*Quality People. Building Solutions.*

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**Date:** 3/13/2024
**Return Request:** 3/23/2024
**Project:** Stone Bank HQ - Chenal
**Supplier:** Sanders Supply
**Manufacturer:** Various
**Submittal:** Plumbing Equipment
**Submittal Number:** 22 00 00-02
**Drawing # and Installation:** Plumbing Drawings

**ARCHITECT**
WDD Architects
5050 Northshore Lane
N. Little Rock, AR 72118
501-376-6681

**ENGINEER**
Batson Inc.
1300 Brookwood Dr.
Little Rock, AR 72202
501-664-3311

**GENERAL CONTRACTOR**
East Harding
2230 Cottondale Lane #3
Little Rock, AR 72202
501-661-1646

**MECHANICAL SUBCONTRACTOR**
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N. Little Rock, AR 72117
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Notes:

Reviewed for Compliance
EAST HARDING CONSTRUCTION
03/18/2024

dpierce@comfortar.com

# P-8

BRADFORD WHITE®

WATER HEATERS

# Residential & Light Duty Commercial Electric Water Heaters


# SERVICE MANUAL

Troubleshooting Guide
and Instructions for Service

(To be performed ONLY by
qualified service providers)

## Models Covered by This Manual:

**Residential:**
RE1 & RE3 Upright Models.
RE1 & RE2 Lowboy Models.
RE1 Utility Models.
RE1 Wall Hung Models.

**Light Duty:**
LE Upright Models.
LE Utility Models.
LE Lowboy.
LE Wall Hung.

Manual 238-51544-00A REV 04/15

Save this manual for future reference

# Table of Contents



## Introduction

This service manual is designed to aid service and maintenance professionals on the function, proper diagnosis and repair of Bradford White residential electric and light duty commercial electric water heaters.

The text and illustrations in this manual provide step by step instructions to facilitate proper operation and troubleshooting procedures. Contact the Bradford White Technical Support Group immediately if diagnosis can not be made using the methods described in this service manual.

## Tools

- Multi Meter
- 1-½ Deep Well Socket
- ¼" Nut Driver
- Phillips Head Screw Driver
- Thermometer
- Drain Hose
- Various Hand Tools: Pipe Wrench, Channel Locks, Pliers (common & needle nose), Wire cutters, Wire Strippers, Flash Light.

## Commonly Used Formulas

Amps = $\frac{\text{Watts}}{\text{Volts}}$ (for single phase units) Example: 4500W/240V = 18.75A

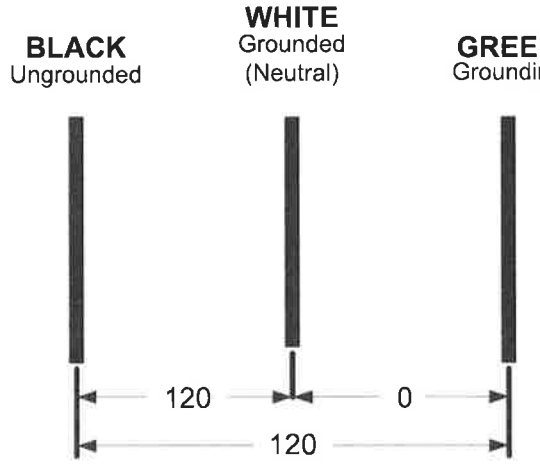
Amps = $\frac{\text{Watts}}{\text{Volts x 1.732}}$ (for balanced 3 phase units) Example: 4500W/240V x 1.732 = 10.82A

Watts = Amps x Volts Example: 18.75A x 240V = 4500W

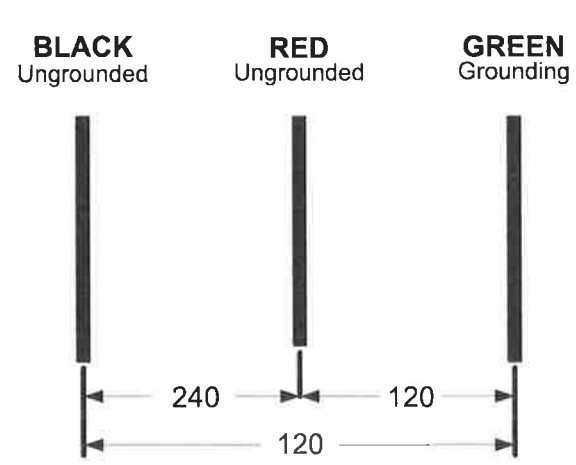
Ohms = $\frac{\text{Volts}^2}{\text{Watts}}$ Example: $(240V)^2$ / 4500W = 12.8 Ohms

# Common Service Wire Configurations

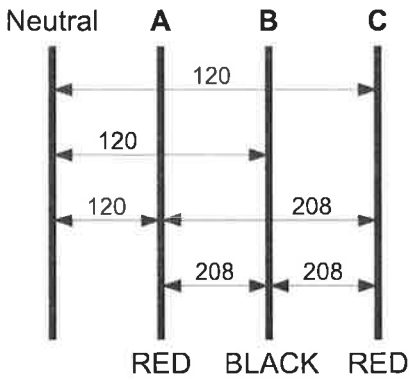
## 120 VOLT



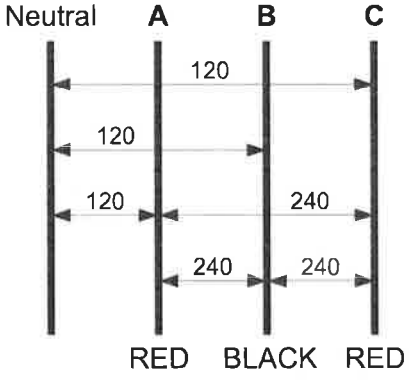

## 240 VOLT



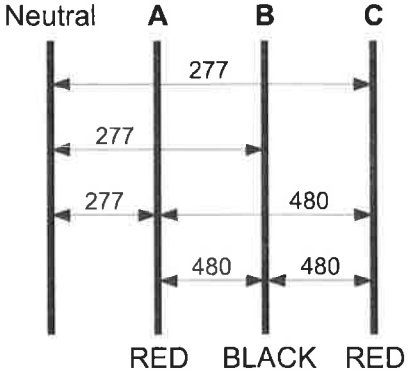

## 208 3Ph




## 240 3Ph




## 480 3Ph/277 1 Ph



# Wattage Limitations at Various Voltages

Residential Electric Upright RE2 & RE3 Series (Non-Simultaneous Operation)
Residential High Efficiency Upright RE2 Series (Non-Simultaneous Operation)
Residential Electric Lowboy RE2 Series (Non-Simultaneous Operation)

| Maximum Wattage | Element Upper/Lower | Voltage |
|---|---|---|
| 3,000 | 3,000/3,000 | 120 |
| 6,000 | 6,000/6,000 | 208, 240 |
| 6,000 | 6,000/6,000 | 277, 480 |

Residential Electric Upright RE2 & RE3 Series (Simultaneous Operation)
Residential High Efficiency Upright RE2 Series (Simultaneous Operation)
Residential Electric Lowboy RE2 Series (Simultaneous Operation)
Light Duty Commercial Electric LE Series (Non-Simultaneous Operation)
Light Duty Commercial Electric LE Series (Simultaneous Operation)

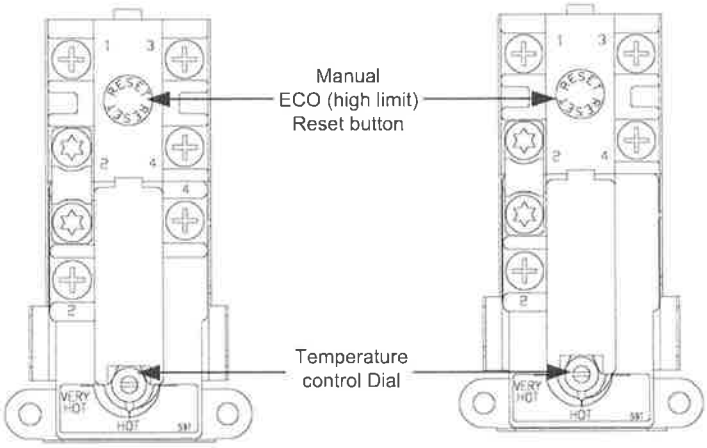
| Maximum Wattage | Element Upper/Lower | Voltage |
|---|---|---|
| 3,000 | 1,500/1,500 | 120 |
| 10,000 | 5,000/5,000 | 208 |
| 11,000 | 5,500/5,500 | 240 |
| 12,000 | 6,000/6,000 | 277, 480 |

Residential Electric Utility Series (Single Element Operation)
Light Duty Utility Series (Single Element Operation)

| Maximum Wattage | Single Element | Voltage |
|---|---|---|
| 3,000 | 3,000 | 120 |
| 6,000 | 6,000 | 208, 240 |
| 6,000 | 6,000 | 277 |
| 6,000 | 6,000 | 480 |

# Surface Mounted Thermostats

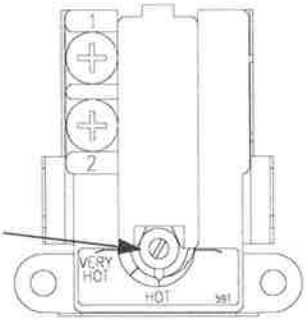
Surface mounted thermostats are mounted into a bracket which holds the thermostat against the side of the tank. Surface mounted thermostats respond to tank surface temperatures to sense a call for heat, set point temperature settings and high limit (ECO) activation. It is important that the entire back surface of the thermostat is in full contact or flush with the tank. Improperly mounted thermostat will lead to improper water heater operation.




Surface Mount
Combination Thermostat/
ECO (high limit)
59T/66T Series

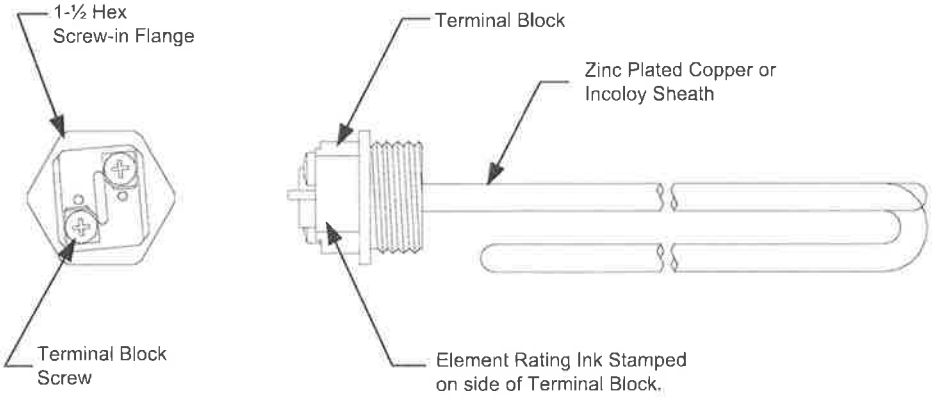



Surface Mount
Combination Thermostat/
ECO (high limit)
59T/66T Series



Surface Mount
Thermostat
59T Series

# Direct Immersion "Screw-in" Type Heating Element

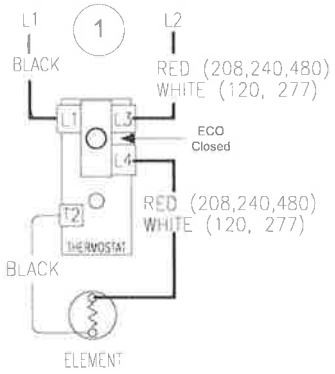


Residential and light duty commercial electric water heaters are designed to operate using several different operating modes. The common modes and sequence of operation are as follows:

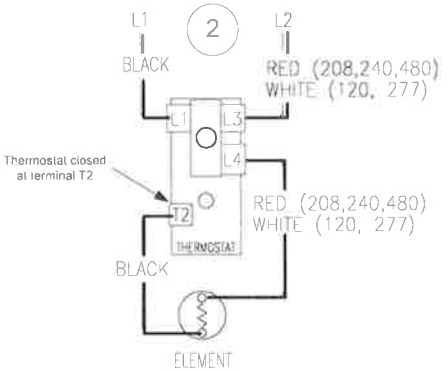
1. Single Element Operation.
2. Double Element Non-Simultaneous Operation (single phase).
3. Double Element Non-Simultaneous Operation (3 phase).
4. Double Element Simultaneous Operation (single phase).
5. Double Element Simultaneous Operation (3 phase).

## **Sequence of Operation-** Single Element Operation.

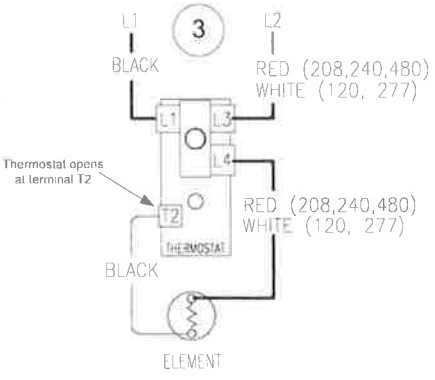
1 Line voltage is applied across terminals L1 & L3 of the thermostat. ECO is closed, so there is voltage at terminal L4 and to one side of the element.




2 Tank is cold therefore thermostat is closed at terminal T2 (calling for heat). This completes the circuit and allows current to flow through the element.




3 When the thermostat is satisfied, it opens at terminal T2 interrupting current flow through the element. System is now in stand-by mode, waiting for the next call for heat.



## Non-Simultaneous and Simultaneous Operation

Double element electric water heaters are designed to operate in either Non-Simultaneous or Simultaneous mode.

**Non-Simultaneous Mode:** Allows only one heating element to operate at a time. For example, when the tank is cold, the upper element is energized first, heating the top of the tank. Only when the upper thermostat is satisfied, the upper element is de-energized and power is directed to the lower thermostat, energizing the lower element and heating the bottom portion of the tank until the lower thermostat is satisfied. As hot water is drawn off the tank, it is replaced with cold water delivered through the diptube to the bottom of the tank. When the tank cools at the lower thermostat level, the lower thermostat will call for heat, energizing the lower element. If enough hot water is drawn from the tank, the top portion of the tank cools and the upper thermostat will call for heat, de-energizing the lower element and allowing only the top element to energize until the upper thermostat is satisfied.

**Simultaneous mode:** allows both heating elements to operate at the same time. That is, if either thermostat (upper or lower) is calling for heat, the corresponding heating element is energized independent of the other.

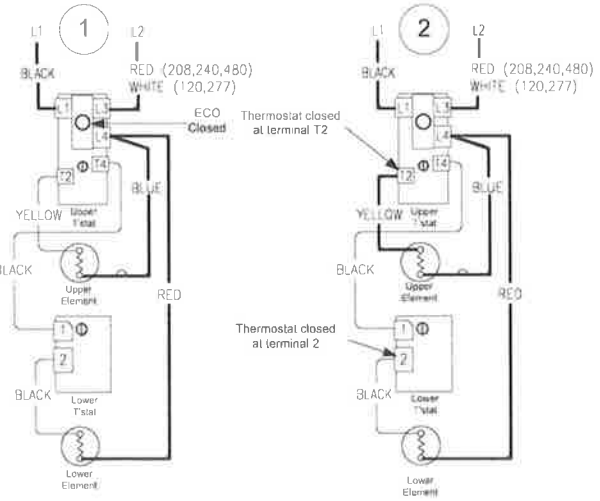
### **Sequence of Operation-** Double Element, Non-Simultaneous Operation, Single Phase.

1. Line voltage is applied across terminals L1 & L3 of the upper thermostat. ECO is closed, so there is voltage at terminal L4 and to one side of the upper and lower elements.

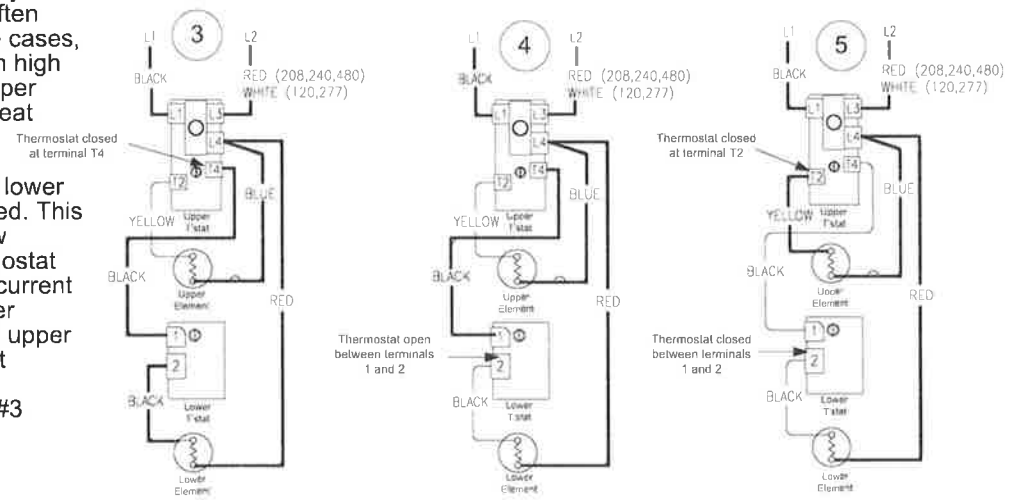
2. Tank is cold. Therefore, the thermostats are closed at terminals T2 & 2 (calling for heat). The circuit is complete through the upper thermostat only, allowing current to flow through upper element.

3. When the upper thermostat is satisfied, it opens at terminal T2, interrupting current flow through the upper element. Terminal T4 closes, allowing voltage to pass to terminal 1 of the lower thermostat. This completes the circuit through the lower thermostat and allows current flow through the lower element.

4. When the lower thermostat is satisfied, it opens at terminal 2, interrupting current flow through lower element. The system is now in stand-by mode waiting for the next call for heat.




5. The lower thermostat/element combination will generally cycle on and off more often than the upper. In some cases, such as a cold tank or in high demand periods, the upper thermostat will call for heat (opening at terminal T4 and closing at terminal T2) prior to the lower thermostat being satisfied. This will interrupt current flow through the lower thermostat and element and allow current to flow through the upper element only. When the upper thermostat is satisfied, it resumes operation as described in sequence #3 above.

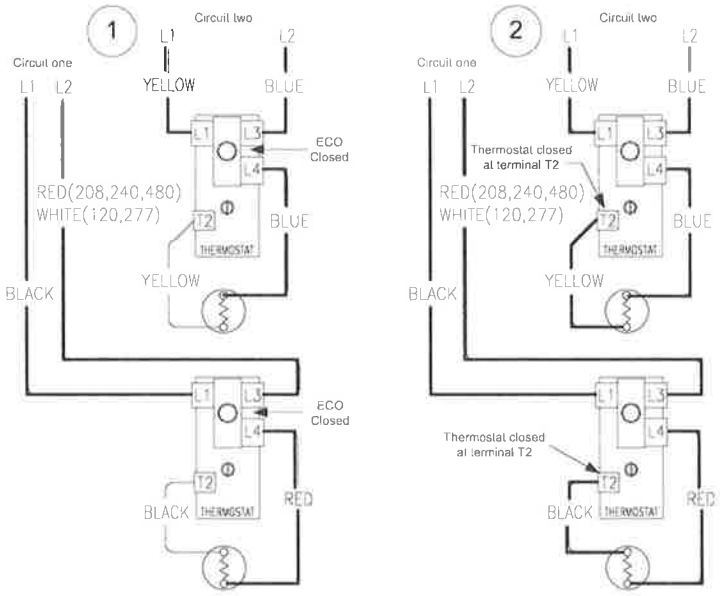


A 4 wire, double element heater wired for simultaneous operation is essentially two single element systems operating independently. The heaters are wired internally with two independent circuits, one circuit for each thermostat/element combination. When installed using a two wire service, the blue and red (or white) wires will be connected together, likewise black and yellow wires will be connected together.

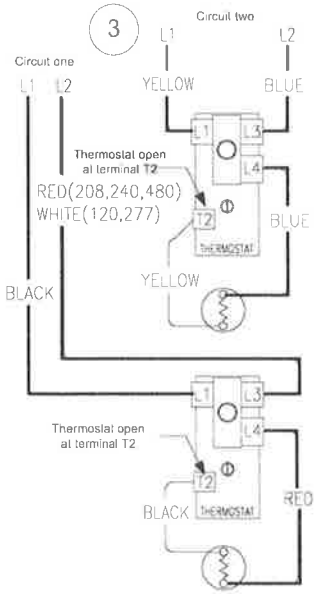
## **Sequence of Operation-** Double Element, Simultaneous Operation, Single Phase, 4 wire service installation.

1. Line voltage from circuit one is applied across terminals L1 & L3 of the lower thermostat. Likewise, line voltage from circuit two is applied across terminals L1 & L3 of the upper thermostat. ECO in both upper and lower thermostat is closed, so there is voltage at terminal L4 of each thermostat and to one side of the upper and lower elements.

2. Tank is cold therefore both thermostats are closed at terminal T2 (calling for heat). This completes the circuit through the thermostats and allows current to flow through the elements.




3. When either thermostat is satisfied, it will open at terminal T2, interrupting current flow through the corresponding element. As both thermostats satisfy, the system will be in stand-by mode waiting for the next call for heat. Thermostats will operate independent of each other.






BRADFORD WHITE
WATER HEATERS

**Sequence of Operation-** Double Element, Non-Simultaneous Operation, 3 Phase.

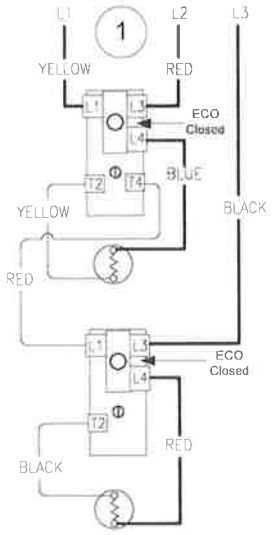
1. Line voltage is applied across terminals L1 & L3 of upper thermostat. Likewise, Line voltage is applied to terminal L3 of lower thermostat. ECO in both upper & lower thermostat is closed, so there is voltage at terminal L4 of both thermostats and to one side of both upper & lower elements.

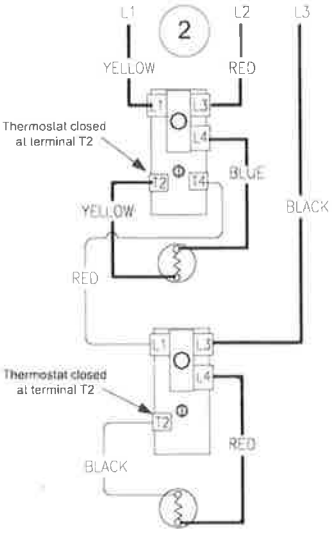
2. Tank is cold therefore both thermostats are closed at terminal T2 (calling for heat). The circuit is complete through the upper thermostat only allowing current to flow through the upper element.

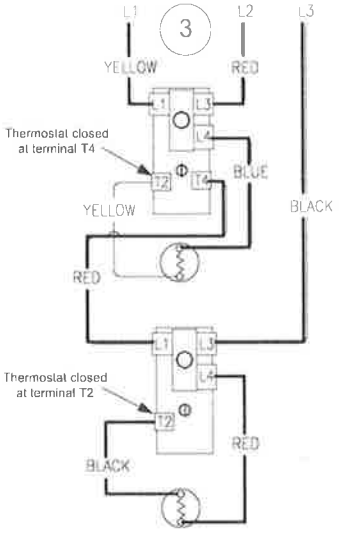
3. When the upper thermostat is satisfied, it opens at terminal T2 interrupting current flow through upper element, and closes at terminal T4 allowing voltage to pass to terminal L1 of lower thermostat. This completes the circuit through the lower thermostat allowing current flow through lower element.

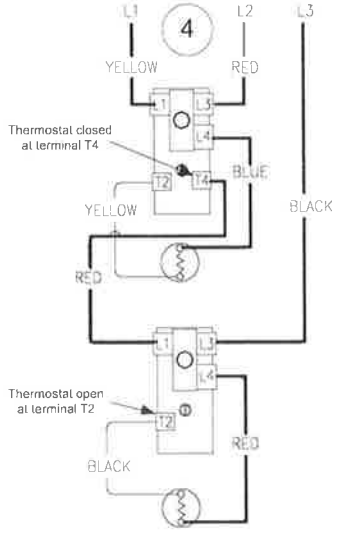
4. When the lower thermostat is satisfied, it opens at terminal T2 interrupting the current flow through the lower element. The system is now in stand-by mode waiting for the next call for heat.

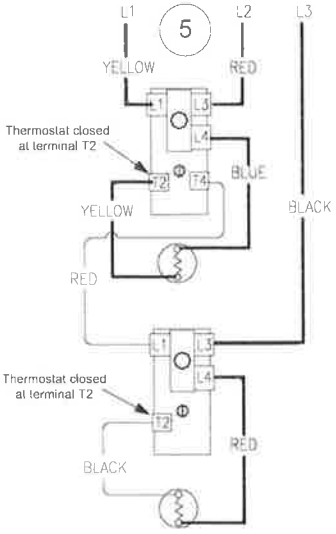
5. The lower thermostat/element combination will generally cycle on and off more often than the upper. In some cases, such as a cold tank or in high demand periods, the upper thermostat will call for heat (opening at terminal T4 and closing at terminal T2) prior to the lower thermostat being satisfied. This will interrupt current flow through the lower thermostat and element and allow current to flow through the upper element only. When the upper thermostat is satisfied, it resumes operation as described in sequence #3 above.



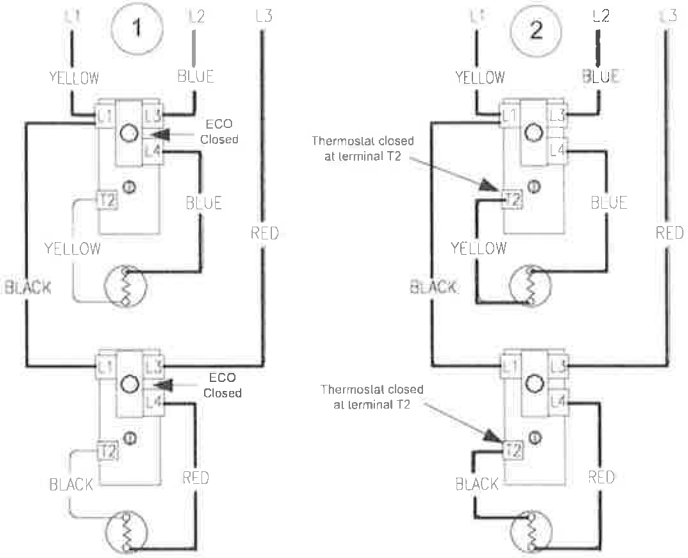



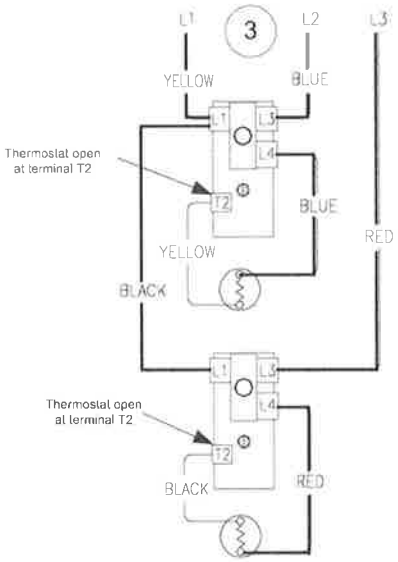
## **Sequence of Operation-** Double Element, Simultaneous Operation, 3 Phase.

1. Line voltage is applied across terminals L1 & L3 of upper thermostat. Line voltage also extends to terminal L1 of lower thermostat. Also, line voltage is applied to terminal L3 of lower thermostat. ECO in both upper & lower thermostat is closed, so there is voltage at terminal L4 of both thermostats and to one side of both upper & lower elements.

2. Tank is cold therefore both thermostats are closed at terminal T2 (calling for heat). This completes the circuit through the thermostats and allows current to flow through the elements.




3. When either thermostat is satisfied, it will open at terminal T2, interrupting current flow through the corresponding element. As both thermostats satisfy, the system will be in stand-by mode waiting for the next call for heat. Thermostats will operate independent of the other.





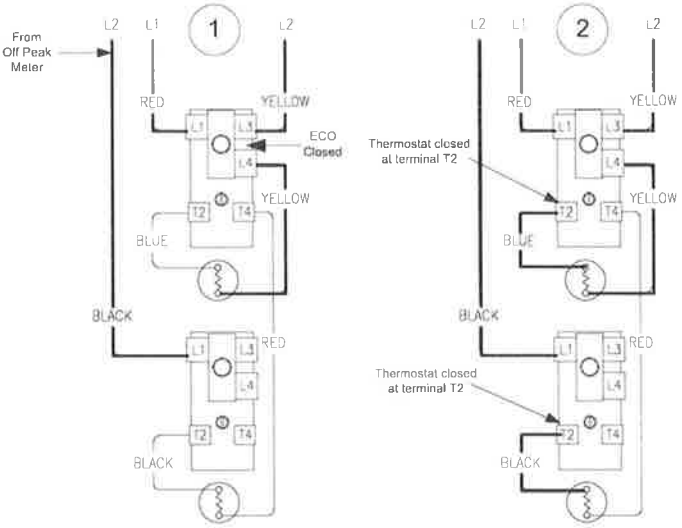

BRADFORD WHITE
WATER HEATERS

Some electric utility companies will offer discounts for using electricity during "Off Peak" Times of the day. The system allows the use of an "Off Peak" meter, which interrupts power to the lower element during high power demand periods.

**Sequence of Operation-** Double Element, Non-Simultaneous Operation, Single Phase, Off Peak.

1. Line voltage is applied across terminals L1 & L3 of the upper thermostat. Line voltage from off peak meter is supplied to terminal L1 of lower thermostat. ECO in the upper thermostat is closed, so there is voltage at terminal L4 of upper thermostat and to one side of the upper element.

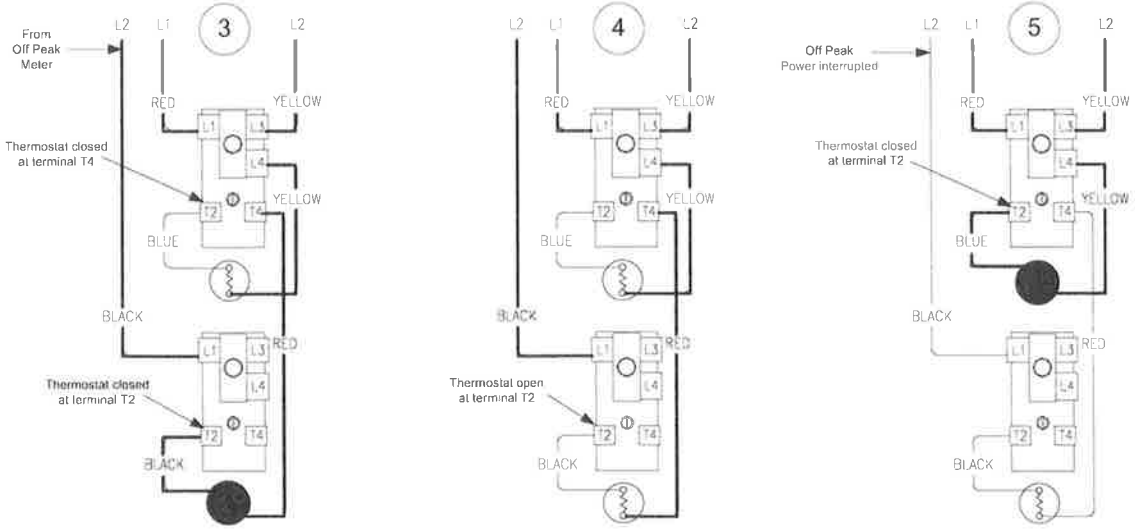
2. Tank is cold therefore both thermostats are closed at terminal T2 (calling for heat). The circuit is complete through the upper thermostat only, allowing current to flow through upper element.




3. When upper thermostat is satisfied, it opens at terminal T2 interrupting current flow through upper element, and closes at terminal T4 allowing voltage to pass to one side of the lower element. This completes the circuit through the lower thermostat and off peak meter allowing current flow through lower element.

4. When the lower thermostat is satisfied, it opens at terminal T2 interrupting current flow through lower element. The system is now in stand-by mode waiting for the next call for heat

5. During peak power demand periods as determined by the local utility, the off peak meter will interrupt power to terminal L1 of lower thermostat. Only the top thermostat/element combination is allowed to operate during this period.



## Most common cause for improper electric water heater operation can be linked to heating element failure.

When troubleshooting an electric water heater with the incidence of "No Hot Water" or "Insufficient Amount of Hot Water," It's always a good idea to check the heating elements first by following the procedure on page 15.

Common Heating Element Failures:

1. **Dry Firing.** Element may be partially submerged in water or most likely, completely exposed with no water in tank. In some cases, sediment or lime build up around an element can eventually cause an air pocket, and within seconds, result in a dry fired element. At this point the element becomes inoperative. When element replacement is required, be sure the tank is full of water prior to energizing the water heater.

2. **Grounded Element.** An element with a short circuit to ground will in most cases cause the circuit breaker in the service panel to open or shut off. In some cases, there may not be enough current draw for the circuit breaker to open. This will allow the heating element to be in continuous operation resulting in over heated water, limited only by the ECO or Energy Cut Out. Repeated actuation of the ECO is usually the result of a grounded element.

3. **Sediment build up.** Slow hot water recovery can usually be traced back to sediment or lime build up around heating element. Sediment build up can also over time cause a dry fired element.

**Figure 1**, below shows a common "Screw-In" type heating element identifying certain features commonly referred to throughout this manual.

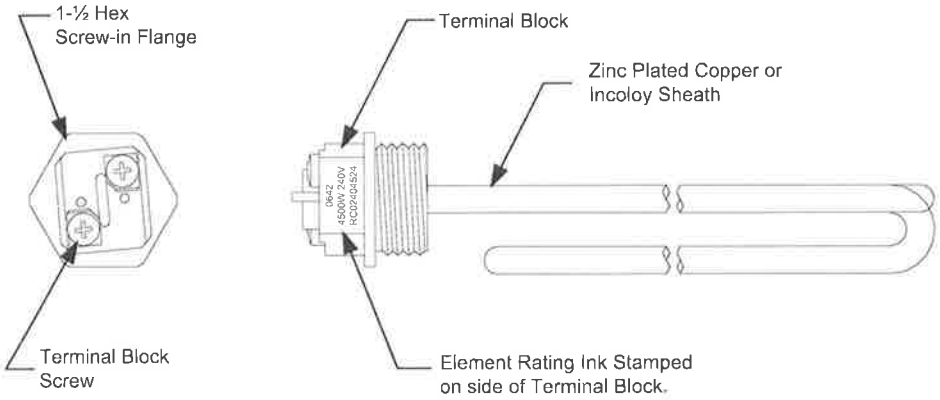



**Figure 1**
**Typical Direct Immersion "Screw-In" Type Heating Element**

# Quick Step Plan to Hot Water

**⚠ WARNING**
**High voltage exposure. Use caution when making voltage checks to avoid personal injury.**

1. TURN OFF power to water heater and check all wire connections to ensure they are tight and corrosion free.
2. Turn power "ON" and determine that service voltage is present, and the high limit (ECO) has not actuated (see procedure on page 14).
3. Check for inoperative heating element (see procedure on page 15).
4. Check for proper thermostat operation (see procedures beginning on page 16). NOTE: Thermostat testing procedures assume items 2 and 3 above are in working order.

| SYMPTOM | PROBABLE CAUSE | CORRECTIVE ACTION | SERVICE PROCEDURE |
|---|---|---|---|
| No Hot Water | 1. No Power to heater.<br>2. Loose wire connections.<br>3. Inoperative upper heating element.<br>4. Inoperative upper thermostat.<br>5. Open ECO. | 1. Check fuses or circuit breakers in service panel.<br>2. Check all wire connections.<br>3. Check heating element(s). Replace as needed.<br>4. Check thermostat(s) operation. Replace as needed.<br>5. Check ECO. Reset or replace thermostat(s) as needed. | 3. See Service Procedure RE-II, Page 15.<br>4. See Service Procedure RE-III, Page 16.<br>5. See Service Procedure RE-I, Page 14. |
| Not Enough Hot Water | 1. Inoperative lower heating element.<br>2. Thermostat(s) set to low.<br>3. Inoperative thermostat(s).<br>4. Loose wire connection.<br>5. Sediment or lime build up on element(s).<br>6. High demand period.<br>7. Undersized heater.<br>8. Very cold inlet water to heater.<br>9. Plumbing connections reversed.<br>10. Damaged diptube. | 1. Check heating element(s), replace as needed.<br>2. Increase thermostat setting.<br>3. Check thermostat(s), replace as needed.<br>4. Check all wire connection.<br>5. Remove heating element(s) and check for lime build up.<br>6. Reduce demand.<br>7. Replace with larger heater.<br>8. Temper water to heater.<br>9. Correct plumbing connections.<br>10. Check dip tube, replace as needed. | 1. See Service Procedure RE-II, Page 15.<br>3. See Service Procedure RE-III, Page 16.<br>5. See Service Procedure RE-VI, Page 34.<br>10. See Service Procedure RE-VII, Page 35. |
| Slow Hot Water Recovery | 1. Sediment or lime build up on element(s).<br>2. Loose wire connections.<br>3. Inoperative thermostat(s).<br>4. Derated heating element installed. | 1. Remove heating element(s) and check for lime build up.<br>2. Check all wire connections.<br>3. Check thermostat(s), replace as needed.<br>4. Check terminal block of element for proper voltage and wattage rating. | 1. See Service Procedure RE-VI, Page 34.<br>3. See Service Procedure RE-III, Page 16. |
| Over Heated Water or Continued Operation | 1. Thermostat not in contact with tank.<br>2. Grounded heating element(s).<br>3. Thermostat set too high.<br>4. Inoperative thermostat(s).<br>5. Inoperative ECO.<br>6. Undersized water heater. | 1. Position thermostat flush with tank surface.<br>2. Check heating element(s). Replace as needed.<br>3. Adjust thermostat(s) to desired setting.<br>4. Check thermostat(s), replace as needed.<br>5. Check ECO, replace thermostat as needed.<br>6. Replace with larger heater. | 1. See Service Procedure RE-V, Page 33.<br>2. See Service Procedure RE-II, Page 15.<br>4. See Service Procedure RE-III, Page 16.<br>5. See Service Procedure RE-I, Page 14. |
| Noisy (singing or hissing) Elements | 1. Lime formation on elements. | 1. Remove and clean heating elements. Replace as needed. | 1. See Service Procedure RE-VI, Page 34. |

## Line Voltage Testing

**⚠ WARNING**
**High voltage exposure. Use caution when making voltage checks to avoid personal injury.**

1. Turn "OFF" power to water heater.
2. Remove access cover(s) from front of water heater. Remove insulation and plastic cover from thermostat.
3. Set multi-meter to "Volts AC."
4. Turn power "ON" to water heater.
5. Check voltage across terminals L1 & L3 of upper thermostat (see Figure 2).

   A) Rated voltage IS present, power to the water heater is okay.

   B) Rated voltage NOT present, Check circuit breaker at service panel.

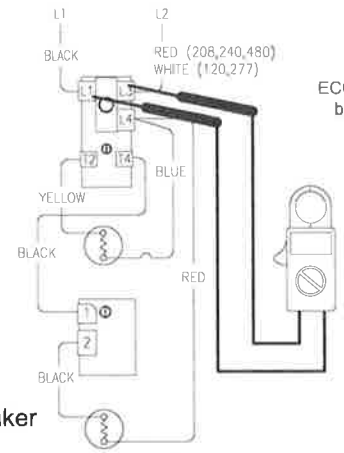



Figure 2

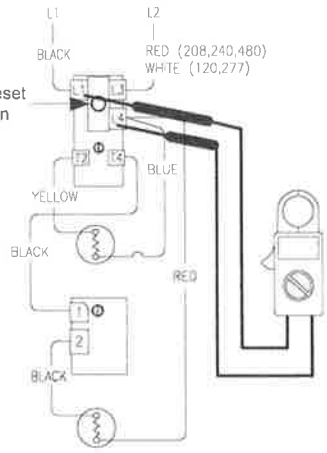



Figure 3

## High Limit (ECO) Testing

1. Check voltage across terminals L1 & L4 upper thermostat (see Figure 3).

   A) Rated Voltage IS present, ECO is okay.

   B) Rated voltage NOT present, proceed to step 2.

2. Turn power "OFF" to water heater and firmly press ECO reset button on thermostat(s). Turn power "ON" and recheck voltage across terminals L1 & L4 of upper thermostat (see Figure 3).

   A) Rated voltage IS present, the ECO has previously opened indicating the water in the tank, at some point did overheat, check the following:
      1. Thermostat must be in full contact with tank.
      2. Be sure heating element(s) is not shorted to ground (see page 15).
      3. Proper thermostat operation (see procedures beginning on page 16).

   B) Rated voltage NOT present, water in tank may be over heated.
      1. If water is hot, turn "OFF" power to water heater and flow water through tank to cool below set point of upper thermostat. Recheck voltage per step 1.

      2. If water is cool, Replace upper thermostat.

**⚠ WARNING**
**High voltage exposure. Be sure power is turned OFF to water heater prior to performing this procedure.**

## Testing For Open Or Burned Out Element

Step 1. **TURN OFF POWER TO WATER HEATER**

Step 2. Remove access cover(s) from front of water heater. Remove insulation and plastic cover from thermostat.

Step 3. Disconnect wires from heating element(s).

Step 4. Set multi-meter to "ohms" setting.

Step 5. Touch probes of multi-meter to screw terminals of heating element(s) (see Figure 4).

Step 6. Reading should be 12.8 ohms (±6%) for a 240 volt, 4500 watt element:

$$\text{Ohms} = \frac{\text{Volts}^2}{\text{Watts}}$$

A reading outside the range using the formula beyond (±6%), indicates a bad element and the element must be replaced.

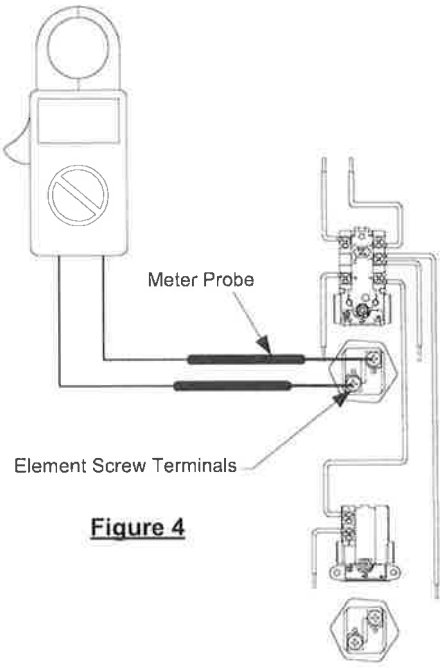



**Figure 4**

## Testing For Heating Element Short Circuit To Ground

Step 1. **TURN OFF POWER TO WATER HEATER**

Step 2. Remove access cover(s) from front of water heater. Remove insulation and plastic cover from thermostat.

Step 3. Disconnect wires from heating element(s).

Step 4. Set multi-meter to "ohms" setting.

Step 5. Touch one probe of multi-meter to either screw terminal of heating element and the other on the element flange (see figure 5). There should be no reading on the ohm meter. Any reading indicates a grounded element and the element must be replaced. Repeat this step for the other screw terminal.

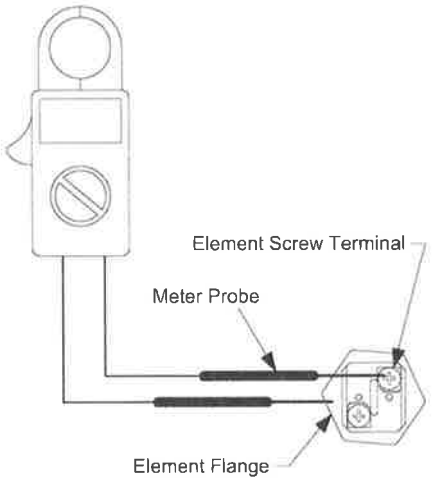



**Figure 5**

**Single Element Operation or Double Element, 4 Wire, Simultaneous, Single Phase Operation**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Water In Tank Is Cold With Power ON**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater.
3. Set multi-meter to "Volts AC."
4. Check across terminals L4 and T2 of thermostat (see Figure 6).
   - A) Rated voltage NOT present, Recheck ECO. If ECO is okay, replace thermostat.
   - B) Rated voltage IS present, proceed to next step.
5. Check across element terminals (see Figure 7).
   - A) Rated voltage NOT present, check wire connections from thermostat to element.
   - B) Rated voltage IS present, Repeat element testing see page 15.

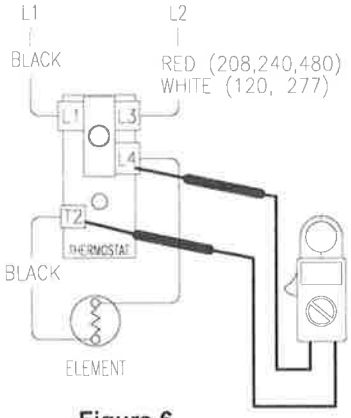



**Figure 6**

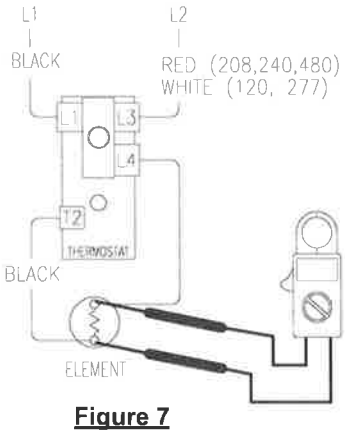
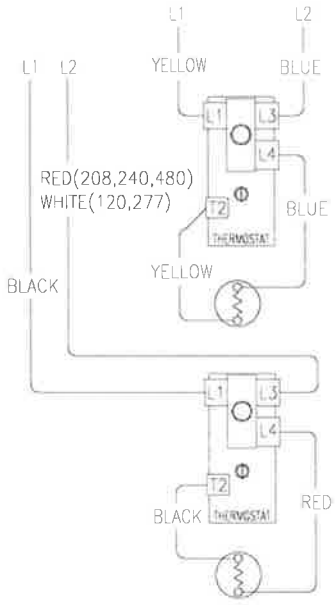



**Figure 7**

**Water Temperature In Tank Is Above Thermostat Setting**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater.
3. Set multi-meter to "Volts AC."
4. See Figure 6 above, check across terminals L4 and T2 of thermostat.
   - A) Rated voltage IS present, replace thermostat.
   - B) Rated voltage NOT present, thermostat is okay.
   - C) Lower than rated voltage IS present, recheck for grounded element (see page 15).




Reference 4 Wire, Simultaneous, Single Phase Wiring diagram.

NOTE: Wiring consists of two single element configurations operating independently.

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

## Double Element, Non-Simultaneous, Single Phase Operation.

### Water In Tank Is Cold With Power ON.

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater.
3. Set multi-meter to "Volts AC."
4. Check across terminals L4 and T2 of upper thermostat (see Figure 8).
   - A) Rated voltage NOT present, Recheck ECO. If ECO is okay, replace thermostat.
   - B) Rated voltage IS present, proceed to next step.
5. Check across element terminals (see Figure 9).
   - A) Rated voltage NOT present, check wire connections from thermostat to element.
   - B) Rated voltage IS present, Repeat element testing see page 15.

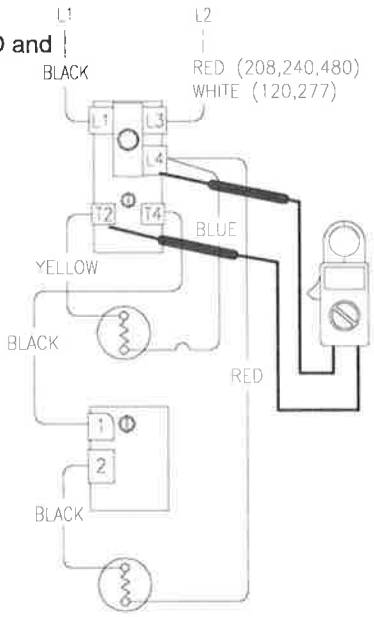



Figure 8

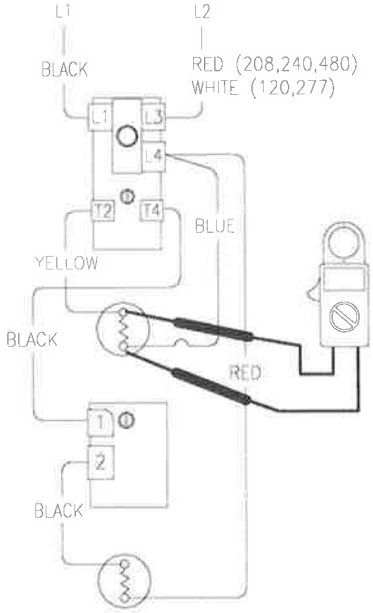



Figure 9

### Tank Does Not Deliver Enough Hot Water.

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater and set multi-meter to "Volts AC."
3. Adjust temperature setting of upper thermostat to the highest setting. Water temperature in tank must be below thermostat setting for this test.
4. See Figure 8 above, check voltage across terminals L4 and T2 of upper thermostat.
   - A) Rated voltage IS present, okay, upper thermostat is calling for heat. Go to step 5 below.
   - B) Rated voltage NOT present, replace upper thermostat.
5. Adjust temperature setting of upper thermostat to the minimum setting. Water temperature in tank must be above thermostat setting for this test.
6. Check voltage across terminals L4 and T4 of upper thermostat (see Figure 10).
   - A) Rated voltage NOT present, replace upper thermostat.
   - B) Rated voltage IS present, thermostat is okay. Go to step 7 on next page.

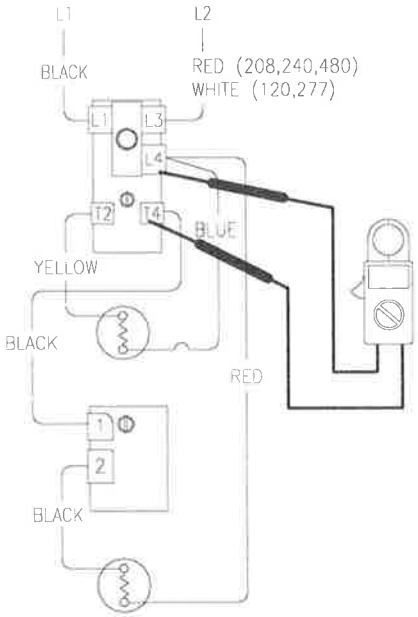



Figure 10

**Double Element, Non-Simultaneous, Single Phase Operation (continued).**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Not Enough Hot Water (continued).**

7. Check voltage across terminal L4 of upper thermostat and terminal 1 of lower thermostat (see Figure 11).

   A) Rated voltage NOT present,
   - check wire connection between thermostats.

   B) Rated voltage IS present, okay, go to step 8.

8. Adjust lower thermostat to highest setting. Water temperature in tank must be below the lower thermostat setting for this test.

9. Check voltage across terminal L4 of upper thermostat and terminal 2 of lower thermostat (see Figure 12).

   A) Rated voltage NOT present, replace lower thermostat.

   B) Rated voltage IS present, thermostat is ok.

**⚠ WARNING**
**Be sure thermostats are reset to their original temperature settings as found prior to thermostat testing**

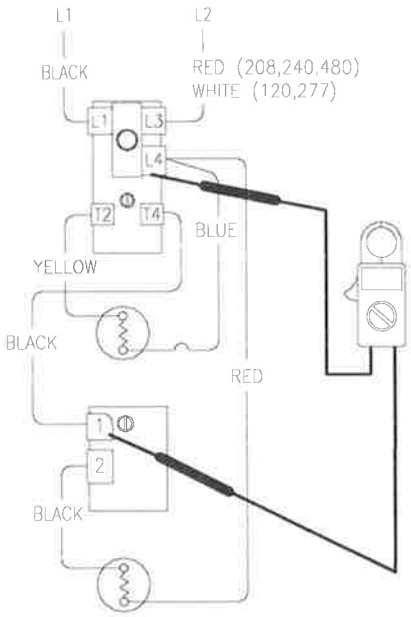



Figure 11

**Water Temperature In Tank Is Above Thermostat Setting.**

1. This procedure assumes Line voltage, ECO and elements are in working order.

2. Adjust upper and lower thermostats to the lowest setting.

3. Turn power "ON" to water heater and set multi-meter to "Volts AC."

4. Check across terminals L4 and T2 of upper thermostat (see Figure 8 on page 17).

   A) Rated voltage IS present, replace upper thermostat.

   B) Rated voltage NOT present, upper thermostat is okay. Go to step 5 below.

   C) Lower than rated voltage IS present, recheck for grounded upper element (see page 15).

5. Check across terminals L4 and 2 of lower thermostat (see Figure 12).

   A) Rated voltage IS present, replace lower thermostat.

   B) Rated voltage NOT present, lower thermostat is okay.

   C) Lower than rated voltage IS present, recheck for grounded lower element (see page 15).

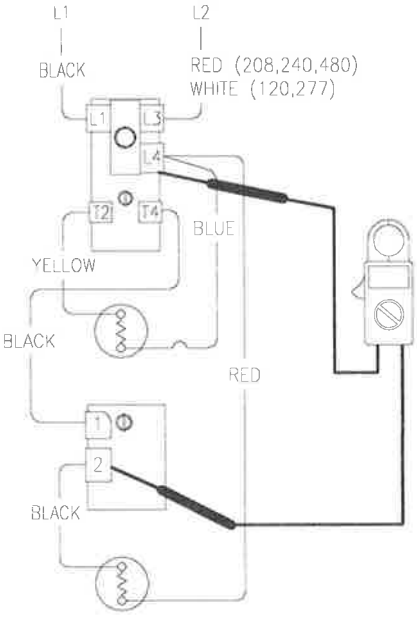



Figure 12

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

## Double Element, Non-Simultaneous, Three Phase Operation.

### Water In Tank Is Cold With Power ON.

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater.
3. Set multi-meter to "Volts AC."
4. Check across terminals L4 and T2 of upper thermostat (see Figure 13).
   - A) Rated voltage NOT present, recheck ECO. If ECO is okay, replace thermostat.
   - B) Rated voltage IS present, proceed to next step.
5. Check across element terminals (see Figure 14).
   - A) Rated voltage NOT present, check wire connections from thermostat to element.
   - B) Rated voltage IS present, repeat element testing, see page 15.

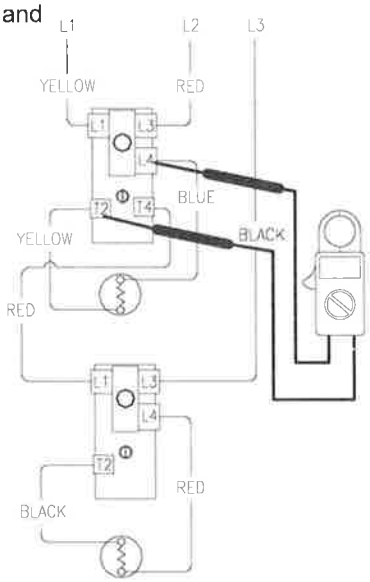



Figure 13

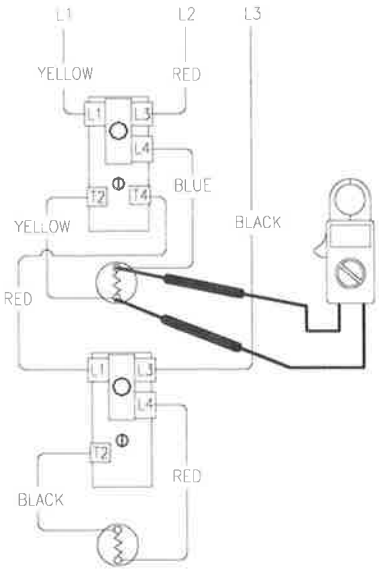



Figure 14

### Tank Does Not Deliver Enough Hot Water.

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater and set multi-meter to "Volts AC."
3. Adjust temperature setting of upper thermostat to the highest setting. Water temperature in tank must be below thermostat setting for this test.
4. See Figure 13 above, check voltage across terminals L4 & T2 of upper thermostat.
   - A) Rated voltage IS present, okay, upper thermostat is calling for heat. Go to step 5 below.
   - B) Rated voltage NOT present, replace upper thermostat.
5. Adjust temperature setting of upper thermostat to the minimum setting. Water temperature in tank must be above thermostat setting for this test.
6. Check voltage across terminals T4 of upper thermostat & L3 of lower thermostat (see Figure 15).
   - A) Rated voltage NOT present, replace upper thermostat.
   - B) Rated voltage IS present, upper thermostat is okay. Go to step 7 on next page.

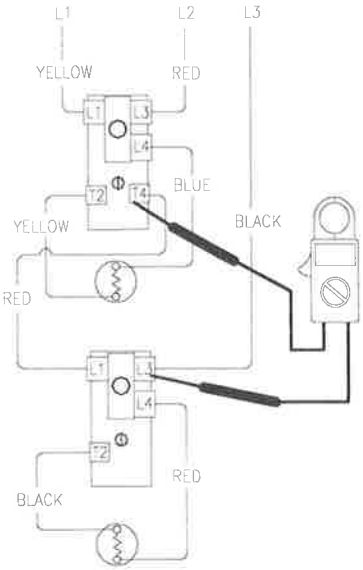



Figure 15

**Double Element, Non-Simultaneous, Three Phase Operation (continued).**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Tank Does Not Deliver Enough Hot Water (continued)**

7. Check voltage across terminal L1 & L3 of lower thermostat (see Figure 16).

   A) Rated voltage NOT present, check wire connection between thermostats.

   B) Rated voltage is present, okay, go to step 8.

8. Adjust lower thermostat to highest setting. Water temperature in tank must be below the lower thermostat setting for this test.

9. Check voltage across terminal L4 & T2 of lower thermostat (see Figure 17).

   A) Rated voltage NOT present, recheck ECO (see page 14). If ECO okay, replace lower thermostat.

   B) Rated voltage IS present, thermostat is ok. Check wire connection to lower element. If connection okay, recheck lower element (see page 15).

**⚠ WARNING**
**Be sure thermostats are reset to their original temperature settings as found prior to thermostat testing**

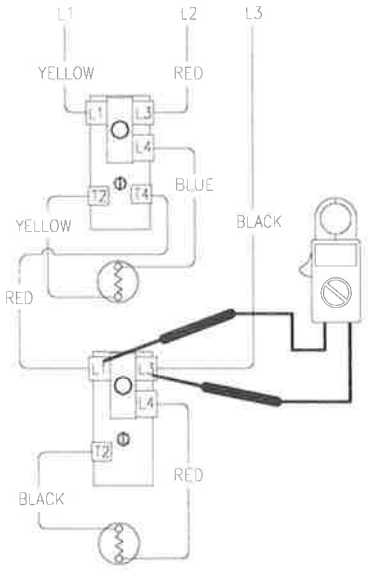



Figure 16

**Water Temperature In Tank Is Above Thermostat Setting.**

1. This procedure assumes line voltage, ECO and elements are in working order.

2. Adjust upper and lower thermostats to the lowest setting.

3. Turn power "ON" to water heater and set multi-meter to "Volts AC."

4. Check across terminals L4 and T2 of upper thermostat (see Figure 13 on page 19).

   A) Rated voltage IS present, replace upper thermostat.

   B) Rated voltage NOT present, upper thermostat is okay. Go to step 5 below.

   C) Lower than rated voltage IS present, recheck for grounded upper element (see page 15).

5. Check across terminals L4 and T2 of lower thermostat (see Figure 17).

   A) Rated voltage IS present, replace lower thermostat.

   B) Rated voltage NOT present, lower thermostat is okay.

   C) Lower than rated voltage IS present, recheck for grounded lower element (see page 15).

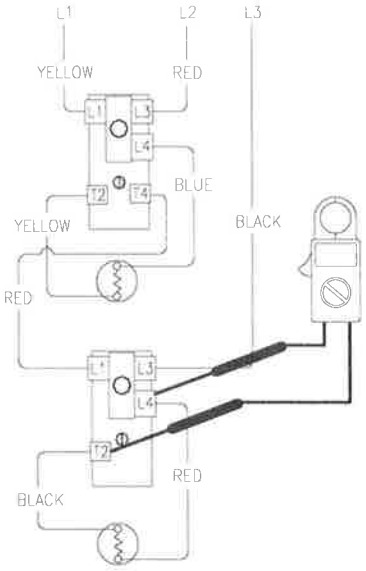



Figure 17

**Double Element, Simultaneous, Three Phase Operation.**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Water In Tank Is Cold Or Not Enough Hot Water With Power ON.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Adjust temperature setting for both thermostats to the highest setting.
2. Turn power "ON" to water heater.
3. Set multi-meter to "Volts AC."
4. Check across terminals L4 and T2 of upper thermostat (see Figure 18).
   - A) Rated voltage NOT present, recheck ECO (see page 14). If ECO is okay, replace thermostat.
   - B) Rated voltage IS present, proceed to next step.
5. Check across upper element terminals (see Figure 19).
   - A) Rated voltage NOT present, check wire connections from thermostat to element.
   - B) Rated voltage IS present, repeat element testing see page 15.
6. Check across terminals L1 & L3 of lower thermostat (see Figure 20).
   - A) Rated voltage NOT present, check wire connections from upper to lower thermostats.
   - B) Rated voltage IS present, okay, go to step 7.
7. Check across terminals L4 and T2 of lower thermostat (see Figure 21).
   - A) Rated voltage NOT present, recheck ECO (see page 14). If ECO is okay, replace thermostat.
   - B) Rated voltage IS present, proceed to next step.
8. Check across lower element terminals.
   - A) Rated voltage NOT present, check wire connections from thermostat to element.
   - B) Rated voltage IS present, repeat element testing see page 15.

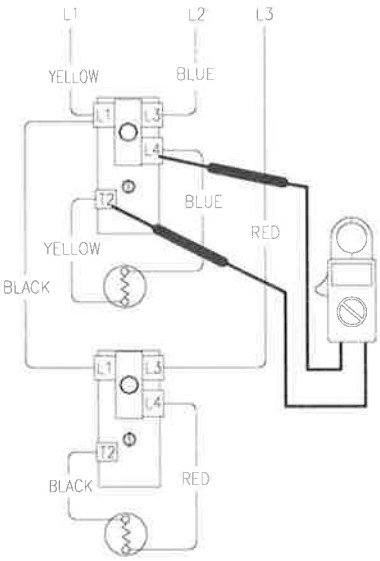


Figure 18

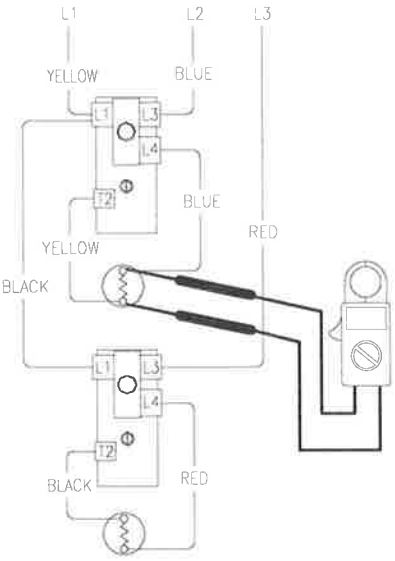


Figure 19

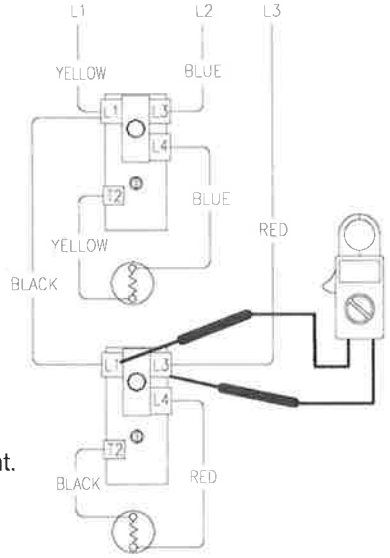


Figure 20

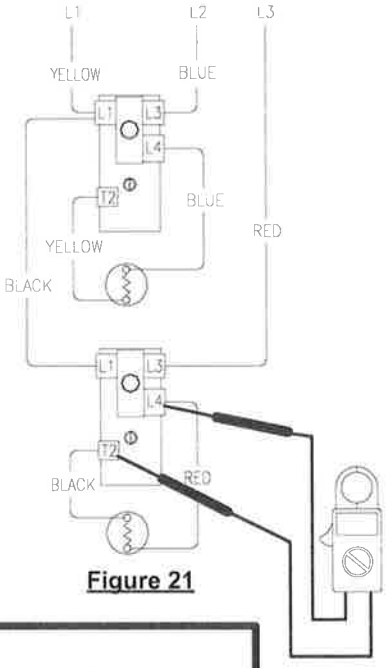


Figure 21

**⚠ WARNING**
**Be sure thermostats are reset to their original temperature settings as found prior to thermostat testing**

**Double Element, Simultaneous, Three Phase Operation (continued).**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Water Temperature In Tank Is Above Thermostat Setting.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Adjust upper and lower thermostat to the lowest setting.
3. Turn power "ON" to water heater.
4. Set multi-meter to "Volts AC."
5. Check across terminals L4 and T2 of upper thermostat (see Figure 22).
   - A) Rated voltage IS present, replace upper thermostat.
   - B) Rated voltage NOT present, upper thermostat is okay. Go to step 6 below.
   - C) Lower than rated voltage IS present, recheck for grounded upper element (see page 15).
6. Check across terminals L4 and T2 of lower thermostat (see Figure 23).
   - A) Rated voltage IS present, replace lower thermostat.
   - B) Rated voltage NOT present, lower thermostat is okay.
   - C) Lower than rated voltage IS present, recheck for grounded lower element (see page 15).

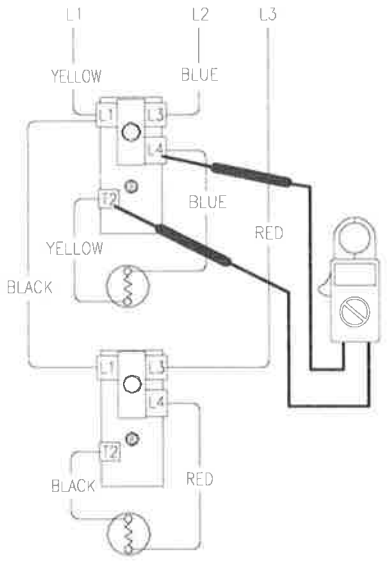



Figure 22

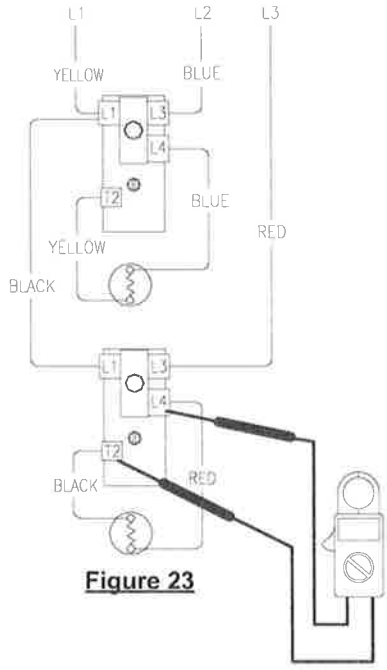



Figure 23

**Double Element, Non-Simultaneous, Single Phase, Off Peak Operation.**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Water In Tank Is Cold With Power ON.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater.
3. Set multi-meter to "Volts AC."
4. Check across terminals L4 and T2 of upper thermostat (see Figure 24).
   - A) Rated voltage NOT present, recheck ECO (see page 14). If ECO is okay, replace thermostat.
   - B) Rated voltage IS present, proceed to next step.
5. Check across element terminals (see Figure 25).
   - A) Rated voltage NOT present, check wire connections from thermostat to element.
   - B) Rated voltage IS present, Repeat element testing see page 15.

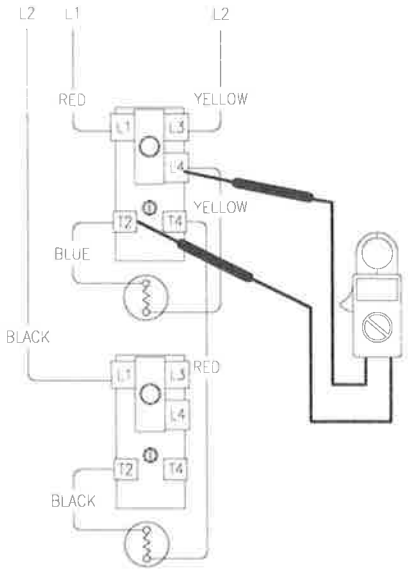



Figure 24

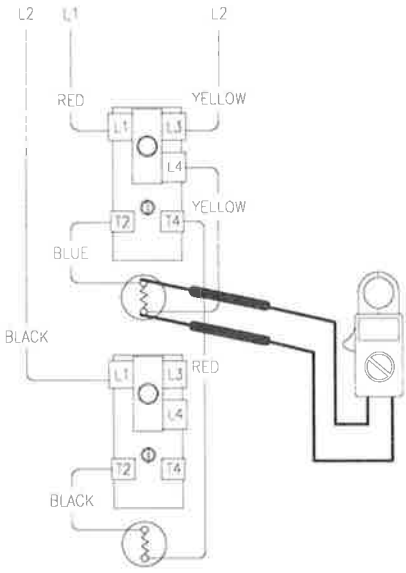



Figure 25

**Tank Does Not Deliver Enough Hot Water.**

1. This procedure assumes line voltage, ECO and elements are in working order. Be sure OFF PEAK meter has not interrupted line voltage.
2. Turn power "ON" to water heater and set multi-meter to "Volts AC."
3. Adjust temperature setting of upper & lower thermostat to the highest setting. Water temperature in tank must be below thermostat setting for this test.
4. See Figure 24 above. Check voltage across terminals L4 & T2 of upper thermostat.
   - A) Rated voltage IS present, okay, upper thermostat is calling for heat. Go to step 5 below.
   - B) Rated voltage NOT present, replace upper thermostat.
5. Adjust temperature setting of upper thermostat to the minimum setting. Water temperature in tank must be above thermostat setting for this test.
6. Check voltage across terminals T4 of upper thermostat & L1 of lower thermostat (see Figure 26).
   - A) Rated voltage NOT present, replace upper thermostat.
   - B) Rated voltage IS present, upper thermostat is okay. Go to step 7 on next page.

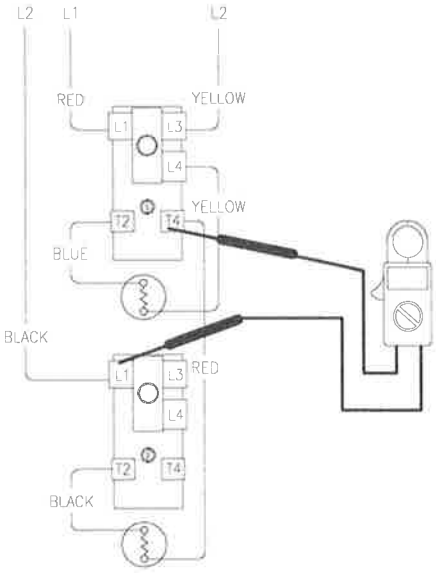



Figure 26

**Double Element, Non-Simultaneous, Single Phase, Off Peak Operation. (continued)**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Not Enough Hot Water (continued).**

7. Check voltage across terminal T4 of upper thermostat & T2 of lower thermostat. (see Figure 27).

   A) Rated voltage NOT present, replace lower thermostat.

   B) Rated voltage is present, okay, go to step 8.

8. Check voltage across lower element (see Figure 28).

   A) Rated voltage NOT present, check wire connections between thermostats & element.

   B) Rated voltage IS present, repeat element testing see page 15.

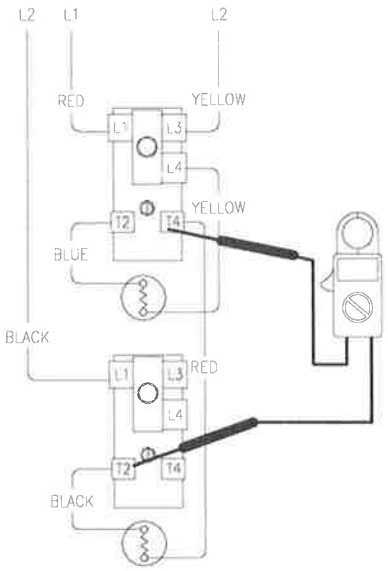



Figure 27

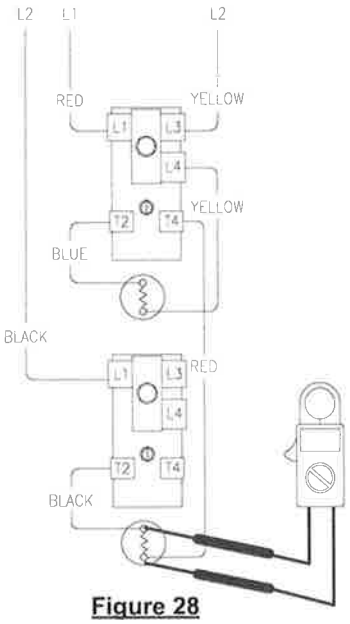



Figure 28

**⚠ WARNING**
**Be sure thermostats are reset to their original temperature settings as found prior to thermostat testing**

**Water Temperature In Tank Is Above Thermostat Setting.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Adjust upper and lower thermostats to the lowest setting.
3. Turn power "ON" to water heater and set multi-meter to "Volts AC."
4. Check across terminals L4 and T2 of upper thermostat (see Figure 24 on page 23).

   A) Rated voltage IS present, replace upper thermostat.

   B) Rated voltage NOT present, upper thermostat is okay. Go to step 5 below.

   C) Lower than rated voltage IS present, recheck for grounded upper element (see page 15).

5. Check across terminals T4 of upper thermostat and T2 of lower thermostat (see Figure 27 above).

   A) Rated voltage IS present, replace lower thermostat.

   B) Rated voltage NOT present, lower thermostat is okay.

   C) Lower than rated voltage IS present, recheck for grounded lower element (see page 15).

**Double Element, Non-Simultaneous, Single Phase Operation.**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Water In Tank Is Cold With Power ON.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater.
3. Set multi-meter to "Volts AC."
4. Check across terminals L4 and T2 of upper thermostat (see Figure 29).
   - A) Rated voltage NOT present, recheck ECO (see page 14). If ECO is okay, replace thermostat.
   - B) Rated voltage IS present, proceed to next step.
5. Check across element terminals (see Figure 30).
   - A) Rated voltage NOT present, check wire connections from thermostat to element.
   - B) Rated voltage IS present, repeat element testing see page 15.

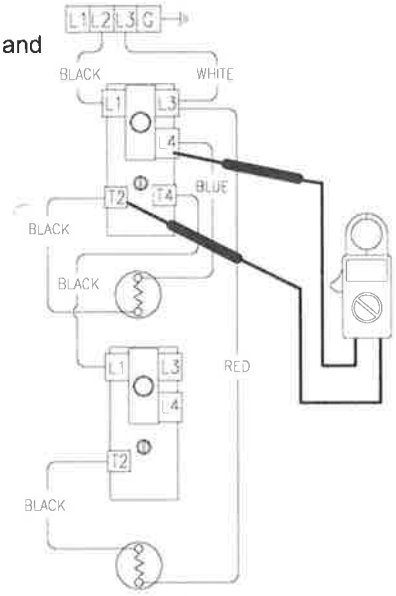



Figure 29

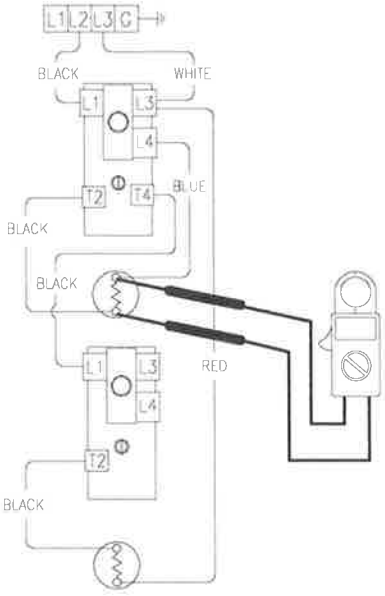



Figure 30

**Tank Does Not Deliver Enough Hot Water.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater and set multi-meter to "Volts AC."
3. Adjust temperature setting of upper & lower thermostat to the highest setting. Water temperature in tank must be below thermostat setting for this test.
4. See Figure 29 above. Check voltage across terminals L4 & T2 of upper thermostat.
   - A) Rated voltage IS present, okay, upper thermostat is calling for heat. Go to step 5 below.
   - B) Rated voltage NOT present, replace upper thermostat.
5. Adjust temperature setting of upper thermostat to the minimum setting. Water temperature in tank must be above thermostat setting for this test.
6. Check voltage across terminals L3 & T4 of upper thermostat (see Figure 31).
   - A) Rated voltage NOT present, replace upper thermostat.
   - B) Rated voltage IS present, upper thermostat is okay. Go to step 7 on next page.

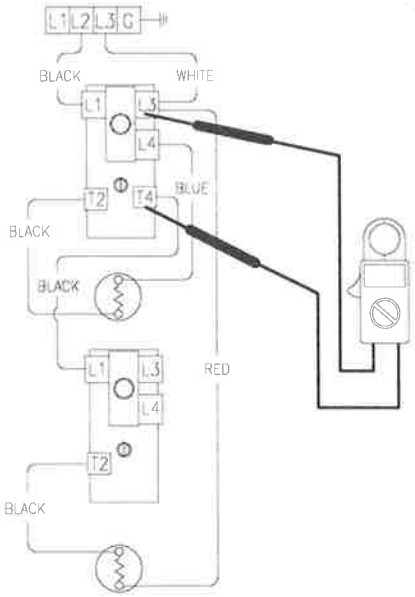



Figure 31

**Double Element, Non-Simultaneous, Single Phase Operation (continued)**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Tank Does Not Deliver Enough Hot Water (continued).**

7. Check voltage across terminal L3 of upper thermostat & T2 of lower Thermostat. (see Figure 32).
   - A) Rated voltage NOT present, replace lower thermostat.
   - B) Rated voltage is present, okay, go to step 8.
8. Check voltage across lower element (see Figure 33).
   - A) Rated voltage NOT present, Check wire connections between thermostats & element.
   - B) Rated voltage IS present, repeat element testing see page 15.

**⚠ WARNING**
**Be sure thermostats are reset to their original temperature settings as found prior to thermostat testing**

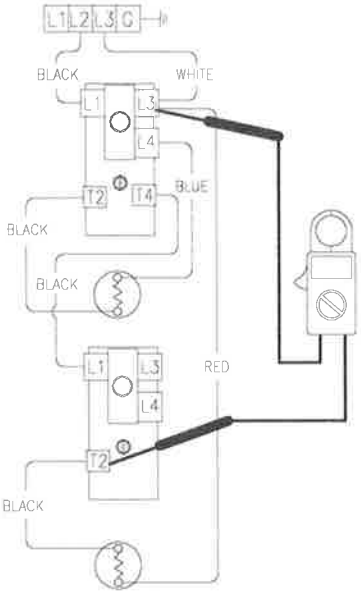



Figure 32

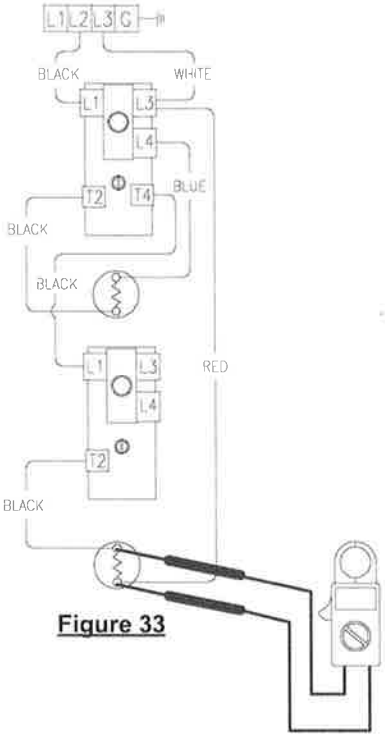



Figure 33

**Water Temperature In Tank Is Above Thermostat Setting.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Adjust upper and lower thermostat to the lowest setting.
3. Turn power "ON" to water heater and Set multi-meter to "Volts AC."
4. See Figure 32 above. Check across terminal L3 of upper thermostat & T2 of lower thermostat.
   - A) Rated voltage IS present, replace lower thermostat.
   - B) Rated voltage NOT present, okay, go to step 5 below.
   - C) Lower than rated voltage IS present, recheck for grounded lower element see page 15.
5. Check across terminal L4 & T2 of upper thermostat (see Figure 34).
   - A) Rated voltage IS present, replace upper thermostat.
   - B) Rated voltage NOT present, upper thermostat is okay.
   - C) Lower than rated voltage IS present, recheck for grounded upper element see page 15.

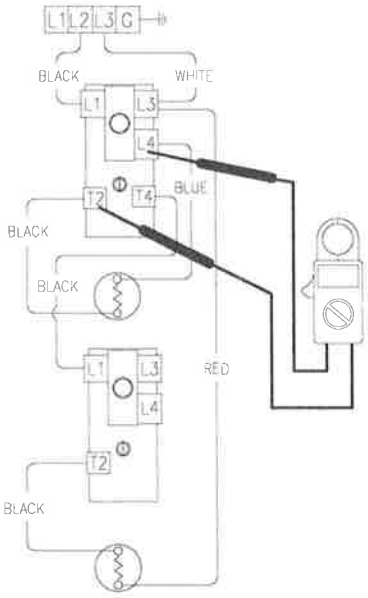



Figure 34

**Double Element, Simultaneous, Single Phase Operation.**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Water In Tank Is Cold Or Not Enough Hot Water With Power ON.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Adjust temperature setting for both thermostats to the highest setting.
3. Turn power "ON" to water heater.
4. Set multi-meter to "Volts AC."
5. Check across terminals L4 and T2 of upper thermostat (see Figure 35).
   - A) Rated voltage NOT present, recheck upper ECO (see page 14). If ECO is okay, replace upper thermostat.
   - B) Rated voltage IS present, proceed to next step.
6. Check across upper element terminals (see Figure 36).
   - A) Rated voltage NOT present, check wire connections from thermostat to upper element.
   - B) Rated voltage IS present, repeat element testing see page 15.
7. Check across terminal L3 of upper thermostat and T2 of lower thermostat (see Figure 37).
   - A) Rated voltage NOT present, check ECO (see page 14) & wire connections at upper & lower thermostats. If okay, replace lower thermostat.
   - B) Rated voltage IS present, proceed to next step.
8. Check across lower element terminals (see Figure 38).
   - A) Rated voltage NOT present, check lower element wire connections to the thermostats.
   - B) Rated voltage IS present, repeat lower element testing see page 15

**⚠ WARNING**
**Be sure thermostats are reset to their original temperature settings as found prior to thermostat testing**

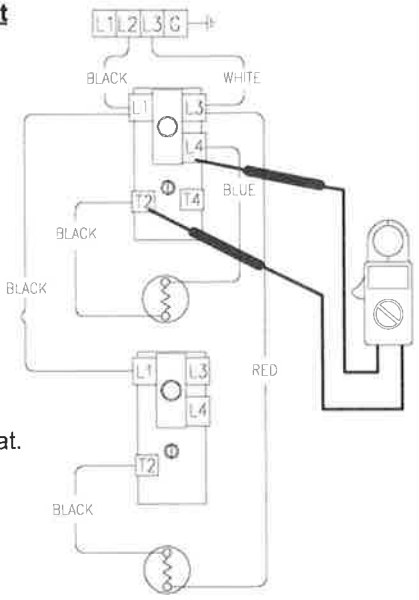



Figure 35

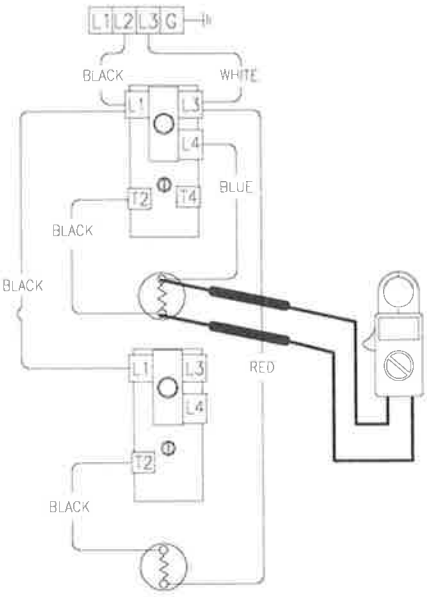



Figure 36

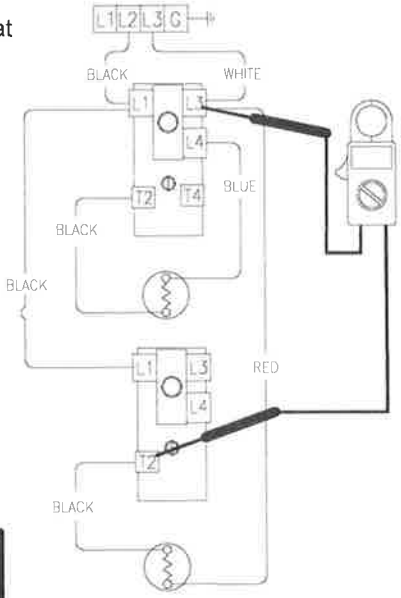



Figure 37

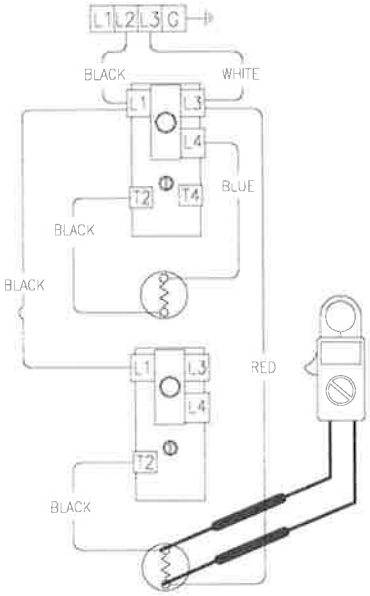



Figure 38

**Double Element, Simultaneous, Single Phase Operation (continued)**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Water Temperature In Tank Is Above Thermostat Setting.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Adjust upper and lower thermostat to the lowest setting.
3. Turn power "ON" to water heater.
4. Set multi-meter to "Volts AC."
5. Check across terminals L4 and T2 of upper thermostat (see Figure 39).
   - A) Rated voltage IS present, replace upper thermostat.
   - B) Rated voltage NOT present, upper thermostat is okay. Go to step 6 below.
   - C) Lower than rated voltage IS present, recheck for grounded upper element see page 15.
6. Check across terminal L3 of upper thermostat and T2 of lower thermostat (see Figure 40).
   - A) Rated voltage IS present, replace lower thermostat.
   - B) Rated voltage NOT present, lower thermostat is okay.
   - C) Lower than rated voltage IS present, recheck for grounded lower element see page 15.

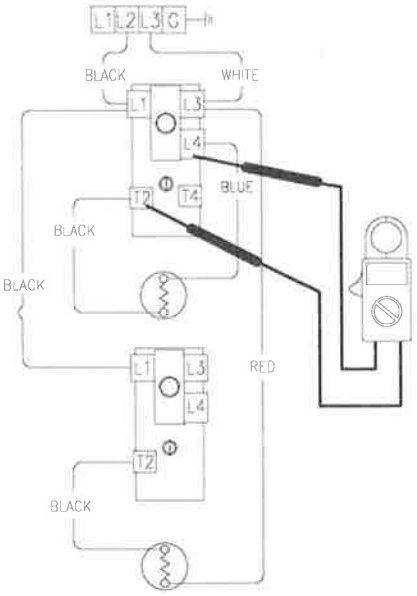



Figure 39

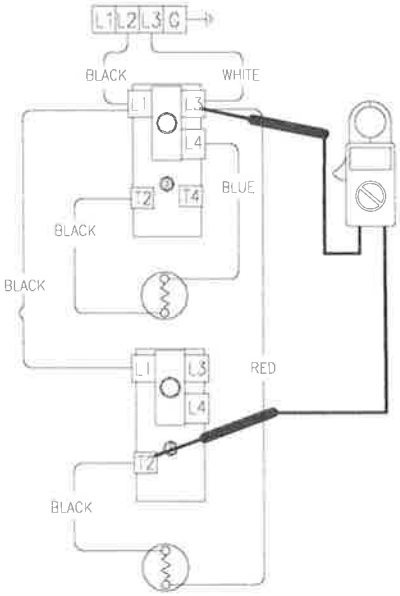



Figure 40

**Double Element, Non-Simultaneous, Three Phase Operation.**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Water In Tank Is Cold With Power ON.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater.
3. Set multi-meter to "Volts AC."
4. Check across terminals L4 and T2 of upper thermostat (see Figure 41).
   - A) Rated voltage NOT present, recheck upper ECO. If ECO is okay, replace thermostat.
   - B) Rated voltage IS present, proceed to next step.
5. Check across element terminals (see Figure 42).
   - A) Rated voltage NOT present, check wire connections from thermostat to element.
   - B) Rated voltage IS present, repeat element testing see page 15.

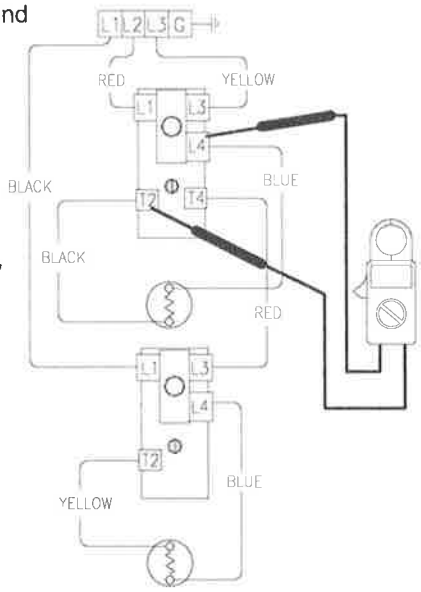



Figure 41

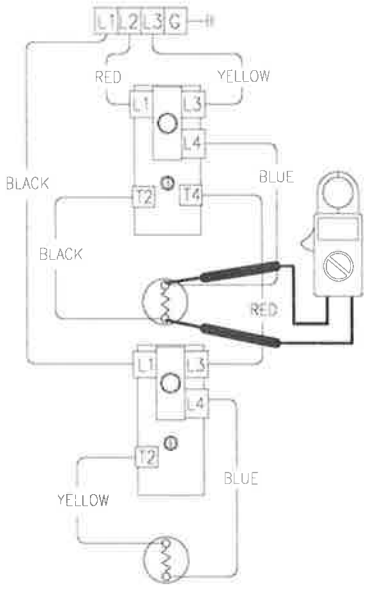



Figure 42

**Tank Does Not Deliver Enough Hot Water.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Turn power "ON" to water heater and set multi-meter to "Volts AC."
3. Adjust temperature setting of upper & lower thermostat to the highest setting. Water temperature in tank must be below thermostat setting for this test.
4. See Figure 41 above. Check voltage across terminals L4 & T2 of upper thermostat.
   - A) Rated voltage IS present, okay, upper thermostat is calling for heat. Go to step 5 below.
   - B) Rated voltage NOT present, replace upper thermostat.
5. Adjust temperature setting of upper thermostat to the minimum setting. Water temperature in tank must be above thermostat setting for this test.
6. Check voltage across terminals L3 & T4 of upper thermostat (see Figure 43).
   - A) Rated voltage NOT present, replace upper thermostat.
   - B) Rated voltage IS present, upper thermostat is okay. Go to step 7 on next page.

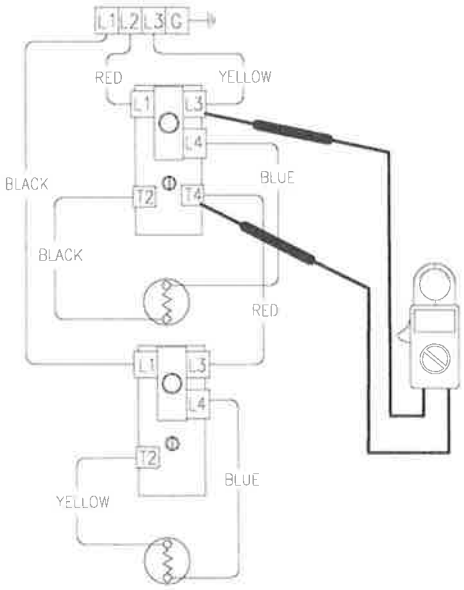



Figure 43

**Double Element, Non-Simultaneous, Three Phase Operation (continued).**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Tank Does Not Deliver Enough Hot Water (continued).**

7. Check voltage across terminal L1 of upper thermostat & T2 of lower thermostat. (see Figure 44).
   - A) Rated voltage NOT present, Replace lower thermostat.
   - B) Rated voltage is present, okay, go to step 8.
8. Check voltage across lower element (see Figure 45).
   - A) Rated voltage NOT present, check wire connections between thermostats & element.
   - B) Rated voltage IS present, repeat element testing see page 15.

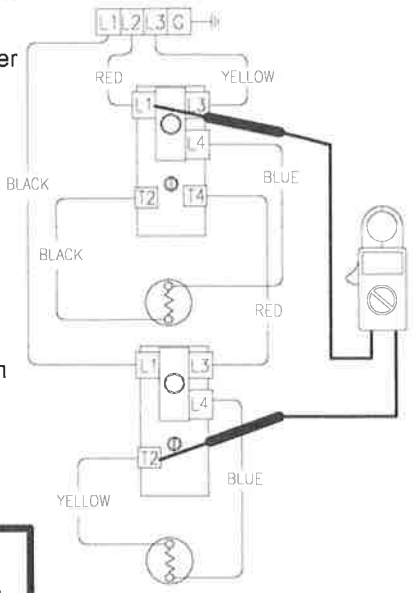



Figure 44

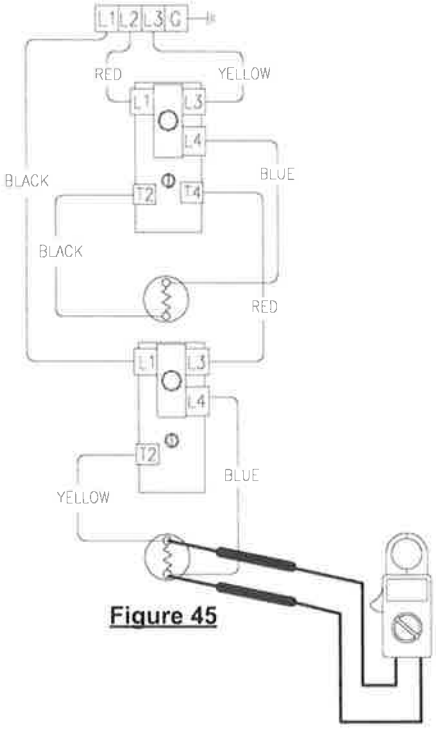



Figure 45

**⚠ WARNING**
**Be sure thermostats are reset to their original temperature settings as found prior to thermostat testing**

**Water Temperature In Tank Is Above Thermostat Setting.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Adjust upper and lower thermostat to the lowest setting.
3. Turn power "ON" to water heater and Set multi-meter to "Volts AC."
4. See Figure 44 above. Check across terminal L1 of upper thermostat & T2 of lower thermostat.
   - A) Rated voltage IS present, replace lower thermostat.
   - B) Rated voltage NOT present, okay, go to step 5 below.
   - C) Lower than rated voltage IS present, recheck for grounded lower element.
5. Check across terminal L4 & T2 of upper thermostat (see Figure 46).
   - A) Rated voltage IS present, replace upper thermostat.
   - B) Rated voltage NOT present, upper thermostat is okay.
   - C) Lower than rated voltage IS present, recheck for grounded upper element, see page 15.

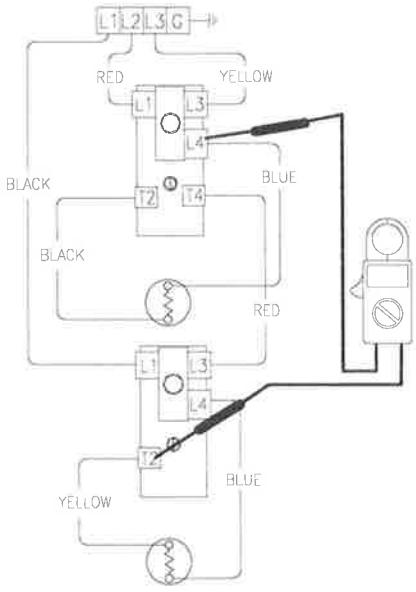



Figure 46

**Double Element, Simultaneous, Three Phase Operation.**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Water In Tank Is Cold Or Not Enough Hot Water With Power ON.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Adjust temperature setting for both thermostats to the highest setting.
3. Turn power "ON" to water heater.
4. Set multi-meter to "Volts AC."
5. Check across terminals L4 and T2 of upper thermostat (see Figure 47).
   - A) Rated voltage NOT present, recheck upper ECO (see page 14). If ECO is okay, replace upper thermostat.
   - B) Rated voltage IS present, proceed to next step.
6. Check across upper element terminals (see Figure 48).
   - A) Rated voltage NOT present, check wire connections from thermostat to upper element.
   - B) Rated voltage IS present, repeat element testing see page 15
7. Check across terminal L4 of lower thermostat and T2 of lower thermostat (see Figure 49).
   - A) Rated voltage NOT present, check ECO (see page 14) & wire connections at upper & lower thermostats. If okay, replace lower thermostat.
   - B) Rated voltage IS present, proceed to next step.
8. Check across lower element terminals (see Figure 50).
   - A) Rated voltage NOT present, check lower element wire connections to thermostat.
   - B) Rated voltage IS present, repeat lower element testing see page 15.

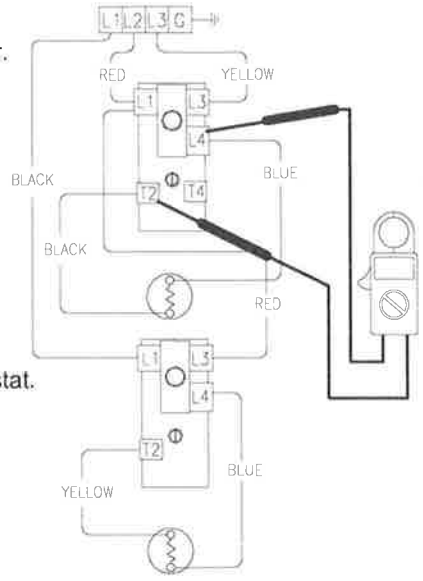



Figure 47

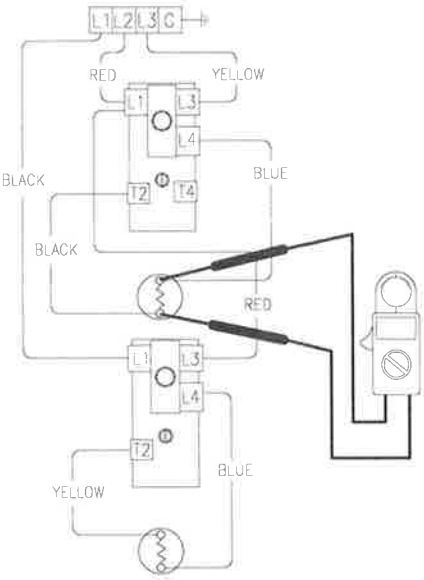



Figure 48

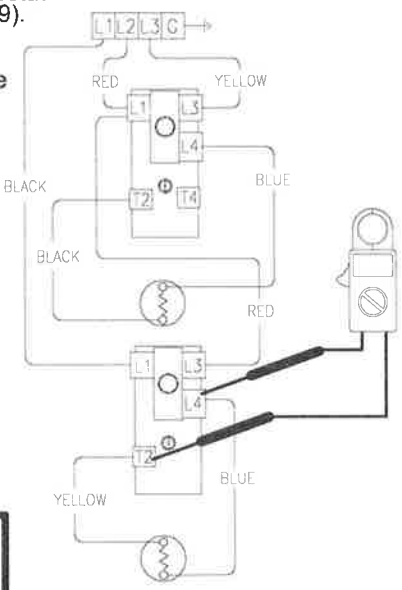



Figure 49

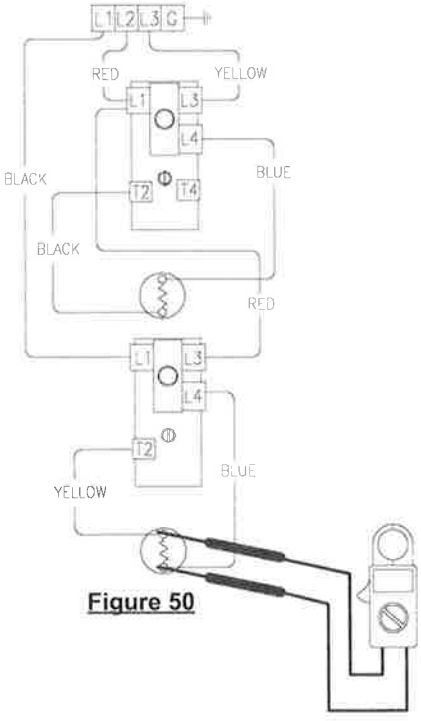



Figure 50

**⚠ WARNING**
**Be sure thermostats are reset to their original temperature settings as found prior to thermostat testing**

**Double Element, Simultaneous, Three Phase Operation (continued).**

**⚠ WARNING**
**High voltage exposure. Use caution to avoid personal injury during this procedure.**

**Water Temperature In Tank Is Above Thermostat Setting.**

1. This procedure assumes line voltage, ECO and elements are in working order.
2. Adjust upper and lower thermostat to the lowest setting.
3. Turn power "ON" to water heater.
4. Set multi-meter to "Volts AC."
5. Check across terminals L4 and T2 of upper thermostat (see Figure 51).
   - A) Rated voltage IS present, replace upper thermostat.
   - B) Rated voltage NOT present, upper thermostat is okay. Go to step 6 below.
   - C) Lower than rated voltage IS present, recheck for grounded upper element see page 15.
6. Check across terminals L4 & T2 of lower thermostat (see Figure 52).
   - A) Rated voltage IS present, replace lower thermostat.
   - B) Rated voltage NOT present, lower thermostat is okay.
   - C) Lower than rated voltage IS present, recheck for grounded lower element.

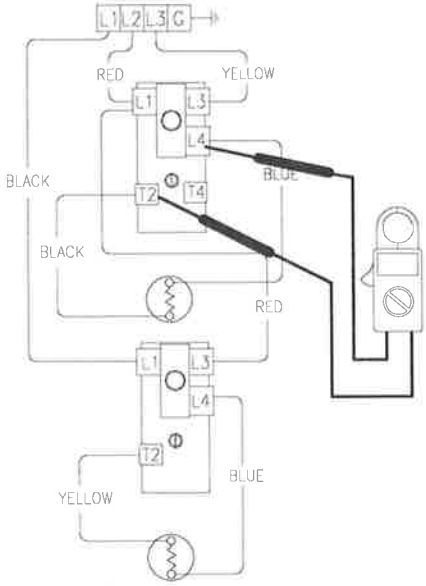



Figure 51

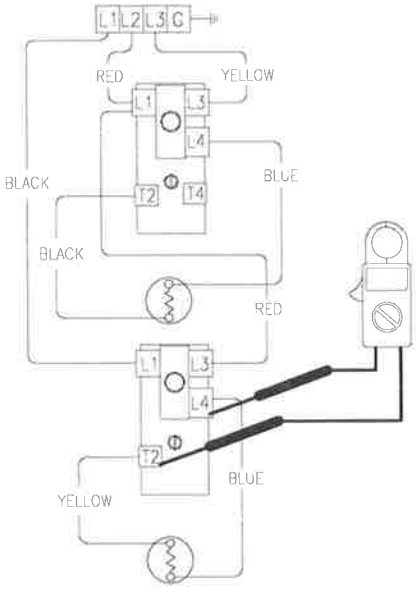



Figure 52



BRADFORD WHITE WATER HEATERS

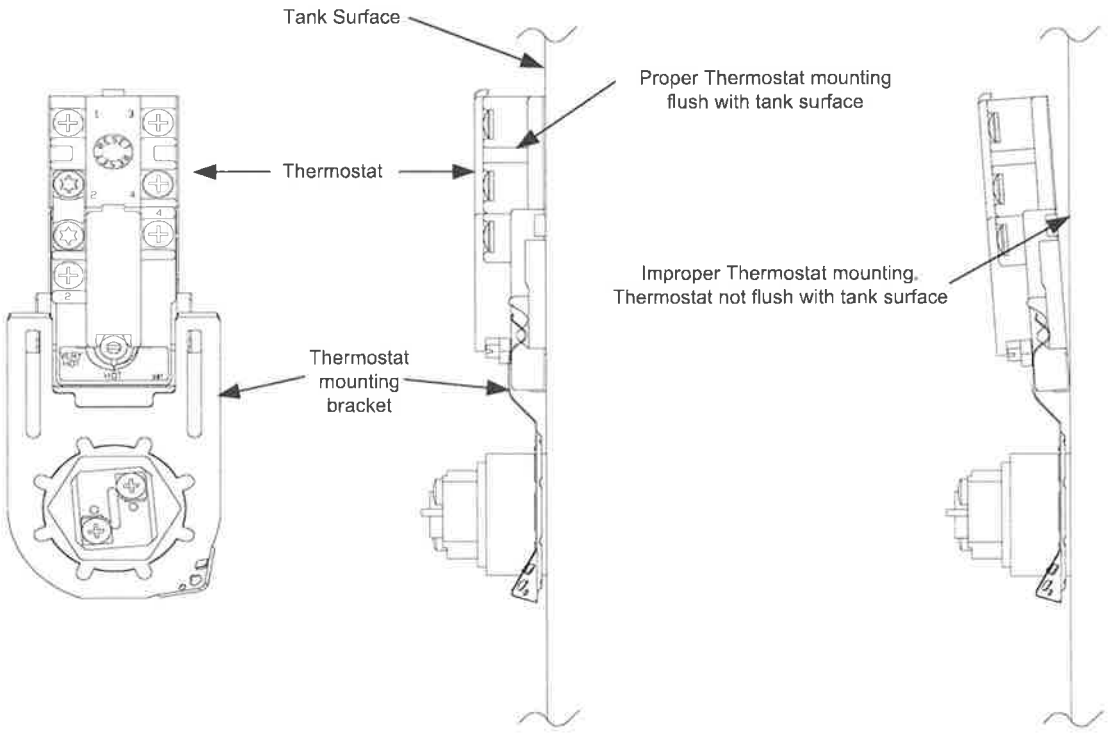
## Thermostat Removal

**⚠ WARNING**
**High voltage exposure. Be sure power is "OFF" when performing this procedure.**

1. Turn power "OFF" to water heater.
2. Remove access cover and insulation.
3. Remove plastic thermostat protector from thermostat.
4. Disconnect wires from thermostat terminals. It may be necessary to label wires for proper re-connection to new thermostat.
5. Note thermostat temperature setting for proper setting of new thermostat.
6. Slide thermostat upwards and out of mounting bracket.

## Thermostat Replacement

1. Use a stiff brush to remove any debris or loose scale from tank surface where new thermostat will be installed.
2. Slide new thermostat down into thermostat bracket until it snaps into place. IMPORTANT! Thermostat must sit completely flat or flush to tank surface. An improperly installed thermostat will cause improper water heater operation.
3. Refer to the wire diagram located on the inside of the access cover and reconnect wires to the thermostat. Be sure wire connections are snug and corrosion free. Do not over tighten, doing so may damage thermostat.
4. Set thermostat to the original thermostat setting found on the old thermostat.
5. Re-install plastic thermostat protector.
6. Re-install insulation and access cover.
7. Restore power to water heater and verify proper heater operation.




Front View
Thermostat Mounting

Side View
Proper Thermostat
Mounting

Side View
Improper Thermostat
Mounting

**⚠ WARNING**
**High voltage exposure. Be sure power is "OFF" when performing this procedure.**

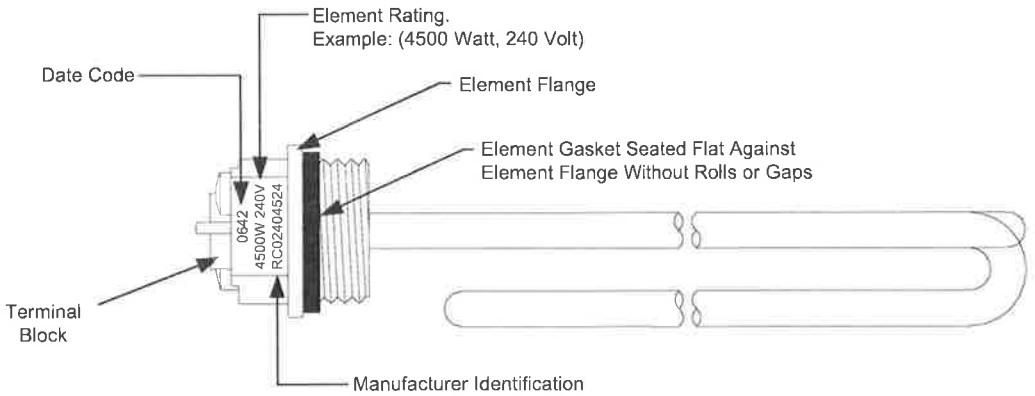
**⚠ WARNING**
**Heater components and stored water may be HOT when performing the following steps in this procedure. Take necessary precaution to prevent personal injury.**

## Heating Element Removal

1. Turn power "OFF" To water heater.
2. Turn off cold water supply to heater. Connect hose to drain spigot of water heater and route to an open drain. Open a nearby hot water faucet to vent heater for draining. Open drain spigot of water heater and allow heater to drain to a point below the element(s).
3. Close drain spigot and remove hose.
4. Remove access cover and insulation.
5. Remove plastic thermostat protector from thermostat.
6. Disconnect wires from element terminals.
7. Remove element from tank using 1-½ deep well socket or appropriate wrench. Unscrew element counter-clockwise to remove from tank.
8. Be sure to remove old element gasket from the tank. It is not recommended to be re-used.

## Heating Element Replacement

1. Check element terminal block for proper electrical rating. NOTE: Some elements have dual ratings, be sure to check all surfaces of the element terminal block (see illustration below).
2. Apply new element gasket to the new element. Be sure gasket is seated flat against element flange without rolls or gaps (see illustration below).
3. Clean any debris from element fitting on tank. Lubricate element threads as needed with thread lubricant.
4. Thread new element clockwise into tank. Tighten element using 1-½ deep well socket or appropriate wrench. Do not over tighten, over tightening may damage element gasket.
5. Reconnect wires to element, be sure wires are snug and corrosion free. Do not over tighten, doing so may damage terminal block.
6. Resume water supply to heater, be sure tank is full of water and check for leaks.
7. Re-install plastic thermostat protector.
8. Re-install insulation and access cover.
9. To resume operation, **BE SURE TANK IS FULL OF WATER** and restore power to water heater. Verify proper heater operation.



## Diptube Inspection and Replacement

**⚠ WARNING**
**Heater components and stored water may be HOT when performing the following steps in this procedure. Take necessary precaution to prevent personal injury.**

Step 1. Turn power "OFF" to water heater.

Step 2. Turn off cold water supply to heater. Connect hose to drain spigot of water heater and route to an open drain. Open a nearby hot water faucet to vent heater for draining. Open drain spigot of water heater and allow heater to drain to a point below the inlet connection nipple.

Step 3. Close drain spigot and remove hose.

Step 4. Disconnect inlet nipple from plumbing system.

Step 5. With an appropriate wrench, remove inlet nipple/dip tube from the water heater. Use caution not to damage nipple threads.

Step 6. Visually inspect inlet nipple/dip tube. Inlet nipple/dip tube should be free of cracks and any blockage. Hydro-jets located near the bottom of the dip tube should be open and free of any blockage. Anti-siphon hole located approximately 6" from the bottom of nipple, should be free of any blockage.

Any damage such as cracks, restriction due to deformation or unintentional holes are not field repairable and the inlet nipple/dip tube must be replaced.

Step 7. Upon completion of inspection or subsequent replacement, reinstall inlet nipple/dip tube into heater. Ensure pipe dope is used on the nipple's threads. Connect nipple to plumbing system, close spigot and remove drain hose, resume water supply and refill heater with water.

Step 8. To resume operation, **BE SURE TANK IS FULL OF WATER** and turn power "ON" to water heater.

## Anode Inspection and Replacement

Step 1. Turn power "OFF" to water heater.

Step 2. Turn off cold water supply to heater. Connect hose to drain spigot of water heater and route to an open drain. Open a nearby hot water faucet to vent heater for draining. Open drain spigot of water heater and allow heater to drain to a point below the outlet connection nipple.

Step 3. Close drain spigot and remove hose.

Step 4. Disconnect outlet nipple from plumbing system.

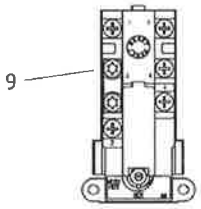
Step 5. With an appropriate wrench, remove outlet nipple/anode from the water heater. Use caution not to damage nipple threads.

Step 6. Visually inspect outlet nipple/anode. Outlet nipple/anode should show signs of depletion, this is normal. If depletion is ½ of the original anode diameter (original diameter approximately ¾"), replacement is recommended. If any of the steel core of the anode is exposed, replacement is recommended.

Step 7. Upon completion of inspection or subsequent replacement, reinstall outlet nipple/anode into heater. Ensure pipe dope is used on the nipple's threads. Connect nipple to plumbing system, close spigot and remove drain hose, resume water supply and refill heater with water.

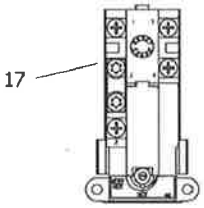
Step 8. To resume operation, **BE SURE HEATER IS FULL OF WATER** and turn power "ON" to water heater.

TOP LOCATION
- Double element water heater, non-simultaneous single phase and three phase operation.

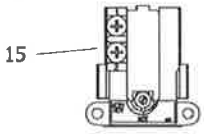


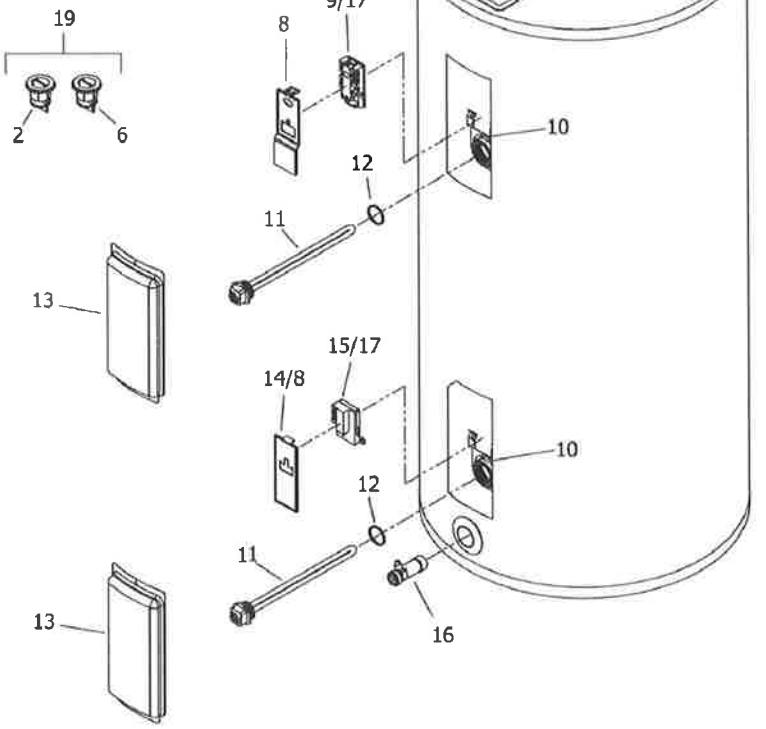

TOP LOCATION
- Double element water heater, simultaneous operation.

BOTTOM LOCATION
- Single element water heater.
- Double element water heater, non-simultaneous three phase operation.
- Double element water heater, simultaneous operation.




BOTTOM LOCATION
- Double element water heater, non-simultaneous single phase operation.




1. T&P Relief Valve
2. Heat Trap Insert (Outlet)
3. Hot Water Outlet/Anode
4. Cover Conduit/Ground
5. Junction Box Cover
6. Heat Trap Insert (Inlet)
7. Cold Water Inlet Diptube
8. Upper Thermostat Protector
9. Upper Thermostat
10. Thermostat Mounting Bracket
11. Heating Element
12. Element Gasket
13. Access Cover
14. Lower Thermostat Protector
15. Lower Thermostat (59T)
16. Brass Drain Valve
17. Thermostat w/High Limit (59T/66T)
18. ASSE Approved Mixing Device
19. Kit Heat Trap

# NOTES

# NOTES

# NOTES

BRADFORD WHITE®
WATER HEATERS

## United States

| | |
|---|---|
| *Sales* | 800-523-2931 |
| *Technical Support* | 800-334-3393 |
| *Email* | *techserv@bradfordwhite.com* |
| *Warranty* | 800-531-2111 |
| *Email* | *warranty@bradfordwhite.com* |
| *Service Parts* | 800-538-2020 |
| *Email* | *parts@bradfordwhite.com* |

## Canada

| | |
|---|---|
| *Sales & Technical Support* | 866-690-0961 905-203-0600 |
| *Fax* | 905-636-0666 |
| *Warranty* | *bwccwarranty@bradfordwhite.com* |
| *Technical Support* | *bwcctech@bradfordwhite.com* |
| *Service Parts* | *orders@bradfordwhitecanada.com* |
| *Orders* | *ca.orders@bradfordwhite.com* |

For U.S. and Canada field service,
contact your professional installer or
local Bradford White sales representative.

## International

| | |
|---|---|
| *General Contact* | *international@bradfordwhite.com* |

 **www.bradfordwhite.com**

# BRADFORD WHITE CORPORATION

# LIMITED COMMERCIAL WATER HEATER WARRANTY

### WHAT DOES THIS LIMITED WARRANTY COVER?

This limited warranty covers both the glass-lined tank and component parts for leakage or other malfunction caused by defects in materials and/or workmanship. It extends to the first buyer and to any subsequent owner(s) as long as the water heater remains installed at its original place of installation.

### WHAT DOES THIS LIMITED WARRANTY NOT COVER?*

1. This limited warranty does not cover leakage or other malfunctions caused by:
   a) Defective installation, and specifically, any installation which is made:
      i) in violation of applicable state or local plumbing, housing or building codes, or
      ii) without a certified American Gas Association, ASME, or comparable combination temperature and pressure relief valve, or
      iii) contrary to the written instructions furnished with the unit.
   b) Adverse local conditions, and specifically, sediment or lime precipitate in the tank or corrosive elements in the atmosphere.
   c) Misuse, and specifically, operations, and maintenance contrary to the written instructions furnished with the unit, removal of anode(s), disconnection, alteration or addition of non-approved components or apparatus, operation with fuels or at settings other than those set forth on the rating plate, or accidental or other exterior damage.
2. This warranty also does not cover:
   a) Production of noise, taste, odors, discoloration or rusty water.
   b) Incidental property damage, loss of use, inconvenience or other incidental or consequential costs.
   c) Costs associated with the replacement and/or repair of the unit, including:
      i) any freight, shipping or delivery charges
      ii) any removal, installation or re-installation charges
      iii) any material, and/or permits required for installation, re-installation or repair
      iv) charges to return the defective water heater and/or component part to the manufacturer.

### WHAT IS THE PERIOD OF COVERAGE?

This limited warranty runs from date of installation (or without proof of installation, from three (3) months after the date of manufacture) for the period specified on the following chart. To determine length of coverage, check model number listed on the rating plate of appliance against this chart.

| MODEL NUMBER PREFIX | LIMITED TANK** WARRANTY | LIMITED PARTS** WARRANTY |
|---|---|---|
| D, H, V, LD, DB, PDV, F-I, L-I-6, M,M-I, M-II, EF, LH-I, LV-I, TW, DH, SW, CDW, PDX, P, E, U, (U)LG, LE, LC, CEHD, CEA, SLE | 1, 3, 5 or 6 YRS | 1 YEAR |
| M3ST, BST, NH, NV | 5 YRS | 1 YEAR |
| No Letter Prefix | 1,3 or 5 YRS | 1 YEAR |

**NOTE:** The duration of the tank warranty will be found in the model number.
i.e.; D80T1991N has a 1 Year tank warranty;
D80T1993N has a 3 Year tank warranty;
LG250H3N has a 3 Year tank warranty;
LG250H5N has a 5 Year tank warranty.
**All replacement water heaters and parts carry the balance of the original warranty, i.e. if an original three (3) year tank warranted water heater develops a leak due to defects in materials/workmanship after only two (2) years, the replacement unit is warranted for only the balance remaining from the original three (3) year warranty, or one (1) year in this example.

### WHAT IS THE DURATION OF THE IMPLIED WARRANTY?

ANY IMPLIED WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY IMPOSED ON THE SALE OF THE WATER HEATER UNDER THE LAWS OF THE STATE OF SALE ARE LIMITED IN DURATION TO ONE YEAR FROM DATE OF ORIGINAL INSTALLATION.

### HOW DOES STATE LAW RELATE TO THE WARRANTY?

Some states do not allow:
1. Limitations on how long an implied warranty lasts.
2. Limitations on incidental or consequential damages.

Therefore, the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

***Restrictions are not applicable to implied warranties in California. See "Special State Provisions" on reverse side.**

**P/N 238-36612-00AA (05/22)**

# LIMITED COMMERCIAL WATER HEATER WARRANTY (CONTINUED)

### WHAT WILL WE DO TO CORRECT PROBLEMS?

If a defect occurs within the warranty period, we will:

1. Provide a replacement water heater of our manufacture, (or at our option) repair any unit which develops a leak in the steel tank within the tank warranty period. To obtain a replacement, you must forward the rating plate from the defective unit to us. If government regulations require the replacement water heater to have features not found in the defective water heater, you will be required to pay the difference in price represented by those government required features.
2. Provide a replacement part (or at our option repair) any part which fails to function within the parts warranty period. To obtain a replacement, you must forward the defective part to us. If government regulations require the replacement part to have features not found in the defective part, you will be required to pay the difference in price represented by those government required features.

We do reserve the right to verify any claims of defect by inspection.

### WHAT WILL WE NOT DO?

We will not:

1. Repair or replace any water heater, or part, subject to conditions outlined in "What Does This Limited Warranty Not Cover?"
2. Reimburse any costs associated with repair and/or replacement.
3. Replace and/or repair any water heater without complete model/serial number.
4. Replace any water heater without prior receipt of actual rating plate from appliance.

### HOW DO YOU GET WARRANTY ASSISTANCE?

Upon discovering a defect or problem, you should:

1. Contact either the installer or dealer, or
2. Contact us--

BRADFORD WHITE CORPORATION
WARRANTY SUPPORT GROUP
200 LAFAYETTE STREET
MIDDLEVILLE, MI 49333
(800) 531-2111

### WHAT SHOULD YOU DO TO KEEP THE WARRANTY IN EFFECT?

To facilitate warranty assistance, you should:

1. Follow all instructions enclosed with the product.
2. Retain all bills of sale or receipts for proof of installation, etc.
3. Contact your installer, dealer or our Warranty Department as soon as any problem or defect is noticed.
4. When necessary, allow us, or our chosen representative, to inspect the unit.
5. For your reference, fill in the Model and Serial Number found on the units Rating Plate:

Model Number _____

Serial Number _____

Date of Installation _____

**SPECIAL STATE PROVISIONS**

For water heaters installed in California or Oregon, Paragraphs 2(c) (i) (iv) of the paragraph "WHAT DOES THIS WARRANTY NOT COVER?" does not apply.
All other terms and conditions of this warranty apply as stated.

## PLEASE RETAIN THIS WARRANTY IN A SAFE LOCATION FOR FUTURE REFERENCE.

# Models: PLT-5, PLT-12, PLT-20

## Potable Hot Water Expansion Tank

### Installation Instructions

**⚠ WARNING!**

Improper installation, adjustment, alteration, service or maintenance can cause property damage, serious bodily injury or death. Read instructions completely before proceeding with installation. Only qualified personnel may install or service this equipment in accordance with local codes and ordinances.

Do not exceed 80psi (5.5 bar) air charge. Air charge pressure exceeding 80psi (5.5 bar) could become hazardous and will void any and all warranties, either written or implied. Failure to follow these instructions will result in the possibility of property damage, serious bodily injury or death.

This Expansion Tank is designed and intended for water storage at a maximum pressure of 150psi (10.3 bar) and a maximum temperature of 200°F (93°C). Any use other than for potable water or a sustained or instantaneous pressure in excess of 150psi (10.3 bar) or 200°F (93°C) is **UNSAFE** and can cause property damage, serious bodily injury or result in death.

Certified to ANSI/NSF 61 (73°F/23°C)

Listed by IAPMO

**Disclaimer:** The manufacturer of this tank does not accept any liability or other responsibility for personal injury or property damage resulting from improper use, installation or operation of this tank or the system of which it is a part.

**Notice:** The expansion tank, piping and your connections may in time leak. Select a location to install the expansion tank where a water leak will not damage the surrounding area. The manufacturer is not responsible for any water damage in connection with this expansion tank.

## Acceptance Volume

| Air Side Pre-pressure (psi) | (bar) | Water Side Volume at 150psi (10.3 bar) (gallons) PLT-5 | PLT-12 | PLT-20 |
|---|---|---|---|---|
| 20 | (1.4) | 1.48 | 3.42 | 7.102 |
| 40 | (2.8) | 1.26 | 2.88 | 5.882 |
| 60 | (4.1) | 1.0 | 2.49 | 4.705 |
| 80 | (5.5) | .80 | 1.85 | 4.009 |

| Description | PLT-5 Order No. 0067370 | PLT-12 Order No. 0067371 | PLT-20 Order No. 0067372 |
|---|---|---|---|
| Max. Pressure - psi | 150 | 150 | 150 |
| Max. Temp. - °F | 200 | 200 | 200 |
| Tank Volume - gal. | 2.1 | 4.5 | 8.5 |
| Tank Acceptance - gal. | 1.26 | 2.8 | 3.4 |
| Air Pre-charge - psi | 20 | 20 | 20 |
| Connections Size - in. | ¾ male | ¾ male | ¾ male |
| Diameter - in. | 8 | 10.5 | 12½ |
| Length - in. | 11 | 13.5 | 19 3/16 |
| Weight - lbs. | 5.5 | 10 | 15 |

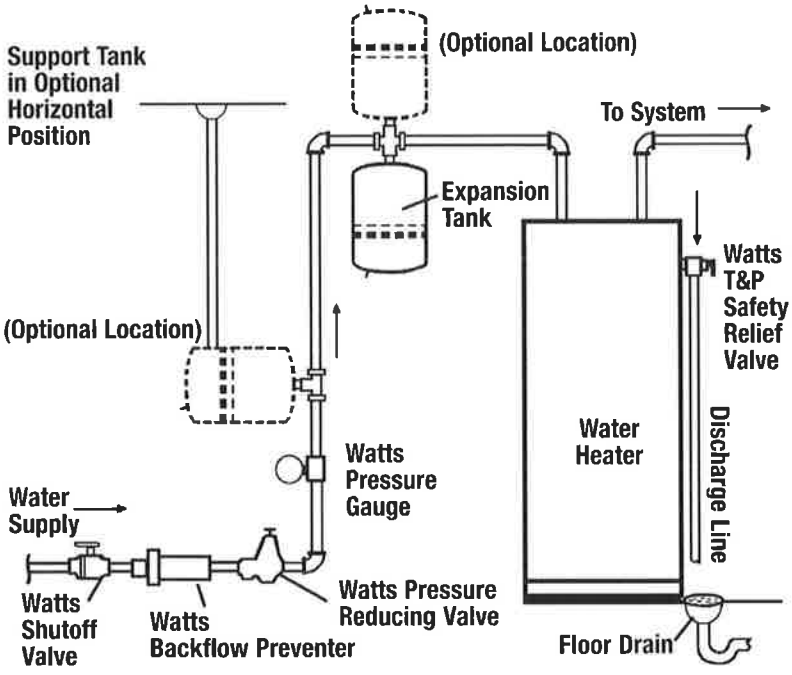



Figure 1

## Installation

1. Before beginning installation determine the system pressure.
   - **a.** Open a faucet to allow the system pressure to equalize.
   - **b.** Close faucet.
   - **c.** Read the system pressure at the pressure gauge (Figure 1).
2. The expansion tank pre-charge must be set to the system pressure as determined in Step 1. Pre-charge prior to installation in the system.

   **Caution:** Pre-charge prior to installation in the system. Do not adjust the air pre-charge of the expansion tank with the system under pressure. The air pre-charge should only be adjusted under zero system pressure.

   **Note:** The normal pre-charge is 20psi (138 kPa). **Do not exceed 80psi.** If system pressure exceeds 80psi (5.5 bar) it will be necessary to either: **A.** Add a pressure reducing valve to the system or, **B.** Locate the expansion tank in a riser where the static pressure is below 80psi (5.5 bar).


   - **a.** Unscrew the protective cap from the air inlet valve.
   - **b.** Using a tire pressure gauge, check the tank pre-charge pressure.
   - **c.** If necessary, pressurize the tank to the proper setting using a manual bicycle tire pump. **Caution do not exceed 80psi.**
   - **d.** Replace the protective air cap.
3. Shut off the water supply valve.
4. Shut off power source to the water heater, (electricity, gas, oil burner switch) and drain system following water heater manufacturer recommendations.
5. Install the expansion tank in the system (refer to Figure 1).
   - **a.** The weight of the expansion tank filled with water is supported by the system piping. Therefore, it is important that, where appropriate, the piping has suitable bracing (strapping, hanger, brackets).
   - **b.** The expansion tank may be installed vertically (preferred method) or horizontally. **Caution: The tank must be properly supported in horizontal applications.**
   - **c.** This expansion tank, as all expansion tanks, may eventually leak. **Do not install without adequate drainage provisions.**
6. Turn on the water supply valve.
7. Open a hot water fixture and allow water flow until all air is removed from the system.
8. Reapply power to the water heater.
9. Open a hot water fixture to allow a slight flow until the hot water has reached operating temperature.
10. Recheck system pressure following Step 1.a through c.

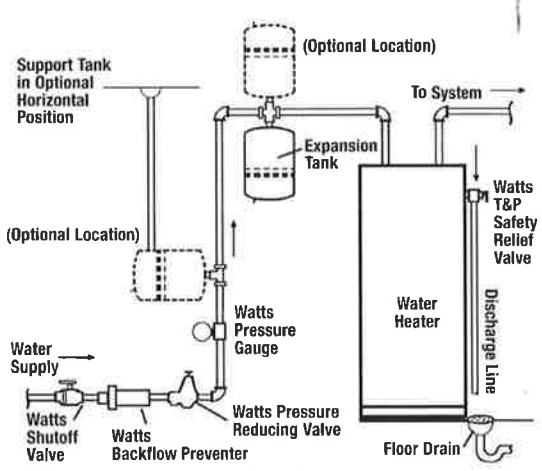



Figure 1

**Caution:** Pre-charge prior to installation in the system. Do not adjust the air pre-charge of the expansion tank with the system under pressure. The air pre-charge should only be adjusted under zero system pressure.

If necessary, adjust the pressure reducing valve to the expansion tank pre-charge as determined in Step 2.

## Important!

- A pressure relief valve sized and installed in accordance with local codes must be incorporated in the systems requiring a combined temperature and pressure safety relief valve. The temperature and pressure safety relief valve should be sized and installed in accordance with local codes.
- Never plug a safety Relief Valve.

**CALIFORNIA PROPOSITION 65 WARNING**

**WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. (California law requires this warning to be given to customers in the State of California.)

**For more information: www.watts.com/prop65**



WATTS®

*A Watts Water Technologies Company*

ISO 9001-2000 CERTIFIED

**USA:** 815 Chestnut St., No. Andover, MA 01845-6098; www.watts.com
**Canada:** 5435 North Service Rd., Burlington, ONT, L7L 5H7; www.wattscanada.ca

## LETTER OF TRANSMITTAL

TO: East Harding Construction

DATE: April 3, 2024

RE: Stone Bank

JOB NO.: 23-057

ATTN: Jake Honeycutt, Jack Whitley, Kim Brass

| COPIES | DATE | NO. | DESCRIPTION |
|---|---|---|---|
| 1 Emailed | 03/18/24 | 22 00 00-100 | *Plumbing Equipment* |
| | | | |
| | | | |
| | | | |
| | | | |

THESE ARE TRANSMITTED:

[ ]For Approval [ ]As Requested [] Reviewed for General Compliance [ ]Resubmit___copies for approval

[ ]For Your Use [ ]For Review and Comment [XX] Reviewed and Noted [ ]Submit ___copies for distribution

[ ]For Your Information [XX] Revise and Resubmit Notes [ ]Return___corrected prints

REMARKS:

COPY TO: Job File

BY: _____

JoAnn White, CIT
Contract Administrator

Batson Inc.
ENGINEERING SOLUTIONS
1300 Brookwood Dr, Little Rock, Arkansas 72202
501-664-3311 www.batson.com

# TRANSMITTAL
## Submittal Review

| | | | |
|---|---|---|---|
| Attention: | **JoAnn White** | Date: | **4-1-24** |
| To: | **WDD Architects**<br>**5050 Northshore Ln**<br>**North Little Rock, AR 72118** | Project: | **Stone Bank** |
| From: | **Eddi Carlisle** | Batson Project # | **5978** |

| | | | | |
|---|---|---|---|---|
| Sent Via: | ☐ **Mail/Courier** | ☑ **Electronic** | ☐ **Hand Delivered** | ☐ **Other** |
| For Your: | ☐ **Approval** | ☑ **Records** | ☐ **Review & Comments** | ☑ **Use** |
| The Following: | ☐ **Drawings** | ☑ **Submittals** | ☐ **Specifications** | ☐ **Other** |

| Copies | Dated | Rev No. | Description |
|---|---|---|---|
| **1** | **3-18-24** | | **22 00 00 100 Pl;umbing Equipment Submittals** |
| | | | |

**Remarks:**

**Only items marked REVISE & RESUBMIT should be returned for futher review.**

APPROVED ☑
APPROVED AS CORRECTED ☐
REVISE & RESUBMIT ☑
NOT APPROVED ☐

Approval is only for conformance with the design concept of this project and compliance with the information given in the contract documents. Contractor is responsible for dimension to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of this work of all trades.

SEE DOCUMENTS FOR COMMENTS ☐
SEE ATTACHED COMMENT SHEET ☑
BATSON INC.
1300 BROOKWOOD DRIVE
LITTLE ROCK, AR 72202
501.664.3311

DATE 4-1-24
BY CEC

# SHOP DRAWING SUBMITTAL REVIEW COMMENTS

Batson Inc.
ENGINEERING SOLUTIONS
SINCE 1984
Little Rock, AR 72202
501.664.3311
www.batson.com

| | |
|---|---|
| *CLIENT* | **WDD Architects** |
| *PROJECT* | **Stone Bank** |
| *ENG JOB #* | **5978** |
| *SUBMITTAL #* | **22 00 00 100 Plumbing Equipment #1** |
| *PAGE* | **1 of 1** |
| *DATE* | **4/1/2024** |
| *REVIEWER* | **Eddie Carlisle** |

SEE SHOP DRAWINGS & APPROVAL STAMP ON SHOP DRAWING DOCUMENTS FOR ADDITIONAL INFORMATION AND NOTATIONS

| NO. | DESCRIPTION | APPROVED | APPROVED AS CORRECTED | REVISE & RESUBMIT | NOT APPROVED | SUBSTITUTIONS | REMARKS |
|---|---|---|---|---|---|---|---|
| 1 | 23.038 220000 100 Plumbing Equipment | | | | | | |
| | Water Heater WH1 & WH2 | X | | | | X | |
| | Expansion Tank | X | | | | | |
| | Expansion Tank Mounting Bracket | X | | | | | |
| | Vacuum Relief Valve | X | | | | | |
| | Pan | X | | | | X | |
| | Quickstand Equipment Support | | | X | | | HOLDRITE Wall Mount Platform #30-SWHP_WM is needed for 20 Gallon water heaters. |
| | | | | | | | |
| | Water Heater WH-3 | X | | | | X | |
| | Expansion Tank | X | | | | | |
| | Expansion Tank Mounting Bracket | X | | | | | |
| | Vacuum Relief Valve | X | | | | | |
| | Pan | X | | | | X | |
| | Quickstand Equipment Support | X | | | | | Floor stand for 50 gallon water heater is correct. |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

The Contractor is reminded that per the specifications:

1) The Contractor is responsible for submitting all items required.
2) When substitutions to the specifications and drawings are approved, the Contractor is responsible for all costs related to other systems affected by the incorporation of substitutions into the work.

EAST HARDING
CONSTRUCTION

2230 Cottondale Lane, Suite 3
Little Rock, AR 72202
501.661.1646 – 501.661.9546 (fax)
www.eastharding.com

**Submittal #60**

## Distribution Summary

*Distributed on by*

**To:**

**Message:**

**Additional Attachments:**

| NAME | RESPONSE | ATTACHMENTS | COMMENT |
|---|---|---|---|

# 23.038 220000 100 Plumbing Equipment

| | | | |
|---|---|---|---|
| **SPEC SECTION:** | | **CREATED BY:** | |
| **STATUS:** | Open | **DATE CREATED:** | 03/18/2024 |
| **ISSUE DATE:** | 03/18/2024 | **REVISION:** | 0 |
| **RESPONSIBLE CONTRACTOR:** | Comfort Systems USA (Arkansas), Inc. | **RECEIVED FROM:** | Matthew Aldridge |
| **RECEIVED DATE:** | // | **SUBMIT BY:** | // |
| **FINAL DUE DATE:** | 04/06/2024 | **LOCATION:** | |
| **TYPE:** | Product Information | **COST CODE:** | |
| **APPROVERS:** | Jake Honeycutt **(East-Harding, Inc.)**, Jack Whitley **(East-Harding, Inc.)**, JoAnn White **(Wittenberg, Delony & Davidson, Inc.)** | | |
| **Project: 23.038:** | | | |
| **Architect's Project: 23-057:** | | | |

**BALL IN COURT:**
Matthew Aldridge **(Comfort Systems USA (Arkansas), Inc.)**

**DISTRIBUTION:**
Kim Brass **(East-Harding, Inc.)** , Jon Isham **(East-Harding, Inc.)** , Jake Honeycutt **(East-Harding, Inc.)** , Jack Whitley **(East-Harding, Inc.)**

**DESCRIPTION:**

**ATTACHMENTS:**

## SUBMITTAL WORKFLOW

| # | NAME | SUBMITTER/ APPROVER | SENT DATE | DUE DATE | RETURNED DATE | RESPONSE | ATTACHMENTS | COMMENTS |
|---|---|---|---|---|---|---|---|---|
| 1 | Matthew Aldridge | Submitter | | 3/19/2024 | | Pending | | |
| 2 | Jake Honeycutt | Approver | | 3/21/2024 | | Pending | | |
| 3 | Jack Whitley | Approver | | 3/23/2024 | | Pending | | |
| 4 | JoAnn White | Approver | | 4/6/2024 | | Pending | | |

**BY** **DATE** **COPIES TO**

# WH-1,2

BRADFORD WHITE®
WATER HEATERS

# ElectriFLEX LD™ (Light Duty) Commercial Utility Electric Water Heater


**Photo is of LE112T3-1**

***Bradford White ElectriFLEX LD™ Utility Electric Models Feature:***

- **Fully Automatic Thermostat Controls**—Fast acting surface-mount thermostats with a maximum setpoint of 175°F and a high limit energy cut-off (manual reset) for safety.
- **Direct Heat Transfer With a Single Immersed Element**—Transfers heat directly and efficiently to the water. Screw-in style element.
- **Vitraglas® Lining with Microban®**—An exclusively engineered enamel formula that provides superior tank protection from the corrosive effects of water; and with Microban® antimicrobial product protection to help prevent the growth of bacteria, mold and mildew on the surface of the tank lining).
- **Insulation System**—1" (25mm) Non-CFC foam insulation covers the sides and top of the tank, reducing heat loss. This results in less energy consumption, improved efficiencies, and jacket rigidity.
- **Water Connections**—3/4" (19mm) NPT factory-installed true dielectric fittings extend water heater life and simplify water line connections. Located on the side for easier installation (Fittings packaged separately inside carton).
- **Protective Anode Rod**—Provides added protection against corrosion for long trouble-free service.
- **Steel Tank**—Heavy gauge steel automatically formed, rolled, and welded.
- **Voltages Available**—120V, 208V, 240V, 277V, 380V, 415V, 480V.
- **Single Phase Operation Only**.
- **Field Conversion Kits**—Change voltage, and kW in the field (see options on following page).
- **T&P Relief Valve**—Installed.

***FEATURING:***

VITRAGLAS

MICROBAN®

Copper Screw Type Immersion Element
(INCOLOY® type immersion element available upon request)

***3 or 5-Year Limited Tank Warranties / 1-Year Limited Warranty on Component Parts.***

For more information on warranty, please visit www.bradfordwhite.com

*For products installed in USA, Canada, and Puerto Rico. Some states do not allow limitations on warranties. See complete copy of the warranty included with the heater.*

Microban® antimicrobial product protection helps prevent the growth of bacteria, mold and mildew that may affect the product. The built-in antimicrobial properties do not protect users or others from disease-causing organisms. Microban® is a registered trademark of Microban Products Company.

c UL us LISTED LISTED

# ElectriFLEX LD™ (Light Duty) Commercial Utility Electric Water Heater

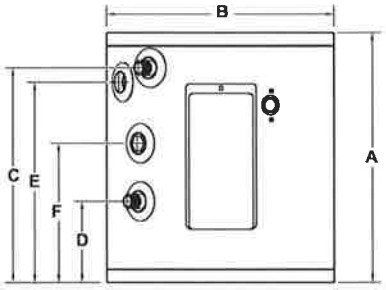
## ElectriFLEX LD™ Utility Electric Models

C.E.C. Listed

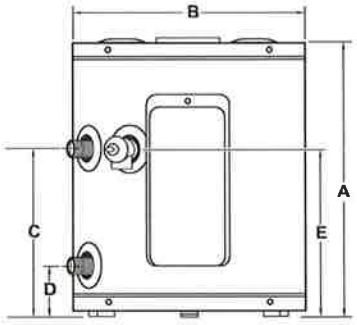
| Model Number | Nominal Gal. Capacity U.S. Gal. | Nominal Gal. Capacity Imp. Gal. | Recovery at 100°F Rise* U.S. GPH | Recovery at 100°F Rise* Imp. GPH | A Floor to Top of Heater in. | B Jacket Dia. in. | C Floor to C/L of Hot Water Conn. in. | D Floor to C/L of Cold Water Conn. in. | E Floor to T&P Conn. in. | F Floor to Anode Rod in. | Water Conn. NPT in. | Approx. Shipping Weight lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LE16U3-1† | 6 | 5 | 6 | 5 | 16 1/2 | 14 | 10 1/3 | 3 1/8 | 10 1/3 | N/A | 3/4 | 33 |
| LE110U3-1 | 10 | 8 | 6 | 5 | 17 1/2 | 16 | 15 | 5 11/16 | 14 | 9 11/16 | 3/4 | 48 |
| LE112T3-1† | 12 | 10 | 6 | 5 | 27 3/4 | 14 | 21 1/8 | 3 | 21 1/8 | N/A | 3/4 | 48 |
| LE120U3-1 | 19 | 16 | 6 | 5 | 24 3/4 | 18 | 18 1/2 | 3 | 18 1/2 | N/A | 3/4 | 59 |

| Model Number | Nominal Liter Capacity | Recovery 56°C Rise* Liters/ Hour | A Floor to Top of Heater mm. | B Jacket Dia. mm. | C Floor to C/L of Hot Water Conn. mm. | D Floor to C/L of Cold Water mm. | E Floor to T&P Conn. mm. | F Floor to Anode Rod mm. | Water Conn. NPT mm. | Approx. Shipping Weight kg. |
|---|---|---|---|---|---|---|---|---|---|---|
| LE16U3-1† | 23 | 23 | 419 | 356 | 257 | 79 | 257 | N/A | 19 | 15 |
| LE110U3-1 | 38 | 23 | 445 | 406 | 381 | 144 | 355 | 246 | 19 | 22 |
| LE112T3-1† | 45 | 23 | 705 | 356 | 537 | 76 | 537 | N/A | 19 | 22 |
| LE120U3-1 | 72 | 23 | 629 | 457 | 470 | 76 | 470 | N/A | 19 | 27 |

Specify wattage and voltage when ordering. Use chart below for maximum wattages at certain voltages.
† Maximum wattage at any voltage is 3000W. For 5 year models, change suffix "3" to "5".
Single element only. *Based on 1500W operation. NSF Kits available when ordering.




10 Gallon Model




6, 12, & 20 Gallon Models

| Wattage | Recovery s GPH Temperature Rise °F 60 | 80 | 90 | 100 | 120 | Wattage | Recovery s LPH Temperature Rise °C 34 | 45 | 50 | 56 | 67 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1500W | 10 | 8 | 7 | 6 | 5 | 1500W | 38 | 30 | 26 | 23 | 19 |
| 2000W | 14 | 10 | 9 | 8 | 7 | 2000W | 53 | 38 | 34 | 30 | 26 |
| 2500W | 17 | 13 | 11 | 10 | 9 | 2500W | 64 | 49 | 42 | 38 | 34 |
| 3000W | 21 | 15 | 14 | 12 | 10 | 3000W | 79 | 57 | 53 | 45 | 38 |
| 3500W | 24 | 18 | 16 | 14 | 12 | 3500W | 91 | 68 | 61 | 53 | 45 |
| 4000W | 28 | 21 | 18 | 16 | 14 | 4000W | 106 | 79 | 68 | 61 | 53 |
| 4500W | 31 | 23 | 21 | 19 | 15 | 4500W | 117 | 87 | 79 | 72 | 57 |
| 5000W | 34 | 26 | 23 | 21 | 17 | 5000W | 129 | 98 | 87 | 79 | 64 |
| 5500W | 38 | 29 | 25 | 23 | 19 | 5500W | 144 | 110 | 95 | 87 | 72 |
| 6000W | 41 | 31 | 28 | 25 | 21 | 6000W | 155 | 117 | 106 | 95 | 79 |

**Voltage and Wattage Conversion Kits**

| Single Element Wattage | Voltage 120V | 208V | 240V | 277V | 380V | 415V | 480V |
|---|---|---|---|---|---|---|---|
| 1500W | 415-46409-01 | 415-46409-05 | 415-46409-13 | 415-46409-16 | 415-46409-24 | 415-46409-41 | 415-46409-32 |
| 2000W | 415-46409-02* | 415-46409-06 | 415-46409-05 | 415-46409-17 | 415-46409-43 | 415-46409-24 | 415-46409-33 |
| 2500W | 415-46409-03* | 415-46409-07 | 415-46409-06 | 415-46409-18 | 415-46409-25 | 415-46409-43 | 415-46409-34 |
| 3000W | 415-46409-04* | 415-46409-08 | 415-46409-14 | 415-46409-19 | 415-46409-26 | 415-46409-25 | 415-46409-35 |
| 3500W | N/A | 415-46409-09 | 415-46409-07 | N/A | 415-46409-54 | 415-46409-26 | N/A |
| 4000W | N/A | 415-46409-49 | 415-46409-08 | 415-46409-20 | 415-46409-56 | 415-46409-54 | 415-46409-36 |
| 4500W | N/A | 415-46409-11 | 415-46409-09 | 415-46409-51 | 415-46409-57 | 415-46409-55 | 415-46409-59 |
| 5000W | N/A | 415-46409-50 | 415-46409-15 | 415-46409-52 | 415-46409-58 | 415-46409-56 | 415-46409-38 |
| 5500W | N/A | 415-46409-65* | 415-46409-49 | 415-46409-61** | 415-46409-63 | 415-46409-57 | 415-46409-62** |
| 6000W | N/A | 415-46409-66* | 415-46409-48* | 415-46409-53 | 415-46409-64 | 415-46409-58 | 415-46409-60 |

| Wattage Limitations | Voltage 120V | 208V | 240V | 277V | 380V | 415V | 480V |
|---|---|---|---|---|---|---|---|
| 1500W | yes | yes | yes | yes | yes | yes | yes |
| 2000W | yes | yes | yes | yes | yes | yes | yes |
| 2500W | yes | yes | yes | yes | yes | yes | yes |
| 3000W | yes | yes | yes | yes | yes | yes | yes |
| 3500W | no | yes | yes | no | yes | yes | no |
| 4000W | no | yes | yes | yes | yes | yes | yes |
| 4500W | no | yes | yes | yes | yes | yes | yes |
| 5000W | no | yes | yes | yes | yes | yes | yes |
| 5500W | no | yes | yes | no | yes | yes | yes |
| 6000W | no | yes | yes | yes | yes | yes | yes |

Note: Above chart can be used to determine maximum wattage at certain voltages. **INCOLOY® element only. * 415-46409-02, -03, -04, -48, -65, & -66 contain only one element. These kits cannot be wired as simultaneous. These are non-simultaneous kits only. Except where noted above, each kit will include two replacement elements, two gaskets, a rating plate overlay and one set of instructions. For water heaters with only one element, please retain the extra element and gasket as a service part.

**General:**
All models are exempt from NAECA requirements and ASHRAE Standard 90.1b. All models UL® listed. These heaters are wired Single Phase, 120V with one 1500W element, unless otherwise specified. All water and electrical connections are 3/4" (19mm) NPT. All models certified at 300 PSI test pressure (2068 kPa) and 150 PSI working pressure (1034 kPa). Applicable models CSA verified for energy performance in accordance with C191.1-M90.

***Dimensions and specifications subject to change without notice in accordance with our policy of continuous product improvement.***


— BRADFORD WHITE IS —
AMERICAN STRONG.

***Sales:*** **800-523-2931** ■ *Fax 215-641-1612*
***24/7 Technical Support:*** **800-334-3393** ■ *Email techserv@bradfordwhite.com*


Products made by Bradford White are manufactured in the United States using the finest raw materials and components from around the world.

**Built to be the Best**

# Engineering Specification

Job Name Stone Bank
Job Location LR
Engineer Batson
Approval

Contractor Comfort Systems USA
Approval
Contractor's P.O. No.
Representative Sanders Supply

**LEAD FREE***

# Series PLT

## Potable Water Expansion Tanks

Series PLT Potable Water Expansion Tanks are designed to absorb the increased volume of water created by thermal expansion and to maintain balanced pressure throughout the potable water supply system.

Heated water expands, and in a domestic hot water system, the system may be closed when the potable water system is isolated from the public water supply by a one-way valve such as pressure reducing valve, backflow preventer or check valve. Provisions must be made for this expansion.

Series PLT expansion tanks absorb the increased volume of water created when the hot water storage tank is heated and keeps the system pressure below the relief setting of the T&P relief valve.

It is a pre-pressurized steel tank with an expansion membrane that prevents contact of the water with the air in the tank. This prevents loss of air to the water and insures long and trouble-free life for the system. These tanks may be used with all types of Direct Fired Hot Water Heaters (gas, oil or electric) and hot water storage tanks.

### Features

- Rugged flexible butyl diaphragm
- Field adjustable pre-charge
- In-line and free standing models
- Can be used with most standard hot water heaters and storage tanks

### Models

| | |
|---|---|
| **PLT-5-M1** | ¾" male connection, tank volume 2.1 gal. |
| ~~**PLT-12-M1**~~ | ~~¾" male connection, tank volume 4.5 gal.~~ |
| **PLT-20-M1** | ¾" male connection, tank volume 8.5 gal. |
| **PLT-35-M1** | 1" female connection, tank volume 14.00 gal. |

### Specifications

The potable water expansion tank shall be of drawn steel construction. It shall have a Butyl diaphragm separating the air chamber from the water containing chamber. Inlet connector shall be Stainless Steel. Materials of manufacture for the diaphragm shall be FDA approved.

The potable water expansion tank shall be a Watts Model PLT.


### Standards

**Models PLT-5, PLT-12 and PLT-20** are Listed by IAPMO.
Certified to ANSI/NSF 61
**Model PLT-35**
Certified to ANSI/NSF 61

(73°F/23°C)

**Note:** The potable water expansion tank shall be installed in the cold water service pipe line on the supply side of the water heater (or water storage tank). A pressure relief valve sized and installed in accordance with local codes must be incorporated in the system.
In those systems requiring a combined temperature and pressure safety relief valve, the temperature and pressure relief valve should be sized and installed in accordance with local codes. Adequate drainage provisions should be provided where water flow will cause damage.

**See chart on back**

**NOTICE**

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

**NOTICE**

Inquire with governing authorities for local installation requirements

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**



WATTS®

## Selection

This Quick Reference Selection Guide may be used as an alternative to using a formula to determine the correct expansion tank for the system. This table is based upon a relief valve setting of 150psi (10.3 bar), and a maximum of 50°F temperature rise.

To select the correct model PLT series tank, simply go the supply pressure equal to the system supply pressure (for pressures between those shown use next highest supply pressure shown), read across the chart to the correct tank as indicated by the water heater capacity (for capacities between those shown, use next highest capacity).

To accommodate the thermal expansion required for higher temperature and/or higher pressure systems, multiple tanks may be used. Please contact the factory for sizing information.

## Materials

Diaphragm: Butyl rubber

Inlet Connection: Stainless Steel

## Technical Information

| DESCRIPTION | PLT-5 | PLT-12 | PLT-20 | PLT-35 |
|---|---|---|---|---|
| Max. Pressure - PSI | 150 | 150 | 150 | 150 |
| Max. Temp. - °F | 200 | 200 | 200 | 200 |
| Tank Volume - Gal. | 2.1 | 4.5 | 8.5 | 14.00 |
| Air Pre-charge - PSI | 20 | 20 | 20 | 20 |
| Connections Size - Inches | ¾ Male | ¾ Male | ¾ Male | 1 Female |
| Diameter - Inches | 8 | 10.5 | 12.5 | 16.0 |
| Length - Inches | 11 | 13.5 | 19.2 | 21.7 |
| Weight - Lbs. | 5.5 | 10 | 15 | 32 |

## Acceptance Volume

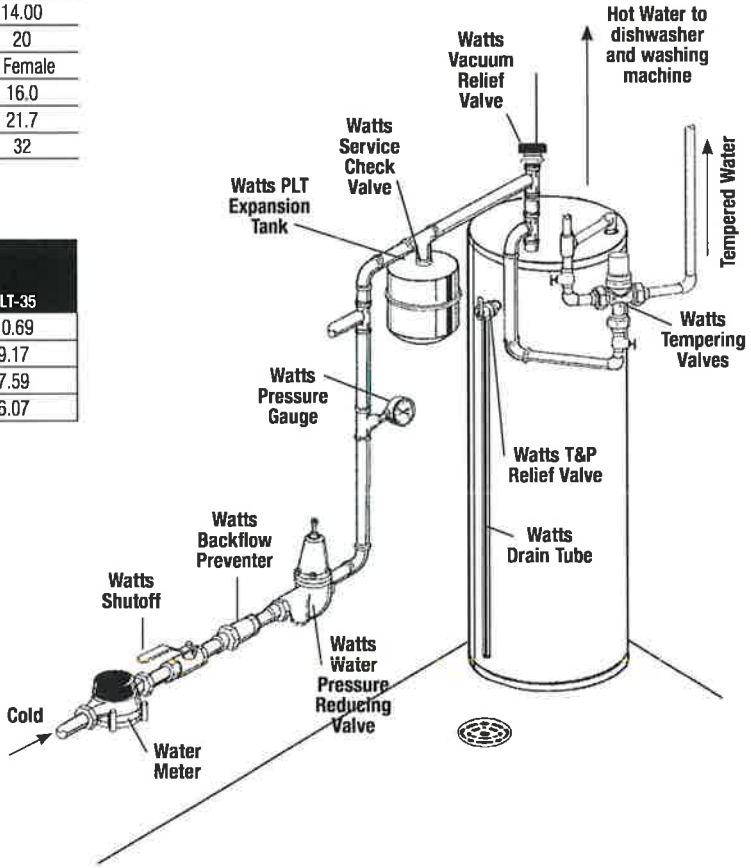
| AIR SIDE PRE-PRESSURE (PSI) | WATER SIDE VOLUME AT 150PSI (GALLONS) PLT-5 | PLT-12 | PLT-20 | PLT-35 |
|---|---|---|---|---|
| 20 | 1.48 | 3.42 | 7.102 | 10.69 |
| 40 | 1.26 | 2.88 | 5.882 | 9.17 |
| 60 | 1.0 | 2.49 | 4.705 | 7.59 |
| 80 | .8 | 1.85 | 4.009 | 6.07 |

| SUPPLY PRESSURE (PSIG) | WATER HEATER (GALLONS) 20 | 30 | 40 | 50 | 80 | 100 | 120 |
|---|---|---|---|---|---|---|---|
| 40 | | | | | | | |
| 50 | | | | | | | |
| 55 | | | | | | | |
| 60 | | | | | | | |
| 70 | | | | | | | |
| 80 | | | | | | | |
| 90 | | | | | | | |
| 100 | | | | | | | |
| 110 | | | | | | | |
| 120 | | | | | | | |

PLT-5 PLT-20

PLT-12 PLT-35

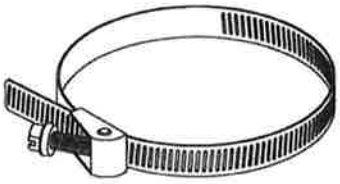
Multiple tanks required - consult factory





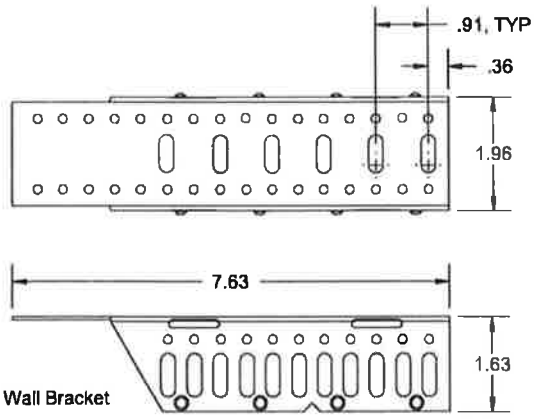
**USA:** T: (978) 689-6066 • F: (978) 975-8350 • Watts.com
**Canada:** T: (888) 208-8927 • F: (905) 332-7068 • Watts.ca
**Latin America:** T: (52) 55-4122-0138 • Watts.com

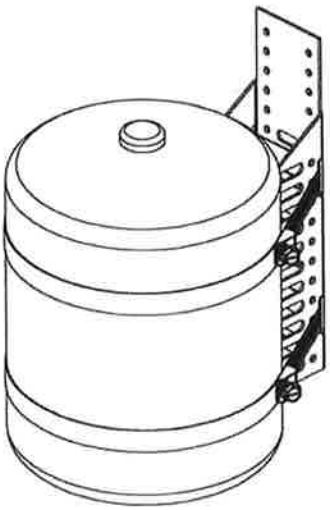
# PRODUCT SPECIFICATION DRAWING
## QUICK STRAP® UNIVERSAL #QS-U
## THERMAL EXPANSION TANK MOUNTING BRACKET



Band Length = 46.25", Diameter Range = 2.50" to 14.25" (2X)

#8 x 1.50" Long Sheet Metal Screw (2X)



| Model | Size |
|---|---|
| QS-U | Up to 5 gallon / Up to 13" diameter |

ALL DIMENSIONS IN INCHES

The QUICK STRAP® #QS-U is a thermal expansion tank mounting bracket. Secures to wall and takes weight load off pipes. Galvanized and stainless steel construction. Available for 2-5 gallon units. The system includes: Wall Bracket, Bands (2X) and #8 x 1.50" Long Sheet Metal Screws (2X).

**Product Information:**

- Material:
  Strap: 1/2" Wide, .025" Thick, 200/410 Stainless Steel
  Bracket: 16GA, Galvanized Steel
  Screws: Pan Head, #8 x 1-1/2" Long, Steel
- Load Rating: 70 LBS. (Choose appropriate wall anchors)

| Product Submittal | |
|---|---|
| Job Name: | |
| Date: | |
| Part Number: | Qty: |
| | |
| | |
| Architect / Owner: | |
| | |
| Contractor: | |
| | |
| Notes: | |
| | |
| | |



HOLDRITE®

## For Water Heater/Tank Applications

Job Name Stone Bank
Job Location LR
Engineer Batson
Approval

Contractor Comfort Systems USA
Approval
Contractor's P.O. No.
Representative Sanders Supply

# LEAD FREE*

# Model LFN36-M1

## Vacuum Relief Valve

### Sizes: ½" – ¾" Male NPT

LFN36-M1

Design certified by

**Tested and rated under "ANSI Z21.22 Relief Valves for Hot Water Supply Systems".**

### Features

- Low profile
- All Lead Free* brass body
- Protective cap
- Suitable for low pressure steam and water service
- Tested and rated to ANSI Z21.22
- CSA certified
- The LFN36-M1 features Lead Free* construction to comply with Lead Free* installation requirements.

### Applications

- Domestic water heaters and supply tanks
- Table top heaters
- Jacketed steam kettles
- Unit heaters
- Low pressure steam systems
- Steam coil heaters

**Note:** Vacuum relief valves are not designed or approved as backsiphonage backflow preventers. For protection against backsiphonage install Watts Series 288A vacuum breakers.

### Standards

Tested and rated to ANSI Z21.22

CSA certified

### Specifications

A Watts Model LFN36-M1 Vacuum Relief Valve shall be installed on domestic hot water supply tanks/ heaters/ unit heaters/ steam kettles as indicated on plans. The vacuum relief valve shall be ANSI Z21.22 rated and CSA certified. The vacuum relief valve shall have an all brass body and include a protective cap for automatic venting of a closed system to atmosphere when a vacuum is created. The Lead Free* Vacuum Relief Valve shall comply with state codes and standards, where applicable, requiring reduced lead content. The Watts LFN36-M1 Vacuum Relief Valve permits air to enter and prevent vacuum conditions that could siphon the water from the system, resulting in collapse of a tank or water heater or equipment burn out. The valve shall be a Watts Model LFN36-M1.

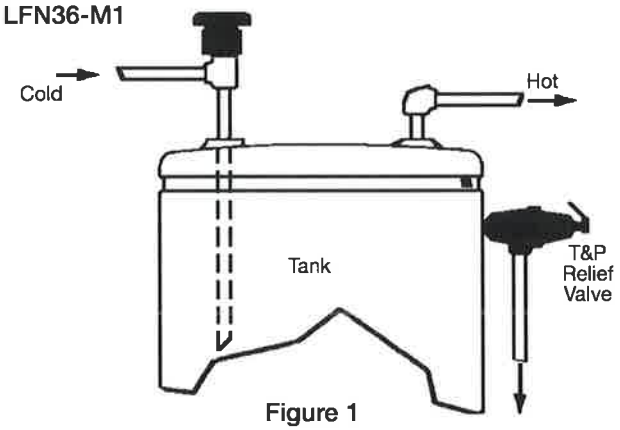



**Figure 1**

**Domestic Hot Water Supply Tanks and Heaters with Top Supply**

**NOTICE**

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

**NOTICE**

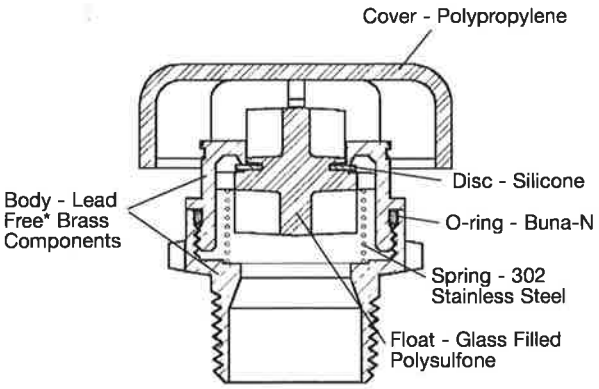
Inquire with governing authorities for local installation requirements

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**



WATTS®

## Materials

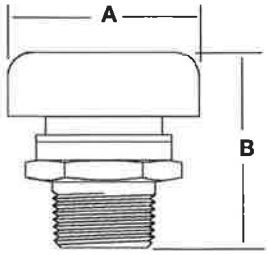



## Pressure – Temperature

Maximum steam working pressure: 15 psi (1.03 bar)

Maximum temperature: 250°F (121°C)

## Dimensions-Weights




| SIZE | DIMENSIONS | | | | WEIGHT | |
|---|---|---|---|---|---|---|
| | A | | B | | | |
| in. | in. | mm | in. | mm | oz. | gr |
| ½ | 2 | 50 | 2 | 50 | 4 | 113 |
| ¾ | 2 | 50 | 2 | 50 | 4 | 113 |

## Capacity

| SIZE | MODEL | VENTING CAPACITY | |
|---|---|---|---|
| in. | | CFM | LPM |
| ½ | LFN36-M1 | 15 | 425 |
| ¾ | LFN36-M1 | 15 | 425 |

## Typical Installations

### Water Service

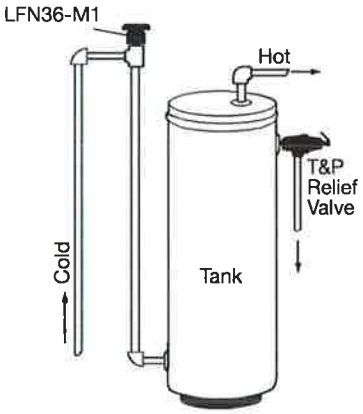



**Figure 2**

**Domestic Hot Water Supply Tanks and Heaters with Bottom Feed**

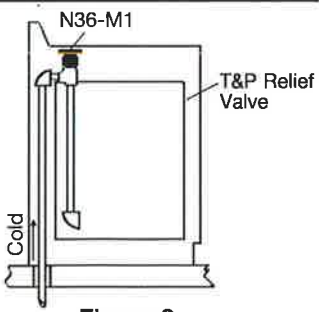



**Figure 3**

**Table Top Heaters**

### Steam Service

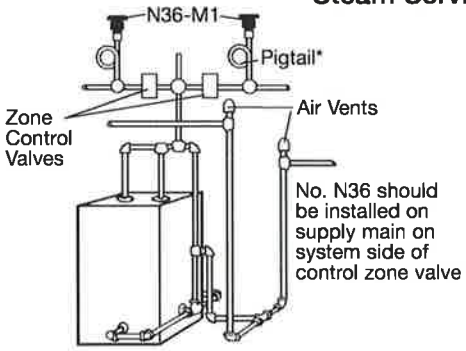



**Figure 4**

**Low Pressure Steam Heating Systems**

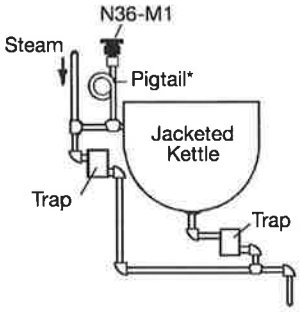



**Figure 5**

**Jacketed Kettles**

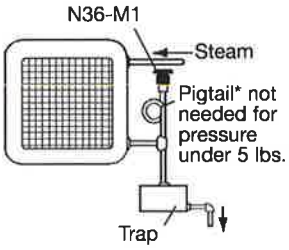



**Figure 6**

**Unit Heaters**

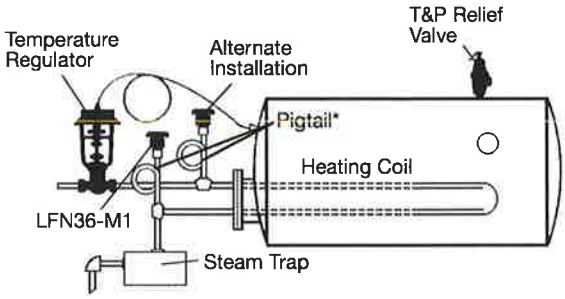



**Figure 7**

**Steam Coil Heaters**

***Note:** When used for steam service, be sure to use pigtail to prevent live steam from damaging N36 valve.


**USA:** T: (978) 689-6066 • Watts.com

**Canada:** T: (905) 332-4090 • Watts.ca

**Latin America:** T: (52) 81-1001-8600 • Watts.com

# ALUMINUM WATER HEATER PANS TECHNICAL SPECIFICATION

| | | | |
|---|---|---|---|
| Job Name | Stone Bank | Item # | 34081 |
| Location | LR | | |
| Engineer | Batson | Contractor | Comfort Systems USA |
| PO # | | Tag | WH-1,2 |
| Representative | Sanders Supply | | |

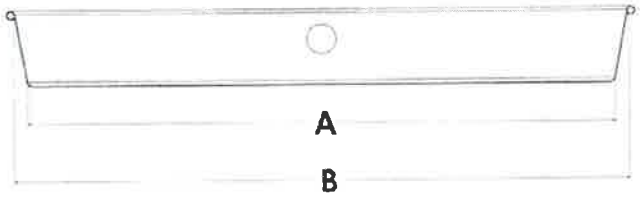
## SPECIFICATIONS

Oatey Aluminum Water Heater Pans can be installed under gas or electric water heaters to protect from water damage. Available with 1" PVC, 1-½" PVC or 1" CPVC drain fittings to allow for connection to indirect drain.

## DESCRIPTION

All dimensions in inches

- Manufactured from .032 Prime Aluminum.
- Pre-cut side opening accommodates drain fitting.
- Meets requirements of Southern Building Code.
- Pan depth is minimum 2-½".




## PRODUCT SELECTOR

### WATER HEATER PANS WITH 1" CPVC FITTING (FITS OVER 1" CPVC PIPE)

| ✓ | Product Number | Description | Qty | Inside Diameter (A) | Outside Diameter (B) |
|---|---|---|---|---|---|
| ☐ | 34170 | 18" Aluminum Water Heater Pan - Bulk | 6 | 18 | 19 |
| ☐ | 34171 | 20" Aluminum Water Heater Pan – Bulk | 6 | 20 | 21 |
| ☐ | 34172 | 22" Aluminum Water Heater Pan – Bulk | 6 | 22 | 23 |
| ☐ | 34173 | 24" Aluminum Water Heater Pan – Bulk | 6 | 24 | 25 |
| ☐ | 34174 | 26" Aluminum Water Heater Pan – Bulk | 6 | 26 | 27 |
| ☐ | 34176 | 28" Aluminum Water Heater Pan – Bulk | 6 | 28 | 29 |
| ☐ | 34175 | 30" Aluminum Water Heater Pan - Bulk | 6 | 30 | 31 |
| ☐ | 34193 | 32" Aluminum Water Heater Pan | 6 | 32 | 33 |

Data is subject to manufacturing tolerances.

Access BIM/Revit content through www.oatey.com

# ALUMINUM WATER HEATER PANS TECHNICAL SPECIFICATION

## PRODUCT SELECTOR

### WATER HEATER PANS WITH 1" PVC FITTING (FITS OVER 1" AND INSIDE 1.5" SCHEDULE 40 PIPE)

| ✓ | Product Number | Description | Qty | Inside Diameter (A) | Outside Diameter (B) |
|---|---|---|---|---|---|
| ☐ | 34079 | 18" Aluminum Water Heater Pan - Bulk | 6 | 18 | 19 |
| ☐ | 34151 | 20" Aluminum Water Heater Pan - Bulk | 6 | 20 | 21 |
| ☐ | 34152 | 22" Aluminum Water Heater Pan - Bulk | 6 | 22 | 23 |
| ☐ | 34153 | 24" Aluminum Water Heater Pan - Bulk | 6 | 24 | 25 |
| ☐ | 34154 | 26" Aluminum Water Heater Pan - Bulk | 6 | 26 | 27 |
| ☐ | 34156 | 28" Aluminum Water Heater Pan - Bulk | 6 | 28 | 29 |
| ☐ | 34085 | 30" Aluminum Water Heater Pan - Bulk | 6 | 30 | 31 |
| ☐ | 34191 | 32" Aluminum Water Heater Pan | 6 | 32 | 33 |

### WATER HEATER PANS WITH 1.5" PVC FITTING (FITS OVER 1" AND OVER 1.5" SCHEDULE 40 PIPE)

| ✓ | Product Number | Description | Qty | Inside Diameter (A) | Outside Diameter (B) |
|---|---|---|---|---|---|
| ✓ | 34081 | 20" Aluminum Water Heater Pan – Bulk | 6 | 20 | 21 |
| ☐ | 34082 | 22" Aluminum Water Heater Pan- Bulk | 6 | 22 | 23 |
| ☐ | 34083 | 24" Aluminum Water Heater Pan - Bulk | 6 | 24 | 25 |
| ☐ | 34084 | 26" Aluminum Water Heater Pan - Bulk | 6 | 26 | 27 |
| ☐ | 34103 | 28" Aluminum Water Heater Pan - Bulk | 6 | 28 | 29 |
| ☐ | 34107 | 30" Aluminum Water Heater Pan | 6 | 29 | 30 |

### WATER HEATER PANS WITHOUT FITTING & WITHOUT HOLE

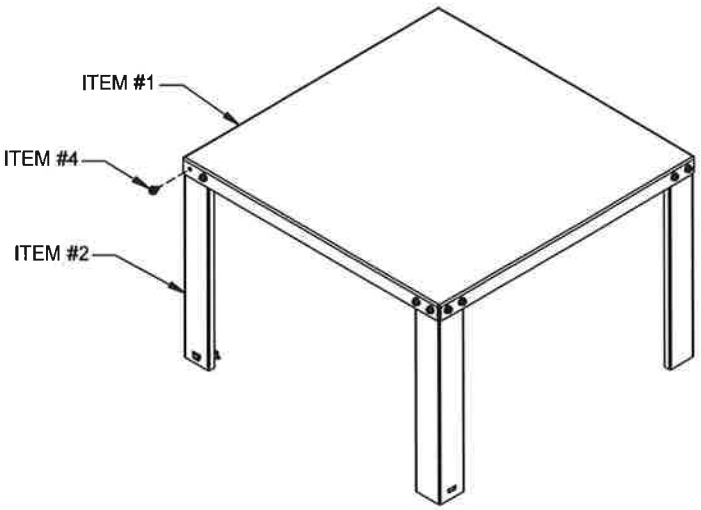
| ✓ | Product Number | Description | Qty | Inside Diameter (A) | Outside Diameter (B) |
|---|---|---|---|---|---|
| ☐ | 34090 | 18" Aluminum Water Heater Pan – Bulk | 6 | 18 | 19 |
| ☐ | 34091 | 20" Aluminum Water Heater Pan – Bulk | 6 | 20 | 21 |
| ☐ | 34092 | 22" Aluminum Water Heater Pan – Bulk | 6 | 22 | 23 |
| ☐ | 34093 | 24" Aluminum Water Heater Pan – Bulk | 6 | 24 | 25 |
| ☐ | 34094 | 26" Aluminum Water Heater Pan – Bulk | 6 | 26 | 27 |
| ☐ | 34095 | 30" Aluminum Water Heater Pan – Bulk | 6 | 30 | 31 |

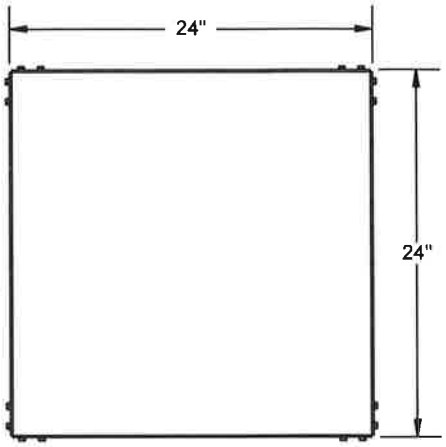
### WATER HEATER PAN ADAPTERS

| ✓ | Product Number | Description | Qty |
|---|---|---|---|
| ☐ | 34086 | 1-½" PVC Adapter (Fits over 1" and over 1.5" schedule 40 pipe) | 12 |
| ☐ | 34088 | 1" PVC Adapter (Fits over 1" and inside 1.5" schedule 40 pipe) | 12 |
| ☐ | 34089 | 1" CPVC Adapter (Fits over 1" CPVC pipe) | 12 |

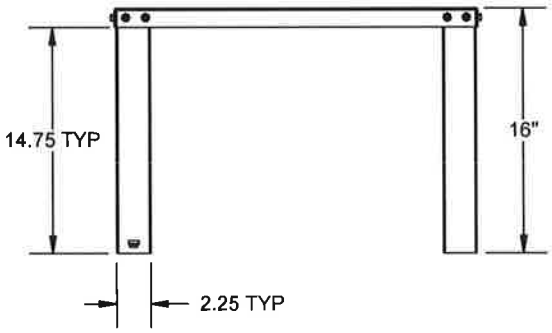
Data is subject to manufacturing tolerances.

# PRODUCT SPECIFICATION DRAWING
## QUICKSTAND™ 24" X 24" (Water Heater & Equipment Support)
## #40-S-24-A (assembled) and #40-S-24-U (unassembled)




ALL DIMENSIONS IN INCHES




**The QUICKSTAND™ #40-S-24- (A or U) stands safely elevates water heaters and other equipment above the floor (1,200 lbs rating).**

## Product Information:

- Material:
  Item #1: Top, 12 gage CRS, galvanized
  Item #2: Leg, 16 gage CRS, galvanized, 4 places
  Item #3: Safety Clip, 14 gage CRS, galvanized, 2 places
  Item #4: Screw, PH, Sems, #1/4 X 1/2"L (w / external starwasher), 16 places
  Item #5: Lag Bolt, #1/4 X 2-1/2"L, self-drilling, 2 places
  (items #3 and #5 included with product)

SAFETY CLIP (2)
ITEM #3

- Engineered and lab tested to meet Uniform Plumbing Code (UPC) and International Plumbing Code (IPC) requirements, including elevation of water heater's ignition source 18" above the floor

LAG BOLT (2)
ITEM #5

- Holds up to 1,200 pounds capacity (up to 100 U.S. gallon tanks)
- QUICKSTAND™ weight 25-1/2 pounds without packaging
- Available in asembled and unassembled configurations

| Product Submittal | |
|---|---|
| Job Name: | |
| Date: | |
| Part Number: | Qty: |
| | |
| | |
| Architect / Owner: | |
| | |
| Contractor: | |
| | |
| Notes: | |
| | |
| | |



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# WH-3

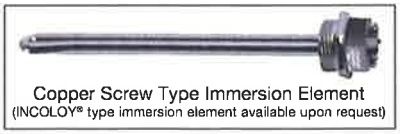
BRADFORD WHITE®
WATER HEATERS

# ElectriFLEX LD™ (Light Duty) Commercial Lowboy Electric Water Heater

**Photo is of LE120L3-3**

***FEATURING:***

Hydrojet® VITRAGLAS® MICROBAN®



Copper Screw Type Immersion Element
(INCOLOY® type immersion element available upon request)

***Bradford White ElectriFLEX LD™ Lowboy Electric Models Feature:***

- **Applications**—Lowboy models are ideal for installations where space is minimal and are perfect for tight installations such as a closet or under a counter.
- **Fully Automatic Thermostat Controls**—Fast acting surface-mount thermostats with a maximum setpoint of 175°F (79°C) and a high limit energy cut-off (manual reset) for safety.
- **Direct Heat Transfer With Immersed Elements**—Transfers heat directly and efficiently to the water. Screw-in style.
- **Vitraglas® Lining with Microban®**—An exclusively engineered enamel formula that provides superior tank protection from the corrosive effects of water; and with Microban® antimicrobial product protection to help prevent the growth of bacteria, mold and mildew on the surface of the tank lining.
- **Hydrojet® Total Performance System**—Sediment build-up reducing device that also increases first hour rating of hot water while minimizing temperature build-up in tank.
- **Insulation System**—2" (51mm) Non-CFC foam insulation covers the sides and top of the tank, reducing heat loss. This results in less energy consumption, improved efficiencies, and jacket rigidity. LE120L models additionally use a supplied flexible fiberglass insulation blanket.
- **Water Connections**—3/4" (19mm) NPT factory-installed true dielectric fittings extend water heater life and simplify water line connections.
- **Factory-Installed Heat Traps**—Design incorporates a flexible disk that reduces heat loss in piping and eliminates the potential for noise generation.
- **Protective Anode Rod**—Provides added protection against corrosion for long-term, trouble-free service.
- **Steel Tank**—Heavy gauge steel automatically formed, rolled, and welded.
- **Field Convertible**—Units are shipped from factory standard Three Phase, Non-Simultaneous and can be converted to Single Phase and/or Simultaneous operation in the field.
- **Field Conversion Kits**—Change voltage and kW in the field (see options on following page).
- **T&P Relief Valve Installed**—Side T&P is standard. Optional top T&P location is available and must be specified when ordering.

AHRI CERTIFIED

UL LISTED c UL us LISTED

***3 or 5-Year Limited Tank Warranties / 1-Year Limited Warranty on Component Parts.***

For more information on warranty, please visit www.bradfordwhite.com

*For products installed in USA, Canada, and Puerto Rico. Some states do not allow limitations on warranties. See complete copy of the warranty included with the heater.*

Microban® antimicrobial product protection helps prevent the growth of bacteria, mold and mildew that may affect the product. The built-in antimicrobial properties do not protect users or others from disease-causing organisms. Microban® is a registered trademark of Microban Products Company.

# Commercial Electric Water Heater

## ElectriFLEX LD™ Lowboy Electric Models

Meet or exceed ASHRAE 90.1 (latest edition). C.E.C. Listed

| Model Number | Rated Nominal Capacity U.S. Gal. | Rated Nominal Capacity Imp. Gal. | DOE Rated Storage Volume Gal. | First Hour Rating Gal. | Uniform Energy Factor | Element Wattage (Watts) Minimum | Element Wattage (Watts) Maximum | A Floor to Top of Heater in. | B Jacket Dia. in. | C Floor to Water Conn. in. | D C/L of Water Conn. in. | E Floor to T&P Conn. †† in. | G Water Conn. NPT in. | Approx. Shipping Weight lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LE120L3-3**† | 19 | 16 | — | — | — | 1500 | 6000 | 24 3/4 | 18 | 25 3/4 | 8 | 19 1/4 / 24 7/8 | 3/4 | 58 |
| LE230LN3-3 | 28 | 23 | 26 | 41 | 0.92 | 1500 | 6000 | 29 9/16 | 23 | 31 5/16 | 8 | 23 9/16 / 31 5/16 | 3/4 | 102 |
| LE240LN3-3 | 37 | 31 | 34 | 45 | 0.92 | 1500 | 6000 | 32 1/16 | 24 1/2 | 34 5/16 | 8 | 23 9/16 / 34 5/16 | 3/4 | 126 |
| LE250LN3-3 | 47 | 39 | 43 | 61 | 0.92 | 4000 | 6000 | 33 5/16 | 26 | 36 1/16 | 8 | 24 5/16 / 36 1/16 | 3/4 | 173 |

| Model Number | Rated Nominal Capacity Liters | DOE Rated Storage Volume Liters | First Hour Rating Liters | Uniform Energy Factor | Element Wattage (Watts) Minimum | Element Wattage (Watts) Maximum | A Floor to Top of Heater mm. | B Jacket Dia. mm. | C Floor to Water Conn. mm. | D C/L of Water Conn. mm. | E Floor to T&P Conn. †† mm. | G Water Conn. NPT mm. | Approx. Shipping Weight kg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LE120L3-3**† | 72 | — | — | — | 1500 | 6000 | 629 | 457 | 654 | 203 | 489 / 632 | 19 | 26 |
| LE230LN3-3 | 106 | 98 | 155 | 0.92 | 1500 | 6000 | 751 | 584 | 795 | 203 | 598 / 795 | 19 | 46 |
| LE240LN3-3 | 140 | 129 | 171 | 0.92 | 1500 | 6000 | 814 | 622 | 872 | 203 | 598 / 872 | 19 | 57 |
| LE250LN3-3 | 178 | 163 | 231 | 0.92 | 4000 | 6000 | 846 | 660 | 916 | 203 | 618 / 916 | 19 | 78 |

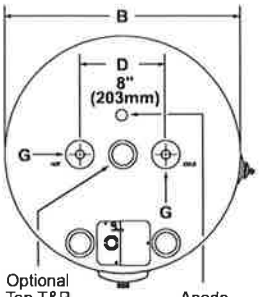
Specify wattage and voltage when ordering. Use chart below for maximum wattages at certain voltages. **Models include supplied insulation blanket (2" (51mm) thick). Dimensions in charts above do not include blanket thickness. For 5 year models, change suffix "3" to "5". NSF Kits available when ordering. †Exempt from ASHRAE 90.1b. Uniform Energy Factor and First Hour Rating is based on the latest AHRI directory listings. †† All models feature side or top T&P location and must specify when ordering. "E" dimension listed as side/top.

| Wattage Limitations for Non-Simultaneous and Simultaneous Operation | Voltage 120V | 208V | 240V | 277V | 380V | 415V | 480V |
|---|---|---|---|---|---|---|---|
| 1500W / 1500W | yes | yes | yes | yes | yes | yes | yes |
| 2000W / 2000W | no | yes | yes | yes | yes | yes | yes |
| 2500W / 2500W | no | yes | yes | yes | yes | yes | yes |
| 3000W / 3000W | no | yes | yes | yes | yes | yes | yes |
| 3500W / 3500W | no | yes | yes | no | yes | yes | no |
| 4000W / 4000W | no | yes | yes | yes | yes | yes | yes |
| 4500W / 4500W | no | yes | yes | yes | yes | yes | yes |
| 5000W / 5000W | no | yes | yes | yes | yes | yes | yes |
| 5500W / 5500W | no | yes | yes | no | yes | yes | no |
| 6000W / 6000W | no | no | yes | yes | yes | yes | yes |

| Wattage | Recovery▲ GPH Temperature Rise °F 60 | 80 | 90 | 100 | 120 |
|---|---|---|---|---|---|
| 1500W | 10 | 8 | 7 | 6 | 5 |
| 2000W | 14 | 10 | 9 | 8 | 7 |
| 2500W | 17 | 13 | 11 | 10 | 9 |
| 3000W | 21 | 15 | 14 | 12 | 10 |
| 3500W | 24 | 18 | 16 | 14 | 12 |
| 4000W | 28 | 21 | 18 | 16 | 14 |
| 4500W | 31 | 23 | 21 | 18 | 15 |
| 5000W | 34 | 26 | 23 | 21 | 17 |
| 5500W | 38 | 29 | 25 | 23 | 19 |
| 6000W | 41 | 31 | 28 | 25 | 21 |

| Wattage | Recovery▲ LPH Temperature Rise °C 34 | 45 | 50 | 56 | 67 |
|---|---|---|---|---|---|
| 1500W | 38 | 30 | 26 | 23 | 19 |
| 2000W | 53 | 38 | 34 | 30 | 26 |
| 2500W | 64 | 49 | 42 | 38 | 34 |
| 3000W | 79 | 57 | 53 | 45 | 38 |
| 3500W | 91 | 68 | 61 | 53 | 45 |
| 4000W | 106 | 79 | 68 | 61 | 53 |
| 4500W | 117 | 87 | 79 | 68 | 57 |
| 5000W | 129 | 98 | 87 | 79 | 64 |
| 5500W | 144 | 110 | 95 | 87 | 72 |
| 6000W | 155 | 117 | 106 | 95 | 79 |

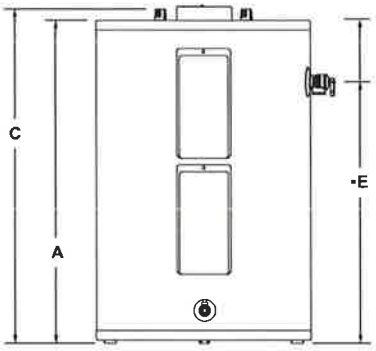
▲(GPH based on Non-Simultaneous operation, when Simultaneous operation the GPH/LPH will approximately double.)




**Voltage and Wattage Conversion Kits**
**Refer to Element Wattage minimum & maximum in chart above**

| Simultaneous and Non-Simultaneous Wattage | Voltage 120V | 208V | 240V | 277V | 380V | 415V | 480V |
|---|---|---|---|---|---|---|---|
| 1500W / 1500W | 415-46409-01 | 415-46409-05 | 415-46409-13 | 415-46409-16 | 415-46409-24 | 415-46409-41 | 415-46409-32 |
| 2000W / 2000W | N/A | 415-46409-06 | 415-46409-05 | 415-46409-17 | 415-46409-43 | 415-46409-24 | 415-46409-33 |
| 2500W / 2500W | N/A | 415-46409-07 | 415-46409-06 | 415-46409-18 | 415-46409-25 | 415-46409-43 | 415-46409-34 |
| 3000W / 3000W | N/A | 415-46409-08 | 415-46409-14 | 415-46409-19 | 415-46409-26 | 415-46409-25 | 415-46409-35 |
| 3500W / 3500W | N/A | 415-46409-09 | 415-46409-07 | N/A | 415-46409-54 | 415-46409-26 | N/A |
| 4000W / 4000W | N/A | 415-46409-49 | 415-46409-08 | 415-46409-20 | 415-46409-56 | 415-46409-54 | 415-46409-36 |
| 4500W / 4500W | N/A | 415-46409-11 | 415-46409-09 | 415-46409-51 | 415-46409-57 | 415-46409-55 | 415-46409-59 |
| 5000W / 5000W | N/A | 415-46409-50 | 415-46409-15 | 415-46409-52 | 415-46409-58 | 415-46409-56 | 415-46409-38 |
| 5500W / 5500W | N/A | 415-46409-67 | 415-46409-49 | 415-46409-61** | 415-46409-63 | 415-46409-57 | 415-46409-62** |
| 6000W / 6000W | N/A | 415-46409-66* | 415-46409-68 | 415-46409-53 | 415-46409-64 | 415-46409-58 | 415-46409-60 |

Note: Each kit will include two replacement elements, two gaskets, a rating plate overlay and one set of instructions. For water heaters with only one element, please retain the extra element and gasket as a service part. *415-46409-66 contains only one element. **INCOLOY® element only.




•"E" dimension listed as side/top.

**General:**

**All models comply with NAECA III requirements.** All models UL® listed. These heaters are wired inter-locking (Non-Simultaneous, Three Phase) 240V with two 4500W elements, unless otherwise specified. All water connections are 3/4" NPT (19mm). All electrical connections are 3/4" (19mm). All models certified at 300 PSI test pressure (2068 kPa) and 150 PSI working pressure (1034 kPa.)

***Dimensions and specifications subject to change without notice in accordance with our policy of continuous product improvement.***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***24/7 Technical Support:*** **800-334-3393** ■ *Email techserv@bradfordwhite.com*


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**Built to be the Best**

# Engineering Specification

Job Name: Stone Bank
Job Location: LR
Engineer: Batson
Approval:

Contractor: Comfort Systems USA
Approval:
Contractor's P.O. No.:
Representative: Sanders Supply

**LEAD FREE***

# Series PLT

## Potable Water Expansion Tanks

Series PLT Potable Water Expansion Tanks are designed to absorb the increased volume of water created by thermal expansion and to maintain balanced pressure throughout the potable water supply system.

Heated water expands, and in a domestic hot water system, the system may be closed when the potable water system is isolated from the public water supply by a one-way valve such as pressure reducing valve, backflow preventer or check valve. Provisions must be made for this expansion.

Series PLT expansion tanks absorb the increased volume of water created when the hot water storage tank is heated and keeps the system pressure below the relief setting of the T&P relief valve.

It is a pre-pressurized steel tank with an expansion membrane that prevents contact of the water with the air in the tank. This prevents loss of air to the water and insures long and trouble-free life for the system. These tanks may be used with all types of Direct Fired Hot Water Heaters (gas, oil or electric) and hot water storage tanks.


## Features

- Rugged flexible butyl diaphragm
- Field adjustable pre-charge
- In-line and free standing models
- Can be used with most standard hot water heaters and storage tanks

## Models

| | |
|---|---|
| **PLT-5-M1** | ¾" male connection, tank volume 2.1 gal. |
| ~~**PLT-12-M1**~~ | ~~¾" male connection, tank volume 4.5 gal.~~ |
| **PLT-20-M1** | ¾" male connection, tank volume 8.5 gal. |
| **PLT-35-M1** | 1" female connection, tank volume 14.00 gal. |

## Specifications

The potable water expansion tank shall be of drawn steel construction. It shall have a Butyl diaphragm separating the air chamber from the water containing chamber. Inlet connector shall be Stainless Steel. Materials of manufacture for the diaphragm shall be FDA approved.

The potable water expansion tank shall be a Watts Model PLT.

## Standards

**Models PLT-5, PLT-12 and PLT-20**
are Listed by IAPMO.
Certified to ANSI/NSF 61
**Model PLT-35**
Certified to ANSI/NSF 61

(73°F/23°C)

**Note:** The potable water expansion tank shall be installed in the cold water service pipe line on the supply side of the water heater (or water storage tank). A pressure relief valve sized and installed in accordance with local codes must be incorporated in the system.
In those systems requiring a combined temperature and pressure safety relief valve, the temperature and pressure relief valve should be sized and installed in accordance with local codes. Adequate drainage provisions should be provided where water flow will cause damage.

**See chart on back**

**NOTICE**

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

**NOTICE**

Inquire with governing authorities for local installation requirements

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**



WATTS®

## Selection

This Quick Reference Selection Guide may be used as an alternative to using a formula to determine the correct expansion tank for the system. This table is based upon a relief valve setting of 150psi (10.3 bar), and a maximum of 50°F temperature rise.

To select the correct model PLT series tank, simply go the supply pressure equal to the system supply pressure (for pressures between those shown use next highest supply pressure shown), read across the chart to the correct tank as indicated by the water heater capacity (for capacities between those shown, use next highest capacity).

To accommodate the thermal expansion required for higher temperature and/or higher pressure systems, multiple tanks may be used. Please contact the factory for sizing information.

## Materials

Diaphragm: Butyl rubber

Inlet Connection: Stainless Steel

## Technical Information

| DESCRIPTION | PLT-5 | PLT-12 | PLT-20 | PLT-35 |
|---|---|---|---|---|
| Max. Pressure - PSI | 150 | 150 | 150 | 150 |
| Max. Temp. - °F | 200 | 200 | 200 | 200 |
| Tank Volume - Gal. | 2.1 | 4.5 | 8.5 | 14.00 |
| Air Pre-charge - PSI | 20 | 20 | 20 | 20 |
| Connections Size - Inches | ¾ Male | ¾ Male | ¾ Male | 1 Female |
| Diameter - Inches | 8 | 10.5 | 12.5 | 16.0 |
| Length - Inches | 11 | 13.5 | 19.2 | 21.7 |
| Weight - Lbs. | 5.5 | 10 | 15 | 32 |

## Acceptance Volume

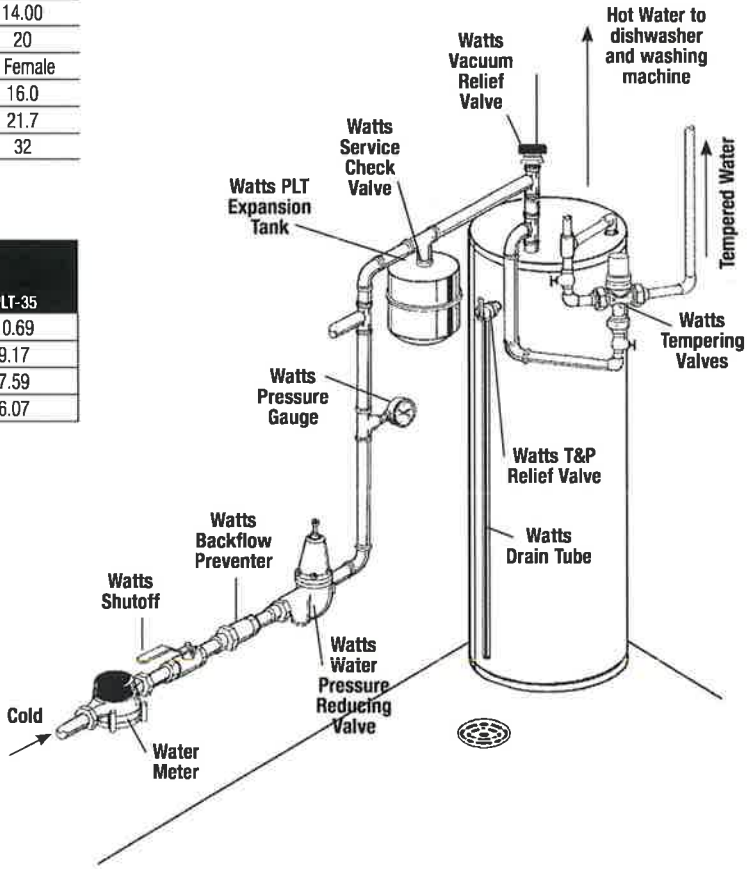
| AIR SIDE PRE-PRESSURE (PSI) | WATER SIDE VOLUME AT 150PSI (GALLONS) PLT-5 | PLT-12 | PLT-20 | PLT-35 |
|---|---|---|---|---|
| 20 | 1.48 | 3.42 | 7.102 | 10.69 |
| 40 | 1.26 | 2.88 | 5.882 | 9.17 |
| 60 | 1.0 | 2.49 | 4.705 | 7.59 |
| 80 | .8 | 1.85 | 4.009 | 6.07 |

| SUPPLY PRESSURE (PSIG) | WATER HEATER (GALLONS) 20 | 30 | 40 | 50 | 80 | 100 | 120 |
|---|---|---|---|---|---|---|---|
| 40 | | | | | | | |
| 50 | | | | | | | |
| 55 | | | | | | | |
| 60 | | | | | | | |
| 70 | | | | | | | |
| 80 | | | | | | | |
| 90 | | | | | | | |
| 100 | | | | | | | |
| 110 | | | | | | | |
| 120 | | | | | | | |

PLT-5 PLT-20

PLT-12 PLT-35

Multiple tanks required - consult factory



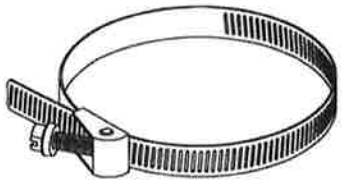


**USA:** T: (978) 689-6066 • F: (978) 975-8350 • Watts.com

**Canada:** T: (888) 208-8927 • F: (905) 332-7068 • Watts.ca

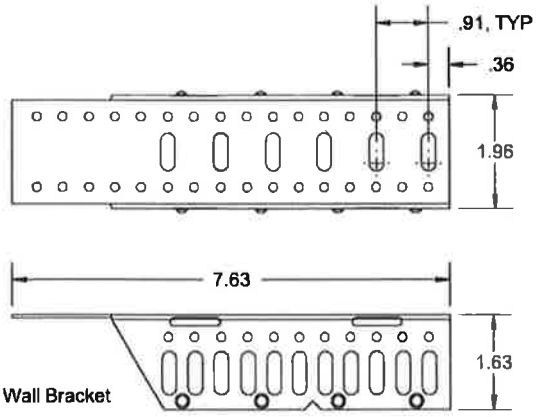
**Latin America:** T: (52) 55-4122-0138 • Watts.com

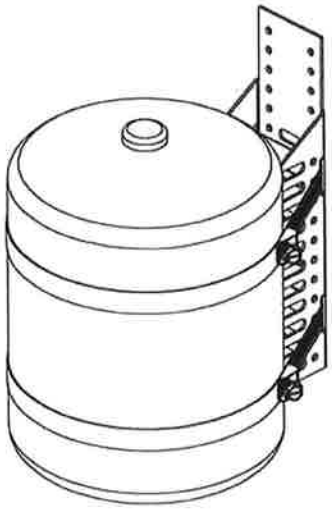
# PRODUCT SPECIFICATION DRAWING
## QUICK STRAP® UNIVERSAL #QS-U
## THERMAL EXPANSION TANK MOUNTING BRACKET



Band Length = 46.25", Diameter Range = 2.50" to 14.25" (2X)

#8 x 1.50" Long Sheet Metal Screw (2X)



| Model | Size |
|---|---|
| QS-U | Up to 5 gallon / Up to 13" diameter |

ALL DIMENSIONS IN INCHES

The QUICK STRAP® #QS-U is a thermal expansion tank mounting bracket. Secures to wall and takes weight load off pipes. Galvanized and stainless steel construction. Available for 2-5 gallon units. The system includes: Wall Bracket, Bands (2X) and #8 x 1.50" Long Sheet Metal Screws (2X).

**Product Information:**

- Material:
  Strap: 1/2" Wide, .025" Thick, 200/410 Stainless Steel
  Bracket: 16GA, Galvanized Steel
  Screws: Pan Head, #8 x 1-1/2" Long, Steel
- Load Rating: 70 LBS. (Choose appropriate wall anchors)

| Product Submittal | |
|---|---|
| Job Name: | |
| Date: | |
| Part Number: | Qty: |
| | |
| | |
| Architect / Owner: | |
| | |
| Contractor: | |
| | |
| Notes: | |
| | |
| | |



HOLDRITE®

## For Water Heater/Tank Applications

Job Name Stone Bank
Job Location LR
Engineer Batson
Approval

Contractor Comfort Systems USA
Approval
Contractor's P.O. No.
Representative Sanders Supply

# LEAD FREE*

# Model LFN36-M1

## Vacuum Relief Valve

**Sizes: ½" – ¾" Male NPT**

LFN36-M1

Design certified by

**Tested and rated under "ANSI Z21.22 Relief Valves for Hot Water Supply Systems".**

### Features

- Low profile
- All Lead Free* brass body
- Protective cap
- Suitable for low pressure steam and water service
- Tested and rated to ANSI Z21.22
- CSA certified
- The LFN36-M1 features Lead Free* construction to comply with Lead Free* installation requirements.

### Applications

- Domestic water heaters and supply tanks
- Table top heaters
- Jacketed steam kettles
- Unit heaters
- Low pressure steam systems
- Steam coil heaters

**Note:** Vacuum relief valves are not designed or approved as backsiphonage backflow preventers. For protection against backsiphonage install Watts Series 288A vacuum breakers.

### Standards

Tested and rated to ANSI Z21.22

CSA certified

### Specifications

A Watts Model LFN36-M1 Vacuum Relief Valve shall be installed on domestic hot water supply tanks/ heaters/ unit heaters/ steam kettles as indicated on plans. The vacuum relief valve shall be ANSI Z21.22 rated and CSA certified. The vacuum relief valve shall have an all brass body and include a protective cap for automatic venting of a closed system to atmosphere when a vacuum is created. The Lead Free* Vacuum Relief Valve shall comply with state codes and standards, where applicable, requiring reduced lead content. The Watts LFN36-M1 Vacuum Relief Valve permits air to enter and prevent vacuum conditions that could siphon the water from the system, resulting in collapse of a tank or water heater or equipment burn out. The valve shall be a Watts Model LFN36-M1.

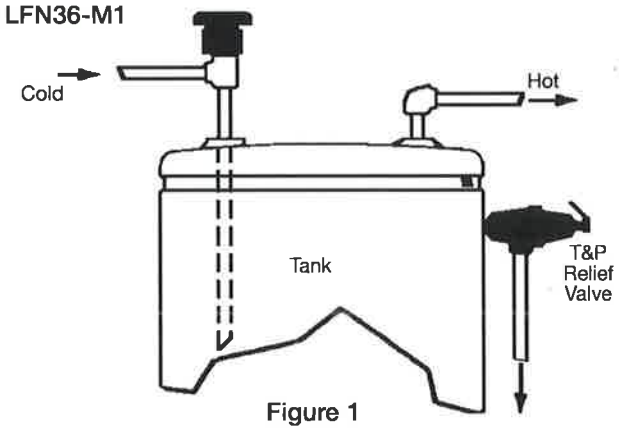



Figure 1

**Domestic Hot Water Supply Tanks and Heaters with Top Supply**

**NOTICE**

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

**NOTICE**

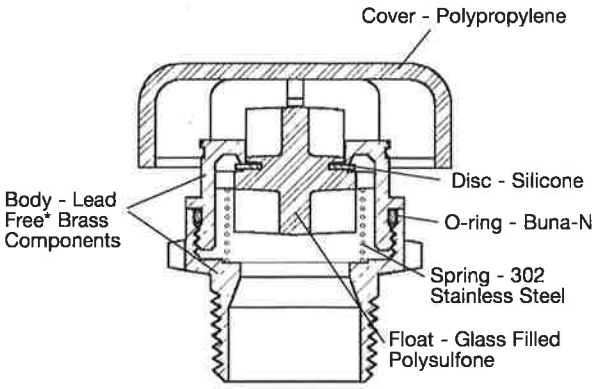
Inquire with governing authorities for local installation requirements

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**



WATTS®

## Materials

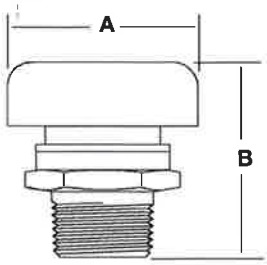



## Pressure – Temperature

Maximum steam working pressure: 15 psi (1.03 bar)

Maximum temperature: 250°F (121°C)

## Dimensions-Weights




| SIZE | DIMENSIONS | | | | WEIGHT | |
|---|---|---|---|---|---|---|
| | A | | B | | | |
| in. | in. | mm | in. | mm | oz. | gr |
| ½ | 2 | 50 | 2 | 50 | 4 | 113 |
| ¾ | 2 | 50 | 2 | 50 | 4 | 113 |

## Capacity

| SIZE | MODEL | VENTING CAPACITY | |
|---|---|---|---|
| in. | | CFM | LPM |
| ½ | LFN36-M1 | 15 | 425 |
| ¾ | LFN36-M1 | 15 | 425 |

## Typical Installations

### Water Service

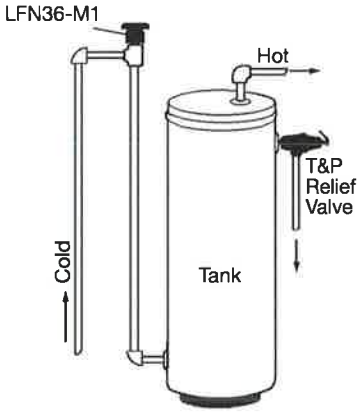



**Figure 2**

**Domestic Hot Water Supply Tanks and Heaters with Bottom Feed**

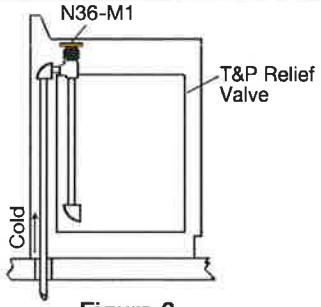



**Figure 3**

**Table Top Heaters**

### Steam Service

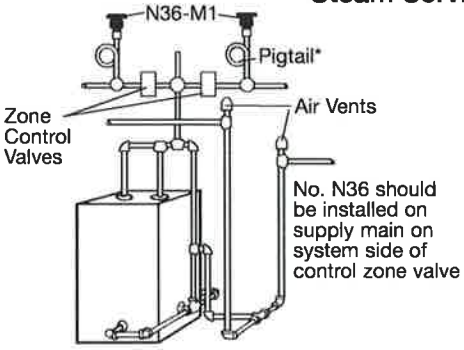



**Figure 4**

**Low Pressure Steam Heating Systems**

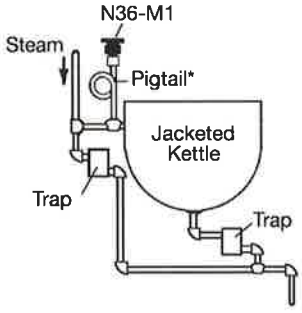



**Figure 5**

**Jacketed Kettles**

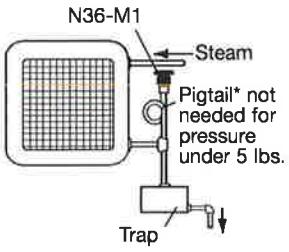



**Figure 6**

**Unit Heaters**

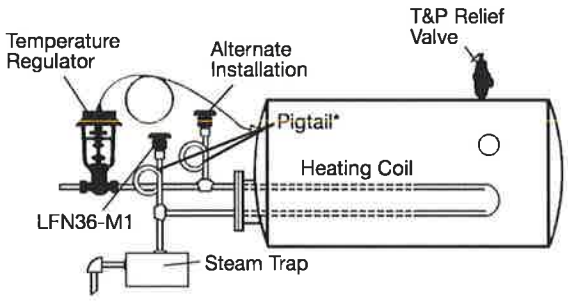



**Figure 7**

**Steam Coil Heaters**

***Note:** When used for steam service, be sure to use pigtail to prevent live steam from damaging N36 valve.

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# ALUMINUM WATER HEATER PANS TECHNICAL SPECIFICATION

Job Name Stone Bank Item # 34081
Location LR
Engineer Batson Contractor Comfort Systems USA
PO # Tag WH-1,2
Representative Sanders Supply

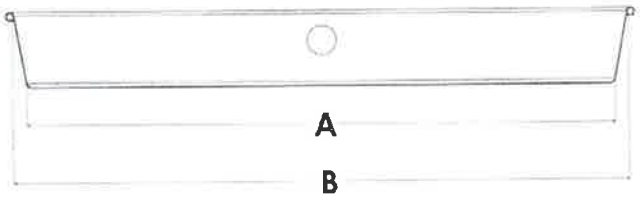
## SPECIFICATIONS

Oatey Aluminum Water Heater Pans can be installed under gas or electric water heaters to protect from water damage. Available with 1" PVC, 1-½" PVC or 1" CPVC drain fittings to allow for connection to indirect drain.

## DESCRIPTION

All dimensions in inches

- Manufactured from .032 Prime Aluminum.
- Pre-cut side opening accommodates drain fitting.
- Meets requirements of Southern Building Code.
- Pan depth is minimum 2-½".




## PRODUCT SELECTOR

### WATER HEATER PANS WITH 1" CPVC FITTING (FITS OVER 1" CPVC PIPE)

| ✓ | Product Number | Description | Qty | Inside Diameter (A) | Outside Diameter (B) |
|---|---|---|---|---|---|
| ☐ | 34170 | 18" Aluminum Water Heater Pan - Bulk | 6 | 18 | 19 |
| ☐ | 34171 | 20" Aluminum Water Heater Pan – Bulk | 6 | 20 | 21 |
| ☐ | 34172 | 22" Aluminum Water Heater Pan – Bulk | 6 | 22 | 23 |
| ☐ | 34173 | 24" Aluminum Water Heater Pan – Bulk | 6 | 24 | 25 |
| ☐ | 34174 | 26" Aluminum Water Heater Pan – Bulk | 6 | 26 | 27 |
| ☐ | 34176 | 28" Aluminum Water Heater Pan – Bulk | 6 | 28 | 29 |
| ☐ | 34175 | 30" Aluminum Water Heater Pan - Bulk | 6 | 30 | 31 |
| ☐ | 34193 | 32" Aluminum Water Heater Pan | 6 | 32 | 33 |

Data is subject to manufacturing tolerances.

Access BIM/Revit content through www.oatey.com

# ALUMINUM WATER HEATER PANS TECHNICAL SPECIFICATION

## PRODUCT SELECTOR

### WATER HEATER PANS WITH 1" PVC FITTING (FITS OVER 1" AND INSIDE 1.5" SCHEDULE 40 PIPE)

| ✓ | Product Number | Description | Qty | Inside Diameter (A) | Outside Diameter (B) |
|---|---|---|---|---|---|
| ☐ | 34079 | 18" Aluminum Water Heater Pan - Bulk | 6 | 18 | 19 |
| ☐ | 34151 | 20" Aluminum Water Heater Pan - Bulk | 6 | 20 | 21 |
| ☐ | 34152 | 22" Aluminum Water Heater Pan - Bulk | 6 | 22 | 23 |
| ☐ | 34153 | 24" Aluminum Water Heater Pan - Bulk | 6 | 24 | 25 |
| ☐ | 34154 | 26" Aluminum Water Heater Pan - Bulk | 6 | 26 | 27 |
| ☐ | 34156 | 28" Aluminum Water Heater Pan - Bulk | 6 | 28 | 29 |
| ☐ | 34085 | 30" Aluminum Water Heater Pan - Bulk | 6 | 30 | 31 |
| ☐ | 34191 | 32" Aluminum Water Heater Pan | 6 | 32 | 33 |

### WATER HEATER PANS WITH 1.5" PVC FITTING (FITS OVER 1" AND OVER 1.5" SCHEDULE 40 PIPE)

| ✓ | Product Number | Description | Qty | Inside Diameter (A) | Outside Diameter (B) |
|---|---|---|---|---|---|
| ☐ | 34081 | 20" Aluminum Water Heater Pan – Bulk | 6 | 20 | 21 |
| ☐ | 34082 | 22" Aluminum Water Heater Pan- Bulk | 6 | 22 | 23 |
| ☐ | 34083 | 24" Aluminum Water Heater Pan - Bulk | 6 | 24 | 25 |
| ✓ | 34084 | 26" Aluminum Water Heater Pan - Bulk | 6 | 26 | 27 |
| ☐ | 34103 | 28" Aluminum Water Heater Pan - Bulk | 6 | 28 | 29 |
| ☐ | 34107 | 30" Aluminum Water Heater Pan | 6 | 29 | 30 |

### WATER HEATER PANS WITHOUT FITTING & WITHOUT HOLE

| ✓ | Product Number | Description | Qty | Inside Diameter (A) | Outside Diameter (B) |
|---|---|---|---|---|---|
| ☐ | 34090 | 18" Aluminum Water Heater Pan – Bulk | 6 | 18 | 19 |
| ☐ | 34091 | 20" Aluminum Water Heater Pan – Bulk | 6 | 20 | 21 |
| ☐ | 34092 | 22" Aluminum Water Heater Pan – Bulk | 6 | 22 | 23 |
| ☐ | 34093 | 24" Aluminum Water Heater Pan – Bulk | 6 | 24 | 25 |
| ☐ | 34094 | 26" Aluminum Water Heater Pan – Bulk | 6 | 26 | 27 |
| ☐ | 34095 | 30" Aluminum Water Heater Pan – Bulk | 6 | 30 | 31 |

### WATER HEATER PAN ADAPTERS

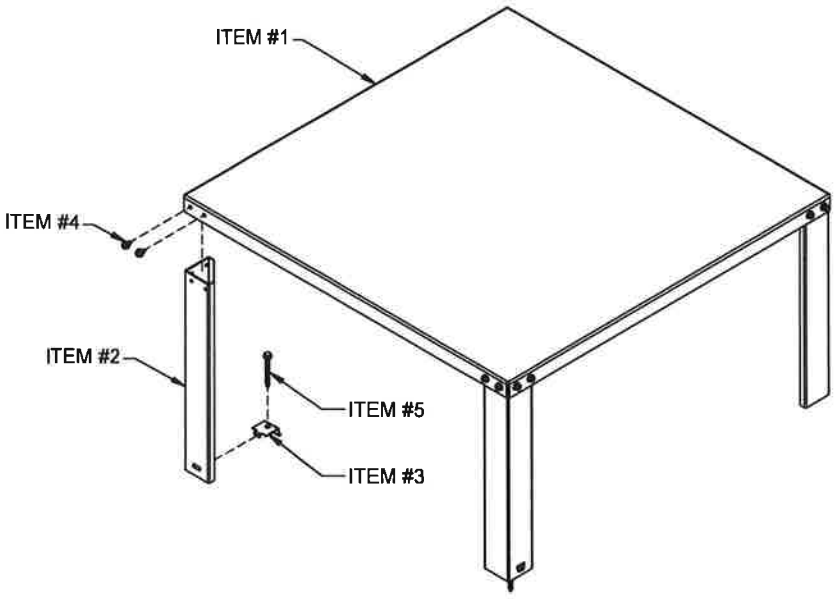
| ✓ | Product Number | Description | Qty |
|---|---|---|---|
| ☐ | 34086 | 1-½" PVC Adapter (Fits over 1" and over 1.5" schedule 40 pipe) | 12 |
| ☐ | 34088 | 1" PVC Adapter (Fits over 1" and inside 1.5" schedule 40 pipe) | 12 |
| ☐ | 34089 | 1" CPVC Adapter (Fits over 1" CPVC pipe) | 12 |

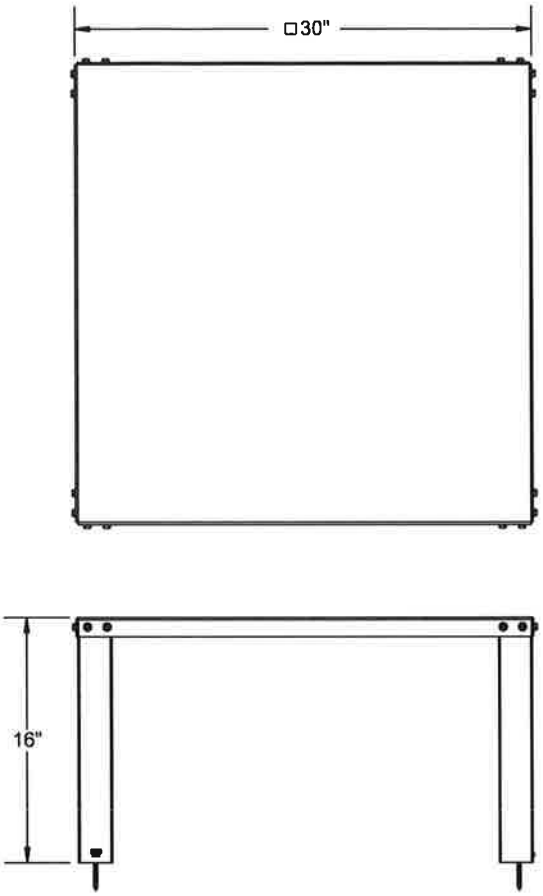
Data is subject to manufacturing tolerances.

# PRODUCT SPECIFICATION DRAWING

## QUICKSTAND™ 30" X 30" (Water Heater & Equipment Support)

## #40-S-30-A (assembled) and #40-S-30-U (unassembled)




**The QUICKSTAND™ #40-S-30- (A or U) stand safely elevates water heaters and other equipment above the floor (1,350 lbs rating).**

ALL DIMENSIONS IN INCHES

### Product Information:

- Material:
  Item #1: Top, 12 gage CRS, galvanized
  Item #2: Leg, 16 gage CRS, galvanized, 4 places
  Item #3: Safety Clip, 14 gage CRS, galvanized, 2 places
  Item #4: SMS, Phillips Hex Head Washer, w/Serrated Under Head, #1/4-14 X 1/2"L, 16 places
  Item #5: Lag Bolt, #1/4-10 X 2-1/2"L, self-drilling, 2 places
  (items #3 and #5 included with product)
- Engineered and lab tested to meet Uniform Plumbing Code (UPC) and International Plumbing Code (IPC) requirements, including elevation of water heater's ignition source 18" above the floor
- Holds up to 1,350 pounds (typical 100 to 120 U.S. gallons)
- QUICKSTAND™ weight 36 pounds without packaging
- Available in assembled and unassembled configurations

| Product Submittal | |
|---|---|
| Job Name: | |
| Date: | |
| Part Number: | Qty: |
| | |
| | |
| Architect / Owner: | |
| | |
| Contractor: | |
| | |
| Notes: | |
| | |
| | |



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