Chromalox®

Installation, Operation
and
RENEWAL PARTS IDENTIFICATION

SERVICE REFERENCE	
DIVISION 4	SECTION TDH
SALES REFERENCE (Supersedes PF405-1)	PF405-2
	161-074180-001
DATE SEPTEMBER, 1998	

TDH Air Duct Heater
Model C

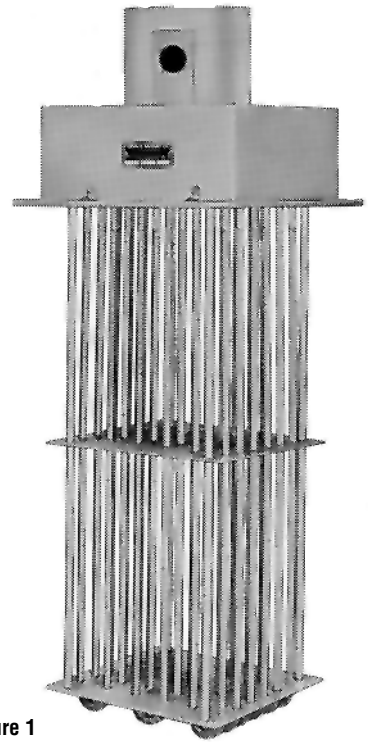


Figure 1

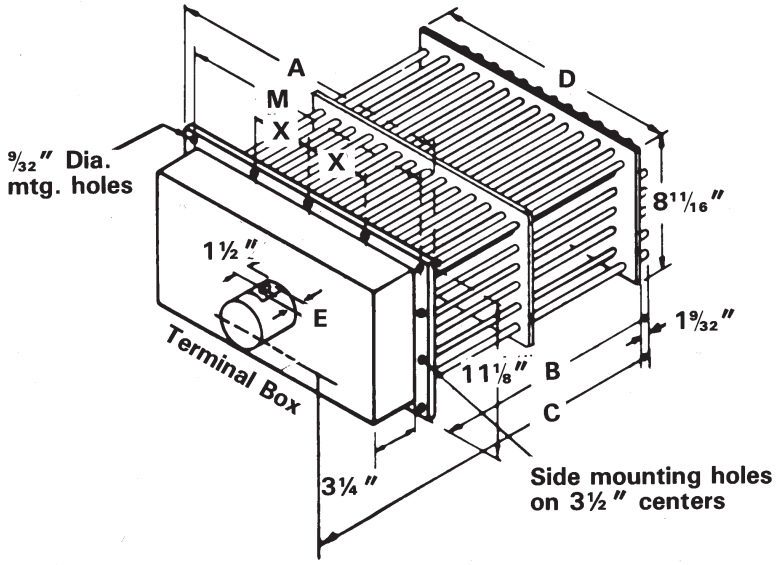


Figure 2

TDH-6C to TDH-30C 240V or 480V-3 1 Circuit 1 Terminal Box	TDH-36C to TDH-60C 240V-3 2 Circuits 2 Terminal Boxes	TDH-36C to TDH 60C 480V-3 1 Circuit 1 Terminal Box

Standard Sizes & Ratings

Model	Volts	kW 22 W/In²	No. Elements	No. Mounting Holes	Approx. Weight (Lbs.)	Dimensions — Inches (See Figure 2)						
						X	A	B	C	D	E	M
TDH-6C	240	6	6	10	19	2-1/2	5-5/8	20-3/8	26-15/16	4	1-1/16	5
TDH-12C	or	12	12	10	26	3-1/2	7-5/8	20-3/8	26-15/16	6	1-3/4	7
TDH-18C	480	18	18	12	34	3	9-5/8	20-3/8	26-15/16	8	1-3/4	9
TDH-24C	3 Phase	24	24	14	42	2-3/4	11-5/8	20-3/8	26-15/16	10	1-3/4	11
TDH-30C		30	30	14	51	3-1/4	13-5/8	20-3/8	26-15/16	12	1-3/4	13
TDH-36C	240	36	36	14	60	3-3/4	15-5/8	20-3/8	27-5/8	14	1-3/4	15
TDH-42C	or	42	42	14	69	4-1/4	17-5/8	20-3/8	27-5/8	16	1-3/4	17
TCH-48C	480	48	48	14	78	4-3/4	19-5/8	20-3/8	27-5/8	18	1-3/4	19
TDH-54C	3 Phase	54	54	14	87	5-1/4	21-5/8	20-3/8	27-5/8	20	1-3/4	21
TDH-60C		60	60	14	96	5-3/4	23-5/8	20-3/8	27-5/8	22	1-3/4	23

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.***

1. Chromalox type TDH heaters are ideal for heating air for various drying/curing operations up to 750°F air temperature, heat treating, re-heating or dehumidification and other similar air heating applications.
2. TDH construction consists of 3/8" diameter U-shape tubular elements with INCOLOY® sheath mounted in a heavy-gage steel flange with 9/32" dia. mounting holes for attaching to duct work. All terminals and connections are of high-temperature alloy construction and are enclosed in an aluminum painted steel housing. Individual elements are easily replaced.

GENERAL

3. The heater may be bolted to the duct with the terminal housing and flange at the top, at either side, or at the bottom.
4. Several heaters may be mounted in tandem, so long as proper controls are used to limit the maximum temperature attained.
5. In high ambient temperature operations, least corrosive action and least oxidation to the terminals will occur if the heaters are mounted with the terminals in the coolest possible ambient, usually on the bottom side of the duct.
6. Use moisture resistant terminal cover in atmospheres bearing corrosive fumes or excessive moisture.
7. Use explosion resistant heaters in explosive atmospheres and reduce current rating to elements.
8. Maximum sheath temperature is 1150°F.
9. Type TDH process air heaters can generally be used in applications at maximum temperatures shown without exceeding their capability if properly installed according to instructions packed with heaters.

Air Velocity	Maximum Output Air Temperature
6 feet/second	650°F
9 feet/second	700°F
16 feet/second	750°F

These maximum work temperatures are based on 22 W/In^2 watt density. If elements have lower watt density, output air temperature may be increased but not to exceed 750°F. If watt density is higher, output air temperature should be lower.

INSTALLATION

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

1. Locate and position heater in duct in accordance with both process requirements and recommendations given under GENERAL.
2. Refer to Figure 2, layout D and 8-11/16" dimensions on duct mounting face established in step 1. The minimum duct size required is A or 11-1/8" dimension plus 3/8" and B dimension plus 1-5/8".
3. With tools suitable for sheet metal work, cut layout opening in duct.
4. In general, heaters less than 35 pounds in weight may be mounted directly in opening without additional duct reinforcement, if duct installation and condition permits. To fasten heater to duct wall use #14 Pan or Round Head Self-Tapping screws. A gasket of suitable material capable of withstanding 1200°F is recommended for insertion between heater flange and duct to minimize air leakage.
5. For heater weights greater than 35 pounds (see Standard Ratings Table, page 1) due consideration should be given to; (a) mechanically strengthening duct work to support the weight of the heater, and (b) heat insulating duct line in immediate area of heater location to prevent excessive heat loss. Consult your local sheet metal contractor.
6. **DANGER:** ***Hazard of Fire.*** Since these heaters are capable of developing high temperatures, extreme care should be taken to:
   - **A.** Avoid installing heaters in an atmosphere containing combustible gases and vapors.
   - **B.** Avoid contact between heater and combustible material.
   - **C.** Keep combustible materials far enough away to be free of the effects of high temperature.

Temperature Control Instructions

1. A Chromalox overtemperature controller is recommended for overheat protection and control of heater and process (See Figure 3). Consult factory or local Chromalox representative.
2. In general, place controller sensing element close to the heating elements, near top of duct, at right angles to the direction of air flow, and on the downstream side of the heater. Controller, provided with a manual reset button, is separately mounted.
3. For heater protection, the indicated maximum temperature of the control unit should be 50°F less than the actual maximum temperature that will be permitted, to allow for overshot.
4. Single circuit heater elements may be wired into two circuits to allow for partial heating and control. *It is important* to have thermal control wired into all electric power circuits, so that all elements may be protected from overheat.

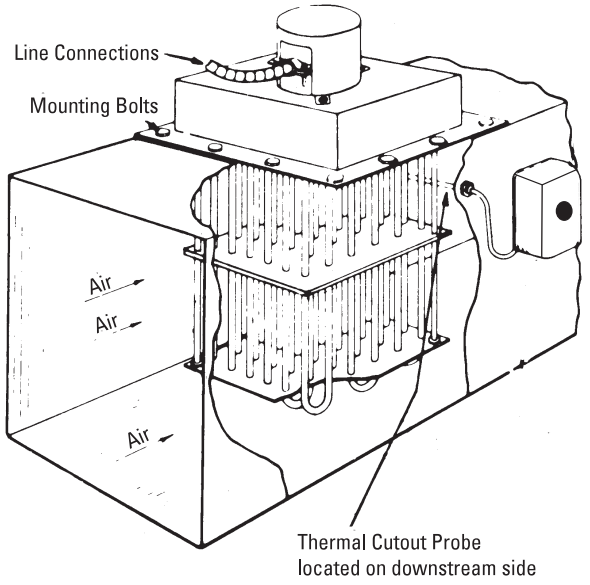


Figure 3 — Typical Installation In Air Duct

WIRING

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

1. All wiring should be done in accordance with the National Electrical Code and with local codes by a qualified person.
2. Connect air heaters to same line voltage, phase, and frequency as on heater nameplate; and in accordance with wiring diagram affixed to terminal housing.
3. Teflon insulated nickel-plated copper wire or bus bar is recommended for power connections to heater terminals and for wiring runs in heated zones. When ambient temperature in heated zone exceeds that for which insulated wire is recommended use bare nickel-plated copper with porcelain beads, tubing or bus bar. Consult local Chromalox representative.
4. **WARNING: Users should install adequate controls and safety devices with their electric heating equipment. Where the consequences of failure may be severe, back-up controls are essential.**

   Selection of controls, thermostat, SCR units, contactors and etc. depends on the degree of accuracy required, reliability, electrical rating of heater and economic considerations.

   Although the safety of the installation is the responsibility of the user, Chromalox will be glad to make equipment recommendations.

WIRING DIAGRAMS

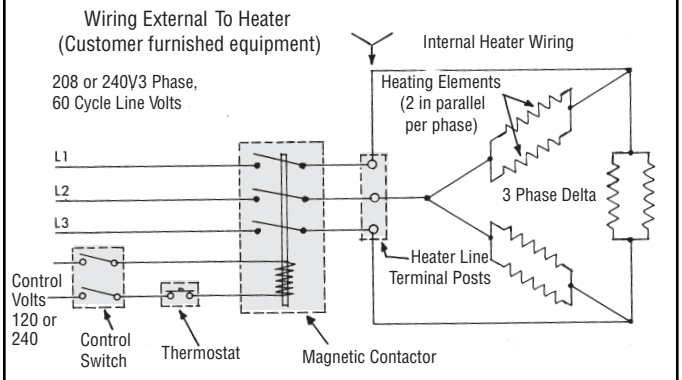


Figure A — 240V, 3 Phase 6 kW Heater

For each 6 kW increase in heater size, connect 1 additional set of elements (2 elements in parallel) across each phase.
Note: For 2 circuit heaters, second circuit arrangement is identical to one shown.

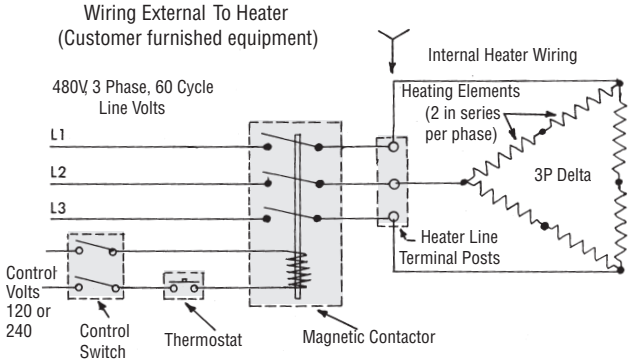


Figure B — 480V, 3 Phase, 60 Cycle 6 kW Heater

For each 6 kW increase in heater size connect 1 additional set of elements (2 elements in series) across each phase.

OPERATION

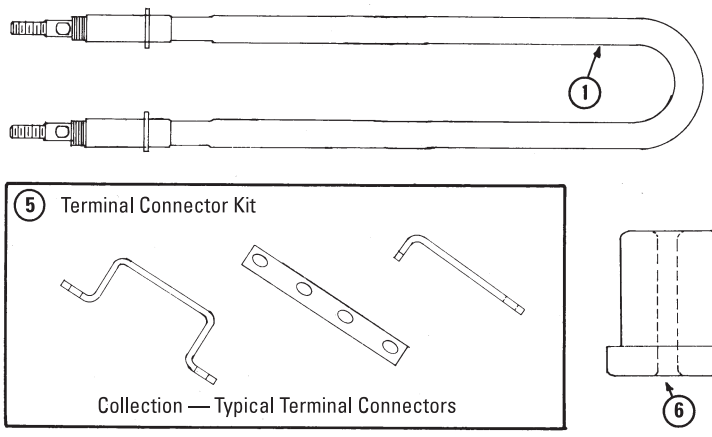
1. Do not operate heaters at voltages in excess of that stamped on the heater since excess voltage will shorten heater life.
2. Do not operate heater in areas where combustible lint, dust or flammable vapors, gases or liquids are present.

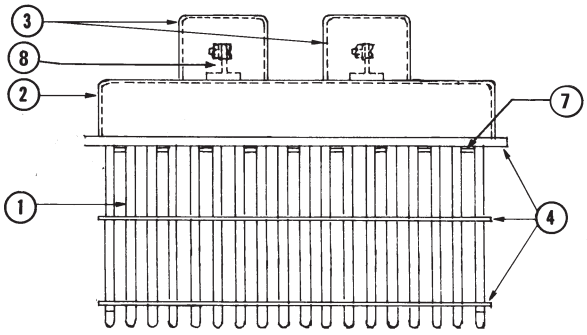
MAINTENANCE

WARNING: ***Hazard of Severe Shock. Disconnect all power to heater before servicing or replacing heaters.***

1. Periodically clean terminals and terminal covers of dust and corrosion to maintain good electrical connections and to permit rapid heat dissipation. Use airblast, and be careful to avoid damage to mica insulation.
2. Check all electrical connections and retighten to avoid electrical wiring difficulties.

RENEWAL PARTS IDENTIFICATION





Model C
Corresponding Parts Same For 1 Circuit
(1 Terminal Box) Heaters

RENEWAL PARTS IDENTIFICATION

Model	Volts	kW	Phase	① Heating Element TI-43 x 752	② Terminal Housing	③ Terminal Cover	④ Frame Sub Ass'y.	⑤ Terminal Connector Kit	⑥ Porcelain Bushing	Wiring Diagram Figure	Heater Amperes Per Circuit	⑦ Element Retaining Channel
TDH-6C	240	6	3	393-019489-001 (6)	304-015290-011	306-011757-001	126-015478-001	168-043158-002	163-033885-001 163-033885-002 (2)	A	14.4	050-015284-001
	480	6	3	393-019489-001 (6)	304-015290-011	306-011757-001	126-015478-001	168-043158-004	163-033885-001 163-033885-002 (2)	B	7.2	050-015284-001
TDH-12C	240	12	3	393-019489-001 (12)	304-015290-012	306-015477-001	126-015478-001	168-043158-006	163-033885-001 163-033885-002 (2)	A	28.8	050-015284-001 (2)
	480	12	3	393-019489-001 (12)	304-015290-012	306-015477-001	126-015478-002	168-043158-008	163-033885-001 (2) 163-033885-002	B	14.4	050-015284-001 (2)
TDH-18C	240	18	3	393-019489-001 (18)	304-015290-013	306-015477-001	126-015478-003	168-043158-010	163-033885-001 163-033885-002 (2)	A	43.2	050-015284-001 (3)
	480	18	3	393-019489-001 (18)	304-015290-013	306-015477-001	126-015478-003	168-043158-012	163-033885-001 163-033885-002	B	21.6	050-015284-001 (3)
TDH-24C	240	24	3	393-019489-001 (24)	304-015290-014	306-015477-001	126-015478-004	168-043158-014	163-033885-001 163-033885-002 (2)	A	57.6	050-015284-001 (4)
	480	24	3	393-019489-001 (24)	304-015290-014	306-015477-001	126-015478-004	168-043158-016	163-033885-001 (2) 163-033885-002	B	28.8	050-015284-001 (4)
TDH-30C	240	30	3	393-019489-001 (30)	304-015290-015	306-015477-001	126-015478-005	168-043158-018	163-033885-001 163-033885-002	A	72.1	050-015284-001 (5)
	480	30	3	393-019489-001 (30)	304-015290-015	306-015477-001	126-015478-005	168-043158-020	163-033885-001 (2) 163-033885-002	B	36.0	050-015284-001 (5)
TDH-36C	240	36	3	393-019489-001 (36)	304-015290-016	306-015477-001 (2)	126-015478-006	168-043158-021	163-033885-001 (2) 163-033885-002 (4)	A (2 CKTS)	43.4	050-015284-001 (6)
	480	36	3	393-019489-001 (36)	304-015290-006	306-015477-001	126-015478-006	168-043158-022	163-033885-001 (2) 163-033885-002	B	43.4	050-015284-001 (6)
TDH-42C	240	42	3	393-019489-001 (42)	304-015290-017	306-015477-001 (2)	126-015478-007	168-043158-023	163-033885-001 (2) 163-033885-002 (4)	A (2 CKTS)	50.5	050-015284-001 (7)
	480	42	3	393-019489-001 (42)	304-015290-007	306-015477-001	126-015478-007	168-043158-024	163-033885-001 (2) 163-033885-002	B	50.5	050-015284-001 (7)
TDH-48C	240	48	3	393-019489-001 (48)	304-015290-018	306-015477-001 (2)	126-015478-008	168-043158-025	163-033885-001 (2) 163-033885-002 (4)	A (2 CKTS)	57.7	050-015284-001 (8)
	480	48	3	393-019489-001 (48)	304-015290-008	306-015477-001	126-015478-008	168-043158-026	163-033885-001 (2) 163-033885-002	B	57.7	050-015284-001 (8)
TDH-54C	240	54	3	393-019489-001 (54)	304-015290-019	306-015477-001 (2)	126-015478-009	168-043158-027	163-033885-001 (2) 163-033885-002 (4)	A (2 CKTS)	65.0	050-015284-001 (9)
	480	54	3	393-019489-001 (54)	304-015290-009	306-015477-001	126-015478-009	168-043158-028	163-033885-001 (2) 163-033885-002	B	65.0	050-015284-001 (9)
TDH-60C	240	60	3	393-019489-001 (60)	304-015290-020	306-015477-001 (2)	126-015478-010	168-043158-029	163-033885-001 (2) 163-033885-002 (4)	A (2 CKTS)	72.2	050-015284-001 (10)
	480	60	3	393-019489-001 (60)	304-015290-010	306-015477-001	126-015478-010	168-043158-030	163-033885-001 (2) 163-033885-002	B	72.2	050-015284-001 (10)

Part Numbers suffixed by a number in ( ) indicates the number of the same part number used or supplied if more than one.

† Includes Appropriate Heaters Wiring Diagram.

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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