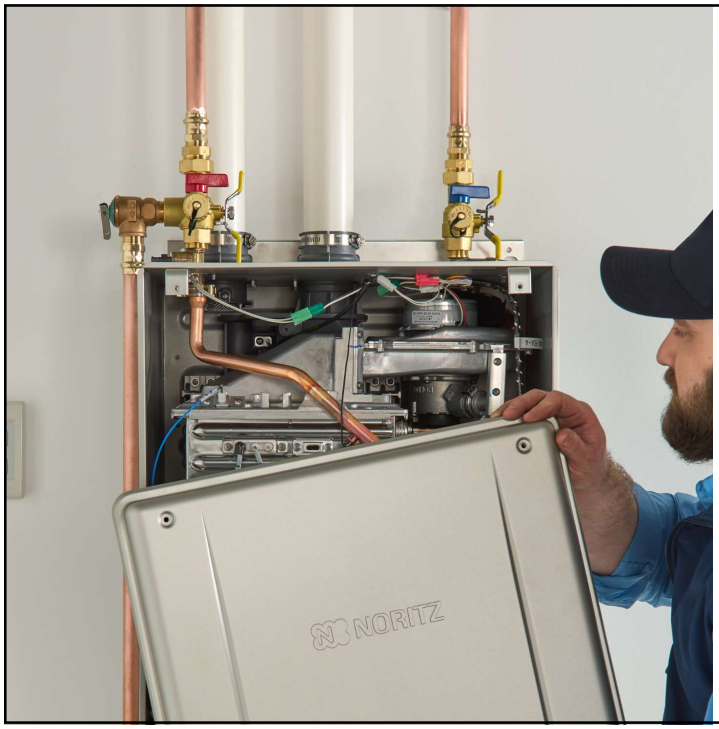
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MAINTENANCE & TROUBLESHOOTING

Level 2 Troubleshooting and Service,
Focused on the EZ, NRCR and CDV.



1



OUTLINE

We will cover the following topics:

- Recommended Tools
- Water Quality & Descale Procedure
- General Service & Maintenance
- Common Error codes and Maintenance Monitors
- ½” Gas Line Requirements
- Component Identification
- PROCard App

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2

RECOMMENDED TOOLS

What's in your tool bag?

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3

RECOMMENDED TOOLS

While you *can* fully disassemble and reassemble a Noritz unit with only a long phillips screwdriver, you may not be able to complete all service or troubleshooting with *only* a screwdriver. A T15 Torx bit, flashlight and plumbers grease are also helpful to round out your tool kit.

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Phillips Screwdriver
Descale Kit
Digital Gas Manometer
Digital Multimeter
Air Compressor
Noritz Remote Control



4

WATER QUALITY AND DESCALE PROCEDURE

Ensure a long life by addressing water quality issues per our guidelines.

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5

WATER QUALITY GUIDELINES

Water Quality Guidelines in the Installation Manual should always be followed. Softening or treating the water with a Scale Shield is best as it prevents scale build up from happening in the first place. Descales are good, but a last resort as you are cleaning up scale build up that could have been prevented.

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 the Water Quality List on page 34.)
- The water heater has displayed a "C1# (Service Reminder)" indicating Scale Build-up, but the heat exchanger has not been flushed.

Treatment Guidelines

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



* 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.

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WATER QUALITY GUIDELINES

Here are some issues related to Hard Water or Poor Water Quality:

- Scale Buildup
- Heat Exchanger Leak
- Unstable Water Temperature
- Clogged Inlet Filter Screen







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7

WATER QUALITY GUIDELINES

All* units since 2016 have a "Flush Mode" used when descaling the unit.



PRO Series Models



Directions can be found in the manual



2016+ Models

*NC380-SV Does not have a flush connector.

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8

DESCALE EQUIPMENT

So, what do you need to perform a proper descale?



Noritz Descale Kit Shown, Part # DSCL-KIT

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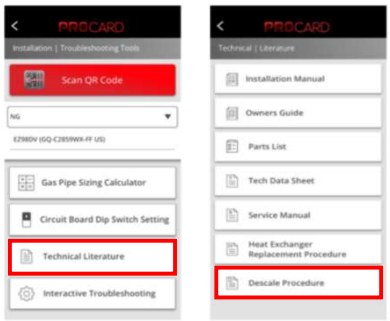
9

DESCALE DIRECTIONS

http://support.noritz.com



PROCard App



Youtube.com/Noritzamerica



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10

GENERAL SERVICE AND MAINTENANCE

Periodic maintenance items to keep the unit running at peak performance

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11

MAINTENANCE ITEMS

A descale takes 1 hour, that's the perfect time to look over the unit and clean any areas that are dirty. This could include:

- Checking intake and exhaust terminations
- Checking internal intake filter
- Cleaning ignition and flame rods
- Cleaning fan motor and burner

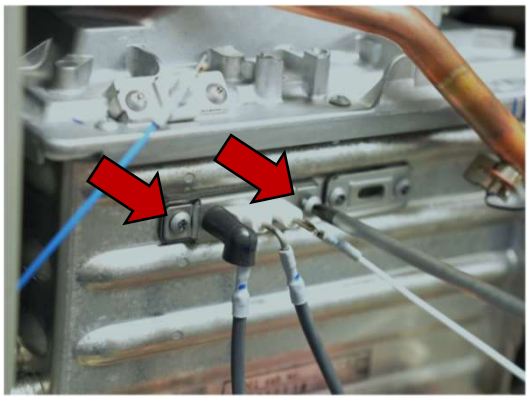


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12

CLEANING IGNITION & FLAME RODS

Remove 2 screws securing rods



Clean with rough side of a sponge, Scotch-Brite pad, fine grit sandpaper (300+ grit)



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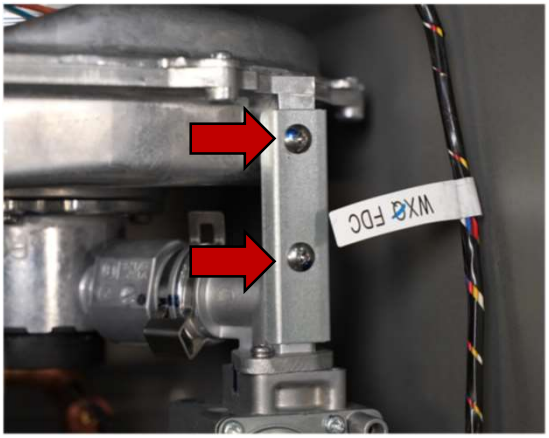
13

CLEANING FAN & BURNER

Scan Here!

SHUT OFF GAS then remove mounting bracket (2 screws)



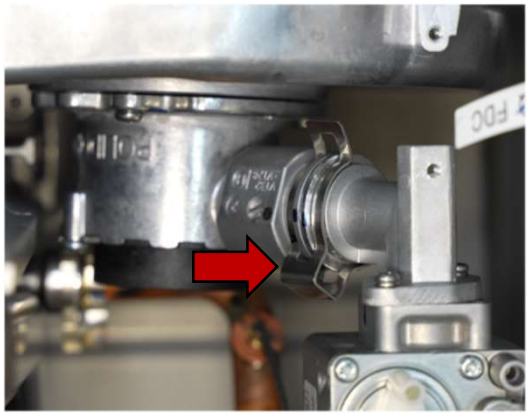


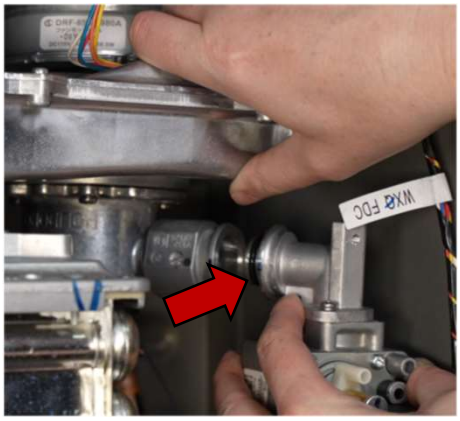
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14

CLEANING FAN & BURNER

Remove c-clip and carefully disconnect gas valve from venturi. There is an o-ring, be careful not to damage it.





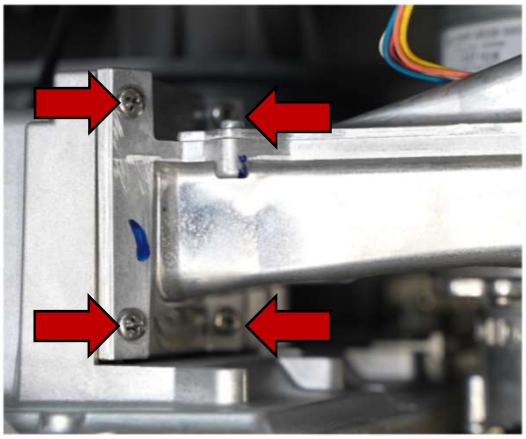
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15

CLEANING FAN & BURNER

Disconnect fan wire harness then remove 4 screws securing it to burner.



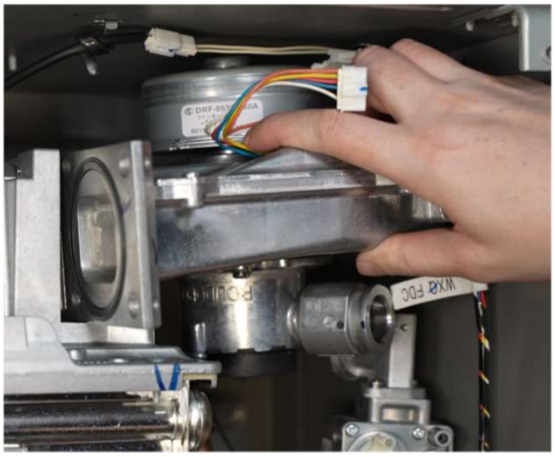


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CLEANING FAN & BURNER

Remove fan motor and venturi from unit and remove venturi from fan.





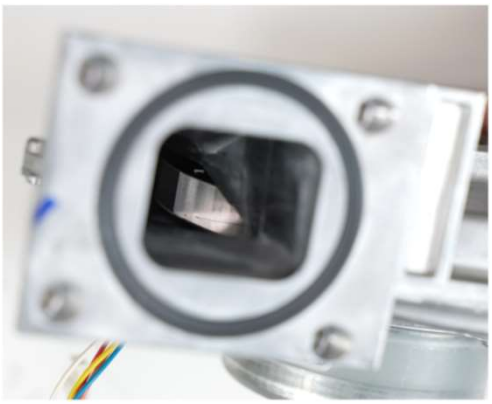
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17

CLEANING FAN & BURNER

Clean the fan with an air compressor, vacuum, plastic brush or any combination of those items. If the fan cannot be cleaned effectively, the fan should be replaced. ***DO NOT SPLIT THE FAN HOUSING.***



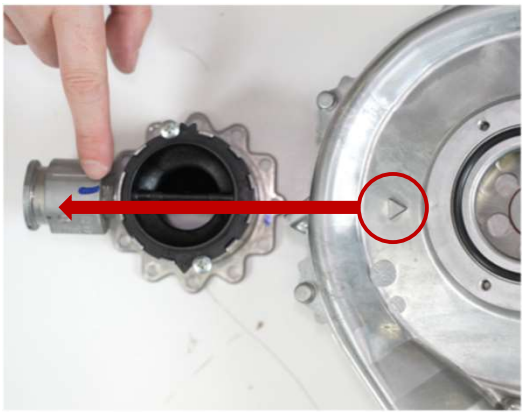


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CLEANING FAN & BURNER

When reassembling, line up the gas connection with the triangle stamped on the fan housing. Be careful not to damage or lose any o-rings or gaskets on the fan housing.



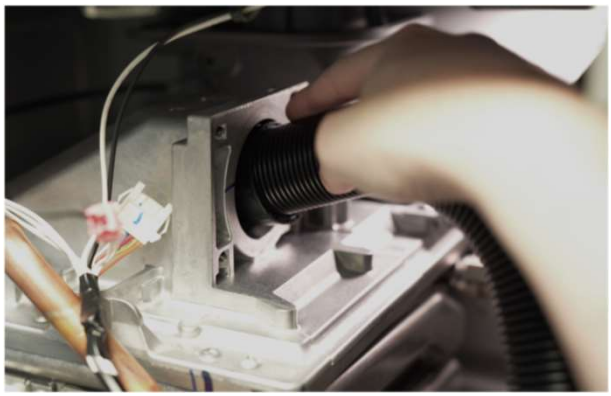


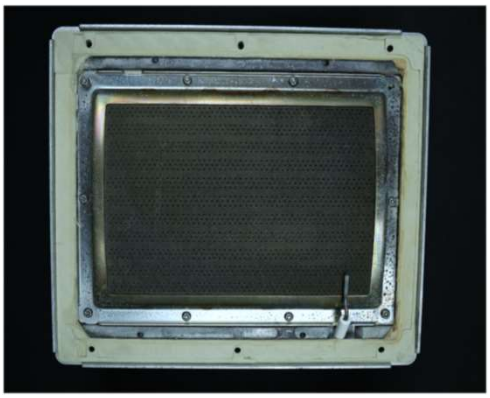
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CLEANING FAN & BURNER

Use a vacuum to clean the burner. ***DO NOT USE AN AIR COMPRESSOR ON THE BURNER!*** The burner mesh could be damaged and cause additional problems.





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COMMON ERROR CODES

21

COMMON ERROR CODES

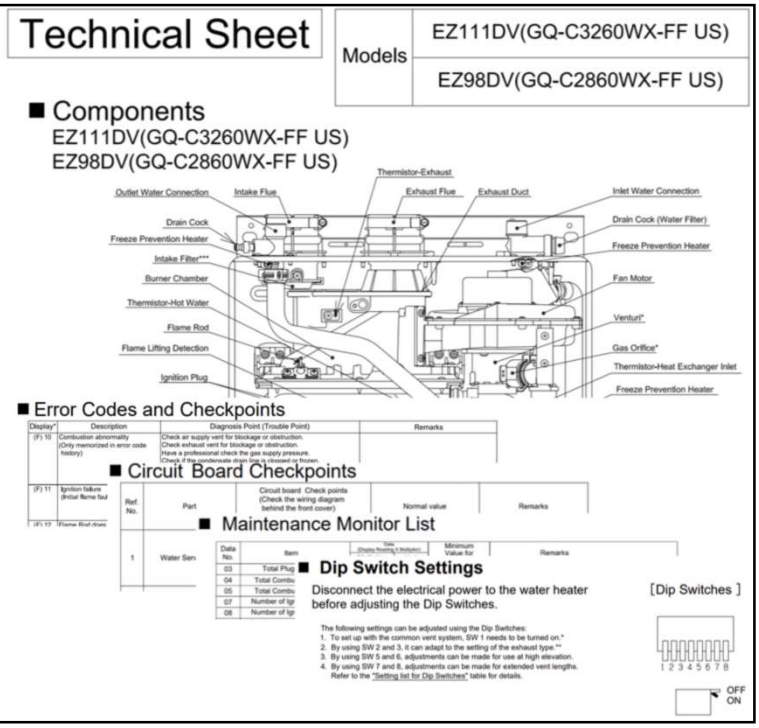
Error Code	Description
11	Ignition Failure (Failure to detect flame)
12	Flame Loss
16	Abnormally High Outlet Temperature
20	High Limit Switch
63	Recirculation Abnormality
65	Main Water Control Servo Abnormality
66	Bypass Water Control Servo Abnormality
73	Circuit Board Setting Abnormality
F76	Multi System Communication Error
90	Combustion Abnormality

22

TECHNICAL DATA SHEET

This sheet is inside a zip bag taped to the inside of the front cover and gives you the most commonly requested technical data.





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EZ START PLUS ERROR HISTORY

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Error history can be displayed, and content can be emailed to Noritz Customer Care.

Tap on the error code to link to the Noritz web site. Detailed error code info displayed.

Shows the number of days elapsed since the error was reported.

Tap the email icon to launch the email app to send data to Noritz Customer Care.

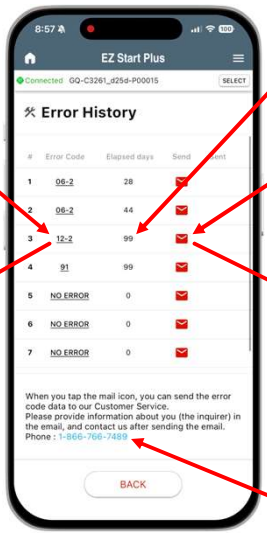


Tap Maintenance Button



Tap Error History Button







To Customer Care

Tap the phone # to launch the phone app and call Noritz.

24

11 ERROR CODE

11 Error Code: Ignition Failure (Failure to Detect Flame)

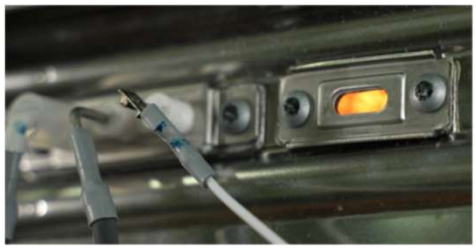
This code indicates a lack of spark or lack of gas entering the burner. Three things needed for combustion are:

- **Air**
- **Fuel**
- **Spark**

Model:	NG	LP
EZ, NRCR, NCC199CDV	3.5” to 10.5” WC	8” to 14” WC



However, you can cross off Air as a cause by simply removing the front cover. Start simple with troubleshooting, don’t jump to the most complicated possibility. Simple steps like verifying inlet gas pressures are within range and cleaning the ignition rods.







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12 ERROR CODE

12 Error Code: Repeated Flame Loss

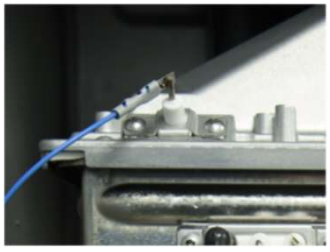
This code indicates the unit cannot maintain flame in the burner. Just like the error code 11, insufficient inlet gas pressures can also cause the flame to go out.

Model:	NG	LP
EZ, NRCR, NCC199CDV	3.5” to 10.5” WC	8” to 14” WC

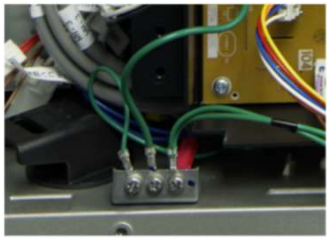
Verify Inlet Pressure



Check/Clean Flame Rod



Check Grounds





Incorrect Venting

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16 & 20 ERROR CODES

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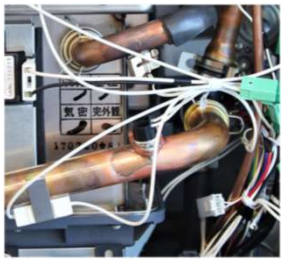
16 Error Code: Abnormally High Output Temp

- Scale deposits in the heat exchanger and/or water components
- Wrong gas type

20 Error Code: High Limit Switch

- Scale deposits in the heat exchanger
- Poor Combustion
- Bad Wiring or Failed High Limit Switch







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63 ERROR CODE

63 Error Code: Recirculation Abnormality (NRCR Only)

This code indicates the unit is trying to run the recirculation pump but is not detecting any flow.

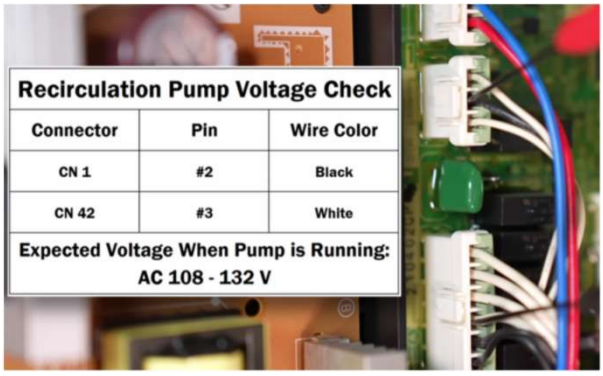
New Installations:

- **Check Return Line Filter and Water Shut Offs**
- **Purge air in the domestic hot and return line (Dedicated Mode)**
- **Check that the "Crossover" connector is connected together**
- **Check crossover valve filter (Crossover Mode)**

Older Installations:

- **Check Return Line Filter and Water Shut Offs**
- **Circuit Board**
- **Recirc Pump**
- **Recirc Flow Sensor**

Scan Here!

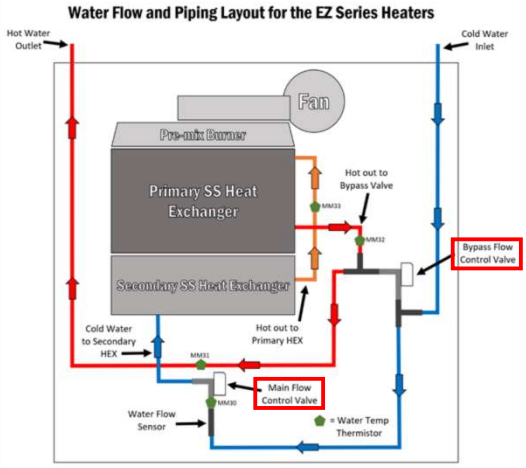


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65 & 66 ERROR CODES

65 Error Code: Main Servo Abnormality
66 Error Code: Bypass Servo Abnormality
Both error codes indicate a problem communicating with or positioning the respective water servo.

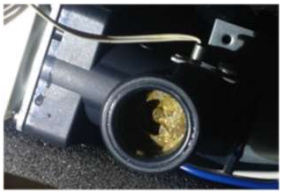


Bypass Servo



Main Servo





29

73 & F76 ERROR CODES

73 Error Code: Circuit Board Setting Abnormality

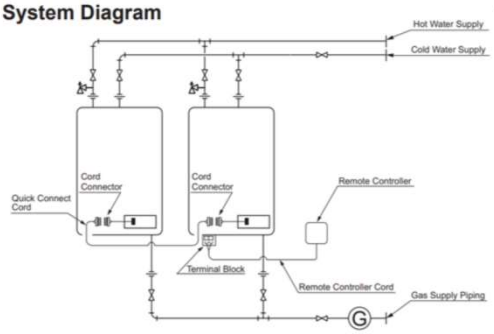
If dipswitches were changed or other connectors changed while unit has power a 73 code will appear. Unplug unit, finalize all dipswitch and wiring changes, and plug in heater.
Also occurs if the circuit board was replaced but not programmed.

F76 Error Code: Multi System Communication Error

Make sure only 1 remote control is hooked up when there are 2 units quick connected.



System Diagram



* When connecting two units, use only a single remote controller.

Note: Connect the remote controller to only one of the units.
Units must be same model in order to quick connect.

30

90 ERROR CODE

90 Error Code: Combustion Abnormality

This code indicates the unit is not able to hit the set temperature.

Most commonly caused by restrictions in the venting (intake and/or exhaust), incorrect dipswitch settings, a clogged or restricted condensate drain line or insufficient gas pressure going to the unit.

Older installs may have a dirty fan or venturi reducing the amount of air and gas that makes it into the burner.





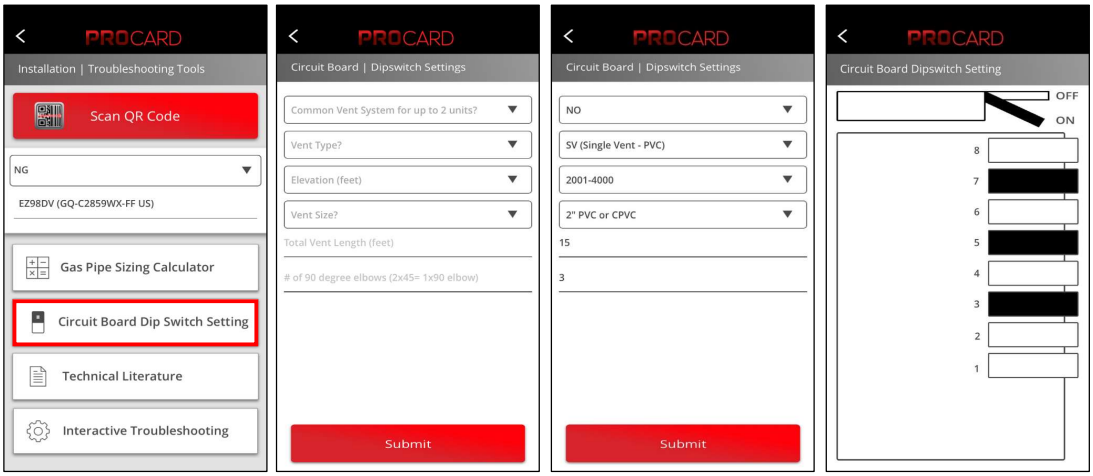
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90 ERROR CODE

90 Error Code: Combustion Abnormality

Use the PROCard App to verify correct dipswitch settings.



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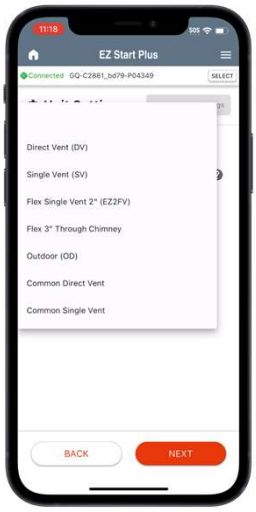
32

90 ERROR CODE

90 Error Code: Combustion Abnormality

Use the EZ Start Plus App or Operation Panel to verify correct settings.





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LESS THAN IDEAL INSTALLS







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COMMON MAINTENANCE MONITORS

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MAINTENANCE MONITORS

Commonly used maintenance monitors for troubleshooting and service

- **MM14: Flow Rate**
- **MM30: Inlet Water Temp**
- **MM31: Outlet Water Temp**
- **MM32: Heat Exchanger (HEX) Water Temp**
- **MM86: Recirculation Mode (NRCR)**

Scan Here!

Residential Remote



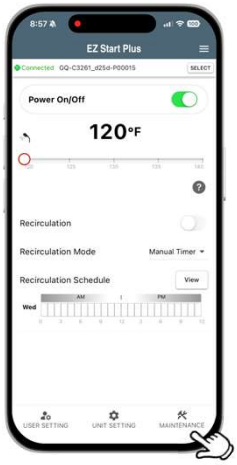
Commercial Remote



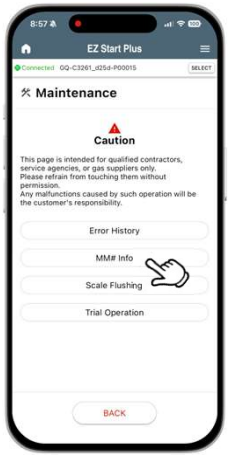
36

EZ START PLUS MAINT MONITORS

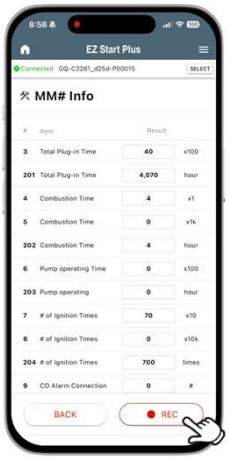
You can check and record up to 2 minutes of Maintenance Monitor data and send to Noritz Customer Care.



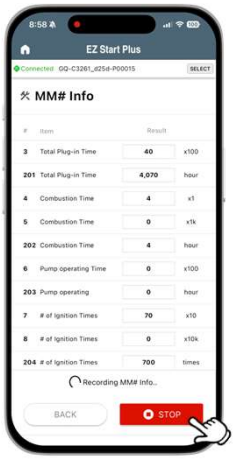
Tap Maintenance Button



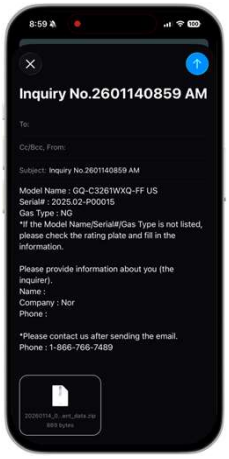
Tap MM# Info Button



Tap REC Button



Tap STOP Button or 2 minutes passed



Auto launches email after recording ended

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MM14 FLOW RATE

Tankless heaters activate and remain on based on a minimum flow rate (usually .5 gallons per minute [gpm]).
Units are on demand and they modulate in real time based on the following conditions: Flow Rate, Set Temp and Incoming Water Temp.

The tankless doesn't do anything when a faucet is opened.

The tankless shuts off after the water temp is adjusted.

The recirculation pump doesn't activate the unit.

Those are just a few examples of common complaints that you can start troubleshooting with MM14

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MM30 INLET WATER TEMP

While this MM might not be as widely used as the others, it can still provide additional insight into why the heater is or is not doing something.

If the complaints are related to heater performance, such as not enough flow in the winter time or the heater doesn't activate in the summer time, you can use MM30 to establish the temperature rise and the BTU demand.

BTU Formula:

BTU = Flow Rate in GPM x Delta T x 500

Lets say the customers faucet flows .6 gpm, their set temp is 115 and the inlet water temp is 87. The Delta T is 28 (115 minus 87). Now let's put all those numbers into the formula:

.6 x 28 x 500 = 8,400 BTU

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MM31 OUTLET WATER TEMP

Along with MM14 (Flow Rate) this MM is one of the most used. This will tell you the temperature of the water leaving the unit. If you get any questions or complaints regarding hot water temperature this MM will be very useful.

The water at the fixture doesn't feel hot enough.
The water temperature seems to fluctuate greatly.
The bathroom sink gets hot but the shower doesn't.
The unit has a 90 error code.

The units goal is to get up to set temp as quickly as possible and maintain that temp as long as there is enough flow. Once the water leaves the unit, there are many things that can result in the water temp at the fixture being different. If the water temp leaving the unit is at set temp, the problem likely is with the plumbing or the fixtures.

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MM32 HEAT EXCHANGER WATER TEMP

This MM is very helpful to determine if the burner is heating up the water in the HEX properly. It is also useful in troubleshooting a 90 error code (along with MM31).

Let's say you have a call for EC90 and you have determined it's because the unit is not hitting set temp. Why is the outlet temp low? Let's find out.

> If MM32 shows 140, but MM31 shows 100 it would indicate there is a problem with the bypass servo (failed, stuck or debris in it).
>
> If MM32 is also low, say 105 or 110 and MM31 shows 100 it would indicate the burner is not heating up the HEX high enough. Most likely not enough gas is entering the burner.

Both above examples would lead you down two very different troubleshooting paths so that's why checking MM32 is important when diagnosing low outlet temps.

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MM86 RECIRCULATION MODE

This MM is specific to the NRCR Series. It will tell the recirculation mode the unit is set to. This is helpful to verify that the recirc mode is *actually set* the way you think it is.

	Recirculation Mode	Dedicated Mode	Crossover Mode
MM 86	Auto Recirc (Default)	11	21
	Manual Timer Recirc	12	22
	Recirc Always ON	13	23
	Recirc Always OFF	14	24
	On-Demand (Title 24)	15	25

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½” GAS LINE DETAILS

Under certain specific conditions, a ½” gas line can be used. The length is equivalent length and factors in fittings and elbows.

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' (3m)	20' (6m)	30' (9m)	40' (12m)	50' (15m)	60' (18m)	70' (21m)	80' (24m)	90' (27m)	100' (30m)	125' (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										
1 1/2"	2,090	1,									
2"	4,020	2,									
2 1/2"	6,400	4,									
3"	11,300	7,									
4"	23,100	15,									

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' (3m)	20' (6m)	30' (9m)	40' (12m)	50' (15m)	60' (18m)	70' (21m)	80' (24m)	90' (27m)	100' (30m)	125' (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	9,685	9,087	8,584	7,608
4"	43678	30,020	24,107	20,632	18,286	16,569	15,243	14,181	13,305	12,568	11,139

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COMPONENT IDENTIFICATION

Circuit Board

Gas System

- **Gas Valve**
- **Venturi**
- **Fan Motor**

Ignition System

- **Igniter**
- **Ignition Rod**

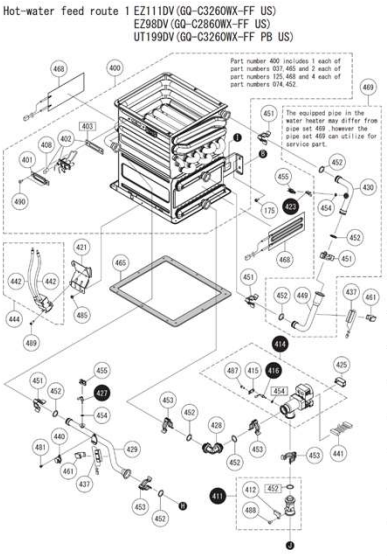
Heat Exchanger Assembly

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PARTS LIST

Helpful to locate parts and what they connect to.



Hot-water feed route EZ111DV(GQ-C3260WX-FF US)
EZ98DV(GQ-C2860WX-FF US)
UT199DV(GQ-C3260WX-FF PB US)

Part No.	Part Names	Order No.	Q'ty/unit
400	Heat Exchanger Kit (SET)	GKJ73MY	1
401	Mounting Plate - Ignition Plug	FDA8065	1
402	Ignition Plug w/ Gasket	GKJ72MT	1
403	Gasket - Ignition Plug (NEW)	FDAL009	1
408	Silicon Sleeve	FDA2052	1
411	Water Flow Sensor (SET)	E0GD101	1
412	Magnetic Sensor	D4MD019	1
413	Water Servo - Bypass (SET)	ETF0050	1
414	Water Servo -Main (SET)	FHMD011	1
415	Thermistor Holding Plate	ALSD088	1
416	Thermistor - Red	EJMD027	1
417	Inlet Water Connection (SET)	GKJ73MY	1
418	Water Filter Cap	07.JD006	1
419	Water Filter	E0BD032	1
420	Outlet Water Connection (SET)	GKJ73MT	1
421	Mounting Plate - Igniter	FDA8015	1
422	Thermistor - Pink	EJMD003	1
423	Thermistor - Blue	EJMD001	1
425	Wire Cover - Servo	E0TD023	2
426	Water Connector - T-Elbow	FDAD017	1
427	Thermistor - Yellow	EJMD004	1
429	Water Connector - Elbow	FDAD016	2
430	Pipe - Primary SS HEX to T-Elbow	FDAD005	1
431	Pipe - Secondary SS HEX to Primary SS HEX	FDAD023	1
433	Pipe - T-Elbow to Outlet Water Connection	FDAD003	1
434	Drain Cock	GRUD003	2
436	O-Ring - High Temp P3	SADA633	2
437	Pipe - Elbow to Water Flow Sensor	FDAD031	1
438	Freeze Prevention Heater -Rectangle	ERDH002	4
439	Freeze Prevention Heater - Round Short	ERDH003	2
439	Wiring Harness - Bypass Water Servo	ETF-J033	1
440	High Limit Switch - 144	FJWH001	1
441	Wiring Harness - Main Water Servo	JBSJ024	1
442	High Voltage Igniter Wire L175	ALSJ078	2
444	Igniter (SET)	GKJ72T9	1
448	Pipe - Secondary SS HEX to Primary SS HEX	FDAD025	1
450	Drain Connection - 1/4" tube	GRUD018	1
451	"C" Clamp - Water Pipe 18-25	SADA593	6
452	O-Ring - High Temp P16	3223302	17
453	"C" Clamp - Water Pipe 16A	4JWC030	10
454	O-Ring - Thermistor High Temp P4	1323709	4
455	"C" Clamp - Thermistor	GRUD055	3
456	Water Connection Elbow	JBUD001	1
457	O-Ring - High Temp P6	2204408	1
458	Cover - Pipe-Inlet Water	FDAA013	1
460	"C" Clamp - 1/4" tube 6-13	SADD284	1
461	Clamp -Freeze Prevention	AMWL001	3
462	Clamp - Freeze Prevention	ELVL011	1
463	Gasket - Connection	FDAL008	2
465	Gasket - Exhaust Duct	FDAL003	1
468	Freeze Prevention Heater - Condensate Container	ETHH004	3
469	Pipe SET - Secondary SS HEX to Primary SS HEX	GKJ73Z0	1

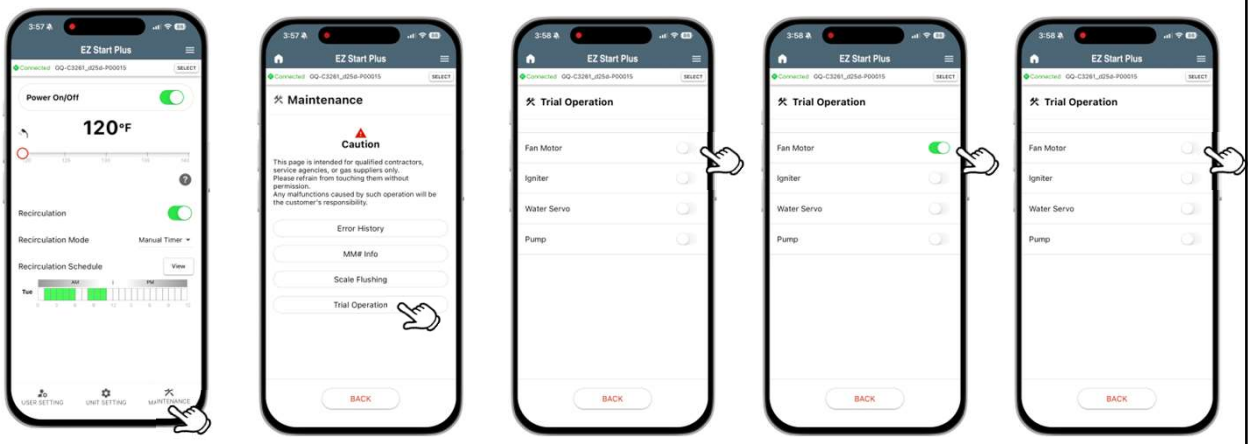
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TRIAL OPERATION

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Depending on the unit you can do a trial operation on:
Fan Motor, Igniter, Water Servo, Pump (NRCR only), or Bypass Servo (CDV only)

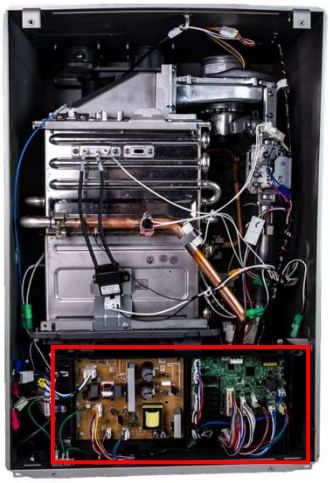


Tap Maintenance Button | Tap Trial Operation Button | Select Part for Trial Operation | Tap Toggle Button to turn ON | Tap Toggle Button to turn OFF

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CIRCUIT BOARD

Control center of the unit.





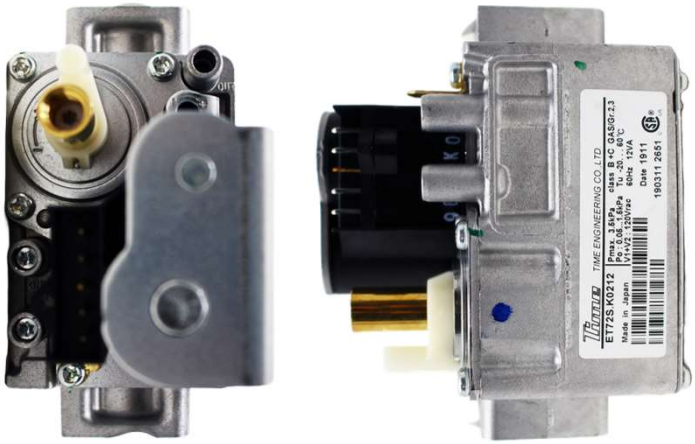
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GAS VALVE

Pre-mix units have a negative pressure gas system. DC voltage opens the main gas solenoid and the negative pressure created by the fan draws gas out of the valve and into the venturi.





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VENTURI

This is specific to the Pre-Mix type units. Air and Gas are introduced here and then enter the Fan Housing to be mixed before entering the Burner



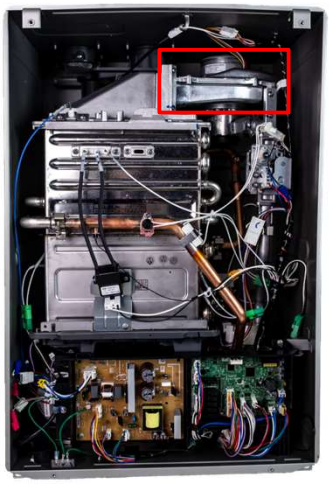


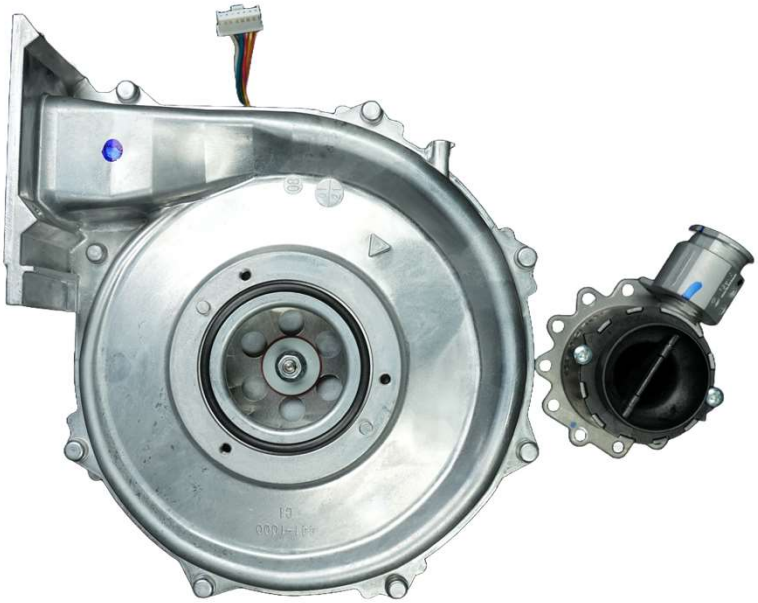
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FAN MOTOR

In Pre-Mix units, the fan acts as a blender and mixes the air and gas together before pushing it into the burner.



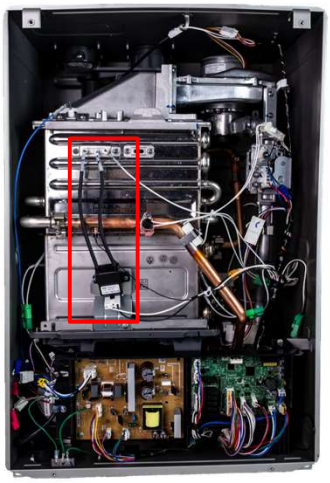


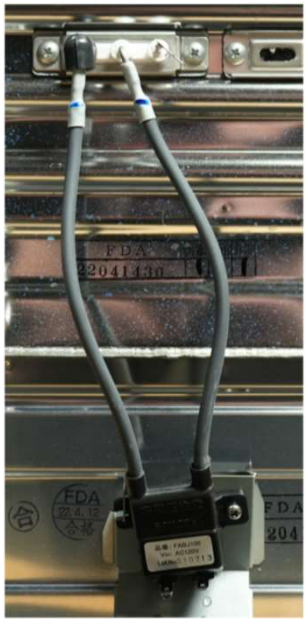
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IGNITION SYSTEM

Igniter and Ignition Rods. Responsible for creating spark to ignite the air/fuel mixture.





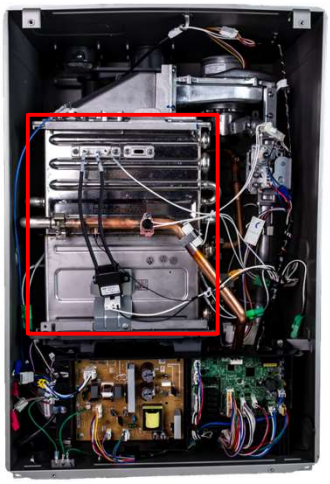


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HEAT EXCHANGER ASSEMBLY

Transfers heat from the burner and exhaust into the water.





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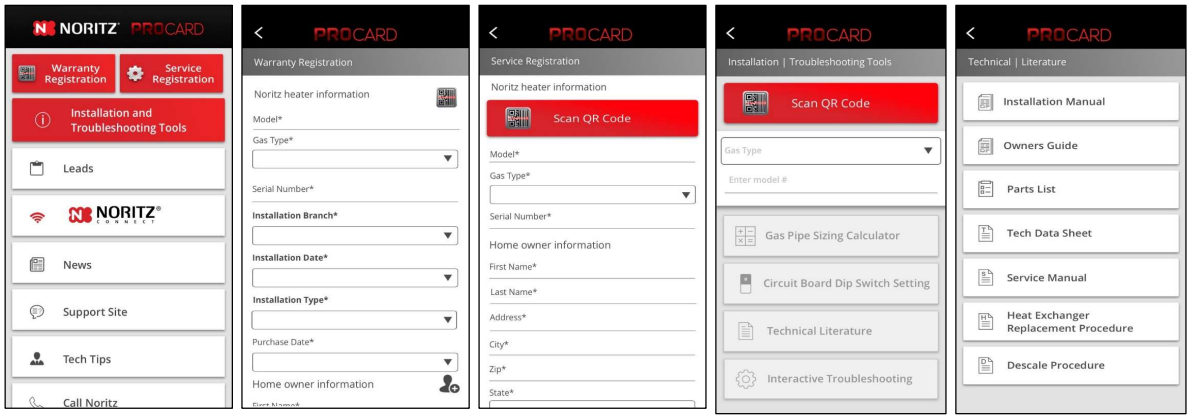
PROCARD APP

ANDROID

APPLE

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The PROCard App (available for both iOS and Android) is a great tool to have on your phone!



PROCard App | Warranty Registration | Service Registration | Troubleshooting | Manuals

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CONTACTING CUSTOMER CARE

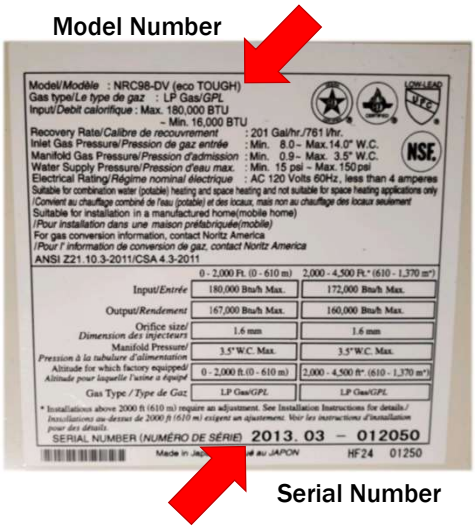
866-766-7489

(866) - 7NORITZ

Please have readily available:

- Model Number
- Serial Number

Being onsite with the unit is not mandatory, but very helpful!



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HELPFUL LINKS

866-7NORITZ (866-766-7489)

EZ Start Plus App
(For New Pro Units)

Gas Conversion
(For New Pro Units)

SUPPORT.NORITZ.COM

NORITZ.COM/TECHTIPS

HELP.NORITZ.COM

TRAINING.NORITZ.COM

YOUTUBE.COM/
NORITZAMERICA

PROCARD.NORITZ.COM

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THANK YOU

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