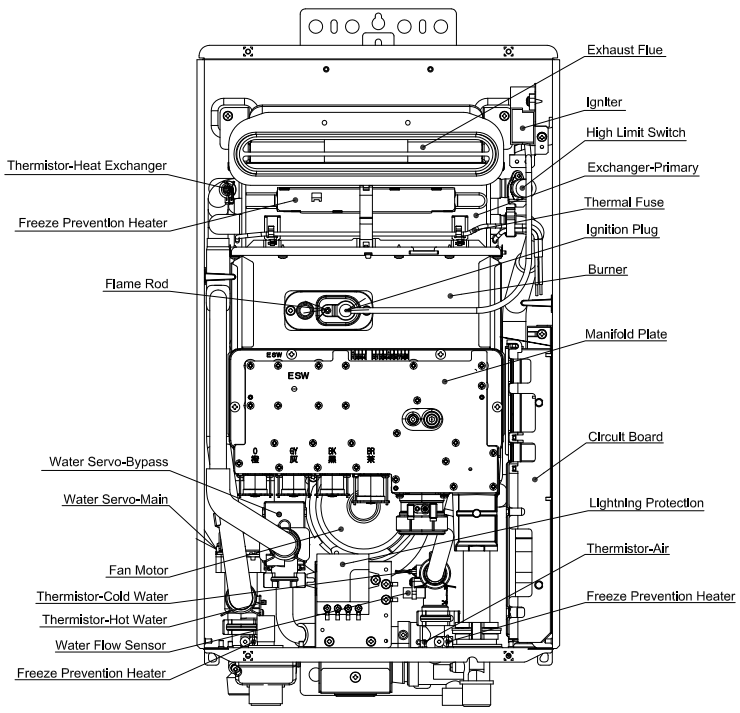
Technical Sheet

Models	
	NC199OD(GQ-2857WZ-US)
	NC199DVC(GQ-2857WZ-FFA US)

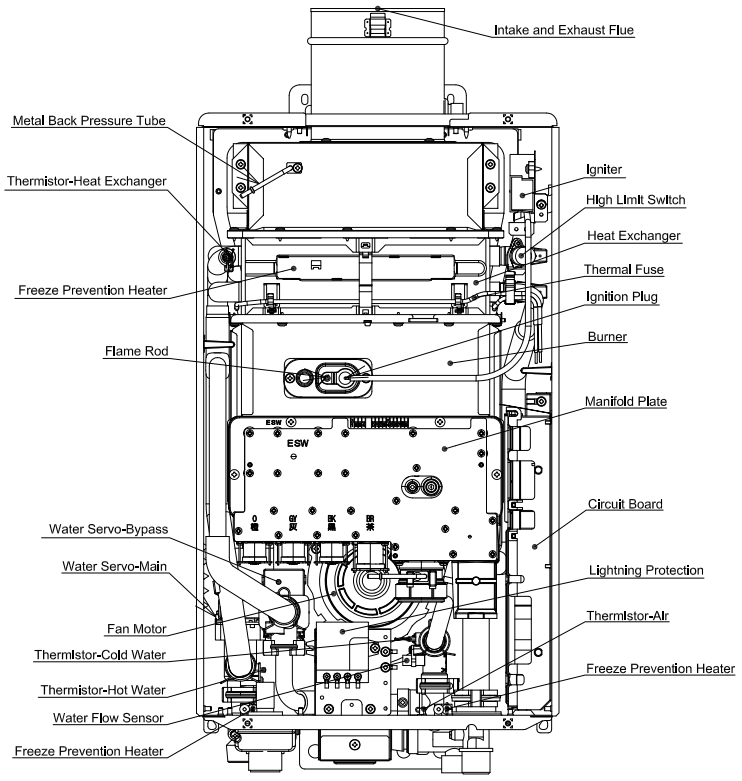
WARNING When performing maintenance, disconnect the power supply from the unit for your safety. Never attach measuring equipment or change components with the power supply connected to the unit.

■ Components

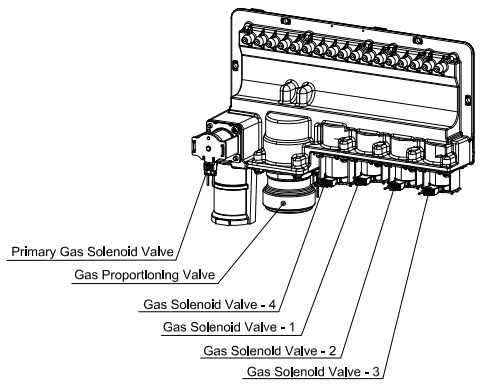
NC199OD(GQ-2857WZ US)



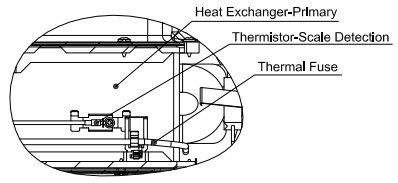
NC199DVC(GQ-2857WZ-FFA US)



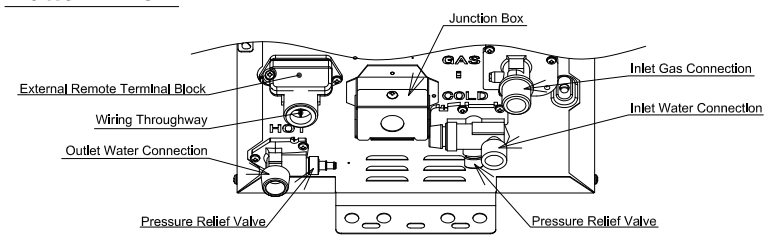
◆ Details of Manifold Plate



◆ Sectional View of Back Side



◆ Bottom View



■ Error Codes and Checkpoints

Display*	Description	Diagnosis Point (Trouble Point)	Remarks
(F) 11	Ignition failure (Initial flame fault detection)	Check the gas supply piping and pressure. Check for Igniter spark (13). Check Gas Solenoid Valves (14, 15, 16, 17). Check Flame Rod (10). Check ground, paying special attention to the ground connection to the Circuit Board.	
(F) 12	Flame Rod does not detect flame (Flame fault detection)	Check for accidental extinction of the flame. Check for abnormal combustion. Check Gas Solenoid Valves. Check Flame Rod (10). Check ground, especially on Circuit Board.	
(F) 14	Overheat Prevention Device (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 temperature	Measure the resistance through the Thermistor-Hot Water (6). Check for Gas Proportioning Valve (17). Check for Manifold Pressure.	
(F) 20	High Limit Switch triggered	Check if High Limit Switch is triggered (20). Check for improper connection of High Limit Switch. Check if the Scale Build-up in the Heat Exchanger. (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) 30	Thermistor-Air abnormality	Measure the resistance through the Thermistor-Air (21). 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 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 abnormality	Check for dropping of Thermistor-Scale Detection on the Heat Exchanger-Primary. 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) 51	Failure of Gas Solenoid Valve (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 (11,12). Check for improper connection of the fan. Check voltage from Circuit Board.	
(F) 65	Water Servo-Main 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 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 abnormality	Check for damage to the Gas Solenoid Valve drive circuit on the Circuit Board.	
(F) 72	Flame Rod circuit abnormality (Detection of flame when no flame is present)	Measure the current from the Flame Rod when there is no flame (9). Check for a ground fault.	
(F) 73	Circuit Board setting abnormality (Improper Maintenance Writers 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. (Ex. high elevation, vent length, etc.).	To reset this error code, the power needs to be disconnected and then reconnected.
F76	Multi-system communication error	Check for proper connection of Quick Connect Cord.	
760	Remote Controller transmission abnormality	Check connection from Remote Controller to Circuit Board. Check Remote Controller and Circuit Board for damage.	
(F) 90	Combustion abnormality (Warning indication)	Check for abnormal combustion. Check flue and air inlet 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.	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) 99	Combustion abnormality (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 ~ (F)C4	Detect Scale Build-up in the Heat Exchanger-Primary. (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. 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 Heat Exchanger-Primary. (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).

■ Circuit Board Checkpoints

Ref. No.	Part	Circuit board Check points (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 over 408 pulses/min. (over 6.8Hz)	Y(+) BL(-)
5	Thermistor-Cold Water	CN63	4	W - W	CN63	2	DC 1 - 4.5 V	32 - 212° F 0 -100° C Note 1)
6	Thermistor-Hot Water	CN63	1	W - W	CN63	2	DC 1 - 4.5 V	32 - 212° F 0 -100° C Note 1)
7	Thermistor-Heat Exchanger	CN63	3	W - W	CN63	2	DC 1 - 4.5 V	32 - 212° F 0 -100° C Note 1)
8	Thermistor-Scale Detection	CN63	6	W - W	CN63	2	Note 2)	Note 2)
9	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
10	Flame Rod	CN78	1	BL - Burnercase	-	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

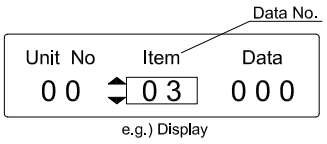
Please visit http://support.noritz.com/, if you would like to get more detail or other information, contact Noritz America (866-766-7489).

EYTK071

■ 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. and Data will appear on the display.

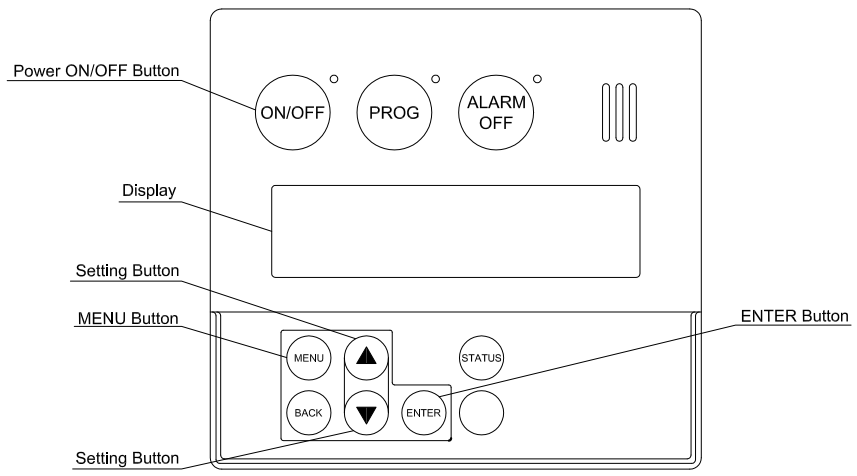


e.g.) Display

2. In order to switch to other maintenance monitor Data No., press either the Up [▲] or [▼] Down Setting Buttons.
   Then different Data No. can be selected using the up [▲] and [▼] down buttons.
3. With the Remote Controller in maintenance mode, the hot water set temperature can not be adjusted.

<Returning to Normal Mode>
1. To return to normal mode, press and hold both the Up [▲] and Down [▼] Setting Button simultaneously for more than two seconds, or leave it alone for more than 10 minutes.

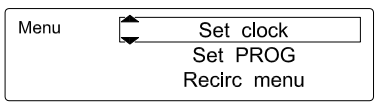
●Remote Controller



■ When setting the maximum temperature to 125-185°F (55-85°C)

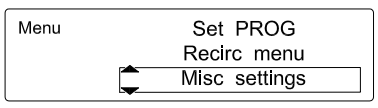
1. Turn the water heater off by pressing the Power ON/OFF Button on the Remote Controller.
2. Press the MENU Button.The following screen display will be appear.(a)

(a)

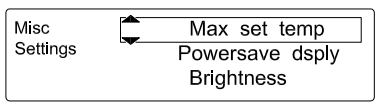


3. Select "Misc settings" by using the Up [▲] and Down [▼] Setting Buttons. (b)
   Then press the ENTER Button. (c)

(b)



(c)



3. Press the ENTER Button.
   Set the upper limit of the hot-water supply temperature* by using the Up [▲] and Down [▼] Setting Buttons. (d)
   * °F Mode : 125°F - 150 °F (in 5 °F interval), 160 °F, 170 °F, 185 °F
   * °C Mode : 55 °C - 80 °C (in 5 °C interval), 85 °C

(d)

e.g.) Limit of the hot-water supply temperature : 140°F

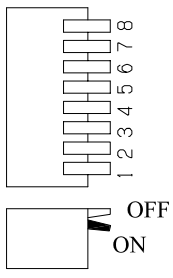
4. Press the ENTER Button, then "Set complete" will appear on the display.
5. To put the water heater back into operation, press the Power ON/OFF Button on the Remote Controller.
   To keep the water heater off, let the unit sit for 30 sec. to return to the original display.

■ Dip Switch Settings

Disconnect the electrical power to the water heater before adjusting the Dip Switches.

The following settings can be adjusted using the Dip Switches:
1. By using SW 1 and 2, this unit can be programmed so that it will default temperatures if the Remote Controller is removed.
2. By using SW 5 and 6, adjustments can be made for use at high elevation.
3. By using SW 7 and 8, adjustments can be made for extended vent lengths.
   Refer to the "Setting list for Dip Switches" table for details.

[Dip Switches]



Setting list for Dip Switches (● :ON ○ :OFF)

SW1	SW2		SW5	SW6		SW7	SW8	
Default temperature setting			Elevations above 2000ft			Vent Length Adjustment*		
SW1	SW2		SW5	SW6	High Elevation Adjustment	SW7	SW8	
○	○	120°F (50°C)	○	○	0~2000ft (0~610m)	○	○	Minimum length
●	○	130°F (55°C)	●	○	2001~4000ft (611~1220m)	●	○	Short length
○	●	140°F (60°C)	○	●	4001~6000ft (1221~1830m)	○	●	Long length
●	●	185°F (85°C)	●	●	6001~8000ft (1831~2440m)	●	●	Maximum length

* NC199DVC(GQ-2857WZ-FFA US) only.
Note) SW 3 is no function. It is possible to cause the trouble, please do not change it.
Note) The unit is fixed with minimum combustion, if you change SW4 to ON. It is possible to cause the trouble, please do not change it.

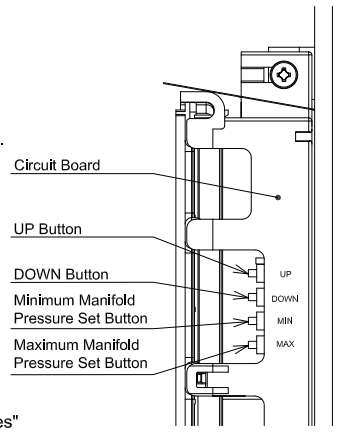
■ Manifold Gas Pressure Adjustment

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).
Note 3) Take the 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)

(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.



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

Manifold Gas Pressures Maximum and Minimum Values

Model Name	Gas type	Supply Pressure (inch H_2O)	Manifold Pressure (inch H_2O) Cover off	
			Max value	Min value
NC199OD(GQ-2857WZ US)	NG	7.9	2.75	1.25
	LPG	11.0	4.20	1.80
NC199DVC(GQ-2857WX-FFA US)	NG	7.9	3.00	1.35
	LPG	11.0	3.35	1.50

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

■ 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 (Display Reading X Multiplier) Multiplier	Unit	Minimum Value for Indication	Remarks
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	10000 times	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	0.1L/min	*3
18	Output (%)	X 1	%	1 %	
20	Calculated Fan Speed	X 10	rpm	25 rpm	*1
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
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 Value	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			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 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.