Chromalox®

Installation and Operating Instructions

SERVICE REFERENCE		
DIV. 4	SEC. CON	NUMBER 3001
SALES REFERENCE		PK473
		161-562785-001
DATE	JULY, 1987	

Chromalox Adjustable Cartridge and Immersion Type Non-Indicating Thermostat 17,000 and 18,000 Series

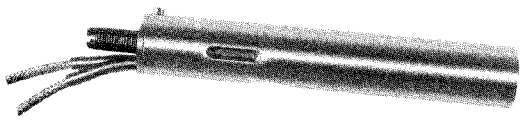

Figure 1 Cartridge Type

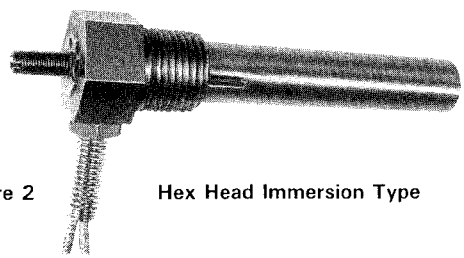

Figure 2 Hex Head Immersion Type

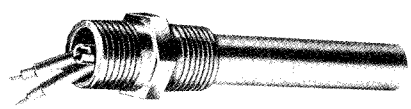

Figure 3 Coupling Head Immersion Type

Specifications — Table A

Temperature Range °F	Contact Operation on Temp. Rise	Maximum (Ampere) AC Rating 120V	240V	Dimensions (Inches) Length A	Dia. B	Catalog Number	Wt. Oz.
Cartridge Type — Figure 1							
−100 to 400	Opens	10	5	$3\frac{23}{32}$	$\frac{5}{8}$	17000-0	2
−100 to 400	Closes	10	5	$3\frac{23}{32}$	$\frac{5}{8}$	17021-0	2
−100 to 600	Opens	10	5	$3\frac{23}{32}$	$\frac{5}{8}$	17002-0	2
−100 to 600	Closes	10	5	$3\frac{32}{32}$	$\frac{5}{8}$	17023-0	2
−100 to 400	Opens	25	12.5	$3\frac{23}{32}$	$\frac{13}{16}$	17050-0	3
−100 to 600	Opens	25	12.5	$3\frac{32}{32}$	$\frac{13}{16}$	17052-0	3
Hex Head Immersion Type — Figure 2							
−100 to 400	Opens	10	5	$4\frac{9}{32}$	$\frac{5}{8}$	17100-0	5
−100 to 400	Closes	10	5	$4\frac{9}{32}$	$\frac{5}{8}$	17121-0	5
−100 to 600	Opens	10	5	$4\frac{9}{32}$	$\frac{5}{8}$	17102-0	5
−100 to 600	Closes	10	5	$4\frac{9}{32}$	$\frac{5}{8}$	17123-0	5
−100 to 400	Opens	25	12.5	$4\frac{15}{32}$	$\frac{13}{16}$	17150-0	8
−100 to 600	Opens	25	12.5	$4\frac{13}{32}$	$\frac{13}{16}$	17152-0	8
Coupling Head Immersion Type — Figure 3							
−100 to 400	Opens	10	5	$4\frac{21}{32}$	$\frac{5}{8}$	18000-0	5
−100 to 400	Closes	10	5	$4\frac{21}{32}$	$\frac{5}{8}$	18021-0	5
−100 to 600	Opens	10	5	$4\frac{21}{32}$	$\frac{5}{8}$	18002-0	5
−100 to 600	Closes	10	5	$4\frac{21}{32}$	$\frac{5}{8}$	18023-0	5

GENERAL

NOTE: If the fourth digit is a "2" (such as 17021), it is tension operated. Tension units are recommended if overshoots are to be encountered. Low temperature units can be overshot to 500 °F and high temperature units (−100 to 600 °F) overshot to 700 °F for intervals not exceeding one hour.

Description and Uses

Cartridge type (Figure 1) is the basic element of all controls. All the desirable features of the ideal thermostat — high sensitivity, wide adjustment range, small size, rugged construction, vibration resistant — are included in this control. It may be inserted into reamed or drilled hole.

Hex head Immersion type (Figure 2) has all the internal features of the cartridge type with the addition of a standard pipe thread for mounting purposes and can be screwed directly through a threaded opening in a tank or duct or directly into a pipe line containing a gas or a liquid.

Coupling head Immersion Type (Figure 3) has a hexagonal mounting section with standard male pipe threads at each end, either of which may be used for Mounting. This unit may be directly attached to electrical conduit. It's uses are identical as the Hex head Immersion type.

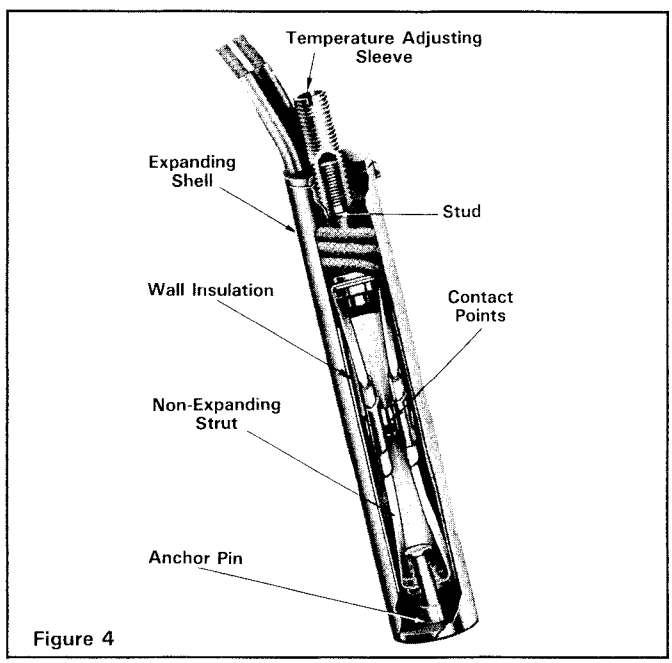

Figure 4

GENERAL (continued)

NOTICE: These controls are designed for temperature control service only. Because they do not fail safe, they should not be used for temperature limiting duty.

CAUTION: ***Not for use in hazardous environments as described in National Electrical Code. Failure to comply can result in explosion or fire.***

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

MOUNTING

Cartridge type (Figure 1)
To avoid restricting shell expansion when making installations in solid metal blocks, a $\frac{5}{8}$" diameter reamed hole for $\frac{5}{8}$" units or a $\frac{13}{16}$" diameter reamed hole for $\frac{13}{16}$" diameter heavy duty units is recommended. Hole should have short spline to receive the $\frac{1}{8}$" diameter locating pin. This prevents the unit from rotating when the adjusting sleeve is turned.

Hex and Coupling Head (Figure 2 and 3) can be installed like any pipe fitting. See Table B for maximum torque value.

NOTE: If the threaded units are installed in a pipe tee, the tee should be large enough to allow adequate circulation of the fluid around the temperature sensitive section of the unit.

NOTE: Certain gases or liquids including water at elevated temperature could be corrosive and may also cause electrolytic action, which could severely shorten the life of the controller.

The rate of corrosion or electrolysis is influenced by a great many system parameters such as chemical makeup and temperature of the solution stray electric currents, etc. Consult the supplier of your chemicals or the factory for suggestions.

Table B — Torque

Max. Torque	Controller Types
35 ft. lbs.	$\frac{5}{8}$" Dia. Standard with N.P.T.*
70 ft. lbs.	$\frac{13}{16}$" Dia. Heavy Duty with N.P.T.**

*4 ft. lbs.	When Teflon tape lubricant is used.
**8 ft. lbs.	

WARNING: *Excessive torque may change temperature settings.*

WIRING

CAUTION: ***Hazard of electrical shock. Disconnect all power before wiring or servicing this control. Failure to comply can result in electrical shock or electrocution.***

1. Electric wiring must be installed in accordance with the National Electrical Code and with local codes. **WARNING:** Use copper conductors only.
2. Connect wires according to wiring diagram. (Figure 5 or 6)

NOTE: Electrical connections should be made with generous loop of wire — approximately 6" per lead.

Contact Protection
Capacitors are not required under average conditions. For smoother control at small loads, on D.C. applications or to prevent contact bounce due to vibration, Table C is recommended as a guide.

Table C — Contact Protection

Voltage	Service	Capacitance MFD (non-polarized)
120VAC	Resistance	Non-required
240VAC	Resistance	.1
120 or 240VAC or DC	Relays, Magnetic Contactors	.001 to .01
15-25VAC or DC	Relays	.02
120 or 240VAC	Motor	Use Relay

NOTE: Capacitors should be wired in parallel with thermostat. Capacitors should be rated for a minimum of 600 VDC on 120 VAC circuits and 1000 VDC on 240 VAC circuit.

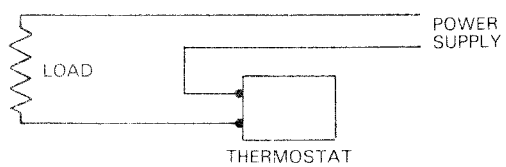

Figure 5 — Single phase loads when load does not exceed rating of thermostat.

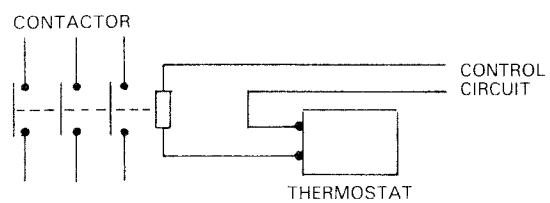

Figure 6 — Single phase loads when load exceeds rating of thermostat and all three phase and motor loads.

TESTING AND ADJUSTMENT

The arrow on the head of the control unit indicates direction to turn adjusting screw to **increase** temperature setting. Torque in excess of 15 inch pounds on adjusting sleeve will deform slot.
Each full turn of adjusting sleeve will change temperature the approximate number of degrees as follows:

Table D — Adjustment Rates

Tension Operated		Compression Operated	
Catalog Number	Approx. F° per full turn of adj. sleeve	Catalog Number	Approx. F° per full turn of adj. sleeve
17000-0	90-115	—	—
17002-0	90-115	17021-0	90-100
17050-0	90-115	17023-0	90-100
17052-0	90-115	17121-0	90-100
17100-0	90-115	17123-0	90-100
17102-0	90-115	—	—
17150-0	90-115	—	—
17152-0	90-115	—	—
18000-0	80-100	18021-0	70-135
18002-0	80-100	18023-0	70-135

After the control unit has been installed, final adjustment can be made by allowing the unit to operate for several cycles to permit the controlled system to stabilize and then adjust to desired temperatures. The system should then be cooled to ambient temperature, reheated and stabilized to check the setting.
Where extremely accurate temperature control is desired several readjustments may be necessary to stabilize the control after which the adjustment will be maintained.

DO'S AND DON'TS

DO connect controller leads in series with the load and power supply (See Figure 5 & 6).

DO be certain that there is sufficient but not excessive room for the installed control unit to expand in diameter and length.

DO insulate head of the control unit where large external temperature variation may occur.

DO prevent internal damage by mechanically presetting regular tension units (those with catalog number containing fourth digit other than 2) to approximate required elevated temperature before inserting into process. Preset by turning adjusting sleeve counterclockwise following the adjustment rate information shown on Table D, Page 3.

DON'T immerse your unit in liquids or vapors unless it was specified for that job.

DON'T seal head with silicone materials.

DON'T exceed the ratings indicated on the control unit shell.

DON'T thermally shield unit from medium being controlled.

DON'T remove adjusting screw or turn adjusting screw in farther than necessary for desired operation. This action may permanently damage the unit and may void standard Chromalox warranty.

DON'T oil your unit. Oil around adjusting screw will flow inside, contaminating contacts.

DON'T try to repair unit yourself.

DON'T handle unit with pliers or force it into position either by hand or tools, or apply excessive torque in tightening threaded units.

DON'T subject shell of unit to deformation.

DON'T over-torque threaded units.

The warranty below has been drafted to comply with the new Federal Law applicable to products manufactured after December 31, 1976. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. The warranty in no manner reduces the coverage provided to you under the warranty it replaces.

Chromalox Warranty: Chromalox industrial products are warranted against defects in workmanship and materials. NO OTHER WARRANTIES, WRITTEN OR ORAL, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY AND WARRANTIES FOR A PARTICULAR PURPOSE, APPLY. No person is authorized to give any other warranty or assume any other liability except by written statement from an officer of the Edwin L. Wiegand Division, Emerson Electric Co.

Warranty Period: This warranty extends for twelve months from date of shipment from factory or authorized distributor.

Limitations: Products must be installed and maintained in accordance with Chromalox instructions. Users are responsible for the suitability of the products to their application. There is no warranty against damage resulting from corrosion, misapplication, improper specification or other operating conditions beyond our control. Claims against carriers for damage in transit must be filed by the buyer.

Remedy: Return the defective part or product, freight prepaid, to the location designated by Chromalox Product Service. All such items must be accompanied by a Material Return Authorization. This form, which includes a tear-out mailing and identification label, should be obtained from your local Chromalox Sales Office.

Defective items will be repaired or replaced at our option. SUCH REPAIR OR REPLACEMENT IS THE EXCLUSIVE REMEDY AVAILABLE FROM EDWIN L. WIEGAND DIVISION, EMERSON ELECTRIC CO. WIEGAND IS NOT LIABLE FOR LABOR COSTS INCURRED IN REMOVAL, REINSTALLATION, OR UNAUTHORIZED REPAIR OF THE PRODUCT OR FOR DAMAGE OF ANY TYPE WHATSOEVER, INCLUDING INCIDENTAL OR CONSEQUENTIAL DAMAGE. Some states do not allow the exclusion or limitations of incidental or consequential damages, so the preceding limitation or exclusion may not apply to you.

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