



# MAINTENANCE & TROUBLESHOOTING

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



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## 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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# RECOMMENDED TOOLS

What's in your tool bag?



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## 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.

Phillips Screwdriver

Descale Kit

Digital Gas Manometer

Digital Multimeter

Air Compressor

Noritz Remote Control



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# WATER QUALITY AND DESCALE PROCEDURE

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



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## 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. Descalers 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
- ⚠ Overheated Water Temperature
- ⚠ Error Codes: 16, 20
- ⚠ Clogged Inlet Filter Screen



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# DESCALE EQUIPMENT

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

SCAN FOR  
VIDEO



Noritz Descale Kit Shown, Part # DSCL-KIT

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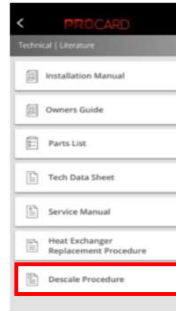
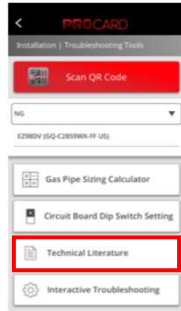
8

# DESCALE DIRECTIONS

<http://support.noritz.com>



PROCard App



[Youtube.com/Noritzamerica](https://www.youtube.com/Noritzamerica)



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# GENERAL SERVICE AND MAINTENANCE

Periodic maintenance items to keep the unit running at peak performance



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# 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:

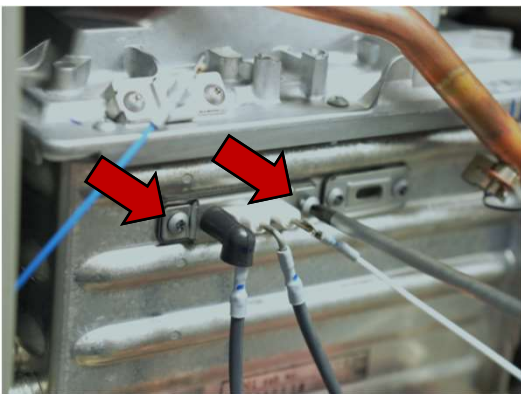
- Checking intake and exhaust terminations
- Checking internal intake filter
- Cleaning ignition and flame rods
- Cleaning fan motor and burner



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# CLEANING IGNITION & FLAME RODS

Remove 2 screws securing rods



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



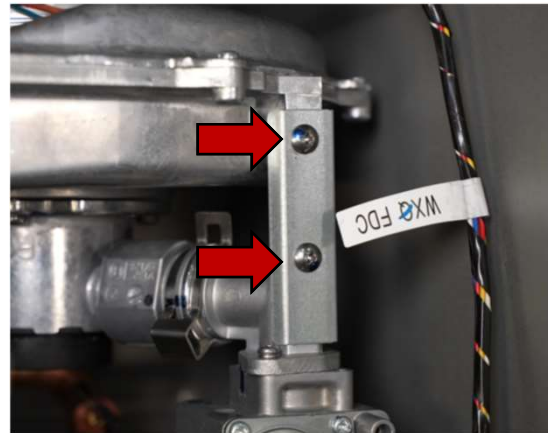
12

# CLEANING FAN & BURNER

SCAN FOR VIDEO



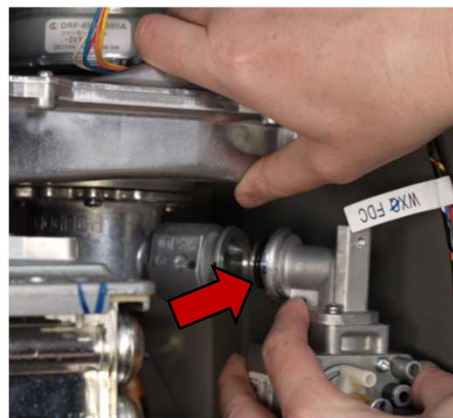
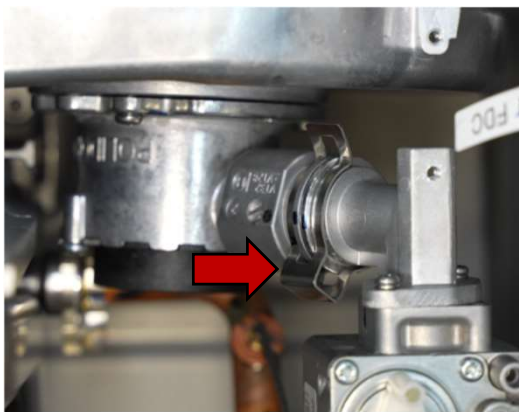
SHUT OFF GAS then remove mounting bracket (2 screws)



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# CLEANING FAN & BURNER

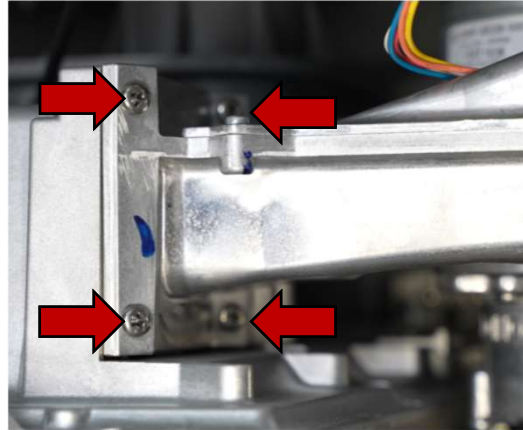
Remove c-clip and carefully disconnect gas valve from venturi. There is an o-ring, be careful not to damage it.



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## CLEANING FAN & BURNER

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

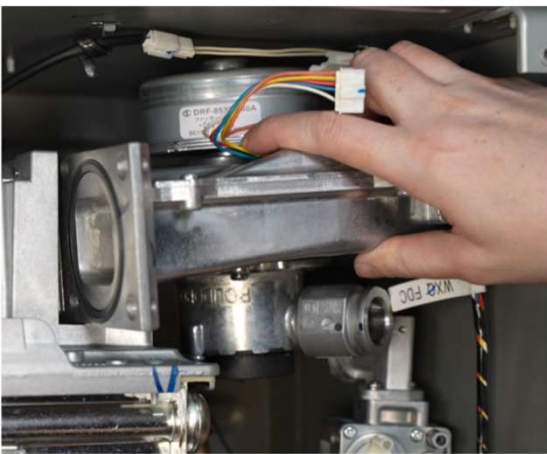


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## CLEANING FAN & BURNER

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



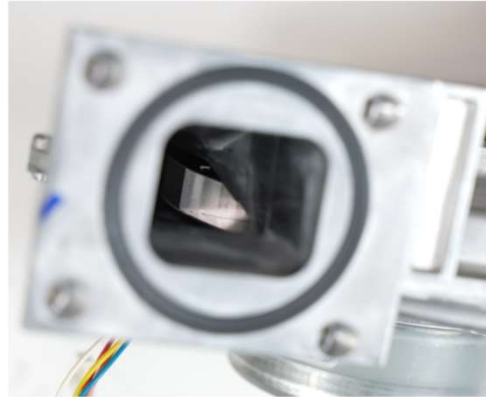
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## CLEANING FAN & BURNER

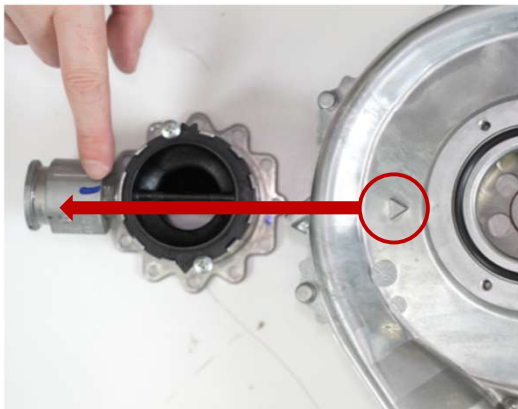
Clean the fan with an air compressor, vacuum, plastic brush or any combination of those items. If the fan cannot be cleaned effectively, the fan should be replaced. **DO NOT SPLIT THE FAN HOUSING.**



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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.

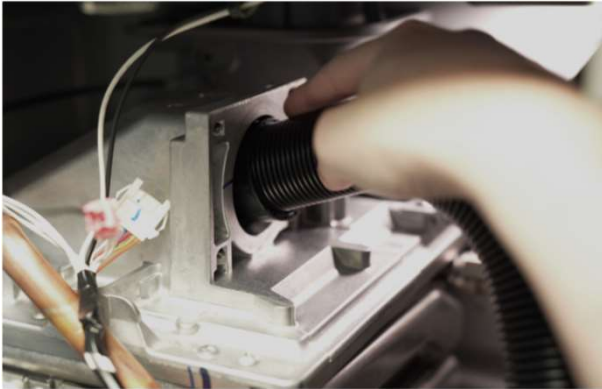


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## **CLEANING FAN & BURNER**

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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**

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# COMMON ERROR CODES

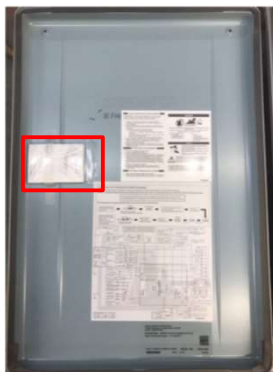
Error Code	Description
11	Ignition Failure (Failure to detect flame)
12	Flame Loss
16	Abnormally High Outlet Temperature
20	High Limit Switch
63	Recirculation Abnormality
65	Main Water Control Servo Abnormality
66	Bypass Water Control Servo Abnormality
73	Circuit Board Setting Abnormality
F76	Multi System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



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## 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.



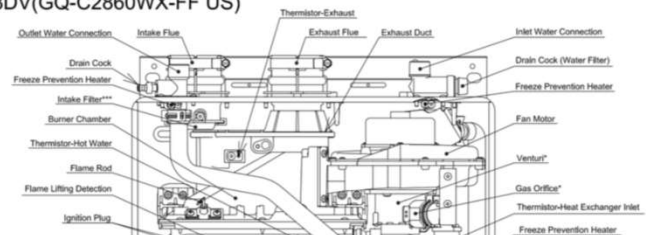
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### Technical Sheet

Models	EZ111DV(GQ-C3260WX-FF US) EZ98DV(GQ-C2860WX-FF US)
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#### Components

EZ111DV(GQ-C3260WX-FF US)  
EZ98DV(GQ-C2860WX-FF US)



#### Error Codes and Checkpoints

Display	Description	Diagnosis Point (Trouble Point)	Remarks
P110	Combustion abnormality (Only referenced in error code history)	Check air supply vent for blockage or obstruction. Check exhaust vent for blockage or obstruction. Have a professional check the gas supply pressure. Check the gas valve for gas to be closed or frozen.	

#### Circuit Board Checkpoints

Ref. No.	Part	Circuit board Check points (Check the wiring diagram behind the front cover)	Normal value	Remarks
P111	Ignition valve (Refer Name list)			
P112	Flame Rod			

#### Maintenance Monitor List

Date	Item	Minimum Value for	Remarks
1	Water Sen.		

#### Dip Switch Settings

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

[Dip Switches]

- The following settings can be adjusted using the Dip Switches:
- To set up with the common vent system, SW 1 needs to be turned on.\*\*
  - By using SW 2 and 3, it can adapt to the setting of the exhaust type.\*\*
  - By using SW 5 and 6, adjustments can be made for use at high elevation.
  - 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.



OFF ON

# 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, NRRCR, 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

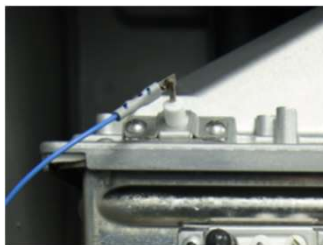
This code indicates the unit cannot maintain flame in the burner. Just like the error code 11, insufficient inlet gas pressures can also cause the flame to go out.

Model:	NG	LP
EZ, NRRCR, NCC199CDV	3.5" to 10.5" WC	8" to 14" WC

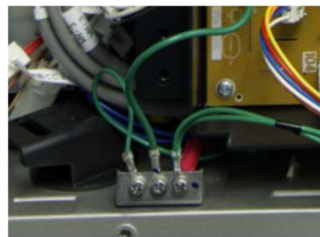
Verify Inlet Pressure



Check/Clean Flame Rod



Check Grounds



Incorrect Venting



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# 16 & 20 ERROR CODES

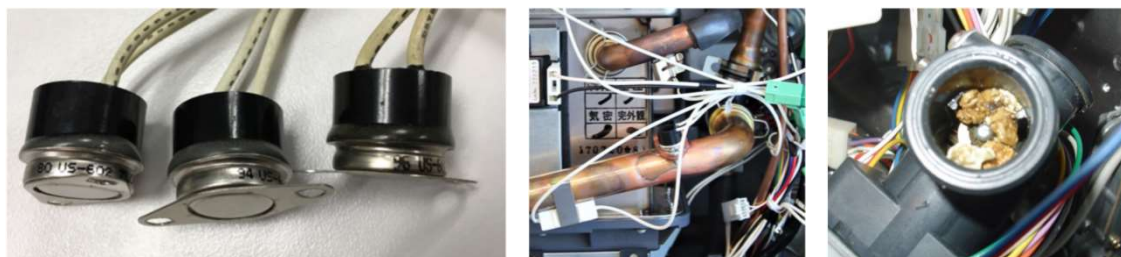


## 16 Error Code: Abnormally High Output Temp

- 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

Recirculation Pump Voltage Check		
Connector	Pin	Wire Color
CN 1	#2	Black
CN 42	#3	White

Expected Voltage When Pump is Running:  
AC 108 - 132 V



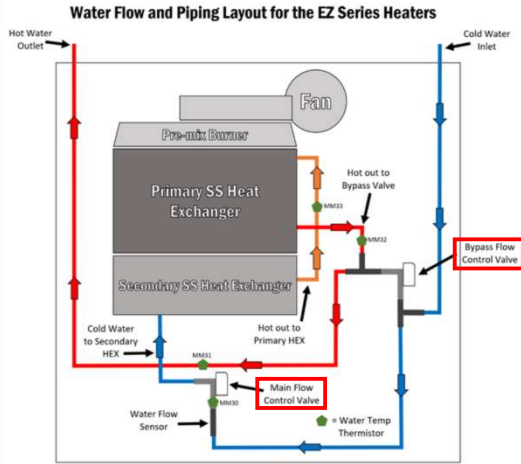
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# 65 & 66 ERROR CODES

**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.



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# 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.

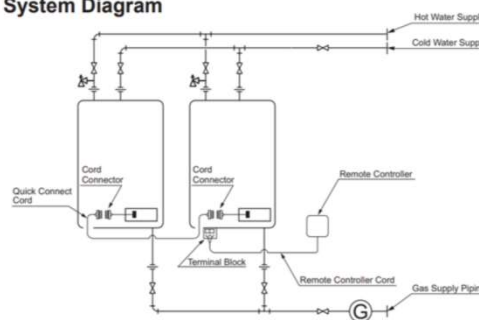
Also occurs if the circuit board was replaced but not programmed.

**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.

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# 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.

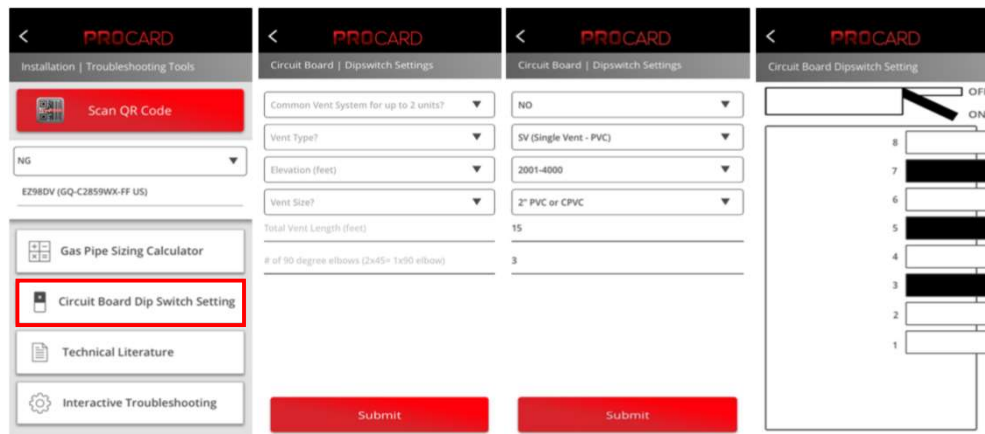
Older installs may have a dirty fan or venturi reducing the amount of air and gas that makes it into the burner.



# 90 ERROR CODE

## 90 Error Code: Combustion Abnormality

Use the PROCard App to verify correct dipswitch settings.



## 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 FOR VIDEO**



Residential Remote



Commercial Remote



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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 water temperature is fluctuating.**

**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:

$$\text{BTU} = \text{Flow Rate in GPM} \times \text{Delta T} \times 500$$

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:

$$.6 \times 28 \times 500 = \mathbf{8,400 \text{ BTU}}$$



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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.

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



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# 1/2" GAS LINE DETAILS

Under certain specific conditions, a 1/2" gas line can be used.

**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'	20'	30'	40'	50'	60'	70'	80'	90'	100'	125'
	(3m)	(6m)	(9m)	(12m)	(15m)	(18m)	(21m)	(24m)	(27m)	(30m)	(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'	20'	30'	40'	50'	60'	70'	80'	90'	100'	125'
	(3m)	(6m)	(9m)	(12m)	(15m)	(18m)	(21m)	(24m)	(27m)	(30m)	(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"	43,678	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

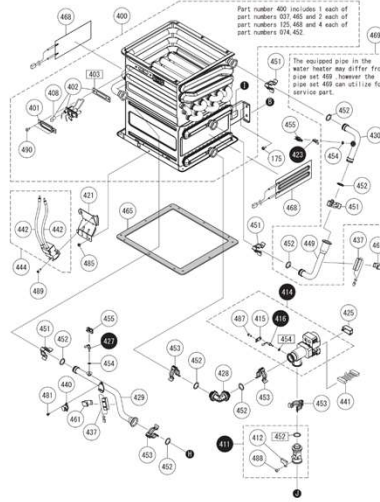
### Heat Exchanger Assembly



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# PARTS LIST

Hot-water feed route | EZ111DV (G0-C3260WX-FF US)  
EZ98DV (G0-C2860WX-FF US)  
UT199DV (G0-C3260WX-FF PB US)



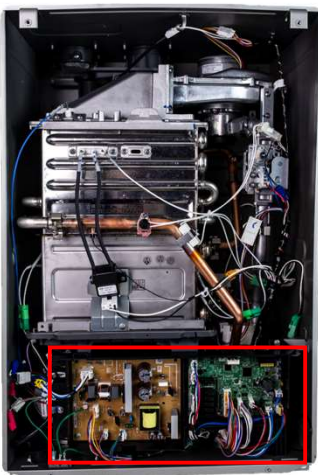
Hot-water feed route | EZ111DV (G0-C3260WX-FF US)  
EZ98DV (G0-C2860WX-FF US)  
UT199DV (G0-C3260WX-FF PB US)

Part No.	Part Name	Order Qty.	Q'ty (US)
400	Hot Water Valve Kit (SET)	1	1
401	Mounting Plate - Ignition Plug	1	1
402	Ignition Plug w. Shield	1	1
403	Shield - Ignition Plug (HE)	1	1
404	Control Solenoid	1	1
405	Water Flow Sensor (SET)	1	1
412	Pressure Sensor	1	1
413	Water Sensor - Reset (SET)	1	1
414	Water Sensor - Main (SET)	1	1
415	Pressure Relief Valve	1	1
416	Thermostat - Red	1	1
417	Hot Water Connection (SET)	1	1
418	Water Filter Cap	1	1
419	Water Filter	1	1
420	Hot Water Connection (SET)	1	1
421	Mounting Plate - Igniter	1	1
422	Thermostat - Blue	1	1
423	Thermostat - Green	1	1
424	Water Connection - T-Elong	1	1
425	Water Connection - T-Short	1	1
426	Water Connection - Elbow	1	1
427	Pipe - Primary SS HEX to T-Elong	1	1
428	Pipe - Secondary SS HEX to Primary SS HEX	1	1
429	Pipe - T-Elong to Outlet Water Connection	1	1
430	Water Valve	1	1
431	O-Ring - High Temp PS	1	1
432	Pipe - Elbow to Water Flow Sensor	1	1
433	Frame Protection Water - Rectangular	1	1
434	Frame Protection Water - Round Square	1	1
435	Water Connection - Reset (SET)	1	1
436	High Limit Switch - 104	1	1
437	Water Sensor - Main (SET)	1	1
438	High Voltage Igniter Wire L175	1	1
439	Igniter (SET)	1	1
440	Pipe - Secondary SS HEX to Primary SS HEX	1	1
441	Hot Water Connection - T-Elbow	1	1
442	O-Ring - High Temp PS	1	1
443	O-Ring - High Temp PS	1	1
444	O-Ring - High Temp PS	1	1
445	O-Ring - High Temp PS	1	1
446	O-Ring - High Temp PS	1	1
447	O-Ring - High Temp PS	1	1
448	O-Ring - High Temp PS	1	1
449	O-Ring - High Temp PS	1	1
450	O-Ring - High Temp PS	1	1
451	O-Ring - High Temp PS	1	1
452	O-Ring - High Temp PS	1	1
453	O-Ring - High Temp PS	1	1
454	O-Ring - High Temp PS	1	1
455	O-Ring - High Temp PS	1	1
456	O-Ring - High Temp PS	1	1
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464	O-Ring - High Temp PS	1	1
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468	O-Ring - High Temp PS	1	1
469	O-Ring - High Temp PS	1	1
470	O-Ring - High Temp PS	1	1
471	O-Ring - High Temp PS	1	1
472	O-Ring - High Temp PS	1	1
473	O-Ring - High Temp PS	1	1
474	O-Ring - High Temp PS	1	1
475	O-Ring - High Temp PS	1	1
476	O-Ring - High Temp PS	1	1
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481	O-Ring - High Temp PS	1	1
482	O-Ring - High Temp PS	1	1
483	O-Ring - High Temp PS	1	1
484	O-Ring - High Temp PS	1	1
485	O-Ring - High Temp PS	1	1
486	O-Ring - High Temp PS	1	1
487	O-Ring - High Temp PS	1	1
488	O-Ring - High Temp PS	1	1
489	O-Ring - High Temp PS	1	1
490	O-Ring - High Temp PS	1	1
491	O-Ring - High Temp PS	1	1
492	O-Ring - High Temp PS	1	1
493	O-Ring - High Temp PS	1	1
494	O-Ring - High Temp PS	1	1
495	O-Ring - High Temp PS	1	1
496	O-Ring - High Temp PS	1	1
497	O-Ring - High Temp PS	1	1
498	O-Ring - High Temp PS	1	1
499	O-Ring - High Temp PS	1	1
500	O-Ring - High Temp PS	1	1



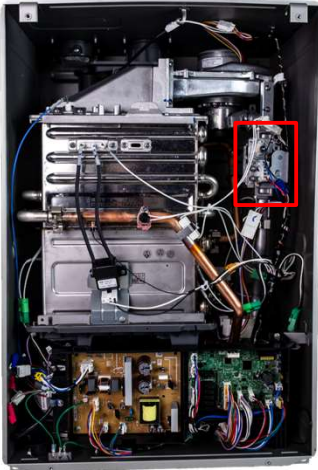
# CIRCUIT BOARD

Control center of the unit.



## 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.

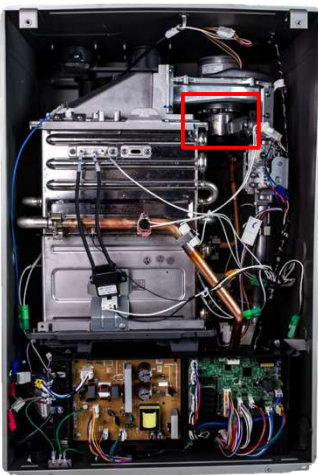


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## VENTURI

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

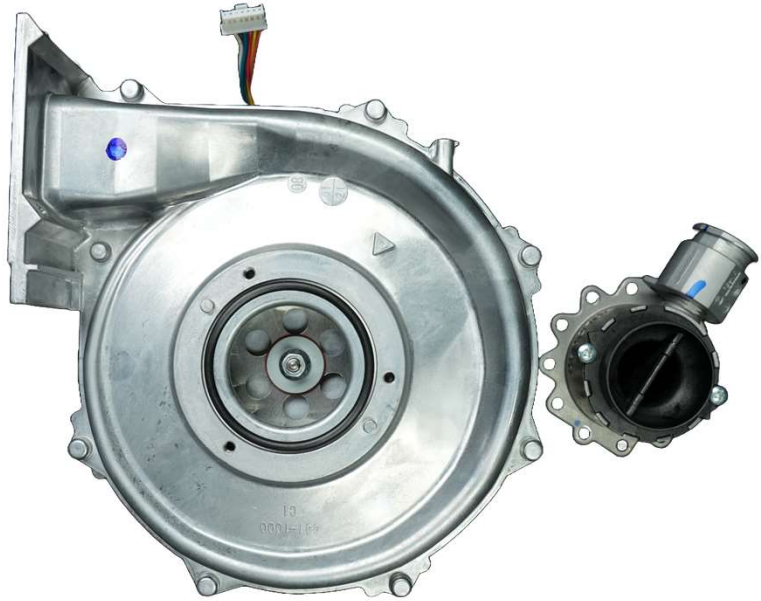
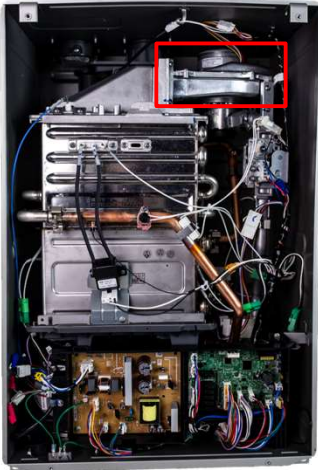


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## FAN MOTOR

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

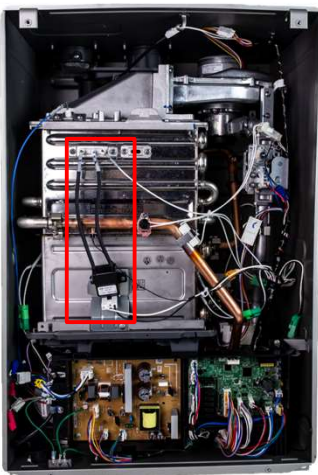


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## IGNITION SYSTEM

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

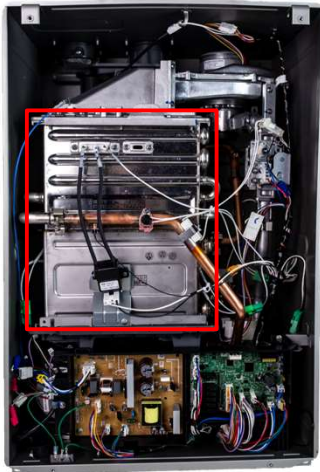


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# HEAT EXCHANGER ASSEMBLY

Transfers heat from the burner and exhaust into the water.



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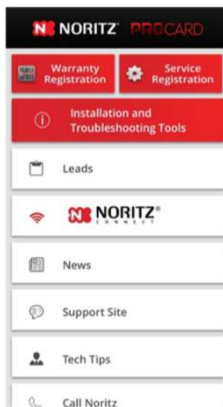
# PROCARD APP

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

ANDROID



APPLE



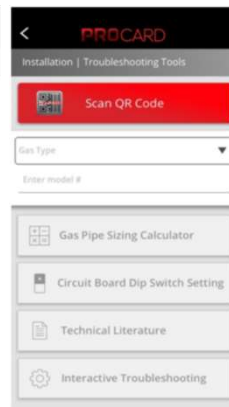
PROCard App



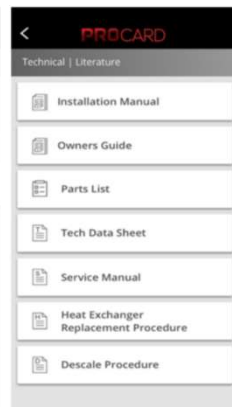
Warranty Registration



Service Registration



Troubleshooting



Manuals

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## **HELPFUL CONTACT INFO**

**866-7NORITZ (866-766-7489)**

- Monday – Friday: 5am to 6pm PST
- Saturday: 6am to 3pm PST



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## **THANK YOU**



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