



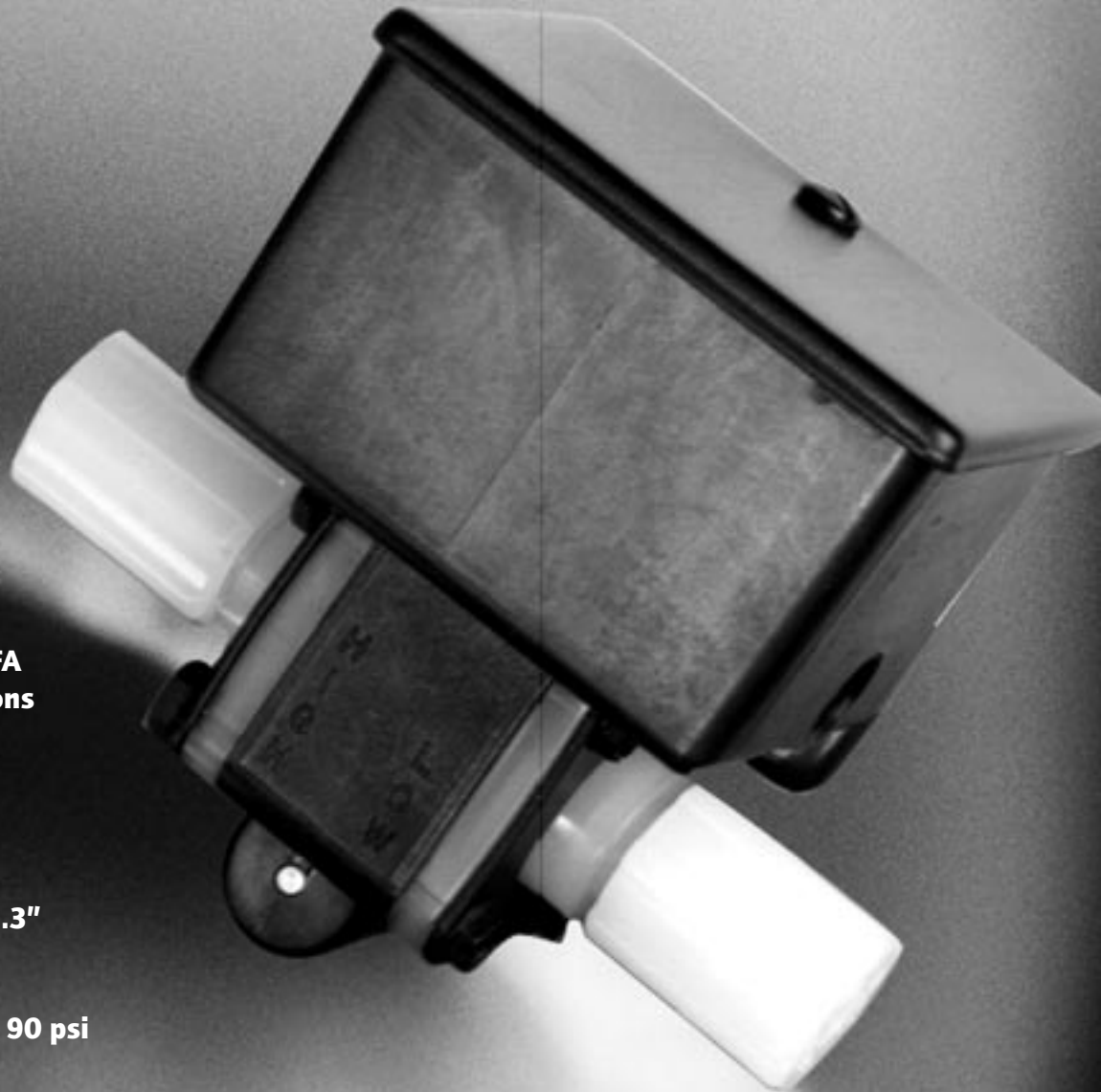
24 series

24 series

**DELTA-PRO™ DIFFERENTIAL PRESSURE,
PRESSURE AND VACUUM SWITCHES**

FEATURES

- **Brass, Polysulfone®, and PFA Teflon® Pressure Connections**
- **Reliable "Proof-of-Flow"**
- **Filter Status Monitoring**
- **Compact Size: 3.5 x 2.5 x 2.3"**
- **Adjustable Ranges from 1 to 45 psid, 30" Hg Vac to 90 psi**
- **±1% Repeatability**



OVERVIEW

24 Series Delta-Pro™ pressure and differential pressure switches offer a blend of compact size, excellent performance, environmental protection and attractive price. Available with brass, polysulfone®, or PFA Teflon® pressure connections the Delta-Pro will stand up in your most corrosive applications. The precision snap-acting switch and sensitive diaphragms combine to provide a narrow deadband and repeatability of approximately ±1% of range span. The convenient, externally accessible adjustment screw is multi-turn to provide easy set point adjustability. The force-balanced design gives the Delta-Pro excellent vibration resistance.

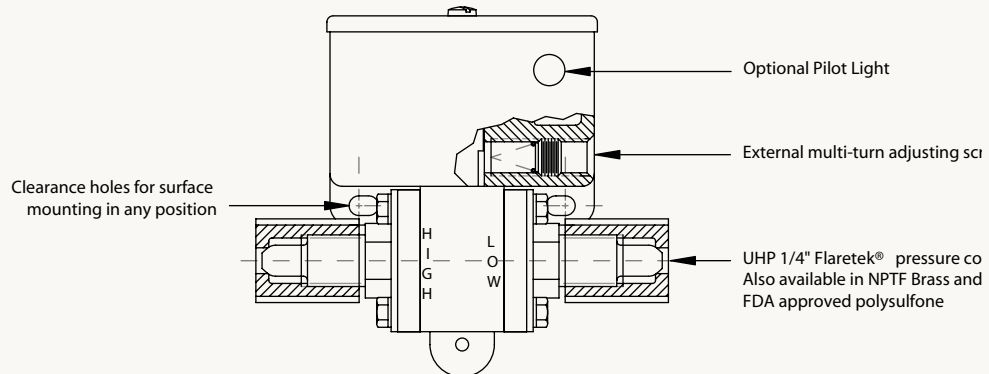
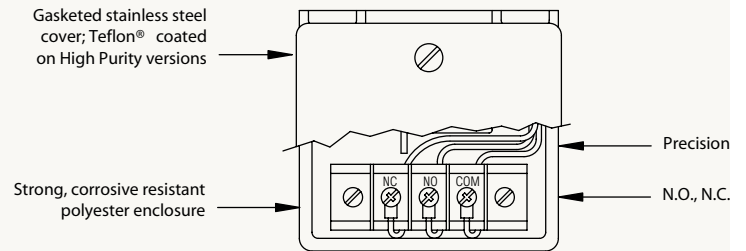
FEATURES

- Brass, Polysulfone®, and PFA Teflon® Pressure Connections
- Reliable "Proof-of-Flow"
- Filter Status Monitoring
- Compact size:
3.5" x 2.5" x 2.3"
- Adjustable Ranges from 1 to 45 psid, 30" Hg Vac to 90 psi
- ±1% Repeatability



APPLICATIONS

Typical applications include filter monitoring and proof-of-flow. High purity versions may also be used to monitor and control deionized water systems, wet benches, cleaning equipment, corrosive gas lines and bulk chemical handling systems.



TECHNOLOGY

The 24 Series (also known as the Delta Pro™) was designed to be a compact, cost-effective differential pressure switch for applications such as proof-of-flow, filter monitoring, etc. It depends on two opposing diaphragms to sense pressure on the "High" and "Low" pressure outputs of a system. The resulting pressure differential is transmitted through a linkage to a snap-action electrical switch, providing an output when a pre-set difference is exceeded. This set point can be easily modified while under pressure via an external adjusting screw. This adjustment "pre-loads" the actuation mechanism, which results in excellent vibration-resistance. Straight pressure and vacuum versions, with a single diaphragm, are also available.

SPECIFICATIONS

STORAGE TEMPERATURE	-20° to 180° F (-29° to 82°C)
AMBIENT TEMPERATURE	30° to 160°F (-1° to 71°C). Set point typically shifts less than ±0.6% of range for a 50°F (28°C) ambient temperature change; consult factory for special ratings
MAX MEDIA TEMPERATURE	200°F (93°C) at 100 psi working pressure; 160°F (71°C) at 100 psi working pressure for models 030, 031
SHOCK	Set point repeats after 15G, 10 millisecond duration. (MIL-STD-810)
VIBRATION	Set point repeats after 2.5 G, 5-500 CPS. (MIL-STD-810)
ENCLOSURE CLASSIFICATION	Complies with enclosure type 4 requirements with optional water tight conduit connector. Reinforced polyester body, stainless steel cover with neoprene gasket. All external hardware Teflon® coated on models 030 and 031
SET POINT REPEATABILITY	Typically ± 1% of span. Application dependent. Consult factory
SWITCH OUTPUT	SPDT precision snap-acting design with mechanical contact life of 10 million cycles. Actual life depends on electrical load and cycle frequency
ELECTRICAL RATING	Rated to 5 A resistive and 5 A inductive (75% PF) at 125 VAC and 250 VAC, 1/4 HP; 5 A resistive and 3 A inductive at 30 VDC and 0.5 A resistive and 0.25 inductive at 125 VDC. Gold clad silver contacts for minimum loads of 5 mA at 6 VDC, 2 mA at 12 VDC and 1 mA at 24 VDC
WEIGHT	6.5 oz.
ELECTRICAL CONNECTION	7/8" hole for optional 1/2" NPT conduit connector. Terminal block with screw terminals. Max wire size 16 AWG
PRESSURE CONNECTION	1/4" NPT female Brass; 1/4" NPS female FDA approved polysulfone®, non-tapered to minimize connection stress with 1/4" NPT male fittings, Max. torque 2 ft. lbs.; 1/4" Flaretek® style connections (nuts provided). Offers high vibration, leak resistant connections with minimal dead volume. On models 030 and 031 pressure connections are PFA Teflon®, nuts are PVD female
MOUNTING & INSTALLATION	Surface mount with two screws through clearance holes, or mount by pressure connections

Teflon® is a registered trademark of E.I. DuPont Company. Flaretek® is a registered trademark of Fluoroware, Inc.

APPROVALS



UL 508 listed, file # E42272

CSA C22.2 no. 14-M95, file # E42272



CE Compliance with Low Voltage Directive (LVD)

MODEL CHART

Model	Adjustable Range		Typical Deadband		Max. Working Pressure		Proof Pressure	
	psid	bar	psid	bar	psi	bar	psi	bar
Polyurethane (polyether) diaphragm, ethylene propylene O-ring, 1/4" NPT female brass pressure connection								
013	1 to 10	70 mBar to 0,7	0.75	0,05	150	10	150	10
014	4 to 45	0,3 to 3	1.0	0,07	150	10	150	10
Polyurethane (polyether) diaphragm, ethylene propylene O-ring, 1/4" NPS female (mechanical) polysulfone® pressure connection								
011	1 to 10	70 mbar to 0,7	0.75	0,05	150	10	150	10
012	4 to 45	0,3 to 3	1.0	0,07	150	10	150	10
PFA Teflon® diaphragm, 1/4" Flaretek® PFA Teflon® pressure connection								
030	1 to 10	70 mbar to 0,7	0.75	0,05	100	7	100	7
031	4 to 45	0,3 to 3	1.0	0,07	100	7	100	7
	psi	bar	psi	bar	psi	bar	psi	bar
Polyurethane (polyether) diaphragm, ethylene propylene O-ring, 1/4" NPS female (mechanical) polysulfone® pressure connection								
015	2" to 30" Hg VAC	-1 mbar to -70	2.5" Hg	0,08	150	10	150	10
016	1 to 10	70 mbar to 0,7	0.75	0,05	150	10	150	10
017	4 to 45	0,3 to 3	1	0,07	150	10	150	10
018	10 to 90	0,7 to 6	3	0,21	150	10	150	10
Polyurethane (polyether) diaphragm, ethylene propylene O-ring, 1/4" NPT female brass pressure connection with glass reinforced polyester base								
019	30" to 2" Hg VAC	-0,9 mbar to -70	2.5" Hg	0,08	150	10	150	10
020	1 to 10	70 mbar to 0,7	0.75	0,05	150	10	150	10
021	4 to 45	0,3 to 3	1	0,07	150	10	150	10
022	10 to 90	0,7 to 6	3	0,21	150	10	150	10

HOW TO ORDER

Build a part number by selecting a model and options. Choose the Sensor Type and the Range from the Model Chart. If options are required, add the code from the option list below. Example: 24 030 * M900.

24

Select a Type

24

030

Select a Model

030

M900

Select an Option

M900

COMPONENTS CODE

DESCRIPTION

SERIES DESIGNATION

24

Designation for 24 Series product line

DIFFERENTIAL PRESSURE MODELS *

011, 012

Polyurethane (polyether) diaphragm, ethylene propylene O-ring, 1/4" NPS female (mechanical) polysulfone® pressure connection

013, 014

Polyurethane (polyether) diaphragm, ethylene propylene O-ring, 1/4" NPT female brass pressure connection

030, 031

PFA Teflon® diaphragm, 1/4" Flaretek® PFA Teflon® pressure connection
*(See Model Chart for Differential Pressure Ranges)

PRESSURE MODELS *

015, 016,
017, 018

Polyurethane (polyether) diaphragm, ethylene propylene O-ring, 1/4" NPS female (mechanical) polysulfone pressure connection

019, 020,
021, 022

Polyurethane (polyether) diaphragm, ethylene propylene O-ring, 1/4" NPT female brass pressure connection with glass reinforced polyster base

*(See Model Chart for Pressure Ranges)

OPTIONS

M020

Red status light, 115 VAC only. Specify whether light turns on or off with increasing or decreasing pressure

M201

Factory set one switch; specify increasing or decreasing pressure and set point

M262

Buna-N diaphragm and O-ring: not available on models 030, 031

M276

Range indicated on nameplate in Bars

M278

Range indicated on nameplate in Kg/cm²

M540

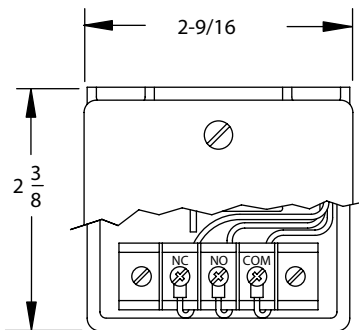
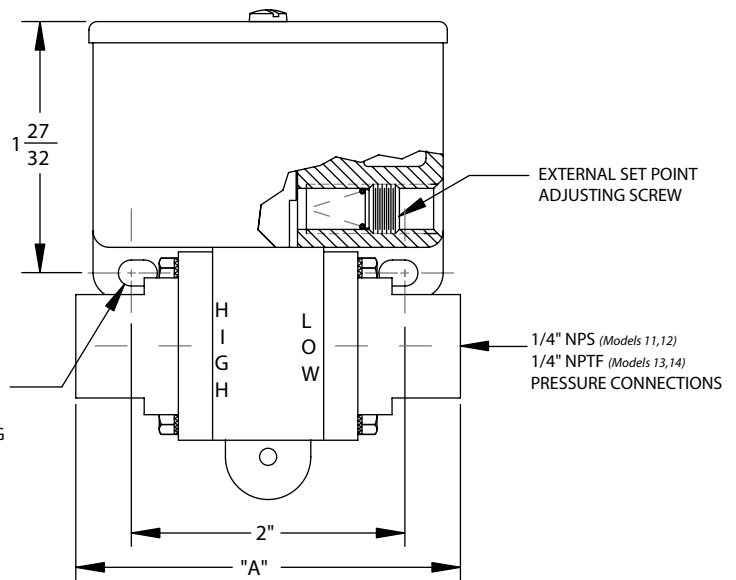
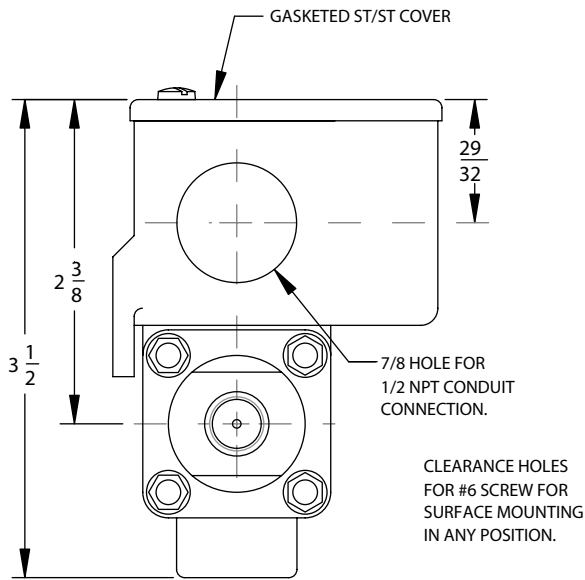
Viton® construction (deadbands and low end of range may increase slightly. Consult factory.) Wetted parts include Viton® diaphragm and/or O-ring plus standard connection material. Not available on models 030, 031

M900

Water tight conduit fitting; converts 7/8" hole to 1/2" NPT fitting; must specify for compliance

DIMENSIONAL DRAWINGS

Models 011, 012, 013, 014



Dimension "A"	Model
2.75 (69,9mm)	011, 012
3.13 (79,4)	013, 014

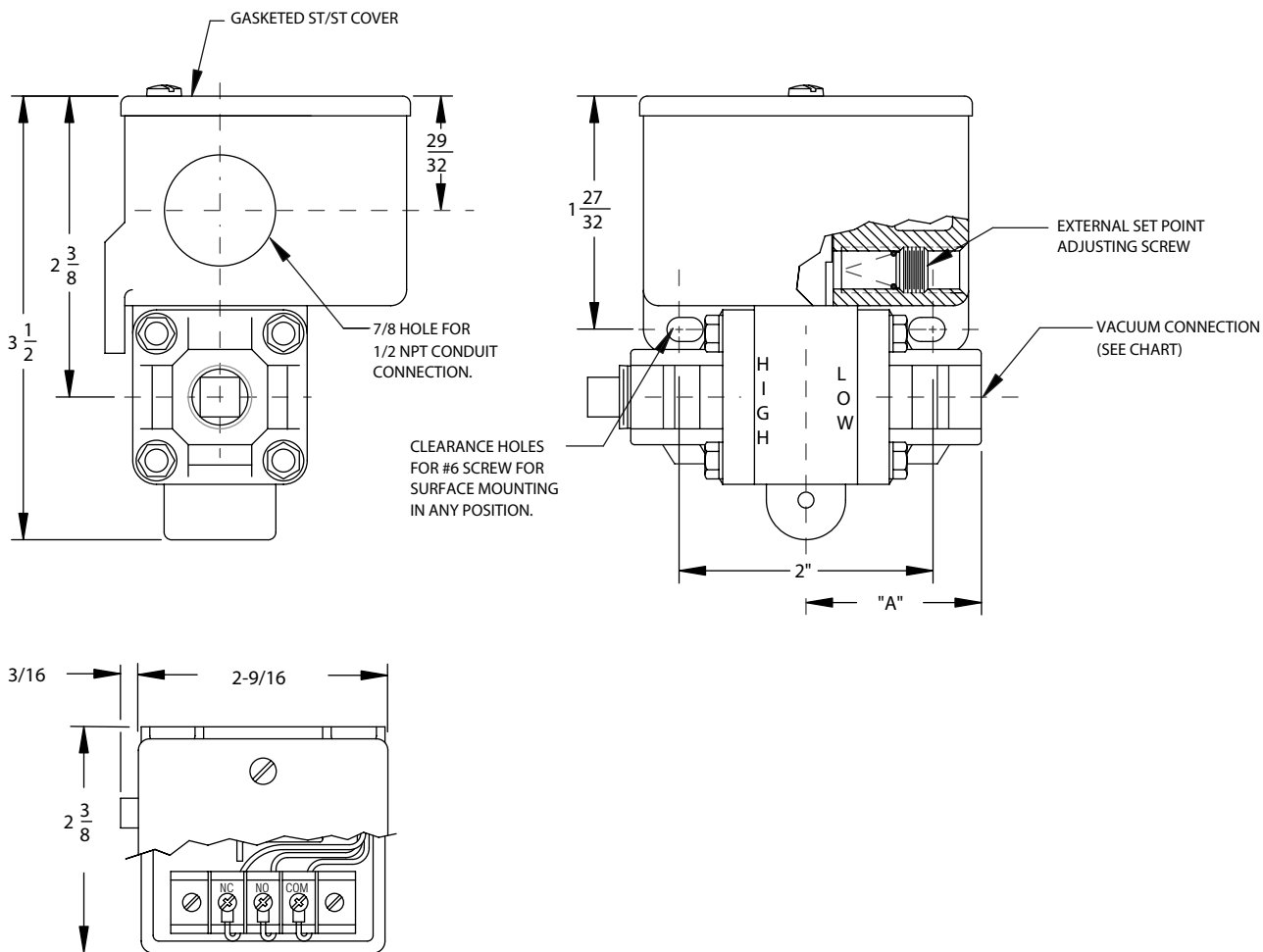


24 Series

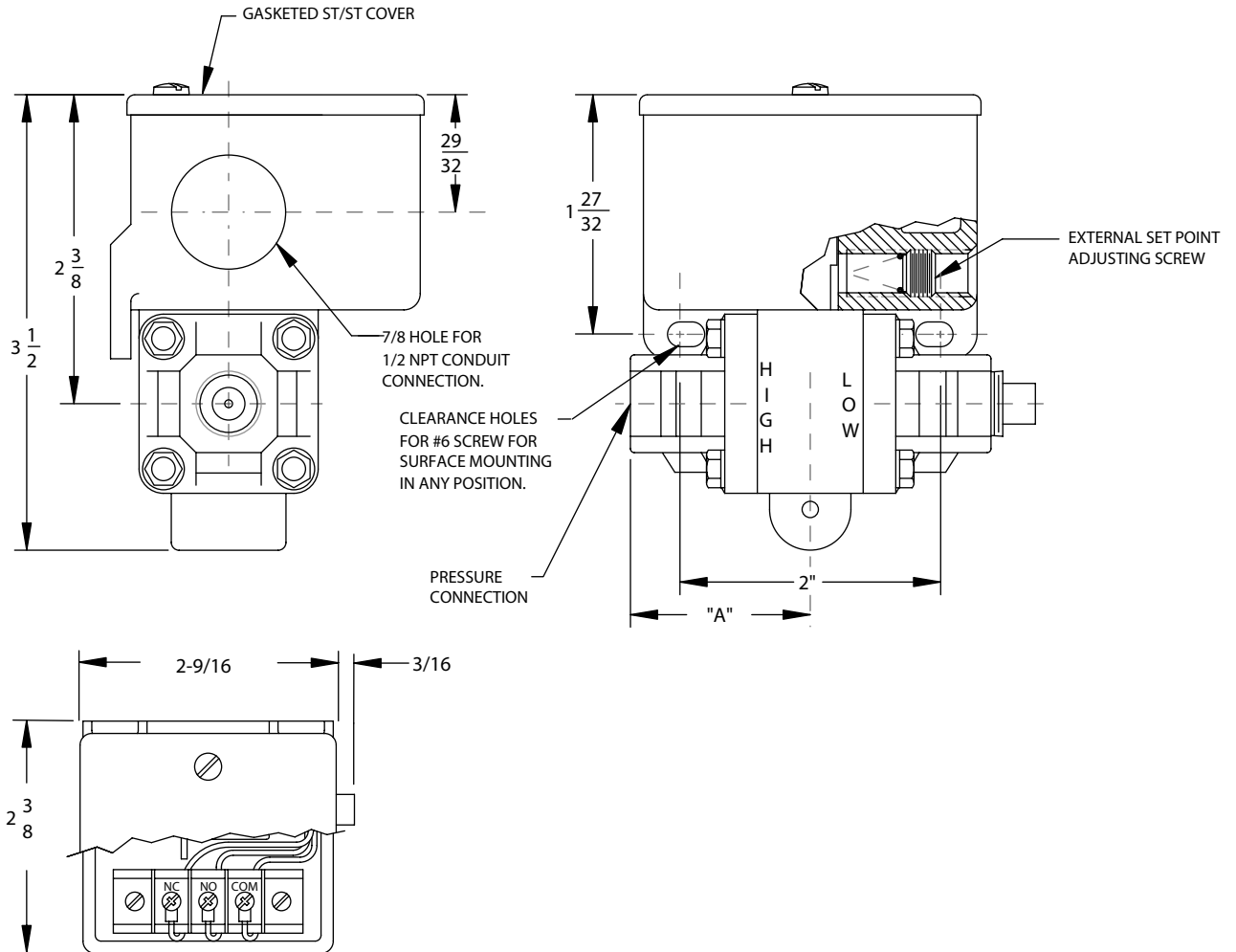
24 Series

DIMENSIONAL DRAWINGS

Models 015, 019



Models 016, 018, 020, 022



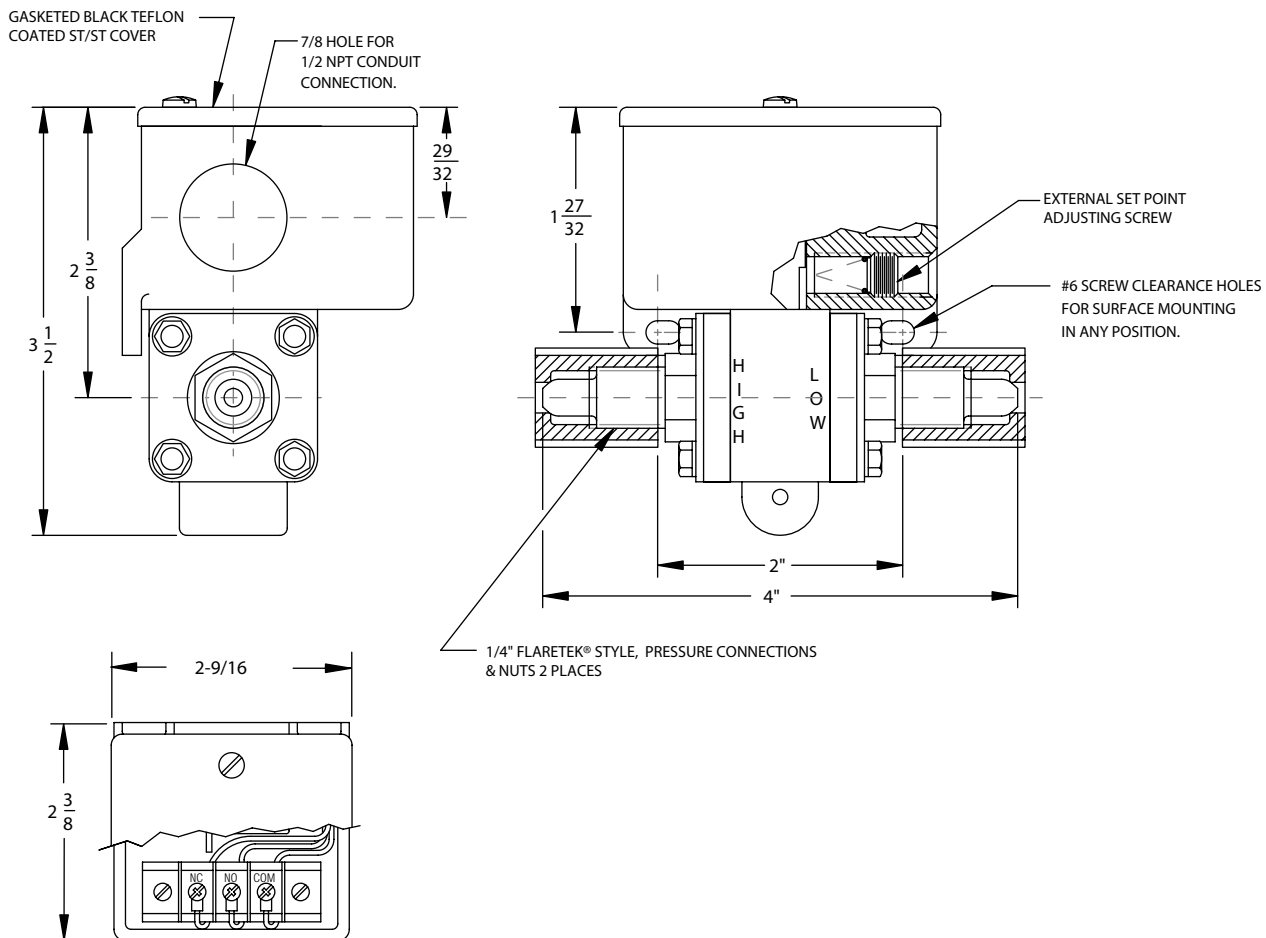


24 Series

24 Series

DIMENSIONAL DRAWINGS

Models 030, 031



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.
- Use only factory authorized replacement parts and procedures.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY OF REPAIR AND REPLACEMENT

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 (F.O.B. UE Watertown); provided, however, that this warranty applies only to equipment found to be so defective within a period of 18 months from the date of manufacture by the Seller (36 months for the Spectra 12 and One Series products). 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.

LIABILITY LIMITATION

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 IMPUTED TO SELLER, IS LIMITED TO THE LIMITED WARRANTY OF 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 THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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