

# Chromalox®

## Installation, Operation

and

## RENEWAL PARTS IDENTIFICATION

### SERVICE REFERENCE

|                                    |           |
|------------------------------------|-----------|
| DIVISION 4                         | SECTION   |
| SALES REFERENCE (Supersedes PG433) | PG433-1   |
| 161-304901-001                     |           |
| DATE                               | MAY, 2003 |

# Type STAR Radiant Heater For Portable Installations

Specifications – Table 1

| Model          | Figure | Volts | KW   | Amperage |         | BTU   | Dimensions (In.) |         |         | Cord Ga./No. cond.  |         |
|----------------|--------|-------|------|----------|---------|-------|------------------|---------|---------|---------------------|---------|
|                |        |       |      | 1 Phase  | 3 Phase |       | A Height         | B Width | D Depth | 1 Phase             | 3 Phase |
| STAR-02A-11-PC | 1      | 120   | 1.5  | 12.5     | NA      | 5118  | 28-1/2           | 11-3/8  | 11-3/4  | Comes w/cord & plug |         |
| STAR-02A-81-P  |        | 208   | 2    | 9.6      | NA      | 6824  |                  |         |         | 14/3                | NA      |
| STAR-02A-21-P  |        | 240   | 2    | 8.3      | NA      | 6824  |                  |         |         | 14/3                | NA      |
| STAR-02A-71-P  |        | 277   | 2    | 7.2      | NA      | 6824  |                  |         |         | 14/3                | NA      |
| STAR-02A-41-P  |        | 480   | 2    | 4.2      | NA      | 6824  |                  |         |         | 14/3                | NA      |
| STAR-02A-61-P  |        | 600   | 2    | 3.3      | NA      | 6824  |                  |         |         | 14/3                | NA      |
| STAR-05A-81-P  | 2      | 208   | 4.5  | 21.6     | NA      | 15354 | 49               | 11-3/8  | 11-3/4  | 12/3                | NA      |
| STAR-05A-21-P  |        | 240   | 4.5  | 18.8     | NA      | 15354 |                  |         |         | 12/3                | NA      |
| STAR-05A-71-P  |        | 277   | 4.5  | 15.9     | NA      | 15354 |                  |         |         | 14/3                | NA      |
| STAR-05A-41-P  |        | 480   | 4.5  | 9.4      | NA      | 15354 |                  |         |         | 14/3                | NA      |
| STAR-05A-61-P  |        | 600   | 4.5  | 7.5      | NA      | 15354 |                  |         |         | 14/3                | NA      |
| STAR-06A-83-P  | 3      | 208   | 6    | 28.8     | 16.7    | 20472 | 32-1/2           | 23-5/8  | 11-1/2  | 10/3                | 12/4    |
| STAR-06A-23-P  |        | 240   | 6    | 25.0     | 14.4    | 20472 |                  |         |         | 10/3                | 12/4    |
| STAR-06A-71-P  |        | 277   | 6    | 21.7     | —       | 20472 |                  |         |         | 10/3                | —       |
| STAR-06A-43-P  |        | 480   | 6    | 12.5     | 7.2     | 20472 |                  |         |         | 12/3                | 12/4    |
| STAR-06A-63-P  |        | 600   | 6    | 10.0     | 5.8     | 20472 |                  |         |         | 12/3                | 12/4    |
| STAR-14A-83-P  | 4      | 208   | 13.5 | NR       | 37.5    | 46062 | 55-5/8           | 23-5/8  | 11-1/2  | NR                  | 6/4     |
| STAR-14A-23-P  |        | 240   | 13.5 | NR       | 32.5    | 46062 |                  |         |         | NR                  | 6/4     |
| STAR-14A-71-P  |        | 277   | 13.3 | 47.7     | —       | 45038 |                  |         |         | 6/3                 | —       |
| STAR-14A-43-P  |        | 480   | 13.5 | 28.1     | 16.2    | 46062 |                  |         |         | 10/3                | 12/4    |
| STAR-14A-63-P  |        | 600   | 13.5 | 22.5     | 13.0    | 46062 |                  |         |         | 10/3                | 12/4    |

NA - Not Available  
NR - Not Recommended

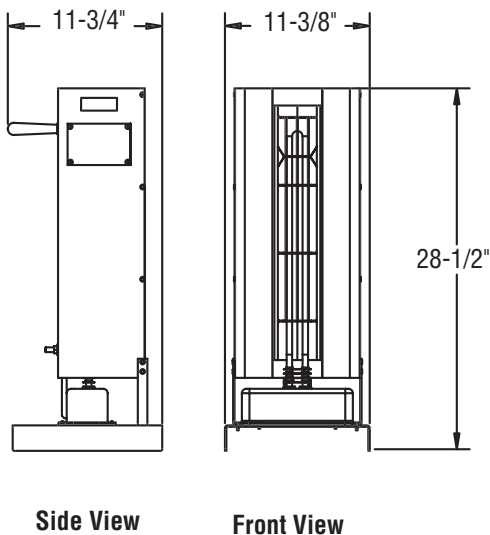


Figure 1

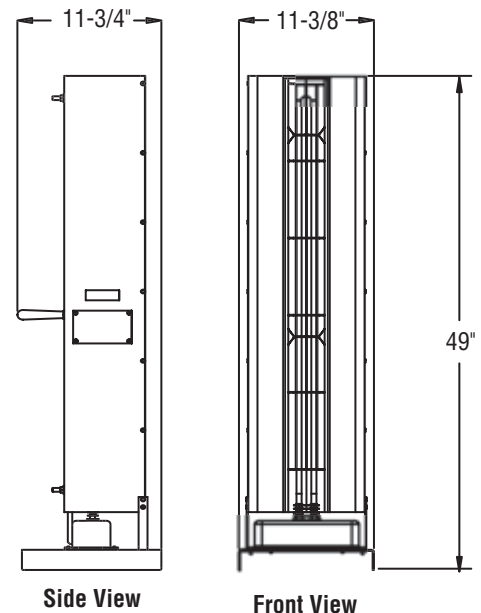


Figure 2

## GENERAL

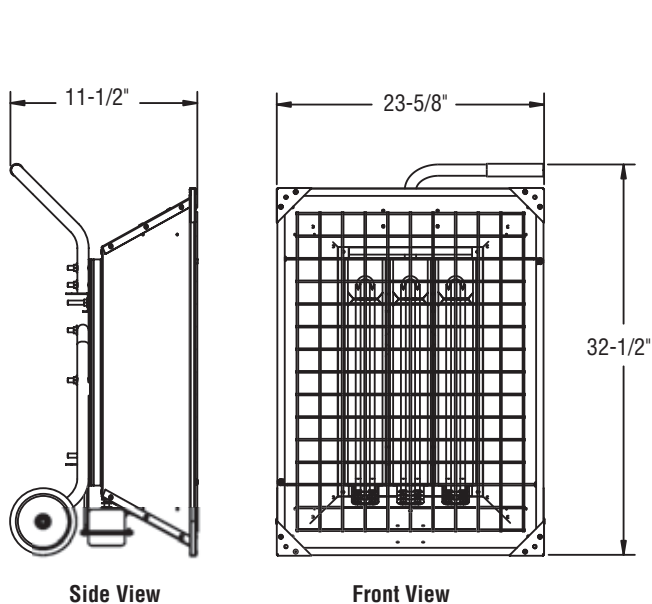


Figure 3

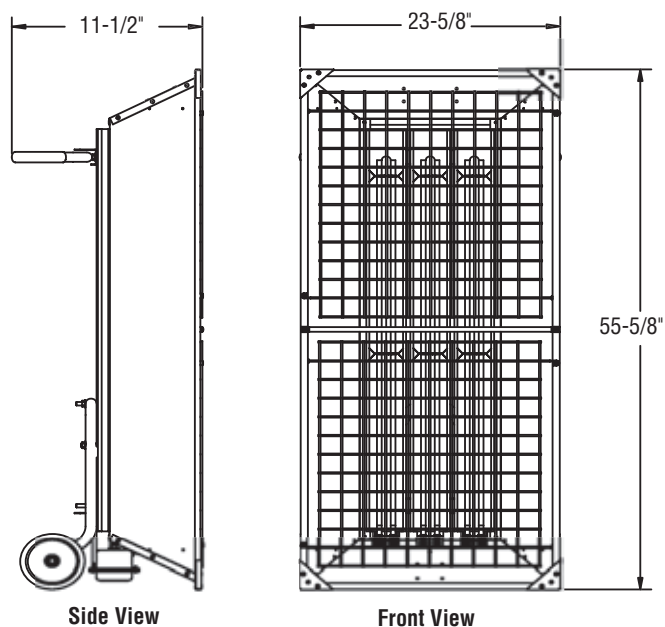


Figure 4

### IMPORTANT: SAVE THESE INSTRUCTIONS

#### **⚠ WARNING**

**FIRE HAZARD. Do not use as a residential or household heater. Keep combustible material away from heater. Do not operate heater where flammable vapors, gases or liquids are present.**

**To avoid personal injury read "IMPORTANT INSTRUCTIONS" on this page before installation or operation of heater.**

## IMPORTANT INSTRUCTIONS

When using electrical appliances, basic precautions should always be followed to reduce risk of fire, electric shock and injury to persons, including the following:

1. Read all instructions before using this heater.
2. This heater is hot when in use. To avoid burns, do not let bare skin touch hot surfaces. Keep combustible materials, such as furniture and papers at least 7 feet from the front of the heater.
3. **Do not leave heater unattended while in operation.**
4. Always disconnect heater when not in use.
5. Do not use outdoors in areas subject to wind.
6. Connect to properly grounded outlets or building ground.
7. This heater has hot surfaces. Do not use it in areas where gasoline, paint or flammable liquids are used or stored.
8. Use this heater only as described in this manual. Any other use not recommended by the manufacturer may cause fire, electric shock or injury to persons.
9. In order to prevent equipment damage, protect with a ground fault device such as Chromalox STAR-TG series monitor.
10. **SAVE THESE INSTRUCTIONS**

## WIRING

### ⚠ WARNING

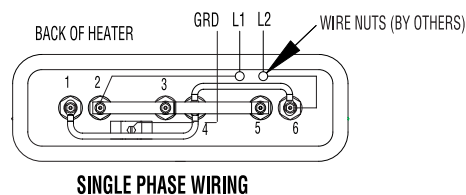
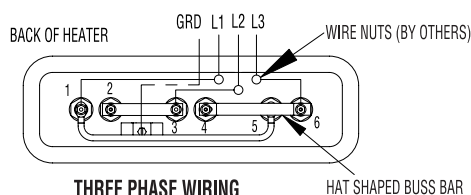
**ELECTRIC SHOCK HAZARD. Disconnect all power before installing or servicing heater. Failure to do so could result in personal injury or property damage. Heater must be effectively grounded in accordance with the National Electrical Code, NFPA 70.**

### ⚠ WARNING

**All electrical wiring must be done by a qualified person in accordance with National Electrical Code (NEC) and meet all state and local regulations.**

1. Use heater only at the voltage specified on the nameplate.

2. The heater connection points are located in the gasketed terminal enclosure. To remove cover, remove screw(s) on the cover. Remove the cover to expose wiring connection points.
3. A green ground terminal is provided in the bottom of the enclosure. The ground wire should be connected before other connections are made.
4. Use type "SO" or equal cord. Refer to Table 1 for proper cord gage and number of conductors.
5. All 3 element heaters are factory pre-wired for 3-phase delta operation. Some units can be converted to single phase operation by changing the wiring. Refer to Table 1 for those heaters that can be converted to single phase. The appropriate wiring diagram (Figure 4) is also located on the bottom of the enclosure.



#### INSTRUCTIONS FOR FIELD CONVERSION FROM 3 PHASE TO 1 PHASE:

1. Remove nuts from all terminals.
2. Remove all pigtail leads and hat shaped buss bar.
3. Remove end of leadwire on terminal 5 and slip onto terminal 4.
4. Remove leadwire attached to instruction sheet and connect between terminals 4 and 6.
5. Install hat shaped buss bar between terminals 3 and 5.
6. Place pigtail lead marked "L1" on to terminal 2 and pigtail lead marked "L2" on to terminal 6.
7. Install nuts.
8. Connect entrance wiring to pigtail leads "L1" and "L2". Connect ground to screw provided.
9. Inspect to make sure wiring is per "Single Phase Wiring" above.

## OPTIONAL ACCESSORIES

Chromalox STAR series radiant heaters can be field modified by adding optional kits. Refer to Chart A and B to select the proper kit.

### Disconnect Kit

The disconnect kit consists of a complete assembly consisting of a disconnect switch (3 Pole), power terminal block and all hardware to complete the installation. This kit can be mounted to both the fixed, overhead heater or the portable heater; see instruction bulletin PG436 for details.

### Cord Kits

Cord kits consist of 25 feet of 90°C cable and a right angle cord fitting which can connect directly to the heater terminal box or disconnect switch (if used). See installation bulletin PF491 for details

### Plugs

Single and three phase with ground. Available in nonlocking and locking. See Chart B.

### Tip Over and Ground Fault Kits

Star Tip Series Kit attaches to portable heater and de-energizes the heater in the event it is tipped over.










Star-TG Series Kit combines the tip over and ground fault feature for portable heaters. See installation bulletin PG436.

## OPTIONAL ACCESSORIES

**Chart A - Kit Selection**

| Model          | Disconnect Kit | Tipover Kit | Tipover w/Ground Fault | Single Phase Cord Set | Three Phase Cord Set |
|----------------|----------------|-------------|------------------------|-----------------------|----------------------|
| STAR-02A-11-PC | NA             | NA          | NA                     | Comes w/cord & plug   |                      |
| STAR-02A-81-P  | NA             | NA          | NA                     | PCN 295670            | NA                   |
| STAR-02A-21-P  | NA             | NA          | NA                     | PCN 295670            | NA                   |
| STAR-02A-71-P  | NA             | NA          | NA                     | PCN 295670            | NA                   |
| STAR-02A-41-P  | NA             | NA          | NA                     | PCN 295670            | NA                   |
| STAR-02A-61-P  | NA             | NA          | NA                     | PCN 295670            | NA                   |
| STAR-05A-81-P  | NA             | NA          | NA                     | PCN 295662            | NA                   |
| STAR-05A-21-P  | NA             | NA          | NA                     | PCN 295662            | NA                   |
| STAR-05A-71-P  | NA             | NA          | NA                     | PCN 295670            | NA                   |
| STAR-05A-41-P  | NA             | NA          | NA                     | PCN 295670            | NA                   |
| STAR-05A-61-P  | NA             | NA          | NA                     | PCN 295670            | NA                   |
| STAR-06A-83-P  | PCN 340662     | PCN 340670  | PCN 340726             | PCN 295443            | PCN 295435           |
| STAR-06A-23-P  | PCN 340662     | PCN 340689  | PCN 340734             | PCN 295443            | PCN 295435           |
| STAR-06A-71-P  | PCN 340662     | PCN 340697  | PCN 340742             | PCN 295443            | NA                   |
| STAR-06A-43-P  | PCN 340662     | PCN 340700  | PCN 340750             | PCN 295662            | PCN 295427           |
| STAR-06A-63-P  | PCN 340662     | PCN 340718  | PCN 340769             | PCN 295662            | PCN 295427           |
| STAR-1A4-83-P  | PCN 340662     | PCN 340670  | PCN 340726             | NA                    | PCN 295494           |
| STAR-14A-23-P  | PCN 340662     | PCN 340689  | PCN 340734             | NA                    | PCN 295478           |
| STAR-14A-71-P  | PCN 340662     | PCN 340697  | PCN 340742             | PCN 295486            | NA                   |
| STAR-14A-43-P  | PCN 340662     | PCN 340700  | PCN 340750             | PCN 295443            | PCN 295435           |
| STAR-14A-63-P  | PCN 340662     | PCN 340718  | PCN 340769             | PCN 295443            | PCN 295427           |

**Chart B - Plug Selection**

| Fits Cable Dia. | Plug Type   | Model     | Description    | Volts | Amps | Configuration  | NEMA # | ANSI # |
|-----------------|-------------|-----------|----------------|-------|------|--|--------|--------|
| .385"-.780"     | Locking     | PGL-15-20 | 3 Pole, 4 Wire | 250   | 20   |  | L15-20 | C73.85 |
| .385"-.780"     | Locking     | PGL-15-30 | 3 Pole, 4 Wire | 250   | 30   |  | L15-30 | C73.86 |
| .595"-1.150"    | Locking     | PGL-16-30 | 3 Pole, 4 Wire | 480   | 30   |  | L16-30 | C73.88 |
| .595"-1.150"    | Locking     | PGL-17-30 | 3 Pole, 4 Wire | 600   | 30   |  | L17-30 | C73.89 |
| .750"-1.125"    | Locking     | PGL-3763C | 2 Pole, 4 Wire | 600   | 50   |  | —      | —      |
| .750"-1.125"    | Locking     | PGL-3764C | 3 Pole, 4 Wire | 600   | 50   |  | —      | —      |
| .625"-1.187"    | Non Locking | PGN-6-50  | 2 Pole, 3 Wire | 250   | 50   |  | 6-50   | C73.53 |
| .390"-.775"     | Non Locking | PGN-15-20 | 3 Pole, 4 Wire | 250   | 20   |  | 15-20  | C73.59 |
| .750"-1.250"    | Non Locking | PGN-15-50 | 3 Pole, 4 Wire | 250   | 50   |  | 15-50  | C73.61 |

The above plugs are designed to be used with specific ranges of cable diameters. If not used with Chromalox Cable Kits, check cable manufacturer's cable diameter to be sure plug fits selected cable.

## MAINTENANCE

### ⚠ WARNING

**ELECRIC SHOCK HAZARD. Disconnect all power before servicing or replacing heating elements.**

The reflectors should be kept clean to obtain the maximum radiant output.

#### Element Replacement

1. Remove Terminal Box Cover.
2. Disconnect lead wires from heater terminals.
3. Remove safety grills (if installed).
4. Remove retainer screw located on the reflector at the terminal end.
5. Loosen (2), 3/8" nuts from the terminal box bracket located on the back of the heater and slide the entire heating element assembly out of the reflector assembly.

6. Remove wires and jumper straps as required to replace the failed heating element(s).
7. Remove bulkhead fitting nuts and washers.
8. Remove failed element and replace with a new element. **Replace only with genuine Chromalox "Arctic End" elements. Use of other elements will cause excess temperatures inside terminal box.**
9. Place gasket on the bulkhead fitting and insert terminals and fittings into the element holes in the terminal box.
10. Place washers and nuts on bulkhead fittings and tighten.
11. Replace wiring and jumper straps ( see Fig. 4).
12. Reassemble by following the reverse procedures (steps 5 through 1)

## RENEWAL PARTS IDENTIFICATION

| Model          | Element*** | Element Housing Reflector | Safety Screen  | Terminal Box Gasket |
|----------------|------------|---------------------------|----------------|---------------------|
| STAR-02A-11-PC | PCN 106059 | 234-891755-004            | PCN 111878     | 132-304879-004      |
| STAR-02A-81-P  | PCN 106067 |                           | PCN 111878     | 132-304879-004      |
| STAR-06A-83-P  |            |                           | PCN 340638     | 132-304879-003      |
| STAR-02A-21-P  | PCN 106075 |                           | PCN 111878     | 132-304879-004      |
| STAR-06A-23-P  |            |                           | PCN 340638     | 132-304879-003      |
| STAR-02A-71-P  | PCN 106083 |                           | PCN 111878     | 132-304879-004      |
| STAR-06A-71-P  |            |                           | PCN 340638     | 132-304879-003      |
| STAR-02A-41-P  | PCN 106091 |                           | PCN 111878     | 132-304879-004      |
| STAR-06A-43-P  |            |                           | PCN 340638     | 132-304879-003      |
| STAR-02A-61-P  | PCN 106104 |                           | PCN 111878     | 132-304879-004      |
| STAR-06A-63-P  |            | PCN 340638                | 132-304879-003 |                     |
| STAR-05A-81-P  | PCN 106403 | 234-891-755-002           | PCN 111894     | 132-304879-004      |
| STAR-14A-83-P  |            |                           | PCN 340857     | 132-304879-003      |
| STAR-05A-21-P  | PCN 106411 |                           | PCN 111894     | 132-304879-004      |
| STAR-14A-23-P  |            |                           | PCN 340857     | 132-304879-003      |
| STAR-05A-71-P  | PCN 106796 |                           | PCN 111894     | 132-304879-004      |
| STAR-14A-71-P  |            |                           | PCN 340857     | 132-304879-003      |
| STAR-05A-41-P  | PCN 106964 |                           | PCN 111894     | 132-304879-004      |
| STAR-14A-43-P  |            |                           | PCN 340857     | 132-304879-003      |
| STAR-05A-61-P  | PCN 106972 |                           | PCN 111894     | 132-304879-004      |
| STAR-14A-63-P  |            |                           | PCN 340857     | 132-304879-003      |

\*\*\* Includes element supports

#### Parts Common to All Models:

Bulkhead fitting gasket . . . . . 132-895735-008  
 Bulkhead fitting washer . . . . . 328-890675-014  
 Bulkhead fitting nut . . . . . 200-890615-031  
 Element Support . . . . . 291-304869-002  
 Vinyl Grip . . . . . 024-304894-001

#### Parts Common to STAR, 06A-P and 14A-P Models:

Wheel . . . . . 333-557518-001  
 End Cap . . . . . 039-510848-001

#### **WARRANTY AND LIMITATION OF REMEDY AND LIABILITY**

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**W2008M**

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