# *THERMO-DYNAMICS*
# Electric Boiler


## A Compact, Versatile, Easy-to-Use Heat Source for Forced Hot Water Systems

## Installation and Maintenance Manual

**Thermo-Dynamics Boiler Company**

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# Thermo-Dynamics TDE Electric Boiler

The Thermo-Dynamics TDE Electric Boiler is compact, clean, quite, and does not require a storage facility or chimney allowing convenient installation near the point of use. The TDE electric boiler provides an energy efficient supply of warm and comfortable heat, and is built to Thermo-Dynamics quality standards – the highest in the heating industry.

This electric boiler is versatile and provides an easy-to-use heat source for forced hot water systems in:

- new homes
- replacement systems in existing homes
- back-up units for solar heating systems
- supplemental heating systems for the heat pump.

### *A Word About Supplemental Heat for the Heat Pump*

If you live in the great northeast, or in a region of the country where temperatures regularly fall below 40°F in the winter, the heat pump will run almost constantly to heat the home. When the temperatures fall below 32°F, most heat pumps literally shut down and the resistance heat comes on to provide back-up.

To extend the life of the very expensive heat pump unit, the electric boiler provides supplemental heat allowing the heat pump to "rest."

When heat is called for when the temperature drops below 32°F, the air in the heat pump system is below body temperature and therefore feels cool. The electric boiler can provide a heat source that is warm and comfortable to the touch.

## CLEAN.

The TDE heating system eliminates the need for fuel storage facilities and chimneys. There are never any odors to permeate the home or combustion emissions to pollute our environment.

## COMPACT.

The TDE electric boiler is extremely compact and can be easily wall-mounted almost anywhere in the home to provide heat for areas that are isolated from the main heat supply. These areas include garages, apartments, and utility rooms to name a few.

## QUIET.

Quiet operation is maintained because elements are energized in steps, thus preventing power surge and start-up vibration. Quality electrical componentry, circulator and cabinet design also contribute to the whisper-quiet operation of the TDE electric boiler.

## ENERGY EFFICIENT.

With Thermo-Dynamic's unique "flow control" system, the TDE electric boiler delivers a steady flow of healthful heat using a minimal amount of electricity. Low watt density heating elements, low voltage thermostat and thorough insulation for minimum heat loss are just a few design features built in to deliver more comfort for every energy dollar.

## SMALL BOILER. BIG IDEAS.

When your projects call for the efficiency of hot water heat and the convenience of electricity, choose the TDE electric boiler. The TDE is small enough to install almost anywhere (remember, all you need is a wall), yet powerful to handle big hot water heating jobs.

# Designed for Reliable Home Heating Comfort

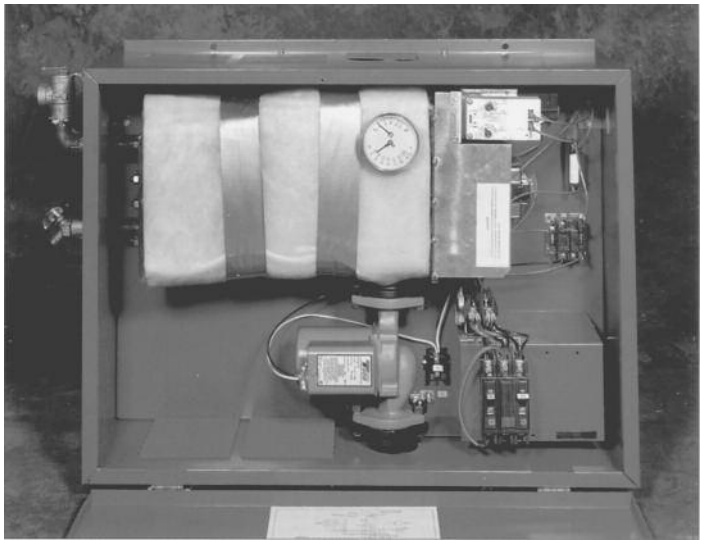
## A Summary of Practical Applications

• **Solar Heating Systems.** Every active solar heating system needs a reliable back-up heating unit that can perform through long periods of adverse weather. The TDE is UL listed as a central heating boiler, thus providing the power needed for total solar security.

• **Recreational Pools.** Because the TDE heats water fast and efficiently, it is an ideal way to warm swimming pool water. Ideal for home, hotel, club and spa pools, and popular with the hot tubs, too. Its powerful circulator maintains steady flow to keep water at uniform temperature.

• **Therapeutic Pools.** Sports and institutional facilities need a precisely regulated hot water supply for their hydrotherapy facilities. Of course, the TDE is the safe choice, offering a high limit switch feature that instantly de-energizes heating elements at a set temperature while the circulator continues operation.

• **Condominiums, Co-ops, Apartments.** When each living unit needs individual hot water heat, the TDE is the cost-efficient answer. It features staged start-up for quiet operation; can be easily piped into existing hydronic systems; is great for new construction; and a necessity for conversion projects.



## A Summary of Product Features

- Five models: 10 kw to 30 kw.
- One-piece steel boiler shell.
- Easily accessible controls.
- Low voltage thermostat.
- Heats single or multi-zone systems.
- Heat process water used in a manufacturing process.
- Boiler Cabinet easily removes before or after piping unit to system.
- UL Listed as central heating boiler.
- Circulator piped and wired at factory.
- 10 Year, plus 10 years pro-rated at 5% per year, limited warranty on boiler shell; full year limited warranty on all other components.
- One-piece steel boiler shell, ASME-constructed.
- Built-in dip tube air elimination system.
- Low voltage thermostat.
- Uniform water temperature.
- Factory tested.
- Low voltage fuse protected control circuit.

# A Summary of Product Benefits

The Thermo-Dynamic TDE electric boiler features low watt density heating elements installed through the sides of the boiler with ample access for service. The elements are energized in steps to prevent power surge, prolonging heater element life and assuring quiet operation.

Standard controls are factory-wired on the control panel. All controls are easily accessible through the removable cover.

Every TDE boiler is insulated with fiberglass insulation for minimum heat loss and housed in a rugged steel cabinet finished in azure blue powder coat for extra durability.

Clean, compact, quiet, energy efficient, versatile, affordable, and backed by Thermo-Dynamics.

Energy efficiency is an important consideration when buying any heating system. But there are other factors you must consider too. Like manufacturer experience, reputation and service. The simple fact is, any heating system is only as good as the company behind it.

Only the finest materials and craftsmanship is used to manufacture our products.

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## Operation

On call for heat the circulator comes on immediately, and the elements are energized in steps — two elements per step spaced at approximately 60 second intervals. When the thermostat is satisfied, all elements and circulator are de-energized at once. A high limit condition will instantly de-energize all elements and the circulator will continue to run.

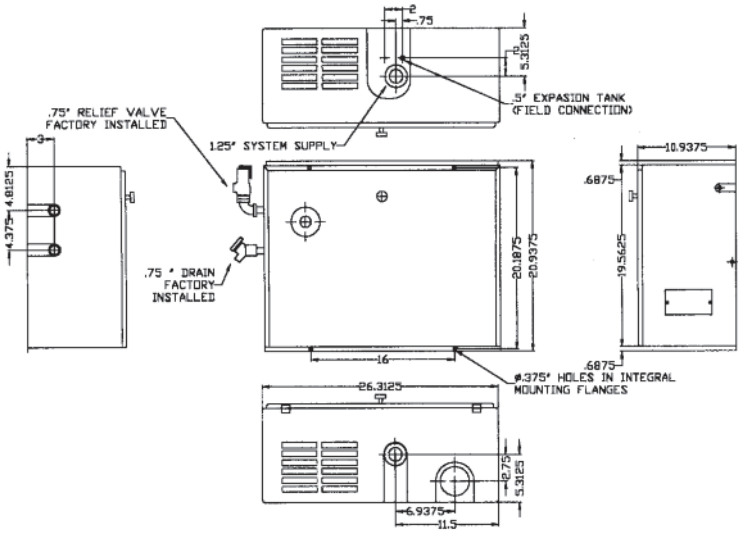
## Ratings

| Boiler Size | KW Rating | Input | BTU/Hour Gross Output | BTU/Hour *Net Output | No. of 5KW Heater Elements | Amps Total | Amps Circuit 1 | Amps Circuit 2 | Amps Circuit 3 | Watts at 240V | Approx. Shipping Wgt. Lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDE-10 | 10 | 34,000 | 34,000 | 30,000 | 2 | 43 | 43 | – | – | 10,000 | 120 |
| TDE-15 | 15 | 51,000 | 51,000 | 44,000 | 3 | 64 | 43 | 21 | – | 15,000 | 125 |
| TDE-20 | 20 | 68,000 | 68,000 | 59,000 | 4 | 85 | 43 | 42 | – | 20,000 | 125 |
| TDE-25 | 25 | 85,000 | 85,000 | 74,000 | 5 | 106 | 43 | 42 | 21 | 25,000 | 141 |
| TDE-30 | 30 | 102,000 | 102,000 | 89,000 | 6 | 127 | 43 | 42 | 42 | 30,000 | 150 |

ELECTRICAL CHARACTERISTICS — 120/240 VOLTS A.C. 3 WIRE SINGLE PHASE 60 HZ

*Net ratings are based on installed radiation of sufficient quantity to serve the requirements of the building and nothing need be added for normal piping and pick up. Net rating is based on a piping and pick up allowance of 13%.

## Dimensions




## Equipment

Steel boiler, jacket, insulation, controls and circulator

**Factory Installed** – ASME relief valve, temperature and pressure gauge, elements, circulator, drain cock, completely wired.

**Included but not installed** Air vent, thermostat.

# *CAUTION: READ ME FIRST*

***Check the unit for shipping damage. If there is any evidence of damage, including damage to the exterior jacket, you should contact your freight company immediately and file a claim. Do not install the boiler.***

***Proper selection of the right size TDE, or any heating device, requires an accurate heat balance performed by a qualified heating professional. Consult the supplier of the indirect hot water heater or Thermo-Dynamics for detailed instructions related to indirect hot water heater applications. Follow the indirect hot water heater installation and piping instructions to ensure proper performance.***

***These instructions include options for installation, including system components. Components are not provided, unless specifically noted otherwise. Suggested installation schemes are for the brand names specified. If another brand is used, see the manufacturer's instructions for installation.***

***Installation of the Thermo-Dynamics TDE electric boiler requires an experienced and trained service person. The TDE is similar to an oil or gas fired boiler in many ways. The differences are important. Follow the installation instructions carefully to avoid problems. Contact Thermo-Dynamics if you have any questions or concerns.***

***Wiring, piping and construction must meet all local, state and federal codes that may apply. In the event that no local electrical codes apply, the National Electrical Code should be followed.***

***See the outline and dimension drawing on page 6 for location of all electrical and hydronic connections.***

Before you start. You will need the following:

Four 3/16" lag screws or toggle bolts for mounting.
A low voltage, remote mounting thermostat.
Expansion tank: Check manufacturer's instructions for sizing criteria.
Isolation valves, piping and zone devices as described in the installation diagrams.

## INSTALLATION

1. Carefully remove unit from shipping carton. Remove the boiler jacket by removing the jacket assembly screws around the perimeter of the jacket. (The jacket can be reinstalled after wiring and piping. The following accessories are included and are loose inside boiler jacket:

   • Air Vent - mount in 1/8" pipe tap hole at boiler top.

2. The Boiler must be wall mounted only. The air vent provided must be at the top of the boiler. The TDE is provided with wall mounting flanges integrally attached to the boiler back sheet. There are two holes 3/8" diameter on 16 inch centers in each flange. Securely mount the boiler to the wall with 3/16" lag screws or 3/16" toggle bolts. Be sure the boiler is level before completing the boiler attachment to the wall.

3. Allow 20" clearance in front of the unit for removal of the jacket, for making electrical connections and servicing. The required side and top clearance is 12". The required bottom and rear clearance is 0".

4. The only piping connections required are the boiler water supply and return, expansion tank, water supply and drain line from the relief valve. The circulator is factory mounted. Flow should be UP, toward the boiler vessel. An arrow cast into the body of the circulator indicates water flow direction.

5. An Expansion Tank (Not Provided) must be matched to the system and installed in accordance with the manufacturer's recommendations. A conventional expansion type of tank may be connected to the 1/2" NPT fitting in the boiler top. If a pressure type tank is used the 1/2" opening must be plugged. See the manufacturer's instructions for sizing the expansion tank.

   ***Do not under-size the expansion tank.***

6. The home inlet water system shall not exceed 60 psi. A pressure reducer will be required if the system exceeds this pressure. An automatic feed valve (Not Provided) should be installed in the water inlet line to keep the entire system (boiler and radiation) from falling below the pressure setting of the valve (12 psi).

7. The water supply and return lines of the system must be connected with shut off valves and purging valves. ***Purging the system of air prior to operation is critical to satisfactory operation.*** All connections must be air tight and leak proof.

8. Required electrical power input is three wire, 120/240 volt, single phase, 60 hz. (The TDE-15 and TDE-30 units may be wired using three phase power, two or three branch circuits. See wiring diagram.)

***Caution***

***Wire the circuits as shown on the diagram. The separate 120 volt circuit for the circulator and control power circuits is required to allow operation of the circulator during the start-up procedure, without energizing the heater elements.***

9. Circuit breaker size is 60 amps per heater circuit and 15 amps for the circulator pump and control circuit. The 24 volt control circuit is protected with a 2 amp ferrule fuse.

10. An opening is provided in the cabinet lower right hand corner of the boiler for input wiring. All wiring must be in accordance with local electric code, or the National Electric Code in the absence of a local code.

***Warning: DISCONNECT ALL WIRING AT THE MAIN SWITCH BEFORE WIRING UNIT***

11. Connect power to terminals marked L1 and L2 and the neutral leg of the three wire service to the terminal marked N (neutral).

12. Connect a ground wire to the case ground connection and connect the ground wire to a ground that meets local electrical codes. Improper grounds may result in unsafe conditions and interfere with other electronic devices.

13. Replace boiler jacket and re-install assembly screws. Remove the door holding screw to allow the door to be opened.

***Re-install the door holding screw when the system is operating to avoid accidental or unintentional opening of the door.***

14. Install the thermostat (not included) in accordance with the instructions provided by the manufacturer.

***Caution: The Thermostat, ground wire and power wires are the only connections that should be made to the TDE. Do not supply power to any other system components from the TDE.***

## OPERATION

***Caution: Follow the start-up procedure carefully and completely. Failure to follow the start-up procedure may cause damage to components including the heater elements.***

### START-UP

1. Verify that the supply breaker at the main circuit breaker panel to the TDE and all of the TDE electrical breakers are in the off position.

**NEVER PUT ELECTRICAL POWER TO BOILER UNLESS BOILER AND HYDRONIC SYSTEM ARE FULL OF WATER.**

2. Fill the hydronic system and the boiler. Purge all air from the system at the purge valve. If it is a multi-zone system, air purge each system.

3. Turn the supply breaker in the Main Circuit panel for 120 volt power to the TDE to on. Turn the 15 amp breaker in the TDE to on. DO NOT ENERGIZE THE HEATER CIRCUITS. The 15 amp breaker provides power to the circulator and the controls. Turn the thermostat up until it turns the circulator on. If multiple zone circulators are installed, turn the zone circulators on. Continue to vent the system with the circulators running, until all air is purged.

4. The pressure gauge should read 12 psi if an automatic feed valve is

used. If equipped with manual feed, close the system water supply valve when a pressure reading of 12 psi is obtained. The purge valve may have to be bled to reduce pressure to 12 psi.

***Check the system for leaks by shutting the water supply valve and observing the pressure gauge. Any decrease in system pressure indicates a leak that must be repaired prior to operation.***

5. Set the thermostat at the lowest setting. Turn the supply breaker for the TDE at the main circuit breaker panel to on. Turn all TDE breakers to on.

6. Raise the thermostat to above room temperature. The unit should operate. The pump and heater element relays will cycle on and off according to demand of the thermostat and timing sequence. See the Sequence of Operation section in this manual for time delay description.

7. The pressure of the system will rise when heated. The normal pressure gauge reading should be between 20 and 22 psi. If pressure rises above 22 psi, additional expansion tank capacity may be necessary. See the manufacturer's manual for information on sizing the expansion tank.

*Note:*

*The pressure relief valve is a safety device set to open at 30 psi.*

8. Set the heat anticipator in the thermostat in accordance with the manufacturers directions, if so equipped.

**When installation is complete and the system is operating satisfactorily, close the cabinet door and re-install the door holding screw to prevent accidental or unintentional opening of the door.**

## SEQUENCE OF OPERATION

The thermostat closes on a call for heat and energizes the circulator relay and the first heater relay which pulls in the circulator and two heating elements. The remaining elements are energized on at one minute intervals (two elements at one time). When the thermostat is satisfied, all the elements de-energize at once and the circulator stops.

***Operating temperatures on the temperature gauge of the TDE may be 110 - 140° F, or lower. This is normal for the TDE.***

This unit is furnished with a dual hot water control aquastat with a High Limit Safety Setting (labeled "Hi") and an Operating Control Limit Setting (labeled "Lo"). The High Limit Safety is factory set at 200°F. The Operating Control Limit is set at 170°. If the boiler water reaches 170° the Operating Control Limit will open the heater relay circuit causing heater elements to de-energize, even though the thermostat may be calling for heat. The circulator will continue to run, as long as the thermostat is calling for heat. When boiler water temperature drops to 160° the Operating Control Limit will close and bring the heating elements back on, provided that the thermostat is calling for heat.

If the water temperature reached 200°, due to a failure of the Operating Control Limit, for example, the High Limit safety will shut off all elements at once.

***The High Limit Safety is set at 200° Do not attempt to change the High Limit setting. Do not set the Operating Control Limit above 180°. Remember, this is not a low temperature set point like on an oil or gas fired boiler. There is no low set point and, if there is a call for heat, the circulator will run and the elements will be energized as long as the thermostat calls for heat and the Operating Control Limit and High Safety limit are not reached.***

Refer to the instruction sheet for the control when making adjustments.

## MAINTENANCE

A trained and experienced service person should check the system prior to each heating season. The supply breaker to the electric boiler should be off prior to performing any service.

If a component is changed in the system, follow the start-up procedure in this manual prior to operating the unit.

Check for leaks after every maintenance, once per year and if there is any visual evidence of a leak. To check for leaks, shut the water supply valve and observe the pressure gauge. Any loss of pressure indicates a leak in the system that must be repaired.

Frequent heater element failures or short heater element life is an indication that there is air in the system. Follow the start-up procedure to make sure that all air is eliminated from the system and verify that the system is leak-free to prevent introduction of air during operation.

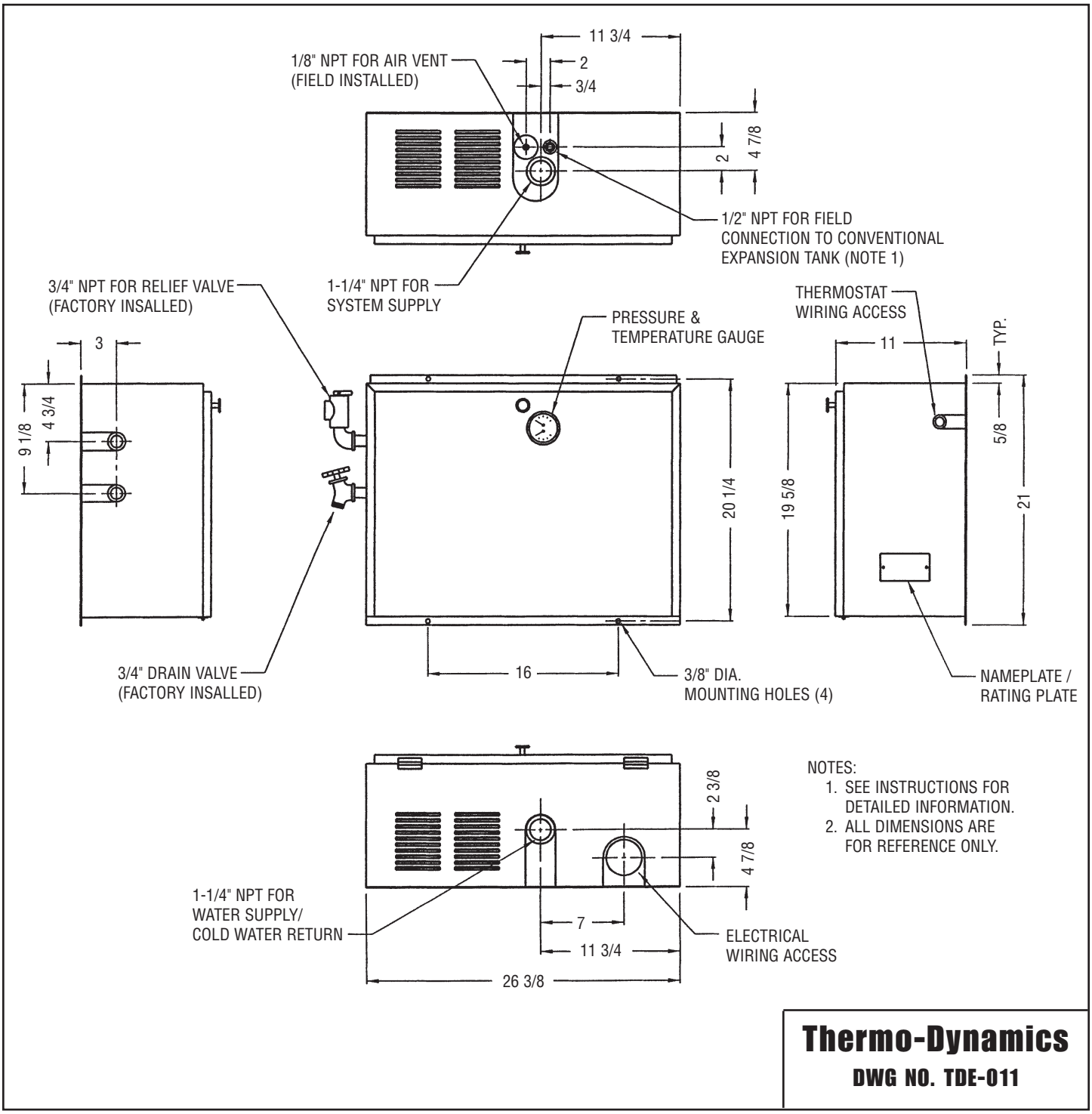
Staging

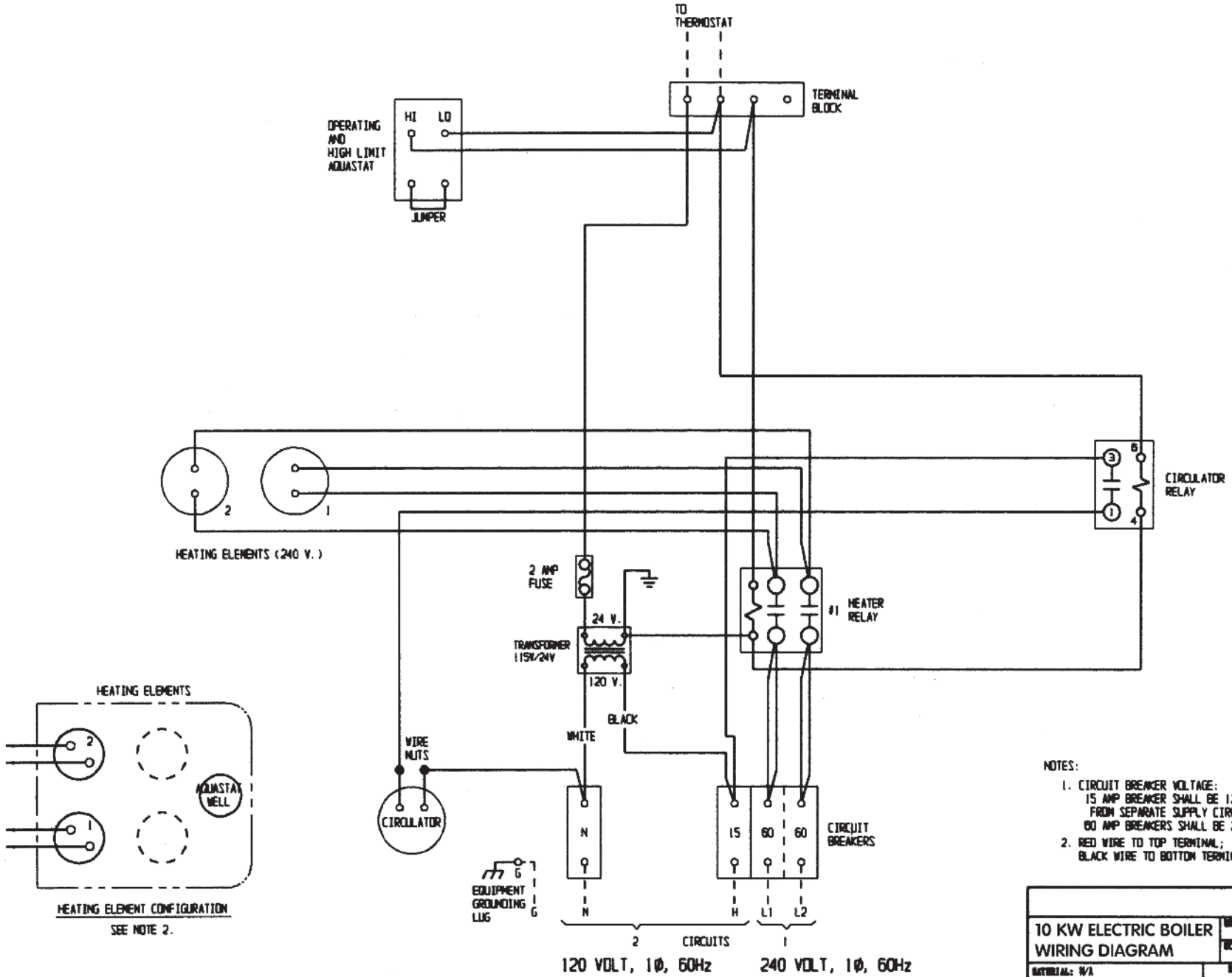
The TDE-15, 20, 25 and 30 can be "staged" using a second thermostat or a dual thermostat. Staging may be a valuable feature if the user's electric bill is based on peak demand. Staging prevents the timed elements from energizing unless the temperature set point of a second or third thermostat is reached. A careful heat balance is required to set the TDE for effective staged operation.

The staging terminals shown in the wiring diagrams have a factory installed jumper when delivered. When the thermostat closes on a call for heat, the first two heater elements are energized immediately. The remaining elements are energized, two at a time at one minute intervals. To stage the TDE, remove the factory installed jumper and install a thermostat or outdoor stat (Not provided) wired to the same terminals where the jumper was removed. The thermostat may be located outdoors, or in a zoned space and set or selected so that if the temperature is above the thermostat set point, heater elements that are time delayed will not turn on. If the outside temperature or a separate zone temperature is below the second thermostat set point, the time delayed heater elements will be energized after the appropriate time delay. The TDE-25 and 30 have two staging terminal sets. The second factory installed jumper can be used so that the first two heaters are energized by a call for heat from the interior thermostat and the remaining heater elements are energized only if the second thermostat set points are reached. Both sets of staging terminals can be connected to thermostats to

allow two of the heater elements to come on after time delay if one set point is reached and the remaining heaters will be energized if the other set point is reached.

When using outside temperature to stage, start by setting the first staged thermostat at 40°F. Set a second thermostat at 20°F if a second stage is used. If required, adjust the thermostats to maintain desired level of comfort.

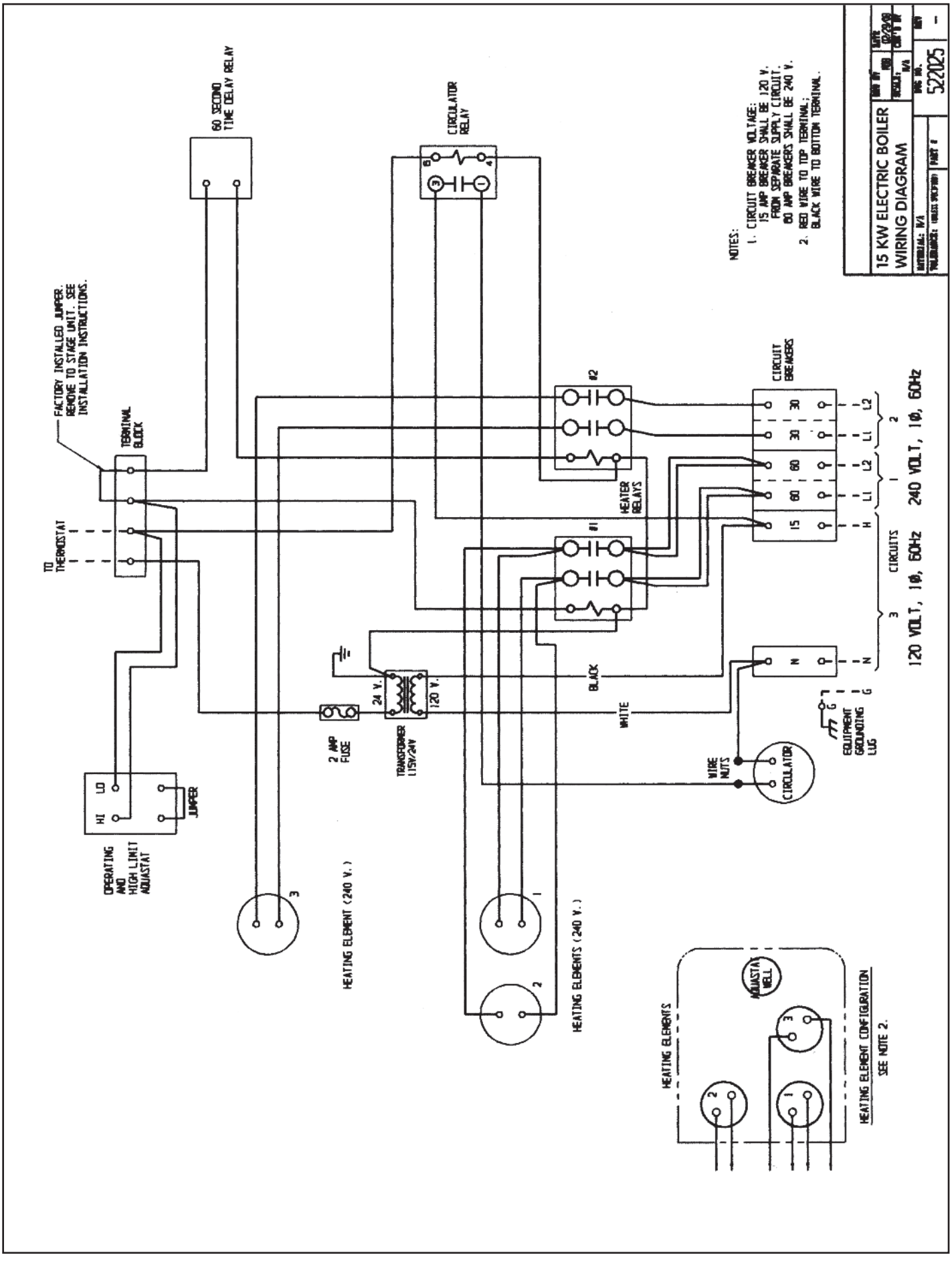





NOTES:

1. CIRCUIT BREAKER VOLTAGE:
   15 AMP BREAKER SHALL BE 120 V.
   FROM SEPARATE SUPPLY CIRCUIT.
   60 AMP BREAKERS SHALL BE 240 V.
2. RED WIRE TO TOP TERMINAL;
   BLACK WIRE TO BOTTOM TERMINAL.

| | | | |
|---|---|---|---|
| 10 KW ELECTRIC BOILER WIRING DIAGRAM | DRN BY: JJH | DATE: 11/2018 | |
| | SCALE: N/A | CHK'D BY: | |
| MATERIAL: N/A | DRG NO. | REV | |
| TOLERANCE: (UNLESS SPECIFIED) PART # | 522028 | B | |


15 KW ELECTRIC BOILER
WIRING DIAGRAM
522025
NOTES:
1. CIRCUIT BREAKER VOLTAGE:
15 AMP BREAKER SHALL BE 120 V.
FROM SEPARATE SUPPLY CIRCUIT.
60 AMP BREAKERS SHALL BE 240 V.
2. RED WIRE TO TOP TERMINAL;
BLACK WIRE TO BOTTOM TERMINAL.
60 SECOND
TIME DELAY RELAY
CIRCULATOR
RELAY
FACTORY INSTALLED JUMPER.
REMOVE TO STAGE UNIT. SEE
INSTALLATION INSTRUCTIONS.
TERMINAL
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TO
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JUMPER
OPERATING
AND
HIGH LIMIT
ADJUSTAT
#2
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HEATER
RELAYS
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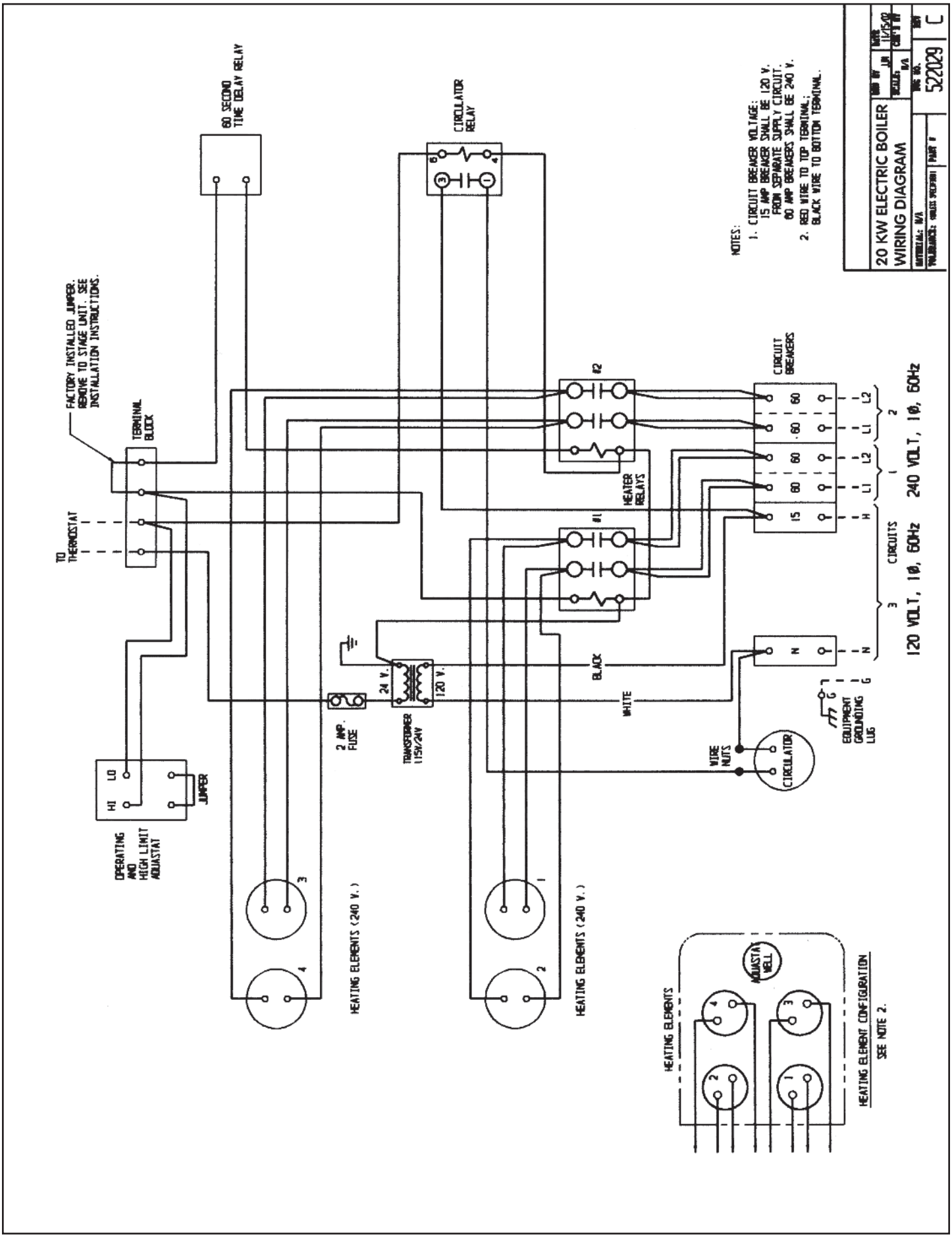
120 VOLT, 1Ø, 60Hz 240 VOLT, 1Ø, 60Hz
BLACK
WHITE
24 V.
120 V.
2 AMP
FUSE
TRANSFORMER
115V/24V
WIRE
NUTS
CIRCULATOR
EQUIPMENT
GROUNDING
LUG
HEATING ELEMENT (240 V.)
HEATING ELEMENTS (240 V.)
HEATING ELEMENTS
ADJUSTAT
WELL
HEATING ELEMENT CONFIGURATION
SEE NOTE 2.


60 SECOND TIME DELAY RELAY
CIRCULATOR RELAY
FACTORY INSTALLED JUMPER. REMOVE TO STAGE UNIT. SEE INSTALLATION INSTRUCTIONS.
TERMINAL BLOCK
TO THERMOSTAT
HI LO
JUMPER
OPERATING AND HIGH LIMIT AQUASTAT
2 AMP. FUSE
24 V.
120 V.
TRANSFORMER 115V/24V
#2
#1
HEATER RELAYS
CIRCUIT BREAKERS
15 60 60 60
H L1 L2 L1 L2
1 2
3 CIRCUITS
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BLACK
WHITE
WIRE NUTS
CIRCULATOR
EQUIPMENT GROUNDING LUG
HEATING ELEMENTS (240 V.)
HEATING ELEMENTS (240 V.)
AQUASTAT WELL
HEATING ELEMENTS
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2. RED WIRE TO TOP TERMINAL; BLACK WIRE TO BOTTOM TERMINAL.
120 VOLT, 1Ø, 60Hz 240 VOLT, 1Ø, 60Hz
20 KW ELECTRIC BOILER
WIRING DIAGRAM
MATERIAL: N/A
TOLERANCES: UNLESS SPECIFIED
PART #
SIZE
DWG NO.
522029
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DRN BY
JJH
SCALE: N/A
DATE
11/15/02
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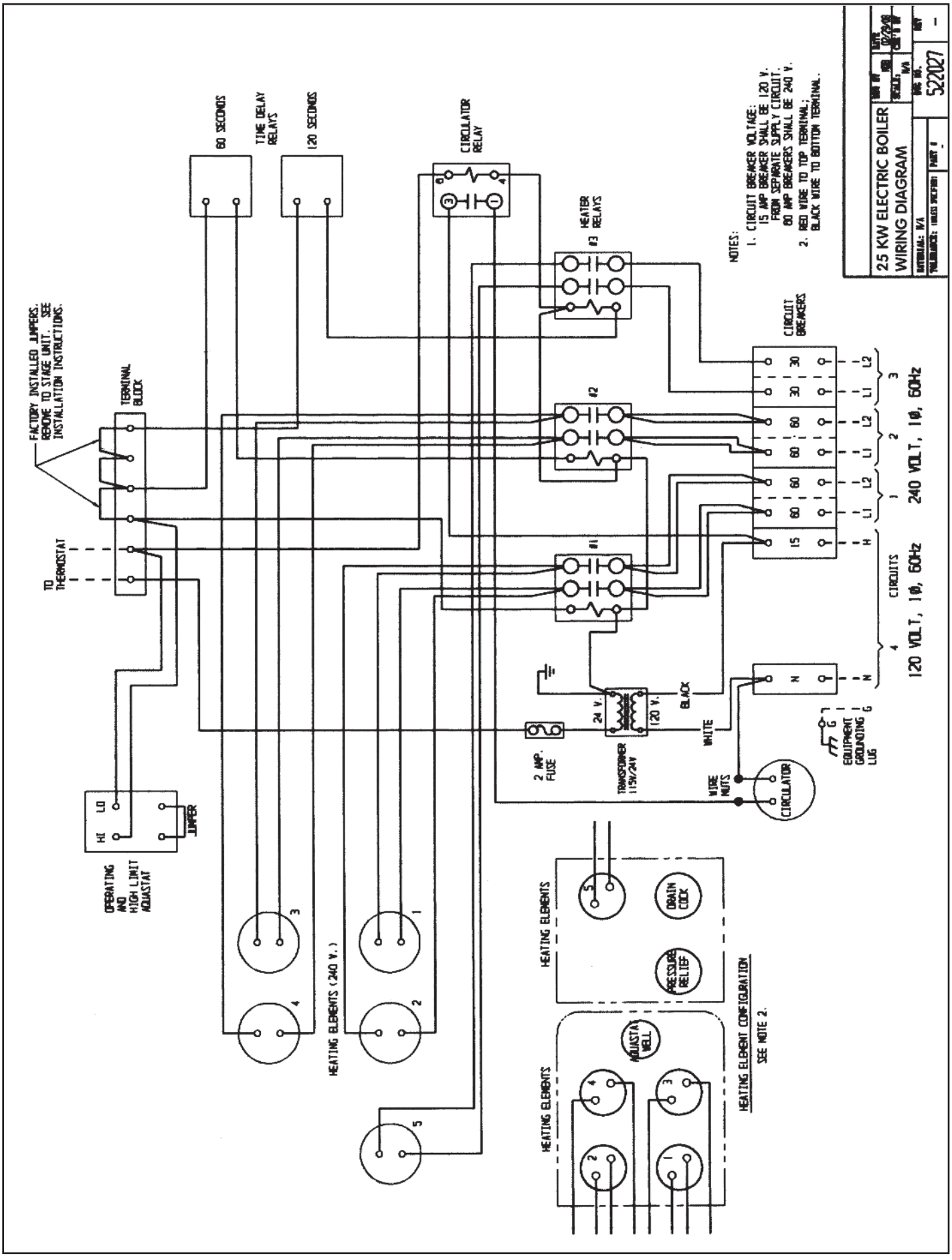
25 KW ELECTRIC BOILER
WIRING DIAGRAM
522027
NOTES:
1. CIRCUIT BREAKER VOLTAGE:
15 AMP BREAKER SHALL BE 120 V.
FROM SEPARATE SUPPLY CIRCUIT.
60 AMP BREAKERS SHALL BE 240 V.
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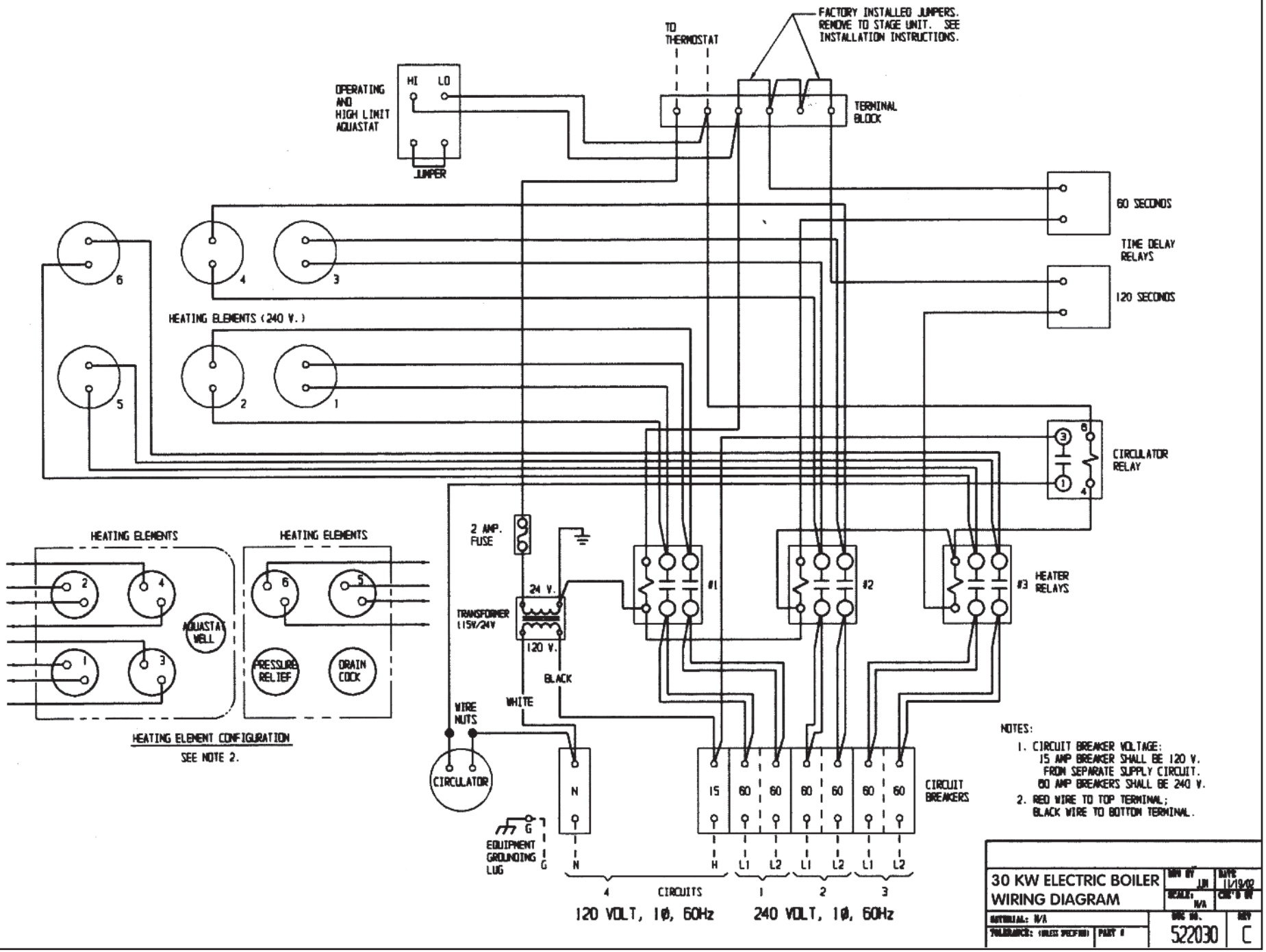
BLACK WIRE TO BOTTOM TERMINAL.
FACTORY INSTALLED JUMPERS.
REMOVE TO STAGE UNIT. SEE
INSTALLATION INSTRUCTIONS.
TO THERMOSTAT
TERMINAL BLOCK
60 SECONDS
TIME DELAY RELAYS
120 SECONDS
CIRCULATOR RELAY
HEATER RELAYS
#3
#2
#1
CIRCUIT BREAKERS
120 VOLT, 1Ø, 60Hz
240 VOLT, 1Ø, 60Hz
4 CIRCUITS
HI LO
JUMPER
OPERATING AND HIGH LIMIT ADJUSTAT
HEATING ELEMENTS (240 V.)
2 AMP. FUSE
TRANSFORMER 115V/24V
24 V.
120 V.
BLACK
WHITE
WIRE NUTS
CIRCULATOR
EQUIPMENT GROUNDING LUG
HEATING ELEMENTS
DRAIN COCK
PRESSURE RELIEF
ADJUSTA WELL
HEATING ELEMENT CONFIGURATION
SEE NOTE 2.


TO THERMOSTAT
FACTORY INSTALLED JUMPERS. REMOVE TO STAGE UNIT. SEE INSTALLATION INSTRUCTIONS.
OPERATING AND HIGH LIMIT AQUASTAT
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JUMPER
TERMINAL BLOCK
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TIME DELAY RELAYS
120 SECONDS
HEATING ELEMENTS (240 V.)
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24 V.
TRANSFORMER (15V/24V
120 V.
BLACK
WHITE
WIRE NUTS
CIRCULATOR
#1
#2
#3
HEATER RELAYS
HEATING ELEMENTS
HEATING ELEMENTS
AQUASTAT WELL
PRESSURE RELIEF
DRAIN COCK
HEATING ELEMENT CONFIGURATION
SEE NOTE 2.
EQUIPMENT GROUNDING LUG
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CIRCUIT BREAKERS
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4 CIRCUITS
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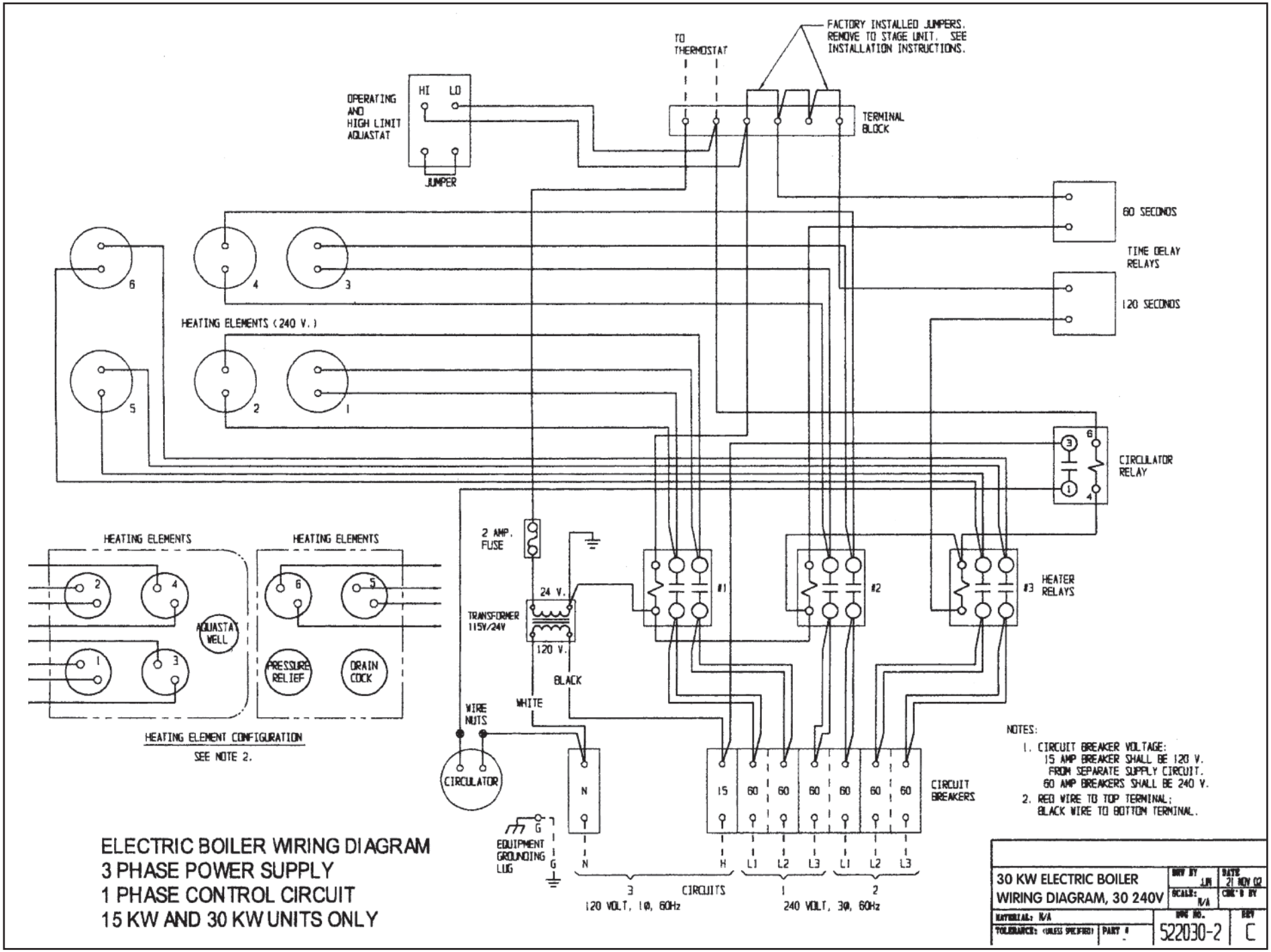
3
120 VOLT, 1Ø, 60Hz
240 VOLT, 1Ø, 60Hz
NOTES:
1. CIRCUIT BREAKER VOLTAGE: 15 AMP BREAKER SHALL BE 120 V. FROM SEPARATE SUPPLY CIRCUIT. 60 AMP BREAKERS SHALL BE 240 V.
2. RED WIRE TO TOP TERMINAL; BLACK WIRE TO BOTTOM TERMINAL.
30 KW ELECTRIC BOILER WIRING DIAGRAM
DRN BY JH
DATE 11/19/09
SCALE: N/A
CHK'D BY
MATERIAL: N/A
TOLERANCE: (UNLESS SPECIFIED)
PART #
DRG NO. 522030
REV C


TO THERMOSTAT
FACTORY INSTALLED JUMPERS. REMOVE TO STAGE UNIT. SEE INSTALLATION INSTRUCTIONS.
OPERATING AND HIGH LIMIT AQUASTAT
HI
LO
JUMPER
TERMINAL BLOCK
60 SECONDS
TIME DELAY RELAYS
120 SECONDS
HEATING ELEMENTS (240 V.)
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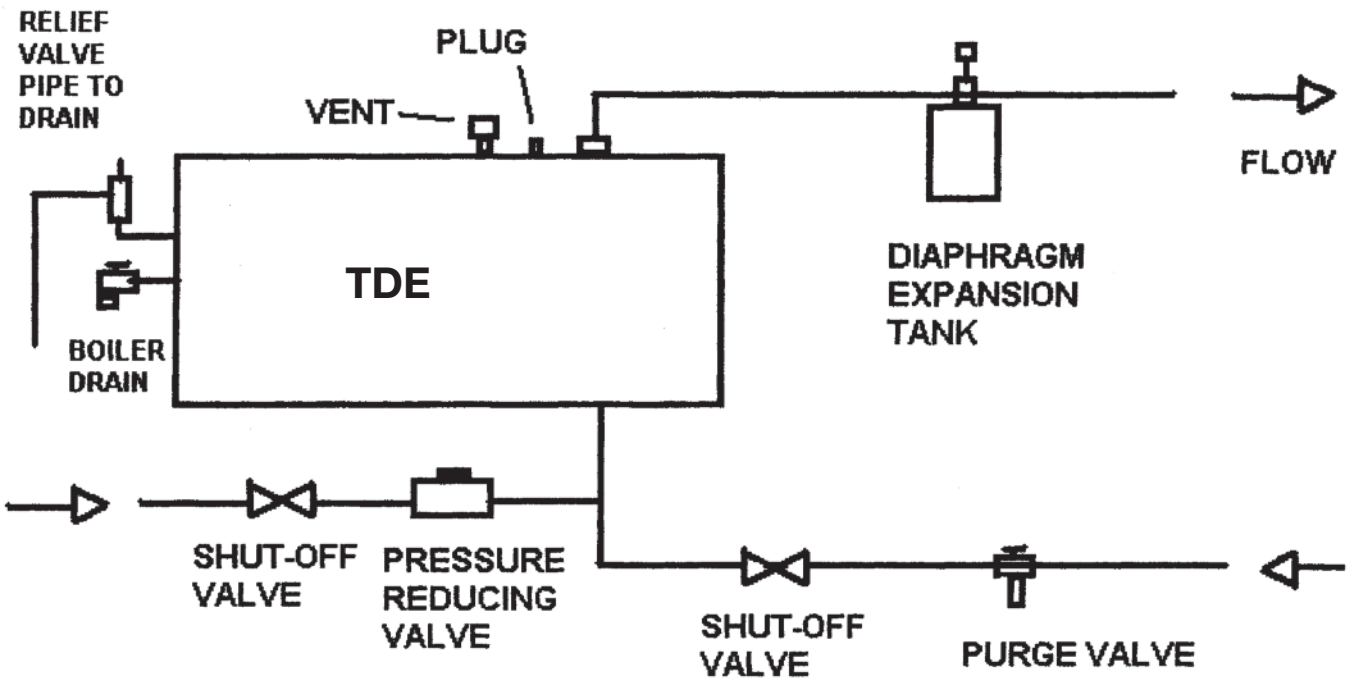
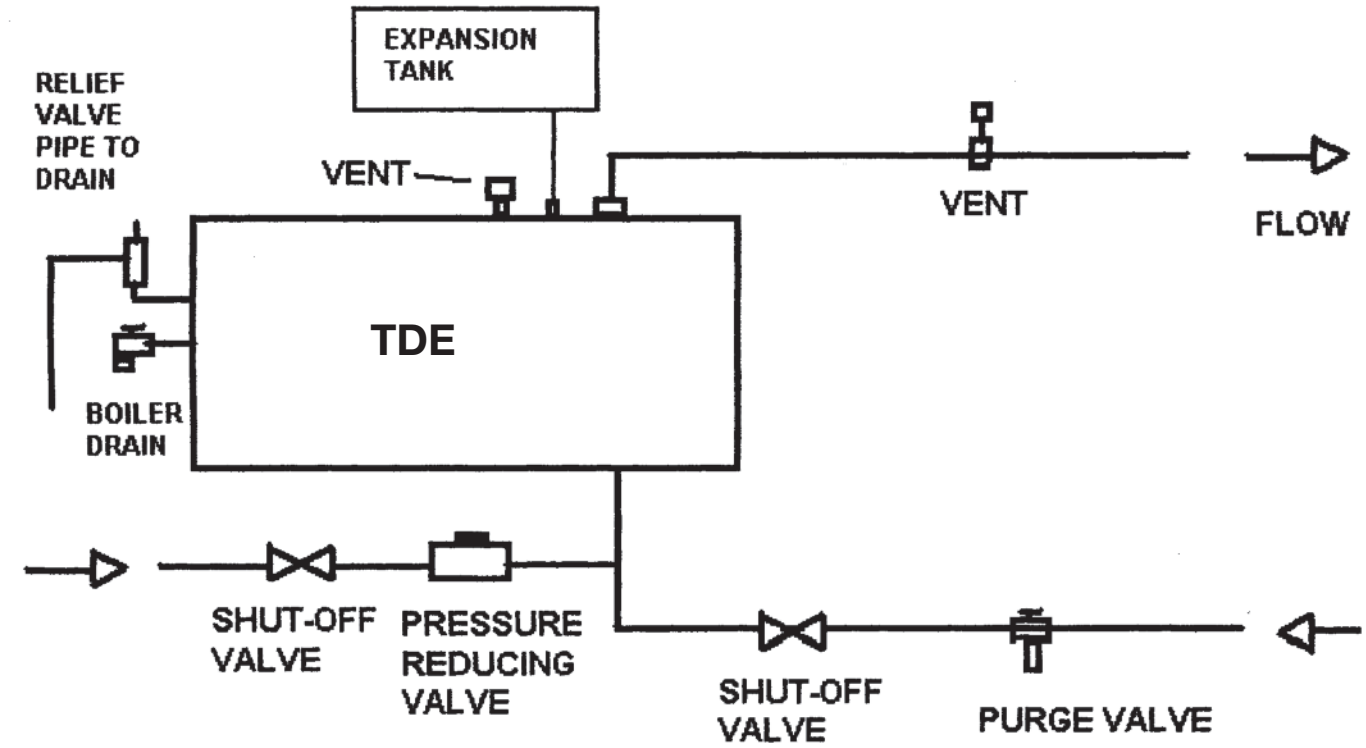
CIRCULATOR RELAY
HEATING ELEMENTS
HEATING ELEMENTS
AQUASTAT WELL
PRESSURE RELIEF
DRAIN COCK
HEATING ELEMENT CONFIGURATION
SEE NOTE 2.
2 AMP. FUSE
24 V.
TRANSFORMER 115V/24V
120 V.
#1
#2
#3
HEATER RELAYS
BLACK
WHITE
WIRE NUTS
CIRCULATOR
EQUIPMENT GROUNDING LUG
G
N
15
60
CIRCUIT BREAKERS
H
L1
L2
L3
3 CIRCUITS
120 VOLT, 1Ø, 60Hz
1
240 VOLT, 3Ø, 60Hz
2
NOTES:
1. CIRCUIT BREAKER VOLTAGE: 15 AMP BREAKER SHALL BE 120 V. FROM SEPARATE SUPPLY CIRCUIT. 60 AMP BREAKERS SHALL BE 240 V.
2. RED WIRE TO TOP TERMINAL; BLACK WIRE TO BOTTOM TERMINAL.
ELECTRIC BOILER WIRING DIAGRAM
3 PHASE POWER SUPPLY
1 PHASE CONTROL CIRCUIT
15 KW AND 30 KW UNITS ONLY
30 KW ELECTRIC BOILER WIRING DIAGRAM, 30 240V
DRW BY JJH
DATE 21 NOV 02
SCALE: N/A
CHK'D BY
MATERIAL: N/A
TOLERANCES: (UNLESS SPECIFIED)
PART #
DWG NO. 522030-2
REV C

## PIPING DIAGRAM, DIAPHRAGM TYPE EXPANSION TANK



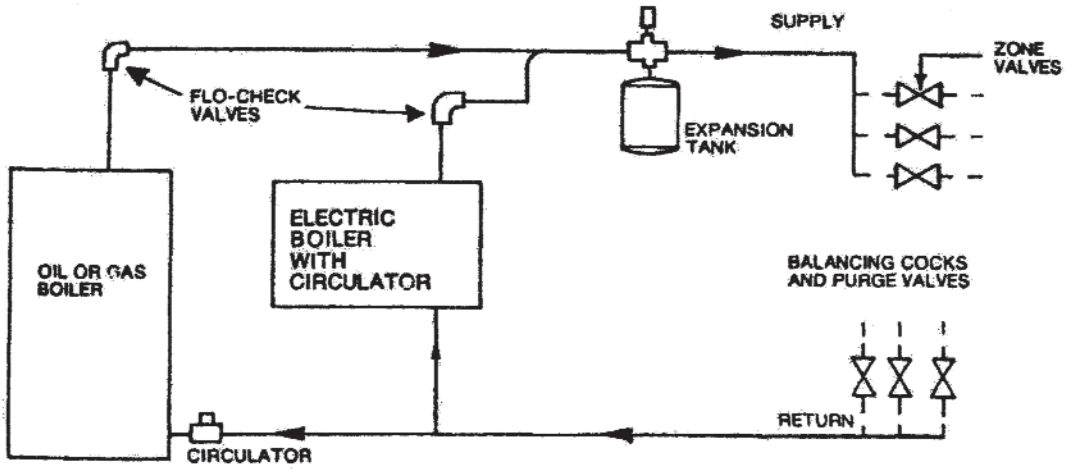

## PIPING DIAGRAM, CONVENTIONAL EXPANSION TANK

## Auxiliary use Piping Diagrams

### Piping Diagram

Auxiliary Electric Boiler

OIL OR GAS FIRED CIRCULATING HOT WATR SYSTEM WITH ELECTRIC BOILER BACK-UP FOR ALTERNATE FUEL OR OFF-PEAK ELECTRIC RATE USE OF ELECTRIC BOILER

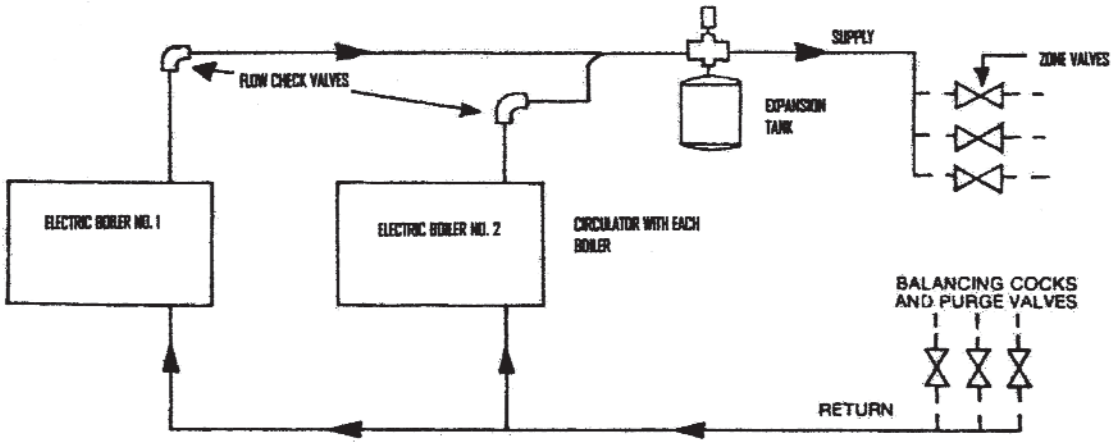



### Piping Diagram

Multi Electric Boilers

**For**

**Larger Capacities**



## Power Supply Wire Sizes

## Split Power Supply

| Wire Sizes AWG Copper | | | | | | |
|---|---|---|---|---|---|---|
| Model | | 10 | 15 | 20 | 25 | 30 |
| Circuit 1 | N | 14 | 14 | 14 | 14 | 14 |
| | L1 | 6 | 6 | 6 | 6 | 6 |
| | L2 | 6 | 6 | 6 | 6 | 6 |
| Circuit 2 | L1 | | 8 | 6 | 6 | 6 |
| | L2 | | 8 | 6 | 6 | 6 |
| Circuit 3 | L1 | | | | 8 | 6 |
| | L2 | | | | 8 | 6 |
| Equipment GRD. | | 6 | 6 | 6 | 6 | 6 |

Single Power Supply

| Model | 10 | 15 | 20 | 25 | 30 |
|---|---|---|---|---|---|
| Wire Size | 6 | 4 | 2 | 1 | 00 |

# *TDE* ELECTRIC BOILER WARRANTY

A. Full Three Year Warranty. **Thermo-Dynamics** warrants the ***TDE*** boiler units are free from defects in material and workmanship for 3 years from date of installation. If any parts are found to be defective in manufacture, **Thermo-Dynamics** will repair or replace them at **Thermo-Dynamics'** option.

B. Limited Lifetime Warranty: Thermo-Dynamics warrants that the steel boiler of it's TDE boiler is free from defects in material and workmanship. Any boiler found to be defective will be repaired or replaced at Thermo-Dynamics' option.

This warranty does not cover:

1. Boilers located out of doors.
2. Components of the heating system not supplied by Thermo-Dynamics.
3. Workmanship of the installer. This warranty does not assume any liability of any nature for unsatisfactory performance caused by improper installation.
4. Failures due to shipping damage. Any evidence of shipping damage must be reported to the shipping company immediately and a claim filed. Do not install the boiler.
5. Improper adjustments, control settings, care, maintenance or failure to follow installation instructions provided with the boiler.
6. Defects resulting from freezing, excessive pressure, temperature or leaks at water connections or any similar cause.
7. Any installation that has been modified, neglected, altered, tampered with, vandalized, misused subjected to accident, fire, flood or other casualty.
8. Installations for which a heat balance provided by an experienced heating professional indicates that the boiler is inadequate for the application.

This warranty does not extend to anyone except for the first purchaser at retail, and only when the boiler is in the original installation site, which must be within the continental limits of the United Sates.

Implied warranties of fitness for a particular purpose and merchantability shall be limited to the duration of the express warranty. **Thermo-Dynamics** expressly disclaims and excludes any liability for consequential or incidental damages for breach of any express or implied warranty, except as otherwise provided by state law.

For prompt service, notify the installer, who in turn will notify the distributor who supplied the boiler. Alleged defective parts must be returned in accordance with the **Thermo-Dynamics** procedure currently in force. **Thermo-Dynamics** will provide the new parts to the installing dealer or distributor.

This warranty gives you specified legal rights. You may have other rights that vary from state to state.