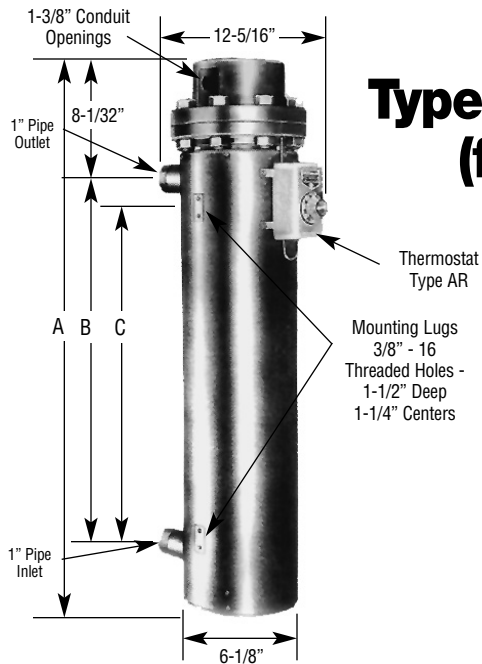


# Chromalox®

## Installation and RENEWAL PARTS IDENTIFICATION

### SERVICE REFERENCE

|                                      |              |
|--------------------------------------|--------------|
| DIVISION 4                           | SECTION NHOW |
| SALES REFERENCE (Supersedes PE406-4) | PE406-5      |
| 161-048710-001                       |              |
| DATE FEBRUARY, 1999                  |              |



## Type NWHO-3 Series Circulation Heaters (for Regular and Fuel Oil Heating)

Specifications — Table A

| Regular Oil Heaters |            |               |     |                   |                  |        |        |
|---------------------|------------|---------------|-----|-------------------|------------------|--------|--------|
| Model               | Volts      | Phase         | kW  | W/In <sup>2</sup> | Dimensions (In.) |        |        |
|                     |            |               |     |                   | A                | B      | C      |
| NWHO-33015          | 240 or 480 | 1 or 3 $\phi$ | 3   | 23                | 32-15/16         | 22-1/2 | 16-1/2 |
| NWHO-34515          |            |               | 4.5 |                   | 32-15/16         | 22-1/2 | 16-1/2 |
| NWHO-36015          |            |               | 6   |                   | 42-15/16         | 32-1/2 | 26-1/2 |
| NWHO-37515          |            |               | 7.5 |                   | 55-7/16          | 45     | 39     |
| NWHO-39015          |            |               | 9   |                   | 55-7/16          | 45     | 39     |
| Fuel Oil Heaters    |            |               |     |                   |                  |        |        |
| NWHO-30315          | 240 or 480 | 1 or 3 $\phi$ | 3   | 15                | 32-15/16         | 22-1/2 | 16-1/2 |
| NWHO-30415          |            |               | 4   |                   | 42-15/16         | 32-1/2 | 26-1/2 |
| NWHO-30615          |            |               | 6   |                   | 55-7/16          | 45     | 39     |

### GENERAL

**WARNING: This heater is not intended for use in hazardous atmospheres where flammable vapors, gases, liquids or other combustible atmospheres are present as defined in the National Electrical Code. Failure to comply can result in explosion or fire.**

The NWHO-3 series is a general-purpose regular and fuel oil solution circulation heater intended for use indoors. It is designed for 150 psig at 550°F per ANSI standards.

The 3 steel-sheathed tubular elements are centered in a 3" diameter steel heating chamber and welded to a removable steel flange. The assembly is surrounded by 1-1/2" insulation and sheet metal jacket.

Depending upon the order specifications, the NWHO-3 may or may not be factory equipped with AR or other Chromalox thermostat. Such thermostats function to control outlet temperatures and to limit internal temperatures under abnormal flow conditions. These controls do not fail safe.

**CAUTION: Users should install adequate back-up controls and safety devices with their electric heating equipment. Where the consequences of failure may be severe, back-up controls are essential. Although the safety of installation is the responsibility of the user, Chromalox will be glad to make equipment recommendations.**

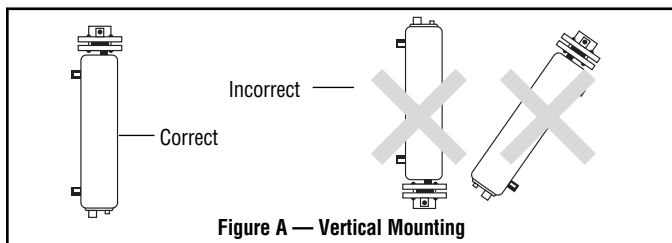
### INSTALLATION

**WARNING: Hazard of Shock. Disconnect all power before installing heater.**

#### 1. Vertical mounting (Preferred) —

When the heater is vertically mounted, the terminal housing will be at the top of the heater. The inlet pipe will be located on the side near the bottom of the heater and the outlet pipe at the top.

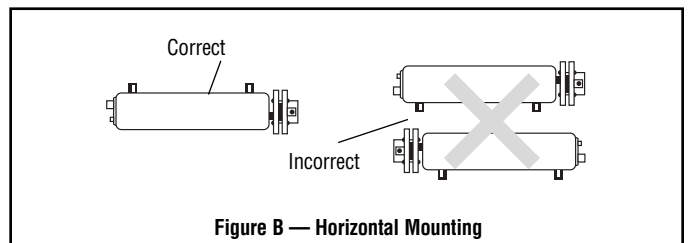
The axis of the chamber will be in a vertical position as in the photo above and as in Figure A.



Note: A drain pipe located at the bottom of the heater should be provided and enough room left, when mounting heater, to allow draining the heater.

#### 2. Horizontal Mounting (Optional) —

When mounting heater horizontally, inlet and outlet pipes **must** be up. In any other position, heater cannot be purged of air, and elements may be seriously damaged. (See Figure B.)



## INSTALLATION

3. Whether vertically or horizontally, the heater should be rigidly mounted so that vibration is at a minimum since excessive vibration will result in erratic thermostat operation. The NWHO-3 is provided with mounting lugs to support the heating chamber. (See photo.)
4. By using a slotted mounting assembly on either of the lugs, the heater chamber will be permitted to expand with increasing temperature.
5. **DANGER: Hazard of Fire.** Provide minimum of 6" spacing from chamber and related piping to nearest combustible material. *Do not operate near combustible fluids or in combustible vapor or gas laden atmosphere.*
6. Provide adequate space at terminal end to permit withdrawal of the heater from chamber should servicing be required.

## WIRING

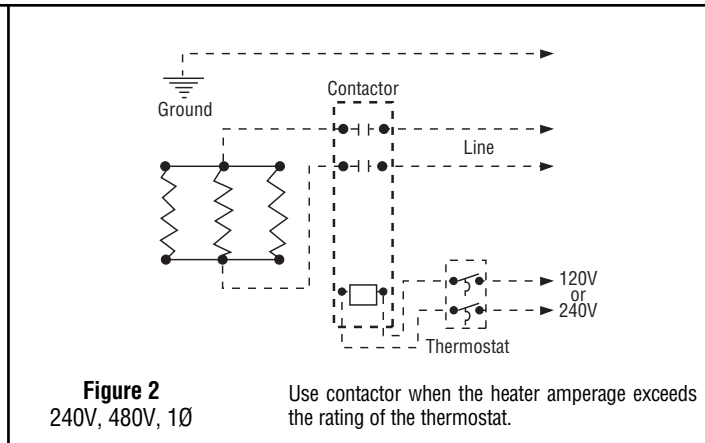
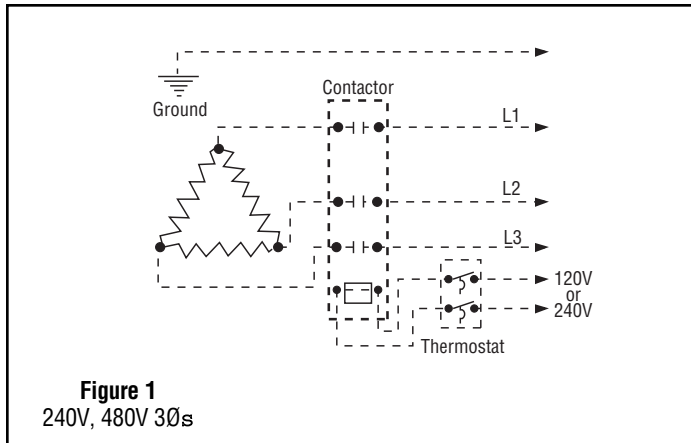
**WARNING: Hazard of Shock. Any installation involving electric heaters must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.**

1. Be sure line voltage matches heat voltage (on nameplate).
2. Electric wiring to heater must be installed in accordance with local and National Electrical Codes by a qualified person as defined in the NEC.
3. Power controllers **must** be used when heaters are rated 3 phase and when the heater amperage exceeds the rating of the thermostat.
4. Refer to Wiring Diagram, Table B, to properly connect the heater.

Wiring Diagrams — Table B

| Model     | 240V, 1Ø<br>Fig. | 240V, 3Ø s<br>Fig. | 480V, 1Ø<br>Fig. | 480V, 3Ø s<br>Fig. |
|-----------|------------------|--------------------|------------------|--------------------|
| NWHO-3301 | 2                | 1                  | 2                | 1                  |
| NWHO-3451 | 2                | 1                  | 2                | 1                  |
| NWHO-3601 | 2                | 1                  | 2                | 1                  |
| NWHO-3751 | 2                | 1                  | 2                | 1                  |
| NWHO-3901 | 2                | 1                  | 2                | 1                  |
| NWHO-3031 | 2                | 1                  | 2                | 1                  |
| NWHO-3041 | 2                | 1                  | 2                | 1                  |

**Note:** Use wire size and type specified by N.E.C. 480V and 550V heaters require 600V wire, per N.E.C. Contactors and wire supplied by customer.



**Note:** Dotted lines indicate "customer furnished." However, Thermostat could have been furnished by Chromalox if so specified on the order.

## OPERATION

1. Do not heat solutions that are corrosive to the heating element sheath or the heating chamber.

**WARNING: Type NWHO Circulation Heaters are equipped with steel heating elements and steel heating chambers. It is the responsibility of the user to know the chemical composition of the corrosive solution and the character of the materials entering the solution as well as the corrosive effect of the solution upon the heating elements and chamber. Chromalox cannot warrant any electric circulation heater against**

**failure by sheath corrosion if such failure is the result of operating conditions beyond our control.**

2. Terminal ends of heater must be protected from drippings, condensation, spray or direct spill-over of material. Their presence at the terminals may damage heater electrical insulation. Liquid-tight terminal enclosures are available to protect heater. Check with local sales representative.
3. If foreign material is carried by the liquid flow, install suitable filters in the inlet pipe line to the heater.
4. Do not allow heater to operate when liquid flow is interrupted.

## MAINTENANCE

1. **WARNING: Hazard of Shock. Disconnect all power before servicing heater.**
2. Remove heating element assembly periodically to check heater sheath for scaling, corrosion or excessive oxidation. Correct operating conditions to minimize sheath deterioration.
3. Periodically check temperature control and limit control operation to insure accurate and safe process operation.
4. Check all electrical connections periodically and retighten connections which may have loosened in service. Replace wire terminals that show signs of oxidation which would interfere with establishment of reliable electrical connections.

## RENEWAL PARTS IDENTIFICATION

| Regular Oil Heater |       |       |     |                  |
|--------------------|-------|-------|-----|------------------|
| Model              | Volts | Phase | kW  | Heating Elements |
| NWHO-33015         | 240   | 1     | 3   | 155-024796-031   |
| NWHO-33015         | 240   | 3 s   | 3   | 155-024796-032   |
| NWHO-33015         | 480   | 1     | 3   | 155-024796-033   |
| NWHO-33015         | 480   | 3 s   | 3   | 155-024796-034   |
| NWHO-34515         | 240   | 1     | 4.5 | 155-024796-036   |
| NWHO-34515         | 240   | 3 s   | 4.5 | 155-024796-037   |
| NWHO-34515         | 480   | 1     | 4.5 | 155-024796-038   |
| NWHO-34515         | 480   | 3 s   | 4.5 | 155-024796-039   |
| NWHO-36015         | 240   | 1     | 6   | 155-024796-041   |
| NWHO-36015         | 240   | 3 s   | 6   | 155-024796-042   |
| NWHO-36015         | 480   | 1     | 6   | 155-024796-043   |
| NWHO-36015         | 480   | 3 s   | 6   | 155-024796-044   |
| NWHO-37515         | 240   | 1     | 7.5 | 155-024796-046   |
| NWHO-37515         | 240   | 3 s   | 7.5 | 155-024796-047   |
| NWHO-37515         | 480   | 1     | 7.5 | 155-024796-048   |
| NWHO-37515         | 480   | 3 s   | 7.5 | 155-024796-049   |
| NWHO-39015         | 240   | 1     | 9   | 155-024796-051   |
| NWHO-39015         | 240   | 3 s   | 9   | 155-024796-052   |
| NWHO-39015         | 480   | 1     | 9   | 155-024796-053   |
| NWHO-39015         | 480   | 3 s   | 9   | 155-024796-054   |

| Fuel Oil Heater |       |       |    |                  |
|-----------------|-------|-------|----|------------------|
| Model           | Volts | Phase | kW | Heating Elements |
| NWHO-30315      | 240   | 1     | 3  | 155-024796-066   |
| NWHO-30315      | 240   | 3 s   | 3  | 155-024796-067   |
| NWHO-30315      | 480   | 1     | 3  | 155-024796-068   |
| NWHO-30315      | 480   | 3 s   | 3  | 155-024796-069   |
| NWHO-30415      | 240   | 1     | 4  | 155-024796-071   |
| NWHO-30415      | 240   | 3 s   | 4  | 155-024796-072   |
| NWHO-30415      | 480   | 1     | 4  | 155-024796-073   |
| NWHO-30415      | 480   | 3 s   | 4  | 155-024796-074   |
| NWHO-30615      | 240   | 1     | 6  | 155-024796-081   |
| NWHO-30615      | 240   | 3 s   | 6  | 155-024796-082   |
| NWHO-30615      | 480   | 1     | 6  | 155-024796-083   |
| NWHO-30615      | 480   | 3 s   | 6  | 155-024796-084   |

| Parts Common To All Heaters        |                |
|------------------------------------|----------------|
| Standard Gasket . . . . .          | 132-017222-015 |
| Spiral Wound Gasket . . . . .      | 132-073008-009 |
| Thermostat (Regular Oil) . . . . . | 300-057502-015 |
| Thermostat (Fuel Oil) . . . . .    | 300-057502-016 |

**Note:** When ordering parts for Model Numbers suffixed by "XX" or any other letters not specifically identified on this instruction sheet, order Renewal Parts on special order basis, giving name of part, part number, model number and description.

**Limited Warranty:**

Please refer to the Chromalox limited warranty applicable to this product at <http://www.chromalox.com/customer-service/policies/termsofsale.aspx>.

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