

**Two-Position, Electric Room Thermostats
General Instructions**

APPLICATION

For low or line voltage on-off control of fan coils, fans motor starters, contactors, two-position electric actuators.

SPECIFICATIONS:

Setpoint Dial Range: See Table 1.

Sensing Element: Bimetal.

Differential: 2°F (1°C).

Electrical Switch: Snap action SPDT.

Rating: See Table 3.

Connections: Color coded 6" leads.

Cover: Beige plastic as standard and brushed bronze cover insert.

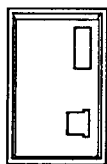
Location: NEMA Type 1 indoor only.

Mounting: Flush or surface 2 x 4 switch box or directly to wall (24 volt only).

Dimensions: 4-3/8 H x 2-7/8 W x 1-5/8 D in. (111 x 73 x 41 mm).

Anticipators: Anticipators are recommended for all thermostats mounted on concrete walls, or other wall surfaces that change temperature slowly or have reduced response time to changes in space temperature. Response time is further reduced for thermostats with guards that restrict air flow over the thermostat. Anticipators are recommended on thermostats that are subjected to restricted air flow conditions and in small spaces for human occupancy, e.g., hotel guest rooms and offices.

Standard Models Include (Company identification shown on cover and inserts.)



Standard

with

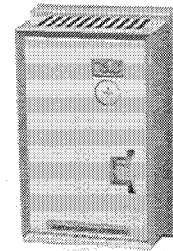


Insert

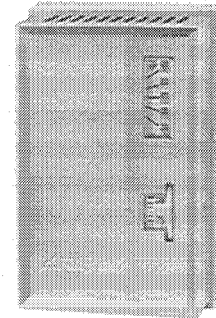


Insert

- One (1) Blank cover insert
- One (1) Cover insert with setpoint dial output
- One (1) 5/64" Allen head screw for securing cover to thermostat base
- One (1) 5/64" Allen wrench
- Two (2) Dial stop pins to limit setpoint range
- Two (2) Mounting screws



**TC-110X with
Digital Thermometer
Kit Installed**



Full Dial Cover Shown
(Covers must be ordered separately except as noted.)

Options for TAC only (for quantities of 24 or more each part number)

Add *dash-number* (-XXX) suffix to base part number for desired option. For metal covers, specify TC2-110X-XXX. All models include dial stop pins to limit setpoint range.



F -399
C -398



-400
-410



-403
-413



-404
-414

Table-1 Specifications for Standard Models.

Part Number		Setpoint Dial Range	Company Identification
Plastic Cover	Metal Cover		
TC-1101	TC2-1101	55-85°F	TAC
TC-1101-116	TC2-1101-116	13-29°C	
TC-1101-500	TC2-1101-500	55-85°F	
TC-1101-602	TC2-1101-602	55-85°F	
TC-1101-770	-	55-85°F	Robertshaw
TC-1102	TC2-1102	45-75°F	TAC
TC-1102-116	TC2-1102-116	7-23°C	
TC-1102-500	TC2-1102-500	45 to 75	
TC-1102-602	TC2-1102-602	45 to 75	
TC-1102-770	-	45 to 75	Robertshaw
TC-1103	TC2-1103	75-105°F	TAC
TC-1103-116	TC2-1103-116	24-40°C	
TC-1103-500	TC2-1103-500	75 to 105	
TC-1103-602	TC2-1103-602	75 to 105	
TC-1103-770	-	75 to 105	Robertshaw

Table-2 Agency Approvals

Configuration	Part Number	UL	CSA
Metal Cover Option^a	TC2-1101 TC2-1101-116 TC2-1102 TC2-1102-116 TC2-1103 TC2-1103-116	NO	YES
Plastic Cover	TC-1101 TC-1101-116 TC-1101-770 TC-1102 TC-1102-116 TC-1102-770 TC-1103 TC-1103-116 TC-1103-770	YES	NO
24 VAC Parallel Heat Anticipation	TC-1101-500 TC-1102-500 TC-1103-500	NO	NO
24 Vac Night Depression	TC-1101-602 TC-1102-602 TC-1103-602	NO	NO

^a Only available as factory assembly; do not convert from plastic to metal cover in the field. TC2-110x-500 and TC2-110x-602 are not CSA approved.

Table-3 Accessories.

Wholesale Number	Replaces Model	Description
20-695	10-15	Aspirating box, satin finish
20-707	10-53	Metal thermostat guard
20-712	10-59	Internal stop kit
20-715	10-62	Clear cover thermostat guard
20-850	—	Thermostat mounting plate
20-881	N2-4	Thermostat calibration wrench
21-473	10-73	Drywall mounting bracket
21-800	10-72	Setpoint adjustment cover (black)
21-801	10-81-48	Setpoint adjustment cover (Euro-white)
21-876	10-76	Opaque cover thermostat guard
22-022	—	Thermostat conversion kit
22-023	—	Thermostat conversion kit
22-138	MCS-GA	Branch tap gauge adaptor
900-002	—	Thermostat calibration kit

Table-4 Maximum Electrical Ratings

Switch Action	Full Load Amps		Locked Rotor Amps		Pilot Duty (VA)
	24/120 Vac	240 Vac	24/120 Vac	240 Vac	
Make for Heating	4.4 Orange to Brown Lead	2.2 Orange to Brown Lead	26.4 Orange to Brown Lead	13.2 Orange to Brown Lead	40 @ 24 Vac 210 @ 120/240 Vac
Make for Cooling	3.0 Orange to Red Lead	1.5 Orange to Red Lead	18 Orange to Red Lead	9 Orange to Red Lead	

ACCESSORIES

- AT-61 Series Brushed bronze cover inserts
- AT-82 Series Digital thermometer Plastic cover kit (TAC)
- AT-82-770 Digital thermometer plastic cover kit (Robertshaw)
- AT-101 Lock cover kit
- AT-104 Dial stop pins (NOTE: Pins included with each unit.)
- AT-504 Plaster hole cover kit (small)
- AT-505 Surface mounting base
- AT-546 Auxiliary mounting base
- AT-602 Selector switch sub-base DP4T
- AT-603 Selector switch sub-base one DP4T, one DPDT
- AT-1100 Series Thermostat guards
- PKG-1093 Digital thermometer battery replacement kit
- TOOL-13 Contact burnishing tool

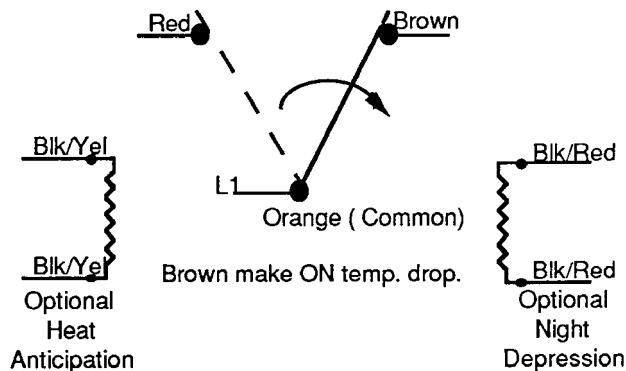


Figure-1 TC-1100 Series Switch Action and Lead Identification.

PRE-INSTALLATION

Inspection

Inspect the carton for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the carton and inspect the device for obvious damage. Return damaged products.

Required Installation Items

- Wiring diagrams
- Tools (not provided):
 - Volt-ohm meter
 - Appropriate screwdriver for mounting screws and terminal connections
- Appropriate accessories
- Mounting screws, two (2) provided for securing to a 2 x 4 conduit box

INSTALLATION

Caution:

1. Installer must be qualified, experienced technician.
2. Make all connections in accordance with the wiring diagram, and in accordance with national and local electrical codes. Class I wiring is required unless all circuits to contacts are powered from Class II source. *Use copper conductors only.*
3. Do not exceed ratings of the device.

Mounting

Thermostats require upright mounting on a properly flat vertical surface. Locate the thermostat where it will be exposed to unrestricted circulation of air which represents the average temperature of the controlled space.

Caution: Do not locate the thermostat near sources of heat or cold, such as lamps, motors, sunlight or concealed ducts or pipes, or where there is a danger of electrocution (i.e. shower rooms).

The thermostat is designed for service in any normally encountered human environment. Avoid locations where excessive vibration, moisture, corrosive fumes or vapors are present. NEMA Type 1 covers are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment.

Thermostats with guards that restrict air flow must have heating or cooling anticipation.

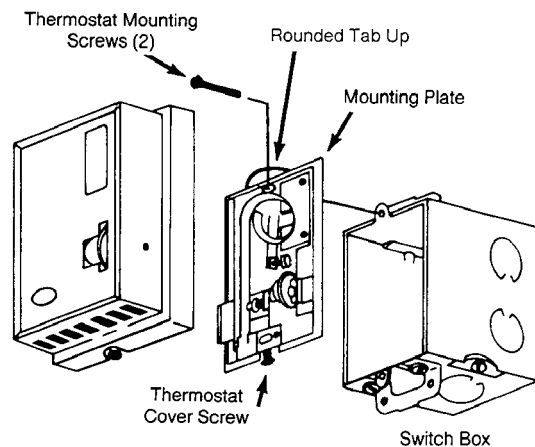


Figure-2 Thermostat Mounting

Procedure

1. Pull all wires.
2. Make electrical connections to thermostat. (Typical heat anticipation and night depression wiring diagrams are shown in Figures 7 through 9.)
3. Remove thermostat cover and fasten thermostat to box or wall.
4. Attach thermostat cover.

CHECKOUT

After installing a thermostat, make an initial check of the switching action. Verify the switch action by listening to and watching the switch contacts or by using a voltmeter between the proper sides of the switch.

1. Run the setpoint dial to a temperature above ambient. This should cause the thermostat to make a circuit between orange and brown leads.
2. Turn the setpoint dial setting down below ambient. This should cause the thermostat to make a circuit between orange and red leads.

CALIBRATION (See Figure 3)

All thermostats are precision calibrated at the factory and normally will not require any further attention. However, if recalibration is necessary, proceed as follows:

1. Turn off control power and power to night depression circuit, where applicable.
2. Set setpoint dial to correspond to actual stable room temperature, as read from an accurate thermometer.
3. Remove thermostat cover. Do not breathe on the thermostat or handle excessively as this will affect the accuracy of the final calibration.
4. If contact blade is the made to left (red) contact, with a small screwdriver, turn calibration screw counterclockwise (looking at head of screw) until blade makes to right (brown) contact.

Note: Each complete turn of screw changes calibration approximately 15°F (8°C).

Now turn screw very slowly clockwise until blade just makes the left (red) contact. Thermostat is now properly calibrated.

If contact blade is originally made to the right (brown) contact, turn calibration screw slowly clockwise until element just makes the left (red) contact. Thermostat is now properly calibrated.

5. Replace thermostat cover.
6. Connect power to thermostat.
7. Recheck calibration about 30 minutes later to be sure heat from handling of or breathing on bimetal element did not result in an erroneous setting.

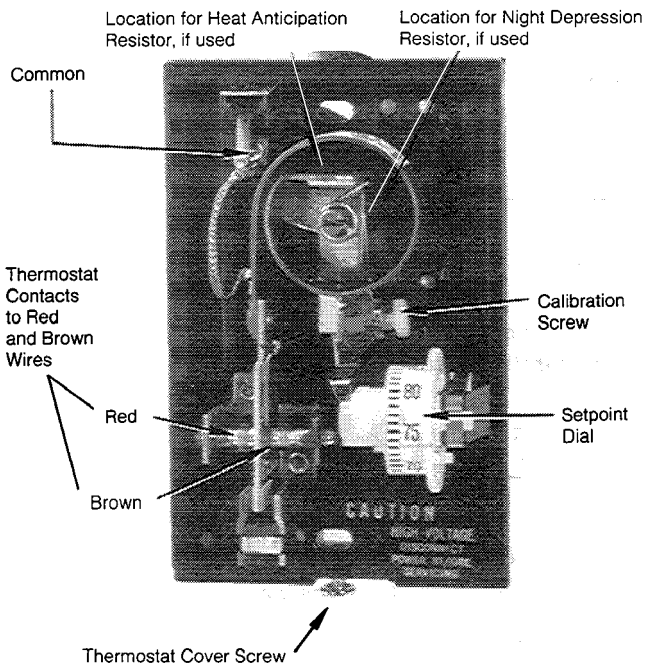


Figure-3

HEAT ANTICIPATION (See Figures 7 and 8)

Parallel heat anticipation is recommended for :

- Systems with excess heating capacity that can cause objectionable space temperature swings.
- Thermostats mounted on walls (i.e., concrete) that change temperature slowly and/or have insufficient air flow over the device.

COOLING ANTICIPATION (See Figure 8)

Parallel cooling anticipation is recommended for:

- Cooling anticipations where current draw exceeds 1 ampere. Cooling lockout (self heat of the thermostat causing over cooling of the space) can occur on these applications.
- Systems with excess cooling capacity that can cause objectionable space temperature swings.
- Thermostats mounted on walls (i.e., concrete) that change temperature slowly and/or have restricted air flow over the device.

CONCEALED CONTROL DIAL

Knurled Dial Removal (See Figure 4)

1. Remove thermostat cover.
2. Secure the control dial with hand so that the dial will not rotate.
3. Place needle nose pliers at knurled ring of the control dial at the points where the knurled ring is attached to the control dial.
4. Twist the pliers at each knurled ring attachment point until the entire knurled ring of the control dial is removed.

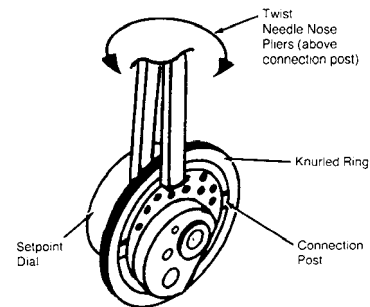


Figure-4 Knurled Dial Removal.

LIMIT CONTROL DIAL RANGE

Dial Stop Pin Insertion (See Figure 5)

1. Remove thermostat cover.
2. Secure the control dial with hand so that the dial will not rotate.
3. Place a dial stop pin in the jaws of a needle nose pliers.
4. Insert the dial stop pin in the appropriate hold on either (or both) side(s) of the control dial to restrict dial rotation.

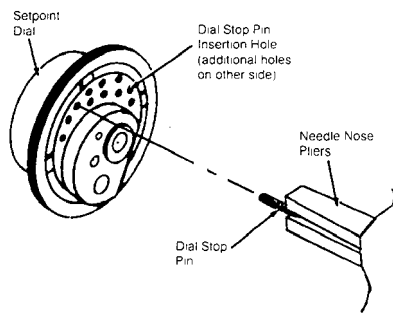


Figure-5 Dial Stop Pin Insertion.

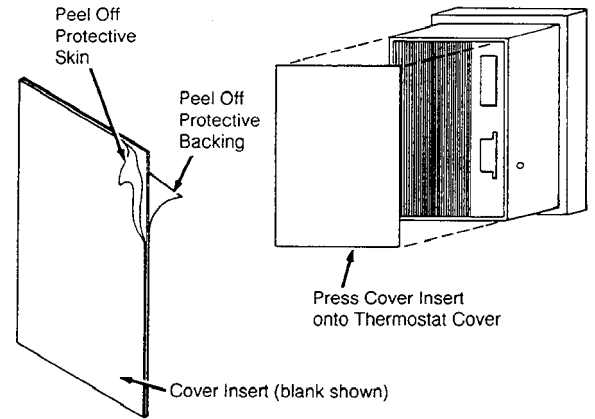


Figure-6 Cover Insert Installation.

COVER INSERT INSTALLATION (See Figure 6)

1. Select appropriate cover insert.

Note: If blank insert is used, the knurled ring must be removed from the setpoint dial. See Knurled Dial Removal. Also, remove dial window by sliding and/or pressing window from front of cover.

2. Remove protective backing and protective skin on face of cover insert.
3. Press insert uniformly on thermostat with logo in lower left-hand corner.

MAINTENANCE

Regular maintenance of the total system is recommended to assure sustained optimum performance.

Open areas at bottom and around base of thermostat should be kept clean and free from obstructions to allow proper flow of air. If switch contacts need cleaning, this may be done with TOOL-13 (burnishing tool).

Note: Thermostat may require calibration after cleaning the contacts.

REPAIR

These thermostats are not field repairable. Replace entire device.

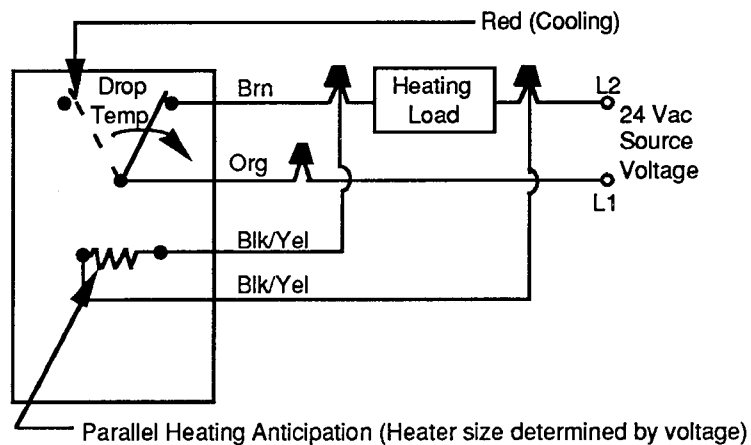


Figure-7 TC-110x-500 Typical of Parallel Heat Anticipation.

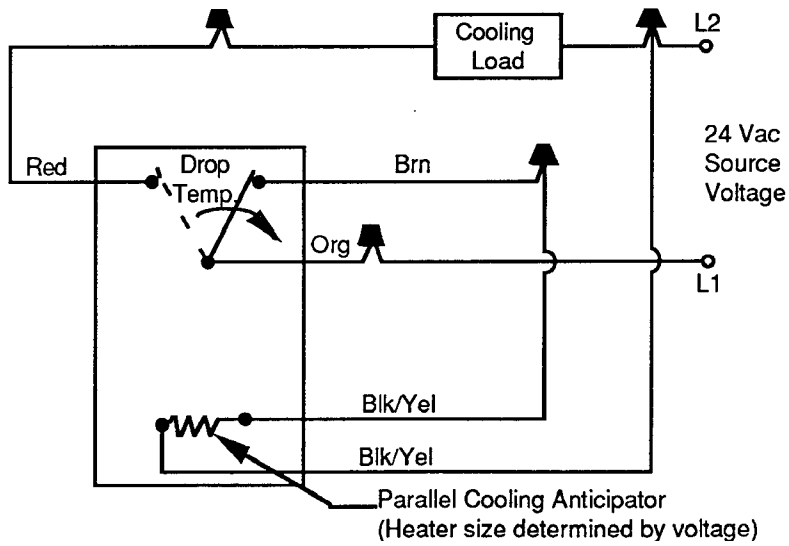


Figure-8 TC-110x-500 Typical of Parallel Cooling Anticipation.

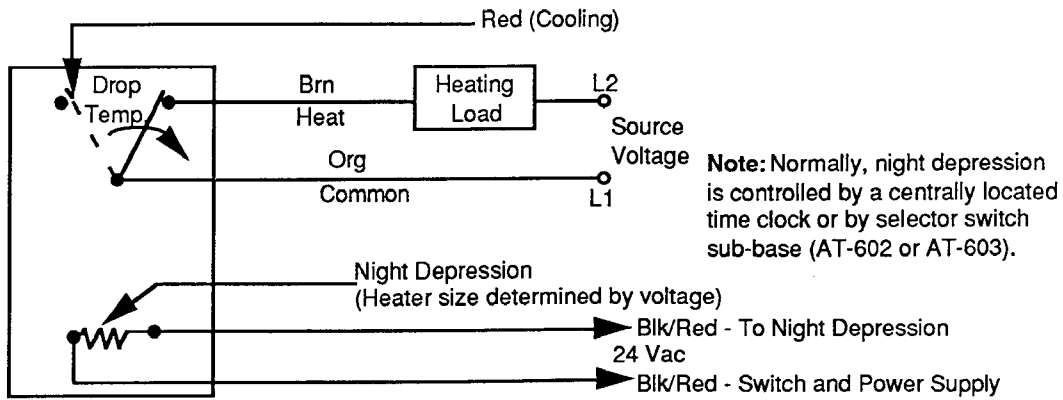


Figure-9 TC-110x-602 Typical of Night Depression.

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