



## THREE-PHASE THERMOSTATIC DE-IONIZED WATER HEATER

**MODELS : EX320TDI, EX240TDI, EX180TDI.**  
**(480/277 Volts only)**

### INSTALLATION GUIDE AND OWNERS MANUAL

#### **WARNING**

BEFORE ATTEMPTING THE INSTALLATION OF THE UNIT OR MAKING ANY ADJUSTMENTS TO THIS UNIT, ALWAYS BE SURE THAT THE MAIN CIRCUIT BREAKER IS "OFF" TO PREVENT THE DANGER OF SERIOUS ELECTRIC SHOCK.

FAILURE TO GROUND THE SYSTEM MAY RESULT IN DEATH OR SERIOUS INJURY.

BEFORE SWITCHING "ON" THE POWER AT THE MAIN CIRCUIT BREAKER PANEL, MAKE SURE THAT THE HOT WATER CIRCUIT IS FREE OF AIR POCKETS OR PREMATURE FAILURE OF THE ELEMENT WILL OCCUR.

#### **INSTALLER / CONSUMER RESPONSIBILITIES**

PLEASE TAKE THE TIME TO READ NOT ONLY THIS MANUAL BUT ALSO THE WARRANTY CARD ENCLOSED. WARRANTY OF THIS WATER HEATER WILL DEPEND ON CORRECT INSTALLATION AND OPERATION. . THE WARRANTY SHALL BE VOID IF THE DESIGN OR STRUCTURE OF THE WATER HEATER HAS BEEN ALTERED IN ANY WAY WHATSOEVER. THE MANUFACTURER OF THIS WATER HEATER WILL NOT BE LIABLE FOR ANY DAMAGES DUE TO FAILURE TO COMPLY WITH THE INSTALLATION AND OPERATING INSTRUCTIONS OUTLINED ON THE FOLLOWING PAGES.

IF YOU REQUIRE ANY HELP OR HAVE ANY QUESTIONS RELATING TO THE INSTALLATION OR PERFORMANCE OF THIS HEATER, PLEASE CALL OUR TECHNICAL SERVICE DEPARTMENT TOLL-FREE AT:

1-800-543-6163

## GENERAL

The Eemax "Three Phase Thermostatic DI" water heater is specifically designed to take in cold or pre-heated De-ionized water and heat it to temperatures suitable for commercial washing, sluicing or processing up to a maximum temperature of 180 F (82 deg. C). To obtain optimum performance and energy savings, the unit should be located as near as possible to the point of use. The unit must only be installed in a vertical position with the inlet and outlet at the bottom. The power is activated by individual electronic flow switches located in each of the three heating modules. These will be damaged by excessive heat, do not solder any pipes that are in contact with the heater.

Also ensure pipes are clear of installation debris before fitting the heater, otherwise the flow switches could jam in the "on" position. The unit must be connected to its own individual electric circuit protected by a suitably rated four pole breaker. The maximum voltage which can be applied across any heating module is 277 volts.

### WARNING

Improper installation, adjustment, alteration, service or maintenance can cause DEATH, SERIOUS BODILY INJURY OR PROPERTY DAMAGE. Refer to this manual for assistance or consult the local electric utility for further information.

The unit is supplied with compression pipe fittings suitable for direct coupling to standard 1/2 " piping. There is no need for additional screwed fittings.

### WARNING

Failure to ground the system may result in death or serious injury.

## MOUNTING THE UNIT

- 1) The unit should be mounted as close to the point of use as possible.
- 2) This unit must only be mounted in the vertical position with the water fittings located at the bottom of the unit. Mounting other than in the vertical position WILL cause element burn out.
- 3) The cold water inlet is on the right hand side and the hot water outlet is on the left hand side. Under NO circumstances can these be reversed.
- 4) Leave a minimum of 8" above the unit for easy replacement of the elements.
- 5) The heater should be fixed to the wall using screws in the four mounting holes at each corner of the backplate.
- 6) The unit should be installed in the plumbing system in such a way that there is no tendency for the unit to be starved of water: for example: by an excessive draw-off of cold water just before the unit. Also do not fit an unrestricted hot water draw-off point below the heater as this will tend to empty the heater by siphoning.

### NOTE

ALL MOUNTING AND PLUMBING MUST BE COMPLETE BEFORE YOU PROCEED WITH ELECTRICAL HOOK-UP.

TEST THE INSTALLATION FOR LEAKS BEFORE CONNECTING THE ELECTRICAL SUPPLY.

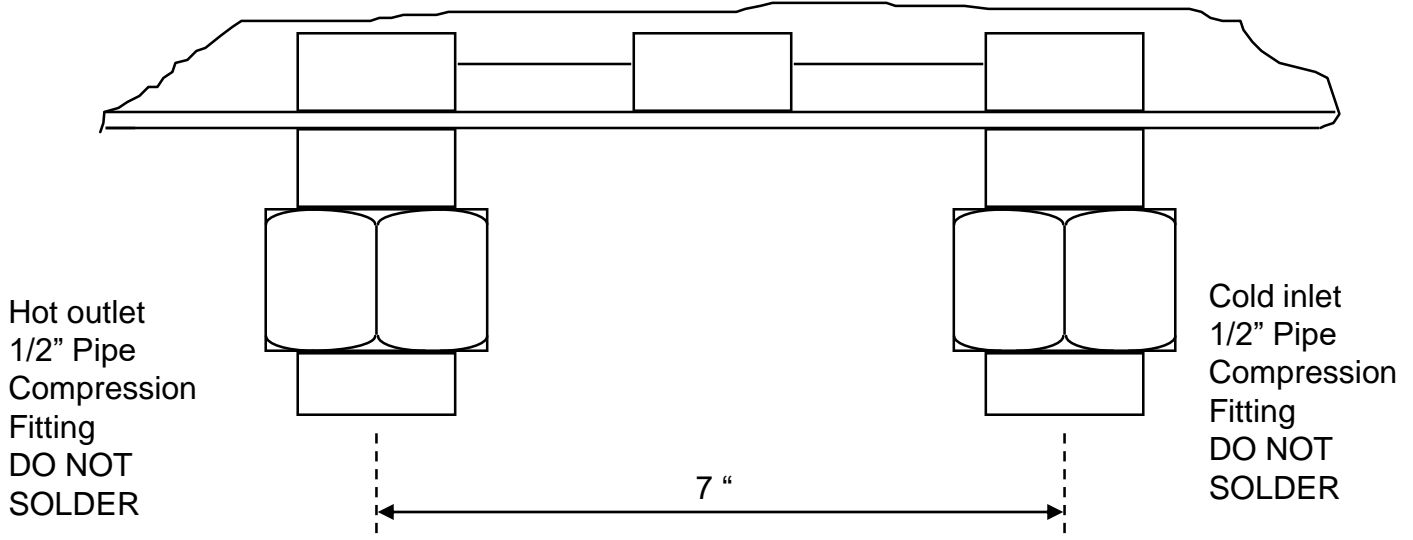
# PLUMBING HOOK-UP

- 1) The unit is supplied with compression fittings for 1/2" pipe, USE THESE; DO NOT SOLDER PIPE TO THE INLET OR OUTLET.
- 2) Take care to ensure that the pipes are correctly aligned with the inlet and outlet bosses in order to avoid excessive stress on the heater body molding.

NOTE: When soldering pipe joints remove heater from the system. Serious damage can occur if any soldering is done while pipes are connected to the heater.

Run water through the supply pipe to remove all debris from the pipe before connecting the heater. Failure to do so could cause damage to the flow switch.

- 3) Install isolating valves (full flow ball valve type) on both inlet and outlet pipes. This allows unit to be isolated for maintenance purposes. (see Fig. 1)
- 4) When all plumbing is complete, fully check the system for water leaks at all plumbing connections. If leak is present take corrective action. Fully open both inlet and outlet ball valves.  
Run all hot water outlets fed by this heater one at a time for a minute or two until the water flow is continuous, free from "gulping" and from all visible air pockets.



## NOTE

ALL MOUNTING AND PLUMBING MUST BE COMPLETE BEFORE YOU PROCEED WITH ELECTRICAL HOOK-UP.

TEST THE INSTALLATION FOR LEAKS BEFORE CONNECTING THE ELECTRICAL SUPPLY.

# ELECTRICAL HOOK-UP

## WARNING

HAZARD OF ELECTRICAL SHOCK! BEFORE BEGINNING ANY WORK ON THE INSTALLATION, MAKE SURE THE ELECTRICAL SUPPLY TO THE HEATER IS TURNED “OFF”. FAILURE TO DO THIS COULD RESULT IN DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.

## WARNING

WATER HEATERS EQUIPPED FOR ONE VOLTAGE ONLY: CHECK THE RATING PLATE ON THE FRONT OF THE UNIT. DO NOT USE THIS WATER HEATER WITH ANY VOLTAGE OTHER THAN THE ONE SHOWN ON THE MODEL RATING PLATE. FAILURE TO DO SO CAN RESULT IN DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE. IF YOU HAVE ANY QUESTIONS OR DOUBTS CONSULT YOUR ELECTRIC COMPANY.

This heater must have its own independent circuit using five wires; three live, neutral and one ground, of the appropriate rating protected by the correctly rated three pole breaker.

## RATINGS OF THREE PHASE MODELS

MODEL	kW RATING	VOLTAGE	CURRENT PER PHASE	TEMPERATURE RISE °F					RECOMMENDED WIRE SIZE
				1.5 GPM	2.0 GPM	2.5 GPM	3.0 GPM	3.5 GPM	
EX 180 T3 AWG	18 kW	480/277 V	21.7 A/PHASE	82°	61°	49°	41°	35°	10
EX 240 T3	24 kW	480/277 V	28.9 A/PHASE	-	82°	65°	54°	47°	10 AWG
EX 320 T3	32 kW	480/277 V	38.5 A/PHASE	-	-	87°	73°	62°	8 AWG

## DANGER

FAILURE TO GROUND THE SYSTEM MAY RESULT IN DEATH OR SERIOUS INJURY

## IMPORTANT

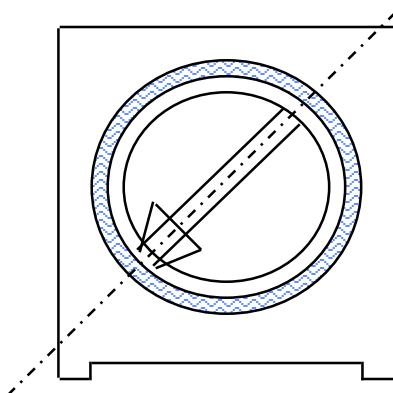
BEFORE SWITCHING “ON” THE POWER AT THE MAIN CIRCUIT BREAKER PANEL MAKE SURE THAT THE HOT WATER CIRCUIT IS FREE OF AIR POCKETS OR PREMATURE FAILURE OF THE ELEMENT WILL OCCUR. TO DO THIS OPEN ALL HOT WATER OUTLETS ONE AT A TIME FOR A MINUTE OR TWO UNTIL THE WATER FLOW IS CONTINUOUS AND FREE FROM “GULPING” AND FROM VISIBLE AIR POCKETS.

# COMMISSIONING YOUR HEATER

## IMPORTANT

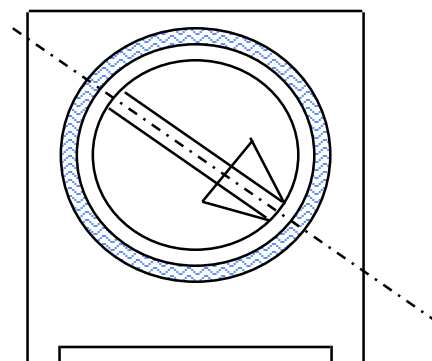
Before switching “on” the power at the main circuit breaker panel make sure that the hot water circuit is free of air pockets or premature failure of the heating element will occur. To do this open all hot water faucets one at a time for a minute or two until the water flow is continuous and free from “gulping” and from visible air pockets.

- 1) With inlet and outlet BALL VALVES fully open, turn on a hot water outlet.
- 2) Run for 1 minute.
- 3) Switch on electric supply at circuit breaker panel.
- 4) The power indicator light should now come on (see Fig. 1), pulsing at first. Allow 40 seconds for the lights to stay full on, the heater is now operating at full power.  
NOTE: At this point water temperature may not be hot.
- 5) Using the OUTLET BALL VALVE slowly reduce water flow until desired temperature is achieved at hot water outlet.  
NOTE: The water temperature is regulated by the flow through the heater. The lower the flow the higher the temperature and vice versa.



MINIMUM SETTING

THE TEMPERATURE CONTROLLING POTENTIOMETER IS A PRECISION COMPONENT. ADJUST GENTLY AND DO NOT TURN BEYOND THE MIN. AND MAX. STOP POINTS



MAXIMUM SETTING

- 6) Now turn the temperature adjustment screw on the first module counter clockwise about 1/8 of a turn, wait for 10-15 seconds and see if the indicator light begins to pulse. If it does not, turn another 1/8 of a turn, wait and again see if the lamp begins to pulse. Repeat until the light is pulsing regularly which indicates that the temperature has stabilized at the set temperature. Repeat with modules two and three. Check that the outlet temperature is at

the desired temperature and that all three elements are pulsing equally. The thermostats are now set and the water temperature will always be the same when the lights are pulsing.

- 7) Check performance of flow switch by opening and closing the faucet of the outlet valve a few times.

THE POWER INDICATOR LIGHT SHOULD ONLY BE ON WHEN WATER IS FLOWING THROUGH THE UNIT. For expected temperature rise at various rates of flow see chart

- 8) It is possible that drawing off cold water at comparatively high rates of flow elsewhere in the building at the same time that the heater is working, could cause premature element failure. Care should be taken not to starve the unit of cold water. To prevent this from happening, open fully the main valve on the cold supply to the building and throttle back the control valves to the other cold water outlets.

# TROUBLESHOOTING

## **SYMPTOM: NO HEAT INDICATOR LIGHT OFF**

### 1) ELECTRIC SUPPLY IS OFF

Turn on the main circuit breaker.

### 2) NO OR LOW WATER FLOW

Ensure that the minimum flow rate to switch on your heater is met, for this figure refer to the front cover of this manual.

Also check that the inlet filter screen is clear from any debris.

### 3) WATER CONNECTIONS ARE REVERSED

Cold water inlet = right side, hot water outlet = left side.

### 4) ELEMENT BURNED OUT

#### **TURN OFF THE MAIN BREAKER!**

Using an ohmmeter test the resistance of the heating element across the two threaded termination rods on top of the element.

See the front cover of this manual for the correct value.

If the resistance is much greater than the correct value, call your supplier for a replacement element.

## **SYMPTOM: NO HEAT OR LOW TEMPERATURE WITH INDICATOR LIGHT ON**

### 1) WATER FLOW TOO HIGH

Reduce the water flow by using an outlet ball valve. See page 5 for temperature rise at various flow rates.

### 2) INCORRECT POWER SUPPLY

Make sure that the unit is connected to the voltage supply specified on the rating label on the the front cover of the unit and no other.

### 3) ELEMENT BURNED OUT

#### **TURN OFF THE MAIN BREAKER!**

Repeat the steps from paragraph 4 above.

### 4) THERMOSTAT ADJUSTMENT SCREW NOT TURNED UP

Turn the thermostat adjustment screw clockwise in small increments until the indicator light remains on. Take care not to force the screw past it's stop position.



# REPLACEMENT PARTS DIAGRAM

## HEATER CORE ASSEMBLY

FOR EX180 T3 DI PART# EX1280 DI

FOR EX240 T3 DI PART# EX960 DI

FOR EX320 T3 DI PART# EX720 DI

