

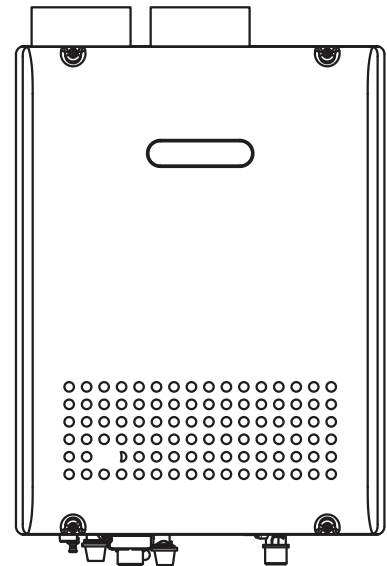
NRC83 (-DV, -OD)
NRC98 (-DV, -OD)
NRC1111/NCC1991(-DV,-OD)
NR981/NC199(-DVC,-OD,-SV)
NR83-DVC

Rev: October, 2012

Field 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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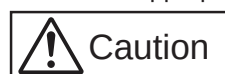
Important Safety Information

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

 Warning	Ignoring this indication will cause an immediate danger of death or serious injury.
 Caution	Ignoring this indication may result in death or serious injury.
	Prohibited.

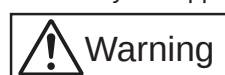
1. Safety Tips for Service

- 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.

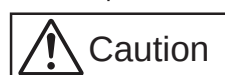
- Exhaust and gas leakage caution:



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

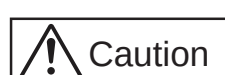
2. Post-Service Checks

- 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:



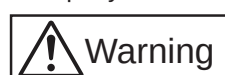
- After service or maintenance is completed, check that there are no combustibles in the vicinity of the unit.

- 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

■ NRC98(-DV/-OD)

Item		Specification	
Model Name		NRC98-DV	NRC98-OD
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 Freeze Prevention 213W	NG : 64W LP : 68W Freeze Prevention 203W
Materials	Casing	Zincified Steel Plate/Polyester Coating	
	Flue Collar	PVC	Stainless Steel
	Primary Heat Exchanger	Copper Sheetting, Copper Tubing	
	Secondary Heat Exchanger	Stainless Steel Sheetting, 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	

■ NRC83(-DV/-OD)

Item		Specification	
Model Name		NRC83-DV	NRC83-OD
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 : 58W LP : 64W Freeze Prevention 213W	NG : 51W LP : 54W Freeze Prevention 203W
Materials	Casing	Zincified Steel Plate/Polyester Coating	
	Flue Collar	PVC	Stainless Steel
	Primary Heat Exchanger	Copper Sheetting, Copper Tubing	
	Secondary Heat Exchanger	Stainless Steel Sheetting, 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	

■ NRC1111(-DV,-OD) / NCC1991(-DV,-OD)

Item		Specification	
Model Name		NRC1111-DV NCC1991-DV	NRC1111-OD NCC1991-OD
Type	Installation	Indoor/Outdoor, Wall Mounted	Indoor/Outdoor, Wall Mounted
	Air Supply/Exhaust	Power Vented	
Ignition		Direct Ignition	
Operating Pressure		15-150 psi	
Minimum Flow Rate		0.5 GPM	
Dimensions		24.4"(Height) x 18.3"(Width) x 9.4"(Depth)	
Weight		68 lbs.	66 lbs.
Water Holding Capacity		0.5 Gallon	
Connection Sizes	Water Inlet	3/4"	
	Hot Water Outlet	3/4"	
	Gas Inlet	3/4"	
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	
	Flue Collar	PVC	
	Heat Exchanger	Copper Sheeting, Copper Tubing	
Safety Devices		Flame Rod, Thermal Fuse, Lightning Protection Device (ZNR), Overheat Prevention Device, Freeze Prevention Device, Fan Rotation Detector	
Accessories		Anchoring Screws	

■ NR981 (-SV,-OD,-DVC) / NC1991 (-OD,-DVC)

Item		Specification		
Model Name		NR981-OD NC1991-OD	NR981-SV	NR981-DVC NC1991-DVC
Type	Installation	Outdoor, Wall Mounted	Indoor, Wall Mounted	
	Air Supply/Exhaust	Power Vented		
Ignition		Direct Ignition		
Operating Pressure		15-150 psi		
Minimum Flow Rate		0.5 GPM		
Dimensions		23.6"(Height) x 13.8"(Width) x 9.4"(Depth)		23.6"(Height) x 13.8"(Width) x 11.0"(Depth)
Weight		54 lbs.		58 lbs.
Water Holding Capacity		0.2 Gallon		
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 : 69W	LP : 67W	LP : 83W
		Freeze Prevention 161W	Freeze Prevention 193W	
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, Freeze Prevention Device, Fan Rotation Detector		
Accessories		Remote Controller, Remote Controller Cord, Anchoring Screws		Anchoring Screws

■ NR83-DVC

Item		Specification
Model Name		NR83-DVC
Type	Installation	Indoor 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 Freeze Prevention 161W
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		Anchoring Screws

Performance

Item		NRC98-DV	NRC98-OD
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:	100-140°F (In 5°F intervals) (9 Options)	
	°C Mode:	37-48°C (In 1°C intervals), 50,55,60°C (In 5°C intervals) (15 Options)	
Default Temperature Options		120°F (50°C), 130°F (55°C), 140°F (60°C) (Original is 120°F (50°C))	

Item		NRC83-DV	NRC83-OD
Gas Consumption	Maximum Performance	NG : 157,000 btuh LP : 157,000 btuh	
	Minimum Performance	NG : 16,000 btuh LP : 16,000 btuh	
Maximum Hot Water Capacity	45°F (25°C) Rise	6.6 GPM (25.0 L/min.)	
Capacity Range		0.5-8.3 GPM (2-31.4 L/min.)	
Temperature Settings	°F Mode:	100-140°F (In 5°F intervals) (9 Options)	
	°C Mode:	37-48°C (In 1°C intervals), 50,55,60°C (In 5°C intervals) (15 Options)	
Default Temperature Options		120°F (50°C), 130°F (55°C), 140°F (60°C) (Original is 120°F (50°C))	

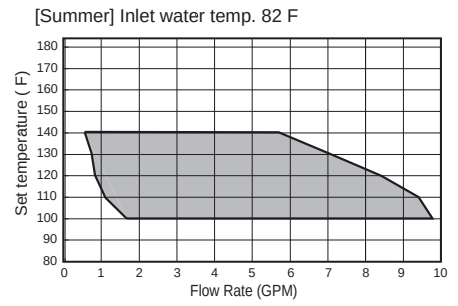
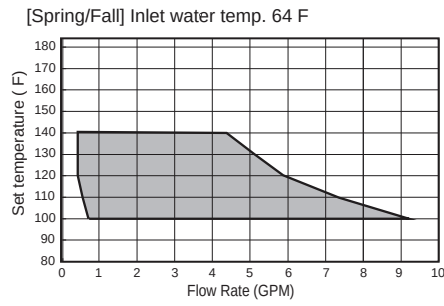
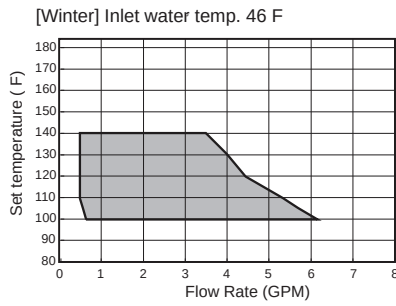
Item		NRC1111-DV	NRC1111-OD	NCC1991-DV	NCC1991-OD
Gas Consumption	Maximum Performance	NG : 199,900 btuh LP : 199,900 bti			
	Minimum Performance	NG : 16,000 btuh LP : 16,000 btuh			
Maximum Hot Water Capacity	45°F Rise	8.4 Gal./min.			
Capacity Range		0.5 - 11.1 Gal./min.			
Default Temperature Options		120, 130, 140°F (Original is 120°F)		120, 130, 140, 185°F (Original is 120°F)	
Temperature Settings (Using the Remote Controller)		100 - 140°F (In 5°F intervals), (9 Options)		100 - 150°F (In 5°F intervals), 160, 170, 185°F (14 Options)	

Item		NR981-DVC / NR981-OD / NR981-SV	NC1991-DVC	NC1991-OD
Gas Consumption	Maximum Performance	NG : 199,900 btuh LP : 199,900 bti		
	Minimum Performance	NG : 16,000 btuh LP : 16,000 btuh		
Maximum Hot Water Capacity	45°F Rise	7.5 Gal./min.		
Capacity Range		0.5 - 9.8 Gal./min.		
Default Temperature Options		120, 130, 140°F (Original is 120°F)	120, 130, 140, 185°F (Original is 120°F)	
Temperature Settings (Using the Remote Controller)		100 - 140°F (In 5°F intervals), (9 Options)	100 - 150°F (In 5°F intervals), 160, 170, 185°F (14 Options)	

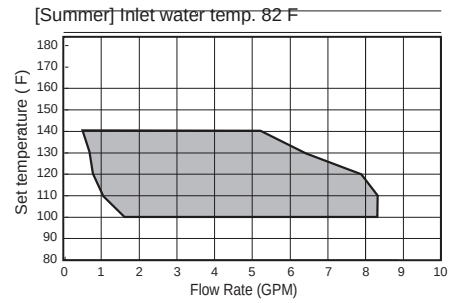
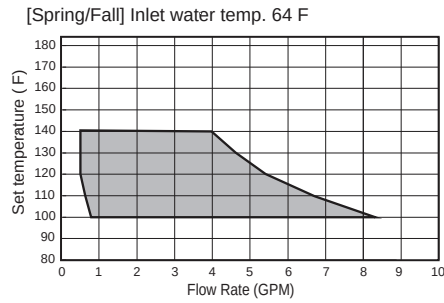
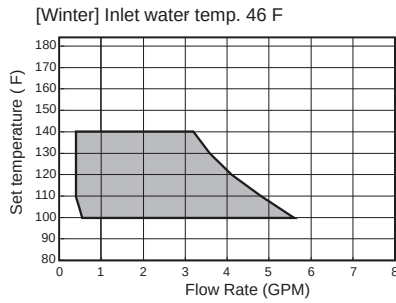
Item		NR83-DVC	
Gas Consumption	Maximum Performance	NG : 180,000 btuh LP : 180,000 btuh	
	Minimum Performance	NG : 18,000 btuh LP : 18,000 btuh	
Maximum Hot Water Capacity	45°F (25°C) Rise	6.7 GPM (25.4 L/min.)	
Capacity Range		0.5-8.3 GPM (2-31.4 L/min.)	
Temperature Settings	°F Mode:	100-140°F (In 5°F intervals) (9 Options)	
	°C Mode:	37-48°C (In 1°C intervals), 50,55,60°C (In 5°C intervals) (15 Options)	
Default Temperature Options	°F Mode:	120,130,140°F (Original is 120°F)	
	°C Mode:	50,55,60°C (Original is 50°C)	

■ Hot Water Supply Capabilities

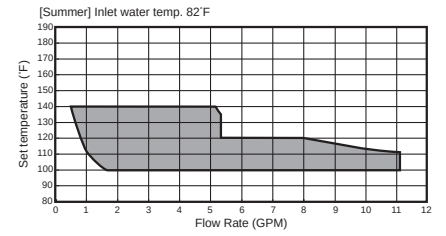
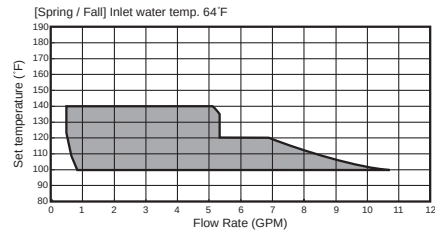
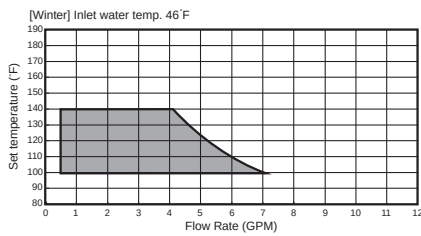
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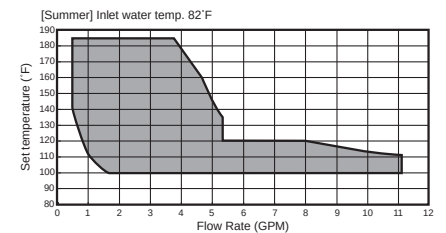
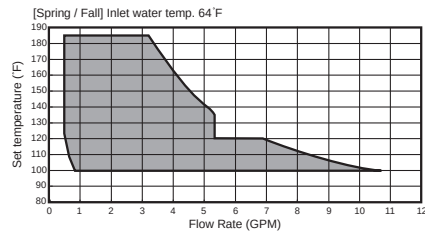
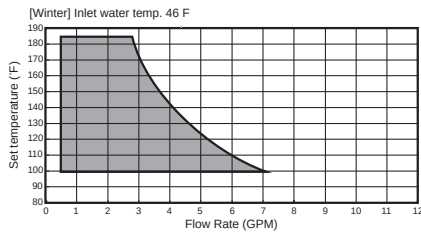
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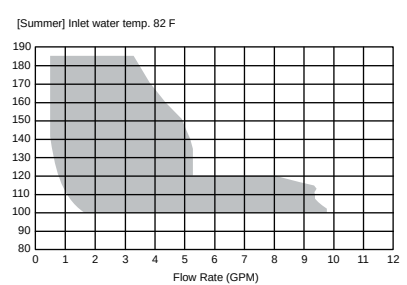
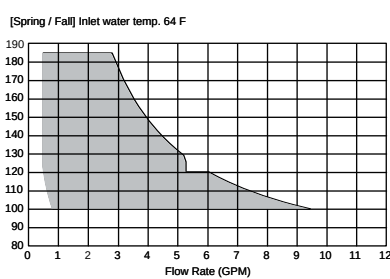
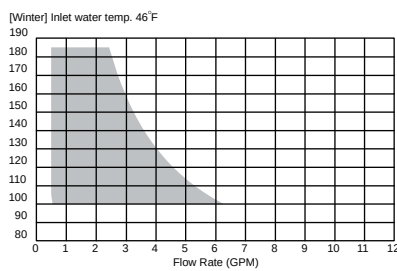
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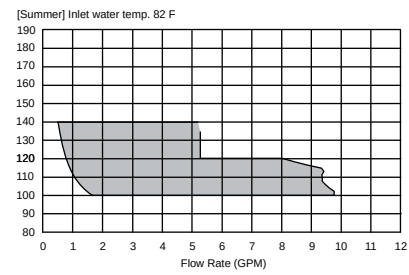
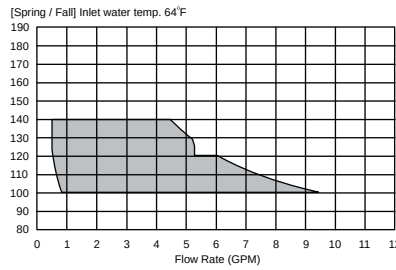
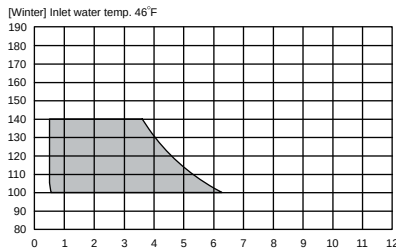


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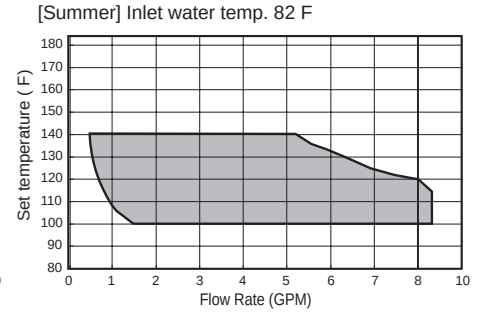
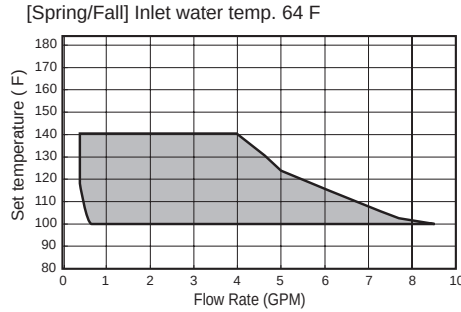
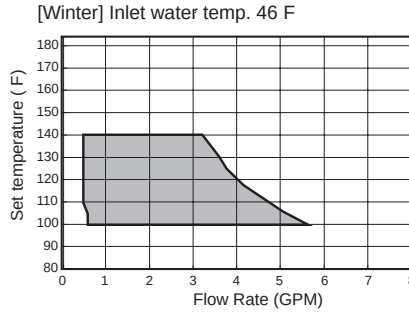


Hot Water Supply Capabilities

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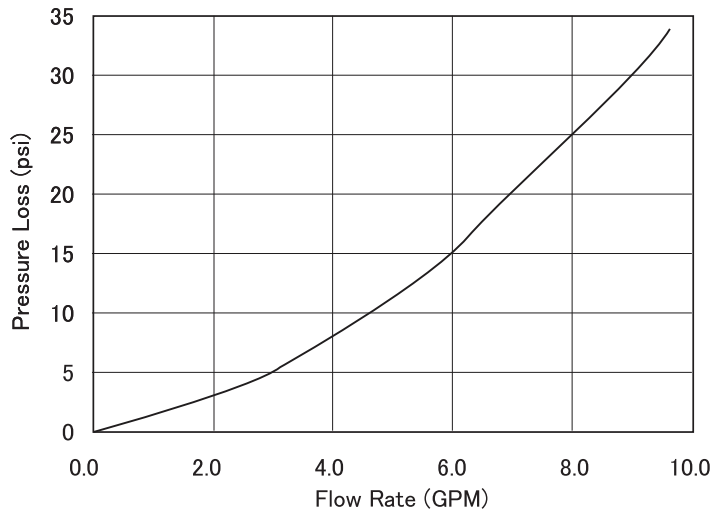


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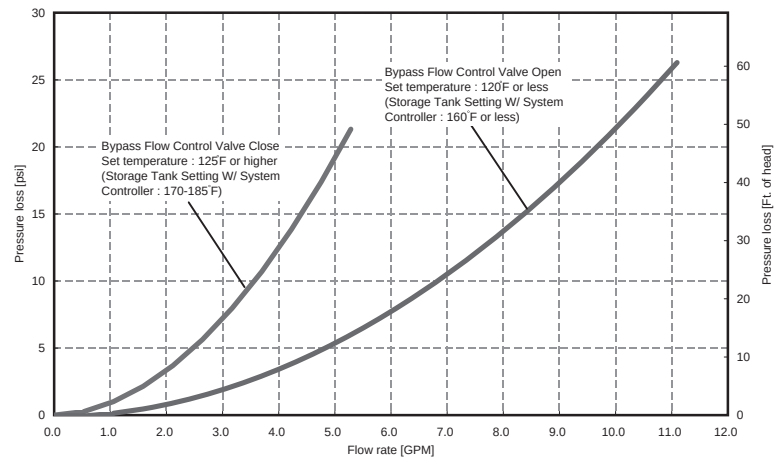


Pressure Loss Characteristics

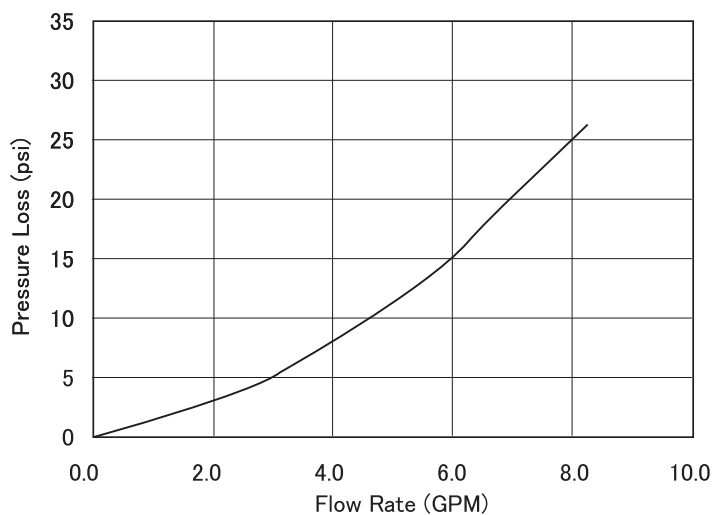
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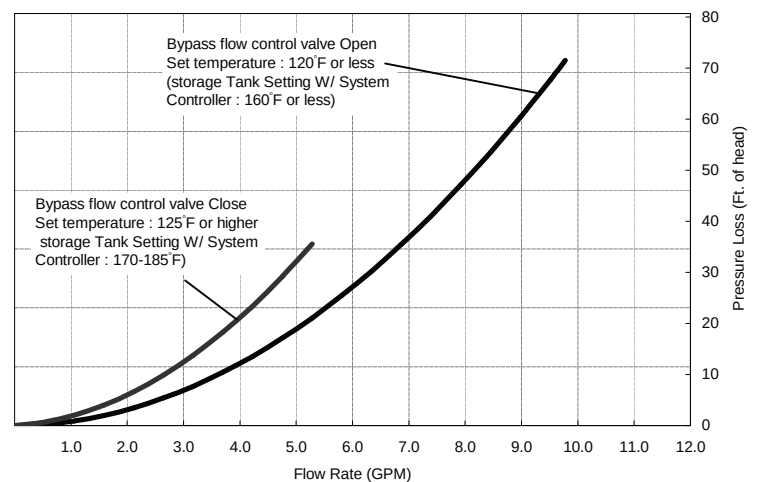
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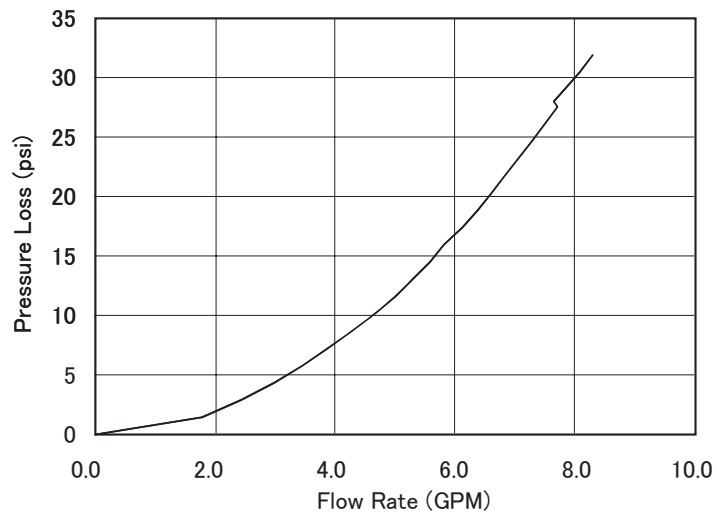
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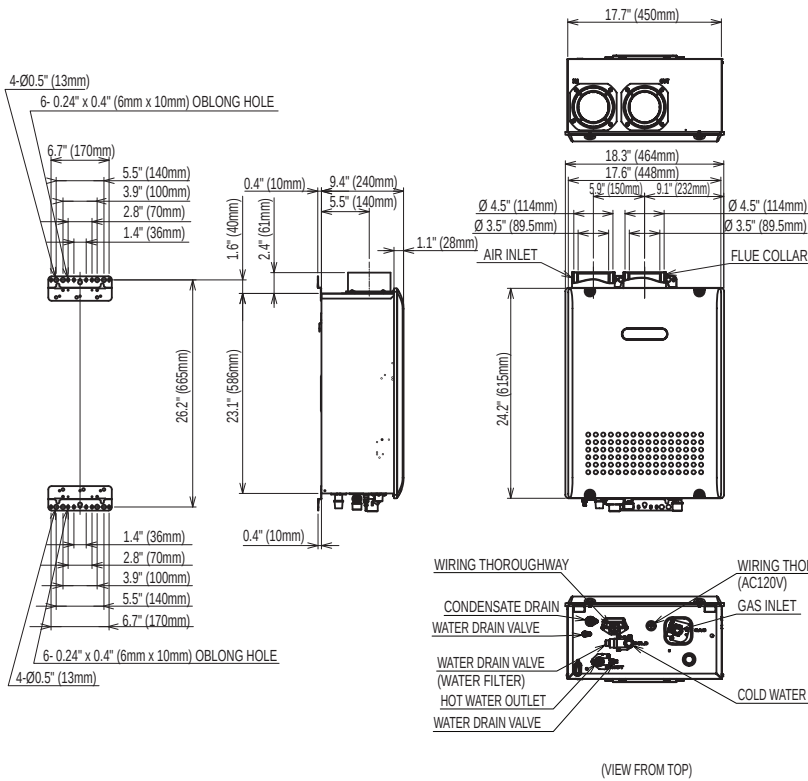
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3. Dimensions

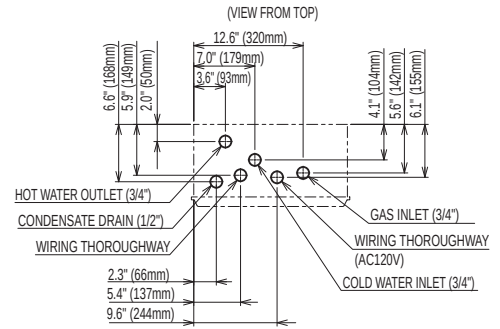
NRC98-DV NRC83-DV

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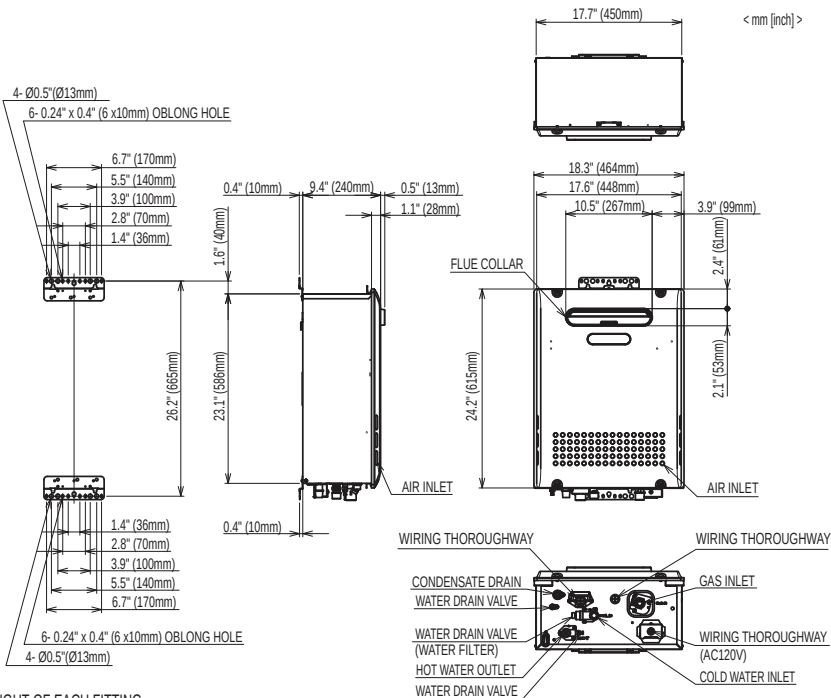
HEIGHT OF EACH FITTING
FROM BOTTOM OF CASE

CONDENSATE DRAIN	0.9" (24mm)
HOT WATER OUTLET	1.8" (45mm)
COLD WATER INLET	1.9" (49mm)
GAS INLET	2.2" (56mm)



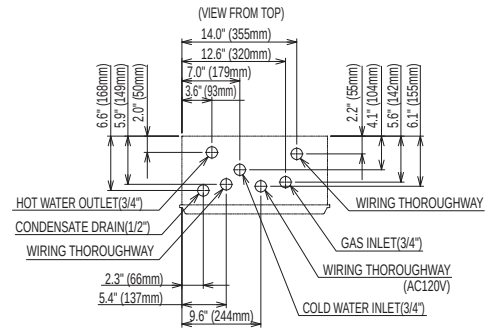
NRC98-OD NRC83-OD

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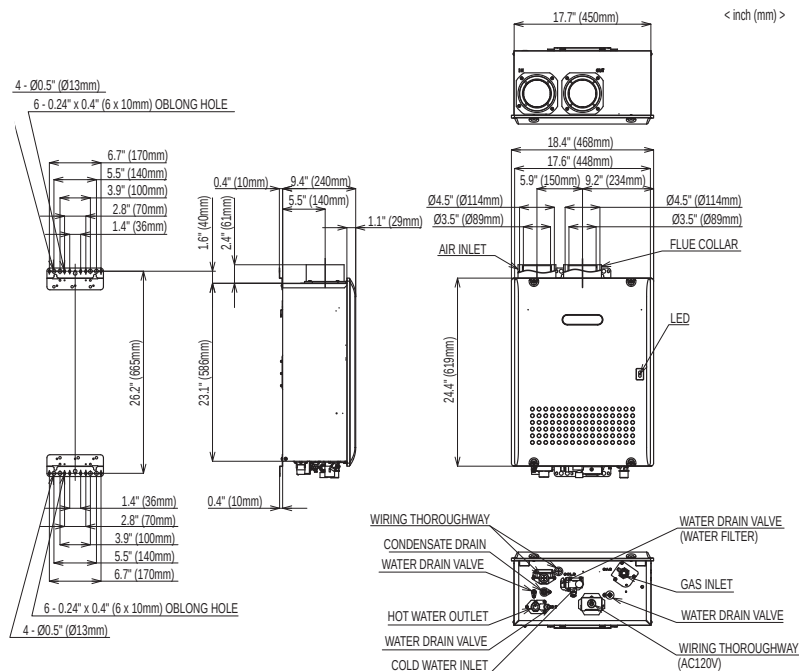
HEIGHT OF EACH FITTING
FROM BOTTOM OF CASE

CONDENSATE DRAIN	0.8" (20mm)
HOT WATER OUTLET	1.8" (45mm)
COLD WATER INLET	1.9" (49mm)
GAS INLET	2.2" (56mm)



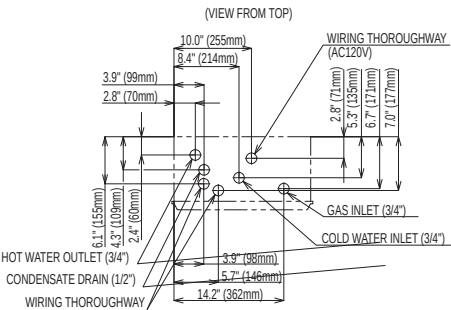
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NCC1991-DV

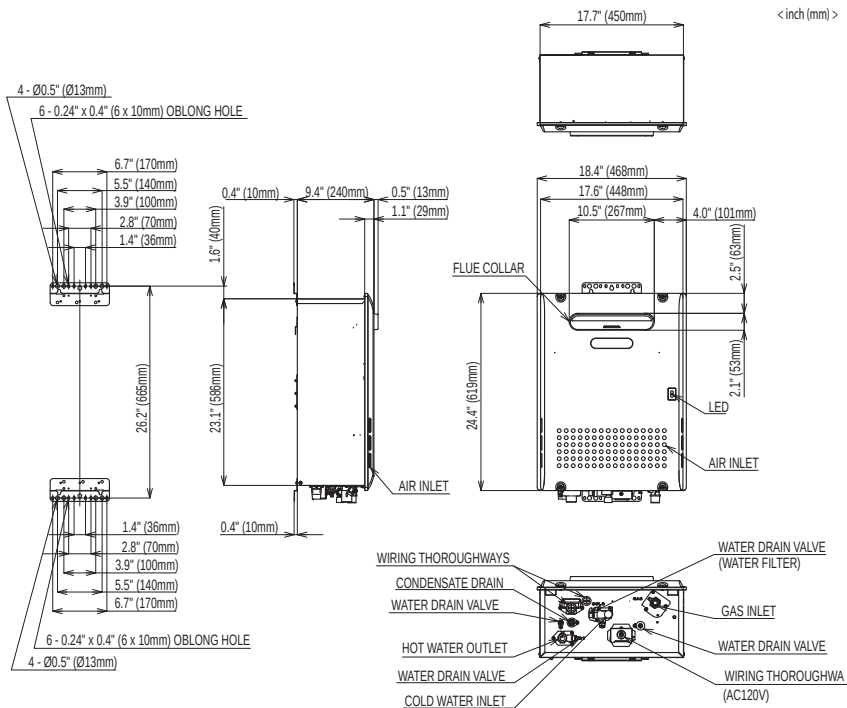


HEIGHT OF EACH FITTING FROM BOTTOM OF CASE

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

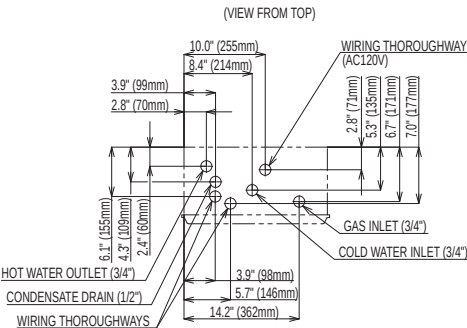


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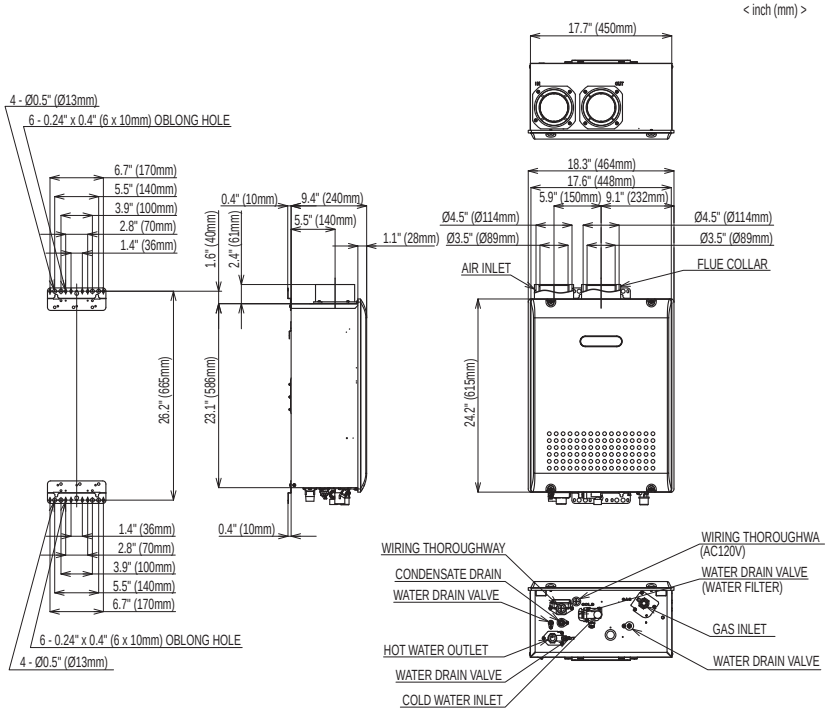


HEIGHT OF EACH FITTING FROM BOTTOM OF CASE

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

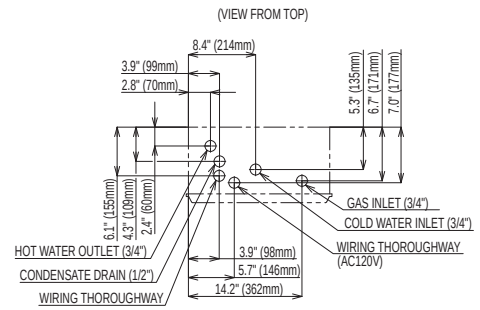


NRC1111-DV

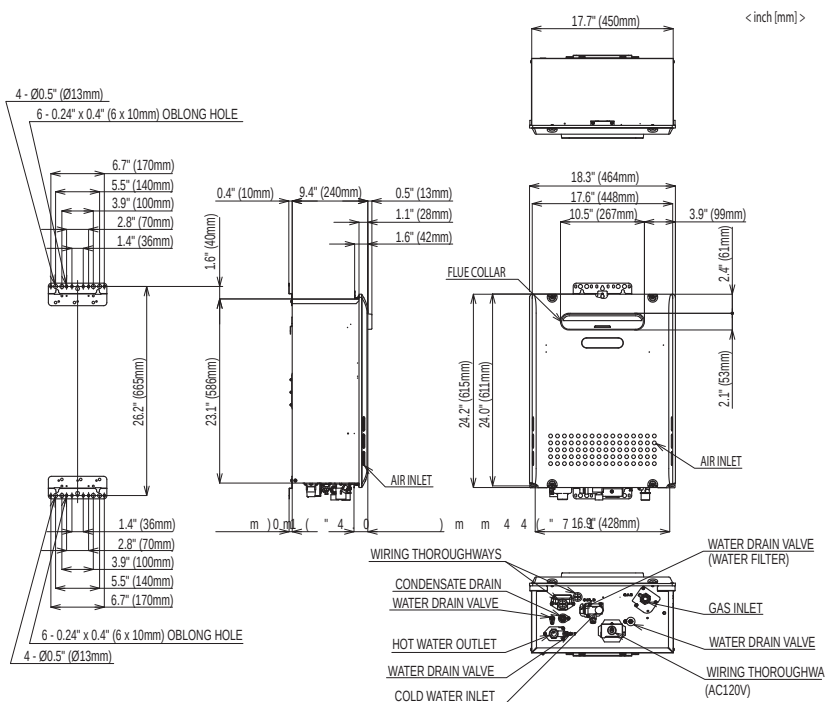


HEIGHT OF EACH FITTING
FROM BOTTOM OF CASE

	NRC1111-DV
CONDENSATE DRAIN	0.8" (20mm)
HOT WATER OUTLET	1.7" (44mm)
COLD WATER INLET	2.2" (55mm)
GAS INLET	2.2" (56mm)

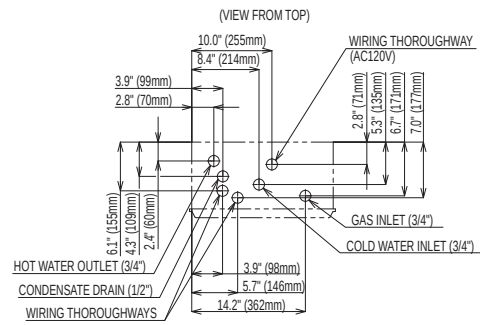


NRC1111-OD

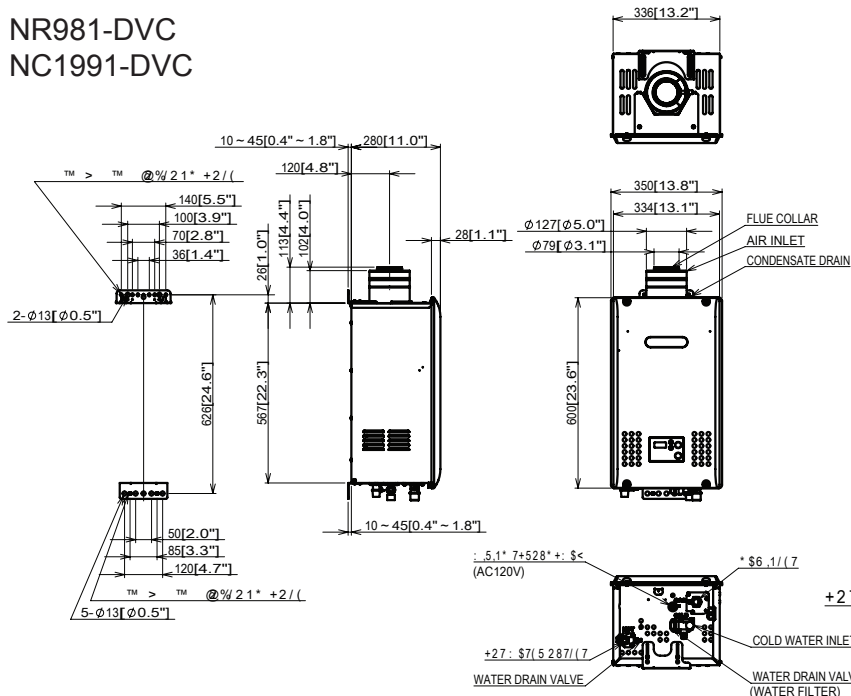


HEIGHT OF EACH FITTING
FROM BOTTOM OF CASE

	NRC1111-OD
CONDENSATE DRAIN	0.8" (20mm)
HOT WATER OUTLET	1.7" (44mm)
COLD WATER INLET	2.2" (55mm)
GAS INLET	2.2" (56mm)



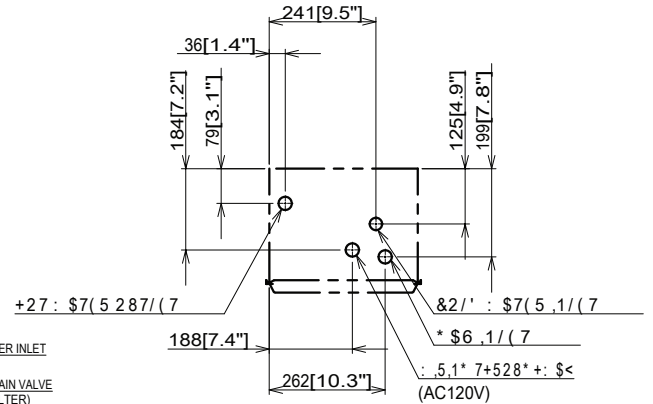
NR981-DVC
NC1991-DVC



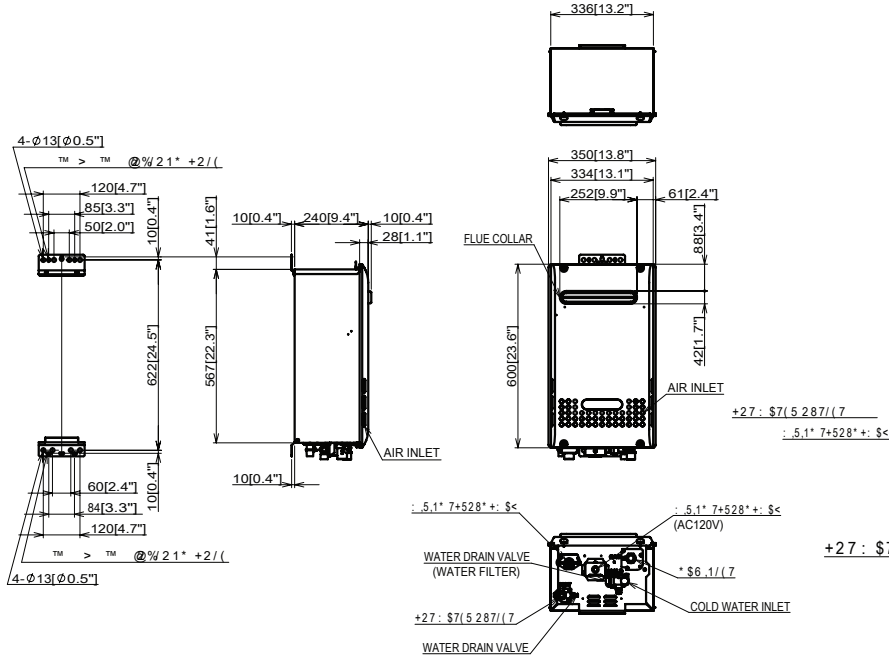
HEIGHT OF EACH FITTINGS
FROM BOTTOM OF CASE

	NR981-DVC/NC1991-DVC
HOT WATER OUTLET	1.8"[45mm]
COLD WATER INLET	2.2"[55mm]
GAS INLET	2.2"[56mm]

(VIEW FROM TOP)



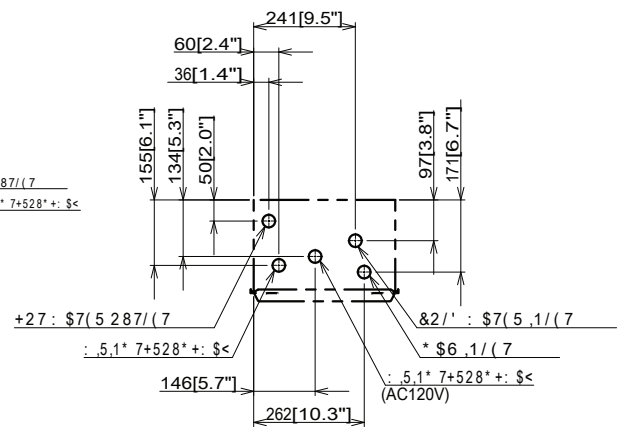
NR981-OD
NC1991-OD



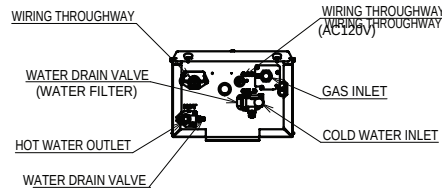
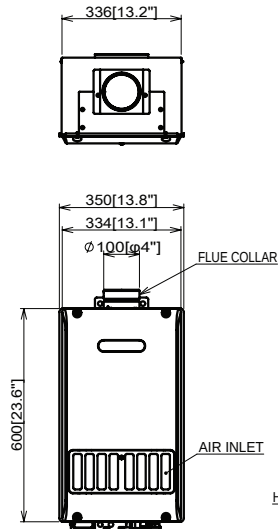
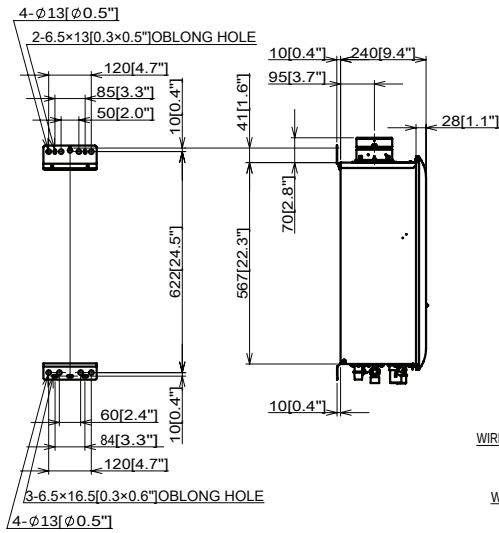
HEIGHT OF EACH FITTINGS
FROM BOTTOM OF CASE

	NR981-OD / NC1991-OD
HOT WATER OUTLET	1.8"[45mm]
COLD WATER INLET	2.2"[55mm]
GAS INLET	2.2"[56mm]

(VIEW FROM TOP)

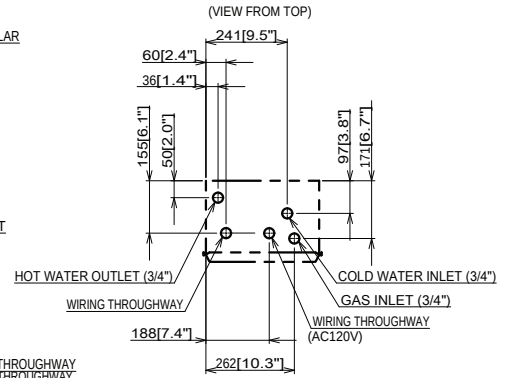


NR981-SV



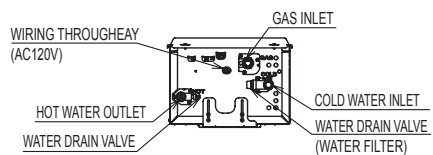
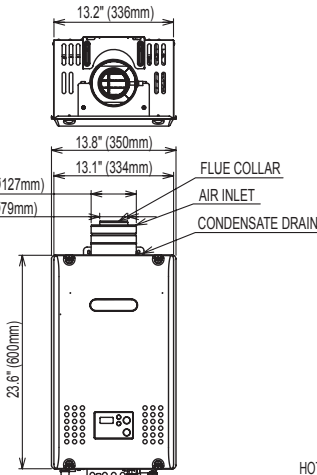
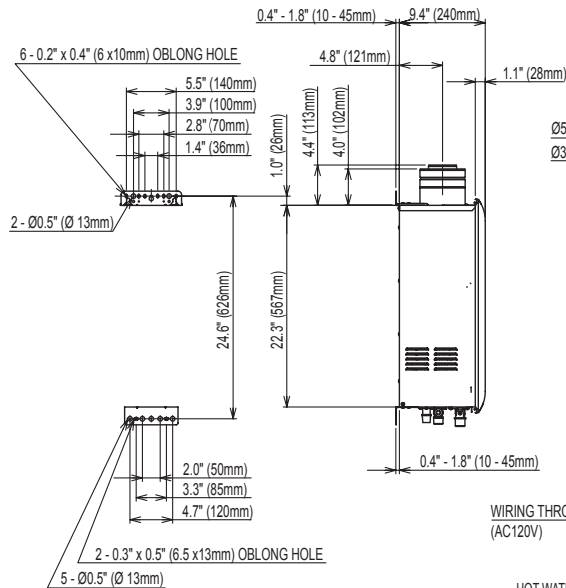
HEIGHT OF EACH FITTINGS FROM BOTTOM OF CASE

	NR981-SV
HOT WATER OUTLET	1.8" [45mm]
COLD WATER INLET	2.2" [55mm]
GAS INLET	2.2" [56mm]



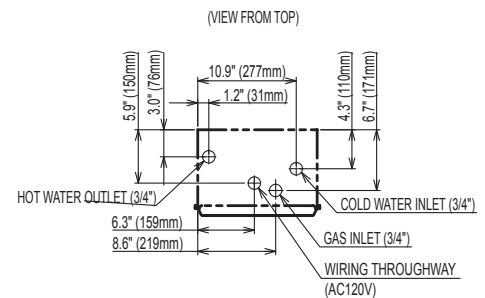
NR83-DVC

<inch(mm)>



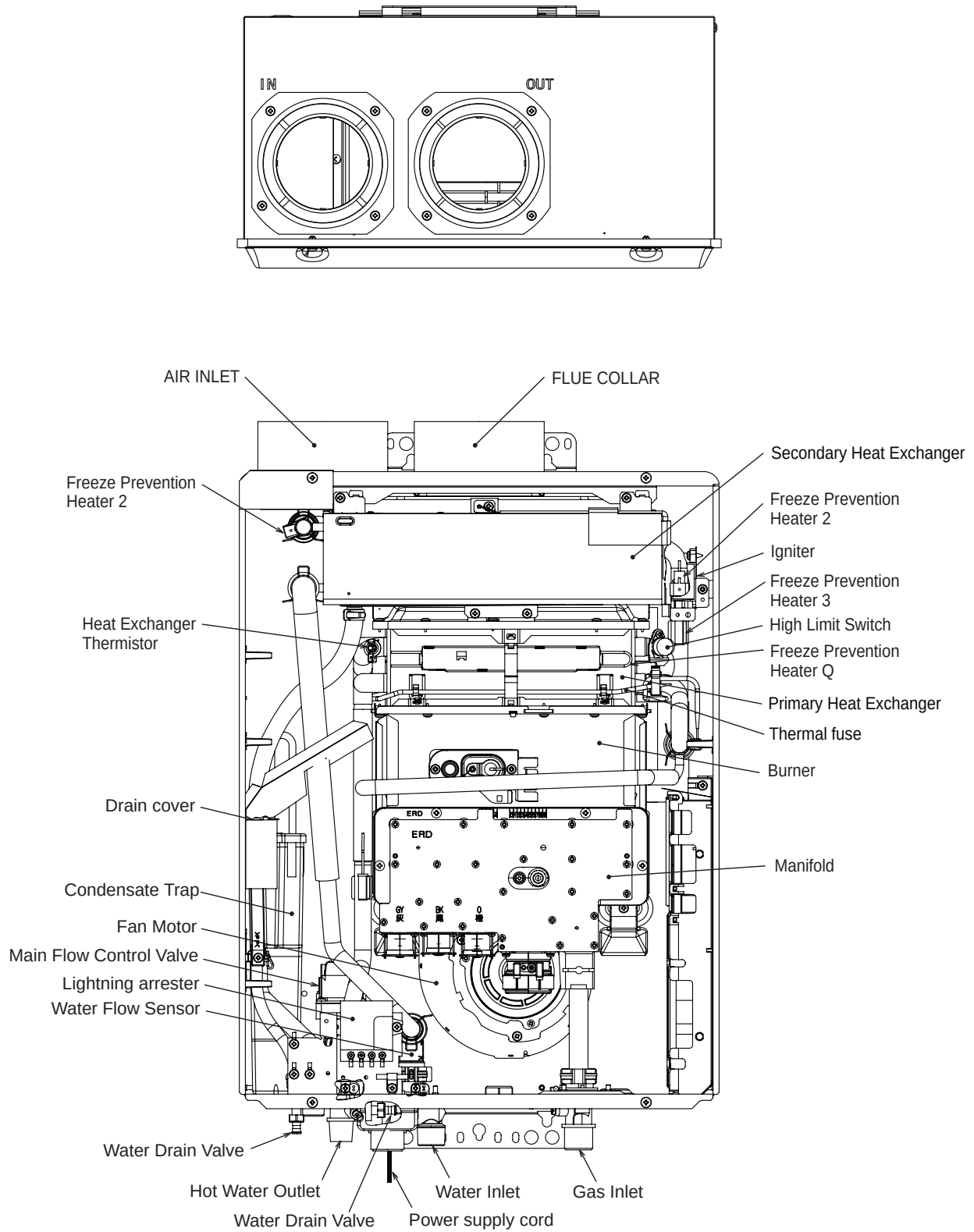
HEIGHT OF EACH FITTINGS FROM BOTTOM OF CASE

	NR83-DVC
HOT WATER OUTLET	1.8" (45mm)
COLD WATER INLET	1.9" (49mm)
GAS INLET	2.2" (56mm)

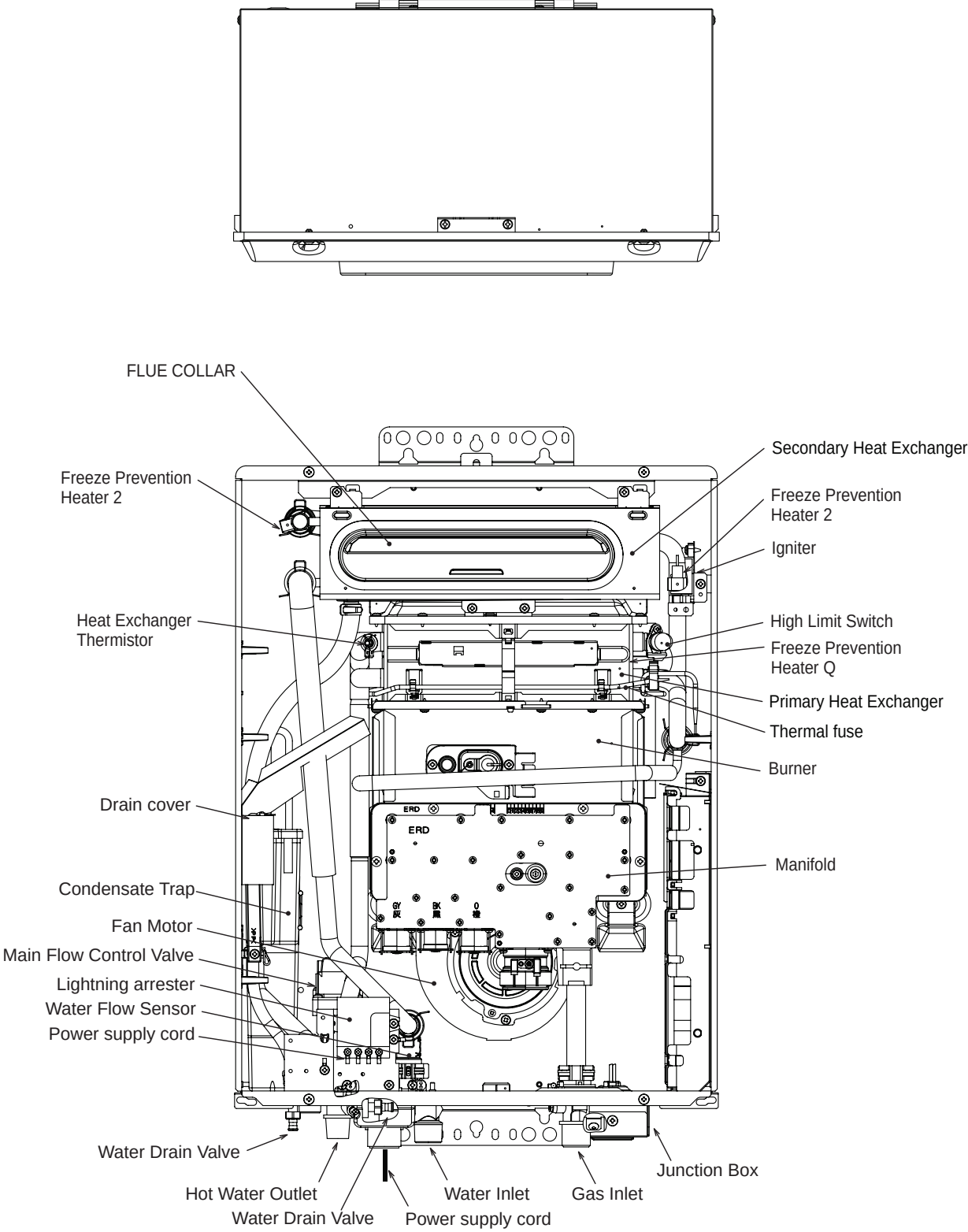


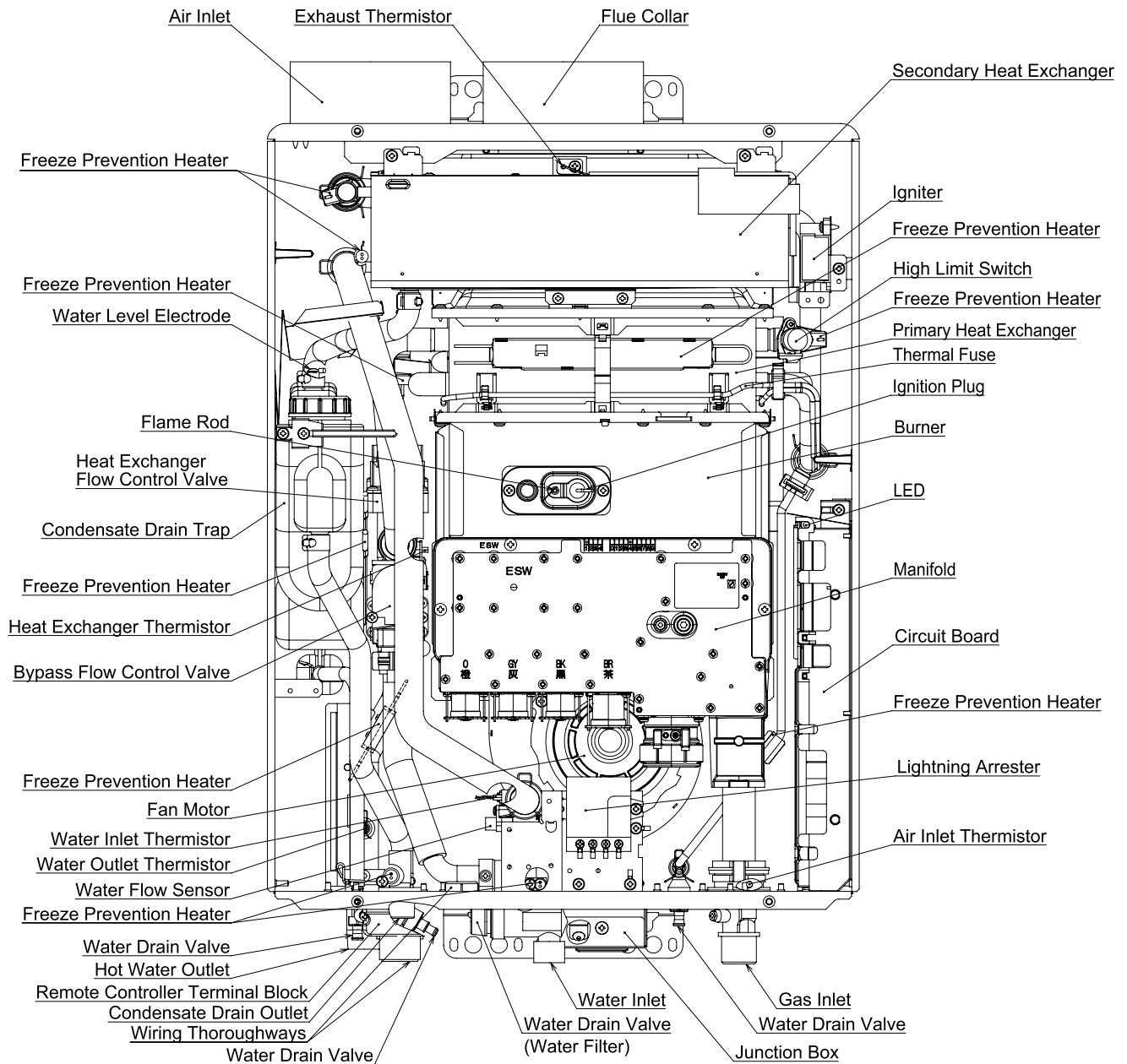
4. Components

NRC98-DV
NRC83-DV

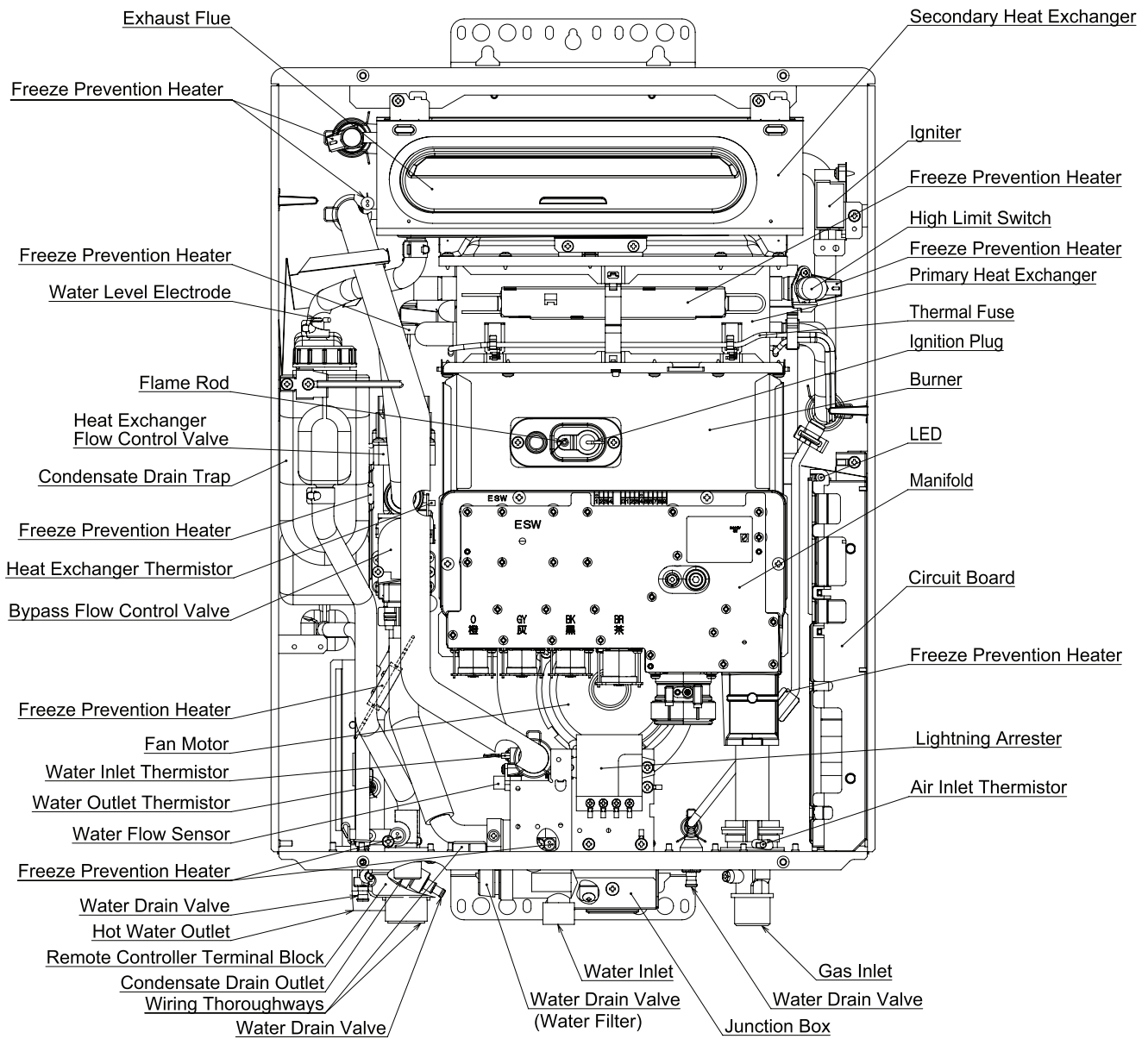


NRC98-OD
NRC83-OD

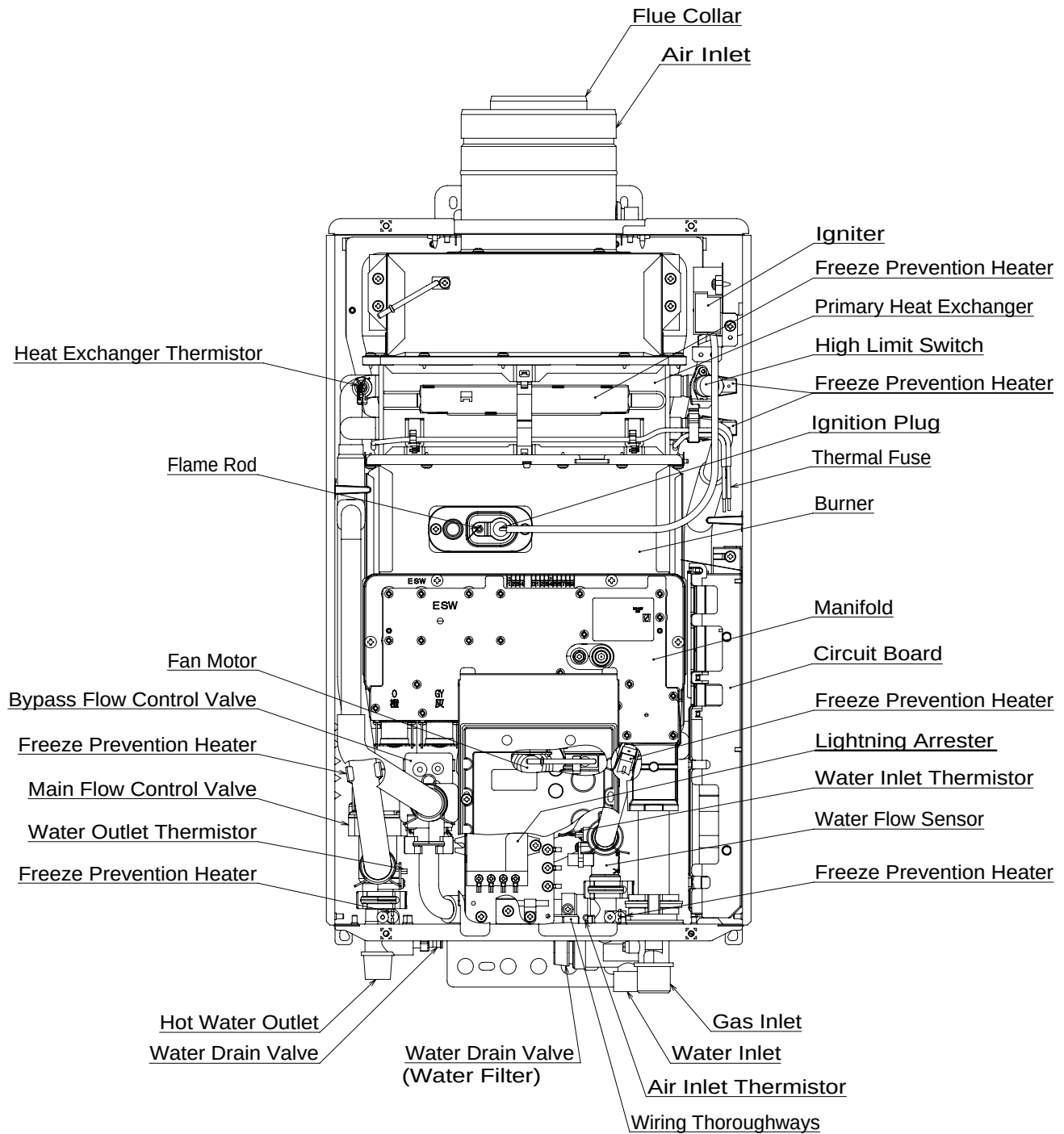




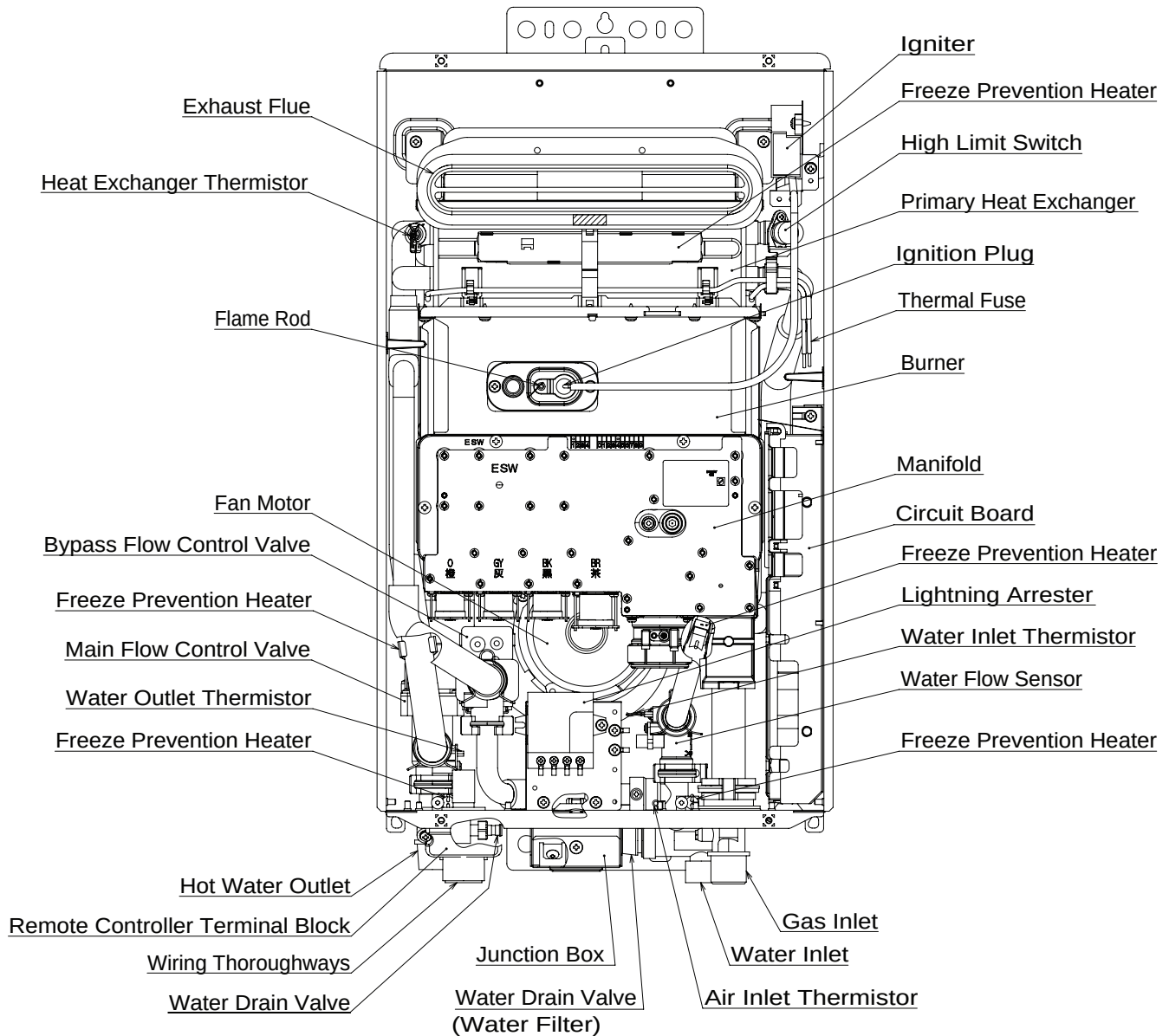
NRC1111-OD
NCC1991-OD



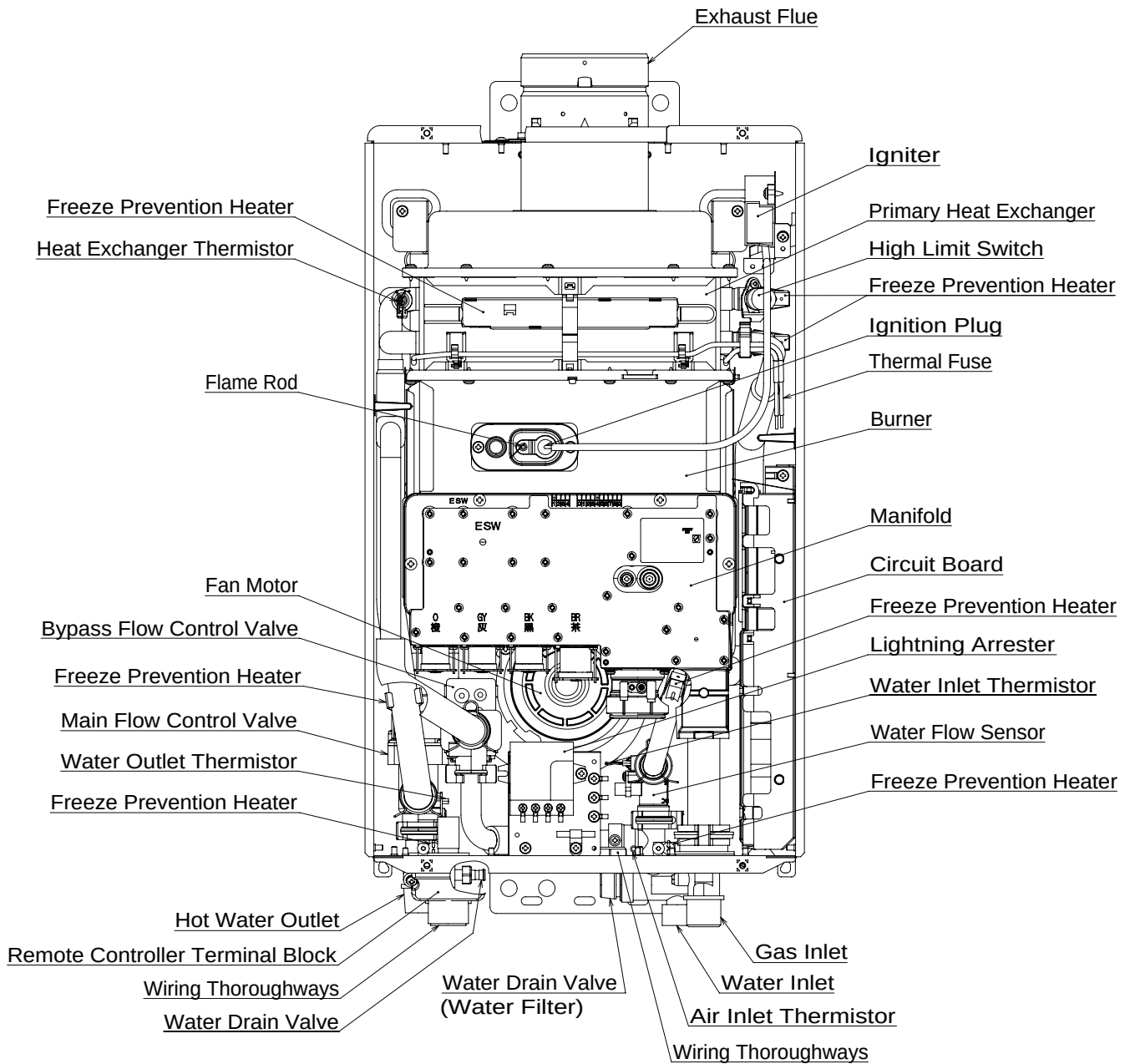
NR981-DVC
NC1991-DVC



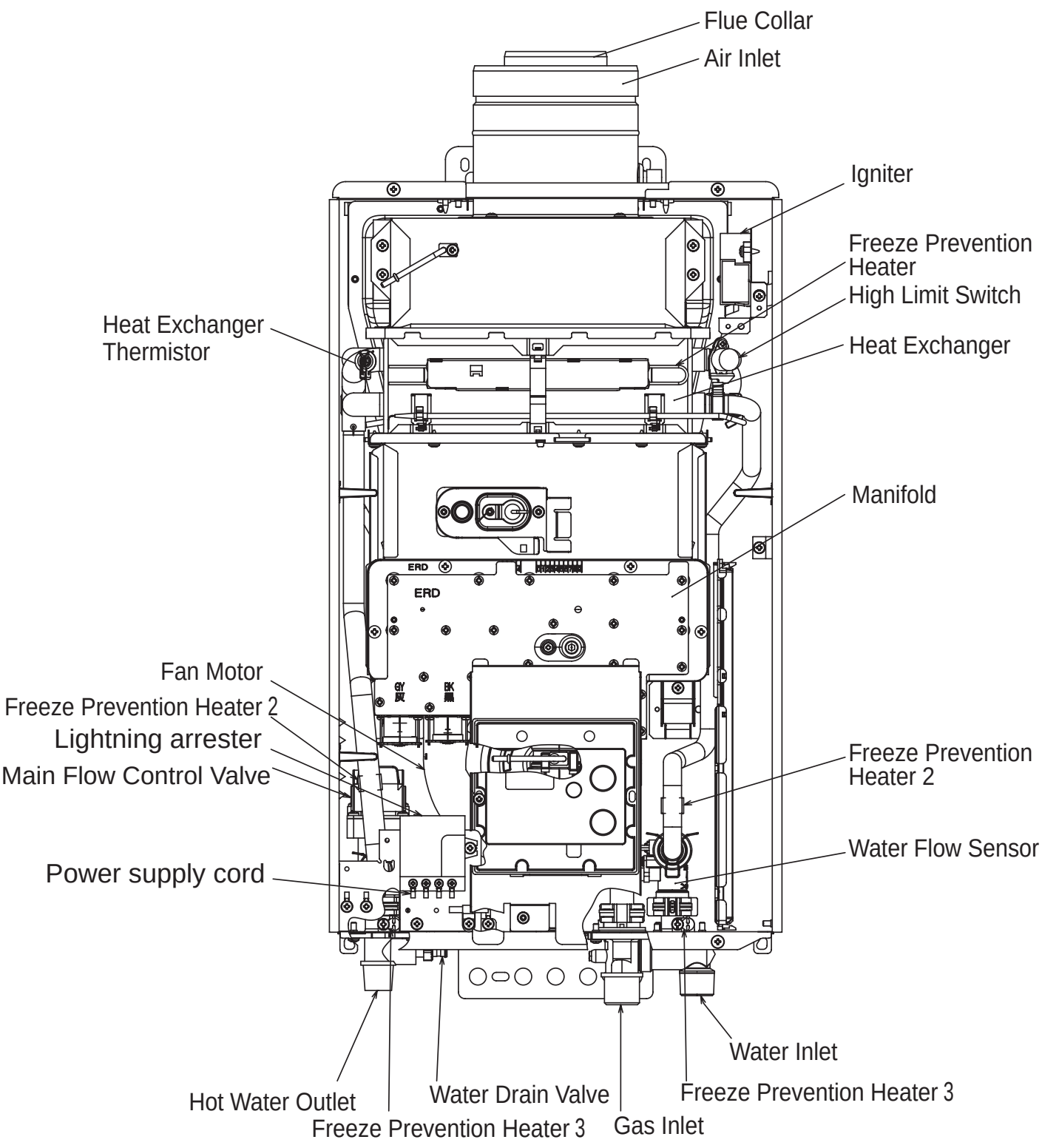
NR981-OD
NC1991-OD



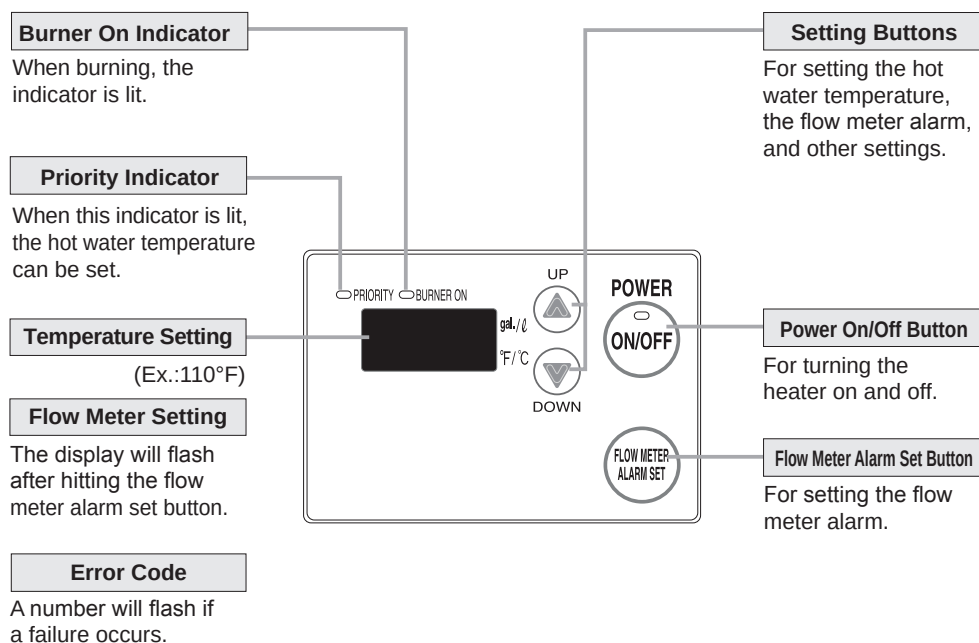
NR981-SV



NR83-DVC



■ Remote controller (RC-7651M)

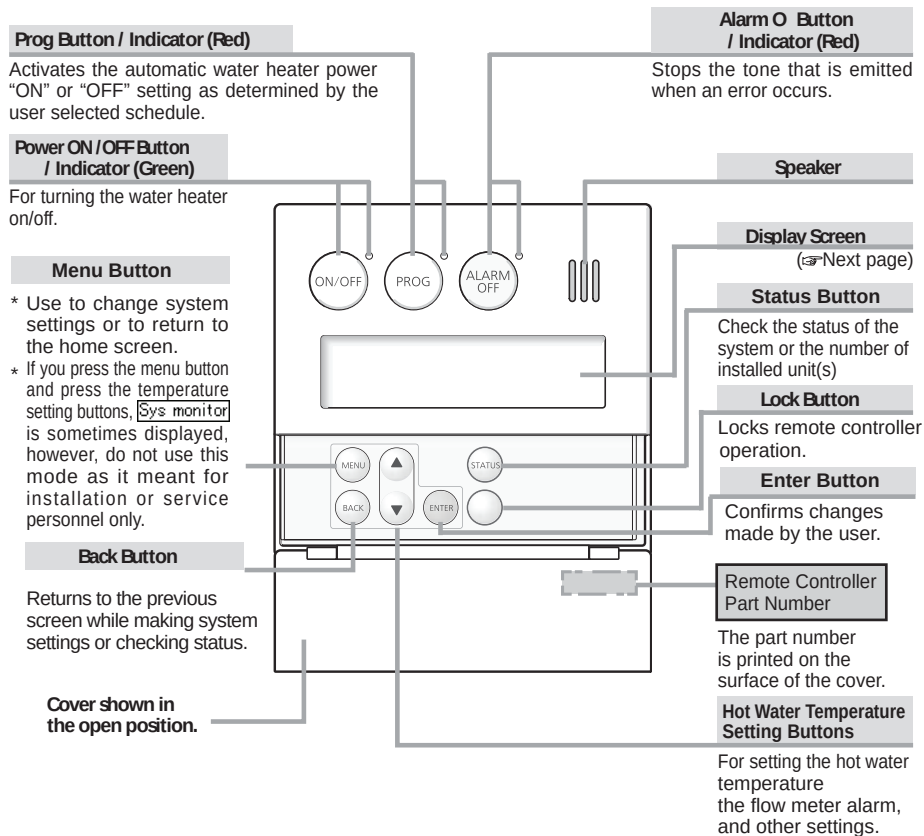


* Before use, remove the protective sheet from the operation panel surface.

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)

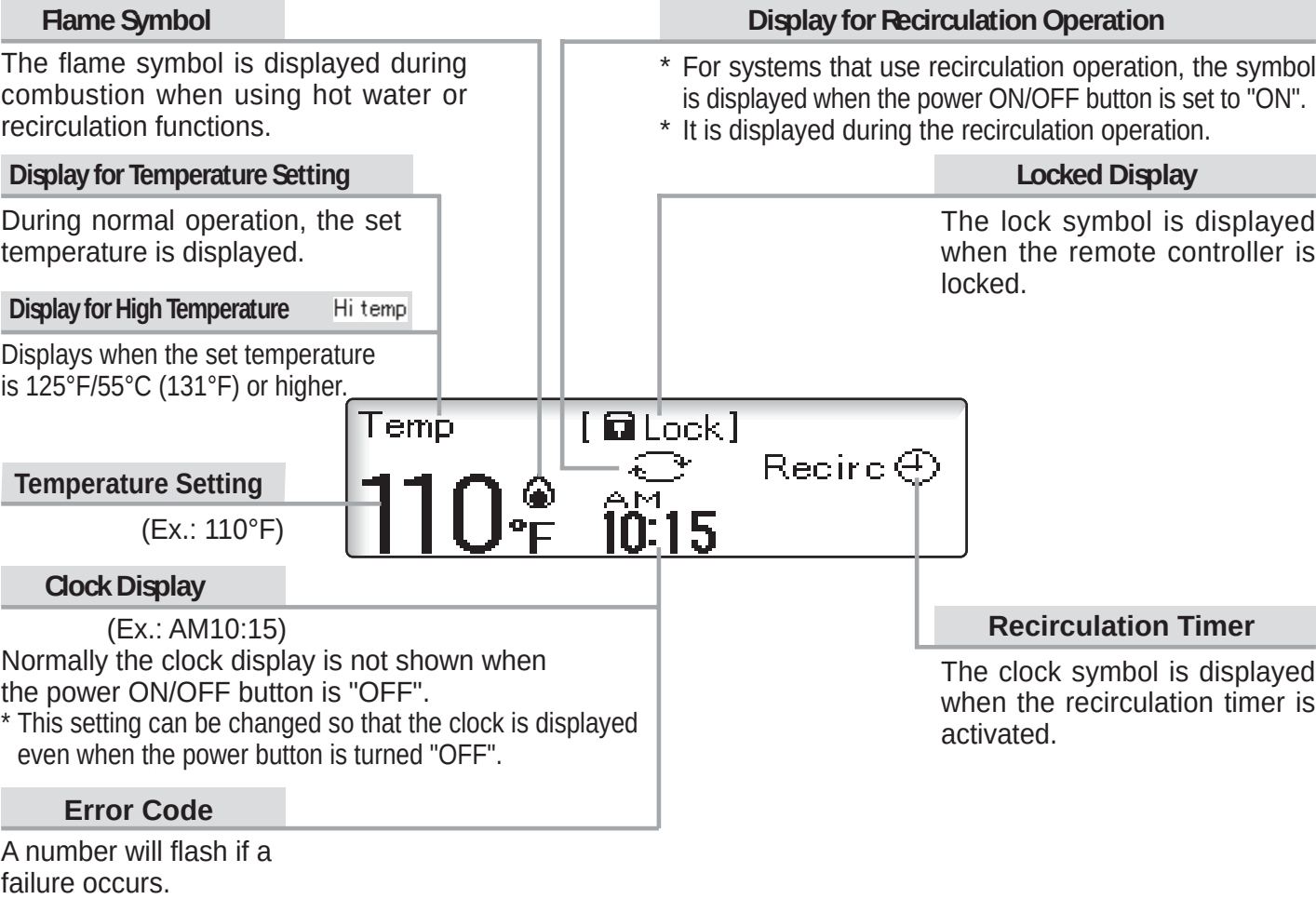
The remote controller will emit a tone when a button is pressed.



Remote Controller (RC-9018M)

● Screen Display ●

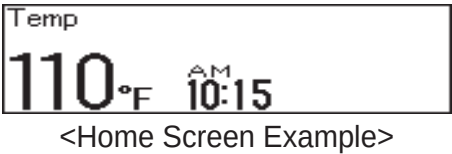
- * The screen display shown below is for illustration purposes only.
The actual display will vary depending on how the water heater is being used.
- * After a button is pressed, the display will gradually become darker to prevent unnecessary power consumption by the remote controller.



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 Installation Manual.

● What is the home screen? ●

The home screen is displayed when the  button is "ON".
Normally, the hot water temperature and the clock, etc. are displayed.



5. Troubleshooting

■ Error Codes and Checkpoints (With optional remote controller connected.)

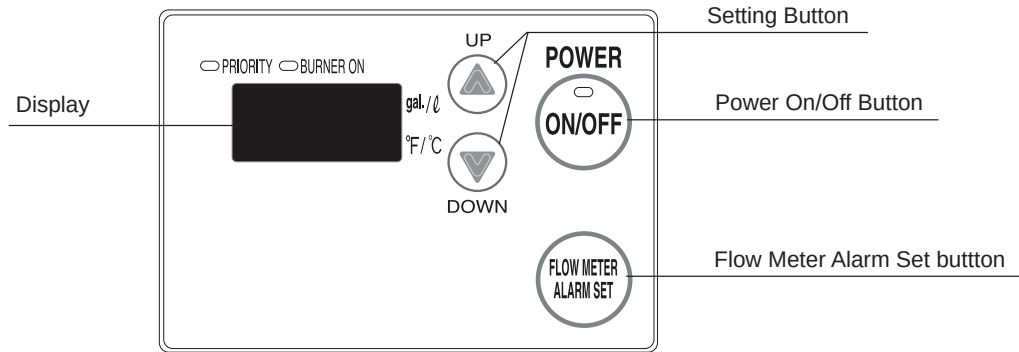
Display	Description	Diagnosis Point (Trouble Point)
05	Service Reminder	Flush heat exchanger and/or service the water treatment device.
10	Combustion Abnormality	Check for abnormal combustion, Check flue for blockage or obstruction
11	Ignition Failure	Is gas valve open, Check gas type, Check burner window for flame, Check flame rod connection, Check igniter connection, What size is gas line, Is the LP tank full
12	Flame Rod Does Not Detect Flame (Secondary Flame Fault Detection)	Is gas valve all the way open, Check gas type, Check flame rod connection, What size is gas line, Is the LP tank full
14	Overheat Cutoff Fuse	Check connection of overheat cutoff fuse, Check for damage of fuse
16	Abnormally High Output Temperature	Check outlet water temperature, Is the water hard, Is the water pressure less than 25 PSI, Is there a clogged pre-filter or strainer
20	High Limit Switch	Check high limit switch connection, Is the water hard
21	Pressure Switch Abnormality	Check pressure switch, Check fan motor, Check flue for blockage or obstruction (For N-1321M-ASME)
29	Neutralizer Water Level Electrode Abnormality	Check for neutralizer and/or drain pipe blockage, Check for proper connection of water level electrode
30	Freeze Protection Thermostat	Check freeze protection thermostat connection
31	Inlet Thermistor Abnormality	Check inlet thermistor connection
32	Outlet Thermistor Abnormality	Check outlet thermistor connection
33	Heat Exchanger Thermistor Abnormality	Check heat exchanger thermistor connection
35	Exhaust Thermistor Abnormality	Check exhaust thermistor connection
41	Flow Sensor Abnormality	Check flow sensor for debris and/or damage
410	Multi-System Flow Imbalance Error	Check flow for blockage or obstruction Check flow sensor and filter for debris and/or damage
51	Gas Solenoid Value Error	Check for proper connection of gas solenoid valves. Check for damage to gas solenoid valve connectors.
56	CCP Valve Abnormality	Check flow for blockage, Check CCP valve(s) for proper operation with System Controller
59	Combustion Abnormality	Check flue for blockage or obstruction Check gas pressure
61	Fan Motor Abnormality	Check that the fan is rotating
63	Recirculation Pump Error	Check for proper pump operation Check recirculation hot water supply pipe
65	Main Water Control Valve	Call Noritz Technical Supprt (866-766-7489)
66	Bypass Water Control Valve	Call Noritz Technical Supprt (866-766-7489)
70	Circuit board Abnormality	Circuit board failure
71	Gas Solenoid Valve Abnormality	Check gas valve connections, Check for damage to gas valve
72	Flame Rod Abnormality	Check for flame on burner
73	Improper Circuit Board Setting	Check circuit board for damage and proper connections, Unplug/replug power to unit if wiring was altered during operation
760	Remote Controller Transmission Abnormality	Check Remote Controller Cord, Check wiring connections if Multi-System or Quick-Connect is in use
90	Combustion Abnormality (Warning indication)	Check for abnormal combustion Check flue for blockage or obstruction
	Combustion abnormality (Unit shuts off)	Check for abnormal combustion Check flue for blockage or obstruction Check that flame ignites all across the burner
94	High Exhaust temperature	Check for abnormal combustion.
99	Combustion Abnormality (Unit shuts off)	Check for abnormal combustion Check flue for blockage or obstruction
(F) 76	Multi-System Communication Error	Check for proper connection of the Quick-Connect Cord or Multi-System Controller

*In a quick connect multi-system, "F###" (except F76) indicates an error code from the secondary unit (unit without a remote). The ON/OFF condition of the neutralizer 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 "111", the condition of the electrode is abnormal.

<NRC98(-DV,-OD), NRC83(-DV,-OD), NRC1111(-DV,-OD), NR981(-DVC,-OD,-SV), NR83-DVC>

■ 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>

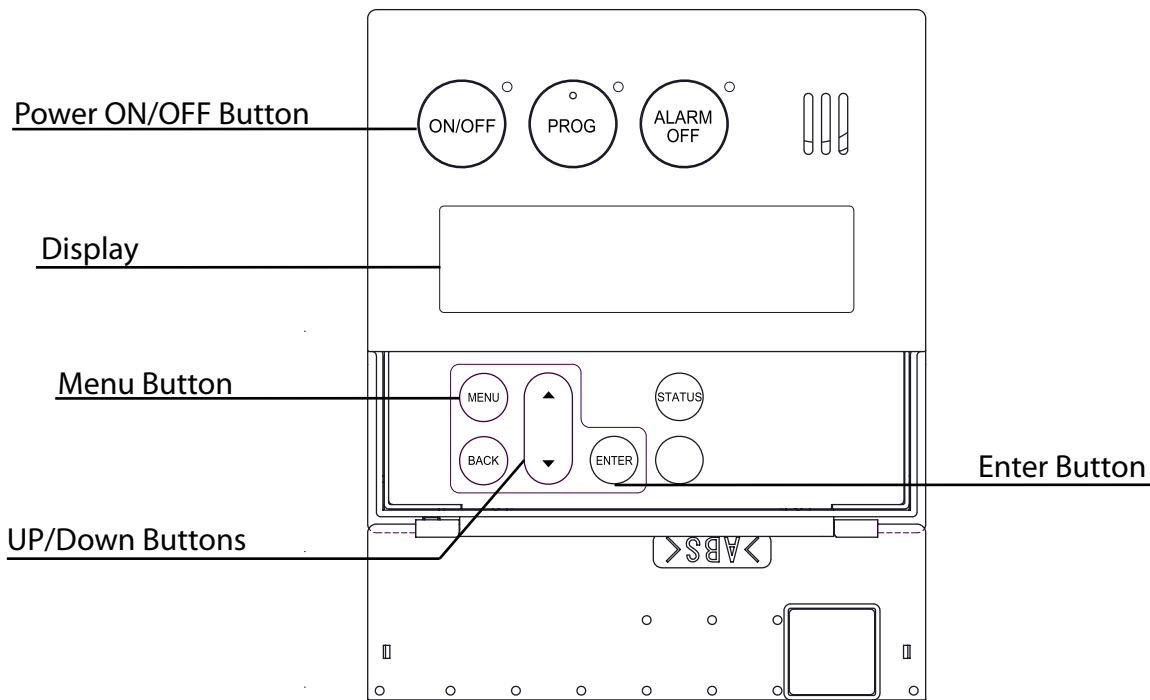
1. For releasing the indication, press and hold both [▲] and [▼] of the setting button simultaneously more than two seconds, or leave it alone for more than 10 minutes.

<Clearing Error Codes from Memory>

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

<NCC1991(-DV,-OD), NC1991(-DVC,-OD)>

☒ 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 / gal] 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 (Using Remote Controller RC-7651M or RC-9018M)

Data No.	Item	Data (Display Reading x Multiplier)		Minimum Value for Indication	Remarks
		Multiplier	Unit		
03	Total Plug-in Time	X 100	hour	100 hours	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 hours	Disp. Range [000] – [65]
07	Number of Ignition Times	X 10	time	10 times	Disp. Range [000] – [999]
08	Number of Ignition Times	X 10000	time	10000 times	Disp. Range [000] – [65]
11	Service Reminder Hours Accumulated	X 1	time	1 hours	[000] – [999]
12	Service Reminder Hours Accumulated	X 1000	time	1000 hours	[000] – [65]
14	Total Flow Rate	X 0.1	gal/min.	0.1 gal/min.	*1
		X 0.1	L/min.	0.1 L/min.	*2
15	Heat Exchanger Flow Rate	X 0.1	gal/min.	0.1 gal/min.	*1
		X 0.1	L/min.	0.1 L/min.	*2
30	Inlet Thermistor Temperature Reading	X 1	°F	1°F	*1
		X 1	°C	0.5 °C	*2
31	Outlet Thermistor Temperature Reading	X 1	°F	1°F	*1
		X 1	°C	0.5 °C	*2
49	Final Fan Speed Correction	X 1	%	1%	[100-104] (NR981, NRC1111, NC1991, NCC1991) [100-110] (NRC98, NRC83, NR83-DVC)
91	Error Code History 1	Most Recent Error Code		— — —	If the same error code is repeated, it will appear in the history list twice. If it is 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 When remote is in F/Gallons mode.

*2 When remote is in O/Liters mode.

- To view the maintenance monitors of another unit in a multi-system or Quick Connection installation, press the FLOW METER ALARM SET button (while in monitor mode) to switch to the desired unit (NR981/NC1991 Series, NCC1991/NRC1111 Series, NRC83 Series, NRC98 Series, and NR83-DVC).

■ Gas Line Requirements

The appliance and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of $\frac{1}{2}$ psig (3.5 kPa).

The Appliance must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than $\frac{1}{2}$ psig (3.5 kPa).

The appliance and its gas connections must be leak tested before placing the appliance in operation.

The inlet gas pressure must be within the range specified. This is for the purposes of input adjustment.

In order to choose the proper size for the gas line, consult local codes or the National Fuel Gas Code ANSI Z223.1.

Gas Pressure

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

Gas Meter

Select a gas meter capable of supplying the entire btuh demand of all gas appliances in the building.

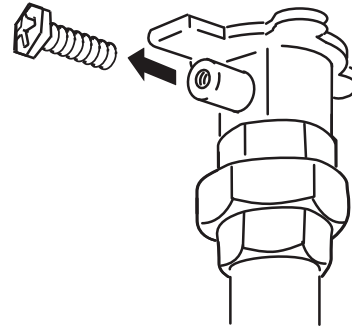
Gas Connection

- Do not use piping with a diameter smaller than the inlet diameter of the water heater.
- Gas flex lines are not recommended unless they are rated for 199,900 btuh (180,000 btuh (NRC98-DV,-OD), 157,000 btuh (NRC83-DV,-OD).
- Install a gas shutoff valve on the supply line.
- Use only approved gas piping materials.

Measuring Gas Pressure

In order to check the gas supply pressure to the unit, a tap is provided on the gas inlet. Remove the hex head philips screw from the tap, and connect a manometer using a silicon tube.

In order to check the gas manifold pressure, a pair of taps are provided on the gas valve inside the unit. The pressure can be checked either by removing the hex head philips screw and connecting a manometer with a silicon tube, or by removing the $\frac{1}{8}$ " NPT screw with an allen wrench and connecting the appropriate pressure gauge.



Sample Gas Line

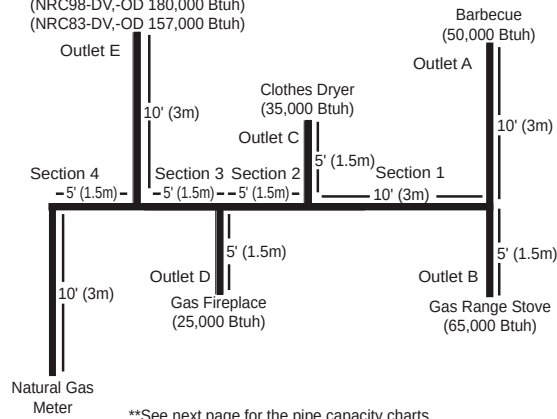
Noritz Condensing Tankless Gas Water Heater

(NCC1991-DV,-OD/NRC1111-DV,-OD 199,900 Btuh)

(NC1991-DVC,-OD/NR981-DVC,-OD,-SV 199,900 Btuh)

(NRC98-DV,-OD 180,000 Btuh)

(NRC83-DV,-OD 157,000 Btuh)



**See next page for the pipe capacity charts.

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

Outlet A: 45' (13.5m) (Use 50' (15m)), 50,000 Btuh requires $\frac{1}{2}$ "

Outlet B: 40' (12m), 65,000 Btuh requires $\frac{1}{2}$ "

Section 1: 45' (13.5m) (Use 50' (15m)), 115,000 Btuh requires $\frac{3}{4}$ "

Outlet C: 30' (9m), 35,000 Btuh requires $\frac{1}{2}$ "

Section 2: 45' (13.5m) (Use 50' (15m)), 150,000 Btuh requires $\frac{3}{4}$ "

Outlet D: 25' (7.5m) (Use 30' (9m)), 25,000 Btuh requires $\frac{1}{2}$ "

Section 3: 45' (13.5m) (Use 50' (15m)), 175,000 Btuh requires 1"

Outlet E: 25' (7.5m) (Use 30' (9m)), 199,900 Btuh requires $\frac{3}{4}$ " (NCC1991/NRC1111, NC1991/NR981),

180,000 Btuh requires $\frac{3}{4}$ " (NRC98-DV,-OD),

157,000 Btuh requires $\frac{3}{4}$ " (NRC83-DV,-OD)

Section 4: 45' (13.5m) (Use 50' (15m)), 355,000 Btuh requires 1- $\frac{1}{4}$ "

Gas Line Sizing for a Noritz Condensing Tankless Gas Water Heater

Adapted from UPC 1997

Maximum **Natural Gas** Delivery Capacity in Cubic Feet per Hour (0.60 Specific Gravity, 0.5" WC Pressure Drop)

Pipe Size	Length in Feet										
	10' (3m)	20' (6m)	30' (9m)	40' (12m)	50' (15m)	60' (18m)	70' (21m)	80' (24m)	90' (27m)	100' (30m)	125' (37.5m)
1/2"	174	119	96	82	73	66	61	56	53	50	44
3/4"	363	249	200	171	152	138	127	118	111	104	93
1"	684	470	377	323	286	259	239	222	208	197	174
1 1/4"	1404	965	775	663	588	532	490	456	428	404	358
1 1/2"	2103	1445	1161	993	880	798	734	683	641	605	536
2"	4050	2784	2235	1913	1696	1536	1413	1315	1234	1165	1033
2 1/2"	6455	4437	3563	3049	2703	2449	2253	2096	1966	1857	1646
3"	11,412	7843	6299	5391	4778	4329	3983	3705	3476	3284	2910
3 1/2"	16,709	11,484	9222	7893	6995	6338	5831	5425	5090	4808	4261
4"	23,277	15,998	12,847	10,995	9745	8830	8123	7557	7091	6698	5936

Contact the Gas Supplier for Btu/Cubic Ft. of the Supplied Gas. 1000 BTU/Cubic Ft. is a Typical Value

Maximum **Liquefied Petroleum** (Undiluted) Delivery Capacity in Thousands of Btuh (0.5" WC Pressure Drop)

Pipe Size	Length in Feet												
	10' (3m)	20' (6m)	30' (9m)	40' (12m)	50' (15m)	60' (18m)	70' (21m)	80' (24m)	90' (27m)	100' (30m)	125' (37.5m)	150' (45m)	200' (60m)
1/2"	275	189	152	129	114	103	96	89	83	78	69	63	55
3/4"	567	393	315	267	237	217	196	185	173	162	146	132	112
1"	1071	732	590	504	448	409	378	346	322	307	275	252	213
1 1/4"	2205	1496	1212	1039	913	834	771	724	677	630	567	511	440
1 1/2"	3307	2299	1858	1559	1417	1275	1181	1086	1023	976	866	787	675
2"	6221	4331	3465	2992	2646	2394	2205	2047	1921	1811	1606	1496	1260

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

Maximum Capacity of Flex TracPipe® in Cubic Feet per Hour of **Natural Gas** (0.60 Specific Gravity, 0.5" WC Pressure Drop)

Pipe Size	Length in Feet											
	10' (3m)	20' (6m)	30' (9m)	40' (12m)	50' (15m)	60' (18m)	70' (21m)	80' (24m)	90' (27m)	100' (30m)	150' (45m)	200' (60m)
3/4"	206	147	121	105	94	86	80	75	71	67	55	48
1"	383	269	218	188	168	153	141	132	125	118	94	82
1 1/4"	614	418	334	284	251	227	209	194	181	171	137	116
1 1/2"	1261	888	723	625	559	509	471	440	415	393	320	277
2"	2934	2078	1698	1472	1317	1203	1114	1042	983	933	762	661

Maximum Capacity of Flex TracPipe® in Thousands of Btuh **Liquefied Petroleum** (0.5" WC Pressure Drop)

Pipe Size	Length in Feet											
	10' (3m)	20' (6m)	30' (9m)	40' (12m)	50' (15m)	60' (18m)	70' (21m)	80' (24m)	90' (27m)	100' (30m)	150' (45m)	200' (60m)
3/4"	325	232	191	166	149	136	126	118	112	106	87	76
1"	605	425	344	297	265	241	222	208	197	186	143	129
1 1/4"	971	661	528	449	397	359	330	307	286	270	217	183
1 1/2"	1993	1404	1143	988	884	805	745	696	656	621	506	438
2"	4638	3285	2684	2327	2082	1902	1761	1647	1554	1475	1205	1045

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

TracPipe® is a registered trademark of Omega Flex.

Maximum Capacity for Gas Flex Connectors in Cubic Feet per Hour of **Natural Gas** (0.60 Specific Gravity, 0.5" WC Pressure Drop)

Pipe Size	Length in Inches					
	12" (300mm)	24" (600mm)	36" (900mm)	48" (1200mm)	60" (1500mm)	72" (1800mm)
1/2"	180	150	125	106	93	86
3/4"	—	290	255	215	197	173
1"	—	581	512	442	397	347
1 1/4"	—	1470	1200	1130	960	930

Maximum Capacity for Gas Flex Connectors in Thousands of Btuh **Liquefied Petroleum** (0.5" WC Pressure Drop)

Pipe Size	Length in Inches					
	12" (300mm)	24" (600mm)	36" (900mm)	48" (1200mm)	60" (1500mm)	72" (1800mm)
1/2"	288	240	200	169	149	137
3/4"	—	465	409	344	315	278
1"	—	930	825	708	638	556
1 1/4"	—	2352	1920	1808	1536	1488

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

<NRC98(-DV,-OD), NRC83(-DV,-OD), NR83-DVC>

■ Water Treatment

This water heater is equipped with an optional automatic service reminder function to alert the user when flushing or a cartridge/filter change is required. Once activated, the unit will display an "05" error code on the remote controller when maintenance is due. The service interval can be set for either 6, 12, or 24 months; refer to page 28 for recommended flushing intervals. If a water treatment device is installed, refer to the instructions provided with the device for suggested service intervals. By default, the service reminder function is disabled.

To activate or adjust the service reminder error "05", refer to the below procedures.

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

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 Setting Button "▲" or "▼" within 10 minutes of connecting electrical power until the remote controller displays "99".
4. Press Setting Button "▲" or "▼" until the remote controller displays "2C".
5. Press the Flow Meter Alarm Set Button for more than 0.5 seconds to switch between ON and OFF.
"oF" PRIORITY LED goes out
"on" PRIORITY LED blinks
6. If "2D" also needs to be changed, repeat steps 4 and 5.
7. To confirm the settings, press the Setting Buttons "▲" and "▼" simultaneously for more than 5 seconds. After the settings are confirmed, the maintenance writer mode will end and the remote controller display will disappear.

	2D	2C
No warning	○	○
6 months	○	●
12 months	●	○
24 months	●	●

*Initial factory setting.

ON= ● OFF= ○

Reset the display of the operation panel in the following way after the water heater is serviced.

When the "05" error code appears, reset the display only after the water heater is flushed and/or the water treatment device is serviced.

If the error is reset without performing the necessary service, the water heater may fail prematurely.

Note : In the case of Quick connect multi system, perform scale cleaning of both units.

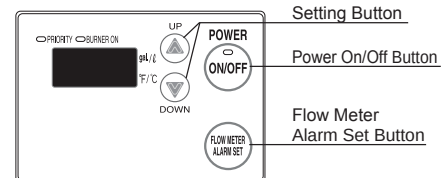
How to reset the scale warning:

1. Set the Power On/Off Button to the OFF position.
2. Push the Flow Meter Alarm Set Button more than 2 seconds.
3. Push the Flow Meter Alarm Set Button several times until "7 oF" is displayed.
4. Press Setting Button "▲" more than 5 seconds.
This will complete the service warning reset.
5. Push the Power On/Off Button.
6. The preset temperature is displayed.



Press setting button "▲" more than 5 seconds. At this time, a sound is emitted from the operation panel.

Push the Power On/Off Button.



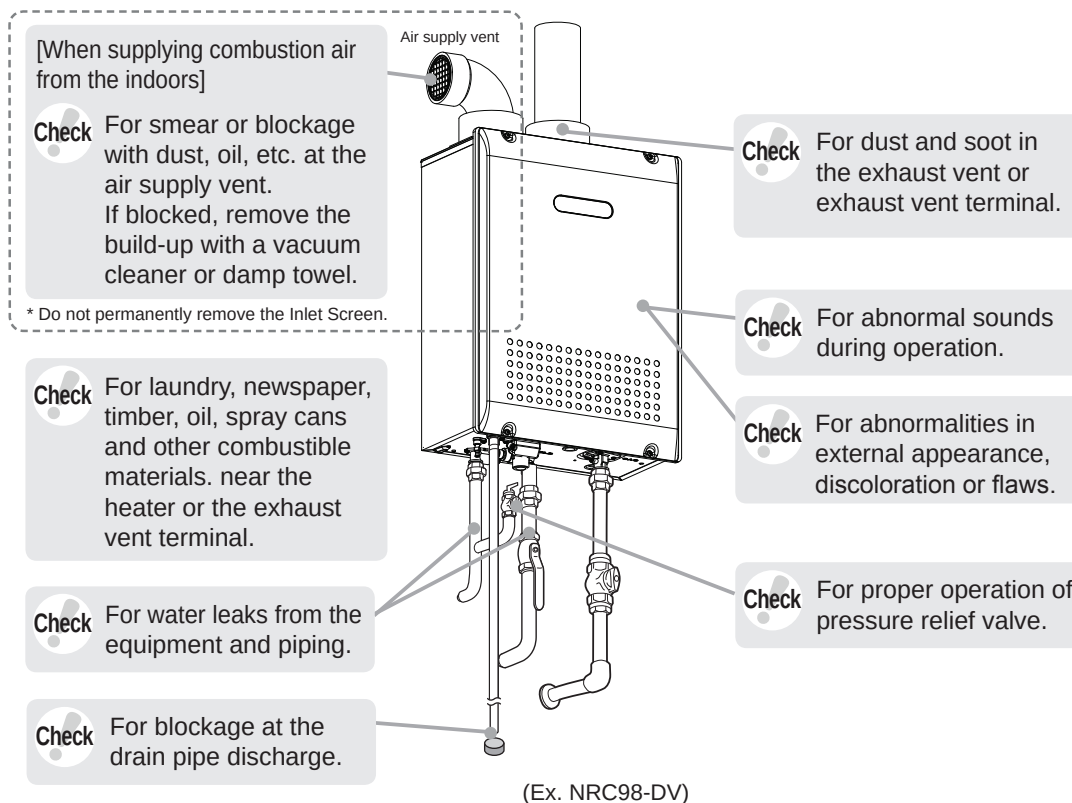
Periodic Inspection

CAUTION



Be sure to do.

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



Periodic Maintenance

Equipment

Wipe the outside surface with a wet cloth, then dry the surface. Use a neutral detergent to clean any stains. If an external condensate neutralizer is installed, periodic replacement of the neutralizing agent will be required. Refer to the instructions supplied with the neutralizer for suggested replacement intervals.

Remote Controller

Wipe the surface with a wet cloth.

- Do not use benzene, oil or fatty detergents to clean the remote controller; deformation may occur.
- The remote controller is water resistant but not water proof. Keep it as dry as possible.

Periodic Maintenance

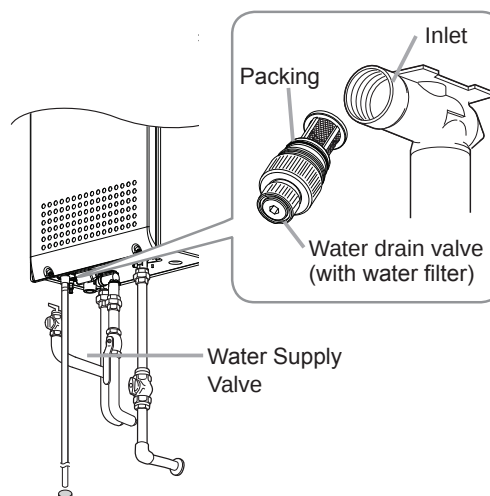
Water Drain Valve (with Water Filter)

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 0.4 gallon (1.4L) 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).



Periodic Maintenance

If the unit becomes saturated with lime or scale build-up, the hot water may not run smoothly, or the unit may put out cold water. In addition, damage can occur resulting in failure of the unit if lime or scale deposits are left untreated within the unit. To remove these deposits from the unit, follow the procedure as explained below. To ensure full warranty coverage, hard, acidic, or otherwise impure water should be treated with approved methods.

Note : Isolation valves will need to be installed in order to perform this procedure.

1. If not already on, turn the unit on with the Power Button on the Remote Controller.
2. Close the gas supply valve.
3. Close both the hot and cold water valves with a quarter turn of the main valve wing handle.
The handle will be perpendicular to the main valve body.
4. Ensure the drain valve lever handles are closed on both the hot and cold valves (the lever will be perpendicular to the drain portion of the body) and slowly remove drain caps. Be sure to retain the rubber washer inside of the drain cap.
5. Connect the pump outlet hose to the cold water drain valve of the isolation valve as shown in Figure 1.
6. Connect a drain hose to the hot water drain valve outlet of the isolation valve as shown in Figure 1.
7. Pour approximately 5 gallons of virgin food grade white vinegar or a solution of Lime Away (or CLR) and water (diluted 3 parts water to 1 part Lime Away or CLR) into a bucket.
8. Place both the pump inlet hose and the drain outlet hose into the pail.
9. Open both drain valve lever handles on the isolation valves.
10. Turn the pump on. The unit will attempt to ignite (make sure that the gas has been turned off) and a number "11" should flash on the remote controller after about 1 minute. Do not reset the unit. Allow the solution to circulate for 45 minutes.

Note: It may take a few minutes to clear air out of the heater and hoses.

11. Turn the pump off and close the cold water drain valve of the isolation valve.
12. Remove the hose from the cold water drain valve and replace cap and washer onto the drain valve outlet.
13. Remove the pump and hose from the bucket and empty the solution.
14. Put the hot water drain hose end back into the empty bucket and open the cold water main valve wing handle.
This procedure will flush out the heater with fresh cold water. Flush for at least 5 minutes or until 20 gallons of water has passed through the heater.
15. Close the cold water main valve wing handle and clean the water inlet filter. Place the filter back into the unit.
16. Close the hot water drain valve lever handle, remove the drain hose and replace cap and washer onto the hot water drain valve outlet.
17. Open both the hot and cold water main valve wing handles. Wing handles should now be (OPEN) parallel to the main valve body and lever handles should be (CLOSED) perpendicular to the drain portion of the body, which is the normal operating position.
18. Open the gas supply valve and reset the unit by turning the power off and then on again using the Power Button on the Remote Controller.

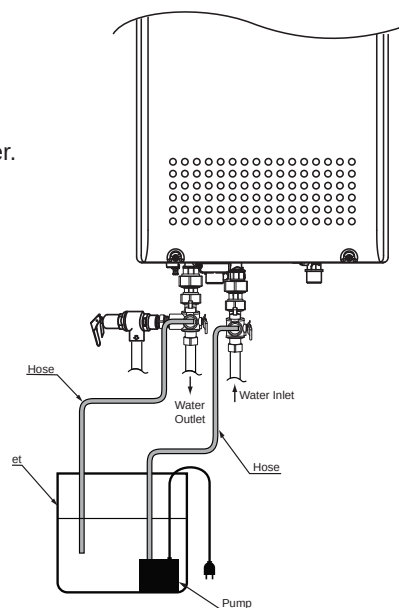


Figure 1. Flush Set-up

■ Changing Default Temperature Setting

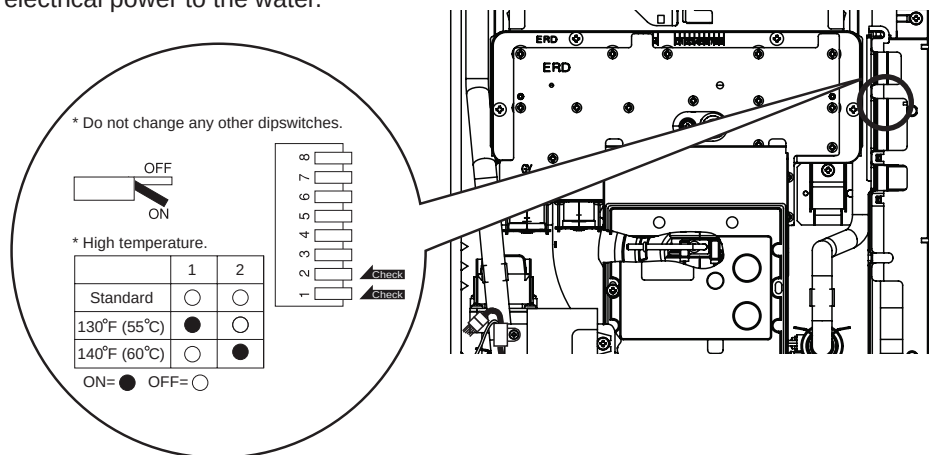
- * The water heater has been factory set to allow a maximum temperature setting of 120 °F (50 °C). To access higher temperature settings through the remote controller, follow the below steps.

<When setting the maximum temperature to 130-140 °F (55-60 °C)>

1. Turn the water heater off by pressing the 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 130 °F (55 °C) or 140 °F (60 °C) using the UP and DOWN setting buttons.
4. To put the water heater back into operation, press the 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.

- The tankless gas water heater can be programmed so that it will default to one of three temperatures if the remote controller is removed (140, 130, 120 °F (60, 55, 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.



WARNING

- 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.

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 -30°F (-35°C) for NRC98-DV, NRC83-DV or -4°F (-20°C) for NRC98-OD, NRC83-OD.
 - For models NRC98-DV and NRC83-DV, when supplying combustion air from the indoors, the room temperature must be greater than 32°F (0°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.

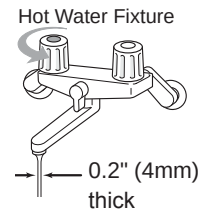
Take the measures below for extremely cold temperatures*.

Outside temperature including wind chill factor less than -30°F (-35°C) for NRC98-DV, NRC83-DV or -4°F (-20°C) for NRC98-OD, NRC83-OD.

- For models NRC98-DV and NRC83-DV, when supplying combustion air from the indoors, the room temperature must be greater than 32°F (0°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 (p. 6), 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.

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

Drain the water as follows:

CAUTION

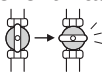


High Temperature

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

Drain water into a bucket to prevent water damage.

1. Close the gas valve.

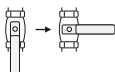


2. Turn off the power button.

3. Turn off the power supply.

Do not touch with wet hands.

4. Close the water supply valve.



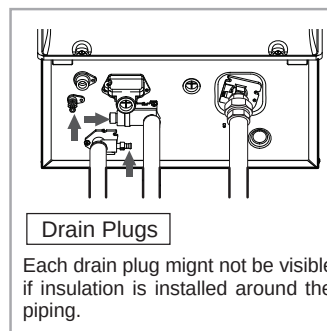
5. Fully open all hot water fixtures.

Fixture



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.



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

Drain the water as follows:



CAUTION



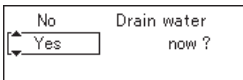
High Temperature

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

Drain water into a bucket to prevent water damage.

Drainage Using the Remote Controller

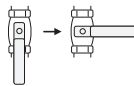
- 1 (1) button is "OFF".
- (2) Press the button inside the cover,
Select **Misc settings** using the buttons.
Press the button.
The "Misc settings" screen appears.
- (3) Select **Drain water** using the buttons,
and then press button.
- (4) Select "YES" using the buttons,



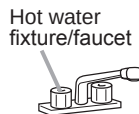
Press button.

Follow the drain procedures
in the manual

- 2 Close the water supply valve.



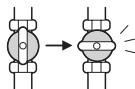
- 3 Fully open all hot water fixtures/faucets.



- 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.

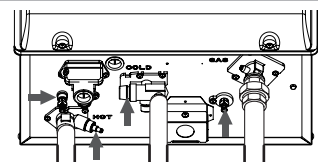
Manual Draining

- 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

(Ex. NCC1991-DV)

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

6. 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.

* 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:

Vent Pipe Diameter	3" or 4" PVC or CPVC Pipe
Maximum Vent Length	35 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.

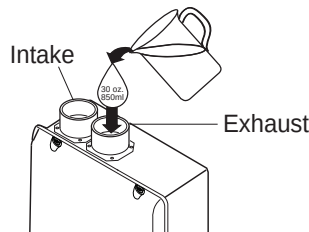


DANGER

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.

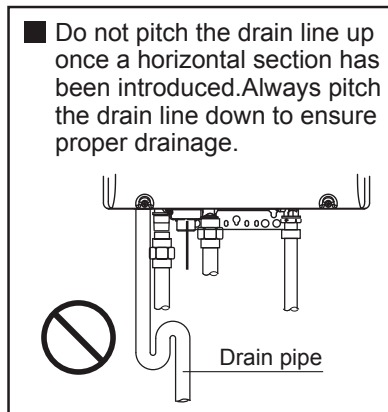
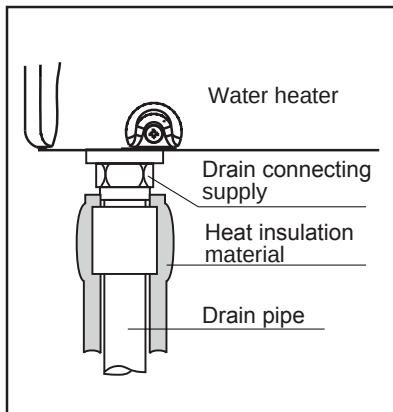
Refer to pages 22-23 for additional details.

Electrical

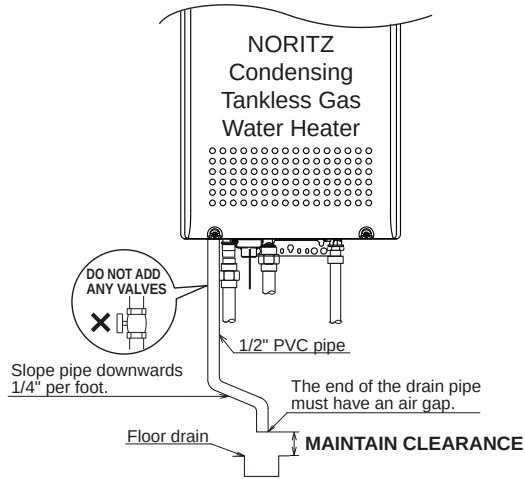
- The electrical power supply to the unit should be installed by a qualified electrician.
 - Allocate 4A on the circuit for this water heater.
- If more than one unit is being installed, allocate an appropriate circuit to provide power for each unit.

Condensate Piping

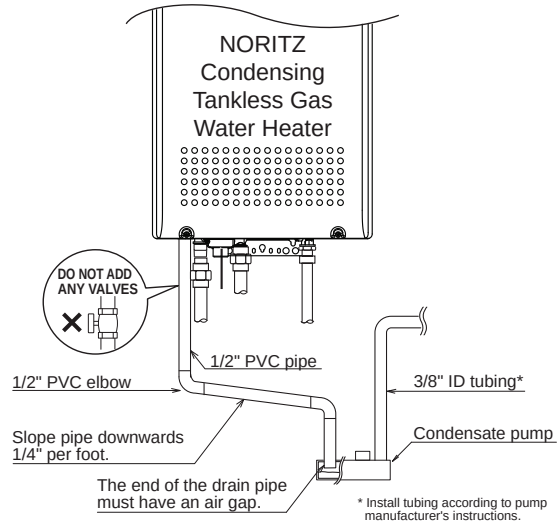
- This water heater is a high efficiency, fully condensing appliance which produces acidic condensate during operation. The water heater incorporates a collection and removal system which must be properly drained in order to ensure proper operation of this appliance.
- The pH level of the condensate 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.).



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.