



55 Series Remote Bulb Temperature Controllers



IM55-06


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 Warranties.

GENERAL

The 55 Series temperature switch utilizes a liquid filled sensing bulb (bulb & capillary, remote mounting) to detect a temperature change. The response at a pre-determined set point(s) actuates a SPDT or dual SPDT snap-acting micro switch(es) converting the temperature signal into an electrical signal. Control set point(s) may be varied by turning the external dial according to the procedures outlined. (See Part II – Adjustments)

 MAXIMUM TEMPERATURE* STATED IN LITERATURE AND ON NAMEPLATE 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.

*Maximum Temperature - the highest temperature to which a sensing element may be occasionally operated without adversely affecting set point calibration and repeatability.

 THESE PRODUCTS DO NOT HAVE FIELD REPLACEABLE PARTS.


Please refer to product bulletin for product specifications. Product bulletin may be found at www.ueonline.com.


Part I - Installation

Tools Needed

Drill, with #25 (.1495") and 5/16" drill bits
Screwdriver

MOUNTING

 ALWAYS LOCATE UNIT WHERE SHOCK, VIBRATION AND TEMPERATURE FLUCTUATIONS ARE MINIMAL. DO NOT MOUNT UNIT IN AMBIENT TEMPERATURES EXCEEDING PUBLISHED LIMITS.

 UNIT MAY BE MOUNTED IN ANY POSITION, PROVIDED THE ELECTRICAL CONDUIT IS NOT FACING UP. ORIENT UNIT SO THAT MOISTURE IS PREVENTED FROM ENTERING THE ENCLOSURE.

Panel Mounting (Types E55S and E55AS)

Drill panel to accommodate #6-32 screws (2 each). Hole locations should align with tapped holes in mounting bracket (see Dimensions). Also, drill 5/16" diameter hole to accommodate control adjustment shaft. Note: maximum panel thickness is 1/2 inch.

Surface Mounting (Types E55 and E55A)

Mount using two enclosure mounting holes as shown.


BULB AND CAPILLARY

Fully immerse the bulb and 6" of capillary in the control zone. 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.

Do not bend "B" style bulbs (3/8" OD). Avoid bending or coiling the capillary tube smaller than 1/2" radius. Exercise caution when making bends near the capillary ends. If a separable well or union connector is used follow the individual instructions included.

WIRING

 DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING UNIT. WIRE UNITS ACCORDING TO NATIONAL AND LOCAL ELECTRICAL CODES. MAXIMUM RECOMMENDED WIRE SIZE IS #14 AWG.

 ELECTRICAL RATINGS STATED IN LITERATURE AND ON NAMEPLATE MUST NOT BE EXCEEDED. OVERLOAD ON A SWITCH CAN CAUSE FAILURE ON THE FIRST CYCLE.

Making Wiring Connections

Wire directly to switch terminals according to particular requirements of the application. For dual switch Types E55A and E55AS, if switches are to be set apart, connect wiring so that switch No. 2 will function at the higher temperature. (See Figure 1)

Start-Up Process

Turn dial and knob to the desired temperature setting. Controller is ready for operation. Minor adjustments may be necessary to obtain better set point accuracy after installing the unit in a particular process. (See Part II-Adjustments)

Part II - Adjustments

Tools Needed

1/16" Allen wrench
Small screwdriver

Adjusting Single Switch Types E55 and E55S

Set point adjustment is made by rotating the knob and dial to the desired temperature setting. Controls are factory calibrated, and do not normally require recalibration in the field. However, should this become necessary, follow the recalibration procedure.

Adjusting Dual Switch Types E55A and E55AS

Note: On dual switch units, both switches are factory set to actuate together within 5% of range (switch No. 2 set on dial) but may be set apart to actuate up to 100% of scale range. Either switch may be set to agree with the dial.

55 Series controllers are standardly supplied with the No. 2 (higher temperature) switch set to the dial. To adjust switch settings for these controllers, follow the recalibration procedure.

RECALIBRATION PROCEDURE


Set the dial to the same temperature as the test bath. Using 1/16" allen head wrench, loosen knob set screw and remove dial, taking care not to rotate the shaft.

Shaft has calibrated flat for easy dial replacement. Using 1/16" allen wrench, turn zero adjustment, located inside adjustment shaft, until switch No. 2 actuates. Turn counter clockwise for higher setting, clockwise for lower setting. Replace dial on shaft and secure.

To Separate Switches

Set the dial to the same temperature as the test bath. Turn dial to a higher setting equal to temperature differential (°F or °C) desired between switches No. 1 and No. 2. Remove dial for access to the No. 1 switch adjustment screw. Using a small screwdriver turn in or out the No. 1 switch adjustment screw until the switch actuates (accessible through opening behind dial). Replace dial, tighten dial set screw to calibrated flat. Controller is ready for operation.

For single switch units the only adjustment needed is the set screw adjustment in the middle of the shaft.

 IF THE UNIT IS BEING USED TO CONTROL A PROCESS, PERFORM CALIBRATION TEST AFTER ADJUSTMENT. UNIT MUST REPEAT ON SUCCESSIVE ON-OFF CYCLES.

Calibration Bath

Place the sensing bulb and the amount of capillary to be exposed to process temperature into the bath, preferably circulating liquid. Bath temperature should be where the greatest setting accuracy is desired or approximately mid-range.

Test Thermometer

Use an accurate test thermometer (such as a thermocouple) with its sensing area located next to the sensing bulb.

Stabilization

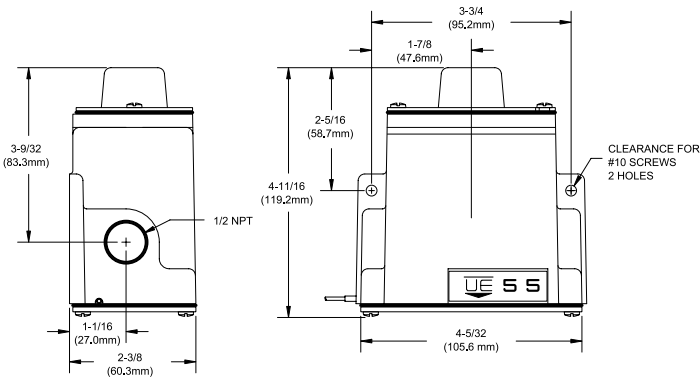
Before making adjustments allow 5 minutes for the thermal system to adjust to the bath temperature.

Set Point Reference

Connect test lights to the terminals to indicate switch operation.

Dimensions

Type E55, E55A



Type E55S, E55AS

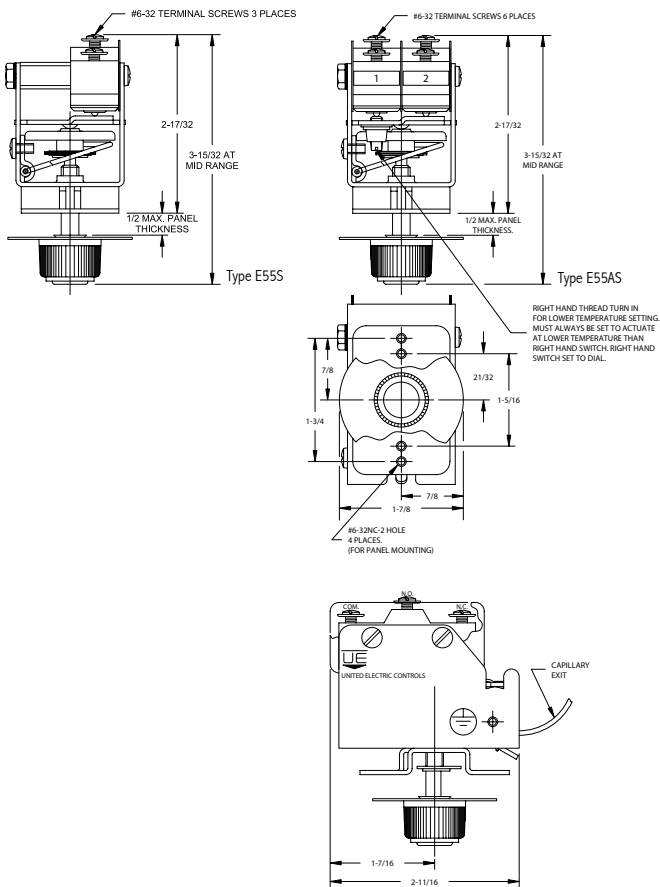
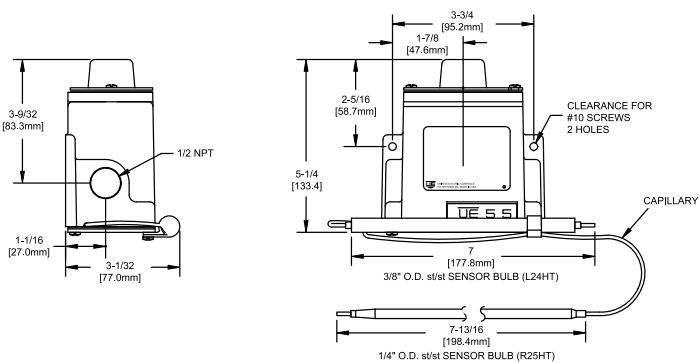


Figure 1

Type E55 Heat Tracing Models



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 maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or 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 a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot 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. When appropriate, this entry point should be sealed to prevent moisture entry.
- 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 or faulty display. 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.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby 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 Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

Seller's liability to Buyer for any loss or claim, including liability 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 inputted to seller, is limited to the "limited warranty" of repair and/or replacement as so stated in our warranty of product. 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 the buyer or any third party.

UE specifications subject to change without notice.



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