Chromalox®

Installation, Operation

and

RENEWAL PARTS IDENTIFICATION

SERVICE REFERENCE	
DIVISION 4	SECTION TTUH
SALES REFERENCE (Supersedes PD400-14)	PD400-15
	161-048415-001
DATE OCTOBER, 2000	

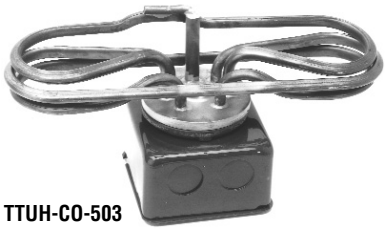
Type TTUH and TTUH-CO URN Heaters

TTUH-20A

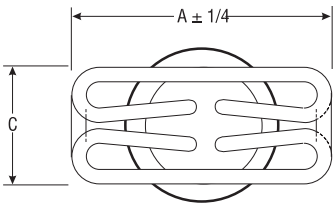
TTUH-50

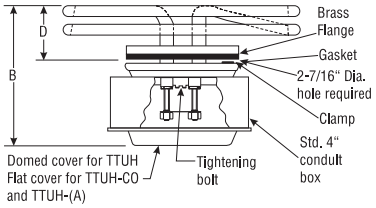
TTUH-703WSS

TTUH-CO-30



TTUH-CO-503





Specifications — TTUH

Model	Volts	kW	W/In²	Dimensions (In.) Overall Length A	B	C	Extends Into Tank D‡
TTUH — 1 Phase — 3" min. liquid depth							
TTUH-10A	120	1	42	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-15A	120	1.5	57	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-15A	208	1.5	57	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-15A	240	1.5	57	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-20A	120	2	57	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-20A	208	2	57	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-20A	240	2	57	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-25A	120	2.5	58	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-25A	208	2.5	58	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-25A	240	2.5	58	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-30A	120	3	55	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-30A	208	3	55	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-30A	240	3	55	6-3/4	4-9/16	4-1/4	2-5/16
TTUH-40A	120	4	53	9-1/2	4-9/16	4	1-3/8
TTUH-40A	208	4	53	9-1/2	4-9/16	4	1-3/8
TTUH-40A	240	4	53	9-1/2	4-9/16	4	1-3/8
TTUH-50	208	5†	39	12-3/4	4-9/16	4	1-11/16
TTUH-50	240	5†	39	12-3/4	4-9/16	4	1-11/16
TTUH-60	208	6†	42	14-1/2	4-9/16	4	1-11/16
TTUH-60	240	6†	42	14-1/2	4-9/16	4	1-11/16
TTUH-70	208	7†	49	14-1/2	4-9/16	4	1-11/16
TTUH-70	240	7†	49	14-1/2	4-9/16	4	1-11/16
TTUH — 3 Phase — 3" min. liquid depth							
TTUH-303	208	3†	55	8-3/4	4-5/8	3-1/8	1-15/16
TTUH-303	240	3†	55	8-3/4	4-5/8	3-1/8	1-15/16
TTUH-403	208	4†	74	8-3/4	4-5/8	3-1/8	1-15/16
TTUH-403	240	4†	74	8-3/4	4-5/8	3-1/8	1-15/16
TTUH-408	480	4†	74	8-3/4	4-5/8	3-1/8	1-15/16
TTUH-503	208	5†	73	11	4-5/8	3-1/8	1-15/16
TTUH-503	240	5†	73	11	4-5/8	3-1/8	1-15/16
TTUH-603	208	6†	67	11-1/16	5	4-1/16	2-3/8
TTUH-603	240	6†	67	11-1/16	5	4-1/16	2-3/8
TTUH-603	480	6†	67	11-1/16	5	4-1/16	2-3/8
TTUH-703	208	7†	78	11-1/16	5	4-1/16	2-3/8
TTUH-703	240	7†	78	11-1/16	5	4-1/16	2-3/8
TTUH-803	208	8†	69	11-1/8	5	4-1/16	2-3/8
TTUH-803	240	8†	69	11-1/8	5	4-1/16	2-3/8
TTUH-1203	240	12†	98	17-3/4	5	4-1/16	2-3/8

‡ Minimum liquid level should be maintained at 1/2" above D dimension.
† Brazed terminal construction; cannot be wired for 3 heats.

Specifications — TTUH-CO

Model	Volts	kW	W/In²	Dimensions (In.) Overall Length A	B	C	Extends Into Tank D‡
TTUH-CO — 1 Phase with cutout — 3-1/4" min. liquid depth							
TTUH-CO-10	120	1	42	7-7/16	4-8/16	3-1/16	1-3/8
TTUH-CO-15	120	1.5	62	7-7/16	4-13/16	3-1/16	2-3/8
TTUH-CO-15	208	1.5†	62	7-7/16	4-13/16	3-1/16	2-3/8
TTUH-CO-15	240	1.5†	62	7-7/16	4-13/16	3-1/16	2-3/8
TTUH-CO-20	208	2	60	9-7/16	4-13/16	3-1/16	2-1/8
TTUH-CO-20	240	2	60	9-7/16	4-13/16	3-1/16	2-1/8
TTUH-CO-25	208	2.5	40	6-3/4	4-13/16	3-1/16	2-1/8
TTUH-CO-25	240	2.5	40	6-3/4	4-13/16	3-1/16	2-1/8
TTUH-CO-30	208	3	55	6-3/4	4-13/16	3-1/16	2-1/8
TTUH-CO-30	240	3	55	6-3/4	4-13/16	3-1/16	2-1/8
TTUH-CO-40	208	4†	64	9-1/2	4-13/16	3-1/16	2-1/8
TTUH-CO-40	240	4†	64	9-1/2	4-13/16	3-1/16	2-1/8
TTUH-CO-50	208	5†	70	12-3/4	5-3/8	4	2-11/16
TTUH-CO-50	240	5†	70	12-3/4	5-3/8	4	2-11/16
TTUH-CO-60	208	6†	73	14-1/2	5-3/8	4	2-11/16
TTUH-CO-60	240	6†	73	14-1/2	5-3/8	4	2-11/16
TTUH-CO-70	240	7†	85	14-1/2	5-3/8	4	2-11/16
TTUH-CO — 3 Phase with cutout — 3-1/2" min. liquid depth							
TTUH-CO-303	208	3	55	8-3/4	5-13/16	3-1/8	2-23/32
TTUH-CO-303	240	3	55	8-3/4	5-13/16	3-1/8	2-23/32
TTUH-CO-403	208	4	74	8-3/4	5-13/16	3-1/8	2-23/32
TTUH-CO-403	240	4	74	8-3/4	5-13/16	3-1/8	2-23/32
TTUH-CO-503	208	5	73	11	5-13/32	3-1/8	2-23/32
TTUH-CO-503	240	5	73	11	5-13/32	3-1/8	2-23/32
TTUH-CO-503	480	5	73	11	5-13/32	3-1/8	2-23/32
TTUH-CO-603	208	6	72	11-1/16	5-3/4	4-1/16	3
TTUH-CO-603	240	6	72	11-1/16	5-3/4	4-1/16	3
TTUH-CO-703	208	7	78	11-1/16	5-3/4	4-1/16	3
TTUH-CO-703	240	7	78	11-1/16	5-3/4	4-1/16	3
TTUH-CO-703	480	7	78	11-1/16	5-3/4	4-1/16	3
TTUH-CO-803	208	8	69	14-1/2	5-3/4	4-1/16	3
TTUH-CO-803	240	8	69	14-1/2	5-3/4	4-1/16	3
TTUH-CO-803	480	8	69	14-1/2	5-3/4	4-1/16	3
TTUH-CO-903	208	9	78	14-1/2	5-3/4	4-1/16	3
TTUH-CO-903	240	9	78	14-1/2	5-3/4	4-1/16	3
TTUH-CO-903	480	9	78	14-1/2	5-3/4	4-1/16	3
TTUH-CO-1003	208	10	82	17-11/16	5-3/4	4-1/16	3
TTUH-CO-1003	240	10	82	17-11/16	5-3/4	4-1/16	3
TTUH-CO-1003	480	10	82	17-11/16	5-3/4	4-1/16	3
TTUH-CO-1203	240	12	98	17-11/16	5-3/4	4-1/16	3
TTUH-CO-1203	480	12	98	17-11/16	5-3/4	4-1/16	3

‡ Minimum liquid level should be maintained at 1/2" above D dimension.
† Brazed terminal construction; cannot be wired for 3 heats.

GENERAL

⚠WARNING

FIRE/EXPLOSION HAZARD. 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 personal injury or property damage.

Chromalox TTUH and TTUH-CO food equipment heaters are ideal for coffee urns, steam tables, kettles, humidifiers and other commercial uses.

Heater Construction Characteristics

A. An opening of 2-7/16" in diameter in the bottom of the tank is required to insert the heater.
B. High watt density.
C. 4" conduit box is mounted to the tank by a tightening bolt.

⚠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.

INSTALLATION

⚠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

FIRE HAZARD. Since heaters are capable of developing high temperatures, extreme care should be taken to:

A. Avoid mounting heaters in an atmosphere containing combustible gases and vapors.
B. Avoid contact between heaters and combustible materials.
C. Keep combustible materials far enough away to be free of the effects of high temperature.
D. Keep heater immersed at all times.

INSTALLATION

TTUH

Note: Mount heater in horizontal position.

1. Cut a hole 2-7/16" in diameter in bottom of tank unless already done.
2. Insert heater with gasket. (Use sealer if tank wall is corroded.)
3. Mount the combination terminal enclosure and clamp over the element flange. (On 3 phase, first remove center jumper strap.)
4. Use bolt to draw mounting flange tight to tank bottom. (Reconnect jumper strap on 3 phase.)
5. For connecting heaters, see wiring diagrams.
6. 120V elements can be connected in series for high voltage operation.

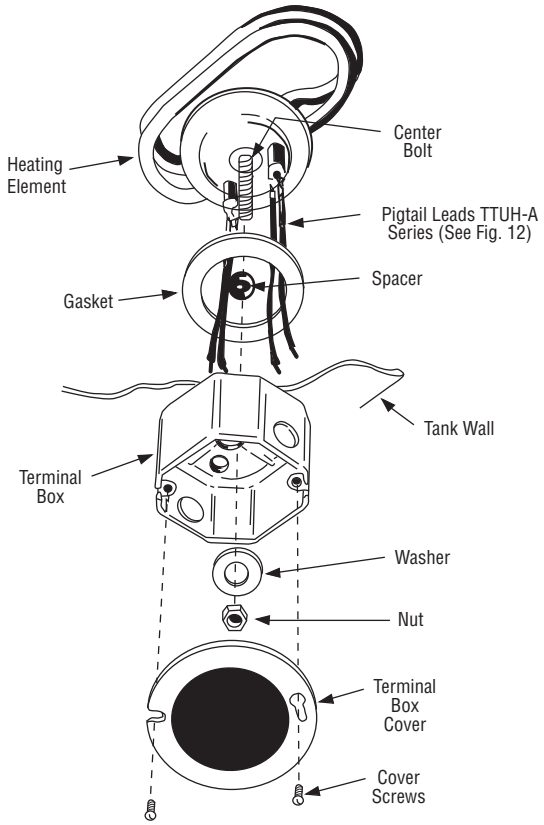


Figure 2

TTUH-CO

1. Remove cover.
2. Loosen set screw with 5/64" balldriver L-wrench. (Alan wrench).
3. Remove thermal cutout by pulling directly out.
4. Remove enclosure flange assembly by removing 5/16" socket head cap screw in center.
5. Insert element and gasket in tank opening (use sealer if tank wall is corroded).
6. Replace enclosure flange assembly and the 5/16" socket head cap screw.
7. Push cutout into place. Be sure the thermal cutout is properly located and seated on the conductor rod. (See Figures 3A & 4A).
8. Secure cutout to the conductor rod with the set screw. (See Figure 3A).
9. Make sure fully insulated 1/4" female spade connectors are used when connecting to the thermal cutout.
10. On all single phase units less than 3kW – attach power leads to T1 & T2 (see Figure 4A) and connect cutout lead to one terminal on the cutout.
    Note: Single phase heaters 3kW and above and all three phase models require the use of a suitable magnetic contactor. (Supplied by customer).
11. On all TTUH-CO Three Phase Delta Units – Twist 1L3 & 2L3 leads together to create L3, then, attach power leads to L1, L2 & L3. Connect coutout to relay or contactor coil. (See Figures 5A & 9)
12. Replace cover with the "push to reset" hole directly over the cutout.
13. Refer to the main portion of the instruction, operation and maintenance instructions for all other information.
14. The thermal cutout on the TTUH-CO provides run dry burn-out protection only. Partial immersion of the elements while energized can shorten element life. The cutout is a safety device only & should not be used continuously as a low-liquid-level control.
15. Should the thermal cutout trip during operation, disconnect all power to the heater before resetting.
16. Apply the manual reset locator label 170-122103-111, in view, to help locate the manual reset button. See procedure 223-304407-007.

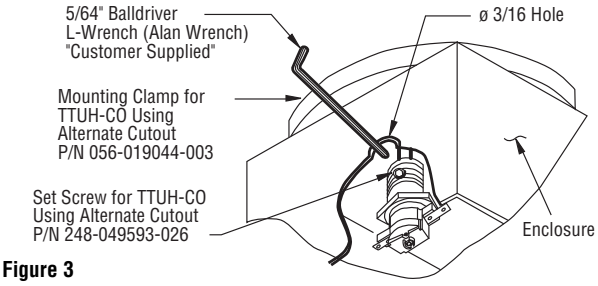


Figure 3

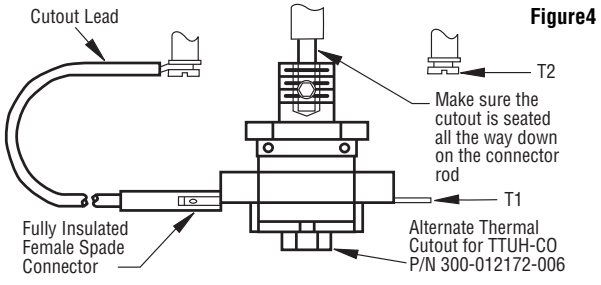


Figure4

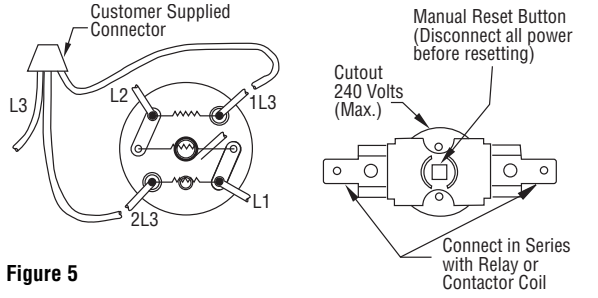


Figure 5

WIRING

⚠WARNING

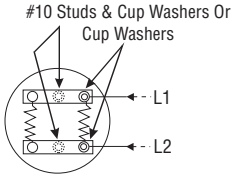
ELECTRIC SHOCK HAZARD. Any installation involving electric heaters must be performed by a qualified person and must be effectively grounded in accordance with the National Electrical Code to eliminate shock hazard.

1. Be sure line voltage matches heater voltage (on nameplate).
2. Electric wiring to heater must be installed in accordance with the National Electrical Code and with local codes by a qualified person.

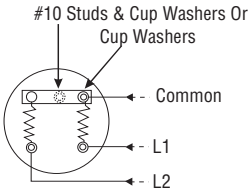
CAUTION: Use copper conductors only.

3. When element wattages are not equal, heaters must not be connected in series.
4. Make necessary wiring connections as shown on wiring diagram (Figures 6 thru 11).

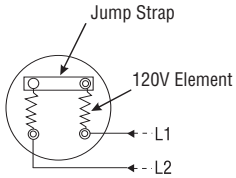
WIRING DIAGRAMS



1 Heat-Parallel — 120, 208 & 240V

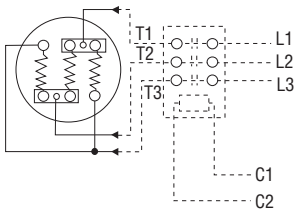


120, 208 & 240V — 3 Heat



240V Series Connected

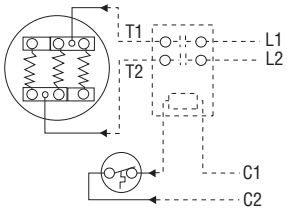
Figure 6 — TTUH 1 Phase



208, 240 & 480V

Note: All 3 phase heaters require the use of a contactor.

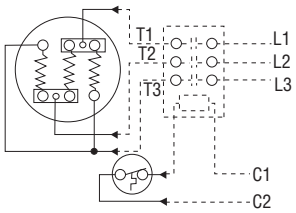
Figure 7 — TTUH 3 Phase Delta



120, 208 & 240V

Note: Single phase heaters 3 kW and above require the use of a contactor.

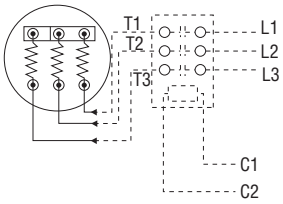
Figure 8 — TTUH-CO 1 Phase



208, 240 & 480V

Note: All 3 phase heaters require the use of a contactor.

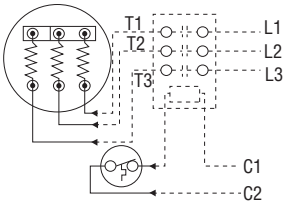
Figure 9 — TTUH-CO 3 Phase Delta



208, 240 & 480V

Note: All 3 phase heaters require the use of a contactor.

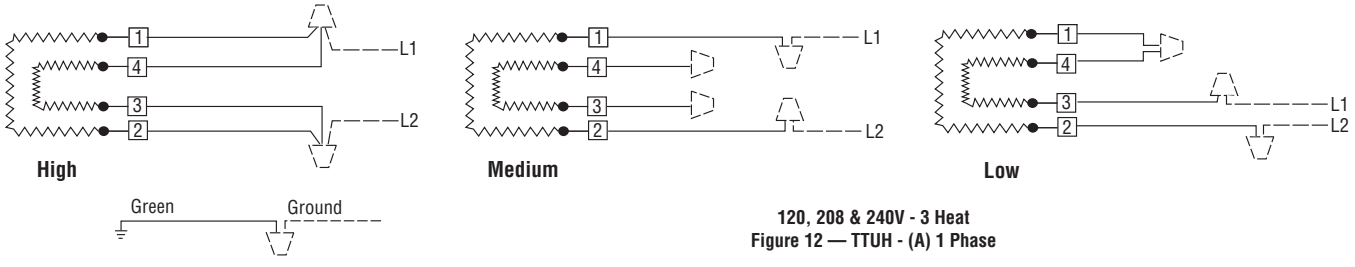
Figure 10 — TTUH 3 Phase Wye



208, 240 & 480V

Note: All 3 phase heaters require the use of a contactor.

Figure 11 — TTUH-CO 3 Phase Wye



120, 208 & 240V - 3 Heat
Figure 12 — TTUH - (A) 1 Phase

Note: Contactors shown in Figure 7, 8, 9, 10 and 11 are supplied by customer.

OPERATION

1. Do not operate at voltages in excess of that stamped on the heater since excess voltage will shorten heater life.

IMPORTANT*: Mount heater in the tank so the liquid level will always be above the effective heated portion of the heater. Provide expansion tank if necessary.*

Note: The Thermal cutout on the TTUH-CO provides run dry burn-out protection only. Partial immersion of the elements while energized can shorten element life. The cutout is a safety device only and should not be used continuously as a low-liquid-level control.5

MAINTENANCE

⚠WARNING

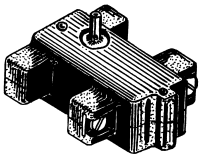
ELECTRIC SHOCK HAZARD. Disconnect all power before installing or servicing heater or resetting the manual reset button. Failure to do so could result in personal injury or property damage. Heater must be installed by a qualified person in accordance with the National Electrical Code. NFPA 70.

⚠WARNING

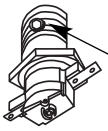
IMPORTANT: It is the responsibility of the purchaser of the heater to make the ultimate choice of sheath material based upon his knowledge of the chemical composition of the corrosive solution, character of the materials entering the solution, and controls which he maintains on the process.

1. Heaters should be checked periodically for coatings and corrosion and cleaned if necessary.
2. Tank should be checked regularly for sediment around the heater. Sediment can act as an insulator and shorten heater life.
3. Check for loose terminal connections.
4. If corrosion is indicated in the terminal enclosure, check terminal box gasket and replace if necessary, and check conduit layout to correct conditions that allow corrosion to enter the terminal housing.
5. Clean terminal ends of all contamination.

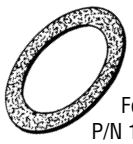
RENEWAL PARTS IDENTIFICATION



THERMAL CUTOUT
For TTUH-CO only
PCN 427725
Note: New cutout will not work with old style TTUH-CO models.



Set Screw P/N 248-049593-026



GASKET
For all heaters
P/N 132-010737-001

MOUNTING CLAMP
For TTUH
(1 and 3 Phase)
P/N 056-016147-001
For TTUH-CO
P/N 056-019044-003

MOUNTING BOLT
For all heaters
5/16 x 1" Lg. Hex
Socket head cap screw
P/N 345-041953-001

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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