



THREE PHASE THERMOSTATIC
ELECTRIC INSTANTANEOUS WATER HEATER
MODELS: EX480T12, EX720T12, EX960T12,
EX1080T12, EX1260T12 480Y/277V, 3Ø4W
INSTALLATION GUIDE AND OWNERS MANUAL

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

INSTALLER/ CONSUMER RESPONSIBILITIES

PLEASE TAKE THE TIME TO READ NOT ONLY THIS MANUAL BUT ALSO THE
WARRANTY CARD ENCLOSED. WARRANTY OF THIS HEATER WILL DEPEND ON PROPER
INSTALLATION, OPERATION, AND REQUIRED MAINTENANCE. THE WARRANTY SHALL BE
VOID IF THE DESIGN ORSTRUCTURE OF THE WATER HEATER HAS BEEN ALTERED IN
ANY WAY WHATSOEVER. THE MANUFACTURER OF THIS WATER HEATER WILL NOT BE
LIABLE FOR ANY DAMAGES BECAUSE OF 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:

1-800-543-6163

HAVE THE INFORMATION LISTED BELOW BEFORE BEFORE CALLING.

MODEL :	ELEMENT RESISTANCE:	OHMS
SERIAL NO :	SWITCH ON FLOW RATE:	GPM
INSTALLATION DATE :	OPERATING TEMPERATURE MIN MAX	

GENERAL SAFETY

The Eemax “Three Phase Thermostatic” water heater is specifically designed to take in cold or pre-heated 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 twelve 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 three 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 1-1/4” NPT pipe connections. Under no circumstances use a blow torch on pipe which is connected to the heater (serious damage to the electronic flow switch will result). Carefully use Teflon tape, ensuring no debris enter the heater. **Do not use pipe dope.**

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 all six mounting holes of the backplate. Unit weight is approximately 70 lbs.. Use an appropriate fastener for this weight. For the unit to be mounted against hollow walls, suggest using steel wall anchors, with the correct grip range and #6-32 screw size minimum.
- 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.

Hazardous Locations - Nonincendive Type Installation

- 1) The unit is mounted in an approved NEMA4 Enclosure.
- 2) Non-incindive for Class I, Division 2, Groups A, B, C&D. Temperature class: T5 (212 °F)
- 3) As to installation, refer to the National Electrical Code and NFPA 70. For locations C1, Div.2 refer to section 501-4 (wiring methods) and 501-10 (utilization equipment) respectively.

Note: If ignition atmosphere is <T5 class, or if other classifications are required, another method of compliance would be "Purged and Pressurized". This is the process of supplying an enclosure with a protective gas at a sufficient flow and positive pressure to reduce the concentration of any flammable gas or vapor initially present to an acceptable level. For further information, see ANSI/NFPA 496-1998, Purged and Pressurized Enclosures for Electrical Equipment.

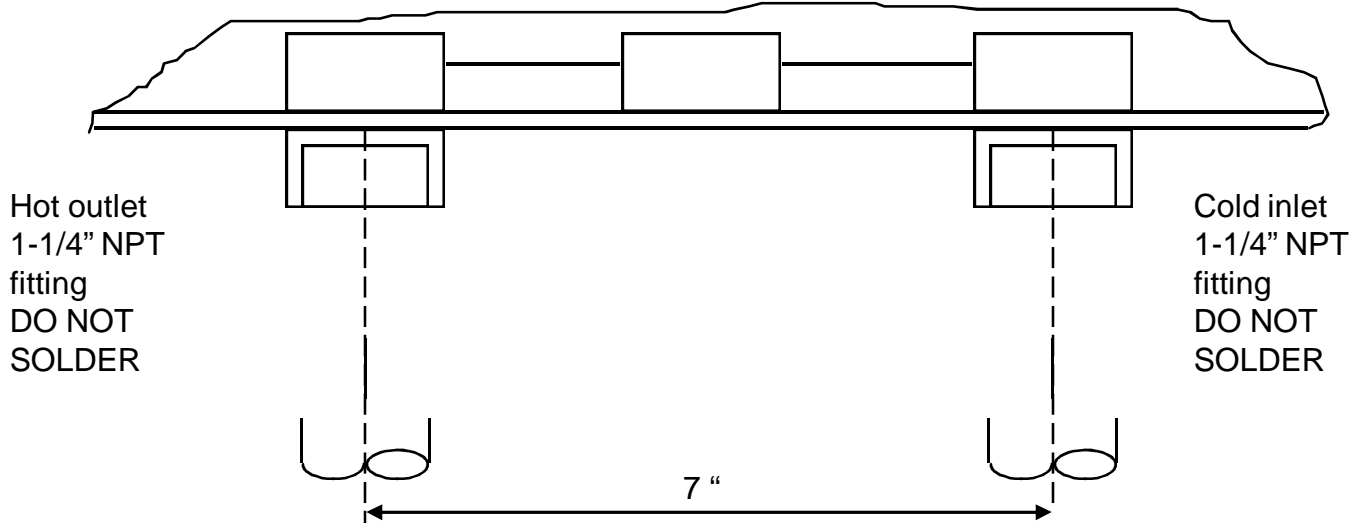
PLUMBING HOOK-UP

- 1) The unit is supplied with NPT fittings., USE THESE; DO NOT USE PIPE DOPE AND 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 wall. 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. 1A)
- 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.



MINIMUM - 8" CLEARANCE ABOVE UNIT

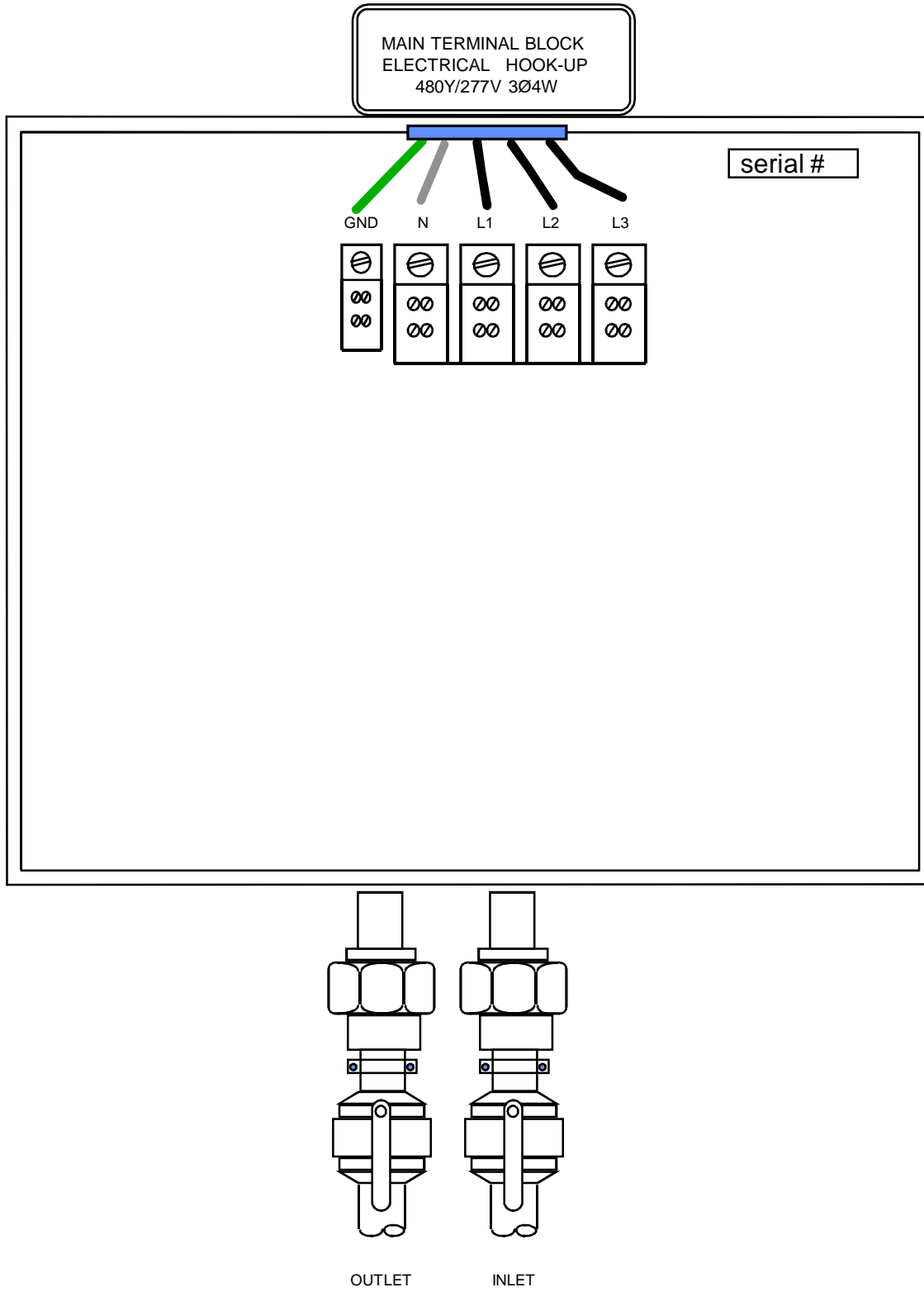


Figure 1A

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, one neutral and one ground of the appropriate rating protected by the correctly rated three pole breaker

RATINGS OF "EX" THREE PHASE MODELS

MODEL	MAX. OUTPUT 480Y/277V 3Ø4W	CURRENT PER PHASE	TEMPERATURE RISE (F)					
			7.5gpm	10gpm	12.5gpm	15gpm	17.5gpm	20gpm
EX 1260	126 KW	156	----	86	69	57	49	43
EX1080	108 KW	130	98	74	59	49	42	37
EX 960	96 KW	116	87	66	52	44	37	33
EX 720	72 KW	87	66	49	39	33	28	25
EX 480	48 KW	58	44	33	26	22	19	16

THIS UNIT MUST NOT BE CONNECTED IN DELTA CONFIGURATION

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

Volts	Module	MODEL NUMBER	L1, L2, L3, N (AWG/kcmil)	(AWG) Min ground wire size 75C/CU	Nominal Knockout Diameter inches	Total KW	Total Amps per Phase	1.25 load amps calculation	Main Fuse Protection
480Y/277V	4.0	EX480T12	3	8	1-31/32	48	58	73	80
	6.0	EX720T12	1/0	6	2-15/32	72	87	109	110
	8.0	EX960T12	3/0	6	2-15/32	96	116	145	150
	9.0	EX1080T12	4/0	6	3	108	130	163	175
	10.5	EX1260T12	250	6	3-5/8	126	156	195	200

IMPORTANT

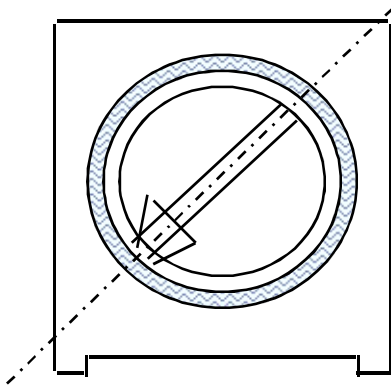
BEFORE SWITCHING "ON" THE POWER AT THE MAIN CIRCUIT BREAKER PANEL MAKE SURE THAT THE HOT WATER CIRCUIT IS FREE OF AIR POCKETS OR PREMATURE FAILURE OF THE ELEMENT WILL OCCUR. TO DO THIS OPEN ALL HOT WATER OUTLETS ONE AT A TIME FOR A MINUTE OR TWO UNTIL THE WATER FLOW IS CONTINUOUS AND FREE FROM "GULPING"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

COMMISSIONING YOUR HEATER

IMPORTANT

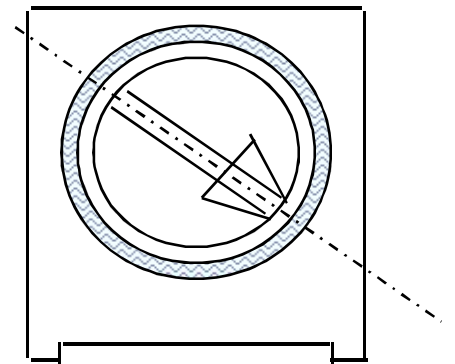
Before switching “on” the power at the main circuit breaker panel make sure that the hot water circuit is free of air pockets or premature failure of the heating element will occur. To do this open all hot water faucets one at a time for a minute or two until the water flow is continuous and free from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

the desired temperature and that all twelve 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.
- 9) Do not operate heater if there is a possibility that the water in the heater is frozen. Element module housing failure could occur.

TROUBLESHOOTING

SYMPTOM “A”: NO HEAT INDICATOR LIGHT OFF

1)ELECTRIC SUPPLY IS OFF

Turn on the main circuit breaker, 3 pole.

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. This is located in the brass inlet boss

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, also located on page 12. If the resistance is much greater than this value, call your supplier or Eemax for a replacement element.

5) ECO TRIPPED (High Limit Thermostat)

TURN OFF MAIN CIRCUIT BREAKER!

Reset by pushing in red button on each heater module (140 deg f units only).

SYMPTOM “B”: 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 6 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.

5) ECO TRIPPED (High Limit Thermostat)

TURN OFF MAIN CIRCUIT BREAKER!

Reset by pushing in red button on each heater module (140 deg f units only).

REQUIRED MAINTENANCE PROCEDURE

To Be Performed by Qualified Personnel

MONTHLY CHECKS

- M1) Ensure main circuit breaker is on.
- M2) Open outlet valve(s) to run water thru unit. Ensure that the minimum flow rate to switch on your heater is met, for this figure refer to the front cover of this manual.
- M3) Check outlet temperature for desired setting.

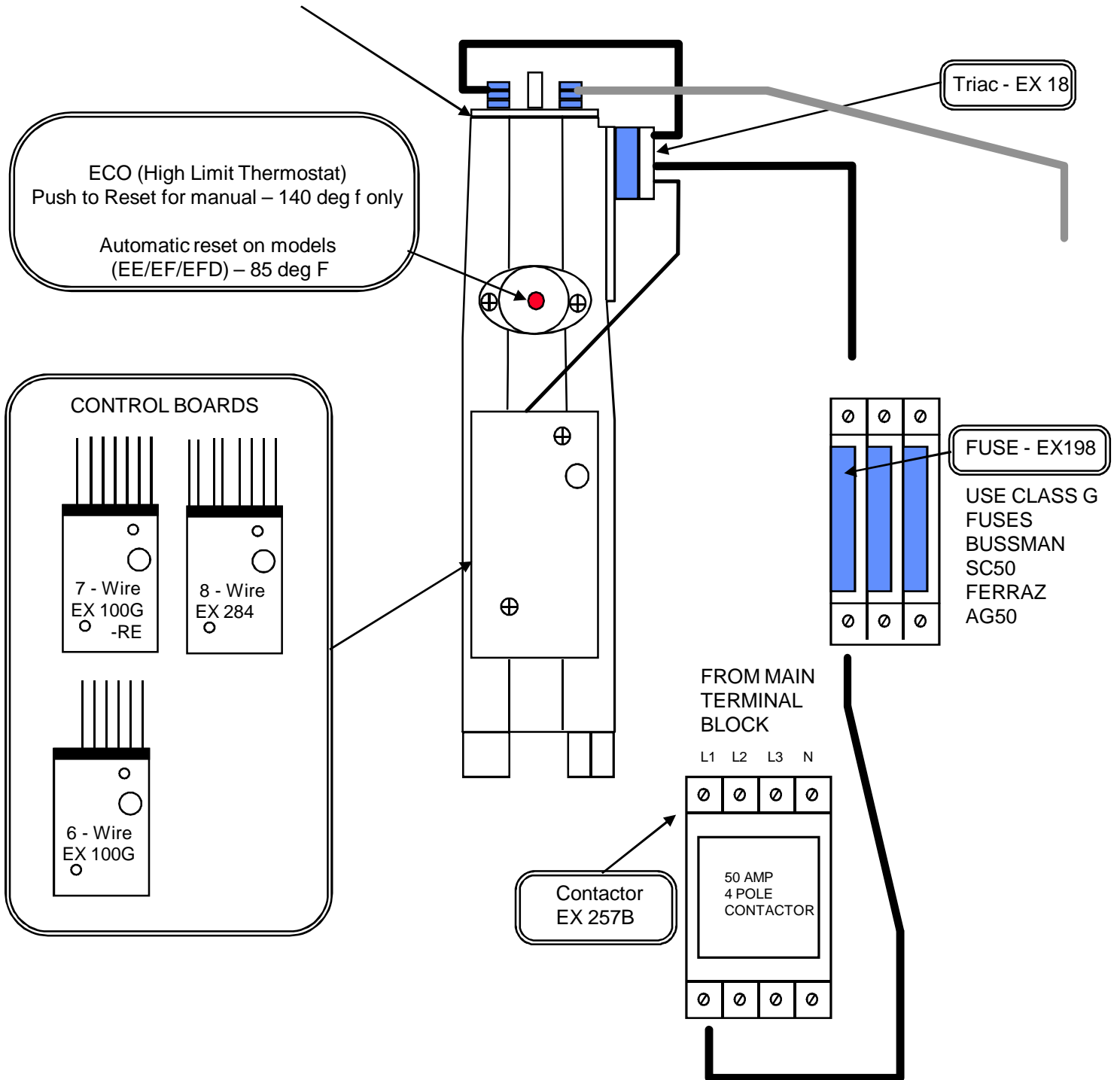
QUARTERLY CHECKS

- Q1) Turn off main circuit breaker.
- Q2) Remove front cover from heater.
- Q3) Inspection of heater bodies and distribution manifold for water leaks.
- Q4) Inspection of 12 fuses (50 amp each) Class G
Example: Eemax p/n EX198, Ferraz AG50 or Bussman SC50
- Q5) Inspection of 12 heater elements (see page 10 for element ohms)
- Q5) Inspection of coarse inlet filter screen is clear from any debris.
- Q6) Turn on main circuit breaker (***note: unit has live electrical***)
- Q7) Carefully perform steps M1 thru M3 with cover removed, observe each module for an indicator light.
- Q8) Turn off circuit breaker
- Q9) Install front cover, then turn on main circuit breaker.

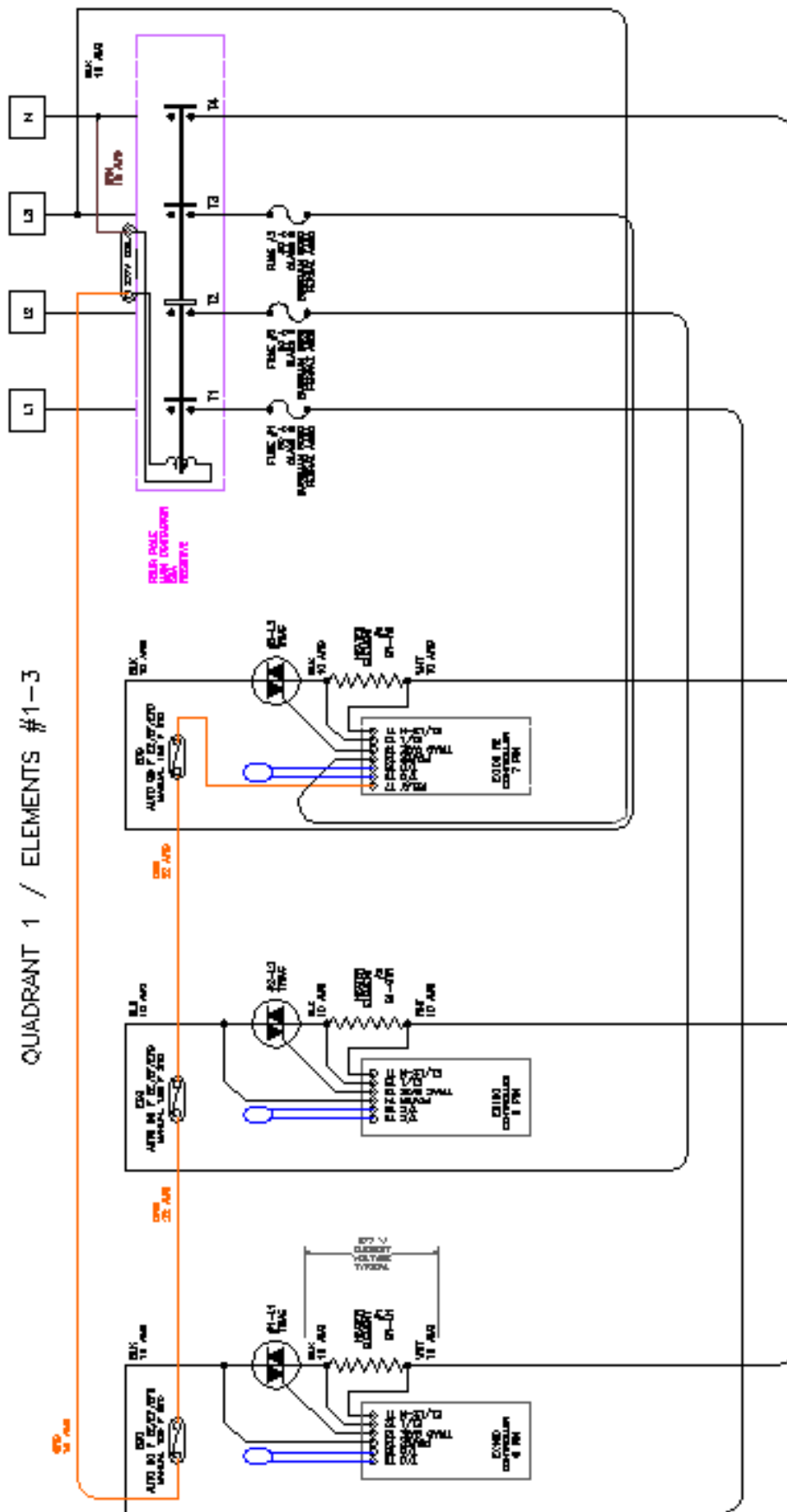
EEMAX REPLACEMENT PARTS DIAGRAM

HEATER CORE ASSEMBLY (PLEASE SPECIFY 277 VOLTS ON ANY ORDERS)

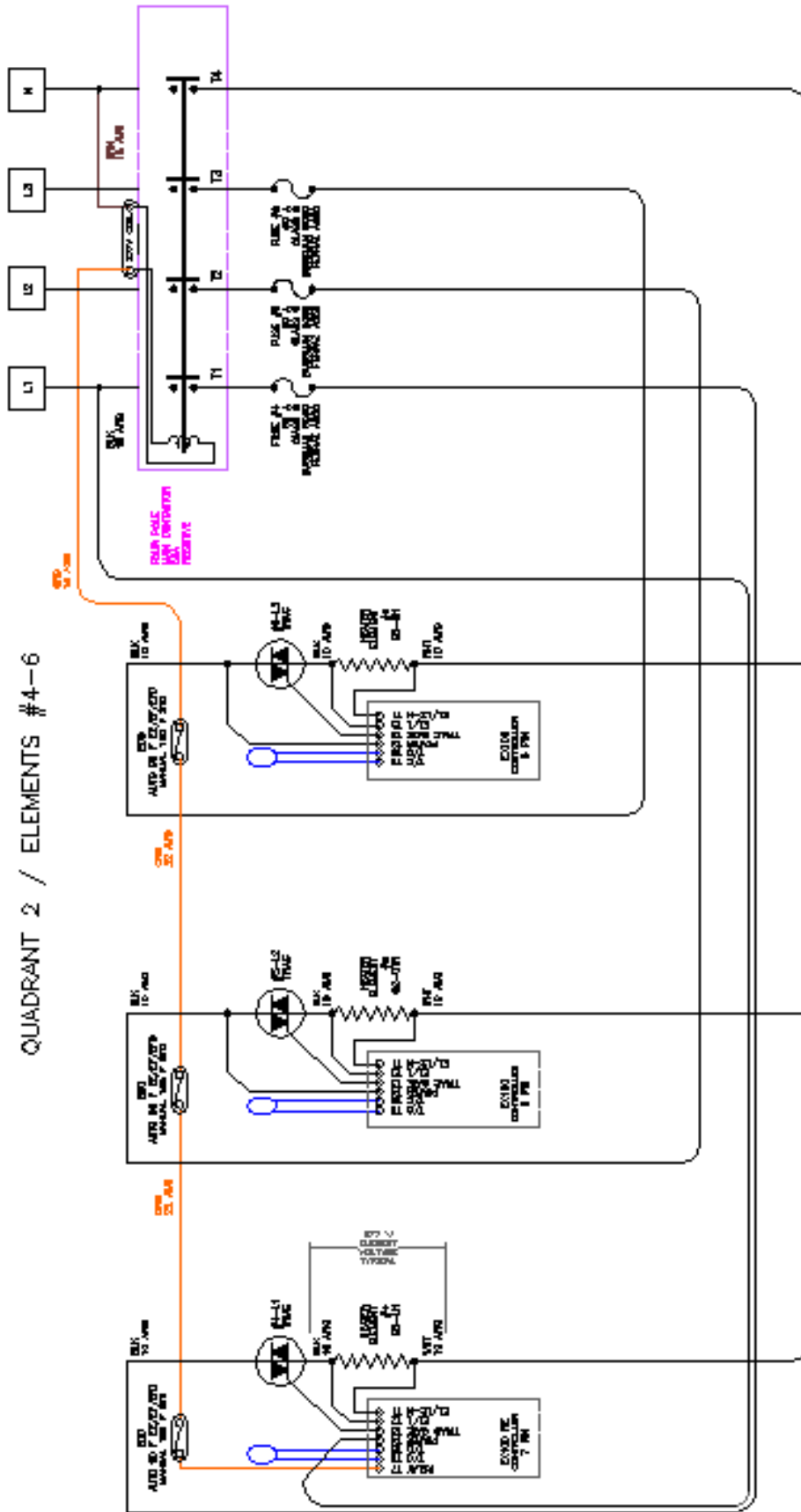
FOR EX480 T12	PART# EX1920	19.2 Ohms
FOR EX720 T12	PART# EX1280	12.8 Ohms
FOR EX960 T12	PART# EX960	9.6 Ohms
FOR EX1080 T12	PART# EX850	8.5 Ohms
FOR EX1260 T12	PART# EX730	7.3 Ohms



QUADRANT 1 / ELEMENTS #1-3



QUADRANT 2 / ELEMENTS #4-6



QUADRANT 3 / ELEMENTS #7-9

