

## 24 Series Delta-Pro Pressure and Differential Pressure Switches

# UE 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



BEFORE INSTALLING, CHECK THE SENSOR MODEL SELECTED FOR COMPATIBILITY TO THE PROCESS MEDIA IN CONTACT WITH THE SENSOR AND WETTED PARTS.

The 24 Series pressure switch is activated when a diaphragm responds to a pressure change while the differential pressure switch is activated when two diaphragms in opposition respond to a pressure change between two sources. This response at a pre-determined set point actuates a single, snap-acting switch converting the pressure signal into an electrical signal. Control set point may be varied by turning the external adjusting screw (See Adjustments – Part II).



PROOF PRESSURE\* LIMITS STATED IN THE LITERATURE AND ON NAMEPLATE MUST NEVER BE EXCEEDED, EVEN BY SURGES IN THE SYSTEM. OCCASIONAL OPERATION OF UNIT UP TO PROOF PRESSURE IS ACCEPTABLE (E.G., START-UP, TESTING). CONTINUOUS OPERATION SHOULD NOT EXCEED THE DESIGNATED OVER RANGE\*\* OR WORKING PRESSURE\*\*\*.

#### \*Proof Pressure

The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage (e.g., start-up, testing). The unit may require re-gapping.

#### \*\*Over Range Pressure

The maximum pressure to which a pressure sensor may be continuously subjected without causing damage and maintaining set point repeatability.

#### \*\*\*Working Pressure Range

The pressure range within which two opposing sensors can be safely operated and still maintain set point repeatability.



THESE PRODUCTS DO NOT HAVE ANY FIELD REPLACEABLE PARTS.

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

## Part I - Installation

### Tools Needed

Screwdriver to accommodate  
customer-supplied mounting screws  
Adjustable wrenches (2)

### MOUNTING



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



ALWAYS HOLD A WRENCH ON THE PRESSURE HOUSING HEX WHEN MOUNTING UNIT. DO NOT TIGHTEN BY TURNING ENCLOSURE.

### Surface Mounting

Insert two #6 screws through mounting ear holes on 2" centers (recommended mounting for maximum vibration resistance).

### Pipe Mounting

Mount unit from its port(s). Always hold a wrench on pressure port when tightening pressure connection.

Use a wrench on the pressure port and thread a 1/4" NPT male fitting into the port. Be sure to connect high pressure source to port labeled "HIGH". Similarly, connect low pressure source to "LOW".



MODELS 24-011, -012, -015, -016, -017 AND -018 HAVE A POLYSULFONE PORT WITH 1/4" NPS FEMALE THREAD. A 1/4 NPT OR 1/4 NPS FITTING MAY BE USED WITH THIS CONNECTION. HOWEVER, IN BOTH CASES, THE MATING FITTING WILL BOTTOM-OUT IN THE PRESSURE CONNECTION. THEREFORE, WITH THESE MODELS, TEFLON TAPE MUST BE APPLIED TO FITTING FOR A TIGHT SEAL. DO NOT OVER TIGHTEN. CONNECTION TORQUE MUST NOT EXCEED 2 FT. / LBS. OVER TIGHTENING MAY DAMAGE THE PORT.



MODELS 24-016, -017, -018, -020, -021 AND -022 ARE STRAIGHT PRESSURE MODELS AND HAVE A PLASTIC PLUG INSTALLED AND SEALED IN THE LOW SIDE PRESSURE PORT. MODELS 24-015 AND -019 ARE VACUUM MODELS AND HAVE A PLASTIC PLUG INSTALLED AND SEALED IN THE HIGH SIDE PRESSURE PORT. THESE PLUGS SHOULD NOT BE REMOVED.

### WIRING



DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING.



ELECTRICAL RATINGS STATED IN LITERATURE AND ON NAMEPLATES SHOULD NEVER BE EXCEEDED. OVERLOAD ON A SWITCH CAN CAUSE FAILURE ON THE FIRST CYCLE.



CONNECT THE CONDUIT TO THE HOLE IN ACCORDANCE WITH NATIONAL AND LOCAL CODES. BRING WIRES UP TO THE TERMINALS FROM THE REAR. MAXIMUM RECOMMENDED WIRE SIZE IS 16 AWG.

Unscrew terminal just enough to put stripped wire under terminal block clamp. Nominal torque value for terminal block screw is 9.0 in-lbs.

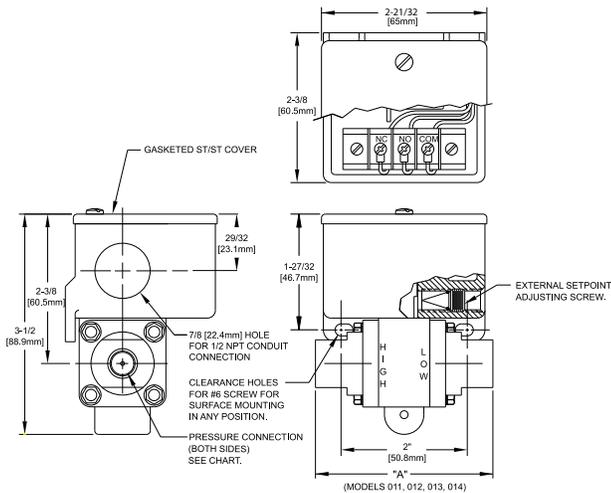
# Part II - Adjustments

## Tools Needed Screwdriver

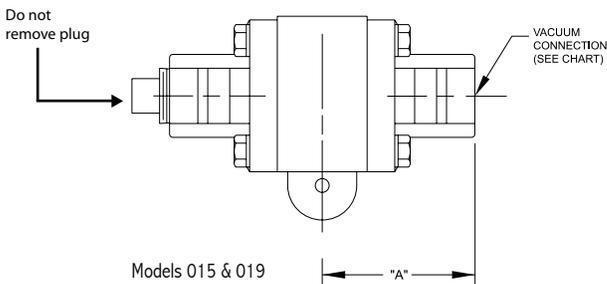
Use screwdriver to turn external adjusting screw, located on the side of the enclosure. Turn clockwise (right) to increase setting or counterclockwise (left) to decrease setting. For best setting accuracy, set the switch using the actual working pressures encountered in the application.

## Dimensions

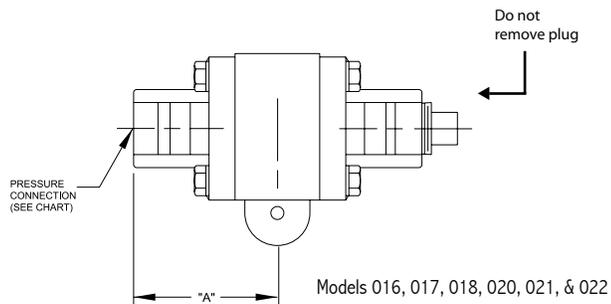
Dimensional drawings for all models may be found at [www.ueonline.com](http://www.ueonline.com)



Models 011, 012, 013, & 014



Models 015 & 019



Models 016, 017, 018, 020, 021, & 022

Model	DIMENSION A	Pressure Connection
011, 012	2.75" (69.9 mm)	1/4" NPS (F) Polysulfone
013, 014	3.13" (79.5 mm)	1/4" NPT (F) Brass
015, 016, 017, 018	1.44" (36.6 mm)	1/4" NPS (F) Polysulfone
019, 020, 021, 022	1.56" (39.6 mm)	1/4" NPT (F) Brass

## 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. When applicable, 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.
- 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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