



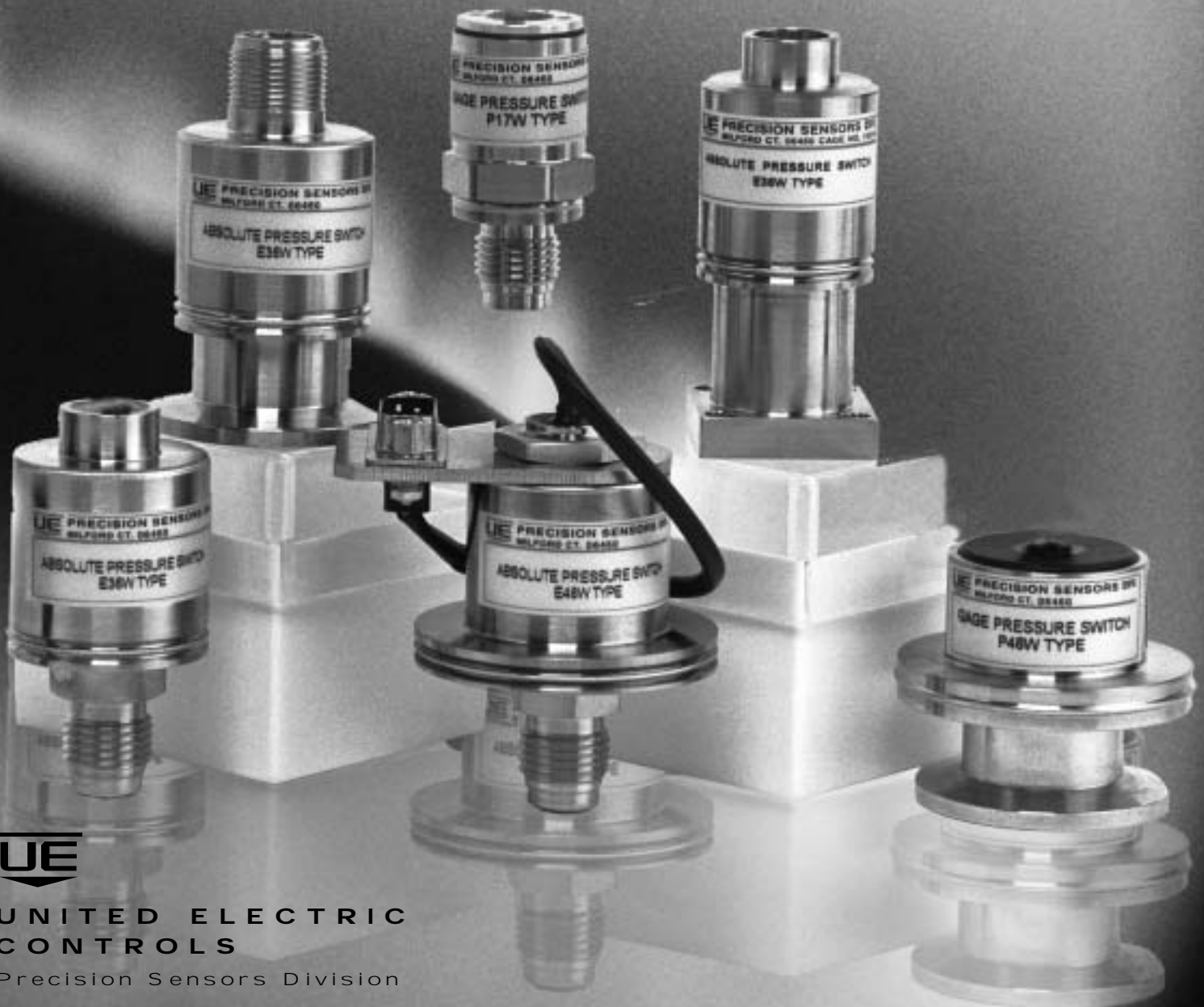
W Series

W Series

## HIGH PURITY PRESSURE SWITCHES FOR CLEAN GAS APPLICATIONS

### FEATURES

- Clean, Reliable, Long Life Performance
- Highly Accurate and Repeatable Design
- Tamper Proof Setting
- No Adjustment Needed



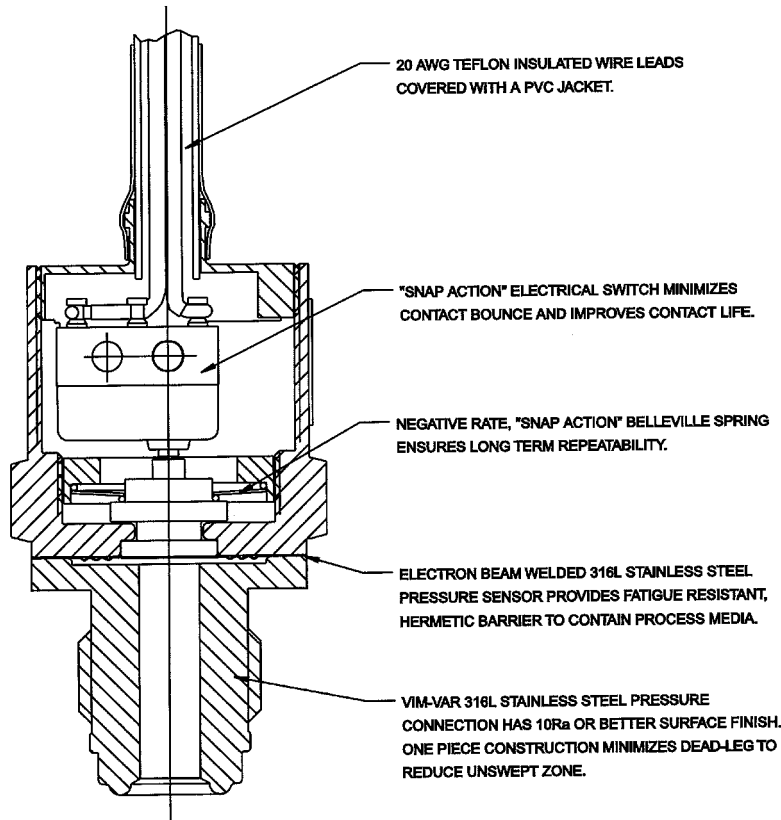
UNITED ELECTRIC  
CONTROLS

Precision Sensors Division



### OVERVIEW

Precision Sensors' high-purity pressure switches are considered "best-of-class" in the semiconductor equipment market. Designed specifically for the demanding requirements of semiconductor tool OEMs, they provide highly repeatable on-off switching for alarm, shutdown and interlock applications. Wetted surfaces are VIM - VAR 316L and are standardly 10 Ra or 5 Ra depending on the requirement. End connections include face-seal, flow-through and flush-type fittings. Set points can be gauge, absolute or vacuum - and cycle life can be over 1 million on-off cycles. Manufacturing of high-purity products is done in a clean-room environment.



### FEATURES

- Factory-set set points in gauge, absolute or vacuum pressure
- 10 Ra or 5 Ra finishes standard
- A wide variety of pressure and electrical connections
- Wetted materials in VIM - VAR 316L, Hastelloy C-276 and Inconel
- Electron-beam welded construction, 100% helium leak-tested
- On-off cycle life as high as 1 million cycles
- Secondary seal for added safety (E types)

## **APPLICATIONS**

The overall flexibility of the PSI design can be quickly matched to the requirements of the customer. PSI high-purity switches are designed specifically for equipment where cleanliness, reliability and performance are critical. This includes applications such as pressure and vacuum interlocks, atmospheric sensing for chamber door interlocks, gas delivery system alarms and shutdown, gas regulator failure alarm and absolute pressure sensing for process interlocks.

## **TECHNOLOGY**

PSI's products are designed with the semiconductor OEM in mind. PSI switches incorporate a number of key design features. The sensor is an electron-beam welded diaphragm for high-reliability and long life. This diaphragm, moving in response to changing pressure, actuates a negative-rate belleville spring. This type of spring is extremely repeatable and vibration/shock resistant, resulting in superior performance under a wide variety of conditions. The belleville spring, in turn, actuates a snap-action switch, providing a digital output. The switch setting is done at the factory to customer specification and cannot be changed once delivered.



### SPECIFICATIONS

<b>CALIBRATION</b>	All models are factory set and are not field resettable
<b>CONSTRUCTION</b>	Electron beam welded diaphragm sensor; negative rate "Snap Action" Belleville load spring
<b>MATERIALS</b>	Wetted parts are VIM - VAR 316L stainless steel; Other materials are available
<b>LEAKAGE</b>	100% helium leak tested to $1 \times 10^{-9}$ std-cc/sec.
<b>SURFACE FINISH</b>	10 Ra standard, 5 Ra optional
<b>TEMPERATURE</b>	Operating: 0° to 130°F Non-operating: -40 to 180°F Higher temperature constructions are available
<b>ELECTRICAL</b>	All units utilize a UL recognized and CSA listed electrical switch. Gold contacts: 1 A resistive, 0.5 A inductive @ 28 VDC Silver contacts: 5 A resistive, 3 A inductive @ 28 VDC, 5 A resistive @ 250 VAC; except E units which are 3 A @28 VDC
<b>ENCLOSURE</b>	P and PV type units are vented to ambient conditions for sensing reference (ambient) pressure; E type units have hermetically sealed contacts, a fixed reference pressure and a secondary seal
<b>INSTALLATION</b>	Insensitive to mounting attitude
<b>MINIMUM OPERATING</b>	Up to 1,000,000 cycles depending on type and application

## APPROVALS



UL Recognized  
CE Marked

## MODEL CHART

Model	Available Settings	Deadband (Actuation Value)	Repeatability	Proof** Pressure	Weight	Internal Volume*
				PSIA to PSIG	Grams	CC
<b>Vacuum</b>						
<input type="checkbox"/> PV48W	10 to 150 mm Hg VAC	20 mm Hg + 5% of setting	± 5 mm Hg + 2% of setting	0 to 15	185	2.22
<input type="checkbox"/> PV36W	125 to 750 mm Hg VAC	40 mm Hg + 6% of setting	± 15 mm Hg + 2% of setting	0 to 25	140	1.06
<b>Gauge</b>						
<input type="checkbox"/> P48W	0.2 to 3 PSIG	0.5 PSI + 5% of setting	± 0.1 PSI + 2% of setting	0 to 15	185	2.22
<input type="checkbox"/> P36W	2.5 to 20 PSIG	1.0 PSI + 6% of setting	± 0.3 PSI + 2% of setting	0 to 25	140	1.06
<input type="checkbox"/> P17W	15 to 100 PSIG	4.0 PSI + 7% of setting	± 1.5 PSI + 4% of setting	0 to 300	95	0.46
<b>Absolute</b>						
<input type="checkbox"/> E48W	10 to 150 Torr	20 Torr + 5% of setting	± 5.0 Torr + 2% of setting	0 to 15	210	2.22
<input type="checkbox"/> E36W	100 to 1000 Torr	40 Torr + 6% of setting	± 15 Torr + 2% of setting	0 to 25	165	1.06
<input type="checkbox"/> E17W	1000 to 5000 Torr	200 Torr to 1,000 Torr	± 75 Torr + 4% of setting	0 to 300	120	0.46
*With 1/4" end seal fitting						
**Higher proof pressure available. Consult factory						



## HOW TO ORDER

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

**PV48W**  
Model

**IT30**  
Setting

**VM**  
End Fitting

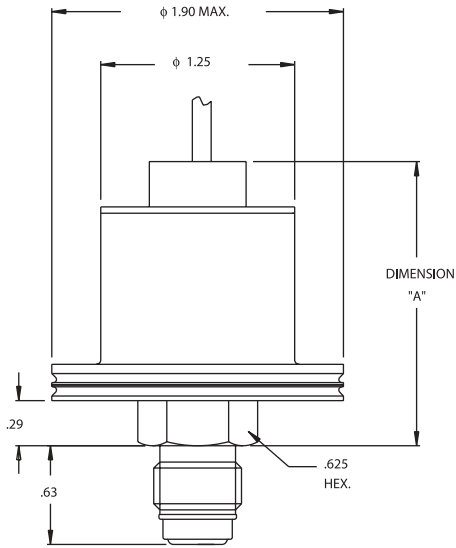
**NCS46L**  
Electrical

The part described above is a vacuum switch with silver contacts which open on increasing vacuum at 30 mm below atmospheric pressure. The switch has a 1/4" male VCR type pressure fitting and 46" wire leads. A factory part number will be assigned upon completion of a drawing based on the part description. When ordering, use the factory part number.

Model	Setting	End Fitting	Electrical
P17W = 15 to 200 PSI P36W = 2.5 to 20 PSI P48W = 0.5 to 10 PSI E17W = 750 to 10,000 torr absolute E36W = 100 to 1,000 torr absolute E48W = 25 to 500 torr absolute PV36W = 125 to 750 torr vacuum PV48W = 20 to 500 torr vacuum	<b>Actuation</b> I = Increasing pressure (vacuum) D = Decreasing pressure (vacuum)  <b>Units</b> P = PSI I = Inches of mercury ("Hg) T = Torr (mm of mercury)  <b>Setting</b> Enter the setting	VM = 1/4 Male VCR type (standard) N2 = NW 25 flange (ISO/KF type) SA = 1.125" Surface mount, C seal type	<b>Contact Position</b> NC = Normally closed (0 PSIG) NO = Normally open (0 PSIG) DT = SPDT (3 wires)  <b>Contact Material</b> G = Gold contacts, 1A @ 24 VDC S = Silver contacts, 5A @ 250 VAC  <b>Lead Length</b> Enter the lead length (24" standard)  <b>Electrical Interface</b> L = Free leads C = Crimp type connector; specify manufacturer and P/N [Amp/MR series standard]

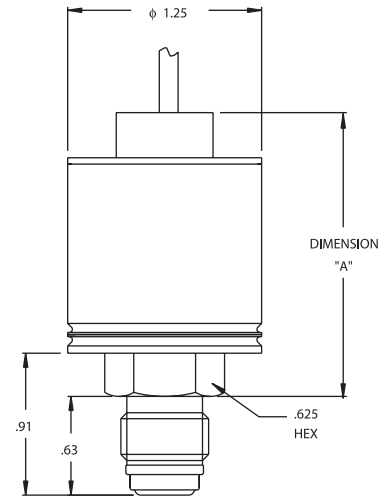
Other options such as dual units, hermetic sealing, different materials, higher proof pressures, and custom pressure connections are available upon request. Please consult the factory or the nearest distributor for more assistance.

DIMENSIONAL DRAWINGS



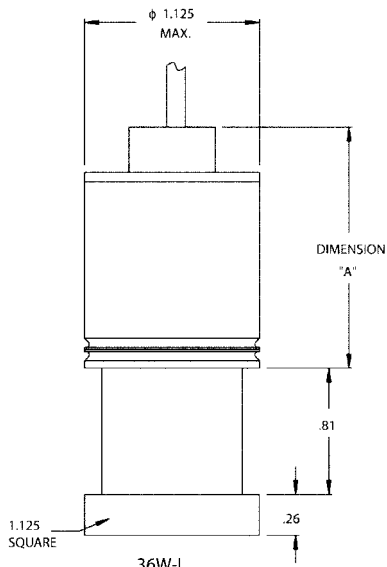
48W

TYPE	DIMENSION "A"
E	1.90 MAX.
PV	1.50 MAX.
P	1.30 MAX.



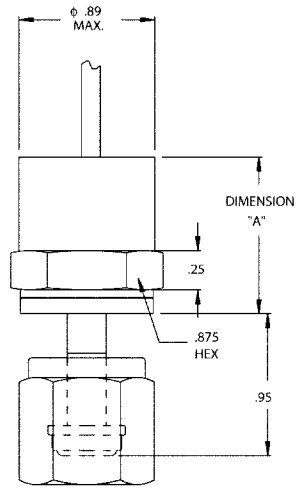
36W

TYPE	DIMENSION "A"
E	2.00 MAX.
PV	1.50 MAX.
P	1.25 MAX.



36W-L

TYPE	DIMENSION "A"
E	1.75 MAX.
P	1.00 MAX.



17W

TYPE	DIMENSION "A"
E	1.60 MAX.
P	1.06 MAX.

## 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 when 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.
- 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 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 Milford); provided, however, that this warranty applies only to equipment found to be so defective within a period of 36 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

## 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.

*PSI specifications subject to change without notice.*

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