

E2F Explosion-Proof Pressure Transducer For Hydrogen Applications

Features

- Flameproof approval for explosion-proof, hazardous applications
- FM, CSA, ATEX and IECEx approvals
- IP66/67 Ingress rating
- Thick sensing diaphragm using proven CVD technology:
 - 316L Stainless steel ranges to 5000 psi/350 bar
 - A286 Stainless steel ranges to 20,000 psi/1400 bar
- External magnetic offset & span adjustment
- Barometric pressure ranges available (standard & custom ranges)
- SIL 3 capable

Typical Uses

- Hydrogen filling stations
- Hydrogen compressors
- Hydrogen storage tanks
- Reactor vessels
- Fuel cells for vehicles

Performance Specifications

Reference Temperature: 70 °F ± 3.6 °F, (21 °C ± 2 °C)

Static Accuracy: $\pm 0.25\%$ of span, $\pm 0.50\%$ of span, $\pm 1.0\%$ of span,
 Terminal Point Method includes:
 hysteresis, linearity, repeatability, offset and span

Stability: $\pm 0.25\%$ year at reference conditions

Environmental Specifications

Thermal Coefficients: Offset: $\pm 0.005\%$ /°F from -40 °F to 257 °F
 ($\pm 0.009\%$ /°C from -40 °C to 125 °C)
 Span: $\pm 0.005\%$ /°F from -40 °F to 257 °F
 ($\pm 0.009\%$ /°C from -40 °C to 125 °C)

Temperature Limits: Storage: -58 °F to 257 °F (-50 °C to 125 °C)
 Operating: -40 °F to 176 °F (-40 °C to 80 °C)
 Media: -40 °F to 176 °F (-40 °C to 80 °C)

Humidity: 0-100% (non-condensing)

Functional Specifications

Response Time (Output) 4 ms

Gauge/Compound Pressure Ranges: Vac to 20,000 psig/Vac to 1400 bar

Shock: 80 g, 6 ms, Haversine

Vibration: Random: 10 g RMS 20-2000 Hz

Proof Pressure: 1.2X - 1.5X

Burst Pressure: 5X - 8X



E2F
Pressure Transducer



Key Benefits

- Highly configurable
- Easy calibration of offset and span
- SIL Certified

Electrical Specifications

Circuit Protection: Reverse polarity protected

SUPPLY VOLTAGE

9-36 Vdc: 4-20 mA, 20-4 Ma (2-wire), 0-5 Vdc, 1-5 Vdc, 1-6 Vdc, 0.1-5 Vdc, 0.5-4.5 Vdc

14-36 Vdc: 0-10 Vdc, 1-11 Vdc, 0.1-10 Vdc

Adjustability: $\pm 5\%$ of span non-interactive offset & span

Supply Current: <8 mA (Vout)

Current Source/Sink for Voltage Output 1 mA (source)/ 0.1 mA (sink) MAX.

Withstand/Breakdown 100 Vdc/Vac, optional 500 Vdc/Vac

Contact Us

1.800.328.8258

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Physical Specifications

Ingress Rating: IP66 (NEMA 4X) (STD.)
IP67 (IP69K Consult Factory)

Wetted Material

Diaphragm:	Sensor:	Material
	B	316L Stainless steel
	D	A286 Stainless steel

Process Connection: 316L Stainless steel

Non-wetted Material

Housing: 316L Stainless steel

EMC Testing

EMC: Directive 2014/30/EU, and EN61326-1, EN61326-2-3 (Industrial Env.)

Immunity:	61000-4-2 (ESD)	±4 kV/±8 kV (Contact/Air)
	61000-4-3 (Radiated RF)	10 V/m to 1 GHz, 3 V/m to 2 GHz, 1 V/m to 2.7 GHz
	61000-4-4 (EFT/Burst)	±1 kV (5/50 ns, 5 kHz)
	61000-4-5 (Surge)	±1 kV, Earth to Shield over all I/O lines
	61000-4-6 (Conducted RF)	3 V (0.15 to 80 MHz)
	61000-4-8 (Line Freq. Magnetic)	30 A/m

Emissions: EN 55011 (CISPR 11) Class A, Group 1 & FCC (47 CFR 15)

Hazardous Area Certifications

Explosion Proof/Flameproof/Dust Ignition Proof Installations

FM:

Class I Division 1, Groups A, B, C, D T4, -40°C < Ta < 80°C

Class II Division 1, Groups E, F, G T4, -40°C < Ta < 80°C

Class III T4, -40°C < Ta < 80°C

Class I, Zone 1, AEx db IIC T4 Gb -40°C < Ta < 80°C

Class II, Zone 21, AEx tb IIIC T135°C Db -40°C < Ta < 80°C

CSA:

Class I, Division 1, Groups A, B, C and D T4

Class II, Division 1, Groups E, F and G T135°C

Class III, Division 1, T135°C

Ex db IIC T4 Gb

Ex tb IIIC T135°C Db

ATEX:

II 2 G Ex db IIC T4 Gb -40°C < Ta < 80°C

II 2 D Ex tb IIIC T135°C Db -40°C < Ta < 80°C

IECEX:

Ex db IIC T4 Gb -40°C < Ta < 80°C

Ex tb IIIC T135°C Db -40°C < Ta < 80°C

Table 1: Proof & Burst Pressure Multipliers

Sensor Range	B Sensor - 316L SS		D Sensor - A286 SS	
	Proof	Burst	Proof	Burst
(psi)				
30				
45	1.4X	8X		
50	2.2X	8X		
60	1.8X	8X		
75	1.5X	8X		
100	1.5X	8X		
150	1.5X	8X		
200	1.5X	8X		
300	1.5X	8X		
500	1.2X	5X		
750	1.2X	5X		
1000	1.2X	5X		
1500	1.2X	5X		
2000	1.2X	5X		
3000	1.2X	5X		
5000	1.2X	5X	2.4X	5X
7500			1.6X	5X
10000			1.2X	5X
15000			1.7X	5X
20000			1.3X	5X
(Compound)				
V&30#				
V&45#	1.5X	8X		
V&60#	1.5X	8X		
V&100#	1.5X	8X		
V&150#	1.5X	8X		
V&200#	1.5X	8X		
V&300#	1.5X	8X		

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Standard Pressure Ranges

	psi	bar	kPa	mPa	kg/cm ²
Vacuum	30IMV	N1BR	N100KP	N1MP	N1KG
	–	N1/0.6BR	N100/60KP	0.1/0.06MP	N1/0.6KG
Compound	V/15#	–	–	–	–
	–	N1/1.5BR	N100/150KP	N0.1/0.15MP	N1/1.5KG
	V/30#	–	–	–	–
	–	N1/3BR	N100/300KP	N0.1/0.3MP	N1/3KG
	V/60#	–	–	–	–
	–	N1/5BR	N100/500KP	N0.1/0.5MP	N1/5KG
	V/100#	–	–	–	–
	–	N1/9BR	N100/900KP	N0.1/0.9MP	N1/9KG
Positive Pressure	15#	1BR	100KP	0.1MP	1KG
	20#	–	–	–	–
	–	1.6BR	160KP	0.16MP	1.6KG
	30#	–	–	–	–
	–	2.5BR	250KP	0.25MP	2.5KG
	60#	4BR	400KP	0.4MP	4KG
	–	6BR	600KP	0.6MP	6KG
	100#	–	–	–	–
	120#	–	–	–	–
	–	10BR	1000KP	1MP	10KG
	160#	–	–	–	–
	200#	–	–	–	–
	–	16BR	1600KP	1.6MP	16KG
	300#	–	–	–	–
	–	25BR	2500KP	2.5MP	25KG
	400#	–	–	–	–
	500#	–	–	–	–
	600#	40BR	4000KP	4MP	40KG
	800#	–	–	–	–
	–	60BR	6000KP	6MP	60KG
	1000#	–	–	–	–
	1500#	100BR	10000KP	10MP	100KG
	2000#	–	–	–	–
	–	160BR	16000KP	16MP	160KG
	3000#	–	–	–	–
	–	250BR	25000KP	25MP	250KG
	4000#	–	–	–	–
	5000#	–	–	–	–
	6000#	400BR	40000KP	40MP	400KG
	8000#	–	–	–	–
	–	600BR	60000KP	60MP	600KG
	10000#	–	–	–	–
	15000#	1000BR	100000KP	100MP	1000KG
	20000#	–	–	–	–

E2F Explosion-Proof Pressure Transducer For Hydrogen Applications

Ordering Code	Example:	E2F	B	3	C	F02	42	CF	X	10	F	100#	-XNH
Model													
E2F - Flame proof		E2F											
Sensor Materials - See Table 2 on page 4 for more options													
B - 316L Stainless steel			B										
D - A286 Stainless steel													
Accuracy													
3 - 0.25% span				3									
5 - 0.50% span													
7 - 1.00% span													
Calibration Chart													
N - Without calibration chart													
C - With calibration chart					C								
Pressure Connections - See Table 3 on page 5 for more options													
F02 - (¼ NPT Female)						F02							
Output Type - Note: Consult factory for additional outputs													
05 - 0-5 Vdc (not available with X1L variation)													
10 - 0-10 Vdc (not available with X1L variation)													
11 - 1-11 Vdc													
15 - 1-5 Vdc													
16 - 1-6 Vdc													
24 - 20-4 mA													
42 - 4-20 mA							42						
45 - 0.5-4.5 Vdc non-ratiometric													
00 - Custom													
Electrical Connections - See Table 4 on page 6 for more options													
CF - (½ NPT conduit w/flying leads)								CF					
Mating Connector													
X - Without mating connector									X				
Flying Lead Length													
Max cable length of 30 ft for outputs 05, 10, 11, 12, 13, 15, 16 and 45. Max cable length of 99 ft for outputs 24 and 42.													
XX - 01 to 99										10			
Unit of Length													
F - Feet											F		
M - Meter													
N - Inches													
Pressure Ranges - Coding example only													
100# - 100 psig												100#	
Options (if choosing an option(s) must include an "X")													-X__
NN - Paper tag													
NH - Stainless steel tag													NH
6B - Cleaned for oxygen service													
6W - Cleaned per ASME B40.100 Level IV, NOT marked for oxygen service													
1L - SIL certification for E2 series transducer													

Accessory**Part Number**

Offset and Span Adjustment Magnet

266A143-01

Accessories must be ordered separately

Contact Us

1.800.328.8258

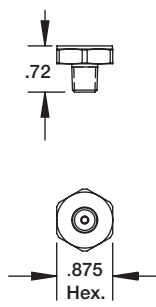
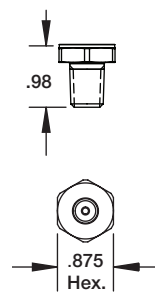
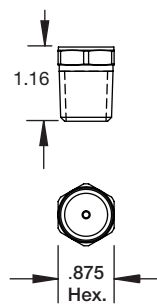
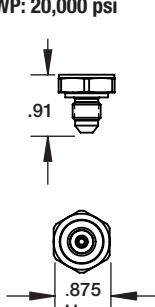
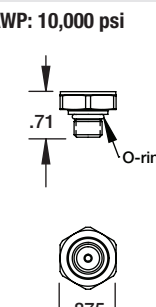
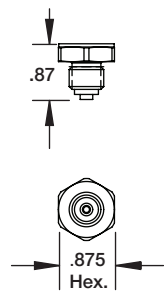
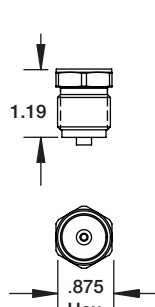
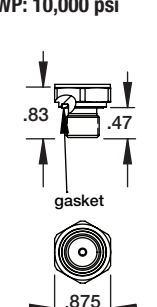
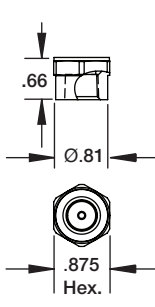
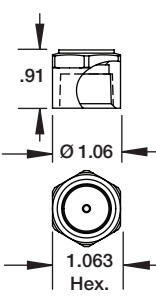
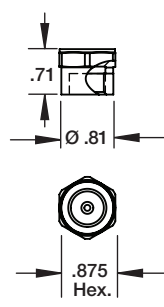
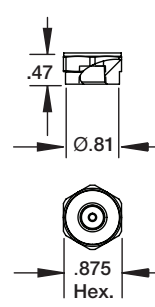
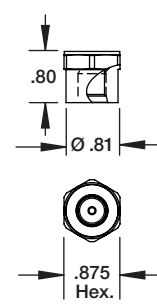
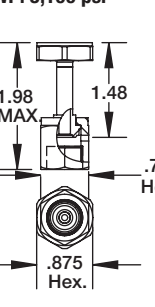
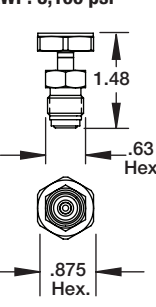
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E2F Explosion-Proof Pressure Transducer For Hydrogen Applications

Table 3 - Pressure Connection Dimensions

1/8 NPT Male Code: M01 MAWP: 20,000 psi 	1/4 NPT Male Code: M02 MAWP: 20,000 psi 	1/2 NPT Male Code: M04 MAWP: 10,000 psi 	7/16-20 UNJF-3A 37° Flare (SAE AS4395) Code: M76 MAWP: 20,000 psi 	7/16-20 UNJF-2A SAE-Male (SAE J1926 O-Ring Boss seal) Code: MEK MAWP: 10,000 psi 
G1/4 B-Male (EN837-1) Code: MG2 MAWP: 20,000 psi 	G1/2 B Male (EN837-1) Code: MG4 MAWP: 20,000 psi 	G1/4 A-MALE (stud end DIN 3852-E G1/4) Code: MGA MAWP: 10,000 psi 	1/4-18 NPT Female Code: F02 MAWP: 10,000 psi 	1/2-14 NPT Female Code: F04 MAWP: 5,000 psi 
9/16-18 UNF-2B Female Code: F09 MAWP: 25,000 psi 	1/8 -27 NPT Female Code: F01 MAWP: 10,000 psi 	7/16-20 UNF-2B SAEJ1926 Code: FRW MAWP: 9,100 psi 	9/16-18 Female Swivel Nut (compatible with 1/4 VCR® fitting) Code: FV2 MAWP: 5,100 psi 	9/16-18 Male Swivel Nut (compatible with 1/4 VCR® fitting) Code: MV2 MAWP: 5,100 psi 

E2F Explosion-Proof Pressure Transducer For Hydrogen Applications

Table 4 - Electrical Connection Dimensions

Maximum temperature range listed

**½ NPT Conduit
With Flying Leads**

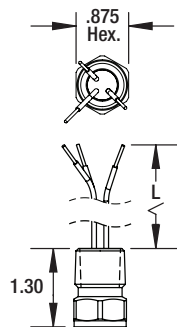
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 IP67 (NEMA 4X)

-40 °F to 176 °F (-40 °C to 80 °C)

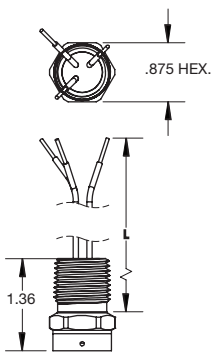
**M20 Conduit
With Flying Leads**

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 IP67 (NEMA 4X)

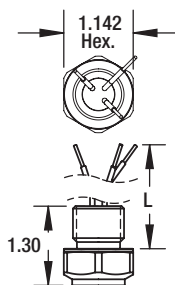
-40 °F to 176 °F (-40 °C to 80 °C)



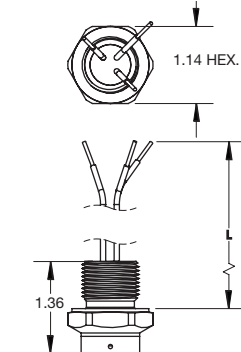
Unvented



Vented



Unvented

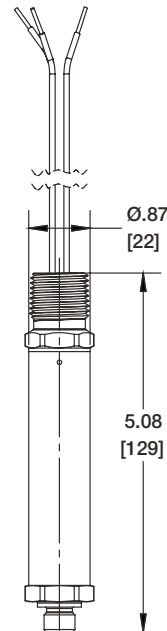


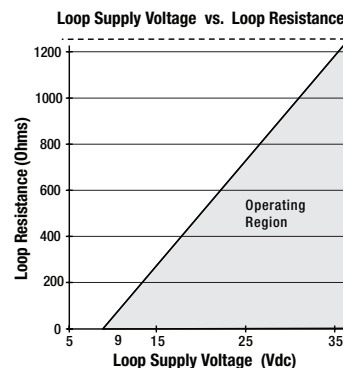
Vented

 Vented conduit supplied on units
 with pressure range ≤ 500#

Dimensions

For reference only, consult Ashcroft for specific dimensional drawings


Loop Supply Voltage Chart

 FOR TRANSMITTERS WITH 4-20 mA OUTPUT SIGNAL,
 THE MINIMUM VOLTAGE AT THE TERMINAL IS 9 VDC


$$V_{MIN} = 9V + (0.022^*A \times R_{LOOP}) \quad (*\text{includes a 10\% safety factor})$$

$$R_{LOOP} = R_{SENSE} + R_{WIRING}$$

$$R_{LOOP} = \text{Loop Resistance (Ohms)}$$

$$R_{SENSE} = \text{Sense Resistance (Ohms)}$$

$$R_{WIRING} = \text{Wire Resistance (Ohms)}$$

NOTE: See power supply requirement chart
 for maximum supply voltage limits