

## RESIDENTIAL LEVEL 2

Maintenance and Troubleshooting



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## INTRODUCTION

We will cover the following topics:

- Descale Procedure
- Common Error codes and Maintenance Monitors
- 1/2" Gas Line Requirements
- PROCard App

TANKLESS WATER HEATERS





## **DESCALING/FLUSHING**

Water Q	uality Gui	delines i	n the Install	ation Manual should always be followed.
	Treatme	ent Guidelines	Damage to • Water in • Poor wat • The water exchange	the water heater as a result of the items below is not covered by the Noritz America Limited Warranty. excess of 12 gpg (200mg/L) of hardness er quality (See the Water Quality List on page 34.) heater has displayed a "C1# (Service Reminder)" indicating Scale Build-up, but the heat er has not been flushed.
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***	* When selecting a treatment device, you must consult with the device's speet and installation and the device's speet and
Very Hard	10-12 gpg (171-200 mg/L)	ScaleShield or Water Softener	Once a Year***	Not all water supplies are compatible - a water test may be required.
Extremely Hard	> 12 gpg (> 200 mg/L)	ScaleShield or Water Softener	Once a Year***	<ul> <li>*** Flushing is required if a water treatment device is not installed.</li> </ul>

## TANKLESS WATER HEATERS



## **DESCALING/FLUSHING**

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













COMM	ON ERROR CODES	
Error Code	Description	
11	Ignition Failure (Failure to detect flame)	
12	Flame Loss	
14	Thermal Fuse Failure	
16	Abnormally High Outlet temp	
20	High Limit Switch	
29	Condensate Collector Water Level 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	



## **11 ERROR CODE**

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





## 14, 16, 20 ERROR CODES

**14 Error Code: Thermal Fuse Failure** 

16 Error Code: Abnormally High Output Temp

20 Error Code: High Limit Switch



Do not pitch the drain line up



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## **29 ERROR CODE**

29 Error Code: Condensate Collector Water Level Abnormality

Line should be no smaller than 1/2" and should be as short and direct as possible with no flat horizontal runs. If they must run horizontal, make sure the pipe is sloped downward away from the unit.





## 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.

### F76 Error Code: Multi System Communication Error

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



## **90 ERROR CODE**

### 90 Error Code: Combustion Abnormality

2 Main causes: Unit is not hitting set temp and/or fan speed is overcorrecting.





## 90 ERROR CODE

90 Error Code: Combustion Abnormality

Use the PROCard App to verify correct dipswitch settings.

< PROCARD	< PROCARD	< PROCARD	< PROCARD	
Installation   Troubleshooting Tools	Circuit Board   Dipswitch Settings	Circuit Board   Dipswitch Settings	Circuit Board Dipswitch Setting	<u>- (62) (5 - 55)</u>
Scan QR Code	Common Vent System for up to 2 units?	NO	OFF	
	Vent Type?	SV (Single Vent - PVC)	8	Google play
NG	Elevation (feet)	2001-4000	7	Coogle play
EZ98DV (GQ-C2859WX-FF US)	Vent Size?	2" PVC or CPVC	6	
	Total Vent Length (feet)	15	5	in cause
$\stackrel{+}{ \times =}$ Gas Pipe Sizing Calculator	# of 90 degree elbows (2x45= 1x90 elbow)	3	4	
Circuit Board Dip Switch Setting			3	- Maraka
Technical Literature				
Interactive Troubleshooting	Submit	Submit		Download on the
	Submit	Jubinit		App Store
TANKLESS WATER HEATERS				

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# COMMON MAINTENANCE MONITORS





## 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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## **INLET WATER TEMP**

While this MM might not be as widely used as the other 4 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** 







TANKLESS WATER HEATERS

## **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.

Some common complaints that you can use MM31 to troubleshoot:

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 unit's 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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## HEX 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 and MM49).

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.



## **FAN SPEED**

This Maintenance Monitor is used most commonly when troubleshooting an EC90.

Normally under all conditions MM49 would show 100 meaning the fan is operating at 100% based on the conditions. If MM49 shows anything above 100 then it means there is something restricting the air flow in to the unit or the exhaust flow out of the unit.



TANKLESS WATER HEATERS

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It's always best to look at MM49 with the cover ON as that's how the unit would be operated normally. If you watch MM49 with the cover OFF and it's at 100, you might assume there is no problem.

You should always try to troubleshoot the problem in a way that closely matches how and when the customer has the problem (cover ON and using the fixture the customer uses when they have a problem). NORITZ

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## **MM DEMONSTRATION**

Let's see what a healthy heater looks like when you check out the maintenance monitors we just reviewed.



## <sup>1</sup>/<sub>2</sub>" GAS LINE DETAILS

### Under certain specific conditions, a $\frac{1}{2}$ " 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]

Dino					l	ength	(including	fittings	)								
Pipe	10'	20'	3	0'	40'	50'	60'	70'	8	80'	90'	100	)' <mark>1</mark>	25'			
Size	(3m)	(6m)	(9	m) (	12m)	15m)	(18m)	(21m)	(2	4m)	(27m)	(30n	n) (3	8m)			
3/4"	360	247		199	170	151	137	126	5	117	110	1	04	92			
1"	678	466		374	320	284	257	237	7	220	207	1	95	173			
1 1/4"	1,390	957		768	657	583	528	486	5	452	424	4	00	355			
1 1/2"	2,090	1,430	1,	150	985	873	791	728	3	677	635	6	00	532			
2"	4,020	2,760	2	Table 3	2 For 8"	WC -	10.5" W	C initia	sun	nly nre	ssure			~ ~ ~			
2 1/2"	6,400	4,400	3	Maximu	m Natura	Gas De	elivery Ca	pacity (	3 0" Pr	essure [	Dron) [S	Schedu	ule 40 M	letallic Pir	el		
3"	11,300	7,780	6		linitatara	Out De	invery ou			Lengt	h (inclue	ding fit	tinge)	iotanio i ip			
4"	23,100	15,900	12	Pipe	10'	20'	30		0'	50'	60'		70'	80'	00'	100'	125'
				Size	(3m)	(6m	) (9n	1) (1	2m)	(15m)	(18m	$\frac{1}{2}$	(21m)	(24m)	(27m)	(30m)	(38m)
				1/2"	(511)		12 2	250	214	100		72	158	147	138	131	116
				3/4"	940		52 6	524	448	307	7 3	60	331	308	289	273	242
				1"	1 78	12	28 0	086	844	748	3 6	78	624	580	544	514	456
				1 1/4'	3,669	25	$\frac{20}{22}$ 20	25 1	733	1 536	3 13	92	1 280	1 191	1 118	1 056	936
				1 1/2'	5.49	37	78 30	34 2	597	2 302	2 20	85	1 919	1 785	1.675	1,582	1 402
				2"	10.58	3 7.2	77 5.8	344 5	.001	4,433	3 4.0	16	3.695	3,437	3,225	3.046	2,700
				2 1/2'	16.87	5 11.5	98 9.3	314 7	971	7.065	5 6.4	01	5,889	5,479	5,140	4,856	4,303
		<b>[7</b> °		3"	29.83	2 20.5	03 16.4	65 14	.092	12.489	11.3	16 1	10.411	9.685	9.087	8.584	7.608
TANKLESS V	NATER HEA	TERS		4"	43678	30,0	20 24,1	107 20	,632	18,286	6 16,5	69 1	15,243	14,181	13,305	12,568	11,139

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## PROCARD APP

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





NORITZ PROCARD	< PROCARD	< PROCARD	< PROCARD	< PROCARD
Warranty 🚓 Service	Warranty Registration	Service Registration	Installation   Troubleshooting Tools	Technical   Literature
Registration Registration	Noritz heater information	Noritz heater information	Scap OB Code	Installation Manual
(i) Installation and Troubleshooting Tools	Model*	Scan QR Code	Stan OK Code	
	Gas Type*	Model*	Gas Type 🔻	Owners Guide
🗂 Leads	Serial Number*	Gas Type*	Enter model #	Parts List
	Installation Branch*	Serial Number*	The Case Direc Sining Calculator	Tech Data Sheet
News	Installation Date*	Home owner information First Name*		
	Installation Type*	Last Name*	Circuit Board Dip Switch Setting	Service Manual
Support Site	▼	Address*	Technical Literature	Heat Exchanger Replacement Procedure
L Tech Tips	Purchase Date*	City*		Descale Procedure
Call Noritz	Home owner information	Zip* State*	() Interactive Troubleshooting	
PROCard App	Warranty	Service	Troubleshooting	Manuals

## **HELPFUL CONTACT INFO**

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

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











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## NOTES



