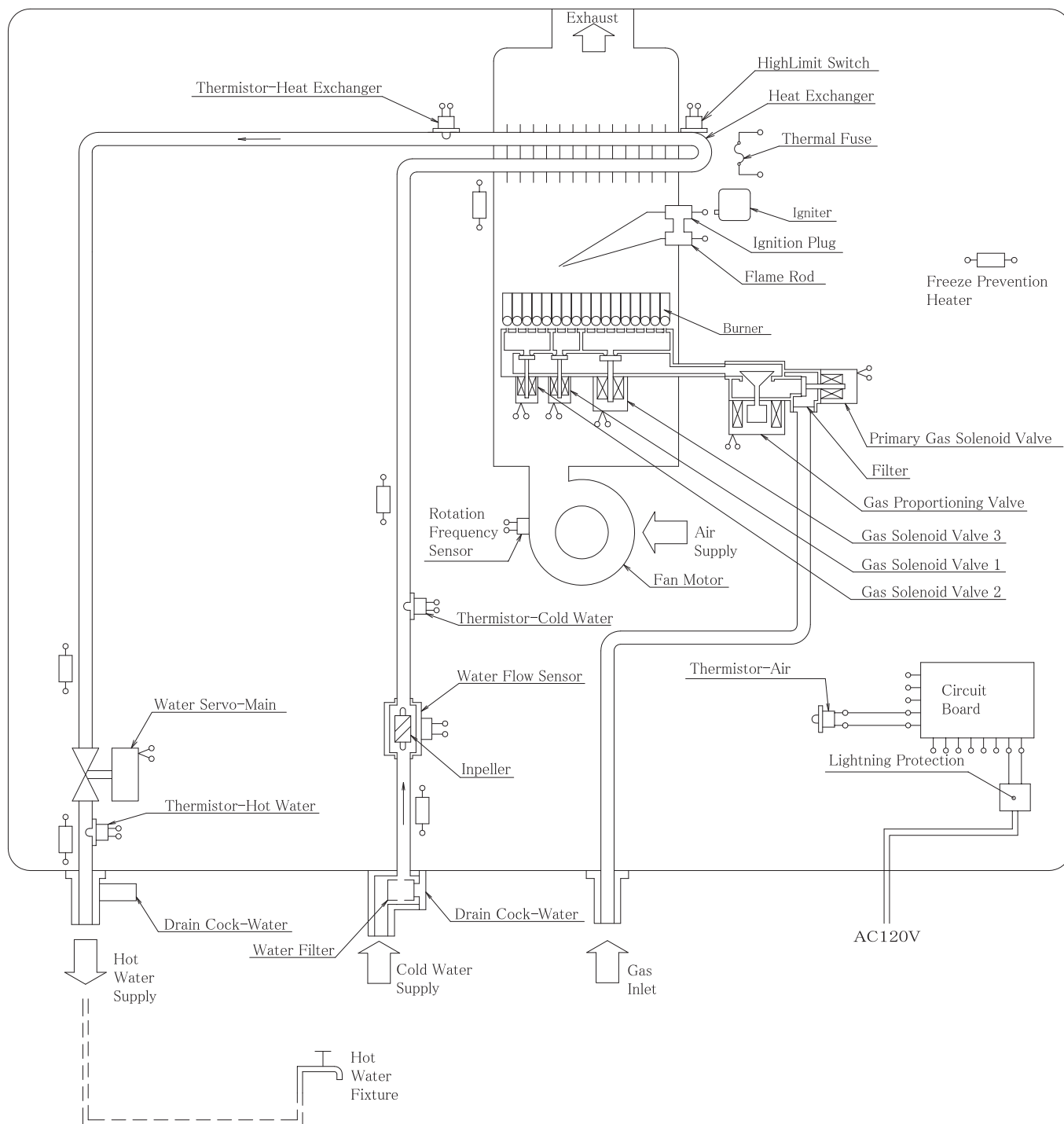
◆ Sectional View of Back Side (Heat Exchanger - Primary)



## 5. Operating Principle

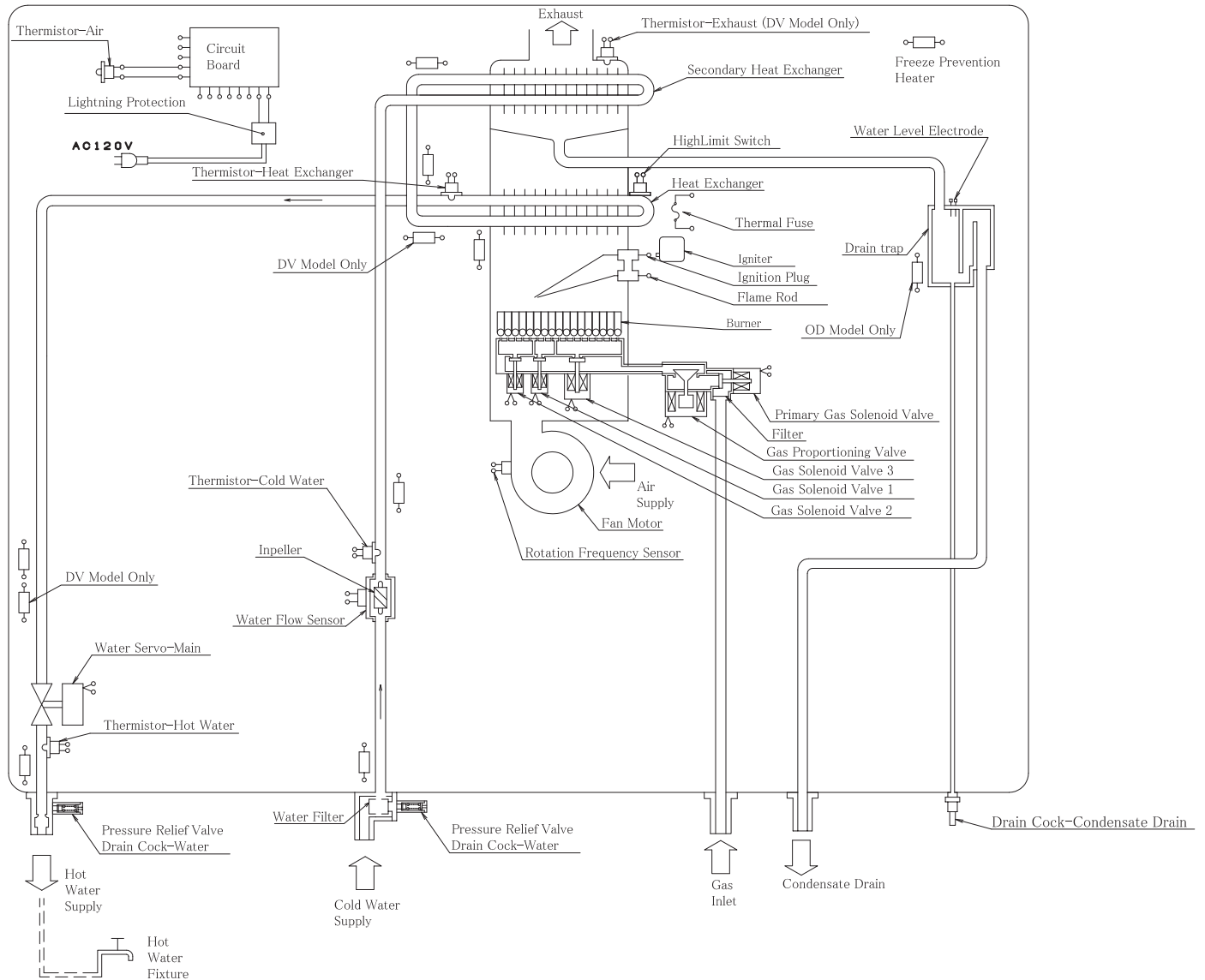
### ■ Operating Principle

GQ-2457WS (-FFA) US [NR83 (DVC/OD)]



## ■ Operating Principle

GQ-C2857WS (-FF) US [NRC98 (DV/OD)]

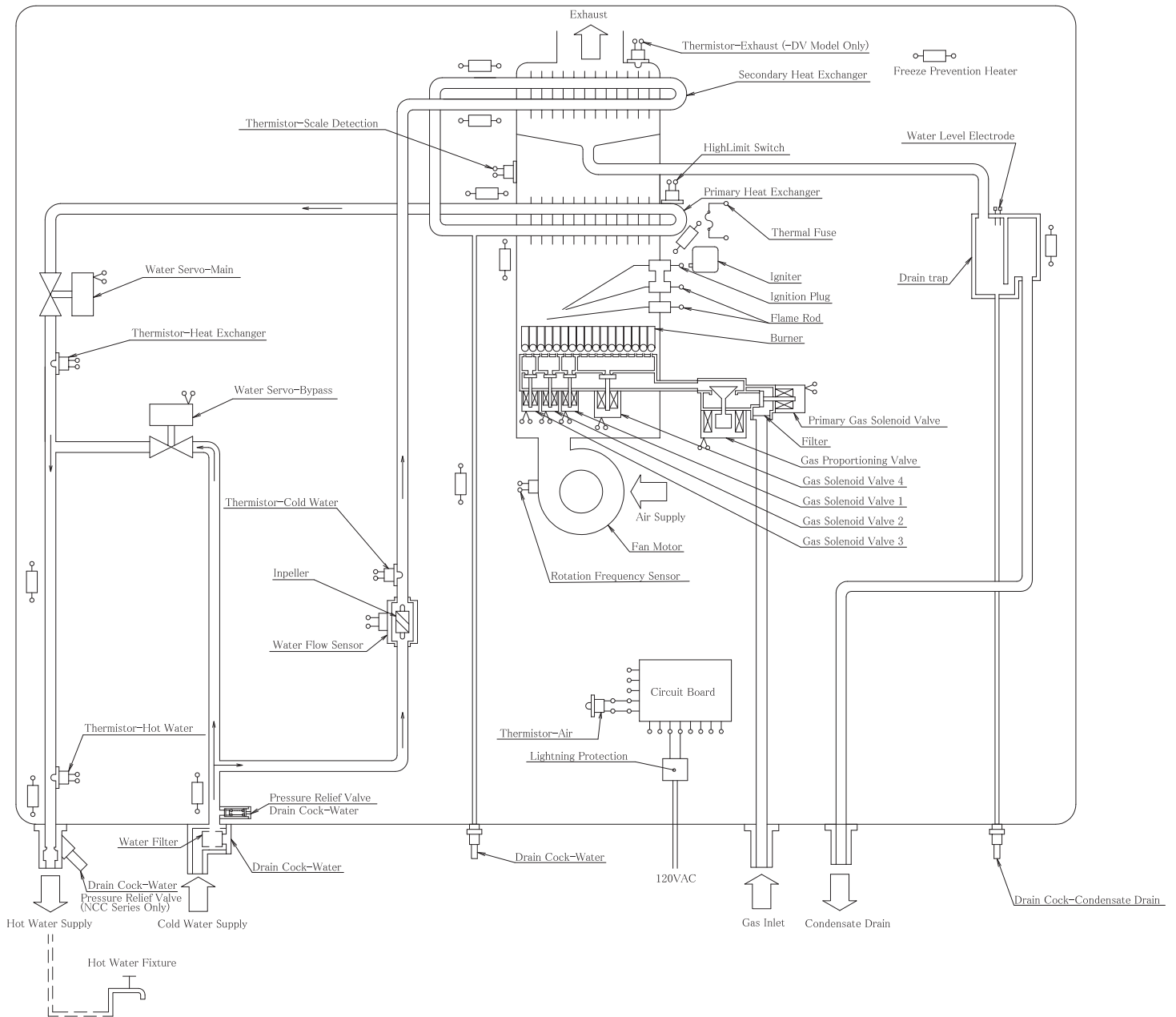




## ■ Operating Principle

GQ-C3257WX (-FF) [NRC111 (DV/OD)]

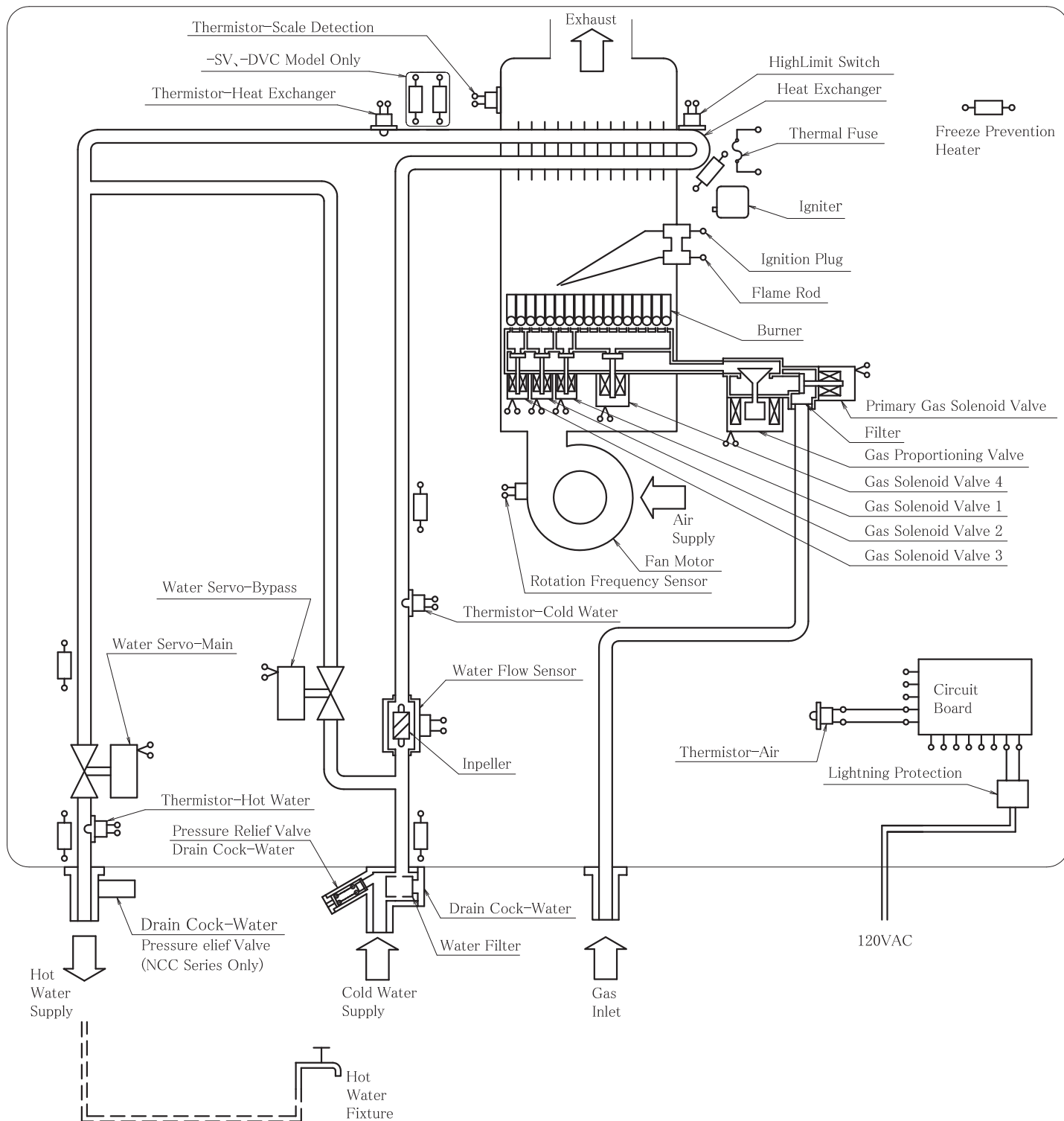
GQ-3257WX (-FF) US [NCC199 (DV/OD)]



## ■ Operating Principle

GQ-2857WX (-FFA,-F) US [NR98 (DVC/OD/SV)]

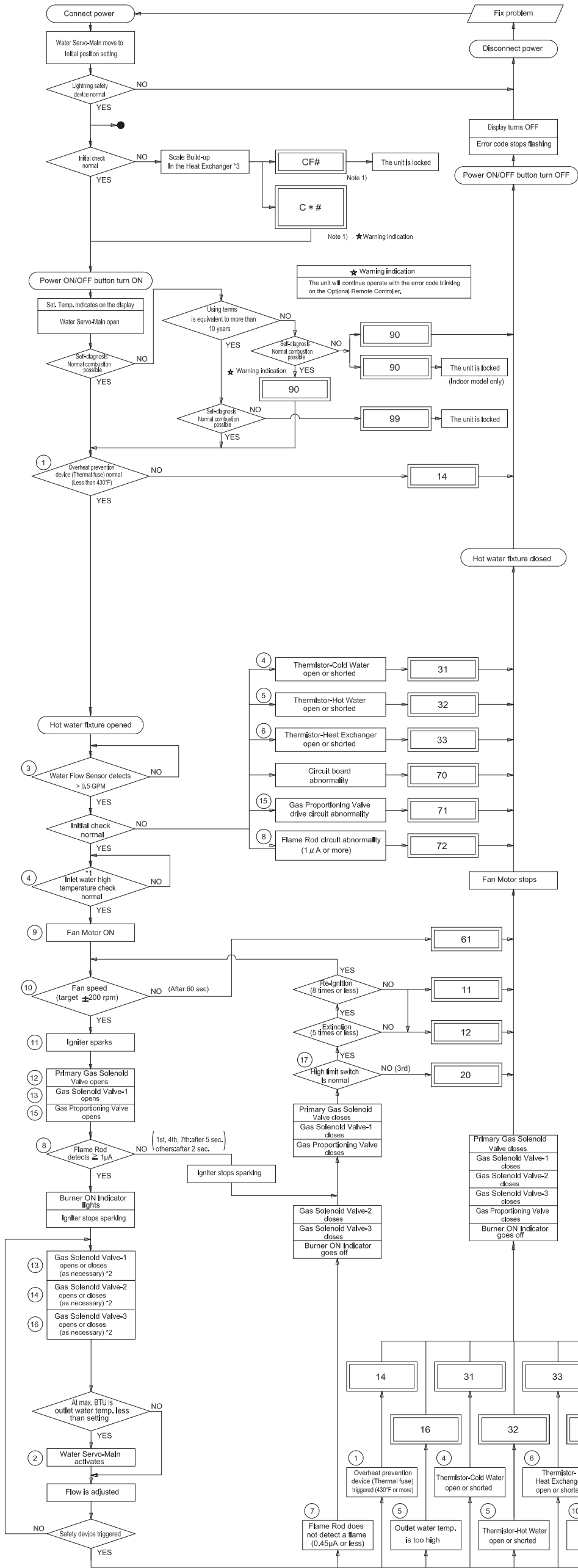
GQ-2857WZ (-FFA) US [NC199 (DVC/OD)]



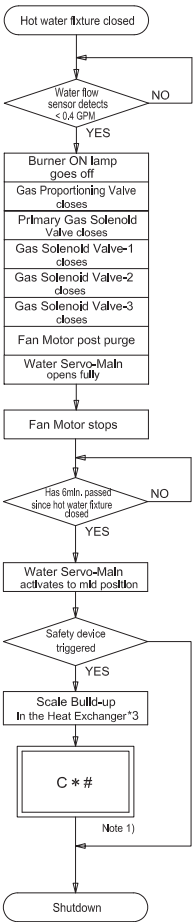
# 6. Operation Flow Chart

GQ-2457WS (-FFA) US [NR83(DVC/OD)]

## Water heating



## Shutdown procedure



\*1 If the inlet temp is less than 122°F or if the following statements about K are true, the inlet temperature will be normal (YES).

$$K > \frac{\text{Approx. } 29.7}{\text{Total water flow (GPM)}} + \text{water inlet temperature (°F)}$$

| Set temperature | Less than 125°F | 125°F or more |
|-----------------|-----------------|---------------|
| K               | 136°F           | Set temp +9°F |

\*2

|                      | Over 120,500 BTU | Over 81,000 BTU | Over 47,000 BTU | Over 28,000 BTU | Over 18,000 BTU |
|----------------------|------------------|-----------------|-----------------|-----------------|-----------------|
| Gas Solenoid Valve-1 | ON               | ON              | ON              |                 | ON              |
| Gas Solenoid Valve-2 | ON               |                 | ON              | ON              |                 |
| Gas Solenoid Valve-3 | ON               | ON              |                 |                 |                 |

\*3

| Optional Remote Controller | Description                                                                                                       |
|----------------------------|-------------------------------------------------------------------------------------------------------------------|
| C1# ~ C4#<br>Note 1)       | The unit detects the Scale Build-up In the Heat Exchanger. (Warning Indication, and then the unit will shut off.) |
| CF#<br>Note 1)             | The unit detects the Scale Build-up In the Heat Exchanger. (The unit is locked.)                                  |

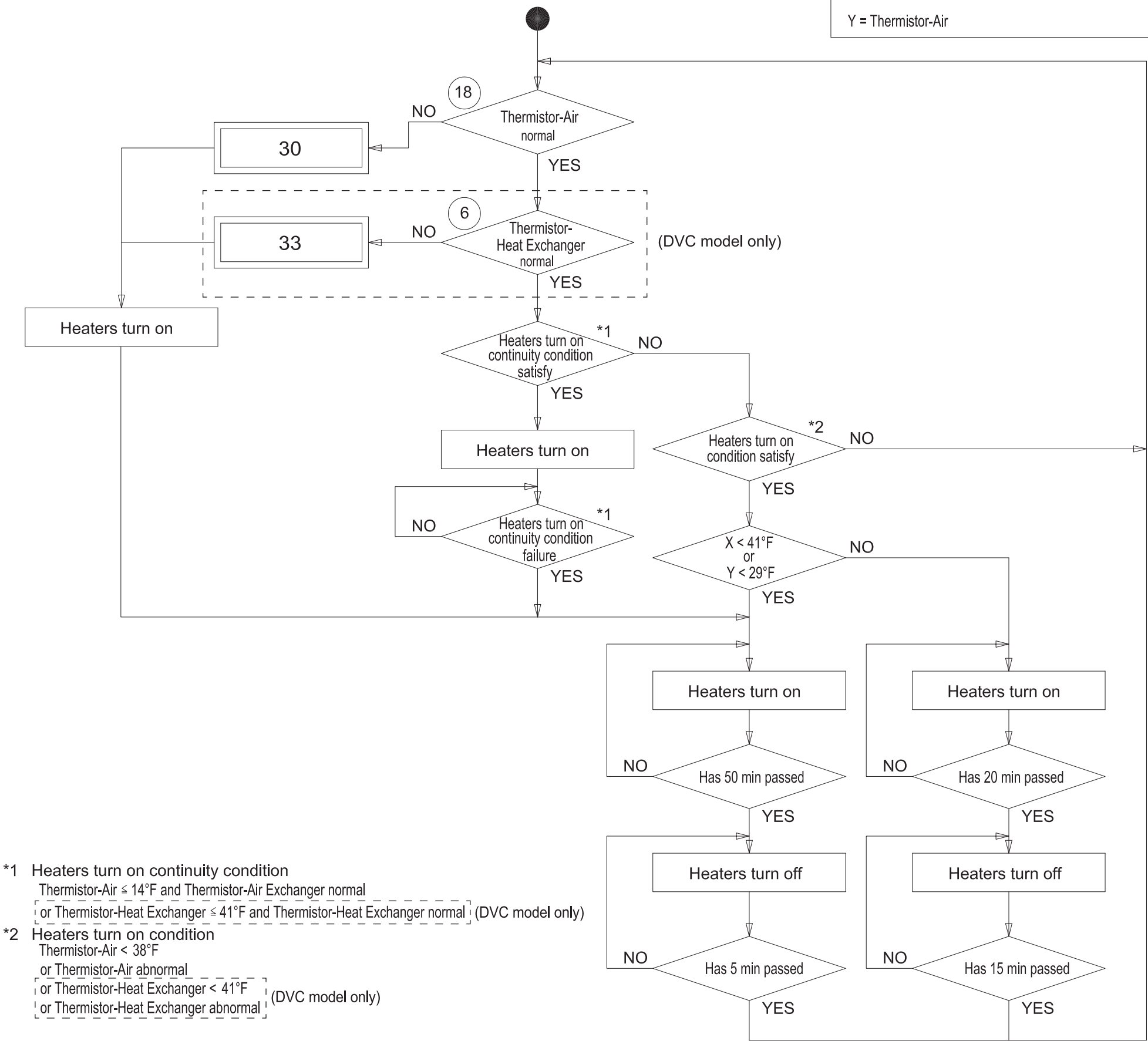
\*4 When the present fan speed is 500rpm more or less than target speed.

Note 1) # = 1, 2, 3, 4, F  
# = 1, 2, 3, 4, 5, 6, 7, 8, 9

# Freeze prevention control

Freeze prevention heater operation flow

X = Thermistor-Heat Exchanger (DVC model only)  
Y = Thermistor-Air

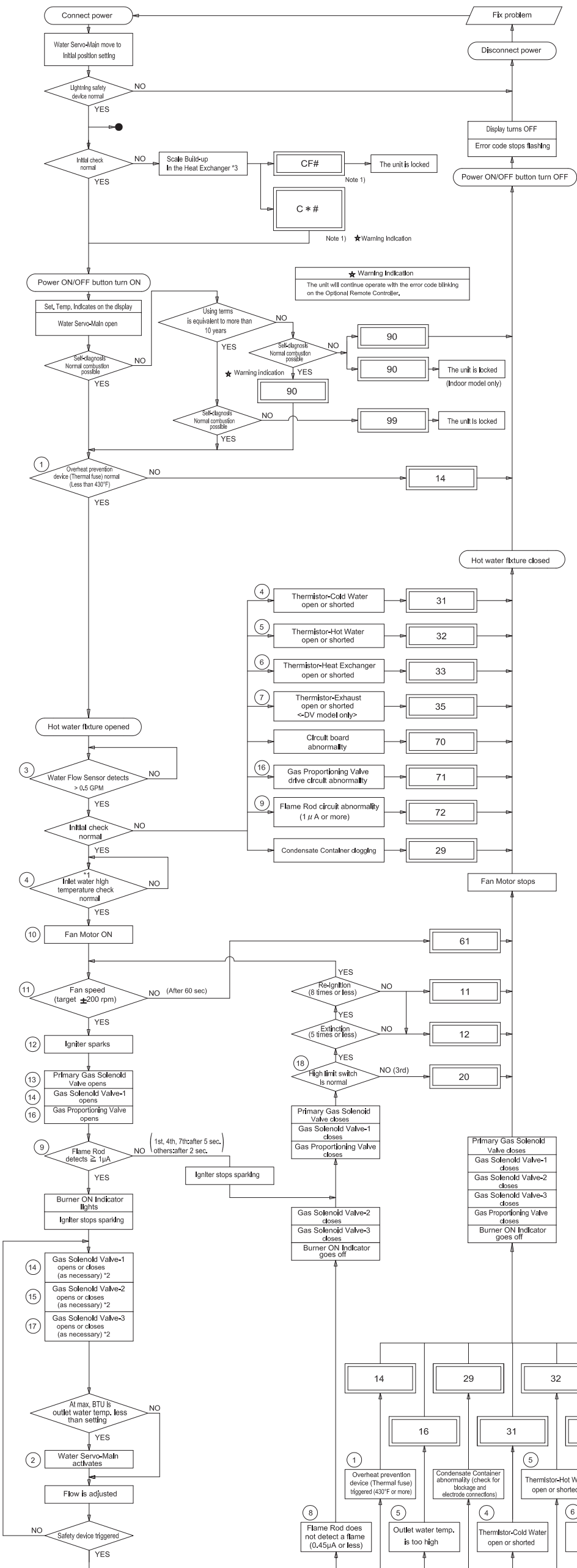


\*1 Heaters turn on continuity condition  
Thermistor-Air ≤ 14°F and Thermistor-Air Exchanger normal  
or Thermistor-Heat Exchanger ≤ 41°F and Thermistor-Heat Exchanger normal (DVC model only)

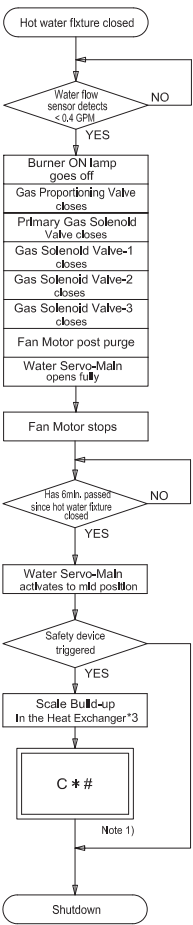
\*2 Heaters turn on condition  
Thermistor-Air < 38°F  
or Thermistor-Air abnormal  
or Thermistor-Heat Exchanger < 41°F  
or Thermistor-Heat Exchanger abnormal (DVC model only)

■Operation Flow Chart

Water heating



Shutdown procedure



\*1 If the inlet temp is less than 122°F or if the following statements about K are true, the inlet temperature will be normal (YES).

Approx. 29.7  
 $K > \frac{\text{Total water flow (GPM)}}{\text{Set temperature} - \text{water Inlet temperature (°F)}}$

| Set temperature | Less than 125°F | 125°F or more |
|-----------------|-----------------|---------------|
| K               | 136°F           | Set temp +9°F |

\*2

|                      | Over 124,000 BTU | Over 81,000 BTU | Over 46,000 BTU | Over 30,000 BTU | Over 16,000 BTU |
|----------------------|------------------|-----------------|-----------------|-----------------|-----------------|
| Gas Solenoid Valve-1 | ON               | ON              | ON              | /               | ON              |
| Gas Solenoid Valve-2 | ON               | /               | ON              | ON              | /               |
| Gas Solenoid Valve-3 | ON               | ON              | /               | /               | /               |

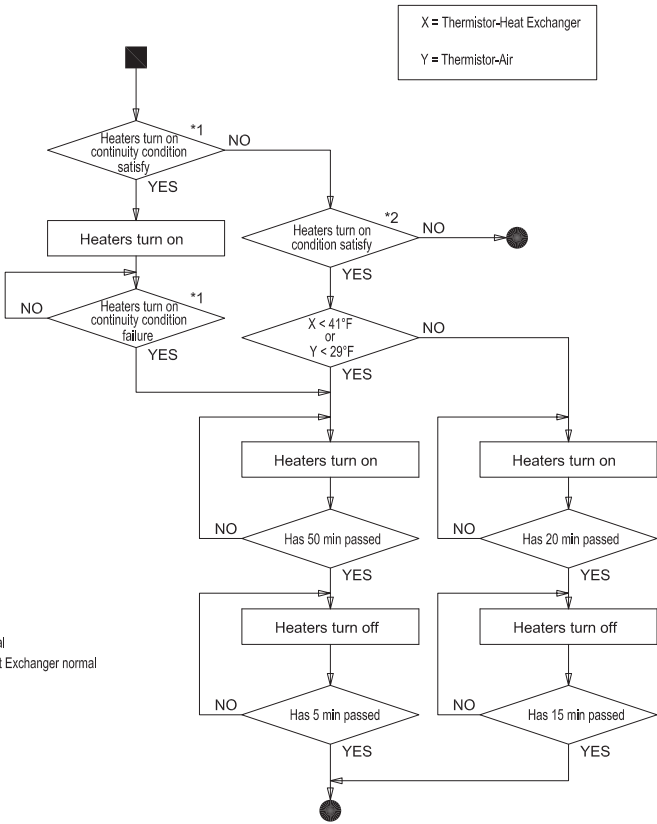
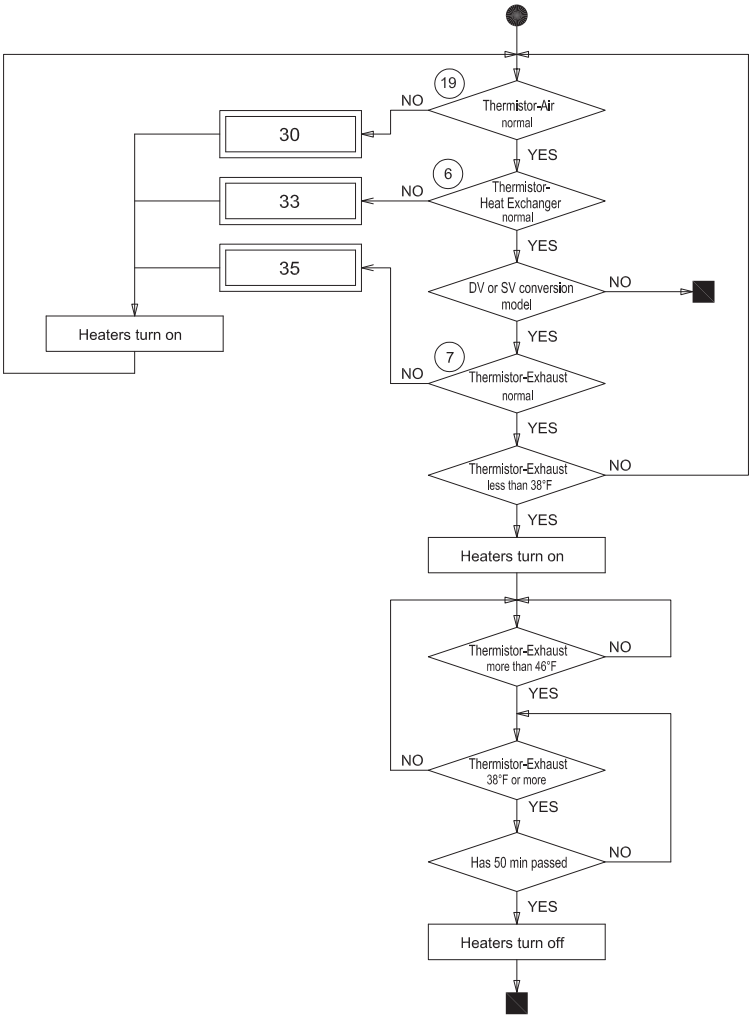
\*3

| Optional Remote Controller | Description                                                                                                       |
|----------------------------|-------------------------------------------------------------------------------------------------------------------|
| C1# ~ C4#<br>Note 1)       | The unit detects the Scale Build-up In the Heat Exchanger. (Warning Indication, and then the unit will shut off.) |
| CF#<br>Note 1)             | The unit detects the Scale Build-up in the Heat Exchanger. (The unit is locked.)                                  |

Note 1) \* = 1, 2, 3, 4, F  
# = 1, 2, 3, 4, 5, 6, 7, 8, 9

Freeze prevention control

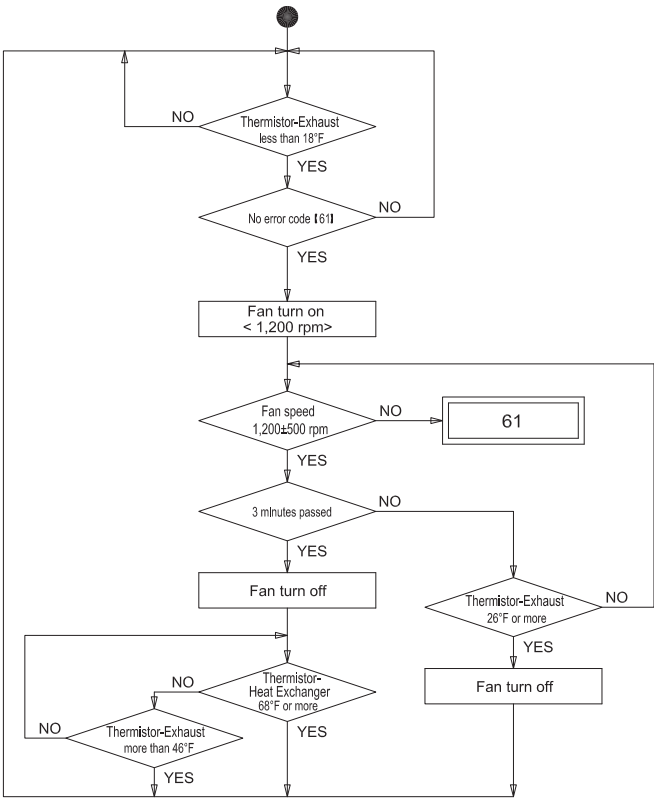
Freeze prevention heater operation flow



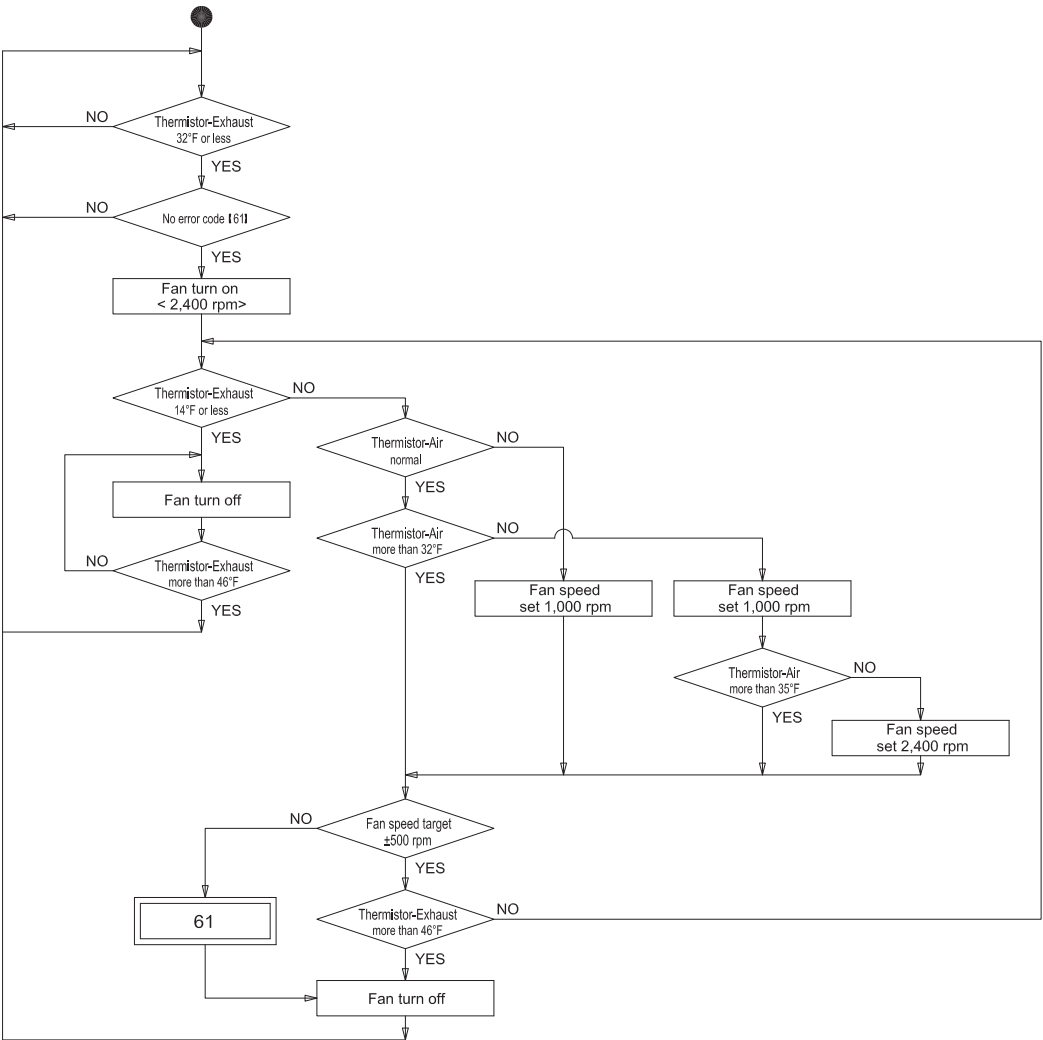
\*1 Heaters turn on continuity condition  
Thermistor-Air ≤ 14°F and Thermistor-Air Exchanger normal  
or Thermistor-Heat Exchanger ≤ 41°F and Thermistor-Heat Exchanger normal

\*2 Heaters turn on condition  
Thermistor-Air < 38°F  
or Thermistor-Heat Exchanger < 41°F  
or Thermistor-Air abnormal  
or Thermistor-Heat Exchanger abnormal

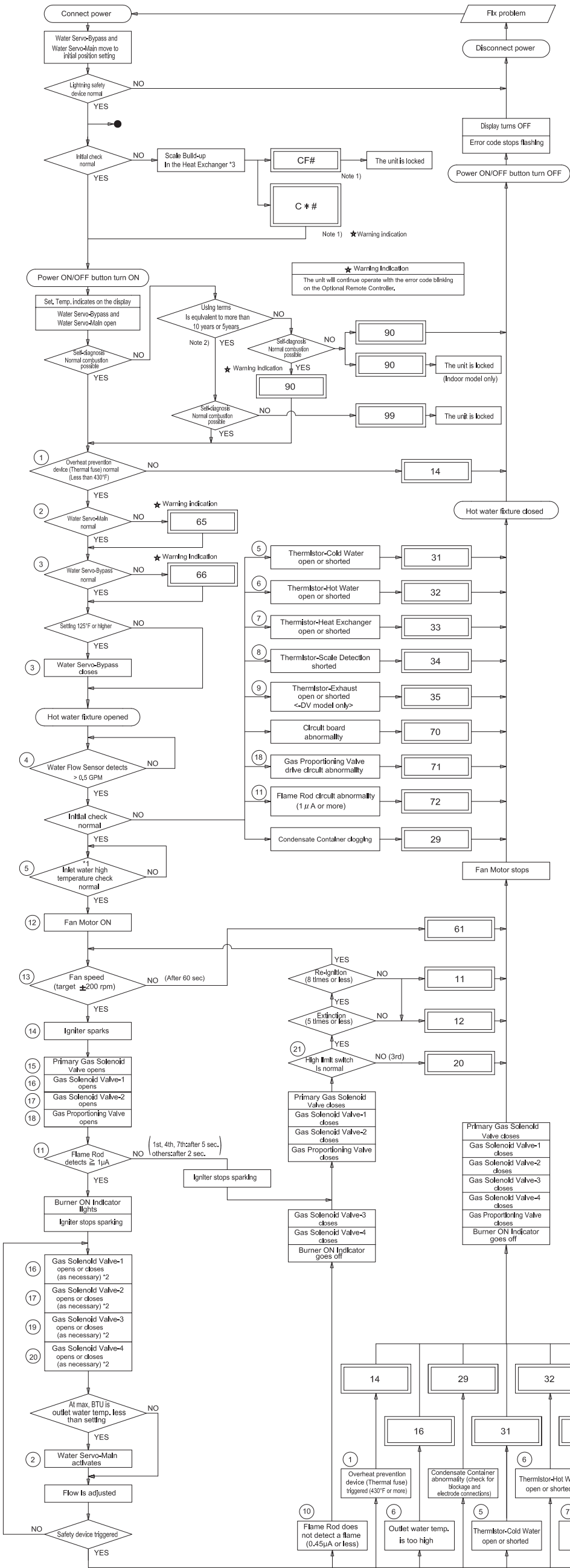
Fan motor operation flow ( DV model )



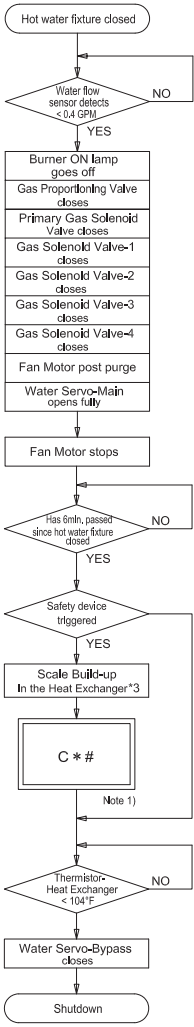
Fan motor operation flow ( SV conversion )



Water heating



Shutdown procedure



\*1 If the inlet temp is less than 122°F or If the following statements about K are true, the Inlet temperature will be normal (YES).

|                 |                        |               |  |
|-----------------|------------------------|---------------|--|
| K >             | Approx. 29,7           |               |  |
|                 | Total water flow (GPM) |               |  |
| Set temperature | Less than 125°F        | 125°F or more |  |
| K               | 136°F                  | Set temp +9°F |  |

\*2

|                      |                  |                 |                 |                 |                 |                 |
|----------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                      | Over 137,000 BTU | Over 85,500 BTU | Over 48,500 BTU | Over 34,500 BTU | Over 21,500 BTU | Over 16,000 BTU |
| Gas Solenoid Valve-1 | ON               | ON              | ON              | ON              | ON              | ON              |
| Gas Solenoid Valve-2 | ON               | ON              | ON              | ON              | ON              | ON              |
| Gas Solenoid Valve-3 | ON               | ON              | ON              | ON              | ON              | ON              |
| Gas Solenoid Valve-4 | ON               | ON              | ON              | ON              | ON              | ON              |

\*3

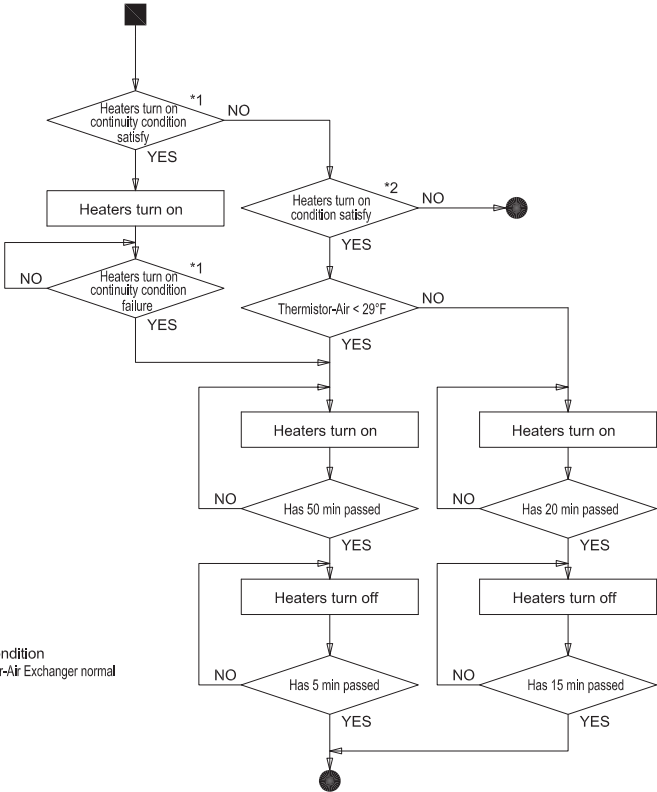
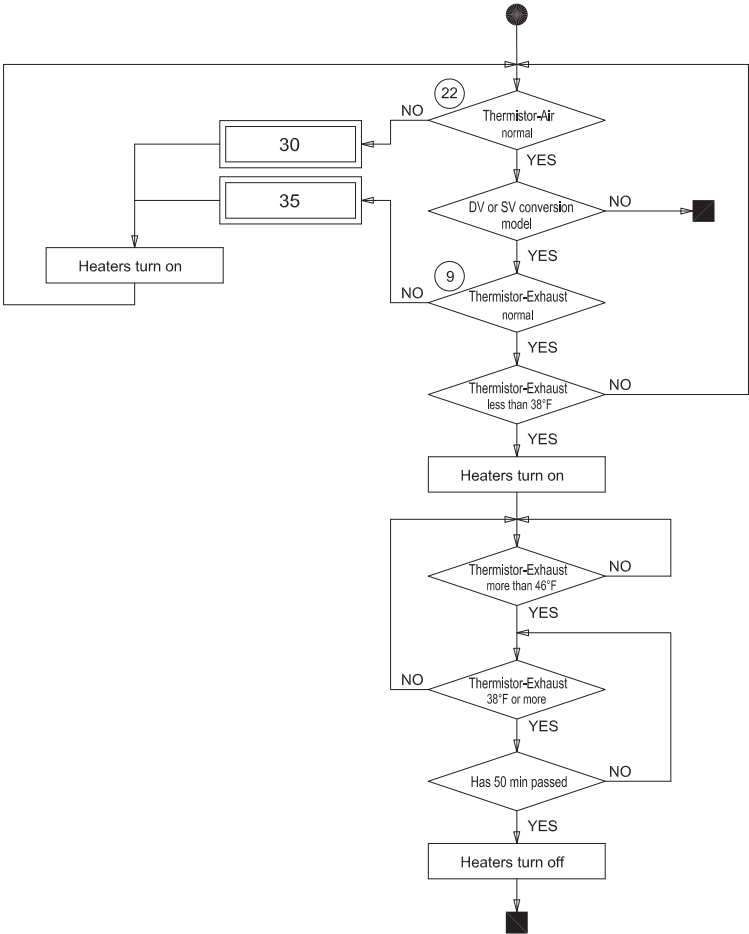
|                            |                                                                                                                   |
|----------------------------|-------------------------------------------------------------------------------------------------------------------|
| Optional Remote Controller | Description                                                                                                       |
| C1# ~ C4#<br>Note 1)       | The unit detects the Scale Build-up In the Heat Exchanger. (Warning Indication, and then the unit will shut off.) |
| CF#<br>Note 1)             | The unit detects the Scale Build-up In the Heat Exchanger. (The unit is locked.)                                  |

\*4 When the present fan speed is 500rpm more or less than target speed.  
Note 1) \* = 1, 2, 3, 4, F  
# = 1, 2, 3, 4, 5, 6, 7, 8, 9  
Note 2) 5 years : Commercial model  
10 years : Residential model



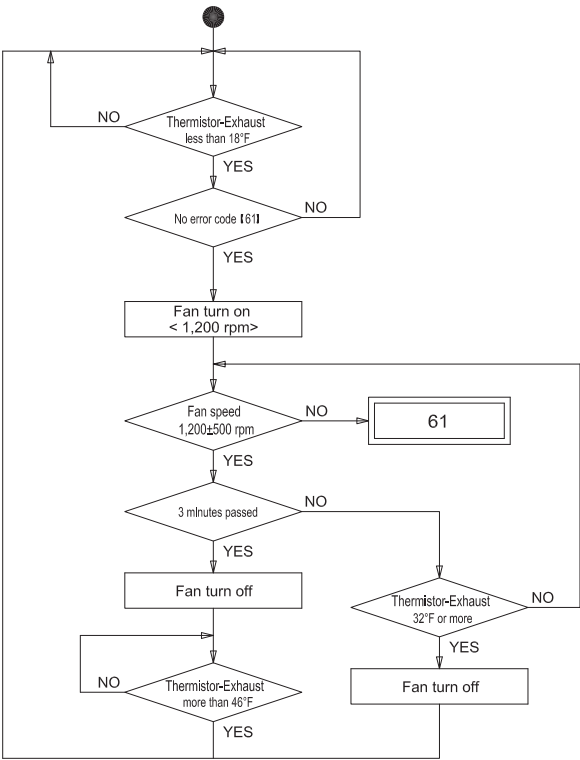
Freeze prevention control

Freeze prevention heater operation flow

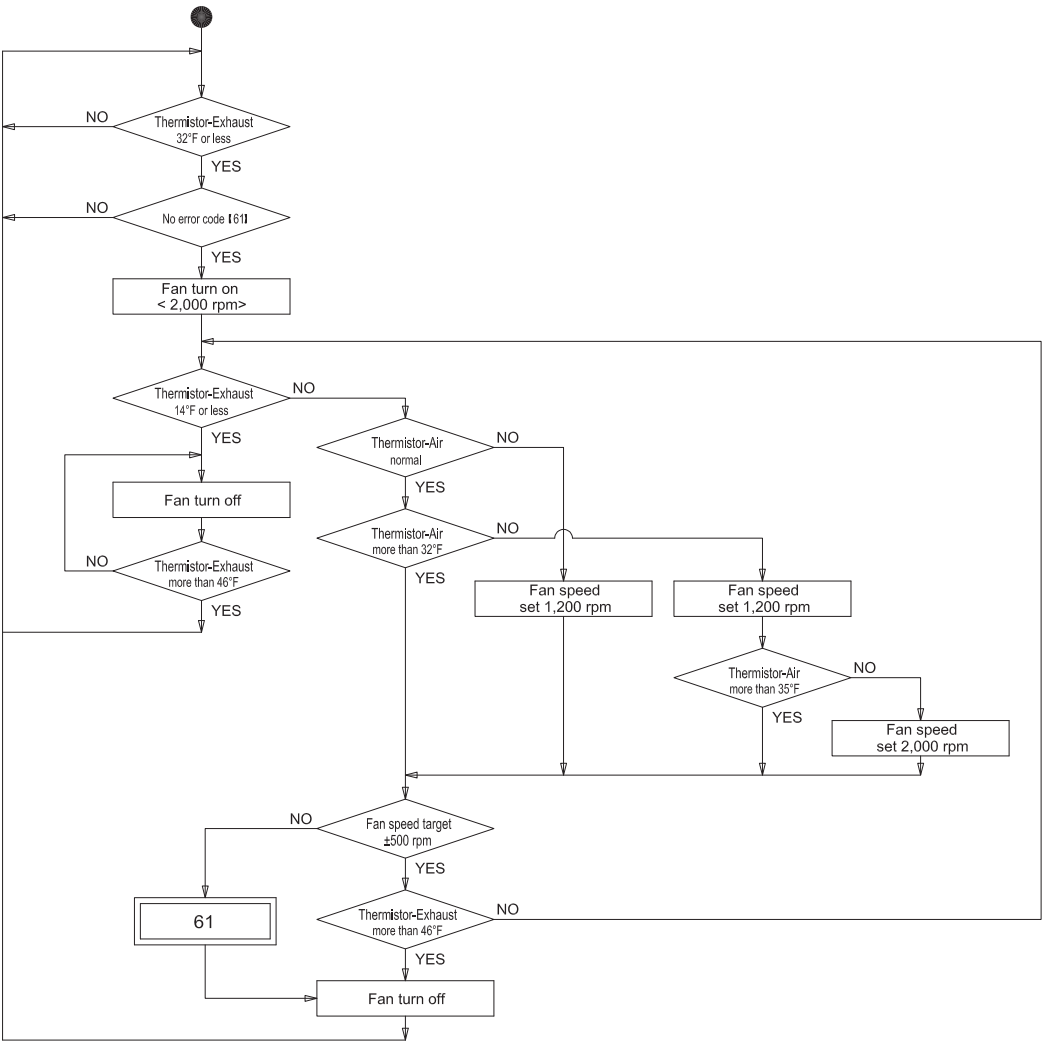


\*1 Heaters turn on continuity condition  
Thermistor-Air ≤ 14°F and Thermistor-Air Exchanger normal  
\*2 Heaters turn on condition  
Thermistor-Air < 38°F  
or Thermistor-Air abnormal

Fan motor operation flow ( DV model )

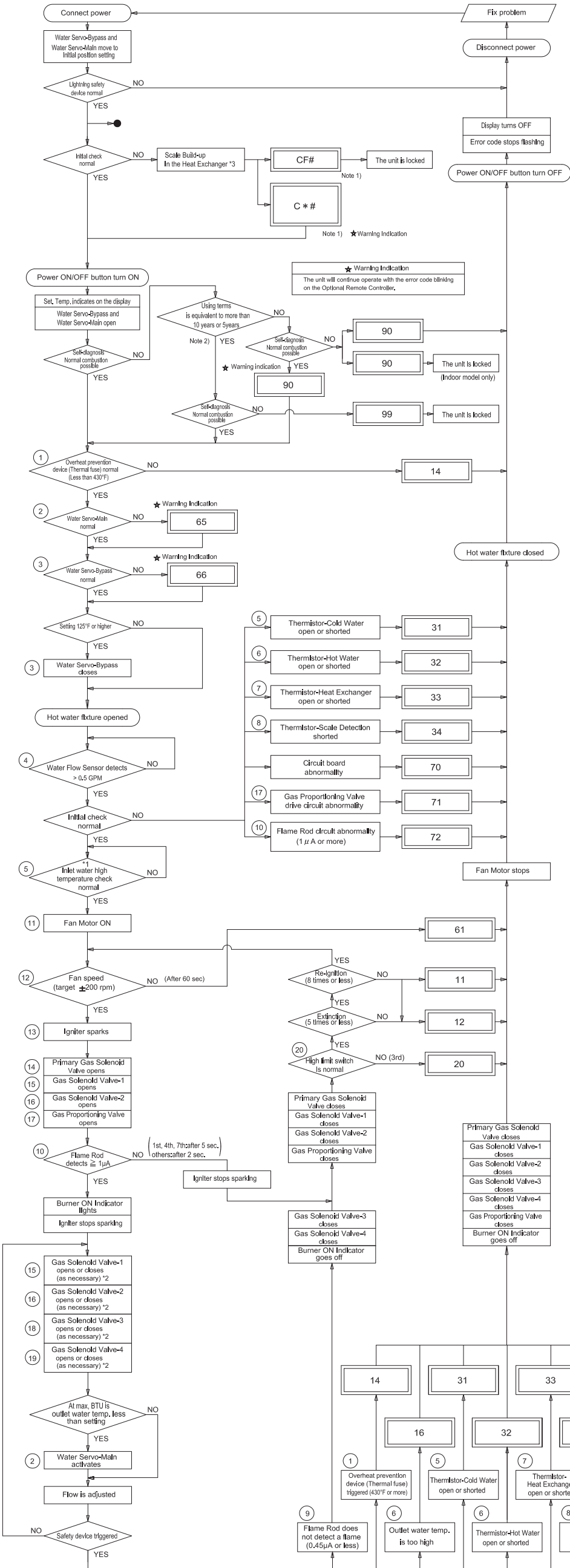


Fan motor operation flow ( SV conversion )

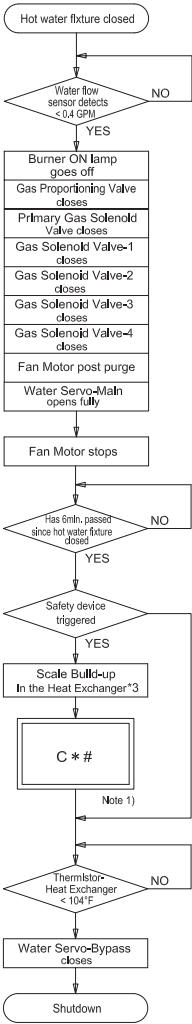




Water heating



Shutdown procedure



\*1 If the inlet temp is less than 122°F or if the following statements about K are true, the inlet temperature will be normal (YES).

|                                                                                                        |                 |               |
|--------------------------------------------------------------------------------------------------------|-----------------|---------------|
| $K > \frac{\text{Approx. } 29.7}{\text{Total water flow (GPM)}} + \text{water Inlet temperature (°F)}$ |                 |               |
| Set temperature                                                                                        | Less than 125°F | 125°F or more |
| K                                                                                                      | 136°F           | Set temp +9°F |

\*2

|                      | Over 137,000 BTU | Over 80,000 BTU | Over 49,000 BTU | Over 35,000 BTU | Over 21,000 BTU | Over 16,000 BTU |
|----------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Gas Solenoid Valve-1 | ON               | ON              | ON              | ON              |                 | ON              |
| Gas Solenoid Valve-2 | ON               |                 | ON              | ON              | ON              |                 |
| Gas Solenoid Valve-3 | ON               |                 | ON              |                 |                 |                 |
| Gas Solenoid Valve-4 | ON               | ON              |                 |                 |                 |                 |

\*3

| Optional Remote Controller | Description                                                                                                       |
|----------------------------|-------------------------------------------------------------------------------------------------------------------|
| C1# ~ C4#<br>Note 1)       | The unit detects the Scale Build-up In the Heat Exchanger. (Warning indication, and then the unit will shut off.) |
| CF#<br>Note 1)             | The unit detects the Scale Build-up In the Heat Exchanger. (The unit is locked.)                                  |

\*4 When the present fan speed is 500rpm more or less than target speed.

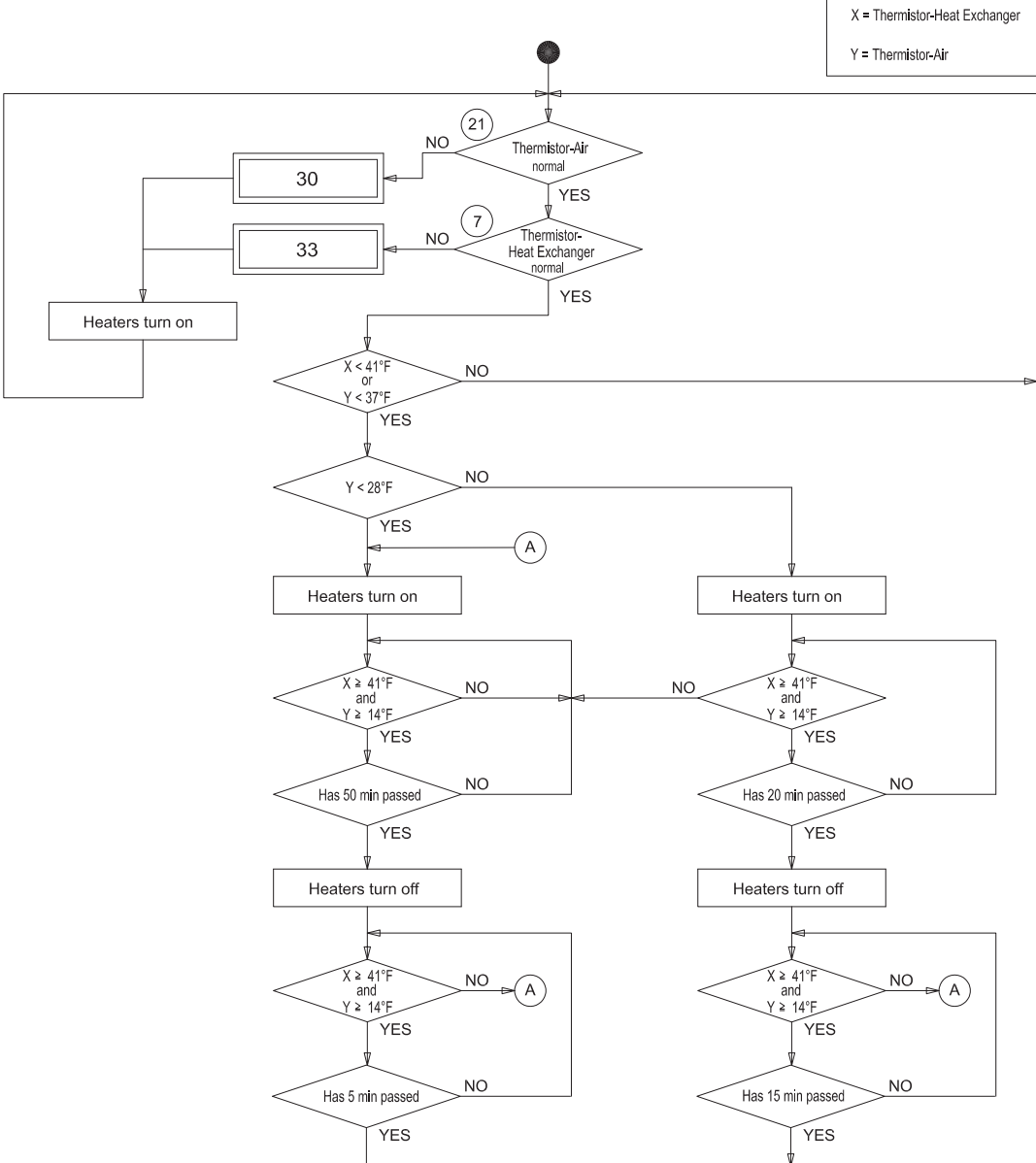
Note 1) \* = 1, 2, 3, 4, F  
# = 1, 2, 3, 4, 5, 6, 7, 8, 9

Note 2) 5 years: Commercial model  
10 years: Residential model

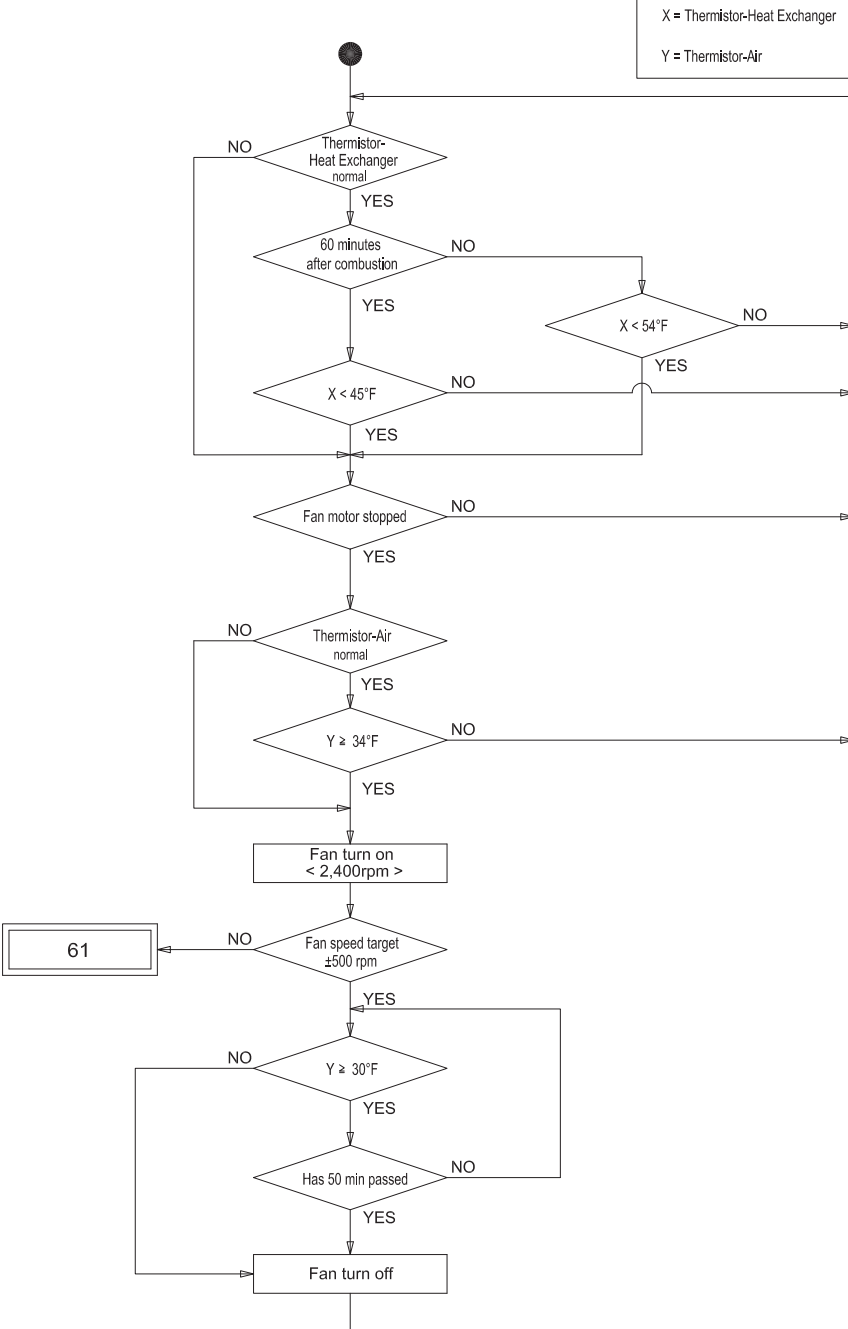
GO-2857WX (-FFA,-F) US [NR98 (DVC/OD/SV) 1

GO-2857WZ (-FFA) US [NC199 (DVC/OD) T

## Freeze prevention contro

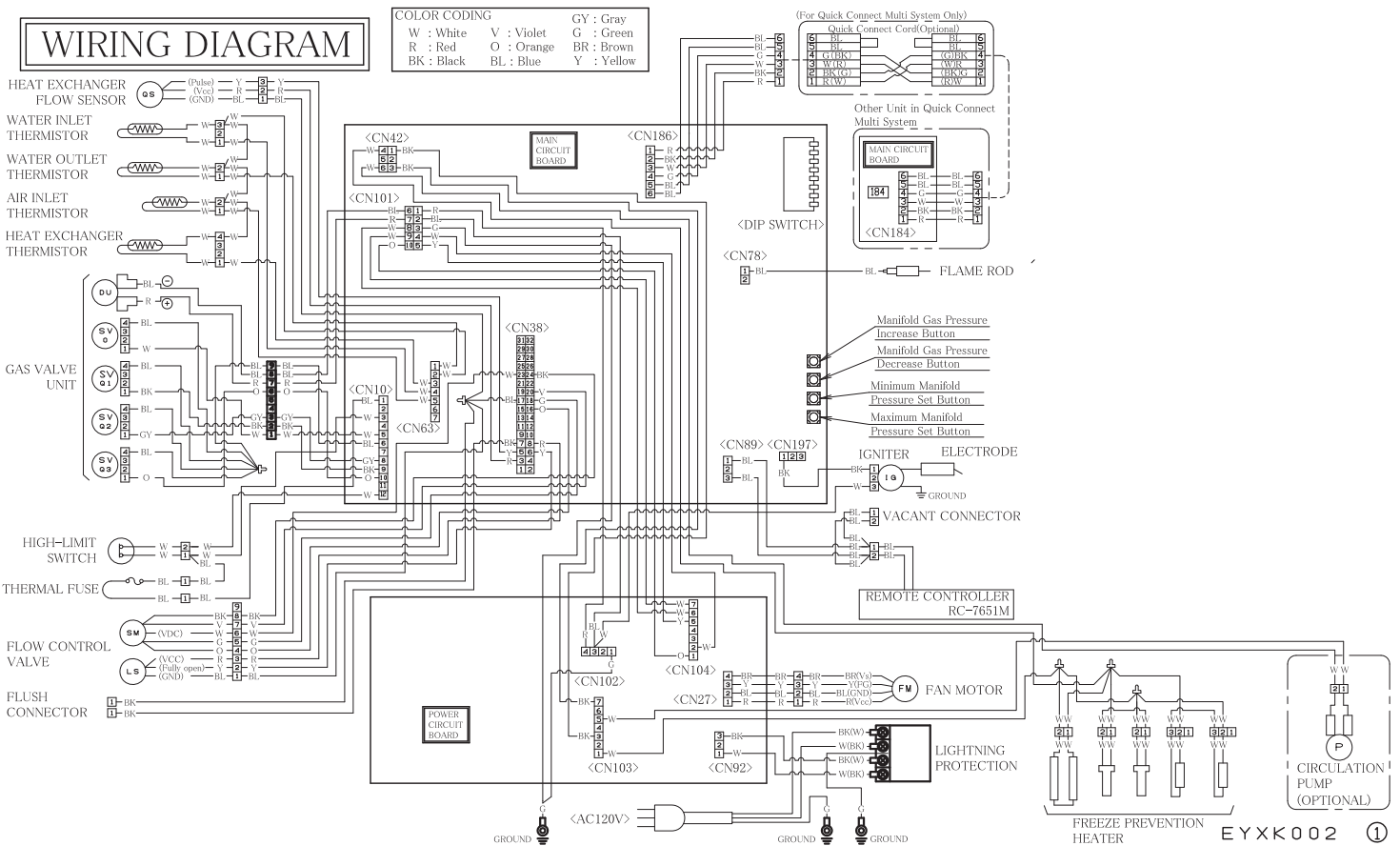


### Fan motor operation flow ( SV model )

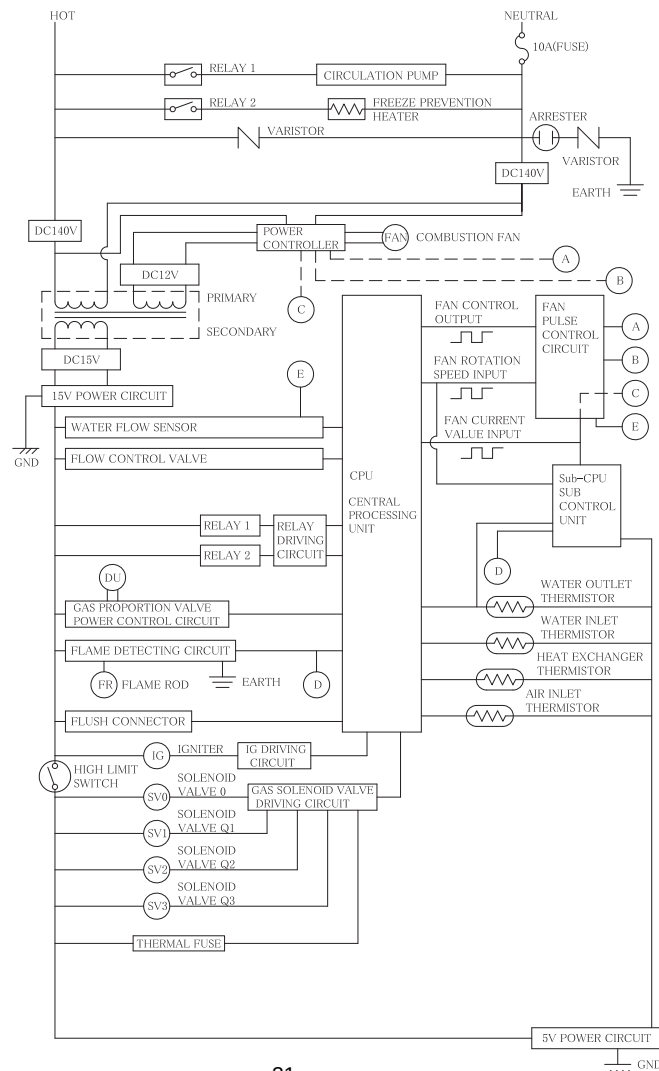


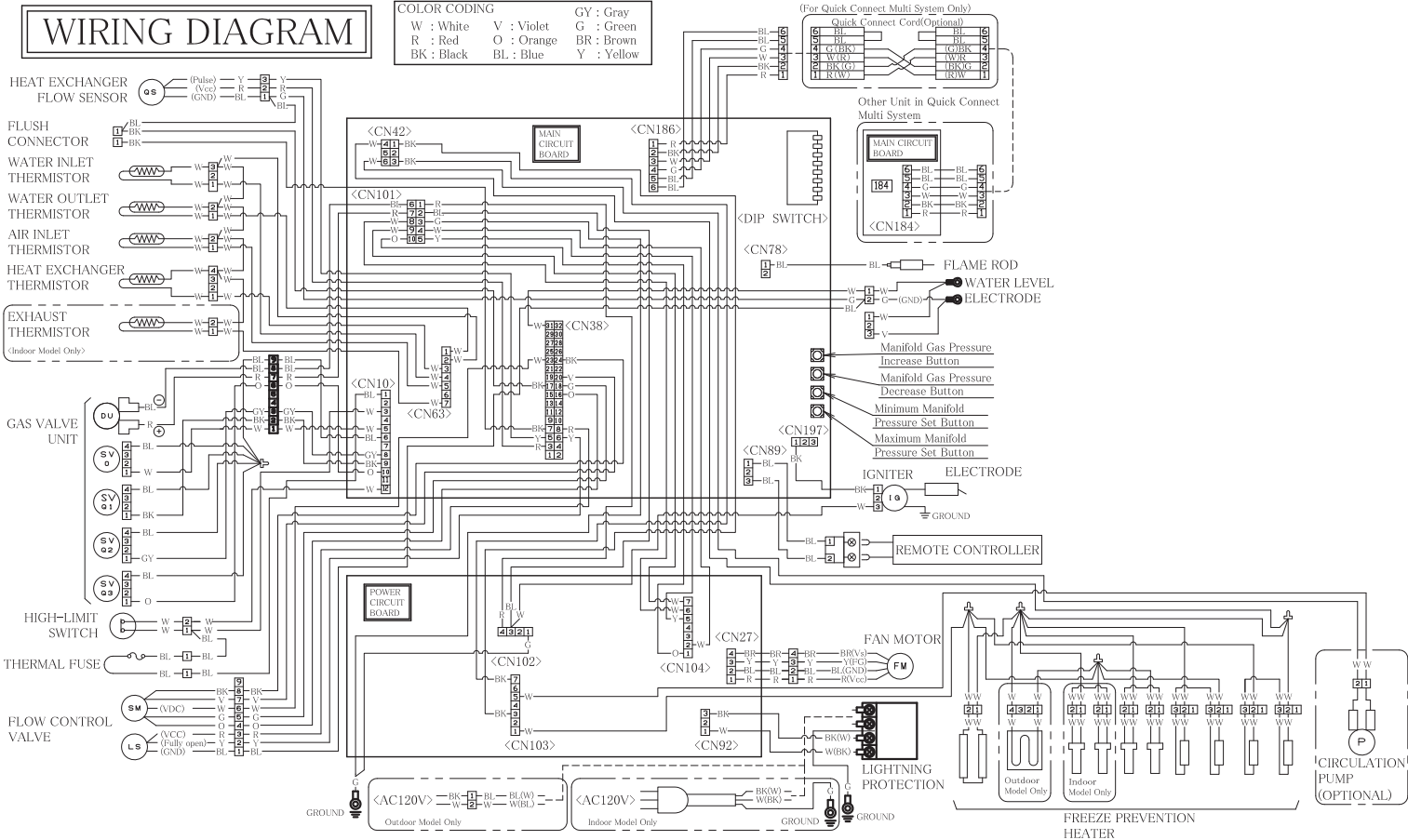
## 7. Wiring Diagram

GQ-2457WS (-FFA) US [NR83 (DVC/OD)]

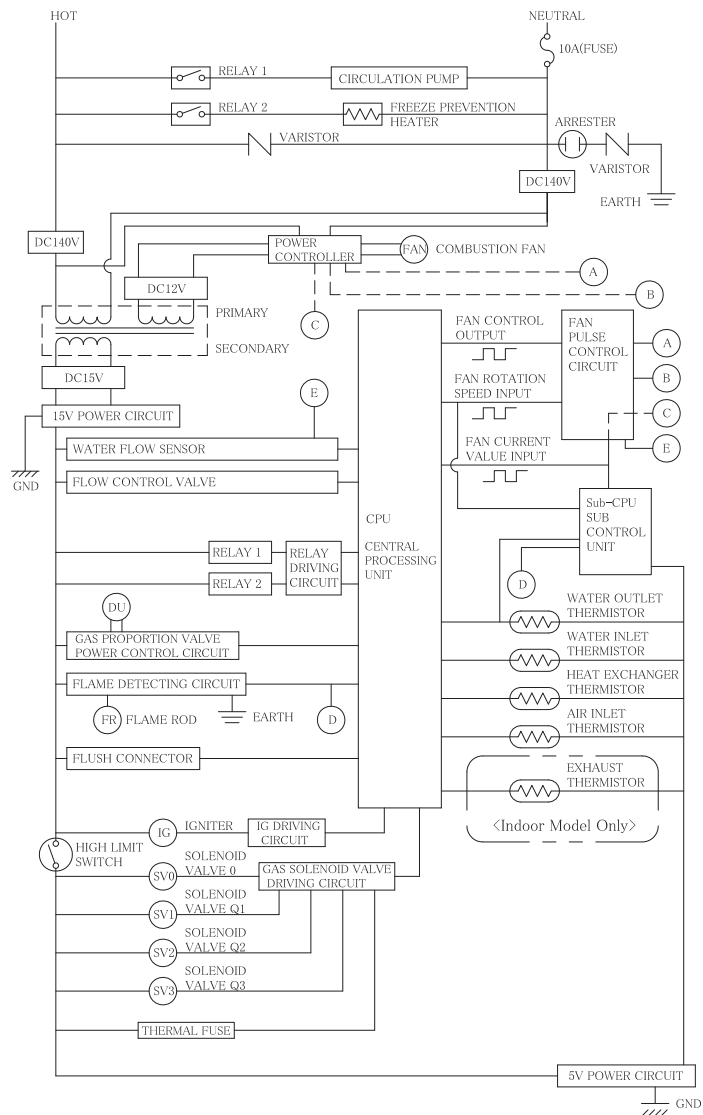


## Block Diagram





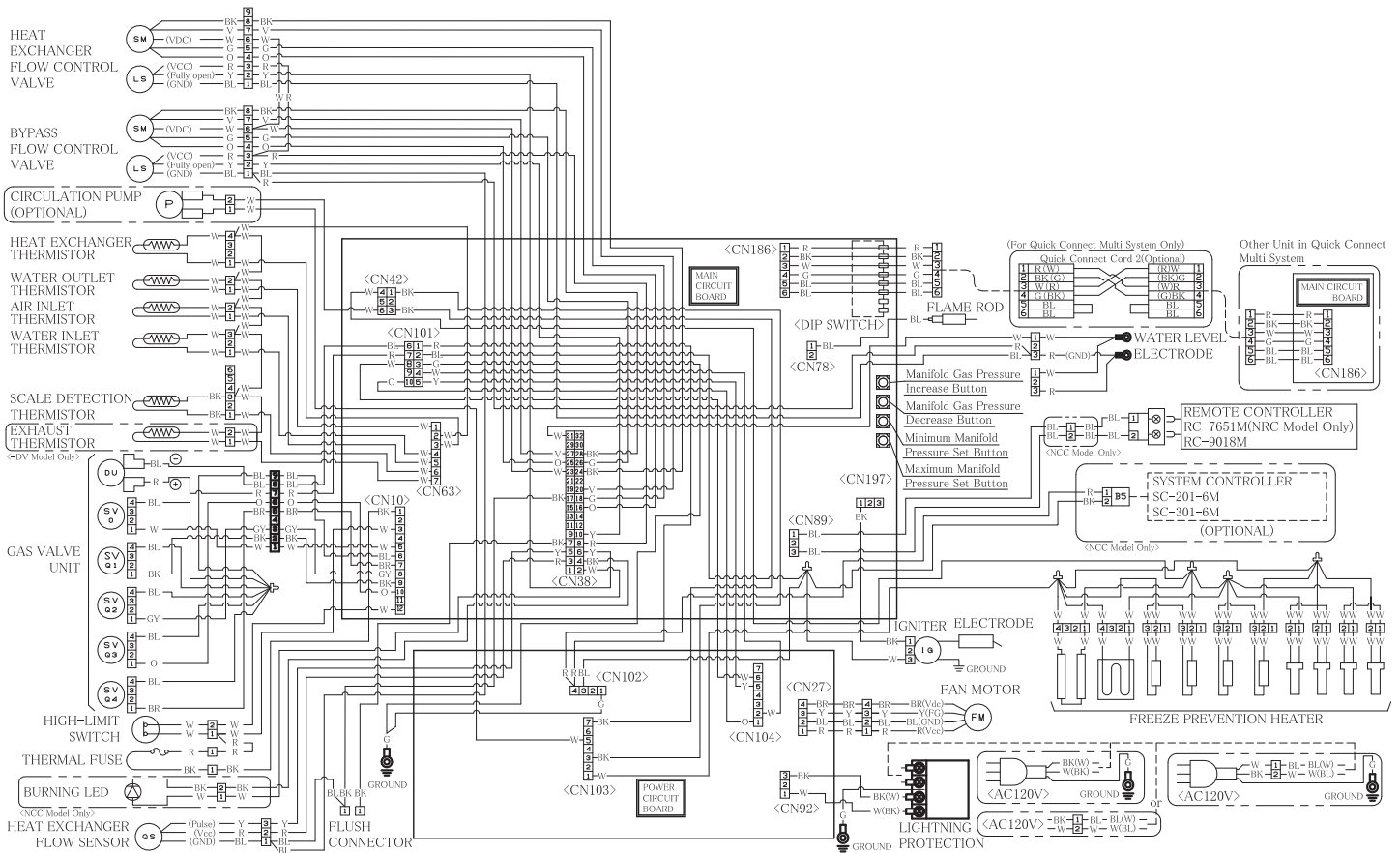
Block Diagram



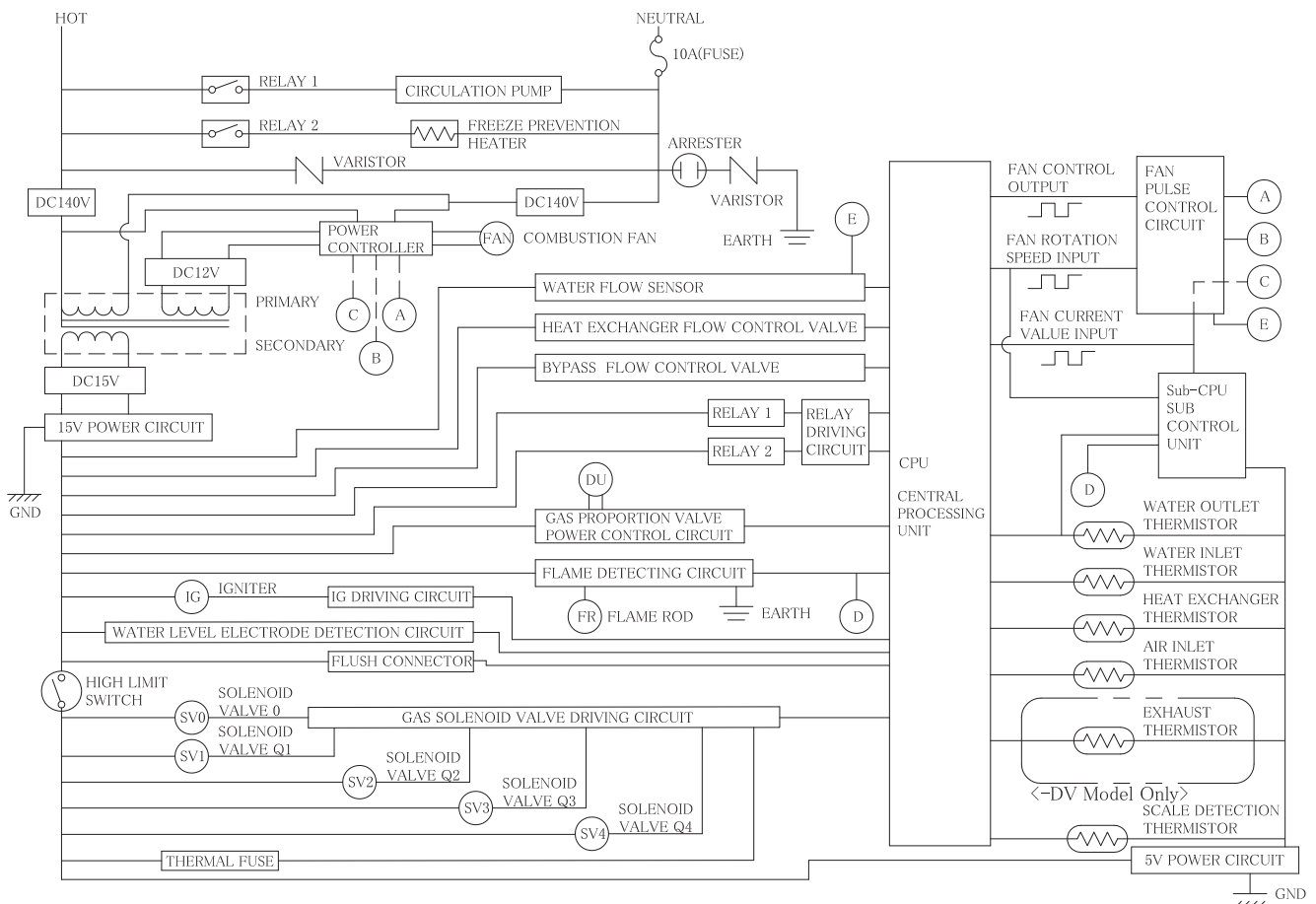
# WIRING DIAGRAM

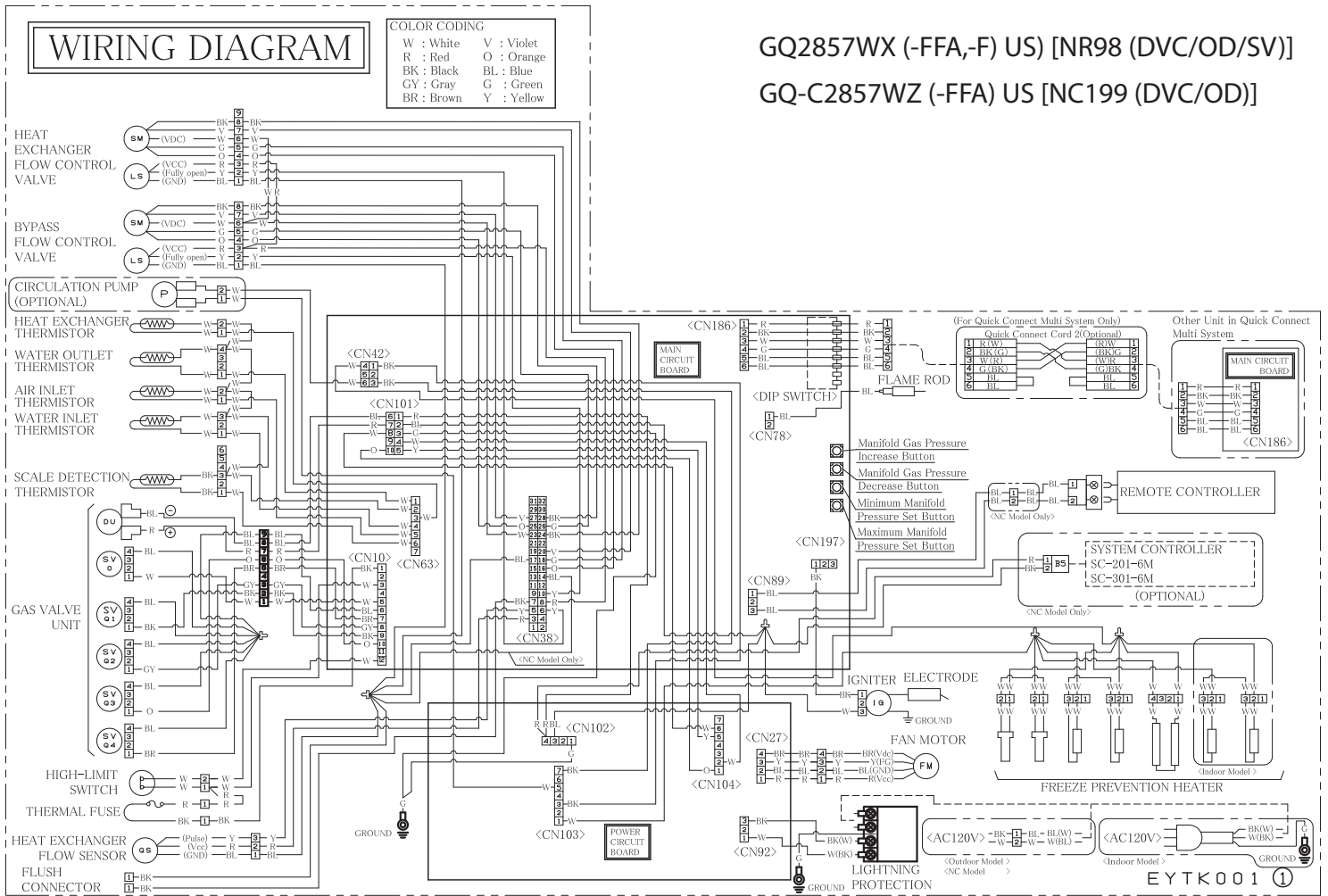
| COLOR CODING |            |  |  |
|--------------|------------|--|--|
| W : White    | V : Violet |  |  |
| R : Red      | O : Orange |  |  |
| BK : Black   | BL : Blue  |  |  |
| GY : Gray    | G : Green  |  |  |
| BR : Brown   | Y : Yellow |  |  |

GQ-C3257WX (-FF) US [NRC111 (DV/OD)]  
GQ-C23257WZ (-FF) US [NCC199 (DV/OD)]

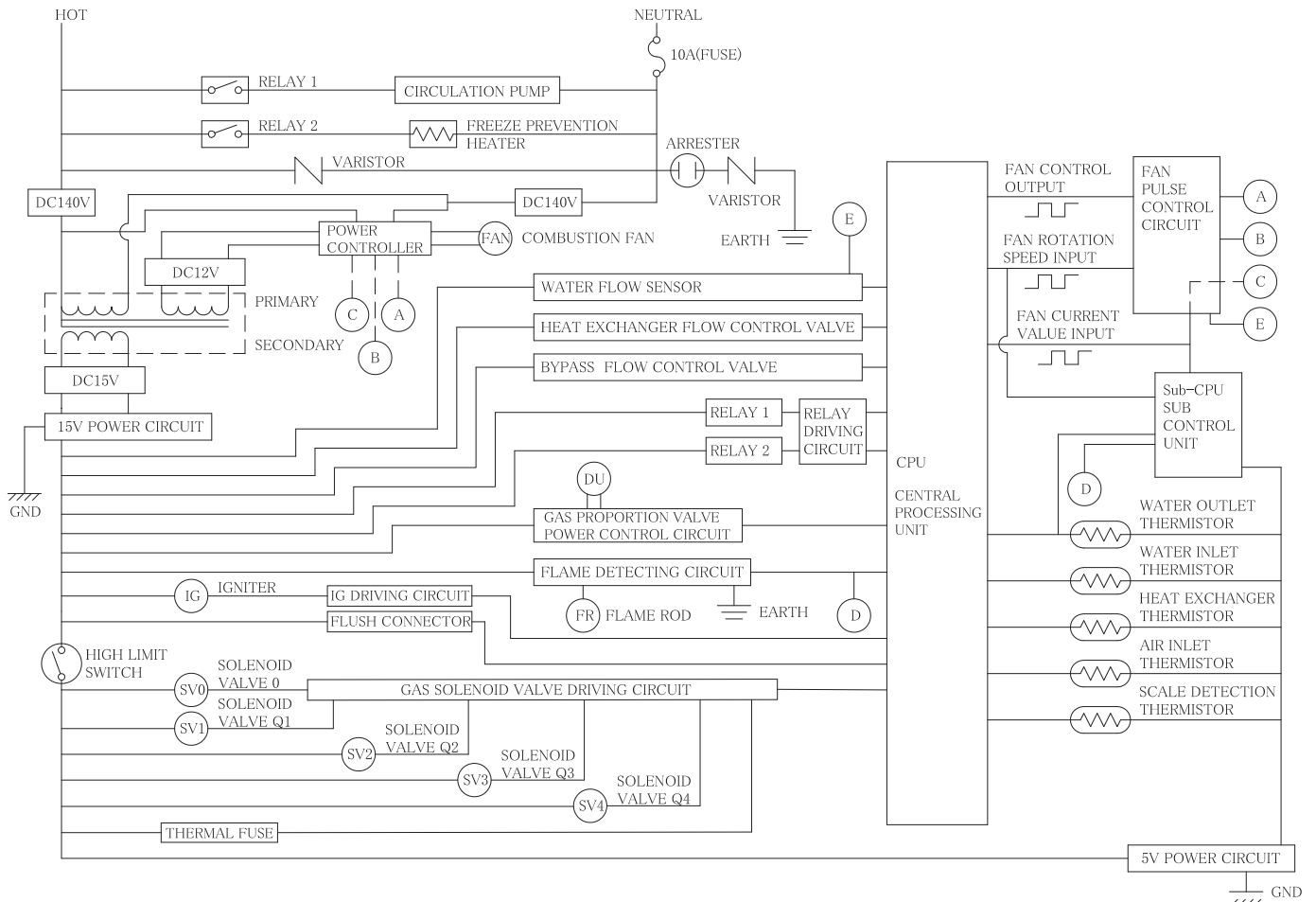


## Block Diagram





## Block Diagram





# 8. Troubleshooting

## Error Codes and Checkpoints

| Display*            | Description                                                                                                 | Diagnosis Point (Trouble Point)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Remarks                                                                            |
|---------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| (F) 11              | Ignition failure<br>(Initial flame fault detection)                                                         | Check the gas supply piping and pressure. Check for Igniter spark ( 14 ). Check Gas Solenoid Valves and Gas Proportioning Valve ( 15, 16, 17, 18 ). Check Flame Rod ( 11 ). Check ground, paying special attention to the ground connection to the Circuit Board.                                                                                                                                                                                                                                                               |                                                                                    |
| (F) 12              | Flame Rod does not detect flame<br>(Flame fault detection)                                                  | Check for accidental extinction of the flame. Check for abnormal combustion. Check Gas Solenoid Valves. Check Flame Rod ( 11 ). Check ground, especially on Circuit Board.                                                                                                                                                                                                                                                                                                                                                      |                                                                                    |
| (F) 14              | Overheat Prevention Device<br>(Thermal Fuse) triggered                                                      | Check for melting or damage to the Thermal Fuse ( 1 ). Check for improper connection of Thermal Fuse.                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                    |
| (F) 16              | Abnormally high output<br>temperature                                                                       | Measure the resistance through the Thermistor-Hot Water ( 6 ). Check for Gas Proportioning Valve ( 18 ). Check for Manifold Pressure.                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                    |
| (F) 20              | High Limit Switch triggered                                                                                 | Check if High Limit Switch is triggered ( 21 ). Check for improper connection of High Limit Switch. Check if the Scale Build-up in the Heat Exchanger.<br>(This error code may be caused by Scale Build-up in the Heat Exchanger)                                                                                                                                                                                                                                                                                               | To reset this error code, the power needs to be disconnected and then reconnected. |
| (F) 29              | Condensate Container clogging                                                                               | Check if the drain line is clogged or frozen ( 23 ). Check that the drain pipe slopes down.                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                    |
| (F) 30              | Thermistor-Air abnormality                                                                                  | Measure the resistance through the Thermistor-Air ( 22 ). Check for an open or short circuit. Check for improper connection of Thermistor-Air.                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                    |
| (F) 31              | Thermistor-Cold Water abnormality                                                                           | Measure the resistance through the Thermistor-Cold Water ( 5 ). Check for an open or short circuit. Check for improper connection of Thermistor-Cold Water.                                                                                                                                                                                                                                                                                                                                                                     |                                                                                    |
| (F) 32              | Thermistor-Hot Water abnormality                                                                            | Measure the resistance through the Thermistor-Hot Water ( 6 ). Check for an open or short circuit. Check for improper connection of Thermistor-Hot Water.                                                                                                                                                                                                                                                                                                                                                                       |                                                                                    |
| (F) 33              | Thermistor-Heat Exchanger<br>abnormality                                                                    | Measure the resistance through the Thermistor-Heat Exchanger ( 7 ). Check for an open or short circuit. Check for improper connection of Thermistor-Heat Exchanger.                                                                                                                                                                                                                                                                                                                                                             |                                                                                    |
| (F) 34              | Thermistor-Scale Detection<br>abnormality                                                                   | Check for dropping of Thermistor-Scale Detection on the Heat Exchanger-Primary.<br>Measure the resistance through the Thermistor-Scale Detection ( 8 ). Check for an open or short circuit. Check for improper connection of Thermistor-Scale Detection.                                                                                                                                                                                                                                                                        |                                                                                    |
| (F) 35              | Thermistor-Exhaust abnormality                                                                              | Measure the resistance through the Thermistor-Exhaust ( 9 ). Check for an open or short circuit. Check for improper connection of Thermistor-Exhaust.                                                                                                                                                                                                                                                                                                                                                                           |                                                                                    |
| (F) 51              | Failure of Gas Solenoid Valve<br>(other than drive circuit)                                                 | Check for proper connection of the Gas Solenoid Valves. Check for damage to the Gas Solenoid Valve connections.                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                    |
| (F) 61              | Fan Motor abnormality                                                                                       | Check that the fan is rotating and check the pulse frequency from the fan rotational frequency sensor ( 12,13 ). Check for improper connection of the fan. Check voltage from Circuit Board.                                                                                                                                                                                                                                                                                                                                    |                                                                                    |
| (F) 65              | Water Servo-Main<br>abnormality                                                                             | Check that the Water Servo-Main is functioning ( 2 ). Check for improper connection of the valve.                                                                                                                                                                                                                                                                                                                                                                                                                               | To reset this error code, the power needs to be disconnected and then reconnected. |
| (F) 66              | Water Servo-Bypass<br>abnormality                                                                           | Check that the Water Servo-Bypass is functioning ( 3 ). Check for improper connection of the valve.                                                                                                                                                                                                                                                                                                                                                                                                                             | To reset this error code, the power needs to be disconnected and then reconnected. |
| (F) 70              | Circuit Board abnormality                                                                                   | Circuit Board failure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | To reset this error code, the power needs to be disconnected and then reconnected. |
| (F) 71              | Gas Solenoid Valve drive circuit<br>abnormality                                                             | Check for damage to the Gas Solenoid Valve drive circuit on the Circuit Board.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                    |
| (F) 72              | Flame Rod circuit abnormality<br>(Detection of flame when no<br>flame is present)                           | Measure the current from the Flame Rod when there is no flame ( 10 ). Check for a ground fault.                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                    |
| (F) 73              | Circuit Board setting abnormality<br>(Improper Maintenance Writers<br>Settings, DIP Switch Settings, etc.)  | Check for proper setting of maintenance writers on Circuit Board. Check the Circuit Board (microcomputer) for damage. Check the dip switch settings.<br>(Ex. high elevation, vent length, etc.).                                                                                                                                                                                                                                                                                                                                | To reset this error code, the power needs to be disconnected and then reconnected. |
| F76                 | Multi-system communication<br>error                                                                         | Check for proper connection of Quick Connect Cord.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                    |
| 760                 | Remote Controller transmission<br>abnormality                                                               | Check connection from Remote Controller to Circuit Board. Check Remote Controller and Circuit Board for damage.                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                    |
| (F) 90              | Combustion abnormality<br>(Warning indication)                                                              | Check for abnormal combustion. Check flue and air inlet for blockage or obstruction.                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                    |
|                     | Combustion abnormality<br>(Unit shuts off)                                                                  | Check for abnormal combustion. Check flue for blockage or obstruction. Check that flame ignites all across the burner.                                                                                                                                                                                                                                                                                                                                                                                                          | To reset this error code, the power needs to be disconnected and then reconnected. |
| (F) 91              | Improper gas type                                                                                           | Check gas type.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | To reset this error code, the power needs to be disconnected and then reconnected. |
| (F) 94              | Exhaust temperature is too high                                                                             | Check for abnormal combustion ( 9 ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | To reset this error code, the power needs to be disconnected and then reconnected. |
| (F) 99              | Combustion abnormality<br>(Unit is locked)                                                                  | Check for abnormal combustion. Check flue for blockage or obstruction.                                                                                                                                                                                                                                                                                                                                                                                                                                                          | To reset this error code, Contact the nearest NORITZ agent.                        |
| (F)C1<br>~<br>(F)C4 | Detect Scale Build-up in the<br>Heat Exchanger-Primary.<br>(Warning indication, and then<br>Unit shuts off) | Flush the Heat Exchanger to remove the Scale Build-up. Refer to the "Procedure for Flushing the Heat Exchanger" in the Parts List inside pocket of the front cover or Installation Manual.<br>If the Heat Exchanger is not flushed, the unit will repeat the warning indication and then shut off. The unit is locked before long. The unit can temporarily operate by reconnecting electrical power until the Heat Exchanger is flushed. Please contact Noritz America for more information about flushing the Heat Exchanger. |                                                                                    |
| (F)CF               | Detect Scale Build-up in the<br>Heat Exchanger-Primary.<br>(Unit is locked)                                 | The unit is locked because of repeated Scale Build-up error code. Must flush the Heat Exchanger to remove the Scale Build-up. Before flushing the Heat Exchanger, please contact Noritz America for more information.                                                                                                                                                                                                                                                                                                           |                                                                                    |

\*In a Quick Connect Multi-System, "F##" (except F76) indicates an error code from the secondary unit (unit without a remote controller).

# GQ-2457WS (-FFA) US [NR83 (DVC/OD)]

## ■ Circuit Board Checkpoints

| Ref. No. | Part                                      | Circuit board Check points<br>(Check the wiring diagram behind the front cover) |     |                 |          |           | Normal value                                          | Remarks                           |
|----------|-------------------------------------------|---------------------------------------------------------------------------------|-----|-----------------|----------|-----------|-------------------------------------------------------|-----------------------------------|
|          |                                           | CN & Pin                                                                        | No. | Wire color      | CN & Pin | No.       |                                                       |                                   |
| 1        | Overheat Prevention Device (Thermal Fuse) | CN10                                                                            | 3   | W - BK          | CN10     | 1         | 2Ω or less                                            |                                   |
| 2        | Water Servo-Main                          | CN38                                                                            | 23  | W - O           | CN38     | 16        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - G           |          | 18        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - V           |          | 20        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - BK          |          | 24        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 6   | Y - BK          |          | 17        | DC 1V or less                                         | When valve is fully open          |
| 3        | Water Flow Sensor                         | CN38                                                                            | 3   | R - BK          | CN38     | 17        | DC 14V - 16 V                                         |                                   |
|          |                                           |                                                                                 | 5   | Y - BK          |          | 17        | DC 0.5 - 15 V<br>over 408 pulses/min.<br>(over 6.8Hz) | Y(+) BL(-)                        |
| 4        | Thermistor-Cold Water                     | CN63                                                                            | 4   | W - W           | CN63     | 2         | DC 1 - 4.5 V                                          | 32 - 212° F<br>0 - 100° C Note 1) |
| 5        | Thermistor-Hot Water                      | CN63                                                                            | 1   | W - W           | CN63     | 2         | DC 1 - 4.5 V                                          | 32 - 212° F<br>0 - 100° C Note 1) |
| 6        | Thermistor-Heat Exchanger                 | CN63                                                                            | 3   | W - W           | CN63     | 2         | DC 1 - 4.5 V                                          | 32 - 212° F<br>0 - 100° C Note 1) |
| 7        | Flame Rod                                 | CN78                                                                            | 1   | BL - Burnercase | -        | GND       | 10 kHz - 100 kHz                                      |                                   |
|          |                                           |                                                                                 | 1   | BL - Electrode  |          | Flame Rod | DC 0.45μA or less                                     | When no flame is detected         |
| 8        | Flame Rod                                 | CN78                                                                            | 1   | BL - Burnercase | -        | GND       | 10 kHz - 100 kHz                                      |                                   |
|          |                                           |                                                                                 | 1   | BL - Electrode  |          | Flame Rod | DC 1μA or more                                        | At flame detection                |
| 9        | Fan Motor                                 | CN27                                                                            | 4   | BR - BL         | CN27     | 2         | DC 7 - 45 V                                           |                                   |
| 10       | Fan Motor                                 | CN27                                                                            | 1   | R - BL          | CN27     | 2         | DC 10 - 14 V                                          |                                   |
|          |                                           |                                                                                 | 3   | Y - BL          |          | 2         | 100 Hz - 400 Hz                                       | 4 pulse/revolution                |
| 11       | Igniter                                   | CN197                                                                           | 1   | BK-BL           | CN102    | 3         | DC 16 - 14 V                                          | When igniter is sparking          |
| 12       | Primary Gas Solenoid Valve                | CN10                                                                            | 5   | W - BL          | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                 |          |           | 19 - 31 Ω                                             | Coil resistance                   |
| 13       | Gas Solenoid Valve - 1                    | CN10                                                                            | 9   | BK - BL         | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                 |          |           | 36 - 58 Ω                                             | Coil resistance                   |
| 14       | Gas Solenoid Valve - 2                    | CN10                                                                            | 8   | GY- BL          | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                 |          |           | 36 - 58 Ω                                             | Coil resistance                   |
| 15       | Gas Proportioning Valve                   | CN101                                                                           | 6   | BL - R          | CN101    | 7         | DC 0.3 - 15 V                                         |                                   |
|          |                                           |                                                                                 |     |                 |          |           | 50 - 80 Ω                                             | Coil resistance                   |
| 16       | Gas Solenoid Valve - 3                    | CN10                                                                            | 10  | O - BL          | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                 |          |           | 36 - 58 Ω                                             | Coil resistance                   |
| 17       | High Limit Switch                         | CN10                                                                            | 12  | W - W           | CN10     | 3         | 1Ω or less                                            | Contact resistance                |
| 18       | Thermistor-Air                            | CN63                                                                            | 5   | W - W           | CN63     | 2         | DC 0.7- 4.4 V                                         |                                   |
| -        | Power Supply (Power Circuit Board)        | CN92                                                                            | 1   | W - BK          | CN92     | 3         | AC 108 - 132 V                                        |                                   |
| -        | Power Supply (Power Circuit Board)        | CN102                                                                           | 4   | R - BL          | CN102    | 3         | DC 14 - 16 V                                          |                                   |
| -        | Remote Controller                         | CN89                                                                            | 1   | BL - BL         | CN89     | 3         | DC 14 - 16 V                                          |                                   |

Note 1) •Cold Water / Hot water / Heat Exchanger Thermistor Temperature Characteristics

|                   |      |      |      |     |     |     |     |     |     |
|-------------------|------|------|------|-----|-----|-----|-----|-----|-----|
| Temperature (° F) | 32   | 50   | 68   | 86  | 104 | 122 | 140 | 158 | 176 |
| Temperature (° C) | 0    | 10   | 20   | 30  | 40  | 50  | 60  | 70  | 80  |
| Resistance (k Ω)  | 23.7 | 15.5 | 10.3 | 7.0 | 4.9 | 3.5 | 2.5 | 1.9 | 1.4 |



# GQ-C2857WS (-FF) US [NRC98 (DV/OD)]

## ■ Circuit Board Checkpoints

| Ref. No. | Part                                      | Circuit board Check points<br>(Check the wiring diagram behind the front cover) |     |                  |          |           | Normal value                                          | Remarks                           |
|----------|-------------------------------------------|---------------------------------------------------------------------------------|-----|------------------|----------|-----------|-------------------------------------------------------|-----------------------------------|
|          |                                           | CN & Pin                                                                        | No. | Wire color       | CN & Pin | No.       |                                                       |                                   |
| 1        | Overheat Prevention Device (Thermal Fuse) | CN10                                                                            | 3   | W - BK           | CN10     | 1         | 2Ω or less                                            |                                   |
| 2        | Water Servo-Main                          | CN38                                                                            | 23  | W - O            | CN38     | 16        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - G            |          | 18        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - V            |          | 20        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - BK           |          | 24        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 6   | Y - BK           |          | 17        | DC 1V or less                                         | When valve is fully open          |
| 3        | Water Flow Sensor                         | CN38                                                                            | 3   | R - BK           | CN38     | 17        | DC 14V - 16 V                                         |                                   |
|          |                                           |                                                                                 | 5   | Y - BK           |          | 17        | DC 0.5 - 15 V<br>over 408 pulses/min.<br>(over 6.8Hz) | Y(+) BL(-)                        |
| 4        | Thermistor-Cold Water                     | CN63                                                                            | 4   | W - W            | CN63     | 2         | DC 1 - 4.5 V                                          | 32 - 212° F<br>0 - 100° C Note 1) |
| 5        | Thermistor-Hot Water                      | CN63                                                                            | 1   | W - W            | CN63     | 2         | DC 1 - 4.5 V                                          | 32 - 212° F<br>0 - 100° C Note 1) |
| 6        | Thermistor-Heat Exchanger                 | CN63                                                                            | 3   | W - W            | CN63     | 2         | DC 1 - 4.5 V                                          | 32 - 212° F<br>0 - 100° C Note 1) |
| 7        | Thermistor-Exhaust<br>(Indoor model only) | CN63                                                                            | 7   | W - W            | CN63     | 2         | Note 2)                                               | Note 2)                           |
| 8        | Flame Rod                                 | CN78                                                                            | 1   | BL - Burner case | -        | GND       | 10 kHz - 100 kHz                                      |                                   |
|          |                                           |                                                                                 | 1   | BL - Electrode   |          | Flame Rod | DC 0.45μA or less                                     | When no flame is detected         |
| 9        | Flame Rod                                 | CN78                                                                            | 1   | BL - Burner case | -        | GND       | 10 kHz - 100 kHz                                      |                                   |
|          |                                           |                                                                                 | 1   | BL - Electrode   |          | Flame Rod | DC 1μA or more                                        | At flame detection                |
| 10       | Fan Motor                                 | CN27                                                                            | 4   | BR - BL          | CN27     | 2         | DC 7 - 45 V                                           |                                   |
| 11       | Fan Motor                                 | CN27                                                                            | 1   | R - BL           | CN27     | 2         | DC 10 - 14 V                                          |                                   |
|          |                                           |                                                                                 | 3   | Y - BL           |          | 2         | 100 Hz - 400 Hz                                       | 4 pulse/revolution                |
| 12       | Igniter                                   | CN197                                                                           | 1   | BK-BL            | CN102    | 3         | DC 16 - 14 V                                          | When igniter is sparking          |
| 13       | Primary Gas Solenoid Valve                | CN10                                                                            | 5   | W - BL           | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                  |          |           | 19 - 31 Ω                                             | Coil resistance                   |
| 14       | Gas Solenoid Valve - 1                    | CN10                                                                            | 9   | BK - BL          | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             | Coil resistance                   |
| 15       | Gas Solenoid Valve - 2                    | CN10                                                                            | 8   | GY- BL           | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             | Coil resistance                   |
| 16       | Gas Proportioning Valve                   | CN101                                                                           | 6   | BL - R           | CN101    | 7         | DC 0.3 - 15 V                                         |                                   |
|          |                                           |                                                                                 |     |                  |          |           | 50 - 80 Ω                                             | Coil resistance                   |
| 17       | Gas Solenoid Valve - 3                    | CN10                                                                            | 10  | O - BL           | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             | Coil resistance                   |
| 18       | High Limit Switch                         | CN10                                                                            | 12  | W - W            | CN10     | 3         | 1Ω or less                                            | Contact resistance                |
| 19       | Thermistor - Air                          | CN63                                                                            | 5   | W - W            | CN63     | 2         | DC 0.7 - 4.4 V                                        | Note 3)                           |
| 20       | Water Level Electrode                     | CN38                                                                            | 31  | W - BK           | CN38     | 17        | DC 14 - 16 V                                          | Note 4)                           |
| -        | Power Supply<br>(Power Circuit Board)     | CN92                                                                            | 1   | W - BK           | CN92     | 3         | AC 108 - 132 V                                        |                                   |
| -        | Power Supply<br>(Power Circuit Board)     | CN102                                                                           | 4   | R - BL           | CN102    | 3         | DC 14 - 16 V                                          |                                   |
| -        | Remote Controller                         | CN89                                                                            | 1   | BL - BL          | CN89     | 3         | DC 14 - 16 V                                          |                                   |

Note 1) •Cold Water / Hot water / Heat Exchanger Thermistor Temperature Characteristics

|                   |      |      |      |     |     |     |     |     |     |
|-------------------|------|------|------|-----|-----|-----|-----|-----|-----|
| Temperature (° F) | 32   | 50   | 68   | 86  | 104 | 122 | 140 | 158 | 176 |
| Temperature (° C) | 0    | 10   | 20   | 30  | 40  | 50  | 60  | 70  | 80  |
| Resistance (k Ω)  | 23.7 | 15.5 | 10.3 | 7.0 | 4.9 | 3.5 | 2.5 | 1.9 | 1.4 |

Note 2) •Thermistor - Exhaust Temperature Characteristics

|                   |     |     |     |      |      |      |
|-------------------|-----|-----|-----|------|------|------|
| Temperature (° F) | -4  | 14  | 32  | 50   | 68   | 86   |
| Temperature (° C) | -20 | -10 | 0   | 10   | 20   | 30   |
| Resistance (k Ω)  | 487 | 296 | 162 | 98.3 | 61.4 | 39.5 |
| Voltage (V)       | 4.6 | 4.3 | 3.9 | 3.4  | 2.8  | 2.3  |

Note 3) •Thermistor - Air Temperature Characteristics

|                   |       |      |      |      |      |     |
|-------------------|-------|------|------|------|------|-----|
| Temperature (° F) | -4    | 14   | 32   | 50   | 68   | 86  |
| Temperature (° C) | -20   | -10  | 0    | 10   | 20   | 30  |
| Resistance (k Ω)  | 106.5 | 59.6 | 34.4 | 20.6 | 12.6 | 8.0 |

Note 4) The ON/OFF condition of water level electrode can be checked using the maintenance monitors.  
When maintenance monitor number 19 reads "000", the condition of the electrode is normal.  
When this monitor reads "001", the condition of the electrode is abnormal.

GQ-2857WX (-FFA,-F) US [NR98 (DVC/OD/SV)]

GQ-2857WZ (-FFA) US [NC199 (DVC/OD)]

## ■ Circuit Board Checkpoints

| Ref. No. | Part                                      | Circuit board Check points<br>(Check the wiring diagram behind the front cover) |     |                  |          |           | Normal value                                          | Remarks |                                     |
|----------|-------------------------------------------|---------------------------------------------------------------------------------|-----|------------------|----------|-----------|-------------------------------------------------------|---------|-------------------------------------|
|          |                                           | CN & Pin                                                                        | No. | Wire color       | CN & Pin | No.       |                                                       |         |                                     |
| 1        | Overheat Prevention Device (Thermal Fuse) | CN10                                                                            | 3   | W - BK           | CN10     | 1         | 2Ω or less                                            |         |                                     |
| 2        | Water Servo-Main                          | CN38                                                                            | 23  | W - O            | CN38     | 16        | DC 1 - 16 V                                           |         |                                     |
|          |                                           |                                                                                 | 23  | W - G            |          | 18        | DC 1 - 16 V                                           |         |                                     |
|          |                                           |                                                                                 | 23  | W - V            |          | 20        | DC 1 - 16 V                                           |         |                                     |
|          |                                           |                                                                                 | 23  | W - BK           |          | 24        | DC 1 - 16 V                                           |         |                                     |
|          |                                           |                                                                                 | 6   | Y - BK           |          | 17        | DC 1V or less                                         |         | When valve is fully open            |
| 3        | Water Servo-Bypass                        | CN38                                                                            | 23  | W - O            | CN38     | 25        | DC 1 - 16 V                                           |         |                                     |
|          |                                           |                                                                                 | 23  | W - G            |          | 26        | DC 1 - 16 V                                           |         |                                     |
|          |                                           |                                                                                 | 23  | W - V            |          | 27        | DC 1 - 16 V                                           |         |                                     |
|          |                                           |                                                                                 | 23  | W - BK           |          | 28        | DC 1 - 16 V                                           |         |                                     |
|          |                                           |                                                                                 | 8   | R - BK           |          | 17        | DC 1V or less                                         |         | When valve is fully open            |
| 4        | Water Flow Sensor                         | CN38                                                                            | 3   | R - BK           | CN38     | 17        | DC 14V - 16 V                                         |         |                                     |
|          |                                           |                                                                                 | 5   | Y - BK           |          | 17        | DC 0.5 - 15 V<br>over 408 pulses/min.<br>(over 6.8Hz) |         | Y(+)    BL(-)                       |
| 5        | Thermistor-Cold Water                     | CN63                                                                            | 4   | W - W            | CN63     | 2         | DC 1 - 4.5 V                                          |         | 32 - 212° F    Note 1)<br>0 -100° C |
| 6        | Thermistor-Hot Water                      | CN63                                                                            | 1   | W - W            | CN63     | 2         | DC 1 - 4.5 V                                          |         | 32 - 212° F    Note 1)<br>0 -100° C |
| 7        | Thermistor-Heat Exchanger                 | CN63                                                                            | 3   | W - W            | CN63     | 2         | DC 1 - 4.5 V                                          |         | 32 - 212° F    Note 1)<br>0 -100° C |
| 8        | Thermistor-Scale Detection                | CN63                                                                            | 6   | W - W            | CN63     | 2         | Note 2)                                               |         | Note 2)                             |
| 9        | Flame Rod                                 | CN78                                                                            | 1   | BL - Burner case | -        | GND       | 10 kHz - 100 kHz                                      |         |                                     |
|          |                                           |                                                                                 | 1   | BL - Electrode   |          | Flame Rod | DC 0.45μA or less                                     |         | When no flame is detected           |
| 10       | Flame Rod                                 | CN78                                                                            | 1   | BL - Burner case | -        | GND       | 10 kHz - 100 kHz                                      |         |                                     |
|          |                                           |                                                                                 | 1   | BL - Electrode   |          | Flame Rod | DC 1μA or more                                        |         | At flame detection                  |
| 11       | Fan Motor                                 | CN27                                                                            | 4   | BR - BL          | CN27     | 2         | DC 7 - 45 V                                           |         |                                     |
| 12       | Fan Motor                                 | CN27                                                                            | 1   | R - BL           | CN27     | 2         | DC 10 - 14 V                                          |         |                                     |
|          |                                           |                                                                                 | 3   | Y - BL           |          | 2         | 100 Hz - 400 Hz                                       |         | 4 pulse/revolution                  |
| 13       | Igniter                                   | CN197                                                                           | 1   | BK-BL            | CN102    | 3         | DC 16 - 14 V                                          |         | When igniter is sparking            |
| 14       | Primary Gas Solenoid Valve                | CN10                                                                            | 5   | W - BL           | CN10     | 6         | DC 14 - 16 V                                          |         | When valve is open                  |
|          |                                           |                                                                                 |     |                  |          |           | 19 - 31 Ω                                             |         | Coil resistance                     |
| 15       | Gas Solenoid Valve - 1                    | CN10                                                                            | 9   | BK - BL          | CN10     | 6         | DC 14 - 16 V                                          |         | When valve is open                  |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             |         | Coil resistance                     |
| 16       | Gas Solenoid Valve - 2                    | CN10                                                                            | 8   | GY- BL           | CN10     | 6         | DC 14 - 16 V                                          |         | When valve is open                  |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             |         | Coil resistance                     |
| 17       | Gas Proportioning Valve                   | CN101                                                                           | 6   | BL - R           | CN101    | 7         | DC 0.3 - 15 V                                         |         |                                     |
|          |                                           |                                                                                 |     |                  |          |           | 50 - 80 Ω                                             |         | Coil resistance                     |
| 18       | Gas Solenoid Valve - 3                    | CN10                                                                            | 10  | O - BL           | CN10     | 6         | DC 14 - 16 V                                          |         | When valve is open                  |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             |         | Coil resistance                     |
| 19       | Gas Solenoid Valve - 4                    | CN10                                                                            | 7   | BR - BL          | CN10     | 6         | DC 14 - 16 V                                          |         | When valve is open                  |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             |         | Coil resistance                     |
| 20       | High Limit Switch                         | CN10                                                                            | 12  | W - W            | CN10     | 3         | 1Ω or less                                            |         | Contact resistance                  |
| 21       | Thermistor - Air                          | CN63                                                                            | 5   | W - W            | CN63     | 2         | DC 0.7 - 4.4 V                                        |         | Note 3)                             |
| -        | Power Supply (Power Circuit Board)        | CN92                                                                            | 1   | W - BK           | CN92     | 3         | AC 108 - 132 V                                        |         |                                     |
| -        | Power Supply (Power Circuit Board)        | CN102                                                                           | 4   | R - BL           | CN102    | 3         | DC 14 - 16 V                                          |         |                                     |
| -        | Remote Controller                         | CN89                                                                            | 1   | BL - BL          | CN89     | 3         | DC 14 - 16 V                                          |         |                                     |

Note 1) •Cold Water / Hot water / Heat Exchanger Thermistor Temperature Characteristics

|                   |      |      |      |     |     |     |     |     |     |
|-------------------|------|------|------|-----|-----|-----|-----|-----|-----|
| Temperature (° F) | 32   | 50   | 68   | 86  | 104 | 122 | 140 | 158 | 176 |
| Temperature (° C) | 0    | 10   | 20   | 30  | 40  | 50  | 60  | 70  | 80  |
| Resistance (k Ω)  | 23.7 | 15.5 | 10.3 | 7.0 | 4.9 | 3.5 | 2.5 | 1.9 | 1.4 |

Note 2) •Thermistor - Scale Detection Temperature Characteristics

|                   |     |     |     |     |     |     |
|-------------------|-----|-----|-----|-----|-----|-----|
| Temperature (° F) | 77  | 122 | 167 | 212 | 257 | 302 |
| Temperature (° C) | 25  | 50  | 75  | 100 | 125 | 150 |
| Resistance (k Ω)  | 280 | 86  | 31  | 13  | 6.1 | 3.1 |
| Voltage (V)       | 4.9 | 4.6 | 4.1 | 3.3 | 2.4 | 1.6 |

Note 3) •Thermistor - Air Temperature Characteristics

|                   |       |      |      |      |      |     |
|-------------------|-------|------|------|------|------|-----|
| Temperature (° F) | -4    | 14   | 32   | 50   | 68   | 86  |
| Temperature (° C) | -20   | -10  | 0    | 10   | 20   | 30  |
| Resistance (k Ω)  | 106.5 | 59.6 | 34.4 | 20.6 | 12.6 | 8.0 |

GQ-C3257WX (-FF) US [NRC111(DV/OD)]  
GQ-C3257WZ (-FF) US [NCC199 (DV/OD)]

## ■ Circuit Board Checkpoints

| Ref. No. | Part                                      | Circuit board Check points<br>(Check the wiring diagram behind the front cover) |     |                  |          |           | Normal value                                          | Remarks                           |
|----------|-------------------------------------------|---------------------------------------------------------------------------------|-----|------------------|----------|-----------|-------------------------------------------------------|-----------------------------------|
|          |                                           | CN & Pin                                                                        | No. | Wire color       | CN & Pin | No.       |                                                       |                                   |
| 1        | Overheat Prevention Device (Thermal Fuse) | CN10                                                                            | 3   | W - BK           | CN10     | 1         | 2Ω or less                                            |                                   |
| 2        | Water Servo-Main                          | CN38                                                                            | 23  | W - O            | CN38     | 16        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - G            |          | 18        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - V            |          | 20        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - BK           |          | 24        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 6   | Y - BK           |          | 17        | DC 1V or less                                         | When valve is fully open          |
| 3        | Water Servo-Bypass                        | CN38                                                                            | 23  | W - O            | CN38     | 25        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - G            |          | 26        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - V            |          | 27        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 23  | W - BK           |          | 28        | DC 1 - 16 V                                           |                                   |
|          |                                           |                                                                                 | 8   | R - BK           |          | 17        | DC 1V or less                                         | When valve is fully open          |
| 4        | Water Flow Sensor                         | CN38                                                                            | 3   | R - BK           | CN38     | 17        | DC 14V - 16 V                                         |                                   |
|          |                                           |                                                                                 | 5   | Y - BK           |          | 17        | DC 0.5 - 15 V<br>over 408 pulses/min.<br>(over 6.8Hz) | Y(+) BL(-)                        |
| 5        | Thermistor-Cold Water                     | CN63                                                                            | 4   | W - W            | CN63     | 2         | DC 1 - 4.5 V                                          | 32 - 212° F<br>0 - 100° C Note 1) |
| 6        | Thermistor-Hot Water                      | CN63                                                                            | 1   | W - W            | CN63     | 2         | DC 1 - 4.5 V                                          | 32 - 212° F<br>0 - 100° C Note 1) |
| 7        | Thermistor-Heat Exchanger                 | CN63                                                                            | 3   | W - W            | CN63     | 2         | DC 1 - 4.5 V                                          | 32 - 212° F<br>0 - 100° C Note 1) |
| 8        | Thermistor-Scale Detection                | CN63                                                                            | 6   | W - W            | CN63     | 2         | Note 2)                                               | Note 2)                           |
| 9        | Thermistor-Exhaust<br>(Indoor model only) | CN63                                                                            | 7   | W - W            | CN63     | 2         | Note 3)                                               | Note 3)                           |
| 10       | Flame Rod                                 | CN78                                                                            | 1   | BL - Burner case | -        | GND       | 10 kHz - 100 kHz                                      |                                   |
|          |                                           |                                                                                 | 1   | BL - Electrode   |          | Flame Rod | DC 0.45μA or less                                     | When no flame is detected         |
| 11       | Flame Rod                                 | CN78                                                                            | 1   | BL - Burner case | -        | GND       | 10 kHz - 100 kHz                                      |                                   |
|          |                                           |                                                                                 | 1   | BL - Electrode   |          | Flame Rod | DC 1μA or more                                        | At flame detection                |
| 12       | Fan Motor                                 | CN27                                                                            | 4   | BR - BL          | CN27     | 2         | DC 7 - 45 V                                           |                                   |
| 13       | Fan Motor                                 | CN27                                                                            | 1   | R - BL           | CN27     | 2         | DC 10 - 14 V                                          |                                   |
|          |                                           |                                                                                 | 3   | Y - BL           |          | 2         | 100 Hz - 400 Hz                                       | 4 pulse/revolution                |
| 14       | Igniter                                   | CN197                                                                           | 1   | BK-BL            | CN102    | 3         | DC 16 - 14 V                                          | When igniter is sparking          |
| 15       | Primary Gas Solenoid Valve                | CN10                                                                            | 5   | W - BL           | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                  |          |           | 19 - 31 Ω                                             | Coil resistance                   |
| 16       | Gas Solenoid Valve - 1                    | CN10                                                                            | 9   | BK - BL          | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             | Coil resistance                   |
| 17       | Gas Solenoid Valve - 2                    | CN10                                                                            | 8   | GY- BL           | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             | Coil resistance                   |
| 18       | Gas Proportioning Valve                   | CN101                                                                           | 6   | BL - R           | CN101    | 7         | DC 0.3 - 15 V                                         |                                   |
|          |                                           |                                                                                 |     |                  |          |           | 50 - 80 Ω                                             | Coil resistance                   |
| 19       | Gas Solenoid Valve - 3                    | CN10                                                                            | 10  | O - BL           | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             | Coil resistance                   |
| 20       | Gas Solenoid Valve - 4                    | CN10                                                                            | 7   | BR - BL          | CN10     | 6         | DC 14 - 16 V                                          | When valve is open                |
|          |                                           |                                                                                 |     |                  |          |           | 36 - 58 Ω                                             | Coil resistance                   |
| 21       | High Limit Switch                         | CN10                                                                            | 12  | W - W            | CN10     | 3         | 1Ω or less                                            | Contact resistance                |
| 22       | Thermistor - Air                          | CN63                                                                            | 5   | W - W            | CN63     | 2         | DC 0.7 - 4.4 V                                        | Note 4)                           |
| 23       | Water Level Electrode                     | CN38                                                                            | 31  | W - BK           | CN38     | 17        | DC 14 - 16 V                                          | Note 5)                           |
| -        | Power Supply<br>(Power Circuit Board)     | CN92                                                                            | 1   | W - BK           | CN92     | 3         | AC 108 - 132 V                                        |                                   |
| -        | Power Supply<br>(Power Circuit Board)     | CN102                                                                           | 4   | R - BL           | CN102    | 3         | DC 14 - 16 V                                          |                                   |
| -        | Remote Controller                         | CN89                                                                            | 1   | BL - BL          | CN89     | 3         | DC 14 - 16 V                                          |                                   |

Note 1) •Cold Water / Hot water / Heat Exchanger Thermistor Temperature Characteristics

|                   |      |      |      |     |     |     |     |     |     |
|-------------------|------|------|------|-----|-----|-----|-----|-----|-----|
| Temperature (° F) | 32   | 50   | 68   | 86  | 104 | 122 | 140 | 158 | 176 |
| Temperature (° C) | 0    | 10   | 20   | 30  | 40  | 50  | 60  | 70  | 80  |
| Resistance (k Ω)  | 23.7 | 15.5 | 10.3 | 7.0 | 4.9 | 3.5 | 2.5 | 1.9 | 1.4 |

Note 2) •Thermistor - Scale Detection Temperature Characteristics

|                   |     |     |     |     |     |     |
|-------------------|-----|-----|-----|-----|-----|-----|
| Temperature (° F) | 77  | 122 | 167 | 212 | 257 | 302 |
| Temperature (° C) | 25  | 50  | 75  | 100 | 125 | 150 |
| Resistance (k Ω)  | 280 | 86  | 31  | 13  | 6.1 | 3.1 |
| Voltage (V)       | 4.9 | 4.6 | 4.1 | 3.3 | 2.4 | 1.6 |

Note 4) •Thermistor - Air Temperature Characteristics

|                   |       |      |      |      |      |     |
|-------------------|-------|------|------|------|------|-----|
| Temperature (° F) | -4    | 14   | 32   | 50   | 68   | 86  |
| Temperature (° C) | -20   | -10  | 0    | 10   | 20   | 30  |
| Resistance (k Ω)  | 106.5 | 59.6 | 34.4 | 20.6 | 12.6 | 8.0 |

Note 3) •Thermistor - Exhaust Temperature Characteristics

|                   |     |     |     |      |      |      |
|-------------------|-----|-----|-----|------|------|------|
| Temperature (° F) | -4  | 14  | 32  | 50   | 68   | 86   |
| Temperature (° C) | -20 | -10 | 0   | 10   | 20   | 30   |
| Resistance (k Ω)  | 487 | 296 | 162 | 98.3 | 61.4 | 39.5 |
| Voltage (V)       | 4.6 | 4.3 | 3.9 | 3.4  | 2.8  | 2.3  |

Note 5) The ON/OFF condition of water level electrode can be checked using the maintenance monitors.  
When maintenance monitor number 19 reads "000", the condition of the electrode is normal.  
When this monitor reads "001", the condition of the electrode is abnormal.

■Error Description and How to Reset

<After Pressing the Operation Button on the Remote Controller>

1. If the Priority lamp does not come on:

| Error Code    | Possible Causes                                   | Checkpoint                                                       | Circuit board Check points |            |              |   |       | Normal Value                         | How to Fix Problem and Reset Unit                                                                                                                       |
|---------------|---------------------------------------------------|------------------------------------------------------------------|----------------------------|------------|--------------|---|-------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |                                                   |                                                                  | CN & Pin No.               | Wire color | CN & Pin No. |   |       |                                      |                                                                                                                                                         |
| No Error Code | A Fuse is Blown                                   | Check whether the 10A fuse on the circuit board is open.         | —                          | —          | —            | — | —     | Closed circuit                       | Remove the cause of excess current, then replace the 10A fuse.                                                                                          |
|               | Power Source Circuit Board Abnormality            | Check the 15V output line form the power (source circuit board.) | CN102                      | 4          | R - BL       | 3 | CN102 | DC14 - 16V                           | If there is AC 120V supplied to the power source circuit board, but there is not DC 15V out of it, the power source circuit board needs to be replaced. |
|               | Circuit Board Abnormality                         | Input voltage measurement of a C.B.A.                            | CN102                      | 4          | R - BL       | 3 | CN102 | DC14 - 16V                           | Check for improper or damaged connections between the two boards, and for an open circuit on the circuit board.                                         |
|               | Remote Control Terminal Block Voltage Abnormality | Check voltage supply from circuit board to remote controller.    | CN89                       | 1          | BL - BL      | 3 | CN89  | DC14 - 16V                           | If voltage is abnormal, replace circuit board.                                                                                                          |
|               | Remote Controller Cord Abnormality                | Check for open or short circuit.                                 | —                          | —          | —            | — | —     | Closed circuit (not open or shorted) | If there is an open or short circuit, or a ground fault is detected, replace the cord.                                                                  |

2. The Priority lamp lights, but an error code appears soon after:

| Error Code | Possible Causes                                                                                      | Checkpoint                                                                                                                                          | Circuit board Check points |            |              |   |      | Normal Value                         | How to Fix Problem and Reset Unit                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------|--------------|---|------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            |                                                                                                      |                                                                                                                                                     | CN & Pin No.               | Wire color | CN & Pin No. |   |      |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 14         | Overheat Prevention Device (Thermal Fuse)                                                            | Check for melting or improper connection of the overheat prevention device (Thermal fuse).                                                          | CN10                       | 3          | W - BK       | 1 | CN10 | 2 Ω or less                          | If the overheat prevention device (Thermal fuse) has fused, it has been exposed to temperatures in excess of 430°F. First fix the cause of the high temperature exposure (hole in heat exchanger, etc.) and then replace the overheat prevention device (Thermal fuse).                                                                                                                                                                                   |
| 73         | Circuit Board Setting Abnormality (Improper Maintenance Writers Settings, Dip Switch Settings, etc.) | 1. Check for proper setting of maintenance writers on circuit board.<br>2. Check the circuit board for damage.<br>3. Check the dip switch settings. | —                          | —          | —            | — | —    | —                                    | 1. Improper maintenance writers setting<br>→e.g.) Gas type, model type, etc.<br>2.Check for damage of circuit board.<br>3. Dip Switch Setting<br>→e.g.) High elevation, Vent length, etc.                                                                                                                                                                                                                                                                 |
| 760        | Remote Controller Transmission Abnormality                                                           | Check remote controller and circuit board. Check connection of remote control cord and cord to circuit board.                                       | CN89                       | 1          | BL - BL      | 3 | CN89 | DC14 - 16V                           | If there is a voltage abnormality, replace the circuit board.                                                                                                                                                                                                                                                                                                                                                                                             |
|            |                                                                                                      | Check remote control cord for a short or open circuit, or for a ground fault.                                                                       | —                          | —          | —            | — | —    | Closed circuit (not open or shorted) | If an open or short circuit or a ground fault exists, replace Remote Control cord.                                                                                                                                                                                                                                                                                                                                                                        |
| 90         | Combustion Abnormality                                                                               | Check for abnormal combustion.<br>Check flue for blockage or obstruction.                                                                           | —                          | —          | —            | — | —    | —                                    | If abnormal combustion is detected, the error code will flash and combustion stops. This error code can be reset by turning the water heater OFF on the operation panel. Remove the cause of the abnormal combustion.<br><br>Check maintenance monitor No.49. If the fan has increased its speed by 103%, the error code will flash but combustion continues. If the fan has increased its speed by 104%, the error code will flash and combustion stops. |
|            | Combustion Abnormality (Warning Indication) (Unit Shuts Off)                                         |                                                                                                                                                     | —                          | —          | —            | — | —    | —                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 99         | Combustion Abnormality (Unit is locked)<br><br><Indoor model only>                                   | Check for abnormal combustion.<br>Check flue for blockage or obstruction.                                                                           | —                          | —          | —            | — | —    | —                                    | If this error code is displayed and the water heater has been in use for 10 years (NRC series) / 5 years (NCC series), the unit has reached the end of its life cycle and should be replaced.                                                                                                                                                                                                                                                             |

<During Regular Operation>

1. Fan does not begin rotating when hot water is being demanded:

| Error Code | Possible Causes                                                                                              | Checkpoint                                                                                               | Circuit board Check points |   |                 |              |      | Normal Value                                     | How to Fix Problem and Reset Unit                                                                                                                                                                                                                                                                       |
|------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------|---|-----------------|--------------|------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            |                                                                                                              |                                                                                                          | CN & Pin No.               |   | Wire color      | CN & Pin No. |      |                                                  |                                                                                                                                                                                                                                                                                                         |
| No Error   | Inlet Water Temperature is too High                                                                          | Check inlet water temperature                                                                            | CN63                       | 4 | W - W           | 2            | CN63 | less than 122°F using thermistor characteristics | OK if K > Approx. 29.7 / Flow Rate (GPM) + inlet water temp (°F), where K = 136°F for less than 125°F temperature setting, K= Set Temp (C) + 9°F for 125°F or more setting. Also check thermistor temperature characteristics.                                                                          |
| 20         | High Limit Switch Triggered                                                                                  | Check if high limit switch is triggered or improperly connected.                                         | CN10                       | 3 | W - W           | 12           | CN10 | 1 Ω or less                                      | Make Sure there is no flame left over in the burner. Check for short or open circuit. Reset unit by turning power off and on. Replace high limit if code remains.                                                                                                                                       |
| 29         | Condensate Container clogging (Water Level Electrode) abnormality<br><br><NRC / NCC : Condensing Model only> | Check maintenance monitor No. 19                                                                         | —                          | — | —               | —            | —    | OFF [000]                                        | If No.19 is ON [001], check the following :<br>Check the drain line is clogged or frozen.<br>Check for proper connection of Condensate Darin Trap water level electrode.<br>Check for short circuit of Condensate Darin Trap water level electrode cord.<br>If normal value, replace the circuit board. |
| 30         | Thermistor - Air Abnormality                                                                                 | Check the resistance through the thermistor.<br>Check for open or short circuit, or improper connection. | CN63                       | 5 | W - W           | 2            | CN63 | DC 0.7 - 4.4 V                                   | Compare to temperature characteristic list (Note 1).<br>Check for open or short circuit or for an improper connection.                                                                                                                                                                                  |
| 31         | Thermistor - Cold Water Abnormality                                                                          | Check the resistance through the thermistor.<br>Check for open or short circuit, or improper connection. | CN63                       | 4 | W - W           | 2            | CN63 | DC 1 - 4.5 V                                     | Compare to temperature characteristic list (Note 1).<br>Check for open or short circuit or for an improper connection.                                                                                                                                                                                  |
| 32         | Thermistor Hot Water Abnormality                                                                             | Check the resistance through the thermistor.<br>Check for open or short circuit, or improper connection. | CN63                       | 1 | W - W           | 2            | CN63 | DC 1 - 4.5 V                                     | Compare to temperature characteristic list (Note 1).<br>Check for open or short circuit or for an improper connection.                                                                                                                                                                                  |
| 33         | Thermistor - Heat Exchanger Abnormality                                                                      | Check the resistance through the thermistor.<br>Check for open or short circuit, or improper connection. | CN63                       | 3 | W - W           | 2            | CN63 | DC 1 - 4.5 V                                     | Compare to temperature characteristic list (Note 2).<br>Check for open or short circuit or for an improper connection.                                                                                                                                                                                  |
| 70         | Circuit board Abnormality                                                                                    | Detection of circuit board abnormality.                                                                  | —                          | — | —               | —            | —    |                                                  | Disconnect the electrical power, then reconnect electrical power to the water heater to reset the system. If the circuit board abnormality is continuous, replace the circuit board.                                                                                                                    |
| 71         | Gas Solenoid Valve Drive Circuit Abnormality                                                                 | Check for damage to the gas solenoid valve drive circuit on the circuit board.                           | —                          | — | —               | —            | —    |                                                  | Disconnect the electrical power, then reconnect electrical power to the water heater to reset the system. If the error code "71" is continuous, replace the circuit board.                                                                                                                              |
| 72         | Flame Rod Abnormality<br>(Flame detected when no flame present)                                              | Measure the current from the flame rod when there is no flame.<br>Check for a ground fault.              | CN78                       | 1 | BL - Burnercase | GND          | -    | 10 kHz - 100 kHz                                 | If the "72" error code is displayed, check the signal from the flame rod (also make sure that there is not a problem with the grounding of the appliance). If the signal is normal, replace the circuit board. If it is abnormal, replace the flame rod.                                                |
|            |                                                                                                              |                                                                                                          |                            | 1 | BL - Electrode  | Flame Rod    |      | DC 0.45 μA or less                               |                                                                                                                                                                                                                                                                                                         |

Note 1) Thermistor - Air Temperature Characteristics

|                  |       |      |      |      |      |     |     |     |     |
|------------------|-------|------|------|------|------|-----|-----|-----|-----|
| Temperature (°F) | 32    | 50   | 68   | 86   | 104  | 122 | 140 | 158 | 176 |
| Temperature (°C) | -4    | 14   | 32   | 50   | 68   | 86  | 104 | 122 | 140 |
| Resistance (kΩ)  | 106.5 | 59.6 | 34.4 | 20.6 | 12.6 | 8.0 | 5.0 | 3.0 | 2.0 |

Note 2) Cold Water / Hot Water / Heat Exchanger Thermistor Temperature Characteristics

|                  |      |      |      |     |     |     |     |     |     |
|------------------|------|------|------|-----|-----|-----|-----|-----|-----|
| Temperature (°F) | 32   | 50   | 68   | 86  | 104 | 122 | 140 | 158 | 176 |
| Temperature (°C) | 0    | 10   | 20   | 30  | 40  | 50  | 60  | 70  | 80  |
| Resistance (kΩ)  | 23.7 | 15.5 | 10.3 | 7.0 | 4.9 | 3.5 | 2.5 | 1.9 | 1.4 |

2. Fan rotates normally, but no flame ignites on the burner:

| Error Code | Possible Causes  | Checkpoint                       | Circuit board Check points |   |            |              |       | Normal Value  | How to Fix Problem and Reset Unit                                                         |
|------------|------------------|----------------------------------|----------------------------|---|------------|--------------|-------|---------------|-------------------------------------------------------------------------------------------|
|            |                  |                                  | CN & Pin No.               |   | Wire color | CN & Pin No. |       |               |                                                                                           |
| 11         | Ignition Failure | Igniter failure                  | CN197                      | 1 | BK - BK    | 3            | CN102 | DC 14 - 16 V  | Replace Igniter                                                                           |
|            |                  | Check primary gas solenoid valve | CN10                       | 5 | W - BL     | 6            | CN10  | DC 14 - 16 V  | Gas Solenoid Valve typical resistance: 19 - 31 Ω                                          |
|            |                  | Check gas solenoid valve - 1     | CN10                       | 9 | BK - BL    | 6            | CN10  | DC 14 - 16 V  | Gas Solenoid Valve typical resistance: 36 - 58 Ω                                          |
|            |                  | Check gas proportioning valve    | CN101                      | 7 | R - BL     | 6            | CN101 | DC 0.3 - 15 V | Current value changes depending on the load.<br>Proportioning value resistance: 50 - 80 Ω |

3. A flame ignites on the burner, but it goes out immediately:

| Error Code | Possible Causes                                                        | Checkpoint                                             | Circuit board Check points |   |                 |              |       | Normal Value                                      | How to Fix Problem and Reset Unit                                                                                                                                                                                                                                                                                    |
|------------|------------------------------------------------------------------------|--------------------------------------------------------|----------------------------|---|-----------------|--------------|-------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            |                                                                        |                                                        | CN & Pin No.               |   | Wire color      | CN & Pin No. |       |                                                   |                                                                                                                                                                                                                                                                                                                      |
| 11         | Flame Detecting Circuit abnormality<br>(initial flame fault detection) | Check the flame rod                                    | CN78                       | 1 | BL - Burnercase | GND          | —     | 10 kHz - 100 kHz                                  | Visually confirm that a flame ignites, check wiring connections to flame rod, and check wiring connections to gas proportioning and gas solenoid valves. Check for a bad contact or a bad connection between flame rod and circuit board, check for a ground fault in the unit, especially the circuit board ground. |
|            |                                                                        | Check the current from the flame rod                   |                            | 1 | BL - Electrode  | Flame Rod    |       | DC 1 $\mu$ A or more                              |                                                                                                                                                                                                                                                                                                                      |
|            |                                                                        | Check for a disconnected ground from the circuit board | —                          | — | —               | —            | —     | —                                                 | Check for damage or improper connection of the ground wire between the circuit board and the metal case of the unit.                                                                                                                                                                                                 |
|            | Gas Supply Pressure or Manifold Pressure Abnormality                   | Check gas supply and manifold pressures                | —                          | — | —               | —            | —     | Refer to "Manifold Pressure Adjustment Procedure" |                                                                                                                                                                                                                                                                                                                      |
|            |                                                                        | Check gas proportioning valve                          | CN101                      | 7 | R - BL          | 6            | CN101 | DC 0.3 - 15 V                                     | Current value changes depending on the load. Proportioning value resistance: 50 - 80 $\Omega$                                                                                                                                                                                                                        |

4. Flame goes out while hot water is being supplied:

| Error Code | Possible Causes                                                                                              | Checkpoint                                                                                                                | Circuit board Check points |            |                 |     | Normal Value | How to Fix Problem and Reset Unit                 |                                                                                                                                                                                                                                                                                                                      |
|------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------|------------|-----------------|-----|--------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            |                                                                                                              |                                                                                                                           | CN & Pin No.               | Wire color | CN & Pin No.    |     |              |                                                   |                                                                                                                                                                                                                                                                                                                      |
| 12         | Flame Rod does not detect flame<br>(Flame fault detection)                                                   | Check the flame rod                                                                                                       | CN78                       | 1          | BL - Burnercase | GND | -            | 10 kHz - 100 kHz                                  | Visually confirm that a flame ignites, check wiring connections to flame rod, and check wiring connections to gas proportioning and gas solenoid valves. Check for a bad contact or a bad connection between flame rod and circuit board, check for a ground fault in the unit, especially the circuit board ground. |
|            |                                                                                                              | Check the current from the flame rod                                                                                      |                            | 1          | BL - Electrode  |     |              | Flame Rod                                         |                                                                                                                                                                                                                                                                                                                      |
|            |                                                                                                              | Check for a disconnected ground from the circuit board                                                                    | —                          | —          | —               | —   | —            |                                                   | Check for damage or improper connection of the ground wire between the circuit board and the metal case of the unit.                                                                                                                                                                                                 |
|            | Gas Solenoid Valve or Gas Supply Pressure or Manifold Pressure Abnormality                                   | Check gas solenoid valve - 1                                                                                              | CN10                       | 9          | BK - BL         | 6   | CN10         | DC 14 - 16 V                                      | Gas Solenoid Valve typical resistance: 36 - 58 $\Omega$                                                                                                                                                                                                                                                              |
|            |                                                                                                              | Check gas solenoid valve - 2                                                                                              | CN10                       | 8          | GY - BL         | 6   | CN10         | DC 14 - 16 V                                      | Gas Solenoid Valve typical resistance: 36 - 58 $\Omega$                                                                                                                                                                                                                                                              |
|            |                                                                                                              | Check gas supply and manifold pressures                                                                                   | —                          | —          | —               | —   | —            | Refer to "Manifold Pressure Adjustment Procedure" |                                                                                                                                                                                                                                                                                                                      |
|            |                                                                                                              | Check gas proportioning valve                                                                                             | CN101                      | 7          | R - BL          | 6   | CN101        | DC 0.3 - 15 V                                     | Current value changes depending on the load. Proportioning value resistance: 50 - 80 $\Omega$                                                                                                                                                                                                                        |
| 29         | Condensate Container clogging (Water Level Electrode) abnormality<br><br><NRC / NCC : Condensing model only> | Check maintenance monitor No. 19                                                                                          | —                          | —          | —               | —   | —            | OFF [000]                                         | If No.19 is ON [001], check the following :<br>Check the drain line is clogged or frozen.<br>Check for proper connection of Condensate Drain Trap water level electrode.<br>Check for short circuit of Condensate Drain Trap water level electrode cord.<br>If normal value, replace the circuit board.              |
| 34         | Thermistor - Scale Detection Abnormality (Note 3)                                                            | Check the resistance through the thermistor.<br>Check for open or short circuit, or improper connection.                  | CN63                       | 6          | W - W           | 2   | CN63         | —                                                 | Check for dropping of Thermistor - Scale Detection on the Heat Exchanger - Primary. Compare to temperature characteristic list (Note 4).<br>Check for open or short circuit or for an improper connection.                                                                                                           |
| 35         | Thermistor - Exhaust Abnormality<br><br><Direct Vent model only>                                             | Check the resistance through the thermistor.<br>Check for open or short circuit, or improper connection.                  | CN63                       | 7          | W - W           | 2   | CN63         |                                                   | Compare to temperature characteristic list (Note 5).<br>Check for open or short circuit or for an improper connection.                                                                                                                                                                                               |
| 91         | Improper gas type                                                                                            | Check gas type of the unit.                                                                                               | —                          | —          | —               | —   | —            | —                                                 | Check whether the supplied gas matches with the installed unit.<br>Confirm the Rating Plate.                                                                                                                                                                                                                         |
| 94         | Exhaust Temperature Abnormality<br><br><Direct Vent model only>                                              | Check the resistance through the thermistor.<br>Check for abnormal combustion.<br>Check flue for blockage or obstruction. | CN63                       | 7          | W - W           | 2   | CN63         |                                                   | Check for heat exchanger pipe clogging.<br>Check for heat exchanger fin blockage.<br>Check for intake water temperature. (too high?)                                                                                                                                                                                 |

Note 3) The following models have "Thermistor - Scale Detection".  
•NRC111OD(GQ-C3257WX US) , NRC111DV(GQ-C3257WX-FF US)  
•NR98OD(GQ-2857WX US) , NR98DVC(GQ-2857WX-FFA US) , NR98SV(GQ-2857WX-F US)  
•NCC199OD(GQ-C3257WZ US) , NCC199DV(GQ-C3257WZ-FF US)  
•NC199OD(GQ-2857WZ US) , NCC199DVC(GQ-2857WZ-FFA US)

| Note 4) Thermistor - Scale Detection Temperature Characteristics |     |     |     |      |     |     |
|------------------------------------------------------------------|-----|-----|-----|------|-----|-----|
| Temperature (°F)                                                 | 77  | 122 | 167 | 212  | 257 | 302 |
| Temperature (°C)                                                 | 25  | 50  | 75  | 100  | 125 | 150 |
| Resistance (k $\Omega$ )                                         | 280 | 86  | 31  | 13.0 | 6.1 | 3.1 |
| Voltage (V)                                                      | 4.9 | 4.6 | 4.1 | 3.3  | 2.4 | 1.6 |

| Note 5) Thermistor - Exhaust Temperature Characteristics |     |     |     |      |      |      |
|----------------------------------------------------------|-----|-----|-----|------|------|------|
| Temperature (°F)                                         | -4  | 14  | 32  | 50   | 68   | 86   |
| Temperature (°C)                                         | -20 | -10 | 0   | 10   | 20   | 30   |
| Resistance (k $\Omega$ )                                 | 487 | 296 | 162 | 98.3 | 61.4 | 39.5 |
| Voltage (V)                                              | 4.6 | 4.3 | 3.9 | 3.4  | 2.8  | 2.3  |

5. Fan does not begin rotating, or the fan rotation is abnormal when hot water is being demanded:

| Error Code | Possible Causes       | Checkpoint                                                                                                                                                                               | Circuit board Check points |            |              |   | Normal Value | How to Fix Problem and Reset Unit |                                                                                                                                                                                                                                                                                                                                                               |
|------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------|--------------|---|--------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            |                       |                                                                                                                                                                                          | CN & Pin No.               | Wire color | CN & Pin No. |   |              |                                   |                                                                                                                                                                                                                                                                                                                                                               |
| 61         | Fan Motor abnormality | Check that the fan is rotating and check the pulse frequency from the fan rotational frequency sensor.<br>Check for improper connection of the fan.<br>Check voltage from circuit board. | CN27                       | 4          | BR - BL      | 2 | CN27         | DC 7 - 45 V                       | Confirm the measured fan speed by Maintenance Monitor (No.10).<br>If the fan motor does not rotate, but voltage is normal, then the fan motor should be replaced. If the voltage is abnormal, replace the circuit board.<br>If the fan motor is rotating and if the voltage is normal, but there is a "61" error code, then the fan motor should be replaced. |
|            |                       |                                                                                                                                                                                          |                            | 1          | R - BL       | 2 |              | DC 10 - 14 V                      |                                                                                                                                                                                                                                                                                                                                                               |
|            |                       |                                                                                                                                                                                          |                            | 3          | Y - BL       | 2 |              | 100 Hz - 400 Hz                   |                                                                                                                                                                                                                                                                                                                                                               |

<During Regular Operation>

6. Temperature control problem:

| Error Code    | Possible Causes                                             | Checkpoint                                                                                         | Circuit board Check points |            |              |    | Normal Value | How to Fix Problem and Reset Unit                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------|------------|--------------|----|--------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |                                                             |                                                                                                    | CN & Pin No.               | Wire color | CN & Pin No. |    |              |                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| No Indication | Gas supply pressure or manifold pressure abnormality        | Check gas supply and manifold pressures.                                                           | —                          | —          | —            | —  | —            | Refer to "Manifold Pressure Adjustment Procedure" |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 65            | Water Servo - Main Abnormality                              | Check that the water servo - main is functioning.<br>Check for improper connection of the valve.   | CN38                       | 23         | W - O        | 16 | CN38         | DC 1 - 16 V                                       | During Operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|               |                                                             |                                                                                                    |                            | 23         | W - G        | 18 |              | DC 1 - 16 V                                       | During Operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|               |                                                             |                                                                                                    |                            | 23         | W - V        | 20 |              | DC 1 - 16 V                                       | During Operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|               |                                                             |                                                                                                    |                            | 23         | W - BK       | 24 |              | DC 1 - 16 V                                       | During Operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|               |                                                             |                                                                                                    |                            | 6          | Y - BK       | 17 |              | DC 1V or less                                     | When valve is fully open.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 66            | Water Servo - Bypass Abnormality                            | Check that the water servo - bypass is functioning.<br>Check for improper connection of the valve. | CN38                       | 23         | W - O        | 25 | CN38         | DC 1 - 16 V                                       | During Operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|               |                                                             |                                                                                                    |                            | 23         | W - G        | 26 |              | DC 1 - 16 V                                       | During Operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|               |                                                             |                                                                                                    |                            | 23         | W - V        | 27 |              | DC 1 - 16 V                                       | During Operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|               |                                                             |                                                                                                    |                            | 23         | W - BK       | 28 |              | DC 1 - 16 V                                       | During Operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|               |                                                             |                                                                                                    |                            | 8          | R - BK       | 17 |              | DC 1V or less                                     | When valve is fully open.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 16            | Abnormally High Output Temperature (temperature is too hot) | Check the resistance of the thermistor - hot water.                                                | CN63                       | 1          | W - W        | 2  | CN63         | DC 1 - 4.5 V                                      | 1. If the thermistor - heat exchanger temp. is 210°F and over for one second with the all set temp.<br>2. If the thermistor - hot water temp. is 203°F and over for two seconds with the set temp. 170°F and more.<br>3. If the thermistor - hot water temp. is 194°F and over for two seconds with the set temp. less than 170°F.<br>4. If the thermistor - hot water temp. is (set temp. + 18°F) and over for 25 seconds with the set temp. more than 122°F.<br>5. If the thermistor - hot water temp. is 140°F and over for 4 seconds with the set temp. 122°F and less.<br>The unit will shut off and a 16 error code will flash. |
|               |                                                             | Check gas proportioning valve.                                                                     | CN101                      | 7          | R - BL       | 6  | CN101        | DC 0.3 - 15 V                                     | Check for short or open circuit or improper connection of wiring to valve.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

<Multi-system only>

| Error Code | Possible Causes                  | Checkpoint                                         |
|------------|----------------------------------|----------------------------------------------------|
| F76        | Multi-system communication error | Check for proper connection of Quick Connect Cord. |

<Abnormalities due to Scale Build-up>

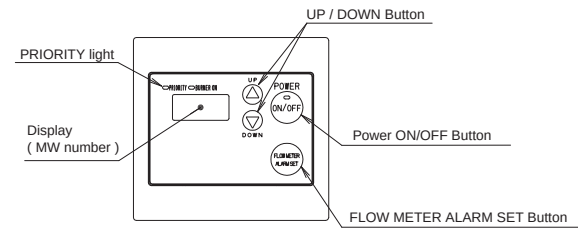
| Error Code            | Possible Causes                                                                                         | Checkpoint                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C1# ~ C4#<br>(Note 6) | Detect Scale Build-up in the Heat Exchanger - Primary.<br>(Warning indication, and then Unit shuts off) | Flush the Heat Exchanger to remove the Scale Build-up. Refer to the "Procedure for Flushing the Heat Exchanger" in the Parts List inside pocket of the front cover or Installation Manual.<br>If the Heat Exchanger is not flushed, the unit will repeat the warning indication and then shut off. The unit is locked before long.<br>The unit can temporarily operate by reconnecting electrical power until the Heat Exchanger is flushed.<br>Please contact Noritz America for more information about flushing the Heat Exchanger. |
| CF#<br>(Note 6)       | Detect Scale Build-up in the Heat Exchanger - Primary.<br>(Unit is locked)                              | The unit is locked because of repeated Scale Build-up error code.<br>Must flush the Heat Exchanger to remove the Scale Build-up.<br>Before flushing the Heat Exchanger, please contact Noritz America for more information.                                                                                                                                                                                                                                                                                                           |

Note 6) # = 1, 2, 3, 4, 5, 6, 7, 8, 9

<How to reset the lock of the unit (for error code 99)>

- 1. Make sure the remote controller is off (completely blank). If it is ON, turn it OFF and wait for 10 seconds.
- 2. ...then disconnect electrical power.
- 3. Wait 10 seconds and reconnect power. Leave the remote controller off.
- 4. With the remote controller blank, hold the up button until the display blinks “99”.  
You are now in the maintenance writer ( MW ) mode and can scroll through the MWs using the UP and DOWN buttons.

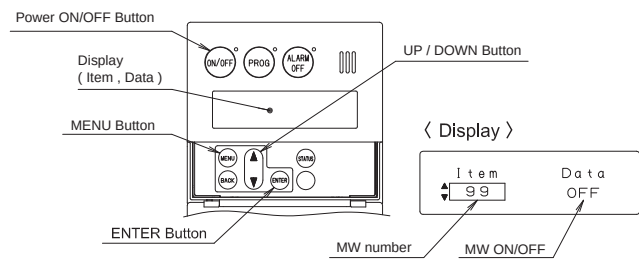
[ Type A ]



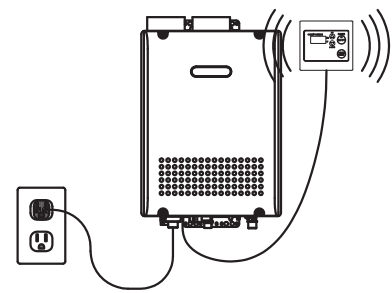
[ Remote Controller Type A ]  
For each MW the PRIORITY light will either be on, indicating that the MW is ON, or off, indicating the MW is OFF. Toggle the MW by pressing the FLOW METER ALARM SET button.

[ Remote Controller Type B ]  
Use the UP or DOWN button to change the “ Item ” number or “ Data ” ON or OFF. Press the “ Enter ” button to select “ Item ” or “ Data ”.

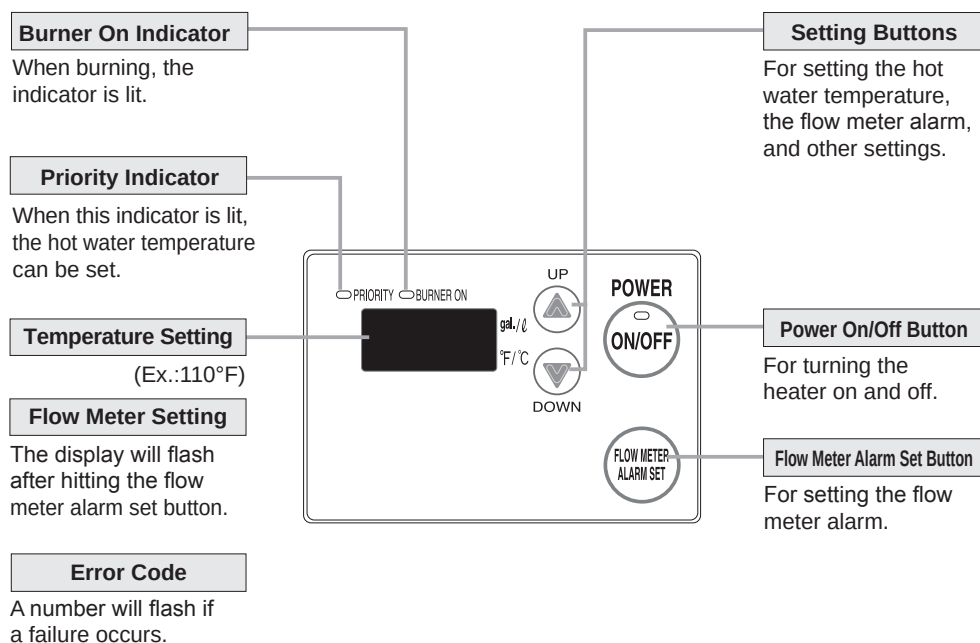
[ Type B ]



- 5. Turn MWs “3F” OFF.  
(If the unit is flashing error code 99, MW “3F” will be ON)
- 6. Once complete, hold the UP and DOWN buttons together for five seconds until the remote controller starts beeping rapidly.  
This is the signal that the changes to the MWs have been saved and the unit is ready for use.



## ■ Remote controller (RC-7651M)

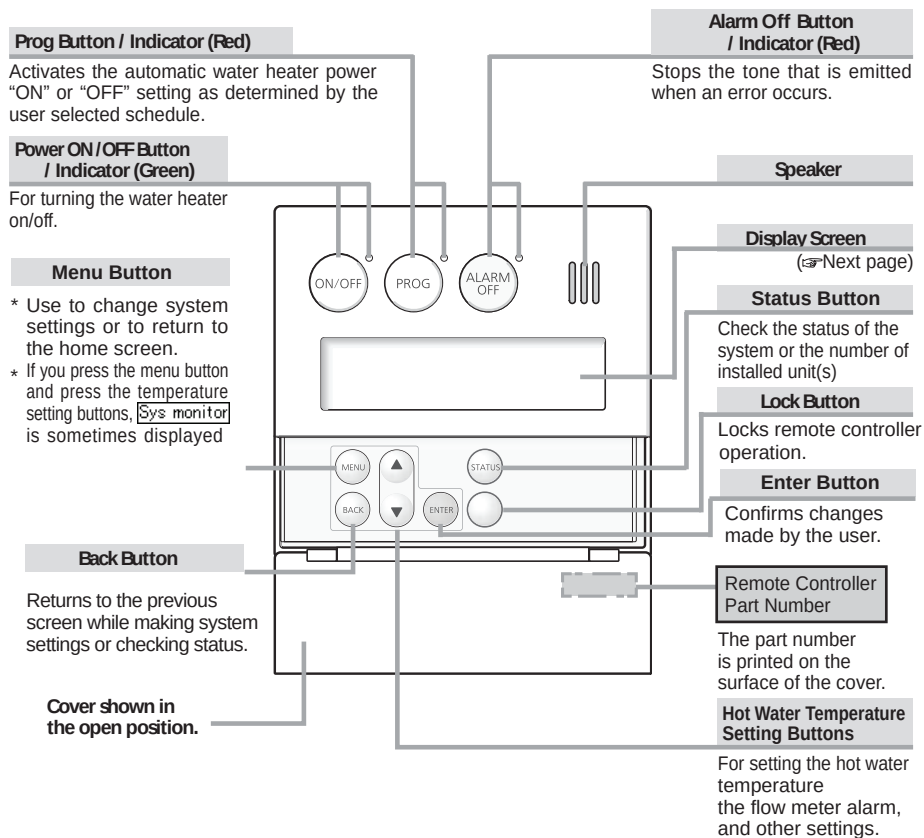


\* Before use, remove the protective sheet from the operation panel surface.

Note: As shipped from the factory, the remote controller is set to display in °F and gallons.  
To adjust the display to °C and liters, refer to the "Remote Controller" section for details.

## ■ Remote controller (RC-9018M)

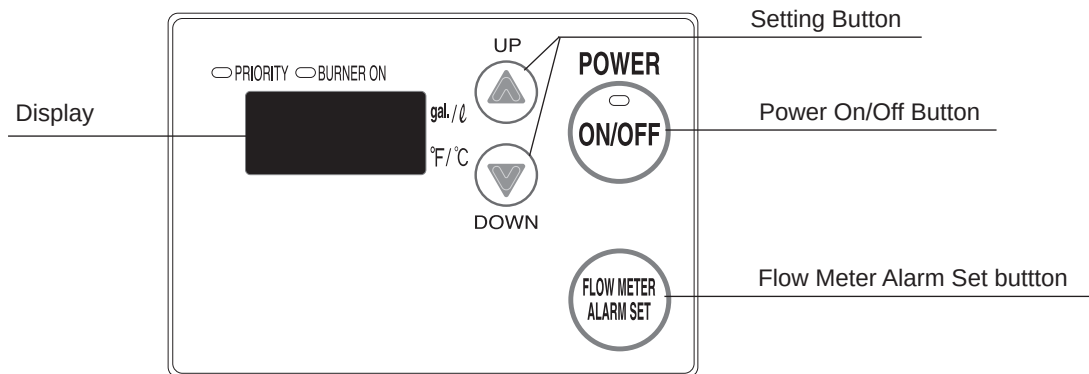
The remote controller will emit a tone when a button is pressed.





## ■ Remote Controller

### RC-7651M



## ■ Adjusting the Temperature Display

Note: The setting must be done within the first 10 minutes of connecting electrical power to the water heater.

1. Turn the water heater off by pressing the Power On/Off Button on the remote controller.
2. Disconnect, then reconnect electrical power to the water heater.
3. Press the Flow Meter Alarm Set Button and hold it in for 2 seconds or more.
4. Press the Flow Meter Alarm Set Button until the remote controller displays item number "12".
5. Press Setting Button "▲" for 5 seconds or more to change the display units to °F.
6. Press Setting Button "▼" for 5 seconds or more to change the display units to °C.
7. To confirm the setting, turn the water heater on by pressing the Power On/Off Button on the remote controller.

## ■ Displaying Maintenance Monitors

### <Display Procedure>

1. Press and hold both the up [▲] and down [▼] setting buttons simultaneously for more than two seconds.  
This can be done regardless of whether the power has been turned on or the unit is operating.

### <Indications>

1. The maintenance monitor data no. will appear on the display for two seconds, and then the data will appear.
2. In order to switch to other maintenance monitor data, press either the up or down button once. The data no. will then reappear, then different data nos. can be selected using the up [▲] and [▼] down buttons. When the maintenance monitor data no. is changed, the data no. will be displayed for two seconds, after which the data will appear.
3. With the remote controller in maintenance mode, the hot water set temperature and flow meter alarm cannot be adjusted.

### <Returning to Normal Mode>

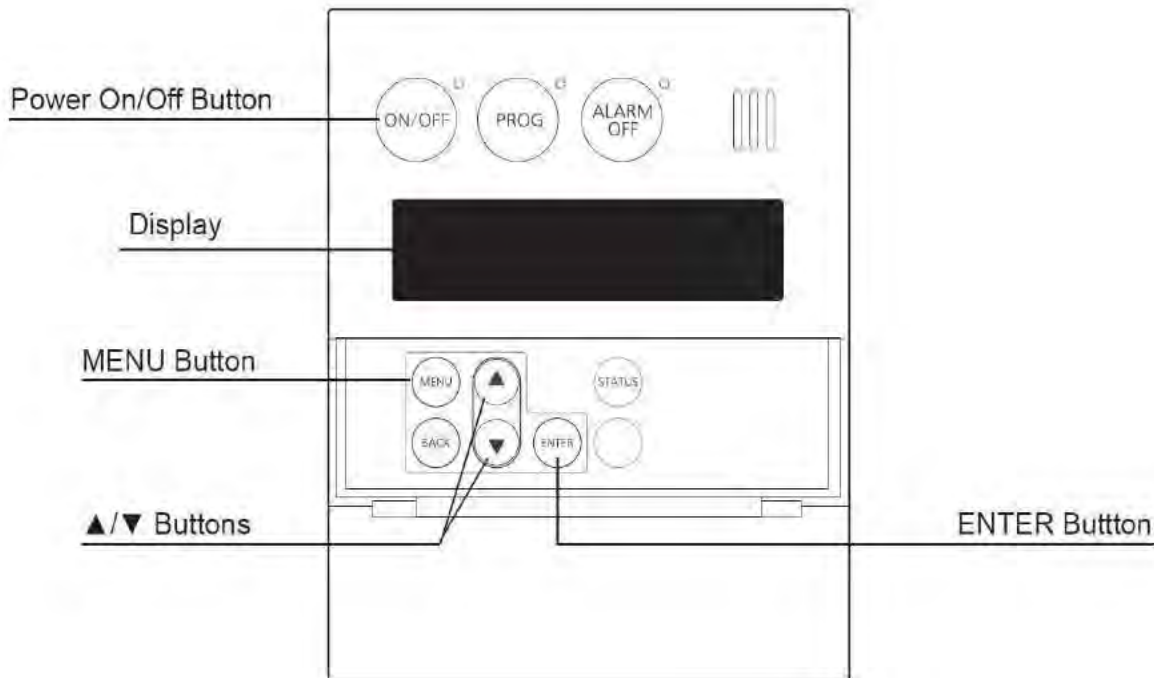
1. For releasing the indication, press and hold both [▲] and [▼] of the setting button simultaneously more than two seconds, or leave it alone for more than 10 minutes.

### <Clearing Error Codes from Memory>

When the power is OFF, press and hold the down [▼] button for more than 5 seconds.



■ Remote Controller  
RC-9018M



■ Adjusting the Temperature Display

Note: The setting must be done within the first 10 minutes of connecting electrical power to the water heater.

1. Turn the water heater off by pressing the Power On/Off Button on the remote controller.
2. Disconnect, then reconnect electrical power to the water heater.
3. Press the MENU Button inside the cover, select "Initial settings" using the ▲/▼ Buttons.
4. Press the ENTER button, the "Initial settings" screen appears on the display.
5. Select "[°F / gal] ⇄ [°C / L]" using the ▲/▼ Buttons.
6. Press the ENTER Button and select either [°F / g al] or [°C / L] using the ▲/▼ Buttons.
7. Press the ENTER Button, "Set complete Please wait..." appears on the display for 5 seconds and then the "Initial settings" screen appears on the display.
8. To confirm the setting, turn the water heater on by pressing the Power On/Off Button on the remote controller.

■ Displaying Maintenance Monitors

<Display Procedure>

1. Press and hold both the up [▲] and down [▼] setting buttons simultaneously for more than 5 seconds. This can be done regardless of whether the power has been turned on or the unit is operating.

<Indications>

1. [Unit No.], [Item(Data) No.], [Data] will appear on the display.
2. Different Item(Data) No. can be selected using the up [▲] or down [▼] buttons.
3. With the remote controller in maintenance mode, the hot water set temperature and other functions cannot be adjusted.

<Returning to Normal Mode>

1. For releasing the indication, press and hold both [▲] and [▼] of the setting button simultaneously more than 2 seconds, or leave it alone for more than 10 minutes.

<Clearing Error Codes from Memory>

When the power is OFF, press and hold the down [▼] button for more than 5 seconds.

# Maintenance Monitor List

To view the maintenance monitors of another unit in a Quick Connect Multi-System installation, press the "Flow Meter Alarm Set Button" (while in monitor mode)" to switch to the desired unit.

| Data No. | Item                                            | Data<br>(Display Reading x Multiplier)                                                                          |         | Minimum Value for Indication | Remarks                                                                                                                                                                                                                                                                                            |
|----------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                                                 | Multiplier                                                                                                      | Unit    |                              |                                                                                                                                                                                                                                                                                                    |
| 02       | Gas quality judging result                      | Judging [000] , NG_Lo [1100] , NG_Hi [1300] , NG_Lo_fix (Dip fixation) [1109] , NG_Hi_fix (Dip fixation) [1309] |         |                              |                                                                                                                                                                                                                                                                                                    |
| 03       | Total Plug-in Time                              | X 100                                                                                                           | hour    | 100 hour                     | Disp. Range [000] - [1310]                                                                                                                                                                                                                                                                         |
| 04       | Total Combustion Time                           | X 1                                                                                                             | hour    | 1 hour                       | Disp. Range [000] - [999]                                                                                                                                                                                                                                                                          |
| 05       | Total Combustion Time                           | X 1000                                                                                                          | hour    | 1000 hour                    | Disp. Range [000] - [1999]                                                                                                                                                                                                                                                                         |
| 07       | Number of Ignition Times                        | X 10                                                                                                            | time    | 10 times                     | Disp. Range [000] - [999]                                                                                                                                                                                                                                                                          |
| 08       | Number of Ignition Times                        | X 10000                                                                                                         | time    | 10000times                   | Disp. Range [000] - [1999]                                                                                                                                                                                                                                                                         |
| 10       | Fan Rotational Frequency                        | X 10                                                                                                            | rpm     | 25 rpm                       |                                                                                                                                                                                                                                                                                                    |
| 11       | Service Reminder Hours Accumulated              | X 1                                                                                                             | time    | 1 hour                       | Disp. Range [000] - [999]                                                                                                                                                                                                                                                                          |
| 12       | Service Reminder Hours Accumulated              | X 1000                                                                                                          | time    | 1000 hour                    | Disp. Range [000] - [65]                                                                                                                                                                                                                                                                           |
| 14       | Total Flow Rate                                 | X 0.1                                                                                                           | gal/min | 0.1 gal/min                  | *2                                                                                                                                                                                                                                                                                                 |
|          |                                                 | X 0.1                                                                                                           | L/min   | 0.1 L/min                    | *3                                                                                                                                                                                                                                                                                                 |
| 18       | Output (%)                                      | X 1                                                                                                             | %       | 1 %                          |                                                                                                                                                                                                                                                                                                    |
| 19       | Condensate Container clogging                   |                                                                                                                 |         |                              |                                                                                                                                                                                                                                                                                                    |
| 20       | Calculated Fan Speed                            | X 10                                                                                                            | rpm     | 25 rpm                       | OFF [000] , ON [001] *1                                                                                                                                                                                                                                                                            |
| 29       | Reason why the unit does not run.               | --                                                                                                              | --      | --                           | [001] : Water inlet temperature is too high<br>→ If possible decrease water inlet temperature<br>[002] : Calculated water outlet temperature is too high<br>→ If possible increase flow rate<br>[004] : Inlet and Outlet temperature are reversed<br>→ Check the pipes and re-install it correctly |
| 30       | Thermistor-Cold Water Detection Temperature     | X 1                                                                                                             | °F      | 1°F                          | *2                                                                                                                                                                                                                                                                                                 |
|          |                                                 | X 0.1                                                                                                           | °C      | 0.5°C                        | *3                                                                                                                                                                                                                                                                                                 |
| 31       | Thermistor-Hot Water Detection Temperature      | X 1                                                                                                             | °F      | 1°F                          | *2                                                                                                                                                                                                                                                                                                 |
|          |                                                 | X 0.1                                                                                                           | °C      | 0.5°C                        | *3                                                                                                                                                                                                                                                                                                 |
| 32       | Thermistor-Heat Exchanger Detection Temperature | X 1                                                                                                             | °F      | 1°F                          | *2                                                                                                                                                                                                                                                                                                 |
|          |                                                 | X 0.1                                                                                                           | °C      | 0.5°C                        | *3                                                                                                                                                                                                                                                                                                 |
| 35       | Thermistor-Scale Detection Temperature          | X 1                                                                                                             | °F      | 1°F                          | *2                                                                                                                                                                                                                                                                                                 |
|          |                                                 | X 1                                                                                                             | °C      | 1°C                          | *3                                                                                                                                                                                                                                                                                                 |
| 36       | Thermistor-Exhaust Detection Temperature        | X 1                                                                                                             | °F      | 1°F                          | *2                                                                                                                                                                                                                                                                                                 |
|          |                                                 | X 1                                                                                                             | °C      | 1°C                          | *3                                                                                                                                                                                                                                                                                                 |
| 38       | Thermistor-Air Detection Temperature            | X 1                                                                                                             | °F      | 1°F                          | Disp. Range [014] - [050] *2                                                                                                                                                                                                                                                                       |
|          |                                                 | X 1                                                                                                             | °C      | 1°C                          | Disp. Range [-10] - [010] *3                                                                                                                                                                                                                                                                       |
| 39       | Fan Motor Current Valve                         | X 1                                                                                                             | mA      | 1mA                          | Disp. Range [000] - [1999]                                                                                                                                                                                                                                                                         |
| 47       | Simple Self-diagnosis Counter                   | [0:xx]                                                                                                          | Decimal |                              | [000] - [036]                                                                                                                                                                                                                                                                                      |
| 48       | Initial Fan Speed Correction                    | X 1                                                                                                             | %       | 1%                           | [100] - [110]                                                                                                                                                                                                                                                                                      |
| 49       | Final Fan Speed Correction                      | X 1                                                                                                             | %       | 1%                           | [100] - [110]                                                                                                                                                                                                                                                                                      |
| 50       | FF No.                                          | X 0.1                                                                                                           |         | 0.1                          |                                                                                                                                                                                                                                                                                                    |
| 51       | FF+FB No.                                       | X 0.1                                                                                                           |         | 0.1                          |                                                                                                                                                                                                                                                                                                    |
| 52       | Output                                          | X 0.1                                                                                                           |         | 0.1                          |                                                                                                                                                                                                                                                                                                    |
| 60       | Position of Water Servo-Main                    | X 2                                                                                                             | Step    |                              | [000](open) - [1350](closed)                                                                                                                                                                                                                                                                       |
| 62       | Position of Water Servo-Bypass                  | X 2                                                                                                             | Step    |                              | [000](open) - [1350](closed)                                                                                                                                                                                                                                                                       |
| 80       | Remaining Time of Scale Flushing                | X 1                                                                                                             | minute  | 1 minute                     | [060] - [000]                                                                                                                                                                                                                                                                                      |
| 87       | Circuit Board ID1: Product 1                    | [1:xy]                                                                                                          |         |                              | A=101,B=102,C=103, . . . , Z=126                                                                                                                                                                                                                                                                   |
| 88       | Circuit Board ID2: Product 2                    | [2:xy]                                                                                                          |         |                              | A=201,B=202,C=203, . . . , Z=226                                                                                                                                                                                                                                                                   |
| 89       | Circuit Board ID3: Version                      | [3:xy]                                                                                                          |         |                              | A=301,B=302,C=303, . . . , Z=326                                                                                                                                                                                                                                                                   |
| 91       | Error Code History 1                            | Most Recent Error Code                                                                                          |         |                              | *4<br><br>If the same error code is repeated, it will appear in the history list twice. If it repeated more than twice, it will only appear twice.                                                                                                                                                 |
| 92       | Error Code History 2                            | Next Most Recent Error Code                                                                                     |         |                              |                                                                                                                                                                                                                                                                                                    |
| 93       | Error Code History 3                            | Next Most Recent Error Code                                                                                     |         |                              |                                                                                                                                                                                                                                                                                                    |
| 94       | Error Code History 4                            | Next Most Recent Error Code                                                                                     |         |                              |                                                                                                                                                                                                                                                                                                    |
| 95       | Error Code History 5                            | Next Most Recent Error Code                                                                                     |         |                              |                                                                                                                                                                                                                                                                                                    |
| 96       | Error Code History 6                            | Next Most Recent Error Code                                                                                     |         |                              |                                                                                                                                                                                                                                                                                                    |
| 97       | Error Code History 7                            | Next Most Recent Error Code                                                                                     |         |                              |                                                                                                                                                                                                                                                                                                    |
| 98       | Error Code History 8                            | Next Most Recent Error Code                                                                                     |         |                              |                                                                                                                                                                                                                                                                                                    |

\*1 A difference in the calculated (#20) and the measured (#10) fan speeds of 500 or less is normal

\*2 When Remote Controller is in °F/Gallons mode.

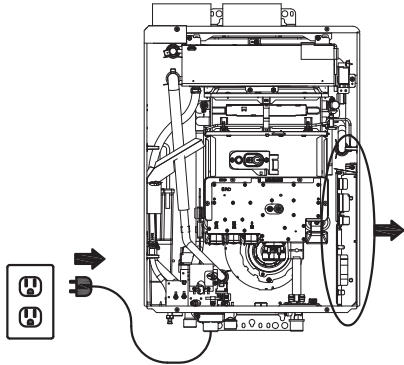
\*3 When Remote Controller is in °C/Liters mode.

\*4 When using RC-9018M, [Data No. 91-98] are displayed [Error record / 1-8].

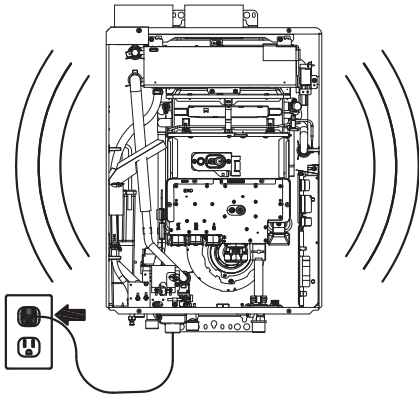
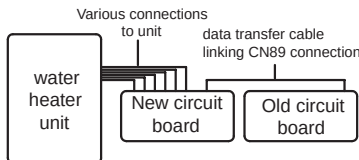
# Circuit Board Replacement Procedure

When swapping in a new circuit board, the new circuit board needs to be programmed.  
Failure to successfully program the circuit board will result in a 73 error code.  
Typically this programming can be done with a data transfer from the old circuit board to the new circuit board.  
Even a damaged circuit board can usually transfer data properly.  
Always attempt to transfer the data first, and if unsuccessful, retry the data transfer procedure.  
If the data transfer is still unsuccessful, follow the procedure for manual programming on the next page.

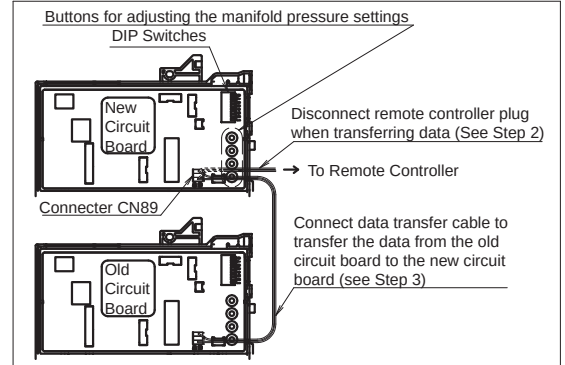
## 1. Data Transfer Procedure



( for illustration only )



1. Make sure the remote is off ( completely blank ). If it is ON, turn it OFF and wait for 10 seconds.
2. ...then disconnect electrical power.
3. Remove old circuit board out of the unit and transfer all electrical connections to the new circuit board.  
...except connector CN89 which should be left unplugged.



4. Use the blue and white data transfer cable supplied with the new circuit board to connect the CN89 connection from the old circuit board to the new one.
5. Connect power and wait about 30 seconds to a minute.  
The unit will signal a successful data transfer by spinning the fan and opening and closing the gas valve for about 3 minutes.

if you get a successful data transfer: disconnect electrical power to the unit, disconnect the data transfer cable and reconnect the original CN89 connector.

The circuit board can now be mounted back into the unit.

Note: (If you disconnected any wires to pull out the circuit board, make sure to reconnect all wires)

Manifold pressures should be checked with a digital manometer and adjusted if necessary.

Refer to the "Setting list for MW settings and Gas manifold pressures" on the next page.

If you fail to get a successful data transfer,  
refer to the reverse side for Manual Programming.

## 2. DIP Switch Settings

\*Disconnect the electrical power to the unit before adjusting DIP Switches.

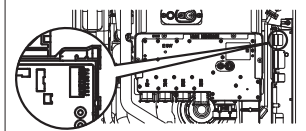
Dip Switch Settings are set to the same as the old circuit board.

The following settings can be adjusted using the DIP Switches.

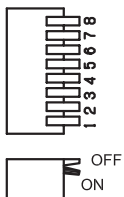
1. By setting DIP Switches 1 and 2, the unit can be programmed to different default temperatures if the remote controller is removed.
2. (Direct Vent model ; DV model) By setting DIP switch 3, the intake air supply can be set to direct vent (DV) or non-direct vent (SV).
3. By setting DIP Switches 5 and 6, adjustments can be made for high elevation installation.
4. By setting DIP Switches 7 and 8, adjustments can be made for extended vent length installations.

Refer to the "Setting list for DIP Switches" table for details.

Location of  
DIP Switches



[ DIP Switches ]



Setting list for DIP Switches

( ● : ON ○ : OFF )

| SW1                         |   | SW2   | SW3                                                         |                   | SW5                     |   | SW6                       |  | SW7                                          |   | SW8                                                  |                |
|-----------------------------|---|-------|-------------------------------------------------------------|-------------------|-------------------------|---|---------------------------|--|----------------------------------------------|---|------------------------------------------------------|----------------|
| Default temperature setting |   |       | Intake air supply type <sup>*1</sup><br>(Indoor model only) |                   | Elevations above 2000ft |   |                           |  | Vent Length Adjustment                       |   |                                                      |                |
|                             |   |       |                                                             |                   |                         |   |                           |  | Direct Vent model <sup>2</sup><br>(DV model) |   | Concentric exhaust model <sup>3</sup><br>(DVC model) |                |
| 1                           | 2 |       | 3                                                           | Intake air supply | 5                       | 6 | High Elevation Adjustment |  | 7                                            | 8 |                                                      |                |
| ○                           | ○ | 120°F | ○                                                           | Outdoor           | ○                       | ○ | 0~2000ft (0~610m)         |  | ○                                            | ○ | 3" Short                                             | Minimum length |
| ●                           | ○ | 125°F | ●                                                           | Indoor            | ●                       | ○ | 2001~4000ft (611~1220m)   |  | ●                                            | ○ | 3" Long                                              | Short length   |
| ○                           | ● | 130°F |                                                             |                   | ○                       | ● | 4001~6000ft (1221~1830m)  |  | ○                                            | ● | 4" Short                                             | Long length    |
| ●                           | ● | 140°F |                                                             |                   | ●                       | ● | 6001~8000ft (1831~2440m)  |  | ●                                            | ● | 4" Long                                              | Maximum length |

\*1 : Indoor model only when using an "SV conversion Kit".

\*2 : NRC98DV

DIP Switches 7 and 8 need to be adjusted for extended exhaust vent lengths when using "SV conversion Kit".

\*3 : NR83DVC

Note) The unit is fixed to the minimum combustion point if you change SW4 to ON. It is possible to cause trouble, do not change this dipswitch.

## Manual Programming

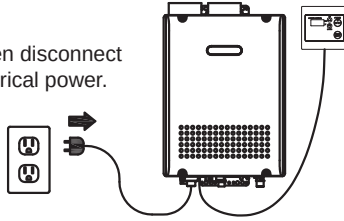
This procedure will require the remote controller.  
Make sure the circuit board is completely connected including connector CN89.

GQ-2857WX(-FFA, -F) US [NR98 (DVC/OD/SV)]  
GQ-2857WZ(-FF) US [NC199 (DV/OD)]  
GQ-C3257WX (-FF) US [NRC111(DV/OD)]  
GQ-C3257WZ (-FF) US [NCC199 (DV/OD)]

If connected, in a multi unit configuration undo the System Controller connections or Quick Connect Cord.  
After Manual Programming, make sure all connections are made before completing initial circuit board settings.

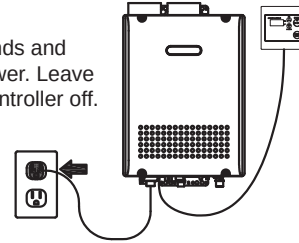
1. Make sure the remote controller is off (completely blank). If it is ON, turn it OFF and wait for 10 seconds.

2. ...then disconnect electrical power.



[ Type A ]

3. Wait 10 seconds and reconnect power. Leave the remote controller off.



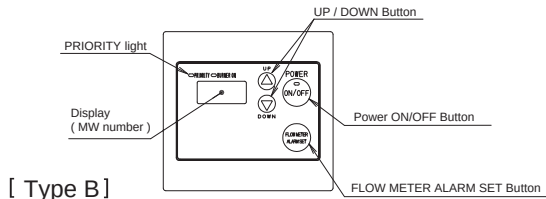
4. With the remote controller blank, hold the up button until the display blinks "99". You are now in the maintenance writer ( MW ) mode and can scroll through the MWs using the UP and DOWN buttons.

[ Remote Controller Type A ]

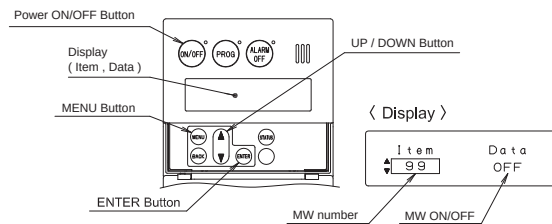
For each MW the PRIORITY light will either be on, indicating that the MW is ON, or off, indicating the MW is OFF.

[ Remote Controller Type B ]

Use the UP or DOWN button to change the " Item " number or " Data " ON or OFF. Press the " Enter " button to select " Item " or " Data " .



[ Type B ]



- a) Turn MWs "15", "34", "3B" and "3E" ON.
- b) If your unit is GQ-C3257WX-FF US (NRC111DV) or GQ-C3257WX-FF US (NCC199DV) turn MW "1B" ON.
- c) If you unit is GQ-C3257WZ US (NCC199OD) or GQ-C3258WZ-FF US (NCC199OD) GQ-2857WZ US (NC199OD) or GQ-2857WZ-FFA US (NC199DVC) turn MW "35" ON.
- d) Turn MWs "FC" and "FE" ON and press the UP or DOWN button. (Display blinks with "A0") Configure the remaining MWs according to the chart below based on your unit's model and gas type

( Type B remote only

After completing the setting, press the "ENTER" button to select "Item". )

Setting list for MW settings and Gas manifold pressure (Check the rating plate for model and gas type)

| Model            | Gas type | Circuit board MW setting (●:ON ○:OFF) |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  | Manifold Pressure (inch H <sub>2</sub> O) Cover off                        |           |
|------------------|----------|---------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|--|--|----------------------------------------------------------------------------|-----------|
|                  |          | A1                                    | A5 | A6 | A7 | A8 | A9 | AA | AB | AD | AE | B0 | B1 | B2 | C7 |  |  | Max value                                                                  | Min value |
| GQ-C3257WX US    | Natural  | ●                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 3.05                                                                       | 1.35      |
| NRC111OD         | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 3.40                                                                       | 1.45      |
| GQ-C3257WX-FF US | Natural  | ●                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 3.20                                                                       | 1.50      |
| NRC111DV         | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 3.70                                                                       | 1.50      |
| GQ-C3257WZ US    | Natural  | ●                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 3.05                                                                       | 1.35      |
| NCC199OD         | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 3.40                                                                       | 1.45      |
| GQ-C3257WZ-FF US | Natural  | ●                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 3.20                                                                       | 1.50      |
| NCC199DV         | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 3.70                                                                       | 1.50      |
| GQ-2857WX US     | Natural  | ●                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 2.75                                                                       | 1.25      |
| NR98OD           | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 4.20                                                                       | 1.80      |
| GQ-2857WX-FFA US | Natural  | ●                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | Refer to the "Setting list for gas manifold pressures (NR98DVC/NC199DVC) " |           |
| NR98DVC          | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  |                                                                            |           |
| GQ-2857WX-F US   | Natural  | ●                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 2.60                                                                       | 1.20      |
| NR98SV           | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 4.15                                                                       | 1.80      |
| GQ-2857WZ US     | Natural  | ●                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 2.75                                                                       | 1.25      |
| NC199OD          | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | 4.20                                                                       | 1.80      |
| GQ-2857WX-FFA US | Natural  | ●                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  | Refer to the "Setting list for gas manifold pressures (NR98/NC199DVC) "    |           |
| NC199DVC         | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |  |  |                                                                            |           |

Setting list for Gas manifold pressure (NR98DVC/NC199DVC)

| Manifold Pressure (inch H <sub>2</sub> O) Cover off |                |           |              |           |             |           |                |           |
|-----------------------------------------------------|----------------|-----------|--------------|-----------|-------------|-----------|----------------|-----------|
| Vent length adjustment                              | DIP7=OFF       | DIP8=OFF  | DIP7=ON      | DIP8=OFF  | DIP7=OFF    | DIP8=ON   | DIP7=ON        | DIP8=ON   |
|                                                     | Minimum length |           | Short length |           | Long length |           | Maximum length |           |
| Gas type                                            | Max value      | Min value | Max value    | Min value | Max value   | Min value | Max value      | Min value |
| Natural                                             | 2.90           | 1.35      | 2.85         | 1.35      | 2.80        | 1.30      | 2.75           | 1.30      |
| LPG                                                 | 3.25           | 1.45      | 3.15         | 1.40      | 3.10        | 1.40      | 3.05           | 1.35      |

5. Once complete, hold the UP and DOWN buttons together for five seconds until the remote controller starts beeping rapidly.
6. Check manifold pressures with a digital manometer and adjust if necessary.

## Remote Controller Settings ( Remote controller Type B only )

1. After turning off the POWER ON/OFF button, press the "MENU" button and select "Misc settings" by pressing the UP or DOWN button. The "Misc settings" screen appears by pressing the "ENTER" button again.
2. Select "Default all settings" by pressing the UP or DOWN button, and then press the "ENTER" button. "Default all settings now?" appears on the screen.
3. Select "Yes" by pressing the UP or DOWN button.
4. Confirm the settings by pressing and holding the "ENTER" button for 5 sec. To return to the home screen, press the "MENU" button or let it sit for approximately 20 sec.

Commercial model ("NCC \* \*" and "NC \* \*" series)

5. Within the first ten minutes of connecting electrical power, before turning on the POWER ON/OFF button, press the "MENU" button on the remote controller and select "Initial settings" by pressing the "▲" or "▼" button. If the unit does not go into "Initial settings" mode, unplug the unit and try again.
6. Change "Save backlight" from "Normal" to "On".
7. To return to the home screen, press the "MENU" button or let it sit for approximately 20 sec.

GQ-2457WS (-FFA) US [NR83 (DVC/OD)]  
GQ-C2857WS (-FF) US [NRC98 (DV/OD)]

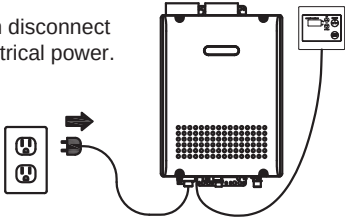
Manual Programming

This procedure will require the remote controller.  
Make sure the circuit board is completely connected including CN89.

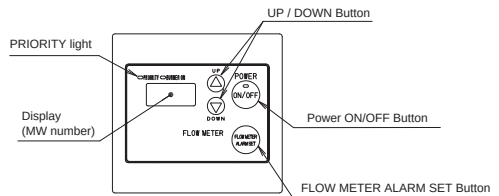
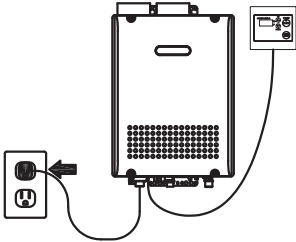
If connected, in a multi unit configurations undo System Controller connections or Quick Connect Cord.  
After Manual Programming, make sure all connections are made before completing the initial circuit board settings.

1. Make sure the remote controller is off (completely blank), If it is ON, turn it OFF and wait for 10 seconds.

2. ...then disconnect electrical power.



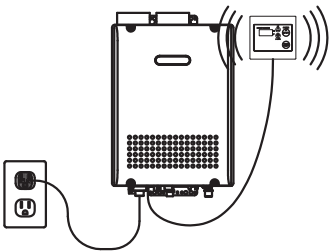
3. Wait for 10 seconds and reconnect power. Leave the remote controller off.



4. With the remote controller blank, hold the up button until the display blinks "99".  
You are now in the maintenance writer (MW) mode and can scroll through the MWs using the UP and DOWN buttons.  
For each MW the PRIORITY light will either be on, indicating the MW is ON, or off, indicating the MW is OFF.  
You can toggle each MW to be ON or OFF using the FLOW METER ALARM SET button.  
a) Turn MW "34" ON.  
b) Turn MWs "FC" and "FE" ON and press either the UP or DOWN button.  
(Display blinks with "A0".)  
Configure the remaining MWs according to the chart below based on your unit's model and gas type.

Setting list for MW settings and Gas manifold pressures (Check the rating plate for model and gas type)

| Model                         | Gas type | Circuit board MW setting (●:ON ○:OFF) |    |    |    |    |    |    |    |    |    |    | Manifold Pressure (inch H <sub>2</sub> O) Cover off               |           |
|-------------------------------|----------|---------------------------------------|----|----|----|----|----|----|----|----|----|----|-------------------------------------------------------------------|-----------|
|                               |          | A1                                    | A5 | A6 | A7 | A9 | AB | AD | AE | B0 | B1 | C7 | Max value                                                         | Min value |
| NRC98OD<br>(GQ-C2857WS US)    | Natural  | ●                                     | ○  | ○  | ○  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | 2.65                                                              | 0.80      |
|                               | LP       | ○                                     | ○  | ○  | ○  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | 3.70                                                              | 1.00      |
| NRC98DV<br>(GQ-C2857WS-FF US) | Natural  | ○                                     | ●  | ●  | ○  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | 3.05                                                              | 0.90      |
|                               | LP       | ○                                     | ○  | ○  | ○  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | 3.85                                                              | 1.00      |
| NR83OD<br>(GQ-2457WS US)      | Natural  | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | 2.85                                                              | 1.00      |
|                               | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | 4.25                                                              | 1.40      |
| NR83DVC<br>(GQ-2457WS-FFA US) | Natural  | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | Refer to the "Setting list for gas manifold pressures (NR83DVC) " |           |
|                               | LP       | ○                                     | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |                                                                   |           |



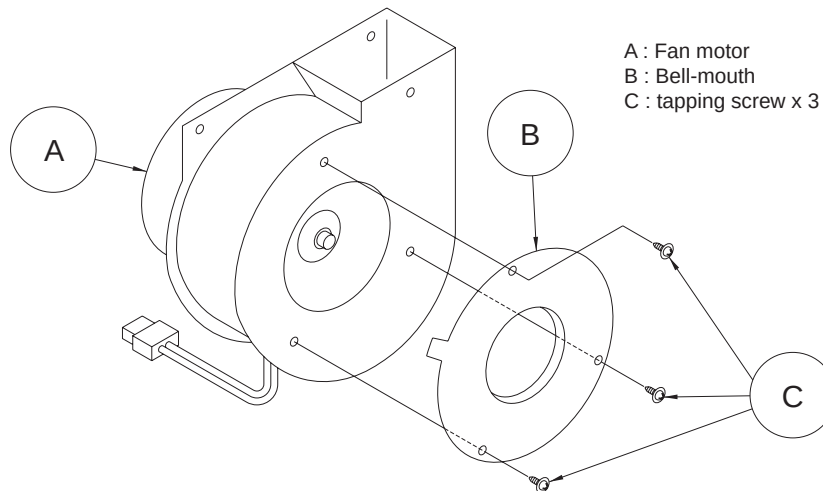
Setting list for Gas manifold pressures (NR83DVC)

| Manifold Pressure (inch H <sub>2</sub> O) Cover off |           |                |           |              |           |             |           |
|-----------------------------------------------------|-----------|----------------|-----------|--------------|-----------|-------------|-----------|
| Vent length adjustment                              |           | DIP7=OFF       | DIP8=OFF  | DIP7=ON      | DIP8=OFF  | DIP7=OFF    | DIP8=ON   |
|                                                     |           | Minimum length |           | Short length |           | Long length |           |
|                                                     |           | Maximum length |           |              |           |             |           |
| Gas type                                            | Max value | Min value      | Max value | Min value    | Max value | Min value   | Max value |
| Natural                                             | 2.75      | 0.90           | 2.70      | 0.85         | 2.70      | 0.85        | 2.65      |
| LPG                                                 | 3.85      | 1.25           | 3.80      | 1.25         | 3.75      | 1.20        | 3.70      |

5. Once complete, hold the UP and DOWN buttons together for five seconds until the remote controller starts beeping rapidly.  
6. Check manifold pressures with a digital manometer and adjust if necessary.

## ■ When Changing the Fan Motor.

When Bell-mouth(B) is installed in the old fan motor, install Bell-mouth (B) as shown in figure to maintain the proper air volume.  
 When you change the fan motor, please remove this part from the old fan motor, and install in the new fan motor.  
 After changing the fan motor, please follow the procedure "Circuit Board Settings 1" or "Circuit Board Settings 2".  
 The water heater will not operate properly unless you carry out this step.



\*Please follow either procedure after changing the fan motor.

\*When the water heater has no remote controller, make sure to connect a remote controller before performing the below steps.

### Circuit Board Settings 1

1. Check that there is no water flow.
2. Within the first ten minutes of connecting electrical power, before turning it on (\*1), press and hold the "FLOW METER ALARM SET" button on the remote controller until a tone is heard (2 sec.) and "120"(example) appears on the display.
3. Press the "FLOW METER ALARM SET" button to change the writer number until "11 1" appears on the display.
4. Press the "UP" button for 5 sec to change the setting number from "1" to "2". "11 2" appears on the display.
5. Set the "POWER" button to ON or let the unit sit for 30 seconds.

Note 1. Disconnect electrical power after setting the "POWER" button off on the remote controller.  
 The water heater will automatically turn on when electrical power is reconnected if this step is not followed.

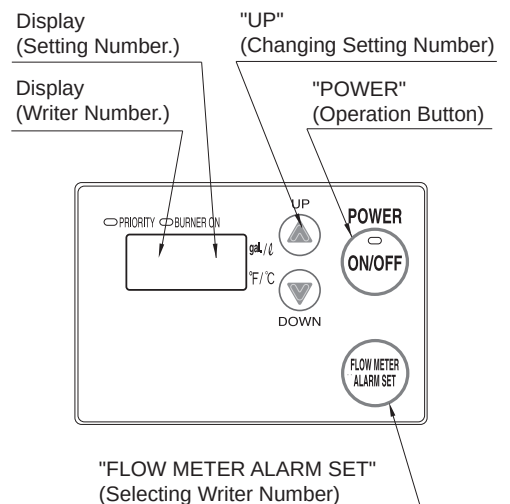
### Circuit Board Settings 2

1. Check that there is no water flow.
2. Within the first ten minutes of connecting electrical power, before turning it on (\*1), press and hold both the "UP(a)" and "DOWN(b)" buttons on the Circuit Board as illustrated to the right until the controller emits a beeping sound.  
 The setting will be not completed if this is not done.

Note 1. Disconnect electrical power after setting the "POWER" button off on the remote controller. The water heater will automatically turn on when electrical power is reconnected if this step is not followed.

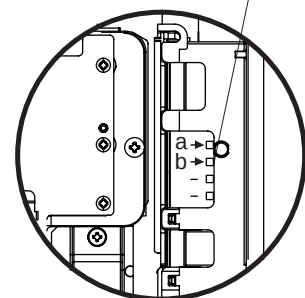
### Remote Controller

[RC-7651M]



### Circuit Board

"UP(a)" - "DOWN(b)" buttons for adjusting the manifold pressure settings





# Gas Piping

Follow the instructions from the gas supplier.



## CAUTION

The guidelines and examples we have provided in this manual section are for reference only. The sizing and installation of the gas system for this water heater, as with any gas appliance, is the sole responsibility of the installer. The installer must be professionally trained to do such work and must always follow all local and national codes and regulations. Gas line sizing calculations must be performed for every installation. Please contact Noritz America at 866-766-7489 if you have any questions or concerns.

### Gas Type

The gas type indicated on the water heater rating plate (NG or LP) must match the type of gas being supplied to the water heater.

### Gas Conversions

If the gas type supplied does not match the gas type on the rating plate, obtain a replacement unit with the proper gas type. If a gas type conversion must be made, there are conversion kits available for some models. [The conversion kit shall be installed by a qualified service agency in accordance with the manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. The qualified service agency is responsible for the proper installation of this kit. Improper installation of this kit will void the warranty.]

### Meter

The gas meter must be sized properly for the water heater and other gas appliances to operate properly. Select a gas meter capable of supplying the entire btuh demand of all gas appliances in the building.



## CAUTION

### Regulators

Ensure that all gas regulators used are operating properly and providing gas pressures within the specified range of the water heater being installed. Excess gas inlet pressure may cause serious accidents.



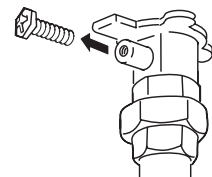
## WARNING

### Pressure

Check the gas supply pressure immediately upstream at a location provided by the gas company. Supplied gas pressure must be within the limits shown in the specifications section with all gas appliances operating. The inlet gas pressure must be within the range specified. This is for the purposes of input adjustment. Low gas pressure may cause a loss of flame or ignition failure at other appliances in the home, which may result in unburned gas in the home. Serious accidents such as fire or explosion may result.

### Measuring Gas Pressure

In order to check the gas supply pressure to the unit, a tap is provided on the gas inlet. Remove the **9/32" hex head/Philips screw** from the tap, and connect a manometer using a silicon tube. Open up at least 2 fixtures and hold in the maximum manifold pressure button on the circuit board. Please call Noritz for details.





## WARNING

### Pressure Test

The appliance and its gas connections must be leak tested before placing the appliance in operation. The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than ½ psig (3.5 kPa). We do not recommend pressure testing in excess of ½ psig (3.5kPa). If it must be done, the appliance and its individual shutoff valve must be completely disconnected from the gas supply piping system during the test process.

### Pipe Sizing/Flexible Connectors

A gas shutoff valve must be installed on the supply line. Gas flex lines are not recommended unless the minimum inside diameter is ¾" or greater and the rated capacity of the connector is equal to or greater than the BTU capacity of the water heater. Gas piping shall be in accordance with local utility company requirements and/or in the absence of local codes, use the latest edition of National Fuel Gas Code (NFPA54GC), ANSI Z223.1. Size the gas line according to total btuh demand of the building and length from the meter or regulator so that the following supply pressures are available even at maximum demand.

#### Natural Gas Supply Pressure

Min 4" WC

Max 10.5" WC

#### LP Gas Supply Pressure

Min 8" WC

Max 14" WC

## Reference Tools & Sample Calculations



## CAUTION

The tables and samples below are for reference only. The professional sizing and installing the gas line should always run the appropriate calculations before all installations.

### Which Table to Use

- For NG installations with the initial supply pressure at point of delivery (at the meter, for example) is less than 8" WC, use the 0.5" WC pressure drop table (Table 1).
- For NG installations with the initial supply pressure at point of delivery is greater than or equal to 8" WC, use the 3.0" pressure drop table (Table 2).
- For all LP installation use (Table 3)

The inlet pressure must be at least 5" WC for NG or 8" WC for LP for all appliances in the gas system. If the inlet gas pressure drops below 5" WC for NG or 8" WC for LP, the heater may continue to operate, but the other appliances in the house may experience flame loss or ignition failure, which can result in gas leakage into the home. Refer to the NFPA 54 for details.

Please contact Noritz for details. For corrugated stainless steel tubing (CSST) capacity tables, please consult with the manufacturer.

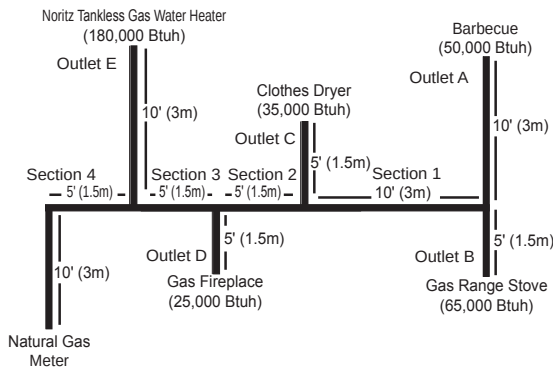


**Table 1. For Less than 8" WC initial supply pressure**

Maximum Natural Gas Delivery Capacity (0.5" Pressure Drop) [Schedule 40 Metallic Pipe]

| Pipe Size | Length (including fittings) |             |             |              |              |              |              |              |              |               |               |
|-----------|-----------------------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|
|           | 10'<br>(3m)                 | 20'<br>(6m) | 30'<br>(9m) | 40'<br>(12m) | 50'<br>(15m) | 60'<br>(18m) | 70'<br>(21m) | 80'<br>(24m) | 90'<br>(27m) | 100'<br>(30m) | 125'<br>(38m) |
| 3/4"      | 360                         | 247         | 199         | 170          | 151          | 137          | 126          | 117          | 110          | 104           | 92            |
| 1"        | 678                         | 466         | 374         | 320          | 284          | 257          | 237          | 220          | 207          | 195           | 173           |
| 1 1/4"    | 1,390                       | 957         | 768         | 657          | 583          | 528          | 486          | 452          | 424          | 400           | 355           |
| 1 1/2"    | 2,090                       | 1,430       | 1,150       | 985          | 873          | 791          | 728          | 677          | 635          | 600           | 532           |
| 2"        | 4,020                       | 2,760       | 2,220       | 1,900        | 1,680        | 1,520        | 1,400        | 1,300        | 1,220        | 1,160         | 1,020         |
| 2 1/2"    | 6,400                       | 4,400       | 4,400       | 3,020        | 2,680        | 2,430        | 2,230        | 2,080        | 1,950        | 1,840         | 1,630         |
| 3"        | 11,300                      | 7,780       | 7,780       | 5,350        | 4,740        | 4,290        | 3,950        | 3,760        | 3,450        | 3,260         | 2,890         |
| 4"        | 23,100                      | 15,900      | 12,700      | 10,900       | 9,660        | 8,760        | 8,050        | 7,490        | 7,030        | 6,640         | 5,890         |

Values in Table are in Cubic Feet of Gas per Hour (0.60 Specific Gravity, 0.5" Pressure Drop, inlet pressure less than 2psi). Contact your gas supplier for BTU/Cubic Foot ratings. For simplification of your calculations, 1 Cubic Foot of Gas is approximately equivalent to 1000 BTU.

**Sample Gas Line****Instructions**

1. Size each outlet branch starting from the furthest using the Btuh required and the length from the meter.
2. Size each section of the main line using the length to the furthest outlet and the Btuh required by everything after that section.

**Sample Calculation - (Using 0.5" WC Pressure Drop Table)**

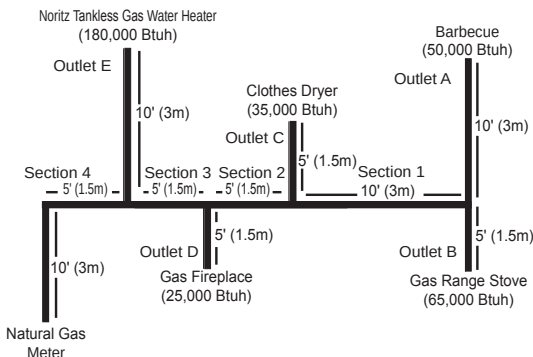
Outlet A: 45' (13.5m) (Use 50' (15m)), 50,000 Btuh requires 1/2"  
 Outlet B: 40' (12m), 65,000 Btuh requires 1/2"  
 Section 1: 45' (13.5m) (Use 50' (15m)), 115,000 Btuh requires 3/4"  
 Outlet C: 30' (9m), 35,000 Btuh requires 1/2"  
 Section 2: 45' (13.5m) (Use 50' (15m)), 150,000 Btuh requires 3/4"  
 Outlet D: 25' (7.5m) (Use 30' (9m)), 25,000 Btuh requires 1/2"  
 Section 3: 45' (13.5m) (Use 50' (15m)), 175,000 Btuh requires 1"  
 Outlet E: 25' (7.5m) (Use 30' (9m)), 180,000 Btuh requires 3/4"  
 Section 4: 45' (13.5m) (Use 50' (15m)), 355,000 Btuh requires 1 1/4"

**Table 2. For 8" WC – 10.5" WC initial supply pressure**

Maximum Natural Gas Delivery Capacity (3.0" Pressure Drop) [Schedule 40 Metallic Pipe]

| Pipe Size | Length (including fittings) |             |             |              |              |              |              |              |              |               |               |
|-----------|-----------------------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|
|           | 10'<br>(3m)                 | 20'<br>(6m) | 30'<br>(9m) | 40'<br>(12m) | 50'<br>(15m) | 60'<br>(18m) | 70'<br>(21m) | 80'<br>(24m) | 90'<br>(27m) | 100'<br>(30m) | 125'<br>(38m) |
| 1/2"      | 454                         | 312         | 250         | 214          | 190          | 172          | 158          | 147          | 138          | 131           | 116           |
| 3/4"      | 949                         | 652         | 524         | 448          | 397          | 360          | 331          | 308          | 289          | 273           | 242           |
| 1"        | 1,787                       | 1,228       | 986         | 844          | 748          | 678          | 624          | 580          | 544          | 514           | 456           |
| 1 1/4"    | 3,669                       | 2,522       | 2,025       | 1,733        | 1,536        | 1,392        | 1,280        | 1,191        | 1,118        | 1,056         | 936           |
| 1 1/2"    | 5,497                       | 3,778       | 3,034       | 2,597        | 2,302        | 2,085        | 1,919        | 1,785        | 1,675        | 1,582         | 1,402         |
| 2"        | 10,588                      | 7,277       | 5,844       | 5,001        | 4,433        | 4,016        | 3,695        | 3,437        | 3,225        | 3,046         | 2,700         |
| 2 1/2"    | 16,875                      | 11,598      | 9,314       | 7,971        | 7,065        | 6,401        | 5,889        | 5,479        | 5,140        | 4,856         | 4,303         |
| 3"        | 29,832                      | 20,503      | 16,465      | 14,092       | 12,489       | 11,316       | 10,411       | 9,865        | 9,087        | 8,584         | 7,608         |
| 4"        | 43,678                      | 30,020      | 24,107      | 20,632       | 18,286       | 16,569       | 15,243       | 14,181       | 13,305       | 12,568        | 11,139        |

Values in Table are in Cubic Feet of Gas per Hour (0.60 Specific Gravity, 3.0" Pressure Drop, 8.0" WC or greater supply pressure, inlet pressure less than 2psi). Contact your gas supplier for BTU/Cubic Foot ratings. For simplification of your calculations, 1 Cubic Foot of Gas is approximately equivalent to 1000 BTU.

**Sample Gas Line****Instructions**

1. Size each outlet branch starting from the furthest using the Btuh required and the length from the meter.
2. Size each section of the main line using the length to the furthest outlet and the Btuh required by everything after that section.

**Sample Calculation (Using 3.0" WC Pressure Drop Table)**

Outlet A: 45' (13.5m) (Use 50' (15m)), 50,000 Btuh requires 1/2"  
 Outlet B: 40' (12m), 65,000 Btuh requires 1/2"  
 Section 1: 45' (13.5m) (Use 50' (15m)), 115,000 Btuh requires 1/2"  
 Outlet C: 30' (9m), 35,000 Btuh requires 1/2"  
 Section 2: 45' (13.5m) (Use 50' (15m)), 150,000 Btuh requires 1/2"  
 Outlet D: 25' (7.5m) (Use 30' (9m)), 25,000 Btuh requires 1/2"  
 Section 3: 45' (13.5m) (Use 50' (15m)), 175,000 Btuh requires 1/2"  
 Outlet E: 25' (7.5m) (Use 30' (9m)), 180,000 Btuh requires 1/2"  
 Section 4: 45' (13.5m) (Use 50' (15m)), 355,000 Btuh requires 3/4"

**Table 3. Maximum Undiluted Propane (LP) Delivery Capacity in Thousands of BtuH (0.5" WC Pressure Drop) [Schedule 40 Metallic Pipe]**

| Pipe Size | Length (including fittings) |             |             |              |              |              |              |               |               |               |               |               |
|-----------|-----------------------------|-------------|-------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|
|           | 10'<br>(3m)                 | 20'<br>(6m) | 30'<br>(9m) | 40'<br>(12m) | 50'<br>(15m) | 60'<br>(18m) | 80'<br>(24m) | 100'<br>(30m) | 125'<br>(38m) | 150'<br>(45m) | 175'<br>(53m) | 200'<br>(60m) |
| 1/2"      | 291                         | 200         | 160         | 137          | 122          | 110          | 101          | 94            | 89            | 84            | 74            | 67            |
| 3/4"      | 608                         | 418         | 336         | 287          | 255          | 231          | 212          | 197           | 185           | 175           | 155           | 140           |
| 1"        | 1,150                       | 787         | 632         | 541          | 480          | 434          | 400          | 372           | 349           | 330           | 292           | 265           |
| 1 1/4"    | 2,350                       | 1,620       | 1,300       | 1,110        | 985          | 892          | 821          | 763           | 716           | 677           | 600           | 543           |
| 1 1/2"    | 3,520                       | 2,420       | 1,940       | 1,660        | 1,480        | 1,340        | 1,230        | 1,140         | 1,070         | 1,010         | 899           | 814           |
| 2"        | 6,790                       | 4,660       | 3,750       | 3,210        | 2,840        | 2,570        | 2,370        | 2,200         | 2,070         | 1,950         | 1,730         | 1,570         |

For reference only. Please consult gas pipe manufacturer for actual pipe capacities.



## CAUTION

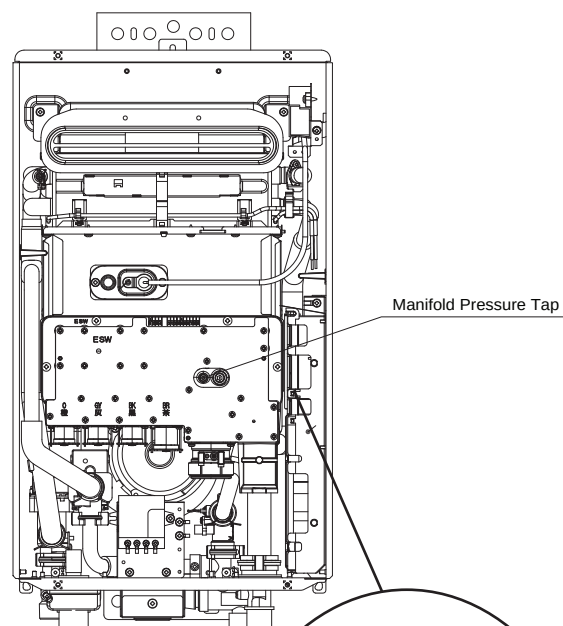
### Final Check

When the installation is complete, verify that inlet gas pressure for the entire gas system does not drop below 5" WC for NG or 8" WC for LP at all appliances. This can be tested by turning on all gas burning appliances including the water heater, then check the inlet pressure at each appliance to verify all appliances are receiving a minimum of 5" WC for NG or 8" WC for LP. If all appliances are not receiving the minimum inlet pressure the gas piping system may need to be changed.

## ■ Manifold Gas Pressure Adjustment

- Note 1) Use the following procedure to adjust the manifold gas pressure only if it can be done with a high flow rate through the unit.
- Note 2) When the manifold gas pressure is adjusted, the front cover will be off. Adjust the manifold gas pressure to the value of "Cover Off" in the table (because it is not possible to adjust the manifold gas pressure with the front cover on).

- (1) With a manometer or pressure gauge connected to the manifold pressure tap, press and hold the "Maximum Manifold Pressure Set Button". Use the "UP and DOWN Buttons" to adjust to the correct pressure.
- (2) Press and hold the "Minimum Manifold Pressure Set Button". Use the "UP and DOWN Buttons" to adjust to the correct pressure.
- (3) Repeat steps (1) and (2) until both are at the correct pressure.



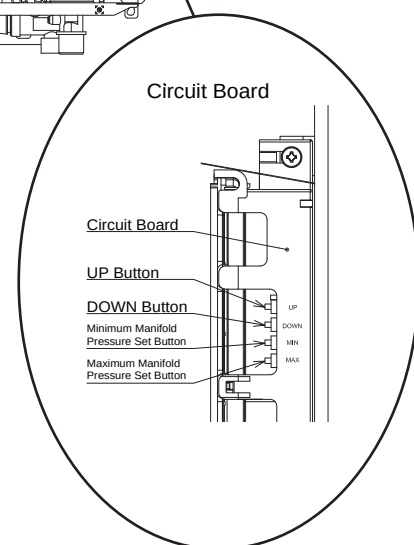
Manifold Gas Pressures Maximum and Minimum Values (DV/SV/OD Models)

| Model Name                  | Gas type | Supply Pressure<br>(inch H <sub>2</sub> O) | Manifold Pressure (inch H <sub>2</sub> O) Cover Off |           |
|-----------------------------|----------|--------------------------------------------|-----------------------------------------------------|-----------|
|                             |          |                                            | Max value                                           | Min value |
| GQ-2857WX US (NR98OD)       | NG       | 7.9                                        | 2.75                                                | 1.25      |
| GQ-2857WZ US (NC199OD)      | LP       | 11.0                                       | 4.20                                                | 1.80      |
| GQ-2857WX-F US (NR98SV)     | NG       | 7.9                                        | 2.60                                                | 1.20      |
|                             | LP       | 11.0                                       | 4.15                                                | 1.80      |
| GQ-C3257WX-FF US (NRC111DV) | NG       | 7.9                                        | 3.20                                                | 1.50      |
| GQ-C3257WZ-FF US (NCC199DV) | LP       | 11.0                                       | 3.70                                                | 1.50      |
| GQ-C3257WX US (NRC111OD)    | NG       | 7.9                                        | 3.05                                                | 1.35      |
| GQ-C3257WZ US (NCC199OD)    | LP       | 11.0                                       | 3.40                                                | 1.45      |
| GQ-C2857WS-FF US (NRC98DV)  | NG       | 7.9                                        | 3.05                                                | 0.90      |
|                             | LP       | 11.0                                       | 3.85                                                | 1.00      |
| GQ-C2857WS US (NRC98OD)     | NG       | 7.9                                        | 2.65                                                | 0.80      |
|                             | LP       | 11.0                                       | 3.70                                                | 1.00      |
| GQ-2457WS US (NR83OD)       | NG       | 7.9                                        | 2.85                                                | 1.00      |
|                             | LP       | 11.0                                       | 4.25                                                | 1.40      |

For DVC Models:

- Note 3) Take the Intake Air and Exhaust Vent Pipes off the unit when adjusting the manifold gas pressure.  
Turn the Dip Switches (#7, #8) off when adjusting the manifold gas pressure.  
(Dip Switches #7 and #8 : For Vent Length Adjustment)

After the manifold gas pressure adjustment was finished, place the "Intake Air and Exhaust Vent Pipes" and "Dip Switches (#7, #8)" to the original state.



Manifold Gas Pressures Maximum and Minimum Values (DVC Models)

| Manifold Pressure (inch H <sub>2</sub> O) Cover Off       |                        |                |           |
|-----------------------------------------------------------|------------------------|----------------|-----------|
| Model Name                                                | Vent length adjustment | DIP7=OFF       | DIP8=OFF  |
|                                                           |                        | Minimum length |           |
| GQ-2857WX-FFA US (NR98DVC)<br>GQ-2857WZ-FFA US (NC199DVC) | Gas type               | Max value      | Min value |
|                                                           | NG                     | 3.00           | 1.35      |
|                                                           | LP                     | 3.35           | 1.50      |
| GQ-2457WS-FFA US (NR83DVC)                                | NG                     | 2.75           | 0.90      |
|                                                           | LP                     | 3.95           | 1.30      |

\* Manifold gas pressure values are subject to change without prior notice.  
Please check the latest burner specification table.

## Periodic Inspection

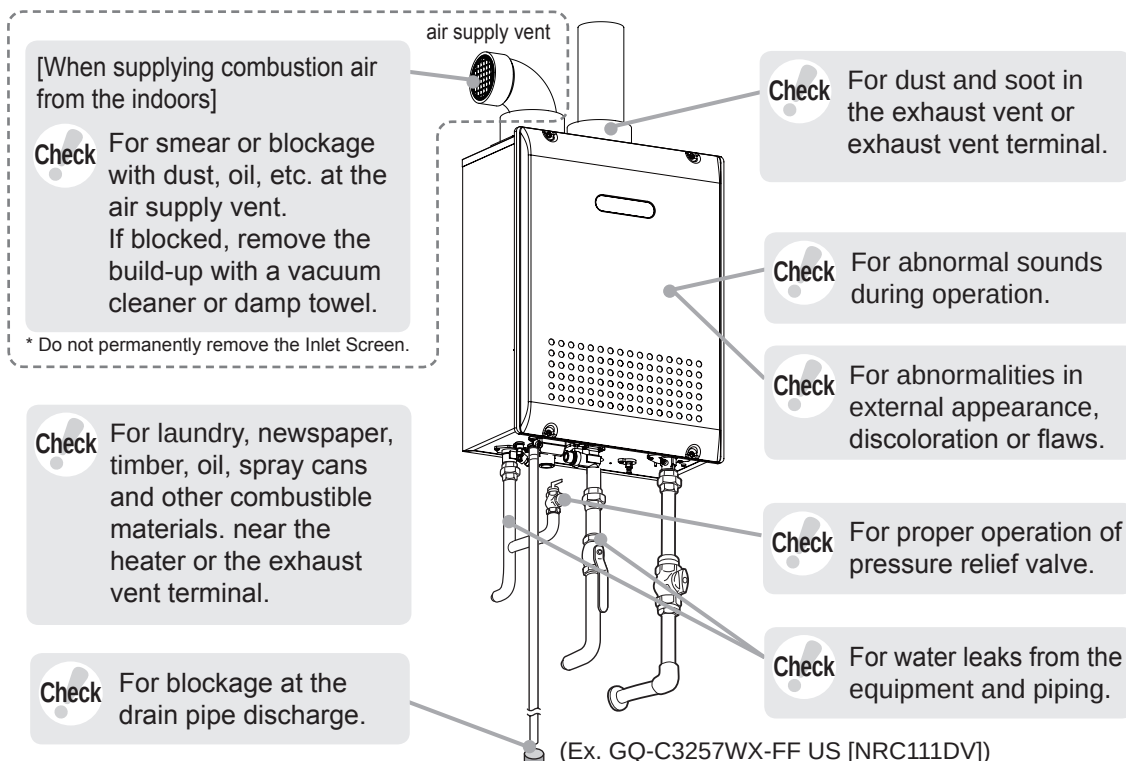


### CAUTION



Be sure to do.

To prevent burns or scalding, turn off the power button and wait until the equipment cools before performing maintenance.



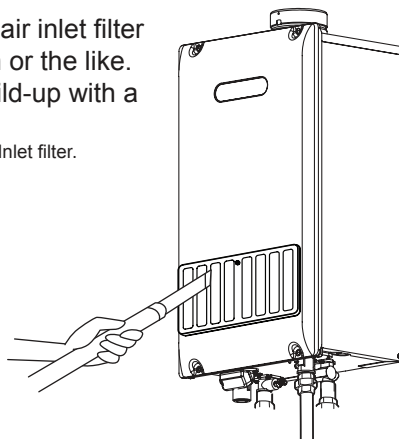
### Air Inlet Filter (NR98SV (GQ-2857WX-F US)) Only

### CAUTION

Do not remove the air inlet filter.  
If it is removed or damaged, please contact Noritz America.  
Damage caused by operating the water heater without the air inlet filter is not covered under warranty.

Check whether or not the air inlet filter is clogged with dust, trash or the like. If clogged, remove the build-up with a vacuum cleaner.

\* Do not permanently remove the air Inlet filter.



## Periodic Maintenance

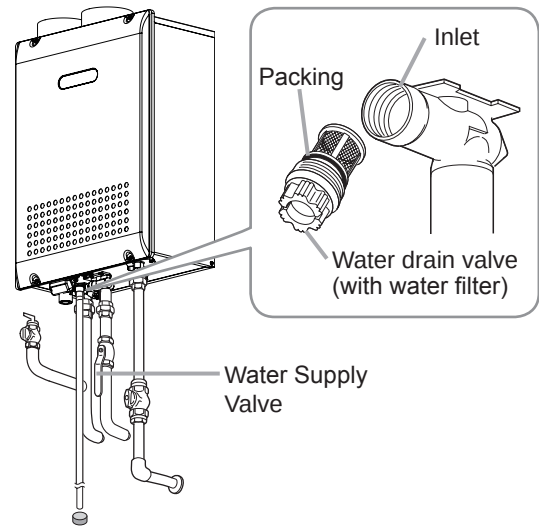
### Water Drain Valve (with Water Filter)

If the water drain valve (with water filter) is covered with debris, the hot water may not run smoothly, or the unit may put out cold water. Check and clean the filter as explained below.

**\* To avoid burns, wait until the equipment cools down before draining the water.**

**The appliance will remain hot after it is turned off.**

1. Close the water supply valve.
2. Open all hot water fixtures.
3. With a bucket ready, remove the inlet and outlet drain plugs (about 0.45 gallon (1.7 L) will drain out)
4. Take the water drain valve (with water filter) out of the inlet. (See illustration to right).
5. Clean the water drain valve (with water filter) with a brush under running water.
6. Replace the water drain valve (with water filter) and close the drain plugs.  
(Take care not to lose the packing.)
7. Close all hot water fixtures.
8. Open the water supply valve and check that water does not leak from the drain plugs or water drain valve (with water filter).



(Ex. GQ-C3257WX-FF US [NRC111DV])

# Periodic Maintenance

## Water Quality

For people who live in a hard water area, periodical flushing is necessary. If the Heat Exchanger is not flushed, the Scale Build-up may cause damage to the Heat Exchanger. In this case, this water heater will detect the Scale Build-up in the Heat Exchanger and then the error code "C\*#" will be displayed on the Operation Panel.

When the error code "C\*#" is flashing on the Operation Panel, the Heat Exchanger needs to be flushed to prevent damage from Scale Build-up. Please contact Noritz America for more information about flushing the Heat Exchanger. (<http://support.noritz.com/> or 866-766-7489)

\* \* = 1, 2, 3, 4, F

# = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Damage to the water heater as a result of below is not covered by the Noritz America Limited Warranty.

To ensure full warranty coverage, treat or condition water that exceeds the target levels provided in this table.

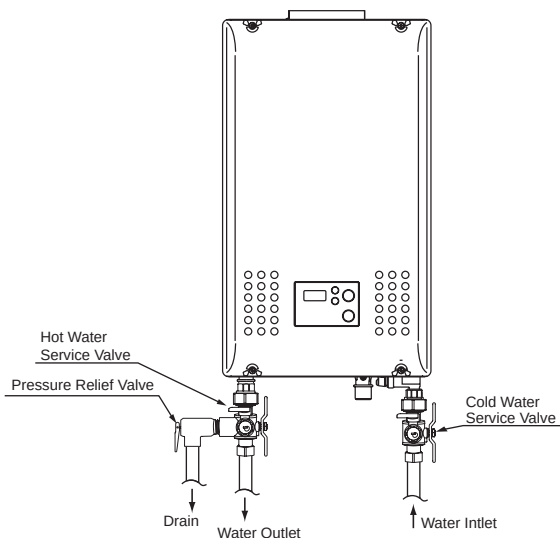
- Hard water
- Poor water quality (See the right list.)
- The water heater has displayed a "C\*#" error code indicating Scale Build-up, but the heat exchanger has not been flushed.

|                        |                             |
|------------------------|-----------------------------|
| Total Hardness**       | : 200 mg/L (12 gpg) or less |
| Aluminum               | : 0.05 to 0.2 mg/L or less  |
| Chloride               | : 250 mg/L or less          |
| Copper                 | : 1 mg/L or less            |
| Iron                   | : 0.3 mg/L or less          |
| Manganese              | : 0.05 mg/L or less         |
| pH                     | : 6.5 - 8.5                 |
| Total Dissolved Solids | : 500 mg/L or less          |
| Zinc                   | : 5 mg/L or less            |
| Sulfate ion            | : 250 mg/L or less          |
| Residual chlorine      | : 4 mg/L or less            |

\*\* Maximum limit suggested by Noritz.

Source: EPA National Secondary Drinking Water Regulations  
(40 CFR Part 143.3)

## Isolation Valves



- \* Isolation valves may be purchased as an accessory from an authorized Noritz wholesaler. They allow for full diagnostic testing and easy flushing of the system.
- \* The kit includes two full port isolation valves and a pressure relief valve for the hot side. Contact Noritz for more information.

## Water Treatment

If this water heater will be installed in an application where the supply water is hard, the water must be treated with either the Noritz H2Flow or ScaleShield or a water softener. Refer to the below tables for suggested treatment and maintenance measures to be taken based on the water hardness level. If this water heater will be installed in an application where the supply water is hard, Scale Build-up may cause damage to the Heat Exchanger. In this case, this water heater detects Scale Build-up in the Heat Exchanger and then the error code "C\*#" will flash on the Remote Controller. When the error code "C\*#" is displayed, the Heat Exchanger needs to be flushed to prevent damage from Scale Build-up. Refer to the "Procedure for flushing the Heat Exchanger" or contact Noritz America for more information. (<http://support.noritz.com/> or 866-766-7489)

\* \* = 1, 2, 3, 4, F

# = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Damage to the water heater as a result of the items below is not covered by the Noritz America Limited Warranty.

- Water in excess of 12 gpg (200mg/L) of hardness
- Poor water quality (see Water Quality)
- The water heater has displayed a "C\*#" error code indicating Scale Build-up, but the heat exchanger has not been flushed.

Note: Water softeners may be regulated by the local water jurisdiction, consult with the manufacturer for code, sizing, and installation guidelines; the below diagram is for reference only. For more information about H2Flow and ScaleShield, contact Noritz America at <http://support.noritz.com/> or 866-766-7489.

Treatment Guidelines

| Type of Water   | Hardness Level              | Treatment Device*        | Flush Frequency**                             |                                                |
|-----------------|-----------------------------|--------------------------|-----------------------------------------------|------------------------------------------------|
|                 |                             |                          | Residential Use                               | Commercial Use                                 |
| Soft            | 0-1 gpg<br>(0-17 mg/L)      | None                     | None                                          | None                                           |
| Slightly Hard   | 1-3 gpg<br>(17-51 mg/L)     | None                     | None                                          | None                                           |
| Moderately Hard | 3-7 gpg<br>(51-120 mg/L)    | H2Flow or ScaleShield    | Once a Year*** or Flashing the error code**** | Once a Year*** or Flashing the error code****  |
| Hard            | 7-10 gpg<br>(120-171 mg/L)  | H2Flow or ScaleShield    | Once a Year*** or Flashing the error code**** | Twice a Year*** or Flashing the error code**** |
| Very Hard       | 10-12 gpg<br>(171-200 mg/L) | H2Flow or Water Softener | Once a Year*** or Flashing the error code**** | Twice a Year*** or Flashing the error code**** |
| Extremely Hard  | > 12 gpg<br>(> 200 mg/L)    | H2Flow or Water Softener | Once a Year*** or Flashing the error code**** | Twice a Year*** or Flashing the error code**** |

\* When selecting a treatment device, you must consult with the device's spec sheet and installation manual for guidelines and limitations. Not all water supplies are compatible - a water test may be required.

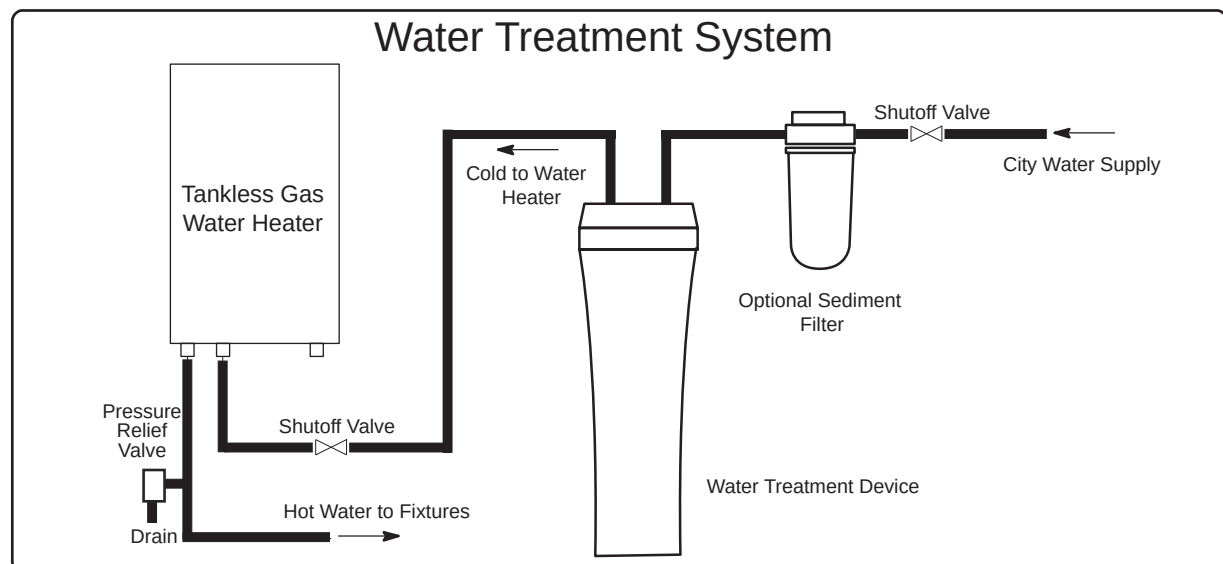
\*\* Install Noritz Isolation Valves to allow for flushing.

\*\*\* Flushing is required if a water treatment device is not installed.

\*\*\*\* The error code "C\*#" will be flashing in the Display Window.

\* = 1, 2, 3, 4, F

# = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9



▲ The illustration is an example. Please check with the actual water heater about the position of piping, and form.



# Procedure for Flushing the Heat Exchanger

This procedure is only intended for use by a qualified service professional or authorized Noritz Service Representative. Any unauthorized use of this procedure may result in voiding the warranty. Please contact Noritz America (866-766-7489) for additional support.

If the error code “C\*#\*~C\*#\*” is flashing on the Remote Controller (or Operation Panel\*\*), it means there is Scale Build-up in the Heat Exchanger. The Heat Exchanger needs to be flushed\*\*\* to remove the Scale Build-up.

Damage to the water heater due to Scale Build-up is not covered by the water heater's warranty.

To clear the error code “C\*#\*~C\*#\*”, the Heat Exchanger must be flushed.

If the error code “C\*#\*” is displayed and flashing on the Remote Controller (or Operation Panel\*\*), please contact Noritz America (866-766-7489).

\* \* = 1, 2, 3, 4, F / # = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

\*\* NR98DVC(GQ-2857WX-FFA US) and NR83DVC(GQ-2457WS-FFA US) only.

\*\*\* Connect the “blue connector for flushing” near the Circuit Board when flushing the Heat Exchanger.

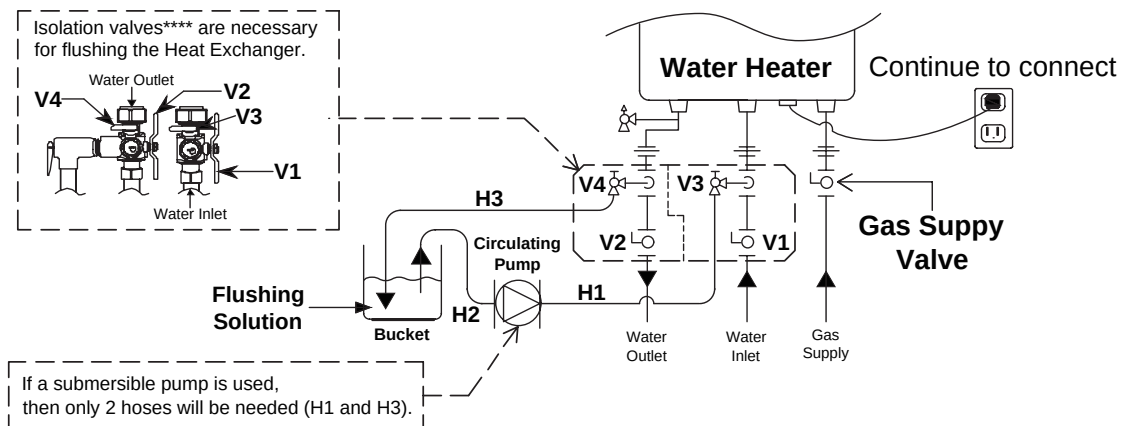
After connecting it, the water heater is set to “Flushing Mode”.

The water heater must remain connected to electrical power when flushing the Heat Exchanger.

## Basic Procedure

### «Procedure 1. The preparation of the flushing system»

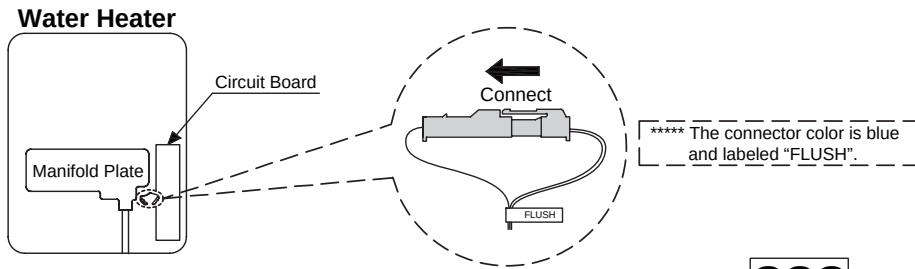
1. Close the gas supply valve.
2. Close the water inlet valve (V1) and the water outlet valve (V2).
3. Connect the one drain hose (H1) to the drain valve (V3), and then the other to the circulating pump.
4. Connect the drain hose (H2) to the circulating pump.
5. Connect the drain hose (H3) to the drain valve (V4).
6. Pour 1 gallon of “Calcium, Lime and Rust Removal Product” and 1 gallon water into the bucket. Noritz recommends “Calcium, Lime and Rust Removal Product” for flushing.
7. Place the both drain hoses (H2 and H3) into the bucket filled with the flushing solution.
8. Open the both drain valves (V3 and V4).



\*\*\*\* Isolation valves may be purchased as an accessory from an authorized Noritz wholesaler. They allow for full diagnostic testing and easy flushing of the system. Contact Noritz America for more information.(866-766-7489)

## «Procedure 2. Flushing the Heat Exchanger (For Single Unit) »»

1. Open the Front Cover.
2. Connect the “blue connector\*\*\*\*\*” for flushing” near the Circuit Board.

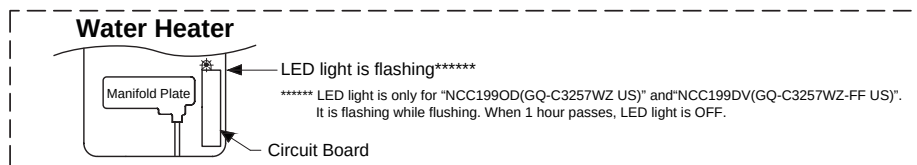


3. Then the code “CCC” is displayed on the Remote Controller. **CCC**
4. Turn on the circulating pump to circulate the flushing solution through the water heater for 1 hour at a rate of 1.5 gallons per minute or more.
5. The code “C60” is displayed on the Remote Controller when the water heater detects the flow of the flushing solution.

When 1 minute passes, the code “C60” will change to “C59” on the Remote Controller.



Please check whether the reverse connection of the hose (H1) and (H3) if the display number will not change. In that case, the flow rate of the flushing solution may be under 1.5 gallons per minute.



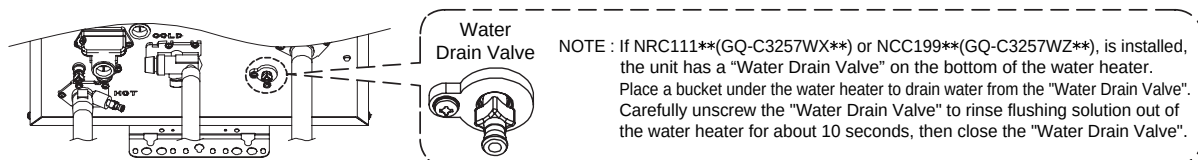
6. When 1 hour passes, the code “C00” is flashing on the Remote Controller. **C00** - Flashing  
Do not disconnect the “blue connector for flushing”.
7. Turn off the circulating pump.

## «Procedure 3. Cleaning the Heat Exchanger »»

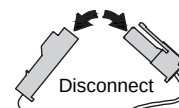
The flushing solution needs to be rinsed and cleaned out of the water heater.

Below is the way to rinse and clean the flushing solution.

1. Remove both drain hoses (H2 and H3) from the bucket. And then place the drain hose (H3) into the sink or outside to drain.
2. Close the drain valve (V3) and then open the water inlet valve (V1).  
Do not open the fresh water outlet valve (V2).
3. Clean the water heater with fresh water for 3 minutes or more.  
(Needs to have enough time to clean the water heater.)

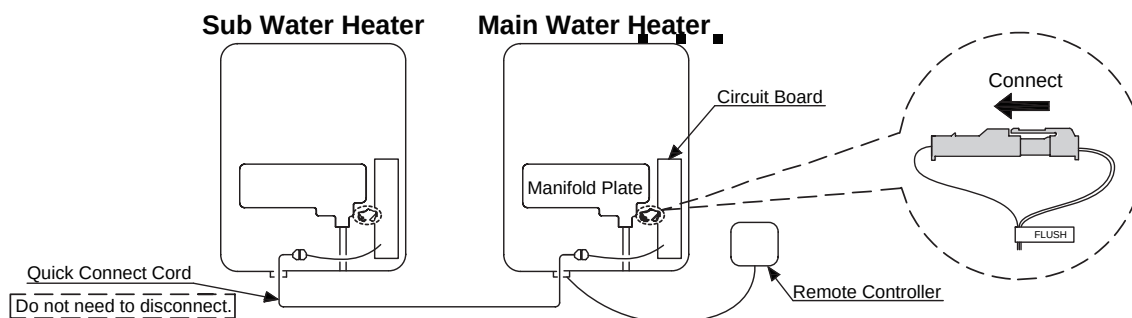


4. Close the drain valve (V4) and then remove the drain hose (H3) from the drain valve (V4).
5. Remove the drain hose (H1) from the drain valve (V3).
6. Disconnect the “blue connector for flushing” near the Circuit Board.  
The code “C00” goes out on the Remote Controller.
7. Close the Front Cover.
8. Open the gas supply valve and water outlet valve (V2).
9. Check for correct operation of the water heater.



## In case of the “Quick Connect Multi System Procedure”

1. Connect the “blue connector for flushing” of need to be flushed.  
(The water heater is isolated from Quick Connect Multi system when the “blue connector for flushing” is connected. Not need to disconnect the Quick Connect Cord.)

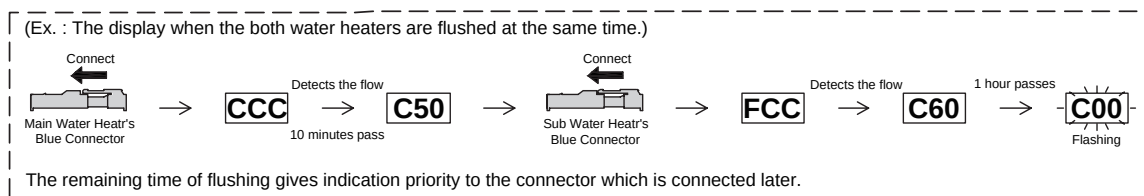
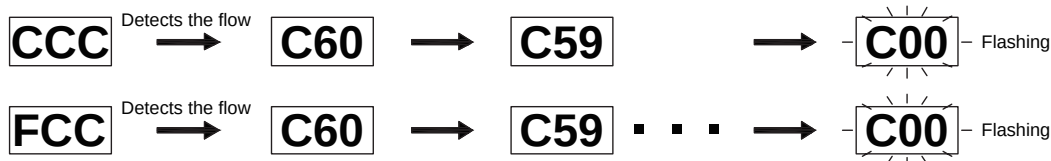


2. Then the code “CCC” or “FCC” is displayed on the Remote Controller.

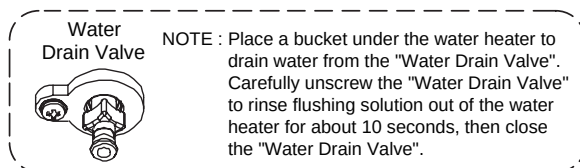
**CCC** is displayed when the Main Water Heater's blue connector is connected.

**FCC** is displayed when the Sub Water Heater's blue connector is connected.

2. Turn on the circulating pump to circulate the flushing solution through the water heaters for 1 hour at a rate of 1.5 gallons per minute or more.  
(LED light is flashing while flushing the heat exchanger. See the “[Procedure 2.5](#)”.)
3. When 1 hour passes, the code “C00” is flashing on the Remote Controller.  
Do not disconnect the “blue connector for flushing”.



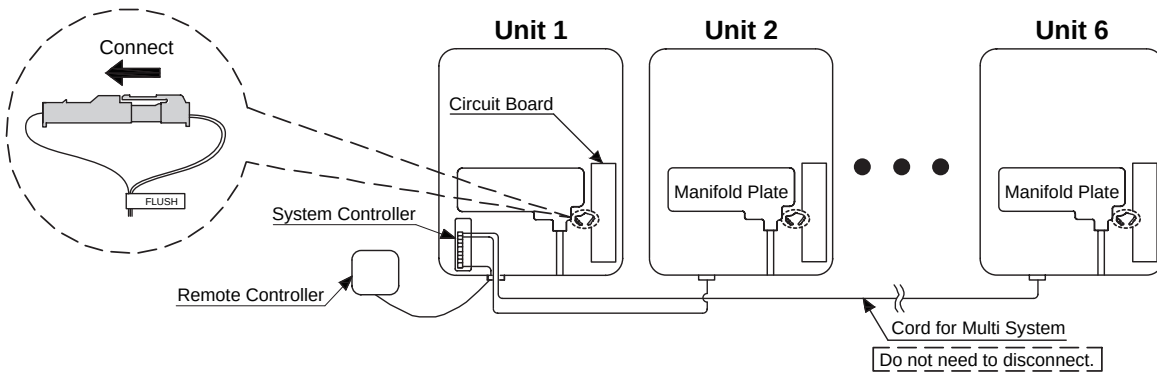
4. Turn off the circulation pump.
5. Rinse and clean the flushing solution out of the water heaters in accordance with “[Procedure 3](#)”.  
(See the “[Procedure 3.1–3.5](#)”.)



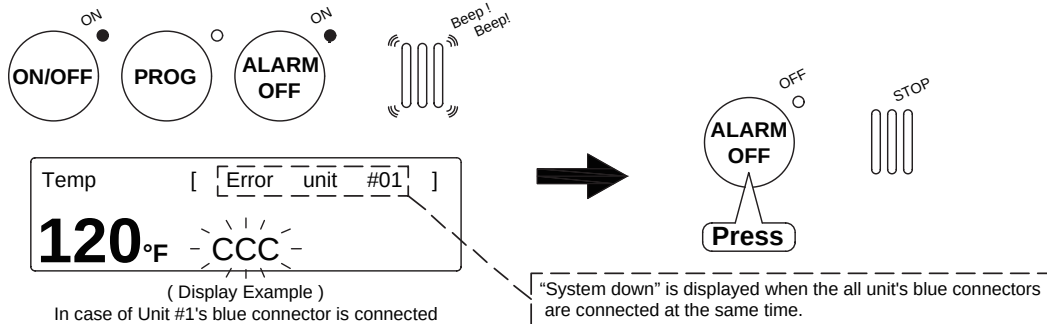
6. Disconnect the “blue connector for flushing”. The Code “C00” goes out on the Remote Controller.
7. Close the Front Covers.
8. Open the gas supply valves and water out let valves.
9. Check for correct operation of the water heaters.

## In case of the “Multi System Procedure”

1. Connect the “blue connector for flushing” of need to be flushed.  
(The water heater is isolated from Multi System when the “blue connector for flushing” is connected. Not need to disconnect the “Cord for the Multi System” .)

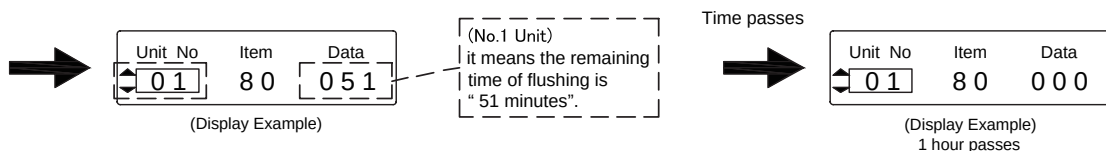
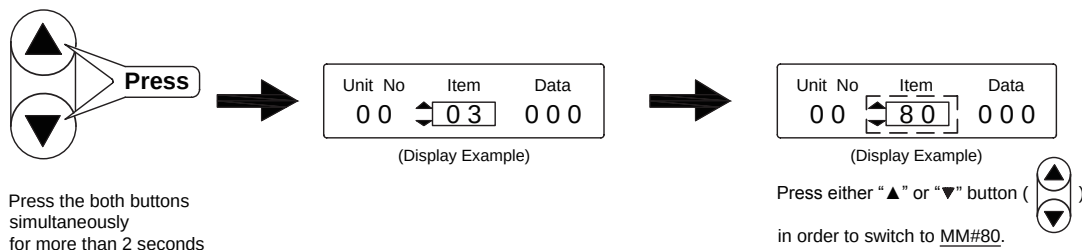


2. Then the code “CCC” is displayed on the Remote Controller and the error alarm continuously sounds. Press the “ALARM OFF” button to stop the error alarm.



3. Turn on the circulating pump to circulate the flushing solution through the water heaters for 1 hour at a rate of 1.5 gallons per minute or more.  
Note : The code “CCC” does not change when Multi System mode. The display does not show the remaining time of flushing.
4. Check for the remaining time of flushing to see the Maintenance Monitor #80 (MM #80).

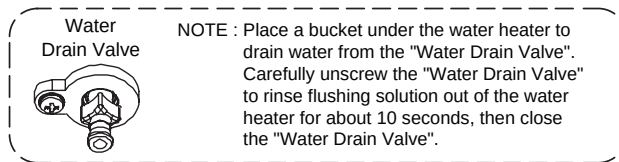
«How to check the remaining time of flushing»



Press either “ENTER” button ( ) in order to move ( ).

And then press either “▲” or “▼” button ( ) in order to switch the Unit No.

5. When 1 hour passes, turn off the circulation pump.  
(LED light is flashing while flushing the heat exchanger. See the "[Procedure 2.5](#)".)
6. Rinse and clean the flushing solution out of the water heaters in accordance with "[Procedure 3](#)".  
(See the [Procedure 3.1~3.5](#).)



7. Disconnect the "[blue connector for flushing](#)". The Code "[CCC](#)" goes out on the Remote Controller.
8. Close the Front Covers.
9. Open the gas supply valves and water outlet valves.
10. Check for correct operation of the water heaters.

Please contact Noritz America if more information is needed for flushing.  
(Phone # : 866-766-7489)

# Preventing Damage from Freezing-1

## CAUTION

- \* Damage can occur from frozen water within the device and pipes even in warm environments. Be sure to read below for appropriate measures.
- \* Repairs for damage caused by freezing are not covered by the warranty.

**Freezing is prevented within the device automatically by the freeze-prevention heater.**

**Freezing cannot be prevented when the power plug is unplugged. Do not remove the power plug from the wall outlet.**

Freezing will be prevented regardless of whether the operation switch is ON or OFF.

- \* In normal operation, freezing is prevented within the device automatically unless the outside temperature without wind is below  $-4^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$ ) for outdoor models or  $-30^{\circ}\text{F}$  ( $-35^{\circ}\text{C}$ ) for indoor models.
  - For model units installed indoors and drawing room air, the room temperature must be greater than  $32^{\circ}\text{F}$  ( $0^{\circ}\text{C}$ ) to prevent freezing and the room inside must not have negative pressure
- \* The freeze prevention heaters will not prevent the plumbing external to the unit from freezing. Protect this plumbing with insulation, heat tape or electric heaters, solenoids, or pipe covers. If there remains a freezing risk, contact the nearest Noritz agent.

### Take the measures below for extremely cold temperatures\*.

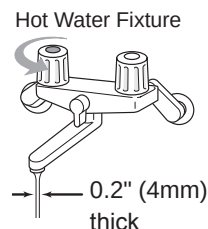
Outside temperature including wind chill factor less than  $-4^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$ ) for outdoor models or  $-30^{\circ}\text{F}$  ( $-35^{\circ}\text{C}$ ) for indoor models.

- For model units installed indoors and drawing room air, the room temperature must be greater than  $32^{\circ}\text{F}$  ( $0^{\circ}\text{C}$ ) to prevent freezing and the room inside must not have negative pressure.

This method can protect not only the heater, but also the water supply, water piping and mixing valves.

1. Turn off the power.
2. Close the gas supply valve.
3. Open a hot water fixture, and keep a small stream of hot water running. (0.1 gallon (400cc)/minute or about 0.2" (4mm) thick.)
  - \* If there is a mixing valve, set it to the highest level.
  - \* When linking multiple units, discharge water equivalent to (0.1 gallon (400cc)/minute per unit.)
4. The flow may become unstable from time to time. Check the flow 30 minutes later.

\* In general, it is not advisable to run water through the unit when it is OFF, but in this case freeze prevention is more important.



- \* Remember to set mixing valves and fixtures to their original levels before using the unit again to prevent scalding.
- \* If there is still a risk that the unit will freeze, drain the unit as shown on the next page.

## If water will not flow because it is frozen

1. Close the gas and water valves.
2. Turn off the power button.
3. Open the water supply valve from time to time to check whether water is running.
4. When the water is flowing again, check for water leaks from the equipment and piping before using.

If the heater or the piping is frozen, do not use the heater or it may get damaged.

## Preventing Damage from Freezing-2

If the water heater will not be used for a long period of time, drain the water.

Drain the water as follows:



**CAUTION**



High Temperature

To avoid burns, wait until the equipment cools down before draining the water. The appliance will remain hot after it is turned off.

To prevent damage from freezing, the water heater must be plugged into power at all times. If power is unplugged, drain the water completely from the water heater. Then use an air compressor to remove all water from inside the unit's water piping. It is recommended that Isolation Valves are installed on the water heater, otherwise the water connections will need to be removed to drain the unit completely. Freeze damage due to not draining properly will not be covered under warranty.

Drain water into a bucket to prevent water damage.

### Drainage Using the Remote Controller

**1**

(1) ON/OFF button is "OFF".

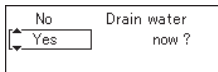
(2) Press the MENU button inside the cover, Select **Misc settings** using the buttons.

Press the ENTER button.

The "Misc settings" screen appears.

(3) Select **Drain water** using the buttons, and then press ENTER button.

(4) Select "YES" using the buttons,

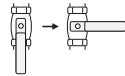


Press ENTER button.

Follow the drain procedures in the manual

**2**

Close the water supply valve.



**3**

Fully open all hot water fixtures/faucets.



**4**

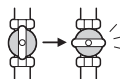
Open all drain plugs and drain the water out of the unit.

**5**

When the water is completely drained, replace all drain plugs and close the hot water fixtures/faucets.

**6**

Close the gas valve and disconnect the electrical power supplied to the unit.

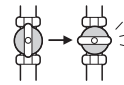


**Do not touch with wet hands.**

### Manual Draining

**1**

Close the gas valve.



**2**

(1) Turn the power on/off button "On".

(2) Turn and leave open the hot water fixtures/faucets for more than 2 minutes and close.



\* If multiple units are being used, drain two minutes for each unit.

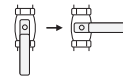
\* An 11 Error Code may appear on the remote controller.

This is not a malfunction of the unit.

Do not turn Power ON/OFF Button OFF.

**3**

Close the water supply valve and disconnect the electrical power supplied to the unit.



**Do not touch with wet hands.**

**4**

Fully open all hot water fixtures/faucets.

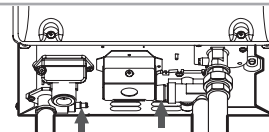


**5**

Open all drain plugs and drain the water out of the unit.

**6**

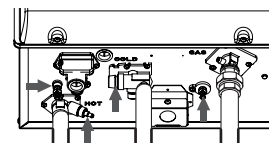
When the water is completely drained, replace all drain plugs and close the hot water fixtures/faucets.



**Drain Plugs**

Each drain plug might not be visible if insulation is installed around the piping.

GQ-2857WZ(-FFA) [NC199(DVC/OD)]



**Drain Plugs**

Each drain plug might not be visible if insulation is installed around the piping.

GQ-C3257WZ(-FF) [NCC199(DV/OD)]



## Preventing Damage from Freezing-2

**If the water heater will not be used for a long period of time, drain the water.**

Drain the water as follows:



**CAUTION**



High Temperature

To avoid burns, wait until the equipment cools down before draining the water. The appliance will remain hot after it is turned off.

To prevent damage from freezing, the water heater must be plugged into power at all times. If power is unplugged, drain the water completely from the water heater. Then use an air compressor to remove all water from inside the unit's water piping. It is recommended that Isolation Valves are installed on the water heater, otherwise the water connections will need to be removed to drain the unit completely. Freeze damage due to not draining properly will not be covered under warranty.

Drain water into a bucket to prevent water damage.

### Drainage Using the Remote Controller

**1**

- (1) Turn the power on/off button "off".



- (2) Press the flow meter alarm set button for about two seconds until the alarm sounds. The maximum hot water temperature will flash.



- (3) Press the flow meter alarm set button again.

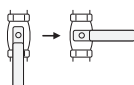


- (4) Press the setting button marked "UP". The display will change from "oF" to "on" after the button is pushed.



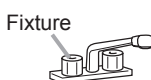
**2**

- Close the water supply valve.



**3**

- Fully open all hot water fixtures.



**4**

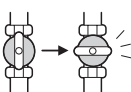
- Open all drain plugs and drain the water out of the unit.

**5**

- When the water is completely drained, replace all drain plugs and close the hot water fixtures.

**6**

- Close the gas valve and disconnect the electrical power supplied to the unit.

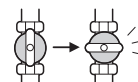


**Do not touch with wet hands.**

### Manual Draining

**1**

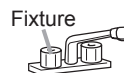
- Close the gas valve.



**2**

- (1) Turn the power on/off button "On".

- (2) Turn and leave open the hot water fixtures for more than 2 minutes and close.

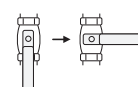


\* If multiple units are being used, drain two minutes for each unit.

\* An 11 Error Code may appear on the remote controller. This is not a malfunction of the unit. Do not turn Power ON/OFF Button OFF.

**3**

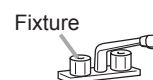
- Close the water supply valve and disconnect the electrical power supplied to the unit.



**Do not touch with wet hands.**

**4**

- Fully open all hot water fixtures.

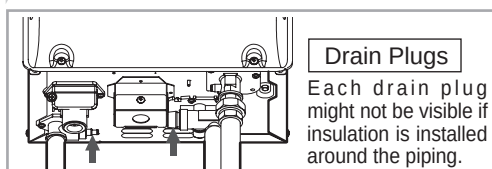


**5**

- Open all drain plugs and drain the water out of the unit.

**6**

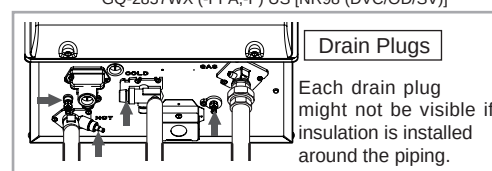
- When the water is completely drained, replace all drain plugs and close the hot water fixtures.



#### Drain Plugs

Each drain plug might not be visible if insulation is installed around the piping.

GQ-2857WX (-FFA,-F) US [NR98 (DVC/OD/SV)]



#### Drain Plugs

Each drain plug might not be visible if insulation is installed around the piping.

GQ-C3257WX (-FF) US [NRC111(DV/OD)]

## Preventing Damage from Freezing-2

**If the water heater will not be used for a long period of time,  
Drain the water.**

Drain the water as follows:

### **CAUTION**

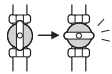
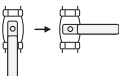
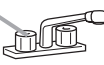


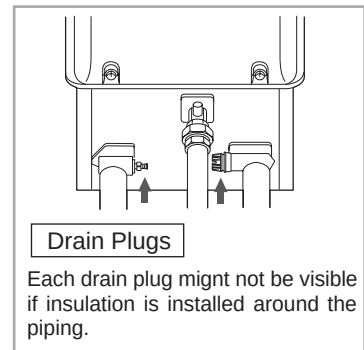
High Temperature

To avoid burns, wait until the equipment cools down before draining the water.  
The appliance will remain hot after it is turned off.

To prevent damage from freezing, the water heater must be plugged into power at all times. If power is unplugged, drain the water completely from the water heater. Then use an air compressor to remove all water from inside the unit's water piping. It is recommended that Isolation Valves are installed on the water heater, otherwise the water connections will need to be removed to drain the unit completely. Freeze damage due to not draining properly will not be covered under warranty.

Drain water into a bucket to prevent water damage.

1. Close the gas valve. 
2. Turn off the power button.
3. Turn off the power supply.  
**Do not touch with wet hands.**
4. Close the water supply valve. 
5. Fully open all hot water fixtures. 
6. Turn the drain plug to the left to open, and then remove.
7. Check that the water is completely drained, close all the drain plugs and the hot water fixtures after 10 minutes or more pass from operation of 6.



## Turning the Unit Back On

1. Check that all drain plugs are inserted.
2. Check that all hot water fixtures are closed.
3. Follow the procedure on "Initial operation", steps 1 through 4.

## Preventing Damage from Freezing-3

### Turning the Unit Back On

1. Check that all drain plugs are inserted.
  2. Check that all hot water fixtures are closed.
  3. Follow the procedure on "Initial operation", steps 1 through 4.
  - 4\*. Make sure that the area around the appliance is well ventilated; open a window or a door if necessary. Then, operate the unit and verify that condensate is coming out of the drain pipe.  
(During normal use of the water heater, condensate will begin to discharge from the drain pipe within 15 minutes of use. However, depending on the season and/or installation site conditions, it may take longer.)  
If water does not appear at the end of the drain line, a qualified service technician must clean the condensate line.
- \*Applies to GQ-C2857WS(-FF) US [NRC98(DV/OD)]  
GQ-C3257WX(-FF) US [NRC111(DV/OD)]  
GQ-C3257WZ(-FF) US [NCC199(DV/OD)]

### DANGER

For:

GQ-C2857WS(-FF) US [NRC98(DV/OD)]  
GQ-C3257WX(-FF) US [NRC111(DV/OD)]  
GQ-C3257WZ(-FF) US [NCC199(DV/OD)]

After the water heater has been out of use for a long time make sure that you fill the condensate trap with water.

This is to prevent dangerous exhaust gases from entering the building.

Failure to fill the condensate trap could result in severe personal injury or death.  
(By performing step 4 as described above, the condensate trap will automatically fill itself with water.)



Be sure to do.

GQ-2857WZ (-FFA) US [NC199(DVC/OD)]

GQ-C3257WZ(-FF) US [NCC199(DV/OD)]

## Remote Controller

### • Applicable Model

|                   |          |
|-------------------|----------|
| Remote controller | RC-9018M |
|-------------------|----------|

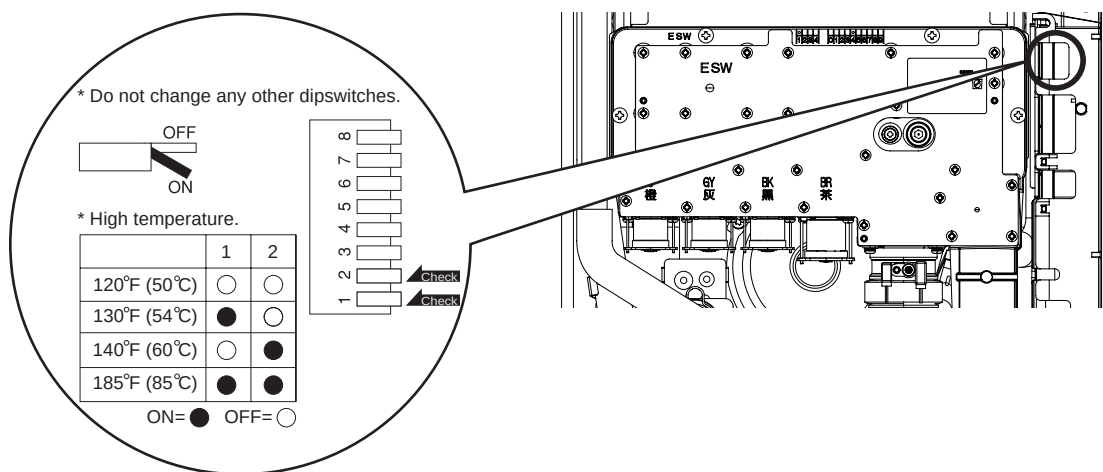
Install the remote controller according to the instructions in the Installation Guide.

\* Only one remote controller can be connected to the water heater.

A malfunction may occur if two or more remote controllers are connected.

- This unit can be programmed so that it will default to one of four temperatures if the remote controller is removed [185°F (85°C), 140°F (60°C), 130°F (54°C), 120°F (50°C)]. To change the default temperature, adjust the dip switches as described below. The default temperature is 120°F (50°C).

1. Disconnect electrical power to the water heater.
2. Remove the front cover of the water heater (4 screws).
3. Disconnect the remote controller. Adjust the dip switches as illustrated below.
4. Replace the front cover of the water heater (4 screws).
5. Reconnect electrical power to the water.



## DANGER

- When changing the temperature, make sure to confirm with the customer that the temperature of the hot water will be very high and that there is a risk of scalding.
- Hot water heater temperatures over 125 °F (52 °C) can cause severe burns instantly or death from scalding.

GQ-2857WZ(-FFA) US [NC199(DVC/OD)]  
GQ-C3257WZ (-FF) US [NCC199 (DV/OD)]

■ Changing Other Features

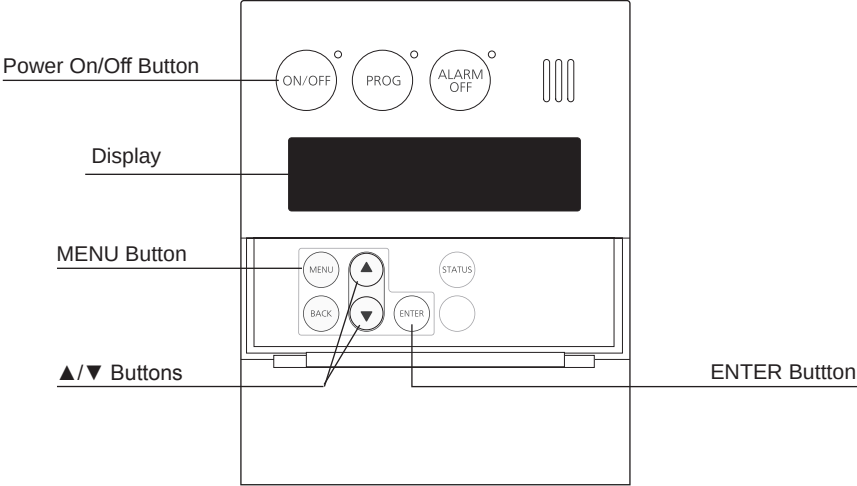
Adjusting the Temperature / Water Quantity Display

Note: The setting must be done within the first 10 minutes of connecting electrical power to the water heater.

Table of Setting Items

| Item                             | Choices (factory defaults shaded) |                  |
|----------------------------------|-----------------------------------|------------------|
| Celsius/Fahrenheit display mode. | °F (Fahrenheit) / gal             | °C (Celsius) / L |

■ Remote Controller



■ Setting Procedure

1. Turn the water heater off by pressing the Power On/Off Button on the remote controller.
2. Disconnect, then reconnect electrical power to the water heater.
3. Press the MENU Button inside the cover, select "Initial settings" using the ▲/▼ Buttons.
4. Press the ENTER button, the "Initial settings" screen appears on the display.
5. Select "[°F / gal] <=> [°C / L]" using the ▲/▼ Buttons.
6. Press the ENTER Button and select either [°F / gal] or [°C / L] using the ▲/▼ Buttons.
7. Press the ENTER Button, "Set complete Please wait..." appears on the display for 5seconds and then the "Initial settings" screen appears on the display.
8. To confirm the setting, turn the water heater on by pressing the Power On/Off Button on the remote controller.

GQ-C2857WS(-FF) US [NRC98(DV/OD)]  
GQ-C3257WX(-FF) US [NRC111(DV/OD)]  
GQ-2857WX(-FFA,-F) US [NR98(DVC/OD/SV)]  
GQ-2457WS(-FFA) US [NR83(DVC/OD)]

## Remote Controller

- Applicable Model

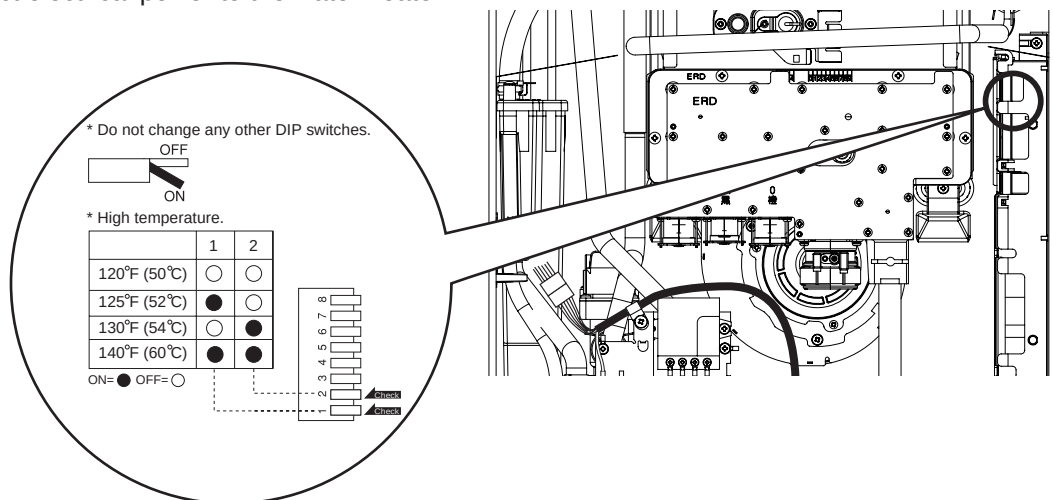
|                   |          |
|-------------------|----------|
| Remote controller | RC-7651M |
|-------------------|----------|

\* Remarks [125 °F / 55 °C]

↑ Celsius display mode  
 — Fahrenheit display mode

Install the remote controller according to the instructions in the Installation Guide (p. 41).

- \* Only one remote controller can be connected to the water heater.  
A malfunction may occur if two or more remote controllers are connected.
- \* The water heater has been factory set to allow a maximum temperature setting of [120 °F / 50 °C].  
To access higher temperature settings through the remote controller, follow the below steps.  
  
<When setting the maximum temperature to [125 -140 °F / 55 - 60 °C]>
  1. Turn the water heater off by pressing the Power On/Off Button on the remote controller.
  2. Press and hold the FLOW METER ALARM SET Button until a sound is heard (2 sec.) and [120 °F / 50 °C] appears on the display.
  3. Set the upper limit of the hot-water supply temperature to [125 °F, 130 °F, 135 °F or 140 °F / 55 °C or 60 °C] using the UP and DOWN setting Buttons.
  4. To put the water heater back into operation, press the Power On/Off Button on the remote controller.  
To keep the water heater off, let the unit sit for 30 sec. to return to the original display.  
  - This unit can be programmed so that it will default to one of three temperatures if the remote controller is removed [140 °F (60 °C), 130 °F (54 °C), 125 °F (52 °C)]. To change the default temperature, adjust the dip switches as described below. The default temperature is 120 °F (50 °C).
    1. Disconnect electrical power to the water heater.
    2. Remove the front cover of the water heater (4 screws).
    3. Disconnect the remote controller. Adjust the dip switches as illustrated below.
    4. Replace the front cover of the water heater (4 screws).
    5. Reconnect electrical power to the water heater.



- When changing the temperature, make sure to confirm with the customer that the temperature of the hot water will be very high and that there is a risk of scalding. Hot water heater temperatures over 125 °F (52 °C) can cause severe burns instantly or death from scalding.

GQ-C2857WS(-FF) US [NRC98(DV/OD)]  
 GQ-C3257WX(-FF) US [NRC111(DV/OD)]  
 GQ-2857WX(-FFA,-F) US [NR98(DVC/OD/SV)]  
 GQ-2457WS(-FFA) US [NR83(DVC/OD)]

## ■ Changing Other Features

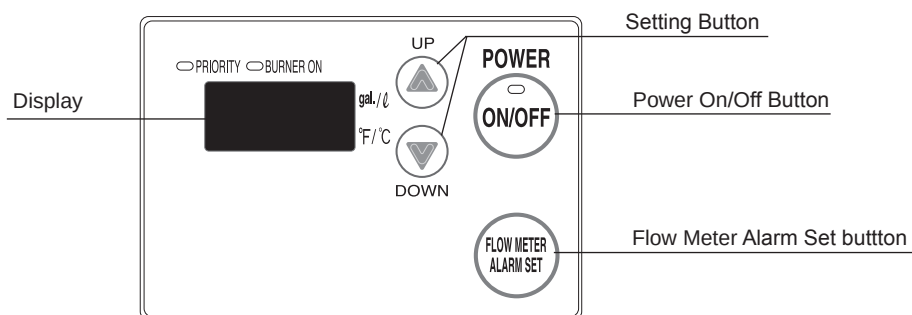
### Adjusting the Temperature Display

Note: The setting must be done within the first 10 minutes of connecting electrical power to the water heater.

Table of Setting Items

| Item No. | Item                             | Choices (factory defaults shaded) |              |
|----------|----------------------------------|-----------------------------------|--------------|
| 12       | Celsius/Fahrenheit display mode. | °F (Fahrenheit)                   | °C (Celsius) |

## ■ Remote Controller



## ■ Setting Procedure

1. Turn the water heater off by pressing the Power On/Off Button on the remote controller.
2. Disconnect, then reconnect electrical power to the water heater.
3. Press the Flow Meter Alarm Set Button and hold it in for 2 seconds or more.
4. Press the Flow Meter Alarm Set Button until the remote controller displays item number "12".
5. Press Setting Button "▲" or "▼" to change the display units to either °F or °C.
6. To confirm the setting, turn the water heater on by pressing the Power On/Off Button on the remote controller.



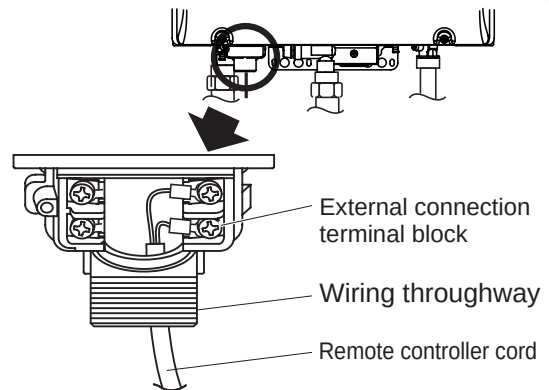
## Connecting Remote Controller Cord to Unit

- Keep the remote controller cord away from the freeze prevention heaters in the unit.
- Tie the redundant cord outside the water heater. Do not put the extra length inside the equipment.
- The remote controller cord can be extended up to 300' (90m) with 18AWG wire.
- Use a Y type terminal with a resin sleeve. (Without the sleeve, the copper wire may corrode and cause problems).
- Be sure to hand tighten when screwing to the terminal block. Power tools may cause damage to the terminal block.

### Remote controller cord

- For extensions, a 26' (8m) cord can be purchased (Part # RC-CORD26) or use 18AWG wire.
- Install according to the National Electrical Code and all applicable local codes.

1. Check to make sure that the remote controller cord has plenty of slack in order to reach the external connection terminal block.
2. Disconnect electrical power to the water heater.
3. Remove the single screw securing the terminal block cover and then remove the cover.
4. Pass the remote controller cord through the wiring throughway and connect the Y terminals at the end of the remote controller cord to the terminal block.
5. Replace the terminal block cover and install the screw previously removed in step 3.
6. Reconnect electrical power to the water heater.



## Changing Other Features

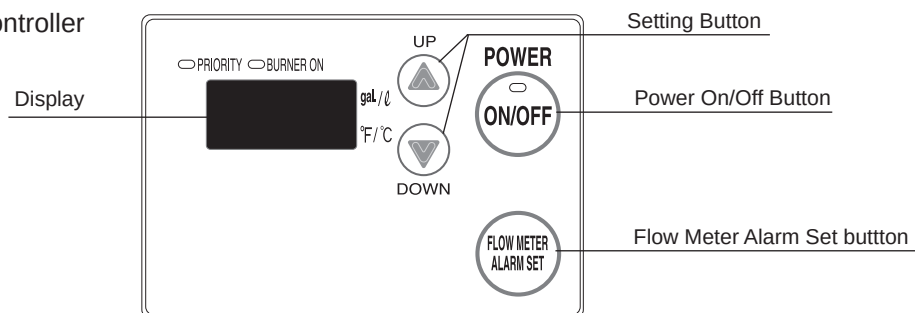
### Adjusting the Temperature Display

Note: The setting must be done within the first 10 minutes of connecting electrical power to the water heater.

Table of Setting Items

| Item No. | Item                             | Choices (factory defaults shaded) |              |
|----------|----------------------------------|-----------------------------------|--------------|
| 12       | Celsius/Fahrenheit display mode. | °F (Fahrenheit)                   | °C (Celsius) |

## Remote Controller



## Setting Procedure

1. Turn the water heater off by pressing the Power On/Off Button on the remote controller.
2. Disconnect, then reconnect electrical power to the water heater.
3. Press the Flow Meter Alarm Set Button and hold it in for 2 seconds or more.
4. Press the Flow Meter Alarm Set Button until the remote controller displays item number "12".
5. Press Setting Button "▲" for 5 seconds or more to change the display units to °F.
6. Press Setting Button "▼" for 5 seconds or more to change the display units to °C.
7. To confirm the setting, turn the water heater on by pressing the Power On/Off Button on the remote controller.

## ■ Changing Other Features

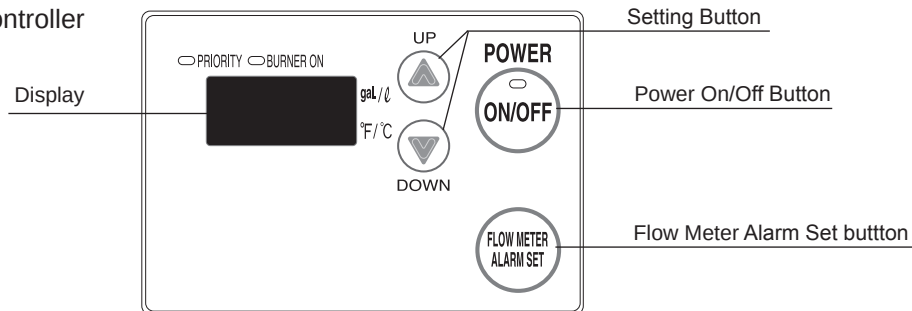
### Adjusting the Temperature Display

Note: The setting must be done within the first 10 minutes of connecting electrical power to the water heater.

Table of Setting Items

| Item No. | Item                             | Choices (factory defaults shaded) |              |
|----------|----------------------------------|-----------------------------------|--------------|
| 12       | Celsius/Fahrenheit display mode. | °F (Fahrenheit)                   | °C (Celsius) |

## ■ Remote Controller



## ■ Setting Procedure

1. Turn the water heater off by pressing the Power On/Off Button on the remote controller.
2. Disconnect, then reconnect electrical power to the water heater.
3. Press the Flow Meter Alarm Set Button and hold it in for 2 seconds or more.
4. Press the Flow Meter Alarm Set Button until the remote controller displays item number "12".
5. Press Setting Button "▲" for 5 seconds or more to change the display units to °F.
6. Press Setting Button "▼" for 5 seconds or more to change the display units to °C.
7. To confirm the setting, turn the water heater on by pressing the Power On/Off Button on the remote controller.

# Installation Check

Installation problems can cause the unit to work unsatisfactorily. If the unit is not working properly, but there are no error codes or evidence of malfunction, check the installation.

## \* Installation Checks:

### Altitude

1. If this water heater is installed in a location where the altitude is greater than 2000 ft., the combustion may become abnormal because of the thinness of the air. The unit must be configured for high elevation installations by adjusting the high elevation dip switches located inside of the water heater. Refer to the "Installation Manual" for detailed instructions.

### Air Supply/Exhaust

1. Make sure that the installation location provides sufficient combustible air and enough space for an exhaust vent.
2. Install the venting only as outlined in the installation manual.

### Installation Environment

1. If this unit will be installed in a factory, salon, or laundry service, install it in a location where it will not be exposed to steam, ammonia, sulfur, chlorine, ethylene compounds, or acids.
2. If this unit will be installed in a restaurant, locate it so that it will not be effected by steam.
3. Avoid any installation that will expose the unit to steam or moisture.

### For Multiple Floor Water Supply

1. If the unit will be installed on the lower floor of a multiple story building, in order to get the maximum flow rate through the unit, there must be at least 29 PSI of water pressure at the inlet to the unit. If this supply water pressure cannot be maintained, install pumps to increase the pressure and install a pressure gauge to adjust the supply pressure to the desired level. If the supply pressure to the water heater falls below this level, boiling may occur in parts of the heat exchanger, causing an abnormal sound and possibly damaging the water heater.

### Installation of Strainer

1. If the unit will be installed in a system with a circulating or pressure increasing pump, install a strainer with a #50 or greater mesh to protect the unit from damage caused by debris in the plumbing line. This is especially important for older piping.

## GQ-2457WS-FFA US [NR83DVC]

### \* Installation Cautions

#### Gas Supply Piping

Because a large quantity of gas is used with these appliances, make sure to size the gas meter and supply piping to match the maximum Btu rating of the heater.

#### Air Supply and Vent Pipe

■ Before installation, note the following:

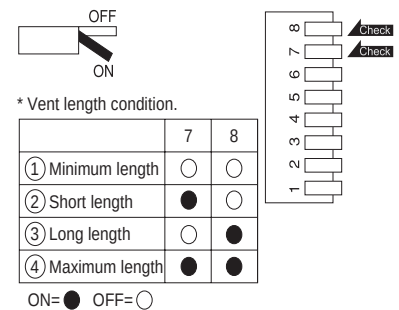
The unit can be adjusted to accommodate longer vent runs; refer to the below table to find the maximum vent length based on the number of elbows. Adjust the dip switches according to the vent condition noted in the tables below.

| Vent length* |       |                    | Elbows           |                   |                   |                      |   |   |   |
|--------------|-------|--------------------|------------------|-------------------|-------------------|----------------------|---|---|---|
| ft           | m     | Number of pieces** | 0                | 1                 | 2                 | 3                    | 4 | 5 | 6 |
| 3            | 0.90  | 1                  | ① Minimum length |                   |                   |                      |   |   |   |
| 6            | 1.80  | 2                  |                  | ② Short length*** |                   |                      |   |   |   |
| 9            | 2.70  | 3                  |                  |                   | ③ Long length**** |                      |   |   |   |
| 12           | 3.60  | 4                  |                  |                   |                   | ④ Maximum length**** |   |   |   |
| 15           | 4.50  | 5                  |                  |                   |                   |                      |   |   |   |
| 18           | 5.40  | 6                  |                  |                   |                   |                      |   |   |   |
| 21           | 6.30  | 7                  |                  |                   |                   |                      |   |   |   |
| 24           | 7.20  | 8                  |                  |                   |                   |                      |   |   |   |
| 27           | 8.10  | 9                  |                  |                   |                   |                      |   |   |   |
| 30           | 9.00  | 10                 |                  |                   |                   |                      |   |   |   |
| 32           | 9.90  | 11                 |                  |                   |                   |                      |   |   |   |
| 35           | 10.80 | 12                 |                  |                   |                   |                      |   |   |   |
| 38           | 11.70 | 13                 |                  |                   |                   |                      |   |   |   |

\*\*\* The BTUH input of the appliance will be reduced by up to 3%.  
 \*\*\*\*The BTUH input of the appliance will be reduced by up to 6%.

\*\*Table assumes straight vent pieces are 3' (0.9m) each.  
 Shorter or longer vent pieces may also be used up to the maximum allowed vent length.

\* Do not change any other dipswitches.



- Make sure the installation location allows for a flue to be built that will be shorter than the maximum allowable vent length.

\* A longer vent will cause a danger of explosion.

Choose a good path for the vent pipe.

- Do not penetrate the vent pipe through a fire wall.
- Extend the vent pipe all the way to the outdoors.
- Steam and condensed water may exit the vent pipe. Be sure to install the vent pipe so that the steam and water droplets will not harm anything.

#### Electrical

- The electrical power supply to the unit should be installed by a qualified electrician.
- Allocate 4A on the circuit for this water heater.

If more than one unit is being installed, allocate an appropriate circuit to provide power for each unit.

GQ-2857WX (-FFA) US [NR98 (DVC/OD/SV)]  
GQ-2857WZ (-FFA) US [NC199 (DVC/OD)]

**\* Installation Cautions**

**Gas Supply Piping**

Because a large quantity of gas is used with these appliances, make sure to size the gas meter and supply piping to match the maximum Btu rating of the heater.

**Air Supply and Vent Pipe**

■ Before installation, note the following:

- Vent pipe diameters and maximum vent length (For SV models) :

|                     |                        |
|---------------------|------------------------|
| Vent Pipe Diameter  | 4"                     |
| Maximum Vent Length | 15 feet 3- 90° elbows* |

\*Refer to the installation manual for proper settings to achieve this length.

- Maximum vent length (For DVC models) :

The unit can be adjusted to accommodate longer vent runs; refer to the below table to find the maximum vent length based on the number of elbows. Adjust the dip switches according to the vent condition noted in the tables below.

| Vent length* |       |                    | Elbows           |                |               |                  |   |   |   |
|--------------|-------|--------------------|------------------|----------------|---------------|------------------|---|---|---|
| ft           | m     | Number of pieces** | 0                | 1              | 2             | 3                | 4 | 5 | 6 |
| 3            | 0.90  | 1                  | ① Minimum length |                |               |                  |   |   |   |
| 6            | 1.80  | 2                  |                  | ② Short length |               |                  |   |   |   |
| 9            | 2.70  | 3                  |                  |                | ③ Long length |                  |   |   |   |
| 12           | 3.60  | 4                  |                  |                |               | ④ Maximum length |   |   |   |
| 15           | 4.50  | 5                  |                  |                |               |                  |   |   |   |
| 18           | 5.40  | 6                  |                  |                |               |                  |   |   |   |
| 21           | 6.30  | 7                  |                  |                |               |                  |   |   |   |
| 24           | 7.20  | 8                  |                  |                |               |                  |   |   |   |
| 27           | 8.10  | 9                  |                  |                |               |                  |   |   |   |
| 30           | 9.00  | 10                 |                  |                |               |                  |   |   |   |
| 32           | 9.90  | 11                 |                  |                |               |                  |   |   |   |
| 35           | 10.80 | 12                 |                  |                |               |                  |   |   |   |
| 38           | 11.70 | 13                 |                  |                |               |                  |   |   |   |
| 41           | 12.60 | 14                 |                  |                |               |                  |   |   |   |

\* Do not change any other dipswitches.

OFF  
ON

\* Vent length condition.

|                  | 7 | 8 |
|------------------|---|---|
| ① Minimum length | ○ | ○ |
| ② Short length   | ● | ○ |
| ③ Long length    | ○ | ● |
| ④ Maximum length | ● | ● |

ON=● OFF=○

\*\*\* The BTUH input of the appliance will be reduced by up to 3%.  
\*\*\*\*The BTUH input of the appliance will be reduced by up to 6%.

\*\*Table assumes straight vent pieces are 3' (0.9m) each.

Shorter or longer vent pieces may also be used up to the maximum allowed vent length.

- Make sure the installation location allows for a flue to be built that will be shorter than the maximum allowable vent length.

\* A longer vent will cause a danger of explosion.

Choose a good path for the vent pipe.

- Do not penetrate the vent pipe through a fire wall.
- Extend the vent pipe all the way to the outdoors.
- Steam and condensed water may exit the vent pipe. Be sure to install the vent pipe so that the steam and water droplets will not harm anything.

**Electrical**

- The electrical power supply to the unit should be installed by a qualified electrician.
- Allocate 4A on the circuit for this water heater.

If more than one unit is being installed, allocate an appropriate circuit to provide power for each unit.

GQ-C3257WX (-FF) US [NRC111 [(DV/OD)]

GQ-C3257WX (-FF) US [NCC199 (DV/OD)]

### \* Installation Cautions

#### Gas Supply Piping

Because a large quantity of gas is used with these appliances, make sure to size the gas meter and supply piping to match the maximum Btu rating of the heater.

#### Air Supply and Vent Pipe

■ Before installation, note the following:

- Vent pipe diameters and maximum vent length (For DV models) :

|                     |                             |                             |
|---------------------|-----------------------------|-----------------------------|
| Vent Pipe Diameter  | 3" PVC or CPVC Pipe         | 4" PVC or CPVC Pipe         |
| Maximum Vent Length | 16 feet with 3- 90° elbows* | 39 feet with 4- 90° elbows* |

\*Refer to the installation manual for proper settings to achieve this vent length.

- Make sure the installation location allows for a flue to be built that will be shorter than the maximum allowable vent length.

\* A longer vent will cause a danger of explosion.

Choose a good path for the vent pipe.

- Do not penetrate the vent pipe through a fire wall.
- Extend the vent pipe all the way to the outdoors.
- Steam and condensed water may exit the vent pipe. Be sure to install the vent pipe so that the steam and water droplets will not harm anything.
- The condensate trap can be filled before connecting the vent pipe.

#### Filling the condensate trap with water (-DV type only)

The condensate trap can be filled before connecting the vent pipe.

#### Filling the condensate trap before vent pipe installation.

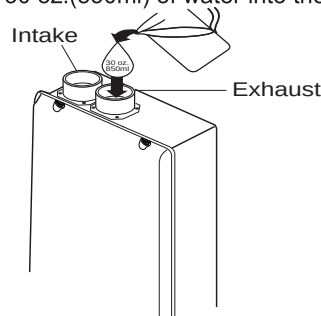


### DANGER

Prior to initial start up, make sure that you fill the condensate trap with water. This is to prevent dangerous exhaust gases from entering the building. Failure to fill the condensate trap could result in severe personal injury or death.

Please follow one of the procedures described below to ensure that the condensate trap is filled with water.

- 1) Fill the condensate trap by pouring approx. 30 oz.(850ml) of water into the exhaust accessory on the top of the appliance as illustrated below.



Or, if the vent pipe has already been installed:

- 2) After installing the drain pipe, make sure that the area around the appliance is well ventilated; open a window or a door if necessary.

Then, operate the unit and verify that condensate is coming out of the drain pipe.

(During normal use of the water heater, condensate will begin to discharge from the drain pipe within 15 minutes of use. However, depending on the season and/or installation site conditions, it may take longer.)

Note: The condensate discharged from the water heater has a pH level of approximately 2-3.

If required by local code, the condensate must be neutralized prior to disposal into the sewer system.

Refer to next pages for additional details.

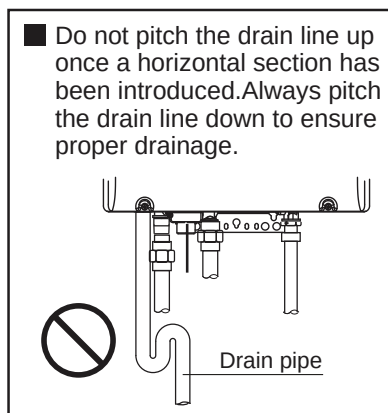
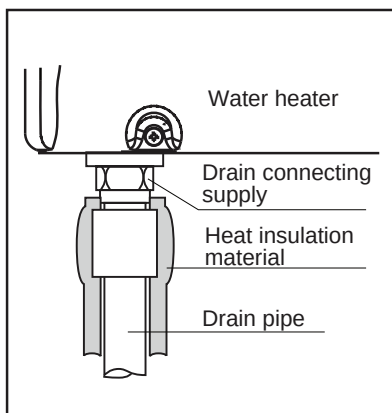
GQ-C3257WX (-FF) US [NRC111(DV/OD)]  
GQ-C3257WZ (-FF) US [NCC199 (DV/OD)]  
GQ-C2857WS (-FF) US [NRC98 (DV/OD)]

#### Electrical

- The electrical power supply to the unit should be installed by a qualified electrician.
- Allocate 4A on the circuit for this water heater.  
If more than one unit is being installed, allocate an appropriate circuit to provide power for each unit.

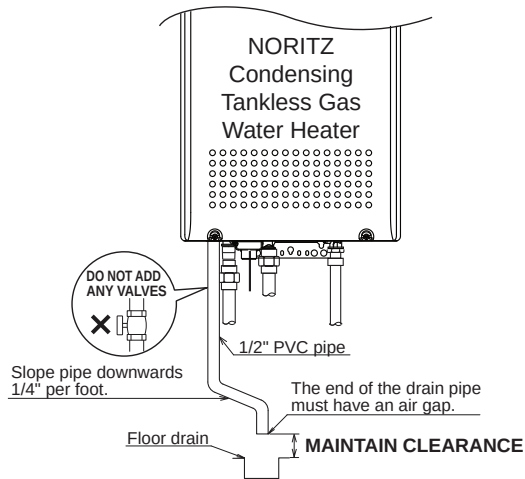
#### Condensate Piping

- This water heater is a high efficiency, fully condensing appliance which produces acidic condensate during operation. The water heater incorporates a collection and removal system which must be properly drained in order to ensure proper operation of this appliance.
- The pH level of the condensate is approximately 2-3. An external neutralizer must be installed on the drain piping prior to disposal when required by local code or when the condensate could cause damage.
- If an external neutralizer is installed, periodic replacement of the neutralizing agent will be required. Refer to the instructions supplied with the neutralizer for suggested replacement intervals.
- In order to drain the condensate, a 1/2" threaded fitting is provided at the base of the water heater. Do not reduce the size of this fitting or the drain piping to less than 1/2".  
In cold climates, do not drain the condensate to the outdoors. If the drain pipe freezes during cold weather, the pipe will not drain condensate and the unit will stop operating.
- Use plastic pipe, such as PVC, for the drain line. Do not use steel, black iron, or any other material which can corrode when placed into contact with water.
- Keep the length of the drain pipe as short as possible. Long runs or applications where the nearest drain is above the water heater will require the use of a condensate pump. Size the pump to allow for a maximum condensate discharge of 2 GPH from the water heater.
- Horizontal runs must be sloped 1/4" per foot towards the drain or condensate pump. The condensate will be discharged by gravity force only. Make the drain pipe run as short as possible.
- The end of the drain pipe must not be submerged in water or blocked in any way. To ensure proper drainage, leave the end of the drain pipe open to the atmosphere. Do not have a trap. Also, make sure that there are no obstructions blocking the drain line from discharging condensate.
- Be sure to check that condensate is freely flowing from the drain piping after the system has been installed. Condensate will begin flowing out of the water heater within 15 minutes after operation has started.
- Take measures to prevent the condensate drain lines from freezing (insulation, heat tape, electric heaters, etc.).

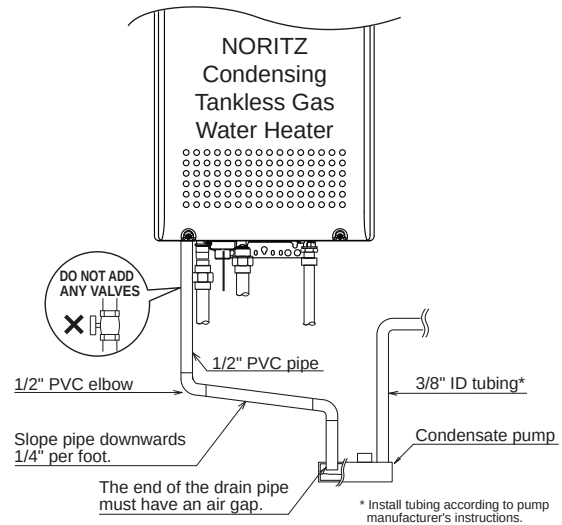


GQ-C3257WX (-FF) US [NRC111(DV/OD)]  
 GQ-C3257WZ (-FF) US [NCC199 (DV/OD)]  
 GQ-C2857WS (-FF) US [NRC98 (DV/OD)]

**Condensate piping to floor drain**



**Condensate piping with pump**



**Note:**

If the drain line becomes clogged or frozen, condensate will back-up into the water heater and a "29" error code will flash on the remote controller, ceasing operation. If this occurs, clear the clog or freeze so that condensate can freely flow. Be sure to slope the drain pipe, use the appropriate size pipe, allow the proper clearances, and apply freeze prevention measures (when necessary) to prevent the drain line from clogging or freezing.



## \* Installation Cautions

### Gas Supply Piping

Because a large quantity of gas is used with these appliances, make sure to size the gas meter and supply piping to match the maximum Btu rating of the heater.

### Air Supply and Vent Pipe

■ Before installation, note the following:

- Vent pipe diameters and maximum vent length (For DV models):

|                     |                              |                              |
|---------------------|------------------------------|------------------------------|
| Vent Pipe Diameter  | 3" PVC or CPVC Pipe          | 4" PVC or CPVC Pipe          |
| Maximum Vent Length | 24 feet with 6 - 90° elbows* | 24 feet with 6 - 90° elbows* |

\*Refer to the installation manual for proper settings to achieve this vent length.

- Make sure the installation location allows for a flue to be built that will be shorter than the maximum allowable vent length.
  - \* A longer vent will cause a danger of explosion.
  - Choose a good path for the vent pipe.
- Do not penetrate the vent pipe through a fire wall.
- Extend the vent pipe all the way to the outdoors.
- Steam and condensed water may exit the vent pipe. Be sure to install the vent pipe so that the steam and water droplets will not harm anything.
- The condensate trap can be filled before connecting the vent pipe.

### Filling the condensate trap with water (-DV type only)

The condensate trap can be filled before connecting the vent pipe.

#### Filling the condensate trap before vent pipe installation.

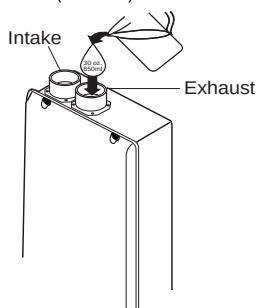


### DANGER

Prior to initial start up, make sure that you fill the condensate trap with water. This is to prevent dangerous exhaust gases from entering the building. Failure to fill the condensate trap could result in severe personal injury or death.

Please follow one of the procedures described below to ensure that the condensate trap is filled with water.

- 1) Fill the condensate trap by pouring approx. 30 oz.(850ml) of water into the exhaust accessory on the top of the appliance as illustrated below.



Or, if the vent pipe has already been installed:

- 2) After installing the drain pipe, make sure that the area around the appliance is well ventilated; open a window or a door if necessary.

Then, operate the unit and verify that condensate is coming out of the drain pipe.

(During normal use of the water heater, condensate will begin to discharge from the drain pipe within 15 minutes of use. However, depending on the season and/or installation site conditions, it may take longer.)

Note: The condensate discharged from the water heater has a pH level of approximately 2-3.

If required by local code, the condensate must be neutralized prior to disposal into the sewer system.

Refer to next pages for additional details.