



**Staset**

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# THREE IN ONE PRESSURE DEVICE



## FEATURES

Factory Set "Tamper Proof" Switch

LED Indication of Contact Position

"Window Mode" Operation

5 Ra Standard

Optional Analog 4-20 mA or 0-5 VDC Output

3 Year Warranty

UL Recognized / CE Marked

**staset** solid

RED +	}	12 - 30 VDC	INPUT
BLACK -			
GREEN	}	SWITCH	OUTPUT
BLACK			
WHITE +	}	ANALOG	OUTPUT
BLACK -			

## OVERVIEW

Precision Sensors' staset<sup>®</sup> line of UHP 3 in 1 pressure switches provides OEMs and process end users with reliable, cost effective solutions for high purity process control systems. Available in continuous display and analog output configurations, staset<sup>®</sup> is an ideal choice for accurate long term protection of equipment and processes that fall under SEMI S2 Safety Guidelines.

Staset<sup>®</sup> is designed to reduce system costs and increase reliability on process tools and in fabs. This unique product combines the safety and simplicity of a switch, the output of a transducer and the convenience of a gauge. The LED indicator displays switch status continuously while an optional 3-digit display shows pressure in real time. Staset<sup>®</sup> eliminates potential leak paths by reducing the number of intrusions in the process. Threshold protection is achieved with a tamper proof switch and deadband that can be factory set from 1 to 98% of full scale. Particulate performance is outstanding. All wetted surfaces are VIM/VAR 316L stainless steel finished to 5 Ra standard.

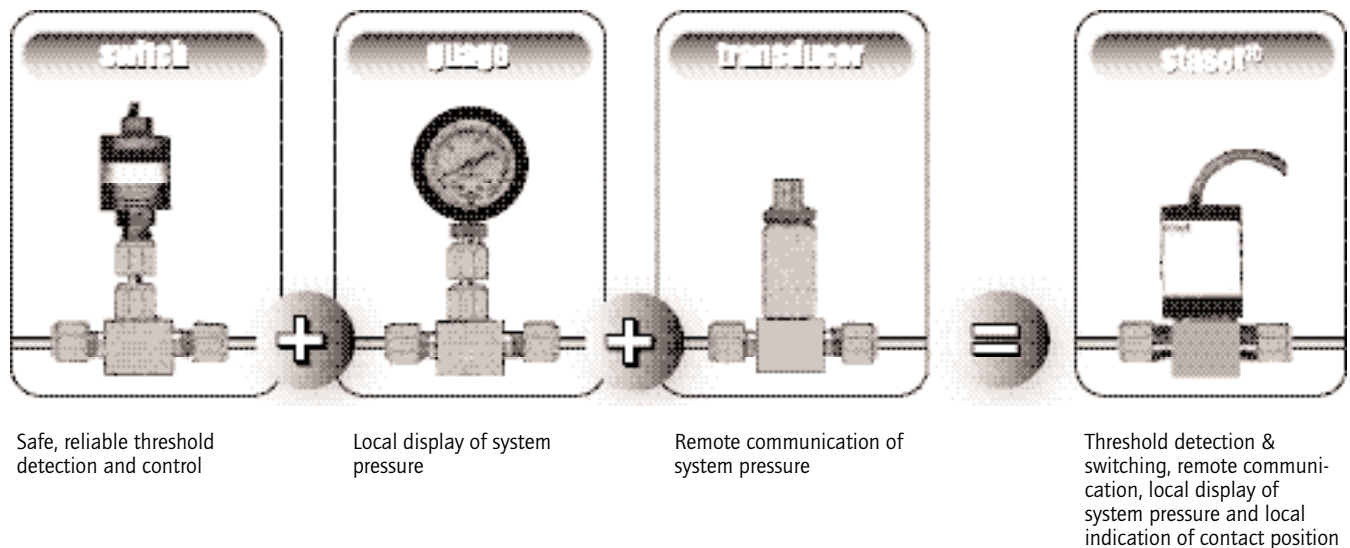
## FEATURES

In satisfying the requirements of demanding applications, the staset<sup>®</sup> 3 in 1 pressure switch provides the following benefits:

- Tamper proof design
- 0.4% accuracy, high set point repeatability
- 5 million cycle life, minimum
- Compact intergrated design saves space and connections
- Low internal volume of less than 0.5cc
- Optional 0 - 5 VDC or 4 - 20mA analog output
- Deadband is factory set to your specification

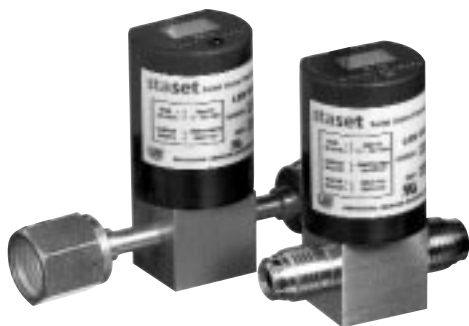
## COMPARISON CHART

Staset<sup>®</sup> provides a "three products in one" solution for high purity process control systems.



- VIM/VAR 316L stainless steel wetted surfaces with 5 Ra standard surface finish
- Electron beam welded pressure sensor minimizes internal volume and achieves  $1 \times 10^{-9}$  cc/sec leak tightness.
- 100% helium leak tested
- LED status indicator indicates power on & contact position Open/Close.
- Flow through, End Seal type, surface mount models available
- UL recognized/ CE marked.

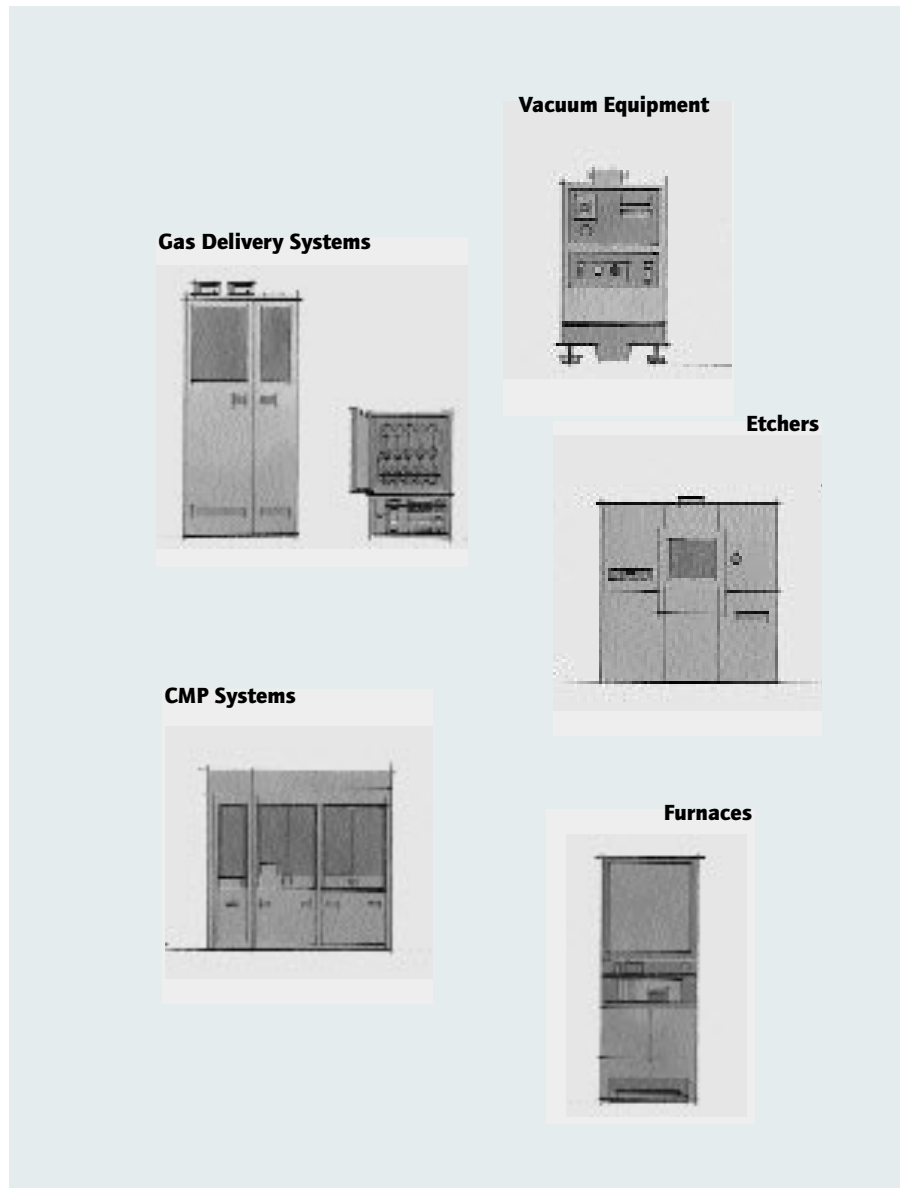
Products are manufactured in a cleanroom certified to Federal STD 209.



**staset® Flow Through Configurations**



**staset® Surface Mount Configuration**



## APPLICATIONS

Specifically designed for use in high purity process equipment, staset® is ideal for applications including the monitoring and control of gas delivery systems, process media recovery systems, and pump down equipment where critical control, indication and safety shut down are required.



## SPECIFICATIONS

<b>PRESSURE SENSOR</b>	Micromachined silicon piezoresistive strain gage isolated from process media by a rugged 2 mil. 316L stainless steel diaphragm. The sensor uses a minute amount of a proprietary very high vacuum fill material
<b>CONSTRUCTION</b>	Wetted material - 316L stainless steel, pressure compartment welded leak tight to 1x10 <sup>-9</sup> cc/sec
<b>SWITCH OUTPUT</b>	Isolated SPST solid state relay, normally open or normally closed, factory set to pressure value referenced in model chart
<b>DEADBAND</b>	Factory set to any value from 1% to 98% full scale
<b>SWITCHING RESPONSE TIME</b>	30 ms max.
<b>SWITCHING OUTPUT RATING</b>	0.25 amps AC or DC continuous, 0.4 amps peak, 50 V maximum
<b>SWITCH POINT ACCURACY</b>	0.4% full scale rms at 22 +/- 5 °C. This includes: linearity, hysteresis, zero offset, span, and long term drift. Temperature coefficient (zero and span): 0.017% full scale/ °C.
<b>SWITCH POINT REPEATABILITY</b>	0.25% full scale
<b>STATUS LED</b>	Indicates circuit condition – open or closed, and power on. Green indicates power on, circuit open; red indicates power on, circuit closed
<b>TEMPERATURE RANGE</b>	Operating 0 to 50 °C (32 to 122 °F); Non-Operating -40 to 85 °C (-40 to 185 °F)
<b>INTERNAL VOLUME</b>	0.5 cc for standard 1/4 End Seal type connection
<b>INPUT POWER</b>	9 to 30 VDC (12 to 30 VDC with analog output option), 25 mA minimum. Product is reverse polarity protected

<b>FAIL SAFE</b>	Upon power loss, contacts will default to the open state
<b>LIFE</b>	5 million cycles minimum
<b>SYSTEM PRESSURE DISPLAY</b>	3 digit LCD display of system pressure with 1% full scale accuracy from 0 to 50°C
<b>ANALOG OUTPUTS</b>	Option V: 0 to 5 VDC analog output proportional to listed pressure range within +/-1% Full scale from 0 to 50°C, 10K ohms minimum load impedance. Option A: 4 to 20 mA analog output; 12 to 30 VDC loop input voltage; isolated, current sinking; load resistance 50 to 1000 ohms.

## APPROVALS



UL recognized component under file #E179859.



CE marked, conforms to the LVD and EMC directives.

*Proof of performance data is available upon request.*

**MODEL CHART**

<b>Model</b>	<b>Type</b>	<b>Range/Unit</b>	<b>Proof Pressure</b>	<b>Burst Pressure</b>
EA15	Absolute	4 to 770 Torr	45 psia	10000 psia
EA100	Absolute	1 to 99 psia	200 psia	10000 psia
EV15	Gauge Vacuum	0.4 to 30" Hg Vac	0 psia- 45 psig	75 psig
EG15	Gauge	0.2 to 14.8 psig (2 to 102 KPa)	0 psia- 45 psig	75 psig
EG100	Gauge	1 to 99 psig (7 to 680 KPa)	0 psia- 200 psig	500 psig
ES1000	Sealed Gauge	10 to 990 psig (0.07 to 6.80 MPa)	0 psia- 2000 psig	10000 psig
ES3000	Sealed Gauge	30 to 2970 psig (0.2 to 20.5 MPa)	0 psia- 6000 psig	10000 psig
EA1000	Absolute	10 to 990 psia	2000 psia	10000 psig
EA3000	Absolute	30 to 2970 psia	6000 psia	10000 psig

# HOW TO SPECIFY

Create a part description by using the system below. The part description will follow this form:

**EG**    **100**    **D**    **C26**    **O25**    **P**    **FM**    **L**    **24**    **V**  
 Type    Setting    Display    Closing    Opening    Units    Pressure    Electrical    Lead    0-5 VDC  
           Range                    Pressure    Pressure                    Connection    Connection    Length    Output

	CODE	DESCRIPTION	EG	100	D	C26	O25	P	FM	L	24	A
<b>TYPE</b>												
	EA	Absolute Pressure										
	EG	Gauge Pressure										
	ES	Sealed Gauge										
	EV	Gauge Vacuum										
<b>SETTING RANGE</b>												
	15	See Model Chart										
	100											
	1000											
	3000											
<b>DISPLAY</b>												
	-	No LCD Display										
	D	LCD Display										
<b>CLOSING PRESSURE (INCREASING OR DECREASING)</b>												
<b>OPENING PRESSURE (INCREASING OR DECREASING)</b>												
<b>UNITS</b>												
	P	PSI										
	M	Millimeters of mercury										
	T	Torr										
	H	"Hg Vac										
	K	Kpa or Mpa (depending on range)										
<b>PRESSURE CONNECTION</b>												
	VM	1/4 Male End Seal type (standard)										
	FM	Flow-through type, / Male End Seal type, both ends										
	FF	Flow-through type, / Female End Seal type, both ends										
	SM	Surface Mount (must specify type for Integrated Gas Systems)										
	P	1/8 - 27 Male NPT										
<b>ELECTRICAL CONNECTION</b>												
	L	Free Leads (standard)										
	C	Crimp-type connector (Amp MR Series Standard)										
<b>LEAD LENGTH (SPECIFY IN INCHES - 24" IS STANDARD)</b>												
<b>ANALOG OUTPUT</b>												
	-	No auxiliary output										
	A	4-20 mA										
	V	0-5 VDC										
<b>OPTION WM</b>												
		"Window" operating mode (Opening and Closing pressures become upper and lower limit of window; specify whether contact is closed inside or outside the window). See detailed description for example.										
<b>OPTION CG</b>												
		Compound gage feature: see detailed description next page.										

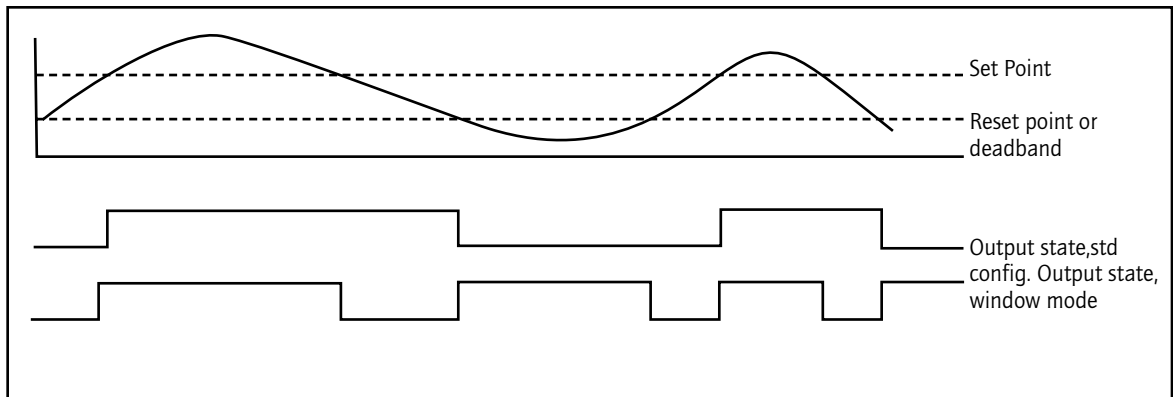


The specified example, at the top of the previous page, denotes a 100 psig staset<sup>®</sup> switch with LCD display. The switch closes on increasing pressure at 26 psig and opens on decreasing pressure at 25 psig. The switch utilizes a flow through design with 1/4 male Endseal type end connections with a 5 Ra finish. The electrical interface consists of 24" free leads. A 4 -20 mA auxiliary output is provided.

**Note:**

A factory part number will be assigned upon completion of a drawing based on the part description. The number will consist of the basic model number followed by a dash and a two or three digit suffix. Use the factory part number when ordering.

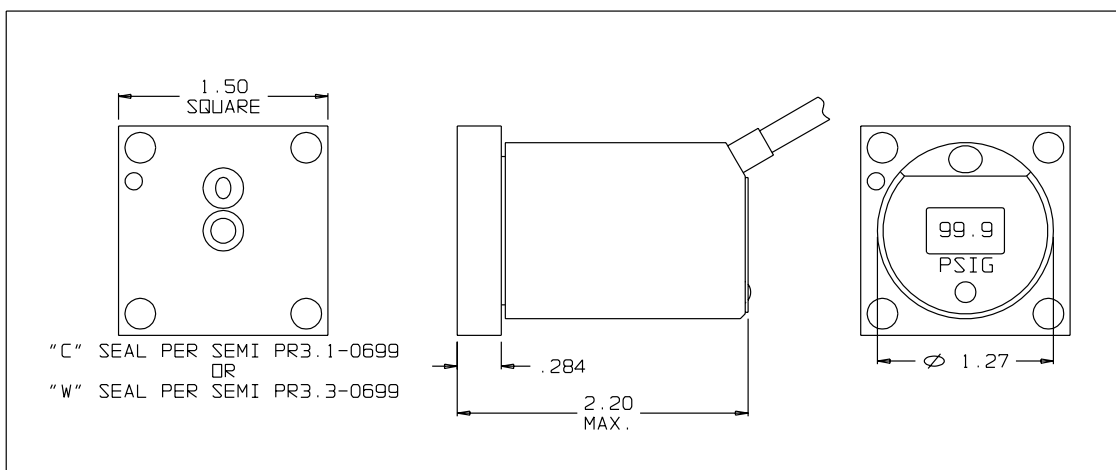
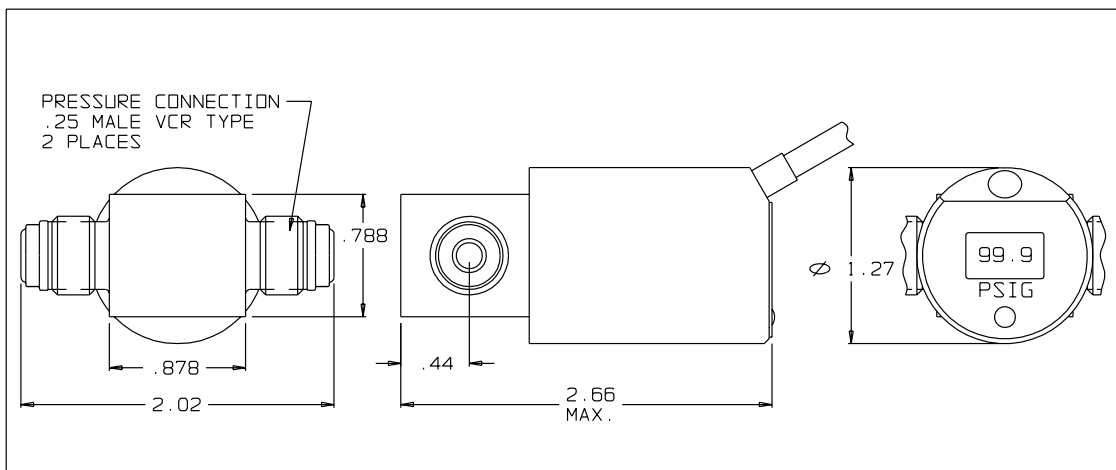
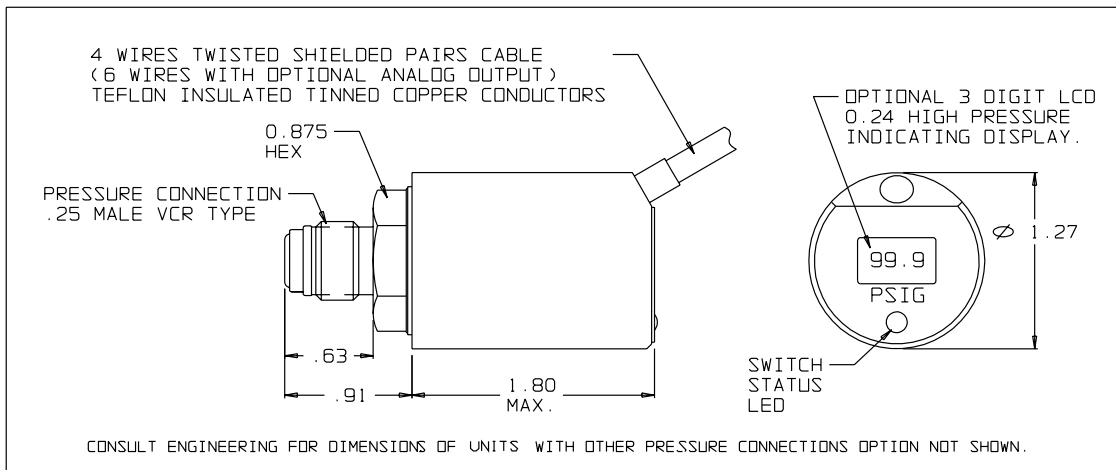
**"Window" Mode.** Unlike the standard "on-off" output mode, window mode allows for the output to be in one state (open or closed) while inside a band, and change state if the pressure goes outside the band (illustrated below). To specify this output, higher pressure set point and lower pressure set point must be specified, along with whether the switch is to be closed inside or outside the band (deadband does not apply). Both high and low set points can be specified anywhere within the setting range of the product. For instance, a typical callout will be "switch closed between 50 psia and 20 psia."



Compound Gage Feature (for EA100D model only). Unit is programmed to display 15 psi vacuum to 85 psi pressure. The sealed gage unit output varies with site atmospheric pressure. The analog output option is 0-5 VDC or 4-20 mA over the 0 to 100 psia range only.



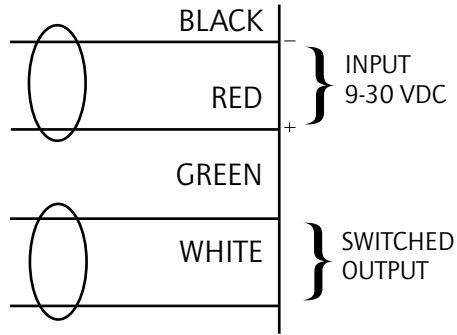
# DIMENSIONAL DRAWINGS



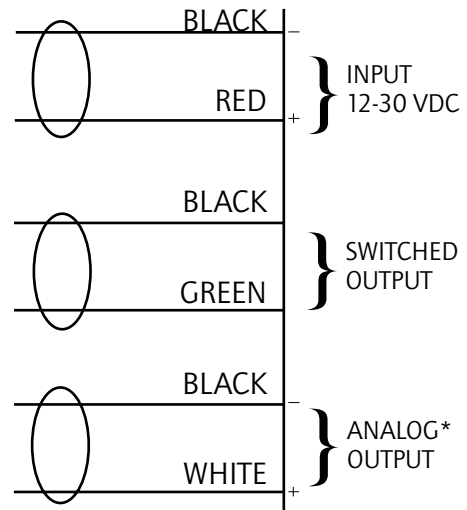


# SCHEMATICS

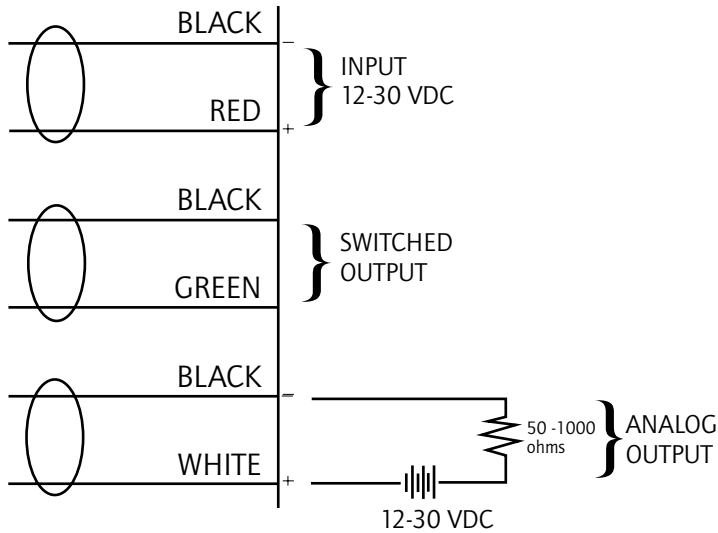
STANDARD



WITH 0-5 VDC OPTIONAL ANALOG OUTPUT



WITH 4-20 mA OPTIONAL ANALOG OUTPUT



## 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.

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