

### PRESSURE SWITCH

#### FEATURES

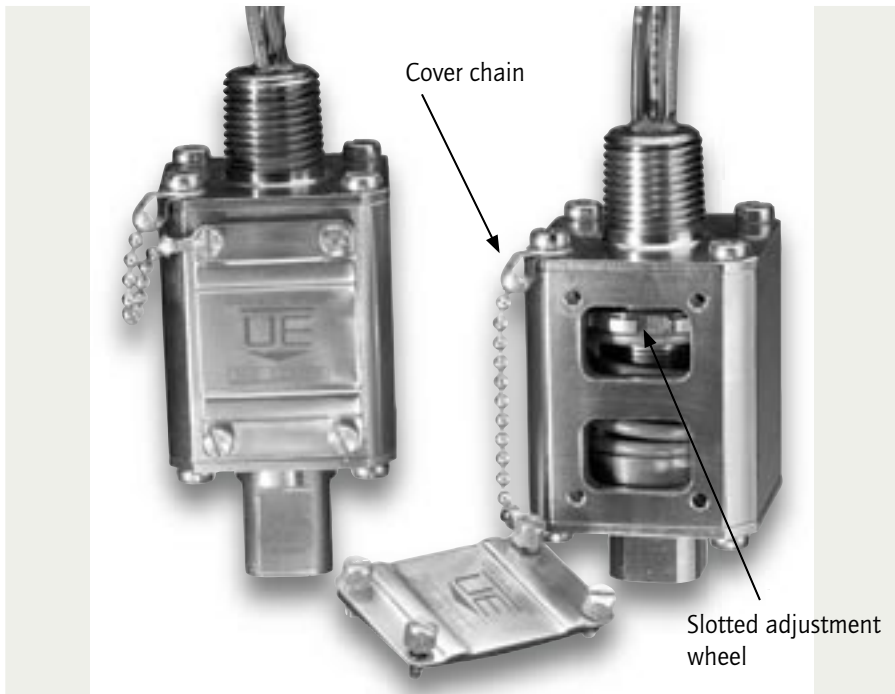
- 316 Stainless Steel Enclosure
- Hermetically Sealed Switch
- SPDT or DPDT Switch Output
- Range Adjustability: 2 to 9000 psi  
(0,1 to 620,5 bar)
- 72" Leadwires



### OVERVIEW

United Electric's 360 Series adjustable pressure switch is a compact design for low, mid and high-pressure applications. The housing and pressure port are made of 316 Stainless Steel. The electrical enclosure is a welded, hermetically sealed, explosion proof assembly available as a single pole double throw (SPDT) or double pole double throw (DPDT) configuration.

An internal, slotted pressure adjustment wheel is accessible through a tethered cover plate for easy setting and field adjustment. The combination of 316 Stainless Steel construction and hermetically sealed switching make the 360 Series particularly well suited for various oil & gas applications including offshore platforms, safety panels, and pipelines, as well as other hazardous location process applications.



### FEATURES

- Compact Design
- cCSAus and CENELEC approved for Div. 1 and Zone 1 hazardous locations
- Convenient Field Adjustments
- 72" Leadwires: color coded and marked every 3"
- CE compliance to Low Voltage Directive and Pressure Equipment Directive
- Optional pressure connections and integrated pressure snubber

## APPLICATIONS

UE's 360 Series pressure switches are used in both critical and non-critical applications, monitoring product, process and hydraulic pressures. When hazardous conditions are detected, 360 Series pressure switches are used to trigger alarms or engage safety shutdowns, protecting people, processes and equipment. A sampling of typical applications are:

- Well head safety shutdown
- Blow out Preventors (BOP)
- Hydraulic pressure safety panels
- Low limit & high limit shutdowns on rotating equipment
- Sand probes & pipeline integrity
- Solenoid valve control

### Offshore Platforms (exploration & production)



### Offshore Stainless Steel Safety Panel



### Pipeline (oil & gas transmission)



### Chemical Plants & Refineries



## SPECIFICATIONS

<b>STORAGE TEMPERATURE:</b>	-58° to 185°F (-50° to 85°C)
<b>OPERATING AMBIENT TEMPERATURE:</b>	-40° to 185°F (-40° to 85°C)
<b>MEDIA TEMPERATURE:</b>	Model 360: -50° to 350°F (-46° to 177°C) Models 361 & 362: -10° to 200°F (-23° to 93° C)
<b>SET POINT REPEATABILITY:</b>	Model 360: +/- 1% of adjustable range; Models 361 & 362: +/- 1.5% of adjustable range
<b>SHOCK:</b>	Set point repeats after 75G's, 10 milliseconds (except Model 360, range A in the inverted position which is 40G's 10 milliseconds)
<b>ENCLOSURE:</b>	316 stainless steel
<b>ENCLOSURE CLASSIFICATION:</b>	Class I, Division 1 product meets enclosure type 7, Class II, Division 1 product meets enclosure type 9
<b>SWITCH OUTPUT:</b>	Code S: One SPDT, hermetically sealed Code D: Two SPDT for DPDT action, hermetically sealed
<b>ELECTRICAL RATINGS:</b>	5 A @ 125/250 VAC, 5 A resistive and 3 A inductive @ 28 VDC.
<b>ELECTRICAL CONNECTION:</b>	1/2" NPT (male) with 72" leadwires
<b>WEIGHT:</b>	Approximately 29 ounces (0,82 kg)
<b>PRESSURE CONNECTION:</b>	1/4" NPT (female) or 1/2" NPT (female) (SF-250-CX Autoclave available on Model 361)

## APPROVALS



**Class I**, Division 1 & 2, Groups A, B, C & D

**Class II**, Division 1 & 2, Groups E, F & G

**Class III**

**Class I**, Zone 1, Group IIC T6

Enclosure Type 4X when interconnected to an approved Type 4X enclosure

**CSA** Certified, **CSAus** Listed

Pressure: CSA C22.2 No. 14-95, 25-1966, 30-M1986, CEC Part 1; UL 508, 1203 – File #LR 106012-1



**CENELEC/LCIE**

**LCIE** certified to Flameproof Protection

EEx d IIC T6

EN 50 014, EN 50 018

Certificate #LCIE 99.E6055/01



**CENELEC/TÜV** Süddeutschland Bau und Betrieb GmbH (N.B. #0036)

**TÜV** certified to PED (97/23/EC)

Category IV, Module H1

Certificate #USA 02/04/38/001 thru USA 02/07/38/033



UEC Compliant to LVD (73/23/EC & 93/68/EEC)

Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD  
The Low Voltage Directive does not apply to products for use in hazardous locations

## PRESSURE MODEL CHART

Range Code	Adjustable Range Low end of range on fall; High end of range on rise		Deadband		Over Range Pressure*		Proof Pressure**	
	psi	bar	psi	bar	psi	bar	psi	bar

**Model 360**, welded Inconel® diaphragm and 316 stainless steel pressure connection

A	2 to 22	0,1 to 1,5	0.4 to 3.5	0,03 to 0,2	600	41,4	1200	82,7
B	12 to 90	0,8 to 6,2	1 to 12	0,07 to 0,8	600	41,4	1200	82,7

**Model 362, 303** stainless steel piston with Buna N O-Ring and 316 stainless steel pressure connection

A	55 to 300	3,8 to 20,7	10 to 35	0,7 to 2	3000	206,8	4500	310,3
B	150 to 650	10,3 to 44,8	15 to 75	1 to 5	3000	206,8	4500	310,3

Range Code	Adjustable Range		Lower 75% range span		Top 25% range span		Over Range Pressure*		Proof Pressure**	
	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar

**Model 361, 303** stainless steel piston with Buna N O-Ring & Teflon® seal and 316 stainless steel pressure connection

A	475 to 1500	32,8 to 103,4	50 to 175	3,4 to 12,1	325 psi max	22,4	6500	448,2	18500	1275,5
B	900 to 3000	62,1 to 206,8	80 to 300	5,5 to 20,7	600 psi max	41,4	9000	620,5	18500	1275,5
C	1800 to 9000	124,1 to 620,5	150 to 1000	10,3 to 68,9	2000 psi max	137,9	10000	689,5	18500	1275,5

**\*Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

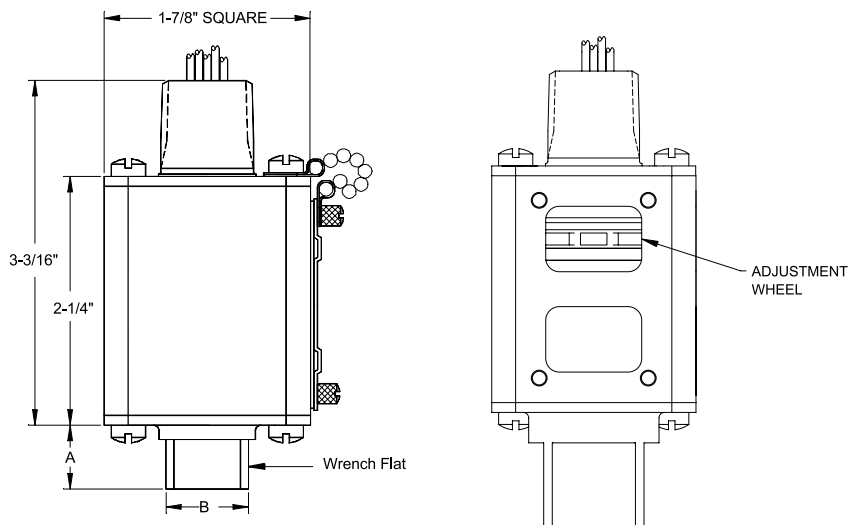
**\*\*Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing).

**Deadband Notes:** Model 361 ranges are expressed as the lower 75% and top 25% of the range span because of the operating characteristics of the piston/o-ring assembly.

**Inconel®** is a registered trademark of the INCO family of companies.

## DIMENSIONAL DRAWINGS

Model 360



Type	Port Size	Dim A	Dim B
360	1/4" NPT	5/8	3/4
	1/2" NPT	3/4	1
361	1/4" NPT	1-1/16	3/4
	1/2" NPT	1-1/2	1
SF-250-CX	Autoclave	1-1/16	5/16
362	1/4"	1-1/16	3/4
	1/2"	1-1/2	1



## HOW TO ORDER

Select letter or number codes to make up part number.

<b>A</b>	<b>361</b>	<b>1</b>	<b>B</b>	<b>S</b>	<b>1</b>	<b>M201</b>
Part #	Model	Pressure Connection	Range	Switch Output	Enclosure Material	Options

ORDERING CODE	DESCRIPTION	<b>A</b>	<b>361</b>	<b>1</b>	<b>B</b>	<b>S</b>	<b>1</b>	<b>M201</b>
<b>MODEL DESIGNATION</b>								
360	Low Pressure Switch							
361	High Pressure Switch							
362	Mid Pressure Switch							
<b>PRESSURE CONNECTION</b>								
1	1/4" NPT (female)							
2	1/2" NPT (female)							
4	SF-250 -CX Autoclave female (available on model 361 only)							
<b>RANGE</b>								
A	See model chart, page 5, for range specifications							
B	See model chart, page 5, for range specifications							
C	See model chart, page 5, for range specifications							
<b>SWITCH OUTPUT</b>								
S	SPDT							
D	DPDT							
<b>ENCLOSURE MATERIAL</b>								
1	316 stainless steel							
<b>OPTIONS</b>								
0140	Gold contacts, 1 A @ 125 VAC resistive							
M201	Factory set switch, specify increasing or decreasing pressure							
M276	Range indicated on nameplate in bar or mbar							
M277	Range indicated on nameplate in kPa or MPa							
M278	Range indicated on nameplate in Kg/cm <sup>2</sup>							
M407	CE compliance to pressure equipment directive (category IV). Nameplate will reflect range in bar and notified body #0036							
M444	Paper ID tag							
M446	Stainless steel ID tag and wire							
M540	Viton® o-ring plus standard connection material (deadband and low end of range may increase slightly). Not available on Model 360							
M550	Oxygen service cleaning; internal construction and materials may change (includes Viton® o-ring when applicable)							
M928	Stainless steel pressure snubber integrated into pressure connection. Not available model 360, and autoclave pressure connection							
NC1	NACE Certificate. Not available on models 361, 362							

## ALTERNATIVE PRODUCTS FROM UE

**460 Series Pressure Transmitters**

- Welded, #316 Stainless steel construction
- CSA, NRTL/C, Cenelec EE xd certified for hazardous locations
- Ranges 0 to 15,000 psi
- Choice of field or factory-sealed zero and span calibration
- 4-20 mA or 0-4 VDC output

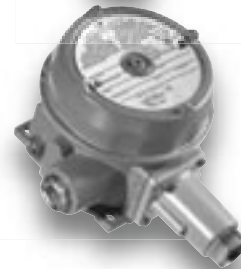
AVAILABLE  
FALL 2003

**Spectra 12 Series**

- Compact, cylindrical stainless steel design
- Hermetically-sealed switch
- Explosion-proof, hazardous location agency Approvals from UL, ATEX, cUL
- Snap-acting belleville spring mechanism to enhance vibration resistance and set point stability
- Pressure ranges 1 to 6000 psi; DP working pressure ranges 0 to 2500 psid; temperature ranges -130 to 650°F

**120 Series**

- Wide selection explosion-proof line of pressure, differential pressure, and temperature models
- UL, cUL, Cenelec EE xd certified for hazardous locations
- Single or dual switch outputs
- Internal or external set point adjustment

**One Series Electronic Pressure and Temperature switches**

- Solid-state reliability with health-checking diagnostics
- Available with innovative low power "2-Wire" model for discrete input to PLC's or DCS; or models to switch 115/230 VAC loads
- Enclosure type 4X design, approved for Class 1, Division 2 hazardous or intrinsically safe locations
- Digital display and tamper-proof keypad adjustment of setpoint and deadband
- Optional dual switch or 4-20 mA analog output

**P100 Deep Submersible Industrial Pressure Transducer**

- Choice of pressure fittings is 1/4-18 NPT (female) and 7/16-20 SAE female
- Submersible up to 10,000 feet
- Monel housing provides excellent resistance to saltwater
- Pressure ranges from 0-50 through 0-10,000 psi
- 0-5 VDC and 4-20 mA



## 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. 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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EMC02500403