



# 12 Series Explosion-Proof Temperature Switch



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

MISUSE OF THIS PRODUCT MAY CAUSE EXPLOSION AND PERSONAL INJURY. THESE INSTRUCTIONS MUST BE THOROUGHLY READ AND UNDERSTOOD BEFORE UNIT IS INSTALLED.

THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISIONS 1 & 2, GROUPS A, B, C AND D; CLASS II, DIVISIONS 1 & 2, GROUPS E, F AND G; CLASS III; OR NON-HAZARDOUS LOCATIONS ONLY.  
-50°C (-58°F) ≤ Tamb. ≤ 95°C (203°F) ENCLOSURE TYPE 4X.

THIS EQUIPMENT IS ATEX CERTIFIED FOR EQUIPMENT CATEGORY 2. SUITABLE FOR APPROPRIATE USE IN GAS ZONE 1 AND DUST ZONE 21 APPLICATIONS.

- 0539 DEMKO 08 ATEX 0717128X
- II 2 G Ex d IIC T6
- II 2 D Ex tD A21 IP66 T+85°C  
-50°C ≤ Tamb. ≤ +80°C

THESE PRODUCTS DO NOT HAVE ANY FIELD REPLACEABLE PARTS. ANY SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 1.

THE EPOXY RESIN SHALL NOT BE SUBJECTED TO A TEMPERATURE GREATER THAN 125°C.

The 12 Series temperature switch utilizes either a liquid filled sensing stem (immersion stem, direct mounting) or liquid filled sensing bulb (bulb & capillary, remote mounting) to detect a temperature change. The response at a predetermined set point, actuates a SPDT or DPDT snap-acting microswitch, converting the temperature signal into an electrical signal. Control set point may be varied by turning the internal adjustment hex according to the procedures outline in Part II - Adjustments.

**MAXIMUM TEMPERATURE:** THE HIGHEST TEMPERATURE TO WHICH A SENSING ELEMENT MAY BE OCCASIONALLY OPERATED WITHOUT ADVERSELY AFFECTING SET POINT CALIBRATION AND REPEATABILITY. MAXIMUM TEMPERATURE STATED IN LITERATURE AND ON NAMEPLATE MUST NEVER BE EXCEEDED, EVEN BY SURGING 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.

Please refer to the product bulletins for product specifications. Product bulletin may be found at [www.ueonline.com](http://www.ueonline.com).

Date code format on nameplate is "YYWW" for year and week.

## Part I - Installation

### Tools Needed

- 1" Open end wrench
- Screwdriver

### MOUNTING

ALWAYS LOCATE UNITS WHERE SHOCK, VIBRATION AND AMBIENT TEMPERATURE FLUCTUATIONS ARE MINIMAL. DO NOT MOUNT IN AMBIENT TEMPERATURE AREAS EXCEEDING 203 °F (IF UL/cUL APPROVAL IS APPLICABLE) OR 80 °C (IF ATEX APPROVAL IS APPLICABLE).

UNIT MAY BE MOUNTED IN ANY POSITION. IF UNIT IS TO BE SET AFTER MOUNTING, VERIFY THAT ADJUSTMENT OPENING IS ACCESSIBLE. "FRONT" MARKING ON NAMEPLATE MUST FACE THE OPERATOR.

For remote mounting, mount the unit via 1 1/4" mounting bracket (see Dimensions on back page, see Figure 3). 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.

### Panel Mounting via 1/2" NPTM or M20 Electrical Connection

When panel mounting, mount through 7/8" clearance hole in panel. Hold

in place with serrated 1/2" or M20 conduit nut. Always support the unit by holding a wrench on the hex.

TO ATTACH CONDUIT CONNECTION, HOLD ELECTRICAL CONNECTION STEADY WITH WRENCH ON HEX, THEN THREAD ON CONDUIT.

### Surface Mounting Bracket Kit (P/N 62169-13), Option M449 (See Figure 3)

Open the adjustment cover and orient the unit so that adjustment opening will be accessible when the switch is mounted. Close the adjustment cover ensuring that the bracket does not interfere with the cover. Failure to do so may result in improper sealing of adjustment cover. Mount assembly in desired location, following instructions included with mounting bracket kit.

### WIRING

DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING UNIT. WIRE UNITS ACCORDING TO NATIONAL AND LOCAL ELECTRICAL CODES.

THE WIRES SHALL BE PROTECTED AGAINST MECHANICAL DAMAGE, E.G. BY USE OF A CONDUIT.

EXTERNAL GROUNDING SCREW (OPTION M460) IS REQUIRED FOR NON-METALLIC CONDUIT SYSTEMS. (SEE FIGURE 1)

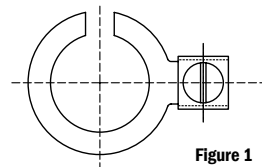
ELECTRICAL RATINGS STATED IN LITERATURE AND ON NAMEPLATES MUST NOT BE EXCEEDED – OVERLOAD ON SWITCH CAN CAUSE FAILURE ON THE FIRST CYCLE.

DIN CONNECTOR (OPTION M515) IS NOT APPROVED FOR CLASS I, DIV. 1/ HAZARDOUS LOCATIONS/FLAMEPROOF ATMOSPHERES.

THE WIRING TO THE TEMPERATURE SWITCH MUST ONLY BE CONNECTED IN THE SAFE AREA OR BY AN APPROVED TERMINAL BOX CERTIFIED TO EN 60079-1 OR EN 60079-7 FOR HAZARDOUS LOCATIONS

1/2" NPT (male) or M20 conduit connection is provided on top of the unit with 72" leadwires. Unit is available with SPDT or DPDT operation. External grounding screw and clamp is provided with option M460. (See Figure 1)

Option M460 External Grounding Screw



Factory Sealed Leadwires are color coded:

TERMINALS	SPDT		DPDT
	SWT1	SWT2	
Common	Brown	Brown	Yellow
Normally Closed	Red	Red	Black
Normally Open	Blue	Blue	Violet
Ground	Green	Green	

### DIN Connector with 4 Male Terminals (See Figure 4)

Wire in accordance with local and national electrical codes. Connector conforms to IEC 43650. Use a mating DIN connector (female type). Coding:

TERMINALS	
Terminal #1	Common
Terminal #2	Normally Closed
Terminal #3	Normally Open
	Ground



# Part II - Adjustment

### Tools Needed

3/16" Open end wrench

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

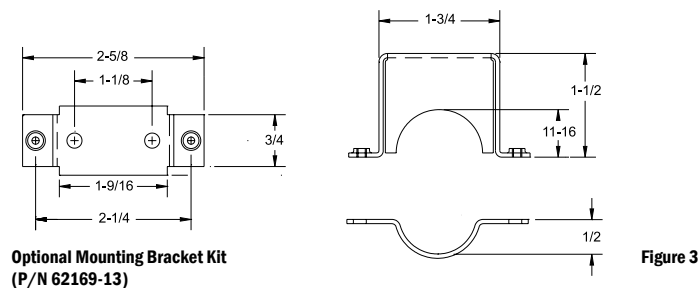
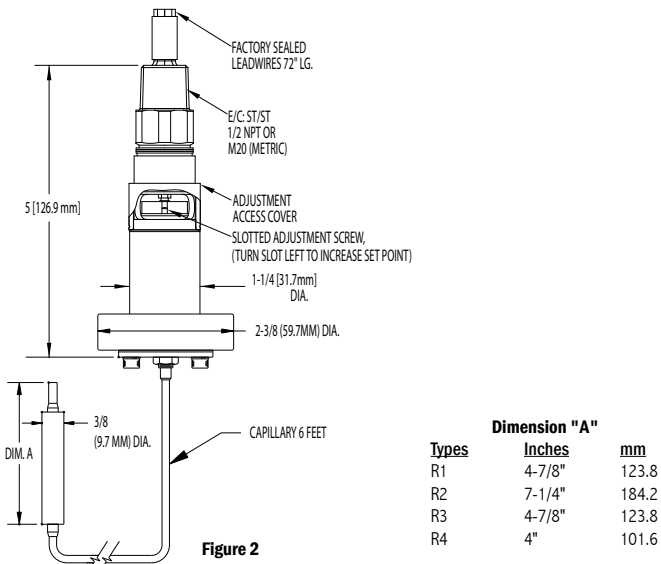
Adjust set point by turning the adjustment hex with a 3/16" open end wrench (see Figure 2). Turn clockwise (left) to increase or counter-clockwise (right) to decrease temperature setting.

## ZONE HAZARDOUS LOCATIONS FLAMEPROOF GAP AND JOINT DETAILS

Electrical conduit fitting threaded connection: M20 x 1.5, 7 threads minimum engagement.

## Dimensions

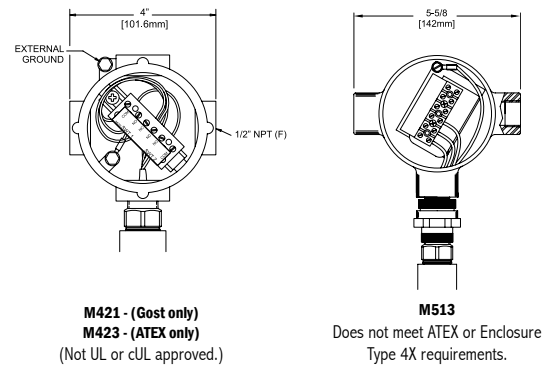
Dimensional drawings for all models may be found at [www.ueonline.com](http://www.ueonline.com)



Optional Mounting Bracket Kit (P/N 62169-13)

Figure 3

### Option M421, M423 & M513 Junction Boxes



M421 - (Gost only)  
M423 - (ATEX only)  
(Not UL or cUL approved.)

M513  
Does not meet ATEX or Enclosure Type 4X requirements.

### Option M515 DIN Connection

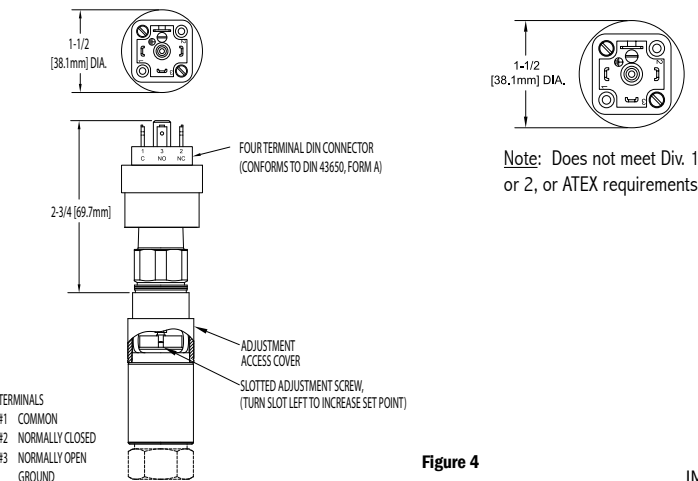


Figure 4

TERMINALS  
#1 COMMON  
#2 NORMALLY CLOSED  
#3 NORMALLY OPEN  
GROUND

## 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 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 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 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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