

Installation, Operation and  
Maintenance Instructions

# HD3D Forced-Air Heater

Corrosion Resistant/Hose Down



PF200-9161-305521-001  
August 2019

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# Warnings

Failure to understand and follow these instructions and the **“WARNING”** notes therein may result in serious personal injury from electrical shock, or from the heater falling due to faulty installation.

## ⚠ 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. For these applications see Product Data Sheet PDS CXH-EP (PF305).**

## ⚠ 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 installed by a qualified person in accordance with the National Electrical Code, NFPA 70.**

## ⚠ WARNING

**ELECTRIC SHOCK HAZARD. Any installation involving electric heaters must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.**

Do not mount mercury type thermostat directly on unit. Vibration could cause heater to malfunction.

Fan blade rotation must be checked. If airflow is not moving out through the louvers, interchange any two of the three customer power leads on three-phase units only.

## ⚠ WARNING

**FIRE HAZARD. To prevent personal injury or property damage, do not operate heater near combustible objects, restrict airflow or use for purposes other than described.**

Chromalox does not guarantee its products against corrosion. To ensure proper operation and service life, contact your local Chromalox sales office for application assistance.

# General Information

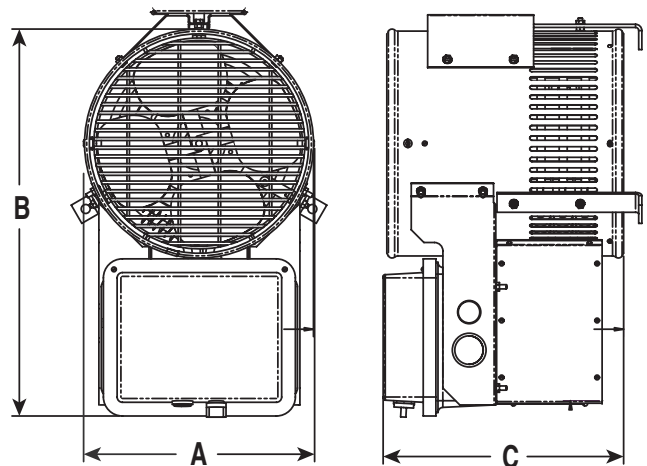
## HD3D Hose Down Heater

Code	Heating Element Rating (kW)	Code	Heating Element Rating (kW)
200	2.0	1500	15.0
300	3.0	2000	20.0
500	5.0	2500	25.0
750	7.5	3000	30.0
1000	10.0	3500	35.0
1250	12.5	4000	39.0

Code	Option
L	Low-Voltage 24V Control
PS	Epoxy Painted Case
T	Thermostat
S	Summer Fan Switch
P	“On” Pilot Light
D	Disconnect Switch
M	Manual Reset Overtemperature Cutout
E	Monel Elements

HD3D -2000 LPSTSPDME Typical Model Number

# Dimensions



kW	Dimensions in Inches (cm)		
	A	B	C
2.5 - 7.5	13-1/2 (34)	24-1/2 (62)	15 (38)
10 - 20	17-1/4 (44)	28 (71)	15-1/8 (38)
25 - 39	21-1/4 (54)	32-1/4 (82)	19-1/2 (50)

## Optional Equipment

- **Universal Swivel Bracket** - Field installed (See PF926 for installation instructions)
- **Drip Shield** - Field installed (See PF927 for installation instructions)
- **Built-in Thermostat** - Factory installed (bulb and capillary type) for automatic temperature control. The thermostat controls the heating elements and fan simultaneously to achieve set temperature.  
  
The Lo setting of the thermostat is approximately 40°F (4°C) and the Hi setting is approximately 100°F (38°C).
- **Heat-Cool Switch** - Factory installed (heater on, heater off, fan only) to permit air flow with or without energizing the heating elements. The switch is accessible from outside the NEMA 4X enclosure.
- **“On” Pilot Light** - Factory installed to indicate when power is on.
- **Internal Fusing** - Factory installed
- **Manual Reset Cutout** - Factory installed
- **Disconnect Switch** - Field/Factory installed See document PF928 for installation instructions
- **For wiring diagram containing options, see label on inside cover of terminal box**

## Package Contents

Item	Quantity	Description
A	1	HD3D Unit Heater <sup>1</sup>
B	3	Standard Mountng Bracket

<sup>1</sup> Aside from mounting brackets, unit heaters with factory installed accessories are shipped fully assembled.



# Mounting Instructions

## Heater Location Instructions:

Arrange units so their discharge air streams:

- A. Are subjected to minimum interference from columns, machinery and partitions.
- B. Wipe exposed walls without blowing directly at them.
- C. Are directed away from room occupants in comfort heating.
- D. Are directed along the windward side when installed in a building exposed to a prevailing wind.

Locate thermostat on interior partition walls or posts away from cold drafts, internal heat sources and away from heater discharge air streams.

Small rooms can be heated by one unit heater. Where two walls are exposed, the heater should be mounted as shown in Figure A.

Large rooms require multi-unit installations. Number and capacity of units will be determined by volume of building and square feet of floor area to be heated. Arrange units to provide perimeter air circulation where each unit supports the air stream from another.

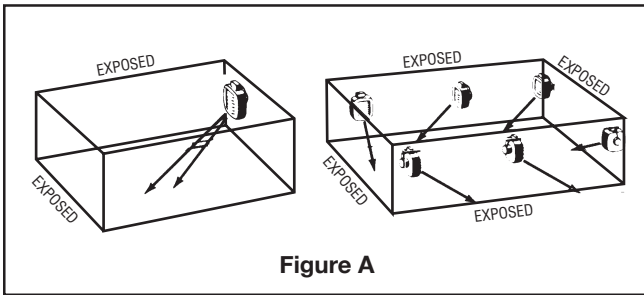


Figure A

## Minimum Clearances

- A. The heater must be mounted at least 7' above the floor to avoid accidental contact with the heating elements or fan blade which could cause injury.
- B. Keep at least 5' clearance in front of the heater. Refer to figures 1 and 2 for side, top and back clearance requirements.
- C. The ceiling mounting structure and the anchoring provisions must be of sufficient strength to support the combined weight of the heater and mounting bracket.
- D. The wall or mounting surface, and the anchoring provisions must be capable of supporting the combined weight of the heater and the mounting brackets cantilevered from the mounting surface.

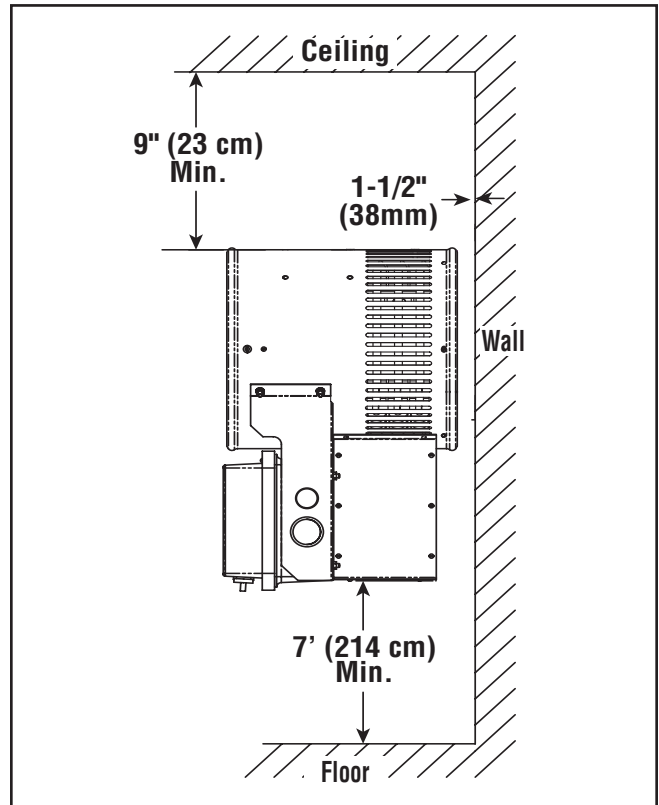


Figure 1: Horizontal Mounting

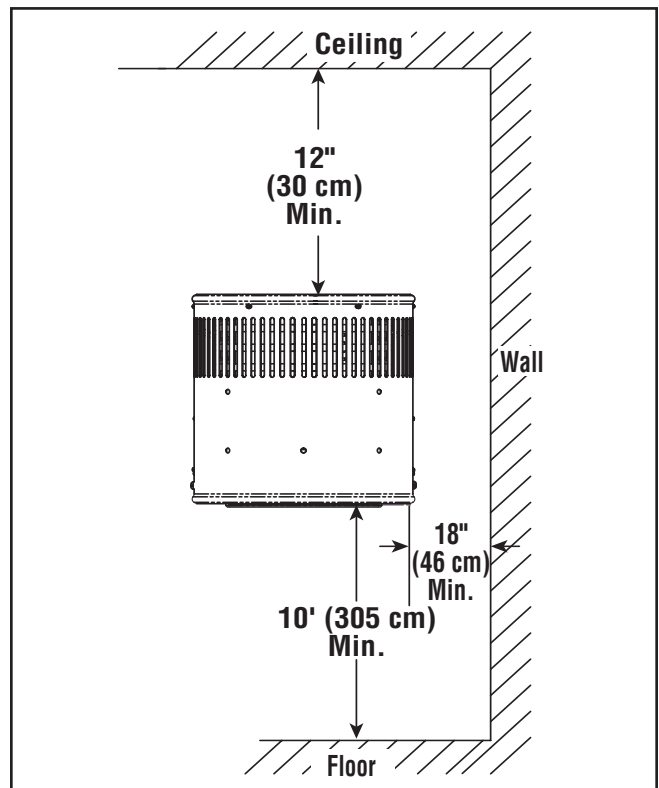
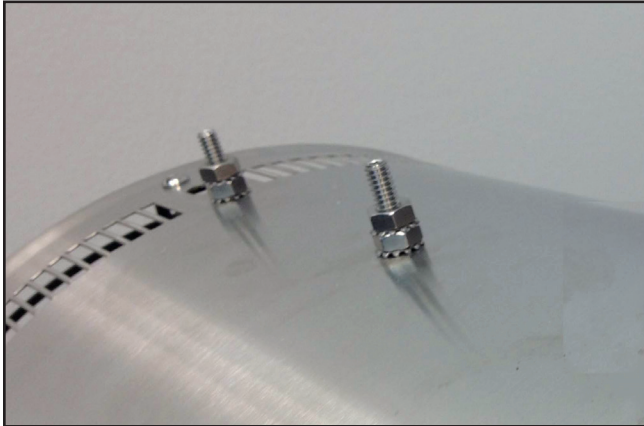


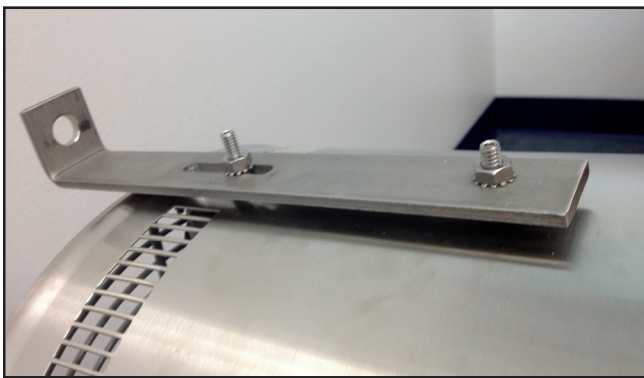
Figure 2: Vertical Mounting

# Standard “L” Bracket Installation

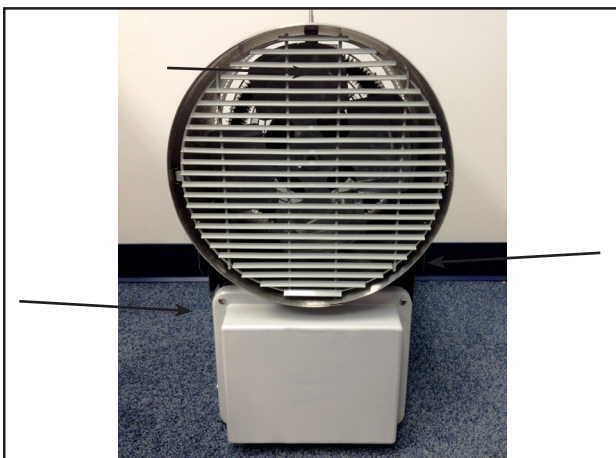
1. While securing bottom set of lock nuts, completely remove top set.



2. Install “L” bracket so that the slot is oriented toward the back (inlet) of the heater and secure using top set of lock nuts. To avoid damaging case, secure bottom set of lock nuts while tightening.



3. Repeat steps 1 and 2 to install remaining two L Brackets.



**Notes:**

- Recommended bolt and threaded rod sizes for installation (to be supplied by installer) are located in figure 3.

- Figure 4 shows typical installation dimensions meeting minimum requirements.

## Standard Non-Swivel Brackets

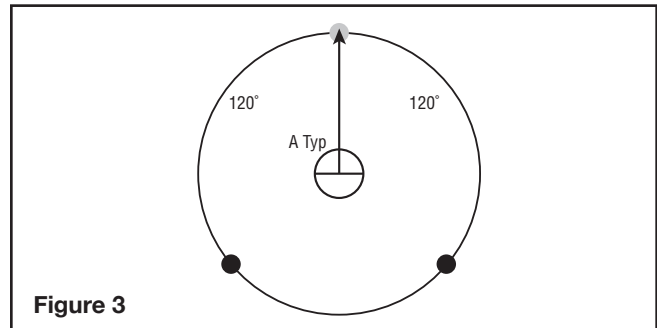


Figure 3

kW	Dimensions	
	A Radius Inches (cm)	Bolt Size Inches (mm)
2 - 7.5	7-3/4 (20)	3/8 to 7/16 (10 to 11)
10 - 20	9-1/2 (24)	3/8 to 7/16 (10 to 11)
25 - 39	11-1/2 (29)	3/8 to 7/16 (10 to 11)

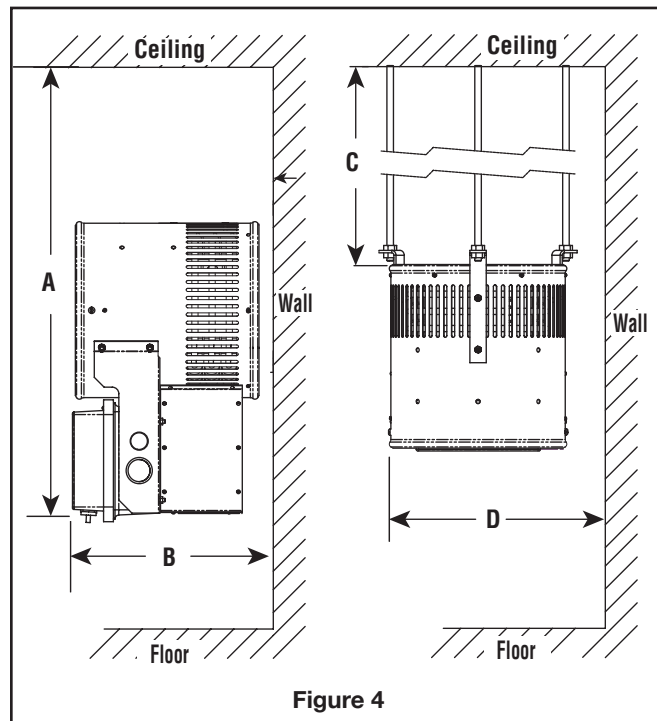


Figure 4

kW	Dimensions in Inches (cm)			
	A	B	C	D
2.5 - 7.5	33-1/2 (85)	16-1/2 (42)	25-1/2 (65)	33 (84)
10 - 20	37 (94)	16-5/8 (42)	29-1/4 (78)	33-1/8 (84)
25 - 39	41-1/4 (105)	21 (53)	33-1/4 (84)	37-1/2 (80)



# Wiring Instructions

**Note:** All electrical wiring must be done according to National Electrical and local codes by a qualified person.

## ⚠ WARNING

**ELECTRIC SHOCK HAZARD. Any installation involving electric heaters must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.**

## ⚠ WARNING

**The system designer is responsible for the safety of this equipment and should install adequate back-up controls and safety devices with their electric heating equipment. Where the consequences of failure could result in personal injury or property damage, back-up controls are essential.**

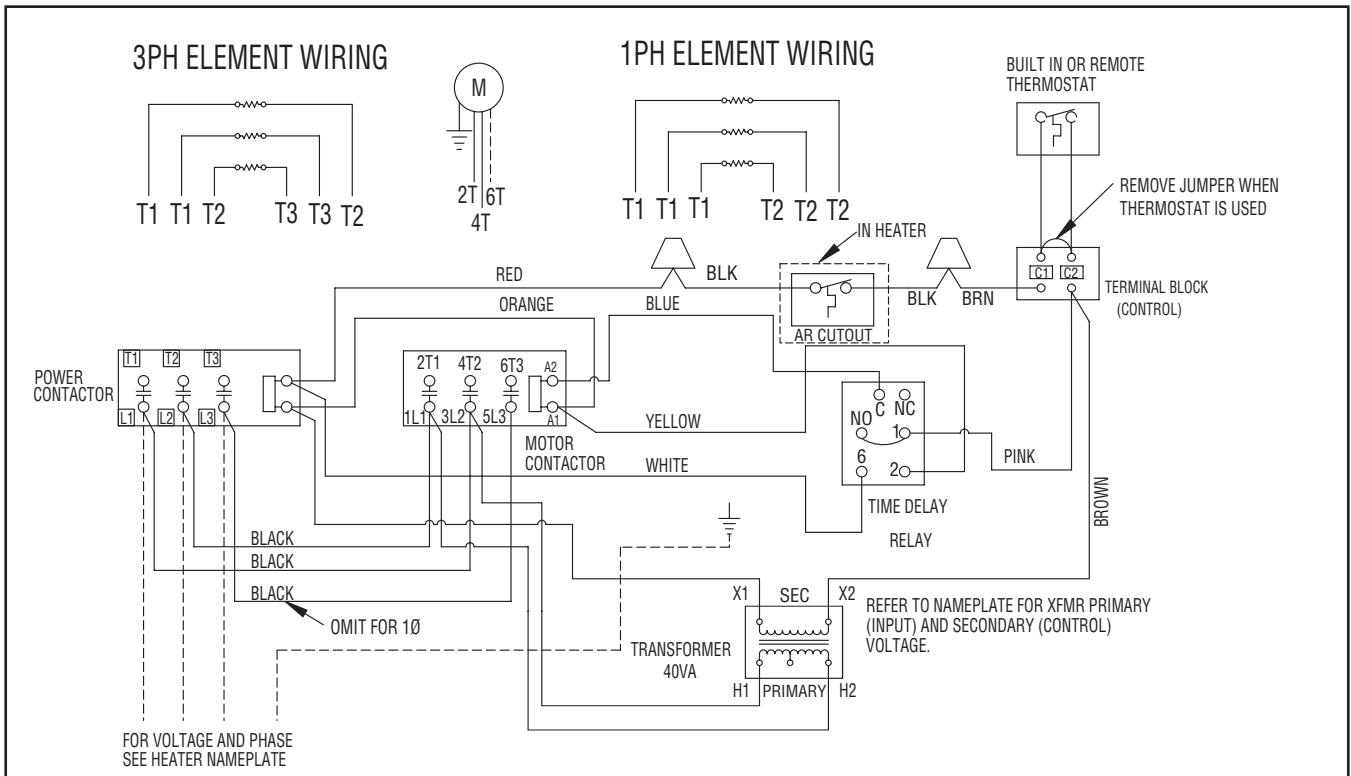
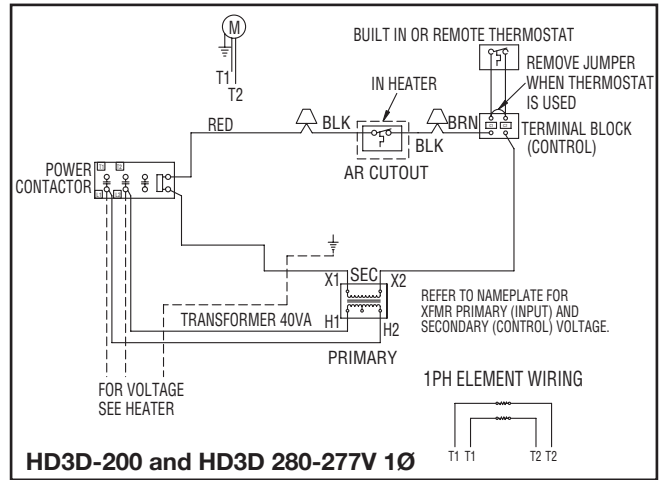
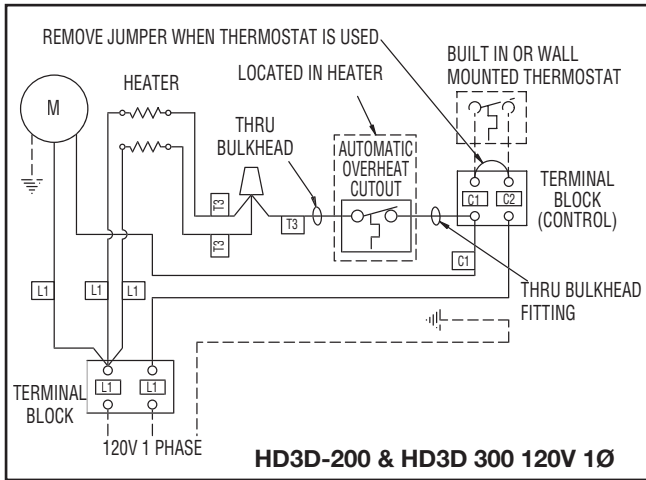
1. Check all factory wiring for loose connections. It is possible for connections to become loose during shipping.
2. Connect heater according to the voltage and frequency specified on the nameplate.
3. Heaters are not provided with a control switch and may be controlled by a wall-mounted thermostat.
4. All units are provided with control and power terminal blocks for customer's connection.
5. Protection against overheating is provided by an internal automatic thermal cutout (manual reset cutout optional) which opens the electric circuit if the normal air-flow is restricted or stopped. Cutout automatically energizes heater on removal of the obstruction. If optional manual reset is tripped, determine cause before re-energizing.
6. Heaters rated 5kW - 39kW are equipped with fan delay control.  
  
This control continues fan operation for a short time after elements are de-energized to dissipate residual heat.
7. Follow wiring diagram label located on door inside control panel.

## Control Panel Layout

Letter	Description
A	Thermostat
B	Power Contactor
C	Fan Relay
D	Terminal Block
E	Motor Contactor
F	Grounding Lug
G	Conduit Opening
H	Fan Only Switch
I	Pilot Light
J	Transformer (Hidden)

The Transformer (J) is located below the motor contactor (E), therefore it is not seen in photo.

# Wiring Diagrams

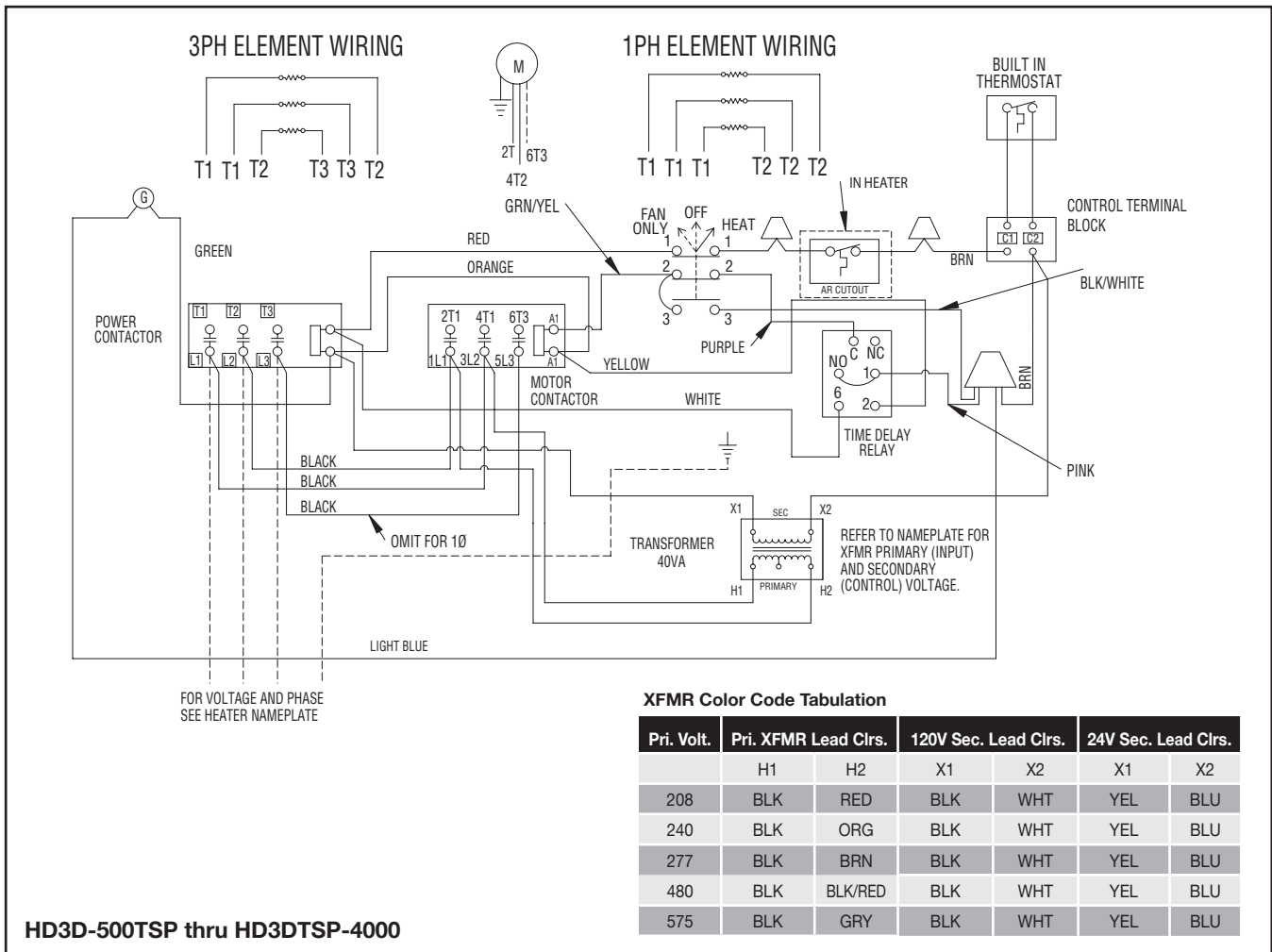


**XFMR Color Code Tabulation**

Pri. Volt.	Pri. XFMR Lead Clrs.		120V Sec. Lead Clrs.		24V Sec. Lead Clrs.		230V Sec. Lead Clrs.	
	H1	H2	X1	X2	X1	X2	X1	X2
208	BLK	RED	BLK	WHT	YEL	BLU	-	-
240	BLK	ORG	BLK	WHT	YEL	BLU	-	-
277	BLK	BRN	BLK	WHT	YEL	BLU	-	-
480	BLK	BLK/RED	BLK	WHT	YEL	BLU	-	-
575	BLK	GRY	BLK	WHT	YEL	BLU	-	-
690	BLK	GRY	-	-	-	-	BLK	WHT

**HD3D-500 thru HD3D 4000**





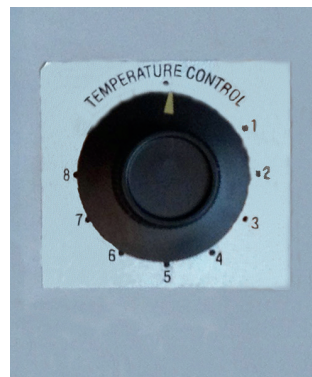
## Operation

With proper installation this heater will provide efficient and dependable service. Please read the following guidelines to ensure reliable operation.

1. Do not allow objects such as fabric or other combustible materials to restrict the airflow through the heater.
2. Heater should not be operated unattended unless adequate controls and safety devices have been installed.
3. The ambient operating temperature limits are  $-20^{\circ}\text{F}$  to  $104^{\circ}\text{F}$  ( $-29^{\circ}\text{C}$  to  $40^{\circ}\text{C}$ ).
4. Thermostat<sup>1</sup>: Unit mounted thermostats are non-indicating. The thermostat dial can be rotated  $270^{\circ}$ , with a low setting of  $40^{\circ}\text{F}$  ( $4^{\circ}\text{C}$ ) when turned fully in the counter clockwise direction and  $100^{\circ}\text{F}$  ( $38^{\circ}\text{C}$ ) when fully turned in the clockwise direction. The dial is equipped with a position indicator for finer adjustments. The setting of 0 represents  $40^{\circ}\text{F}$  ( $4^{\circ}\text{C}$ ) and 8 Represents  $100^{\circ}\text{F}$  ( $38^{\circ}\text{C}$ ).

5. Disconnect: To disconnect the heater, turn lever in the clockwise direction until you hear a click.

<sup>1</sup> It is recommended that a remote thermostat be used when ceiling height exceeds 20 feet.



# Maintenance

## ⚠ WARNING

**Turn off power to service heater. Do not attempt to service or clean heater while unit is operating as there is hazard of electric shock, injury from operating fan, and burns from hot heating elements.**

## ⚠ WARNING

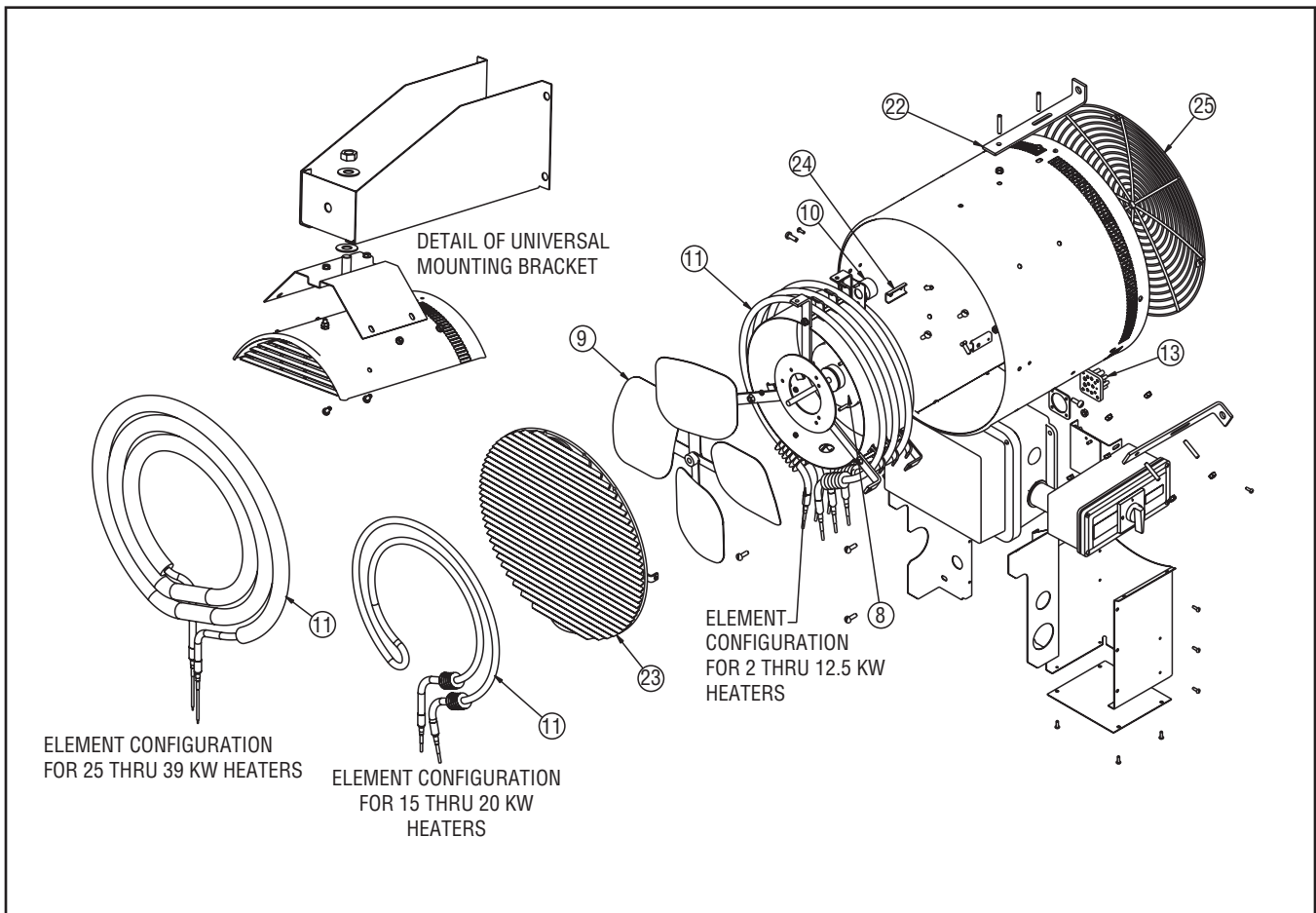
**ELECTRIC SHOCK HAZARD. Disconnect all power before installing or servicing heater. Failure to do so could result in personal injury or property damage.**

In order to optimize heater operating life and prevent unexpected down time, preventative maintenance should be performed at least once per year, preferably before start of heating season.

1. Turn off heater and allow to cool before performing these maintenance procedures.
2. Fan motors in these heaters are provided with sealed ball bearings, factory lubricated, requiring no further lubrication under normal service conditions.
3. Vacuum or hose off heater with water (at city pressure) before activating for next heating season to remove accumulated dust or lint which otherwise may smoke or incinerate on initial heat up.
4. Check internal and external wiring connections to ensure they have not become loose.
5. Check motor hardware, including fan hub set screw to ensure nothing has become loose. Do not over-tighten. Torque value on set screw should be 35 in-lbs. (3.95 N.m)

**Note:** Do not use high pressure cleaning systems.

# Renewal Parts Identification



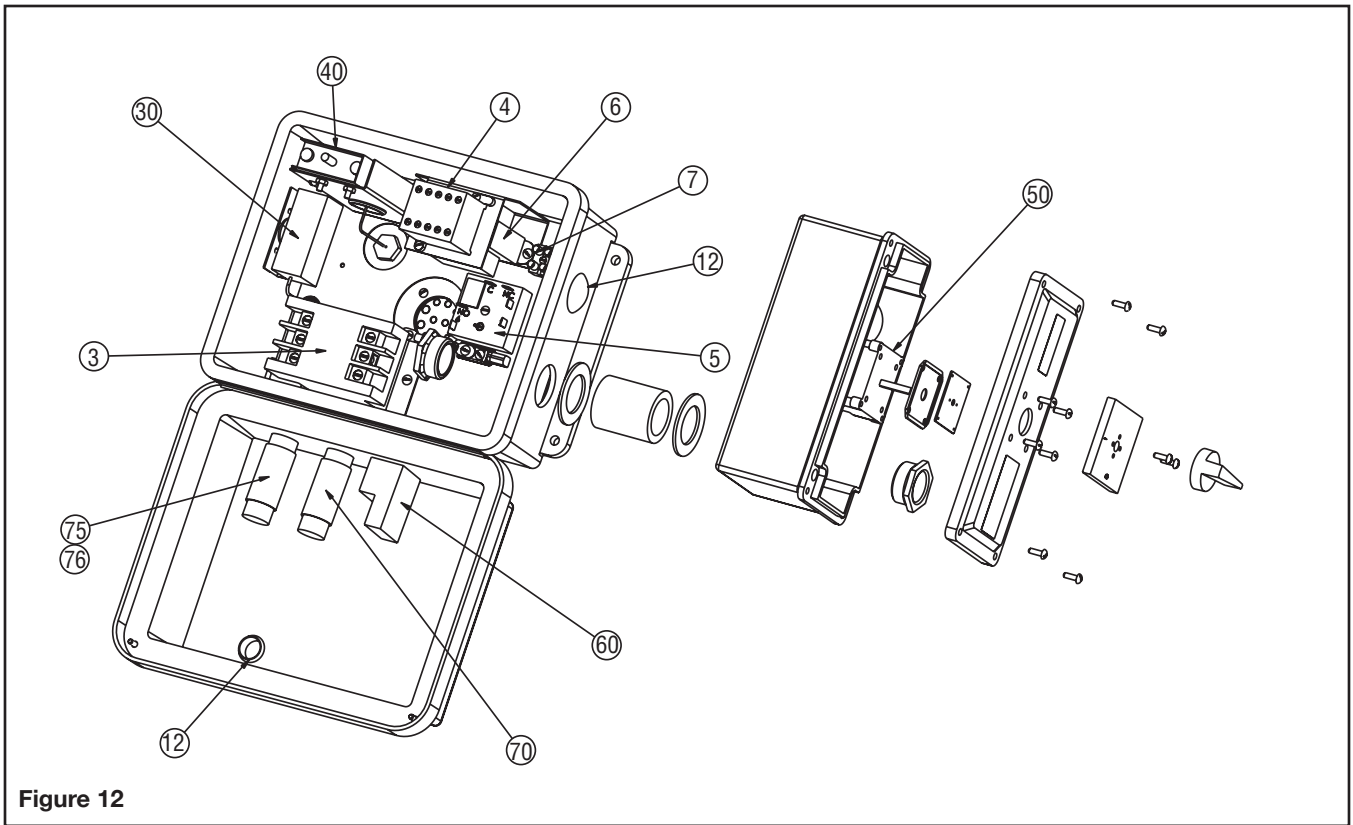


Figure 12

Elements

Heater kW	120 Volt	208 Volt	240 Volt	277 Volt	480 Volt	575 Volt
	118-305471-001	118-305471-002	118-305471-004	118-305471-005	Not Available	Not Available
3	118-305471-006	118-305471-007	118-305471-009	118-305471-010	Not Available	Not Available
5		118-305471-011	118-305471-013	118-305471-014	118-305471-019	Not Available
7.5		118-305471-020	118-305471-022	118-305471-023	118-305471-028	118-305471-024
10		118-305471-101	118-305471-103	118-305471-104	118-305471-109	118-305471-105
12.5		118-305471-110	118-305471-112	118-305471-113	118-305471-117	118-305471-118
15		118-305471-201	118-305471-203		118-305471-207	118-305471-208
20	Not Available		118-305471-209		118-305471-213	118-305471-214
25					118-305471-304	118-305471-305
30		Not Available	Not Available	Not Available	118-305471-309	118-305471-310
35					118-305471-311	118-305471-312
39					118-305471-313	118-305471-314

Notes:

1. All heaters have three (3) elements except for 2kw heaters which have two (2).
2. Specified voltages are heater voltages. See heater nameplate for heater voltage.
3. 690V Heaters - contact factory for replacement parts.

## Mechanical Parts and Cutout – kW Dependent

Heater kW	Fan (9)	Cutout (10)	Fitting Kit (13)	Mounting Bracket (22)	Louver (23)	Louver Stop (24)	Grille (25)
2 & 3	112-027709-018	168-053169-105	168-053169-090	027-305488-001	182-047073-035	282-119082-005	134-027038-007
5	112-027709-018	168-053169-105	168-053169-090	027-305488-001	182-047073-035	282-119082-005	134-027038-007
7.5	112-027709-019	168-053169-105	168-053169-090	027-305488-001	182-047073-035	282-119082-005	134-027038-007
10 & 12.5	112-027709-021	168-053169-105	168-053169-090	027-305488-001	182-047073-028	282-119082-005	134-027038-008
15 & 20	112-027709-021	168-053169-105	168-053169-090	027-305488-001	182-047073-028	282-119082-005	134-027038-008
25, 30, 35 & 39	112-027568-003	168-053169-106	168-053169-090	027-305488-002	182-047073-028	282-119082-005	134-027038-005

### Notes:

1. See heater nameplate for heater kW
2. Fitting kit (13) includes fitting, gasket, screws and heat shrink tubing.
3. Cutout Kit (10) includes cutout, heat shrink and hardware.

## Electrical Parts

Heater kW	Htr. Line Voltage	Htr. Ctrl. Voltage	Htr. Phase	Contactors (3)	Motor Relay (4)	Time Delay Relay (5)	Transformer (6)	Terminal Block (7)	Motor (8)	Plug (12)
2 & 3	120	120	1	Not Used	Not Used	Not Used	Not Used	303-302177-010	168-053169-091	221-300463-002
2 & 3	208-240	120	1	072-304551-008	Not Used	Not Used	315-304252-001	303-302177-010	168-053169-091	221-300463-002
2 & 3	277	120	1	072-304551-008	Not Used	Not Used	315-304252-003	303-302177-010	168-053169-091	221-300463-002
5, 7.5, 10, 12.5, 15 & 20	208-240	120	1 or 3	072-304551-008	072-123534-064	072-071847-042	315-304252-001	303-302177-010	168-053169-091	221-300463-002
5, 7.5, 10, 12.5, 15 & 20	277	120	1	072-304551-008	072-123534-064	072-071847-042	315-304252-003	303-302177-010	168-053169-091	221-300463-002
5, 7.5, 10, 12.5, 15 & 20	480	120	1 or 3	072-304551-008	072-123534-064	072-071847-042	315-304252-001	303-302177-010	168-053169-092	221-300463-002
5, 7.5, 10, 12.5, 15 & 20	575	120	1 or 3	072-304551-008	072-123534-064	072-071847-042	315-304252-003	303-302177-010	168-053169-093	221-300463-002
25, 30, 35 & 39	480	120	3	072-304551-008	072-123534-064	072-071847-042	315-304252-001	303-302177-010	168-053169-094	221-300463-002
25, 30, 35 & 39	575	120	3	072-304551-008	072-123534-064	072-071847-042	315-304252-003	303-302177-010	168-053169-095	221-300463-002
2 & 3	208-240	24	1	072-304551-002	Not Used	Not Used	315-304252-002	303-302177-010	168-053169-091	221-300463-002
2 & 3	277	24	1	072-304551-002	Not Used	Not Used	315-304252-004	303-302177-010	168-053169-091	221-300463-002
5, 7.5, 10, 12.5, 15 & 20	208-240	24	1 or 3	072-304551-002	072-123534-075	072-071847-043	315-304252-002	303-302177-010	168-053169-091	221-300463-002
5, 7.5, 10, 12.5, 15 & 20	277	24	1	072-304551-002	072-123534-075	072-071847-043	315-304252-004	303-302177-010	168-053169-091	221-300463-002
5, 7.5, 10, 12.5, 15 & 20	480	24	1 or 3	072-304551-002	072-123534-075	072-071847-043	315-304252-002	303-302177-010	168-053169-092	221-300463-002
5, 7.5, 10, 12.5, 15 & 20	575	24	1 or 3	072-304551-002	072-123534-075	072-071847-043	315-304252-005	303-302177-010	168-053169-093	221-300463-002
25, 30, 35, & 39	480	24	3	072-304551-002	072-123534-075	072-071847-043	315-304252-002	303-302177-010	168-053169-094	221-300463-002
25, 30, 35, & 39	575	24	3	072-304551-002	072-123534-075	072-071847-043	315-304252-005	303-302177-010	168-053169-095	221-300463-002

## Electrical Parts

Heater kW	Htr. Line Voltage	Htr. Ctrl. Volt.	Htr. Phase	Thermostat (30)	Man. Reset Cutout (40)	Disconnect Switch (50)	3 Position Switch (60)	Pilot Light GREEN (70)	Pilot Light AMBER (75)	Pilot Light RED (76)
2 & 3	120	120	1	168-053169-096 40 to 100°F (4 to 38°C)	168-053169-097	168-053169-098	292-304687-001	213-304688-007 (LED Replacement Lamp Per 213-304688-012)	213-304688-008 (LED Replacement Lamp Per 213-304688-014)	213-304688-002 (LED Replacement Lamp Per 213-304688-005)
2 & 3	208-240	120	1		168-053169-097	168-053169-098	292-304687-001			
2 & 3	277	120	1		168-053169-097	168-053169-098	292-304687-001			
5, 7.5, 10, 12.5, 15 & 20	208-240	120	1 or 3		168-053169-097	168-053169-098	292-304687-001			
5, 7.5, 10, 12.5, 15 & 20	277	120	1		168-053169-097	168-053169-098	292-304687-001			
5, 7.5, 10, 12.5, 15 & 20	480	120	1 or 3		168-053169-097	168-053169-098	292-304687-001			
5, 7.5, 10, 12.5, 15 & 20	575	120	1 or 3		168-053169-097	168-053169-098	292-304687-001			
25, 30, 35 & 39	480	120	3		168-053169-097	168-053169-098	292-304687-001			
2 & 3	208-240	24	1	168-053169-096 40 to 100°F (4 to 38°C)	168-053169-097	168-053169-098	292-304687-001	213-304688-009 (LED Replacement Lamp Per 213-304688-011)	213-304688-010 (LED Replacement Lamp Per 213-304688-013)	213-304688-001 (LED Replacement Lamp Per 213-304688-004)
2 & 3	277	24	1		168-053169-097	168-053169-098	292-304687-001			
5, 7.5, 10, 12.5, 15 & 20	208-240	24	1 or 3		168-053169-097	168-053169-098	292-304687-001			
5, 7.5, 10, 12.5, 15 & 20	277	24	1		168-053169-097	168-053169-098	292-304687-001			
5, 7.5, 10, 12.5, 15 & 20	480	24	1 or 3		168-053169-097	168-053169-098	292-304687-001			
5, 7.5, 10, 12.5, 15 & 20	575	24	1 or 3		168-053169-097	168-053169-098	292-304687-001			
25, 30, 35, & 39	480	24	3		168-053169-097	168-053169-098	292-304687-001			
25, 30, 35, & 39	575	24	3		168-053169-097	168-053169-098	292-304687-001			

### Notes:

1. See heater nameplate for heater kw, line voltage, control voltage and phase.
2. Thermostat includes compression fitting, knob, indicator label, seal, bulb strap and mounting hardware.
3. Manual reset includes compression fitting, bulb mounting bracket and mounting hardware.
4. Disconnect switch includes handle, face plate, gasket and mounting hardware.
5. 690V Heaters - contact factory for replacement parts.

### Limited Warranty:

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

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