800 Series

800 Series

INDICATING TEMPERATURE CONTROLS AND THERMOMETERS

FEATURES

- **Temperature Indication and Control**
- **Single or Dual SPDT Output**
- **Stainless Steel Bulb and Capillary**
- **± 1% Repeatability**
- **NEMA 1, 4, and Explosion Proof Versions**
- **Temperature Ranges: -180 to 650°F (-117 to 340°C)**

OVERVIEW

For applications that require a visual display of process temperature and set point, the 800 Series offers a highly readable four inch setting/indication scale. It is available in two versions: a Lexan enclosure for NEMA 1 or 4 applications with option M300, and an epoxy-coated aluminum enclosure for Div. 1 explosion-proof applications. For temperature indication only, the T800 thermometer incorporates the same performance and construction features of the 800 Series.

800's are controlling and indicating the temperatures of food service appliances, ovens, packaging machines and HVAC equipment as well as other temperature applications within plants.

Dual set point version

Explosion proof version

FEATURES

- Temperature indication and control switching
- Single or dual SPDT output
- Stainless steel bulb & capillary
- ± 1% repeatability
- NEMA 1, 4, and explosion proof versions
- Simple to adjust via external knob

SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71°C)
AMBIENT TEMPERATURE LIMITS	-40 to 160°F (-40 to 71°C); set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change
SET POINT REPEATABILITY	± 1% of adjustable range
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 Hz
ENCLOSURE	Types 800, 802, T800 - Lexan®, black finish; clear Lexan® faceplate Types 820E, 822E – Die cast aluminum, epoxy coated enclosure, gasketed
ENCLOSURE CLASSIFICATION	Designed to meet NEMA 1 requirements; NEMA 4 by specifying option M300
INDICATION ACCURACY	± 1% of adjustable range
SWITCH OUTPUT	One or two SPDT; dual switch may be separated up to 100% of range. Switches may be wired "normally open" or "normally closed"
DUAL SWITCH ADJUSTMENT	802: Dual switch controls have separate knob & temperature pointers for each switch set point (standard); turn inner green knob for setting #1 switch; outer black knob for switch #2; common adjustment available with type 822E: switch #2 can be set up to 25% of range span below the switch #1 set point
ELECTRICAL RATING	15 A 125/250/480 VAC resistive
WEIGHT	Approx. 3 lbs., 4 oz. (1,47 kg) (types 800, 802, T800), Approx. 7 lbs (3,18 kg) (types 820E, 822E)
ELECTRICAL CONNECTION	Types 800, 802: 7/8" diameter knockout on left hand side; 18 AWG color-coded leadwires, approx. 9 inches exposed with strain relief (option M100 adds terminal block wiring). Types 820E, 822E: terminal block wiring
BULB AND CAPILLARY	6 feet 304 stainless steel
TEMPERATURE FILL	Model 1BS: solvent filled; models 2-8: non-toxic oil filled
TEMPERATURE DEADBAND	Typically 1% of range under laboratory conditions (70°F ambient circulating bath at rate of 1/2°F per minute change)

APPROVALS

UL Listed
Types 800 and 802– UL 873, file #E10667

CSA certified
Types 800 and 802– C22.2 no. 24 file #LR7814

CE Compliance with Low Voltage Directive (LVD)
Types 800 and 802

Class I, Division 1 & 2, Groups B, C & D
Class II, Division 1 & 2, Groups E, F & G
Class III
Class I, Zone 1, Group IIB + H_2 T6
Enclosure Type 4X

UL Listed, **cUL** Certified
Temperature: UL 50, 698; CSA C22.2 No. 25-1966, 30-M1986, CEC Part 1 -- File #E43374
Types 820E and 822E

CENELEC/DEMKO A/S (N.B. #0539)
Demko A/S certified to **ATEX** Directive (94/9/EC)
II 2 G EEx d IIC T6, Tamb.= -40 °C to +71 °C (-40 °F to +160 °F), IP 66
II 2 D T+85°C, Tamb.= -40 °C to +71 °C (-40 °F to +160 °F), IP 66
EN 50 014, EN 50 018, EN 50 281, EN 60529
Certificate #DEMKO 03 ATEX 0305048
Types 820E and 822E

UEC Compliant to LVD (73/23/EC & 93/68/EEC)
Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD
The Low Voltage Directive does not apply to products for use in hazardous locations
Types 820E and 822E

TEMPERATURE MODEL CHART

Model	Adjustable Set Point Range		Max. Temp.		Scale Div.		Bulb Size
	°F	°C	°F	°C	°F	°C	OD x Length
Bulb & Capillary							
1BS*	-180 to 120	-117.8 to 48.9	170	76.6	5	5	3/8 x 3 3/4"
2BS	-125 to 350	-87.2 to 176.7	400	204.4	10	5	3/8 x 2 5/8"
3BS	-125 to 500	-87.2 to 260	550	287.8	10	5	3/8 x 2 1/8"
4BS	-40 to 120	-40 to 48.9	170	76.6	5	2	3/8 x 6 3/4"
5BS	-40 to 180	-40 to 82.2	230	110	5	2	3/8 x 5"
6BS	0 to 250	-17.8 to 121.1	300	148.8	5	2	3/8 x 4 1/2"
7BS	0 to 400	-17.8 to 204.4	450	232.2	10	5	3/8 x 3"
8BS	50 to 650	10 to 343.3	700	371.1	10	10	3/8 x 3 1/4"

Standard capillary length is 6 ft., optional capillary lengths and protection are available, consult UE.
*NOT AVAILABLE TYPE T800

HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts".

Determine model based on adjustable range.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section.

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number.

Leave "option" portion blank if no options are needed. FOR MULTIPLE OPTIONS: Call United Electric Controls.

TYPE — TEMPERATURE

Type 800 - Bulb and capillary; one SPDT output; external indication
Type 802 - Bulb and capillary; two SPDT outputs; external indication
Type 820E - Bulb and capillary; one SPDT output; external indication, explosion proof
Type 822E - Bulb and capillary; two SPDT outputs; external indication, explosion proof
Type T800 - Thermometer only with external indication

OPTIONS

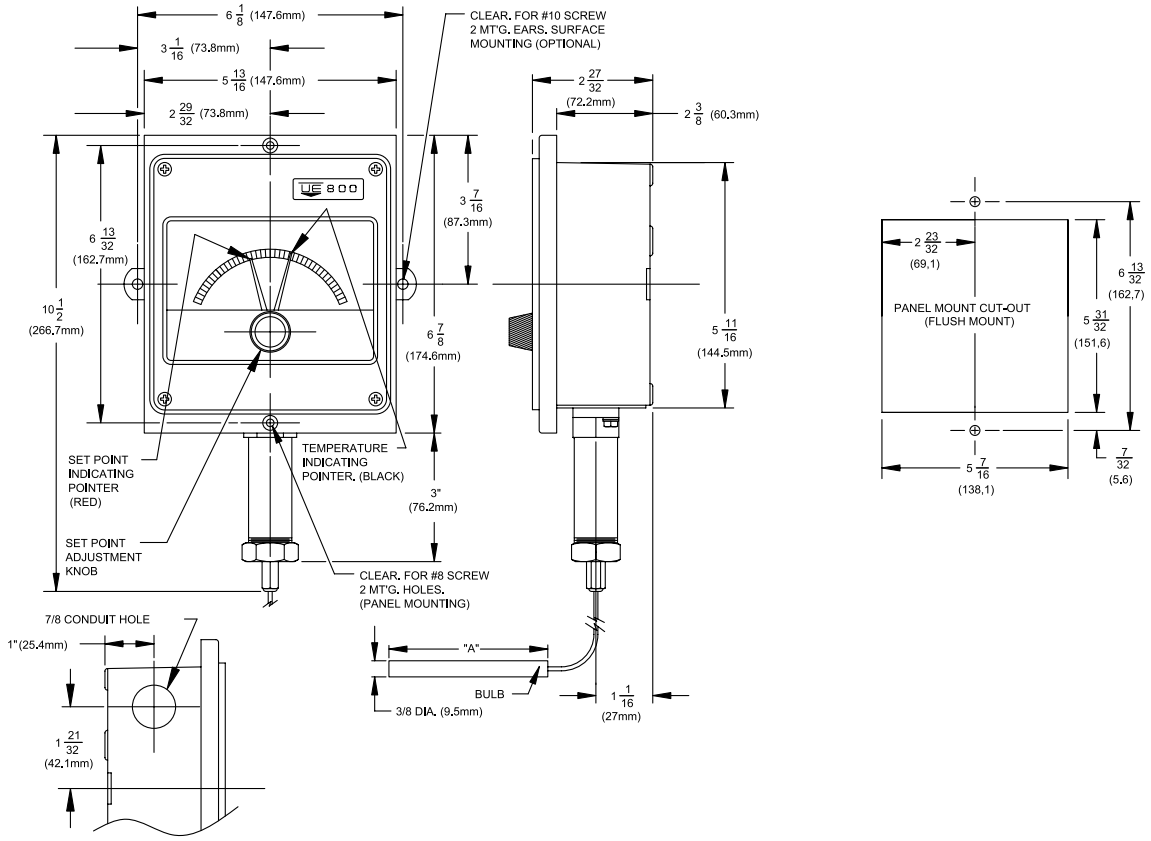
SWITCH OPTIONS	DESCRIPTION
0500	Close deadband, 5 A 125/250 VAC resistive. NOT AVAILABLE TYPE T800
2000	20 A 125/250 VAC resistive. NOT AVAILABLE TYPE T800

OTHER OPTIONS	
M007	Drilled 7/8" electrical opening on right side. NOT AVAILABLE TYPES 820E, 822E and T800
M100	Terminal block wiring. NOT AVAILABLE TYPE 820E, 822E (standard) AND T800
M201	Factory set one switch; specify increasing or decreasing temperature and set point. NOT AVAILABLE TYPE T800
M202	Factory set two switches; specify increasing or decreasing temperature and set point. NOT AVAILABLE SINGLE SWITCH VERSIONS
M300	NEMA 4 construction; includes watertight conduit fitting and gasketing. NOT AVAILABLE TYPE 820E, 822E
M320	Tamper resistant cover. NOT AVAILABLE TYPES T800
M416	SAA approval. NOT AVAILABLE TYPES 800, 802, T800
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment *(attachment location will vary depending on product)*
M900	Watertight conduit fitting; converts 7/8" hole to 1/2" NPT fitting. NOT AVAILABLE TYPES 820E, 822E, T800

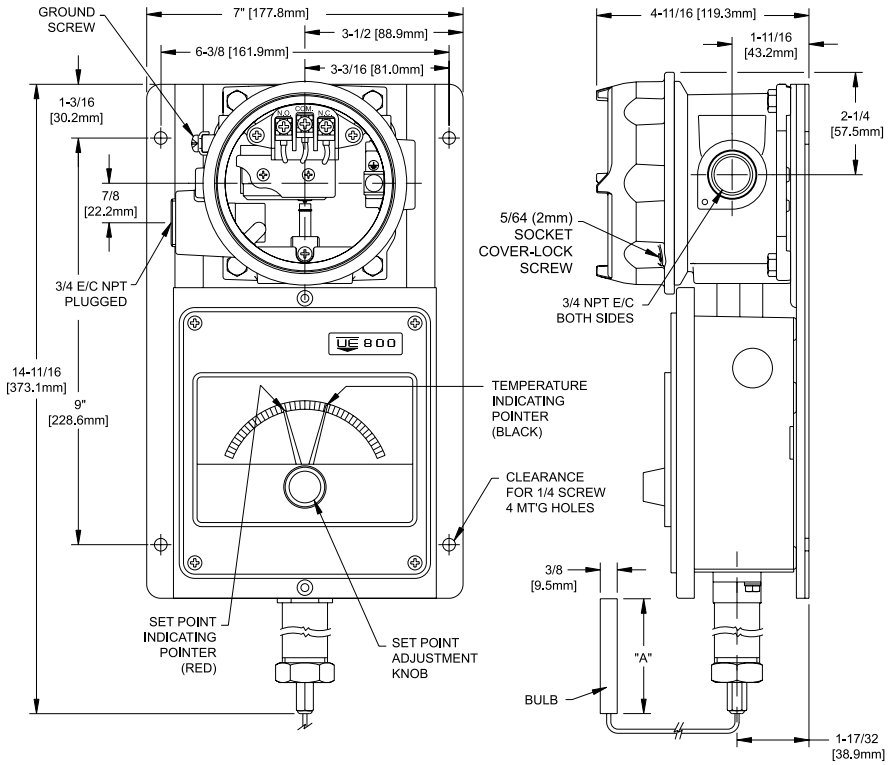
800 Series

DIMENSIONAL DRAWINGS

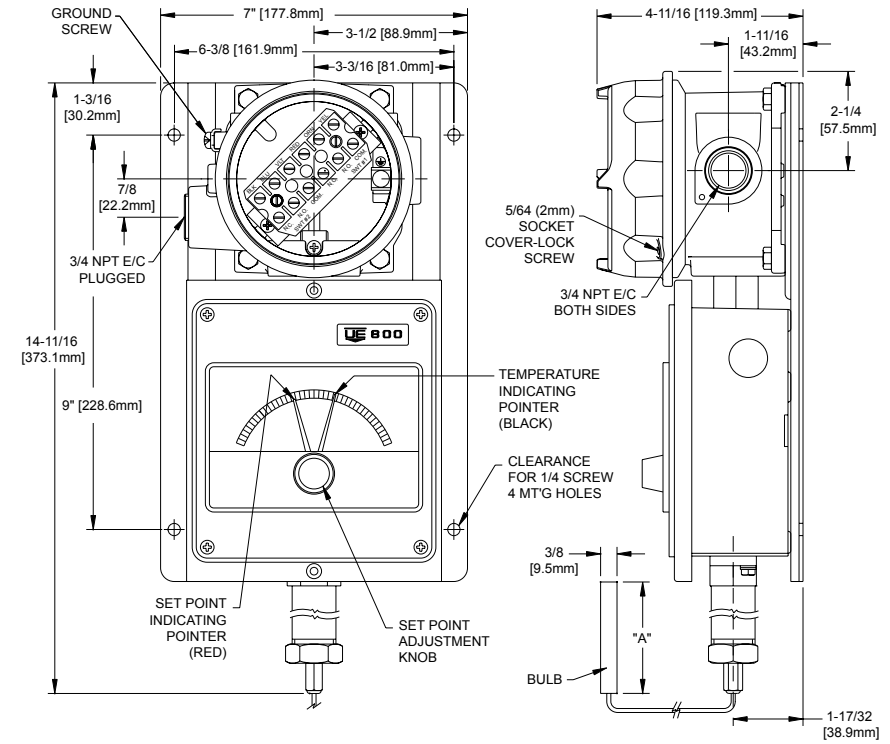
800 Series
Set Point Adjustment via Reference Dial



820 E


GROUND SCREW
7" [177.8mm]
3-1/2 [88.9mm]
6-3/8 [161.9mm]
3-3/16 [81.0mm]
1-3/16 [30.2mm]
7/8 [22.2mm]
3/4 E/C NPT PLUGGED
14-11/16 [373.1mm]
9" [228.6mm]
SET POINT INDICATING POINTER (RED)
SET POINT ADJUSTMENT KNOB
TEMPERATURE INDICATING POINTER (BLACK)
CLEARANCE FOR 1/4 SCREW 4 MT'G HOLES
4-11/16 [119.3mm]
1-11/16 [43.2mm]
2-1/4 [57.5mm]
5/64 (2mm) SOCKET COVER-LOCK SCREW
3/4 NPT E/C BOTH SIDES
3/8 [9.5mm]
"A"
BULB
1-17/32 [38.9mm]

822 E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BULB
1-17/32 [38.9mm]

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 temperature 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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