

Data Sheet

E2F Explosion-Proof Pressure Transducer

FEATURES

- Flameproof approval for explosion-proof, hazardous applications.
- FM, CSA, ATEX and IECEx approvals
- Ranges vac through 20,000 psi
- IP66/67 Ingress rating
- Wide selection of process connections available
- Customizable configurations
- External magnetic offset & span adjustment
- Barometric pressure ranges available (standard & custom ranges)
- SIL 3 capable

TYPICAL USES

- Oil field equipment
- Upstream oil & gas production
- Natural gas compression
- Alternative energy projects
- Engine monitoring
- Process & pneumatic sensing
- Hydrogen applications



E2F
Pressure Transducer



PERFORMANCE SPECIFICATIONS

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

Static Accuracy: ±0.25% of span, ±0.50% of span, ±1.0% of span, (0-1.5# Range only available in ±0.5% and 1.0% accuracy) Terminal Point Method includes: hysteresis, linearity, repeatability, offset and span

Stability: ±0.25% year at reference conditions

ENVIRONMENTAL SPECIFICATIONS

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

Shock: 80g, 6 ms, Haversine

Vibration: Random: 10g RMS 20-2000 Hz

Absolute Pressure Ranges: 0 to 500 psia

Proof Pressure: 1.2X - 2X (See Table 1 on page 2)

Burst Pressure: 3X - 8X (See Table 1 on page 2)

KEY BENEFITS

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

ELECTRICAL SPECIFICATIONS

Circuit Protection: Reverse polarity protected

Supply Voltage Output

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: ±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

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PHYSICAL SPECIFICATIONS

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

WETTED MATERIAL

Diaphragm:	Sensor:	Material:
	A	17-4PH® Stainless steel
	B	316L Stainless steel
	C	316L Stainless steel, liquid isolated
	D	A286

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)	±4kV/±8kV (Contact/Air)
	61000-4-3 (Radiated RF)	10 V/m to 1GHz, 3 V/m to 2GHz, 1 V/m to 2.7GHz
	61000-4-4 (EFT/Burst)	±1kV (5/50ns, 5kHz)
	61000-4-5 (Surge)	±1kV, Earth to Shield over all I/O lines
	61000-4-6 (Conducted RF)	3V (0.15 to 80MHz)
	61000-4-8 (Line Freq. Magnetic)	30A/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	A Sensor - 17-4PH® SS		B Sensor - 316L SS		C Sensor - 316L SS ISO		D Sensor - A286	
	Proof	Burst	Proof	Burst	Proof	Burst	Proof	Burst
(psi)								
1.5					3.3X	5X		
5					3X	5X		
10					2X	5X		
15					2X	5X		
30					2X	5X		
45	1.9X	8X	1.4X	8X	3.1X	5X		
50	2.9X	8X	2.2X	8X	2.8X	5X		
60	2.4X	8X	1.8X	8X	2.3X	5X		
75	1.9X	8X	1.5X	8X	1.9X	5X		
100	2X	8X	1.5X	8X	3.0X	5X		
150	2X	8X	1.5X	8X	2X	4X		
200	2X	8X	1.5X	8X	3.0X	3X		
300	1.9X	8X	1.5X	8X	2X	3X		
500	2X	8X	1.2X	5X	2X	3X		
750	1.9X	8X	1.2X	5X				
1000	2X	8X	1.2X	5X				
1500	1.9X	8X	1.2X	5X				
2000	2X	8X	1.2X	5X				
3000	1.9X	5X	1.2X	5X				
5000	1.5X	5X	1.2X	5X			2.4X	5X
7500	1.5X	3X					1.6X	5X
10000	1.2X	3X					1.2X	5X
15000	1.7X	3X					1.7X	5X
20000	1.3X	3X					1.3X	5X
(Compound)								
VAC#					2X	5X		
V&15#					2X	5X		
V&30#					2X	5X		
V&45#	2X	8X	1.5X	8X	3X	7.7X		
V&60#	2X	8X	1.5X	8X	2X	5X		
V&100#	2X	8X	1.5X	8X	3.3X	6X		
V&150#	2X	8X	1.5X	8X	2X	4X		
V&200#	2X	8X	1.5X	8X	3X	4.5X		
V&300#	2X	8X	1.5X	8X	2X	3X		
(psia)								
15					2X	5X		
30					2X	5X		
70					2X	5X		
150					2X	4X		
300					2X	3X		
500					2X	3X		

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E2F Explosion-Proof Pressure Transducer

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													
A - 17-4PH® Stainless steel													
B - 316L Stainless steel			B										
C - 316L Stainless steel (liquid isolated)													
D - A286													
Accuracy													
3 - 0.25% span (not available with 1.5 psi range)				3									
5 - 0.50% span													
7 - 1.00% span													
Calibration Chart													
N - Without calibration chart													
C - With Traceable calibration certificate					C								
Pressure Connections - See Table 3 on page 5 for more options													
F02 - (¼ NPT Female)					F02								
Output Type - 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				
Cable Length													
Max cable length of 30ft for outputs 05, 10, 11, 12, 13, 15, 16 and 45. Max cable length of 99ft for outputs 24 and 42													
00 - No cable													
XX - 01 to 99										10			
Unit of Length													
F - Feet											F		
M - Meter													
N - Inches													
0 - No cable													
Pressure Ranges - Coding example only, see Table 5 on page 7 for more options													
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 to 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	

E2F Explosion-Proof Pressure Transducer

TABLE 2 - SENSOR PRESSURE RANGE

psi	Sensor Material				bar	Sensor Material				inHg	Sensor Material			
	A 17-4PH® SS	B 316L SS	C 316 ISO	D A286		A 17-4PH® SS	B 316L SS	C 316 ISO	D A286		A 17-4PH® SS	B 316L SS	C 316 ISO	D A286
1.5#			•											
5#			•		400MB			•		10IM		•		
10#			•		600MB			•		20IM		•		
15#			•		1BR			•		30IM		•		
30#	•	•	•		1.6BR	•	•	•		50IM	•	•	•	
45#	•	•	•		2BR	•	•	•		100IM	•	•	•	
50#	•	•	•		2.5BR	•	•	•		200IM	•	•	•	
60#	•	•	•		4BR	•	•	•		300IM	•	•	•	
75#	•	•	•		6BR	•	•	•		500IM	•	•	•	
100#	•	•	•		10BR	•	•	•		1000IM	•	•	•	
150#	•	•	•		16BR	•	•	•		VACIM		•		
200#	•	•	•		20BR	•	•	•		V&30IM		•		
250#	•	•	•		25BR	•	•	•		V&60IM	•	•	•	
300#	•	•	•		40BR	•	•	•		V&100IM	•	•	•	
500#	•	•	•		60BR	•	•	•		V&200IM	•	•	•	
750#	•	•	•		100BR	•	•	•		30IMA		•		
1000#	•	•	•		160BR	•	•	•		50IMA		•		
1500#	•	•	•		200BR	•	•	•		100IMA		•		
2000#	•	•	•		250BR	•	•	•	•	200IMA		•		
2500#	•	•	•		400BR	•	•	•	•	300IMA		•		
3000#	•	•	•		600BR	•	•	•	•	500IMA		•		
5000#	•	•	•	•	1000BR	•	•	•	•	1000IMA		•		
7500#	•	•	•	•	1400BR	•	•	•	•	20&32IMA		•		
10000#	•	•	•	•	VACBR	•	•	•	•	26&32IMA		•		
15000#	•	•	•	•	V&1BR	•	•	•	•	700&1100MBA		•		
20000#	•	•	•	•	V&1.6BR	•	•	•	•	900&1100MBA		•		
VAC#			•		V&2BR	•	•	•						
V&15#			•		V&4BR	•	•	•						
V&30#	•	•	•		V&6BR	•	•	•						
V&45#	•	•	•		1BRA			•						
V&60#	•	•	•		1.6BRA			•						
V&100#	•	•	•		2BRA			•						
V&150#	•	•	•		2.5BRA			•						
V&200#	•	•	•		4BRA			•						
V&300#	•	•	•		6BRA			•						
15#A			•		10BRA			•						
30#A			•		16BRA			•						
50#A			•		20BRA			•						
100#A			•		25BRA			•						
120#A			•											
200#A			•											
300#A			•											
500#A			•											

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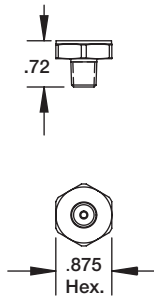
E2F Explosion-Proof Pressure Transducer

TABLE 3 - PRESSURE CONNECTION DIMENSIONS

1/8 NPT Male

Code: M01

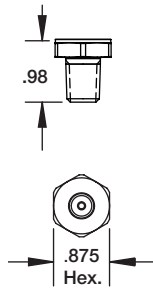
MAWP: 20,000 psi



1/4 NPT Male

Code: M02

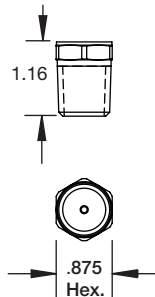
MAWP: 20,000 psi



1/2 NPT Male

Code: M04

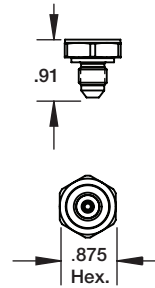
MAWP: 10,000 psi



7/16-20 UNJF-3A 37° Flare (SAE AS4395)

Code: M76

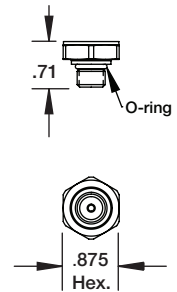
MAWP: 20,000 psi



7/16-20 UNJF-2A SAE-Male (SAE J1926 O-Ring Boss seal)

Code: MEK

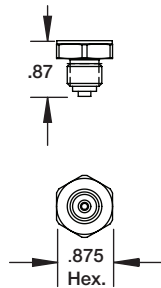
MAWP: 10,000 psi



G1/4 B-Male (EN837-1)

Code: MG2

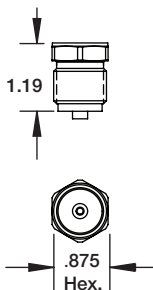
MAWP: 20,000 psi



G1/2 B Male (EN837-1)

Code: MG4

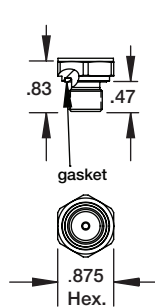
MAWP: 20,000 psi



G1/4 A-MALE (stud end DIN 3852-E G1/4)

Code: MGA

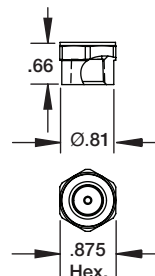
MAWP: 10,000 psi



1/4-18 NPT Female

Code: F02

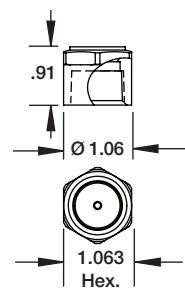
MAWP: 10,000 psi



1/2-14 NPT Female

Code: F04

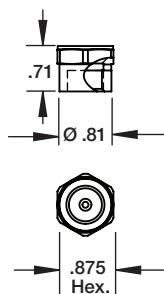
MAWP: 5,000 psi



3/16-18 UNF-2B Female

Code: F09

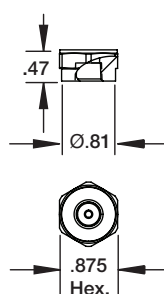
MAWP: 25,000 psi



1/8-27 NPT Female

Code: F01

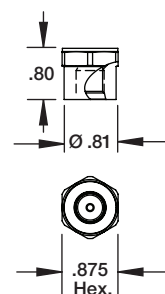
MAWP: 10,000 psi



7/16-20 UNF-2B SAEJ1926

Code: FRW

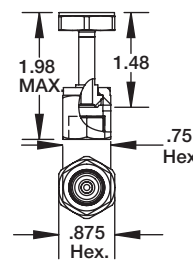
MAWP: 9,100 psi



1/4" VCR® gland with 3/16-18 Female Swivel Nut

Code: FV2

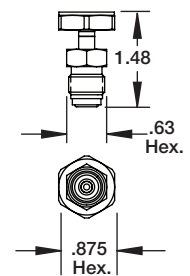
MAWP: 5,100 psi



1/4" VCR® gland with 3/16-18 Male Swivel Nut

Code: MV2

MAWP: 5,100 psi



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TABLE 4 - ELECTRICAL CONNECTION DIMENSIONS

Maximum temperature range listed

**½ NPT Conduit
With Flying Leads**

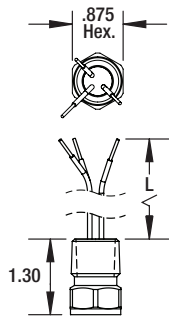
**Code: CF
IP67 (NEMA 4X)**

-40 °F to 176 °F (-40 °C to 80 °C)

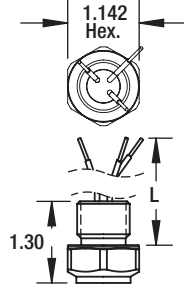
**M20 Conduit
With Flying Leads**

**Code: MF
IP67 (NEMA 4X)**

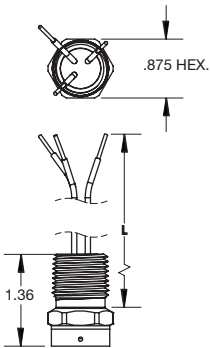
-40 °F to 176 °F (-40 °C to 80 °C)



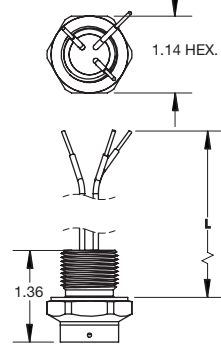
Unvented



Unvented



Vented



Vented

Vented conduit supplied on units
with pressure range ≤ to 500#

TABLE 5 - PRESSURE RANGES

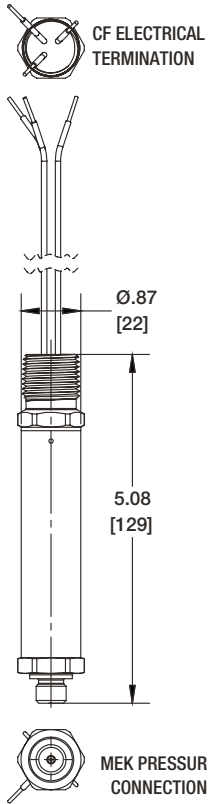
	PSI	bar	inHg
Vac.	VAC#	VACBR	VACIM
	V&15#	V&1BR	V&30IM
	—	V&1.6BR	—
	V&30#	V&2BR	V&60IM
	V&45#	—	V&100IM
	V&60#	V&4BR	—
	—	V&6BR	—
	V&100#	—	V&200IM
	V&150#	—	—
	V&200#	—	—
Compound	V&300#	—	—
	1.5#	100MB	3IM
	5#	400MB	10IM
	—	600MB	—
	10#	—	20IM
	15#	1BR	30IM
	—	1.6BR	50IM
	30#	2BR	—
	—	2.5BR	—
	45#	—	—
Positive Pressure (psig)	50#	—	100IM
	60#	4BR	—
	75#	—	—
	—	6BR	—
	100#	—	200IM
	150#	10BR	300IM
	200#	—	—
	—	16BR	—
	250#	—	500IM
	300#	20BR	—
Absolute Pressure (psia)	—	25BR	—
	500#	—	1000IM
	—	40BR	—
	750#	—	—
	—	60BR	—
	1000#	—	—
	1500#	100BR	—
	2000#	160BR	—
	—	200BR	—
	2500#	—	—
Compound	3000#	—	—
	—	250BR	—
	5000#	—	—
	—	400BR	—
	7500#	—	—
	—	600BR	—
	10000#	—	—
	15000#	1000BR	—
	20000#	—	—
	Absolute Pressure (psia)	15#A	1BRA
—		1.6BRA	50IMA
30#A		2BRA	—
—		2.5BRA	—
50#A		—	100IMA
—		4BRA	—
—		6BRA	—
100#A		—	200IMA
—		10BRA	300IMA
200#A		—	—
Compound	—	16BRA	500IMA
	300#A	20BRA	1000IMA
	500#A	25BRA	—

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E2F Explosion-Proof Pressure Transducer

DIMENSIONS

For reference only, consult Ashcroft for specific dimensional drawings



TruAccuracy

What Does It Mean?

Ashcroft's TruAccuracy™ specification is exclusively based on terminal point methodology instead of statistically derived schemes like 'best fit straight line'.

TruAccuracy™ means the Ashcroft E2F has ±0.25% accuracy out of the box. Zero and span setting errors are already included in the ±0.25% accuracy spec.

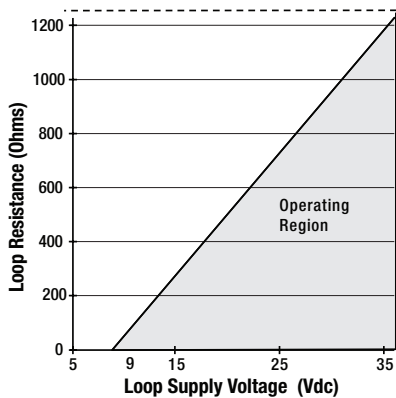
The E2F is ready to be installed with no additional calibration adjustments required.

A unit from another manufacturer advertised as ±0.25% best fit straight line may actually be a ±1.25% to ±2.25% device. Using best fit straight line method, the accuracy spec does not include zero and span setting errors, which can be as much as ±1.00% each.

LOOP SUPPLY VOLTAGE CHART

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

Loop Supply Voltage vs. Loop Resistance



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

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

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

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

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

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