100 Series Temperature Controls

Types B100, C100, E100, F100

UNITED ELECTRIC CONTROLS

Installation and Maintenance Instructions

Please read all instructional literature carefully and thoroughly before starting. Refer to the final page for the listing of Recommended Practices, Liabilities and Warrantees.

GENERAL

Types B100 and C100 (Immersion Stem)

Temperature variations are sensed by a liquid filled sensor which expands or contracts against a bellows which in turn actuates or deactuates a snap-action switch at a predetermined set point.

Types E100 and F100 (Bulb & Capillary)

Temperature variations of a liquid filled sensing bulb are hydraulically transmitted to a bellows or diaphragm which either actuates or deactuates a snap-acting switch at a predetermined set point.

MAXIMUM TEMPERATURE IS THE HIGHEST TEMPERATURE TO WHICH A SENSING ELEMENT MAY BE OCCASIONALLY OPERATED WITHOUT ADVERSELY AFFECTING SET POINT CALIBRATION AND REPEATABILITY. MAXIMUM TEMPERATURE LIMITS STATED IN LITERATURE MUST NEVER BE EXCEEDED, EVEN BY SURGES IN THE SYSTEM. OCCASIONAL OPERATION OF UNIT UP TO MAX. TEMPERATURE IS ACCEPTABLE (E.G. START-UP, TESTING). CONTINUOUS OPERATION SHOULD BE RESTRICTED TO THE DESIGNATED ADJUSTABLE RANGE.

Part I - Installation

Tools Needed

Adjustable wrench
Flathead screwdriver
Hammer (for alternate wire knockouts)

MOUNTING

INSTALL UNIT WHERE SHOCK, VIBRATION AND TEMPERATURE FLUCTUATIONS ARE MINIMAL. ORIENT UNIT SO THAT MOISTURE IS PREVENTED FROM ENTERING THE ENCLOSURE. SHOULD THE CONTROL BE INSTALLED WHERE HEAVY CONDENSATION OR WASHDOWN IS EXPECTED, VERTICAL MOUNTING IS RECOMMENDED (PRESSURE CONNECTION DOWN).

Do not mount unit in ambient temperatures exceeding published limits. 100 Series Temperature Controls can be mounted in any position, provided the electrical conduit is not facing up.

For remote mounting, mount the unit via the (2) 1/4" screw clearance holes on the enclosure (See Dimensions on back page.) Fully immerse the bulb and 6" capillary in the control zone. For best control it is generally desirable to place the bulb close to the heating or cooling source in order to sense temperature fluctuations quickly. Be sure to locate the bulb so that it will not be exposed to temperatures beyond the instrument range limits.

FOR LOCAL MOUNTING, ALWAYS HOLD A WRENCH ON THE TEMPERATURE HOUSING HEX WHEN MOUNTING UNIT. DO NOT TIGHTEN BY TURNING ENCLOSURE. THIS WILL DAMAGE SENSOR AND WEAKEN SOLDERED OR WELDED JOINTS.

WIRING

DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING UNIT. ELECTRICAL RATINGS STATED IN LITERATURE AND NAMEPLATES MUST NOT BE EXCEEDED-OVERLOAD ON A SWITCH CAN CAUSE FAILURE ON THE FIRST CYCLE. WIRE UNITS ACCORDING TO NATIONAL AND LOCAL ELECTRICAL CODES. MAXIMUM RECOMMENDED WIRE SIZE IS14 AWG.

Remove the two screws retaining the cover and cover gasket. Two cast-in 7/8" diameter knockouts for electrical conduit are located on the side and rear of enclosure. These can easily be knocked out by placing the blade of a screwdriver in the groove and rapping sharply with a hammer. A 1/2" NPT conduit connection is located on the side of the enclosure.

Connect conduit to the case and wire directly to the switch terminals according to local and national electrical codes. Bring the wires up to terminals from the rear of the case allowing enough slack so as not to affect switch movement when making setting adjustments. The three switch terminals are clearly labeled "common", "norm open", and "norm closed". If lead wires are supplied, color coding is as follows:

	SPDT	DPDT (Option 1010)	
		SWT1	**SWT2**
Common	Violet	Violet	Yellow
Normally Open	Blue	Blue	Orange
Normally Closed	Black	Black	Red

A grounding screw and clamp (cast in symbol) is provided which meets a 35 lb. pull test. Keep the wire as short as possible to prevent interference with the plunger and, when provided, the adjustable differential switch wheel.

Part II - Adjustments

Tools Needed

5/8" open end wrench

NOTE: For set point adjustments and recalibration, connect control to a calibrated temperature source and stabilize unit.

Types C100 and F100

Remove cover. Switch has a hex screw adjustment inside enclosure. If switch transfer point differs from actual temperature, adjust setting. To raise the temperature setting, turn the hex in (clockwise), and to lower the setting turn the screw out (counterclockwise). When making adjustments, do not exceed the maximum temperature rating on nameplate.

Types B100 and E100 (with reference dial)

Controls are factory calibrated for maximum accuracy at the midpoint of the scale.

To re-calibrate, turn dial to desired set point. If the actual temperature and set point temperature do not agree, turn adjustment screw clockwise to raise and counterclockwise to lower temperature setting.

Part III - Replacements

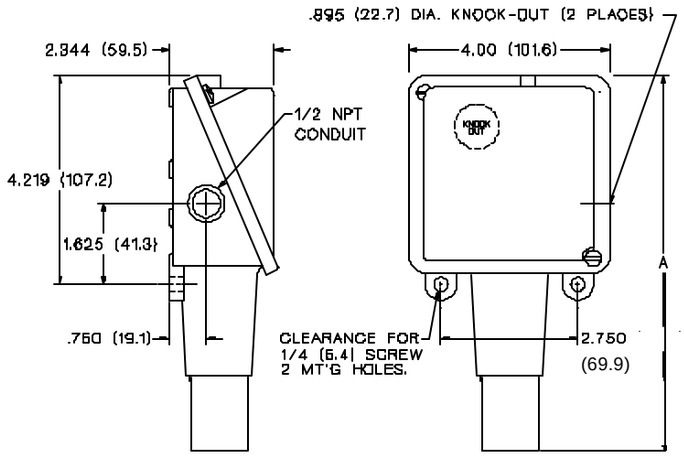
Tools Needed
Flathead screwdriver

USE ONLY FACTORY AUTHORIZED REPLACEMENT PARTS AND PROCEDURES. ALWAYS DISCONNECT SUPPLY CIRCUITS BEFORE REMOVING COVER.

REPLACEMENT OF SWITCHES

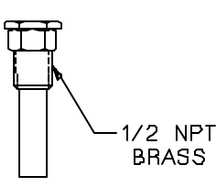
1. Remove cover, switch mounting screws, switch and insulator.
2. Disconnect switch wires at switch terminal.
3. Wire new switch per wiring instructions.
4. Mount switch and insulator inside enclosure and re-calibrate per PART II.

Dimensions

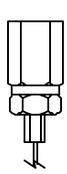


Types B100, C100, E100, F100

	Dimension A		
Models	Inches	mm	NPT
120,121	10.44	265,10	Immersion stem
1BC-M9BB	8.75	222,23	Bulb & capillary



Models 120-121



Models 1BC-M9BB

RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and max temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to proof pressure or max temperature is acceptable on a limited basis (i.e.start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at proof pressure or maximum temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point can not result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. Orient unit so that moisture does not enter the enclosure via the electrical connection.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- For all applications, a factory set unit should be tested before use.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Use only factory authorized replacement parts and procedures.
- Do not mount unit in ambient temp. exceeding published limits.
- For remote mounted temperature units, capillary lengths beyond 10 feet can increase chance of error, and may require re-calibration of set point and indication.

LIMITED WARRANTY

UE warrants that the product thereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by UE (F.O.B. UE); provided, however, that this warranty applies only to equipment found to be so defective within a period of 12 months after installation by buyer but not to exceed 18 months after delivery by the seller. **Except for the limited warranty of repair and replacement stated above, UE disclaims all warranties whatsoever with respect to the product, including all implied warranties of merchantability or fitness for any particular purpose.**

LIABILITY LIMITATION

The sole and exclusive remedy of buyer for any liability or seller for any claim, including incurred in connection with (I) breach of any warranty whatsoever expressed or implied, (II) a breach of contract, (III) a negligent act or acts (or negligent failure to act) committed by seller, or (IV) an act for which strict liability will be imputed to seller, is limited to the limited warranty or repair and replacement stated herein. **In no event shall the seller be liable for any special, indirect, consequential or other damages of a like general nature, including, without limitation, loss of profits or production, or loss or expenses of any nature incurred by any third party.**

UNITED ELECTRIC CONTROLS
P.O. Box 9143, Watertown, MA 02471-9143 USA
617 926-1000 Fax 617 926-2568