

E2F Explosion-Proof Pressure Transducer

FEATURES

- Flameproof approval for explosion-proof, hazardous application
- FM, CSA, ATEX and IECEx approvals
- Ranges vac through 1400 bar
- IP66/67 Ingress rating
- Wide selection of electrical & process connection 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



E2S
Pressure Transducer



PERFORMANCE SPECIFICATIONS

Reference Temperature:	21 °C ±2 °C
Static Accuracy:	±0.25 % of span, ±0.50 % of span, ±1.0 % of span (0...100 mbar range only available in ±0.50 % and ±1.0 % accuracy) Terminal Point Method includes: hysteresis, linearity, repeatability, offset and span
Stability:	≤±0.25 % of span/year at reference conditions

ENVIRONMENTAL SPECIFICATIONS

Thermal Coefficients:	Offset: ±0,09 % / 10 K (-40 °C to 125 °C) Span: ±0,09 % / 10 K (-40 °C to 125 °C)
Temperature Limits:	Storage: -50 °C to 125 °C Operating: -40 °C to 80 °C Media: -40 °C to 80 °C
Humidity:	0-100 % (non-condensing)

FUNCTIONAL SPECIFICATIONS

Response Time (Output):	4 ms
Gauge/Compound Pressure Ranges:	-1 to 1400 bar Vacuum to 20,000 psi (see Table 6 at page 7)
Shock:	80 g, 6 ms, Haversine
Vibration:	Random: 10 g RMS 20-2000 Hz
Absolute Pressure Ranges:	0 to 1 up to 0 to 35 bar absolute 0 to 500 psia
Pressure:	
Proof:	1,2x to 2x
Burst:	3x to 8x (see Table 1 at page 2)

KEY BENEFITS

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

ELECTRICAL SPECIFICATIONS

Circuit Protection:	Reverse polarity protected	
Output Signal:	Supply Voltage: (unregulated)	
	Min.	Max
0-5 Vdc (3 Wire)	9 Vdc	36 Vdc
1-5 Vdc (3 Wire)	9 Vdc	36 Vdc
1-6 Vdc (3 Wire)	9 Vdc	36 Vdc
0-10 Vdc (3 Wire)	14 Vdc	36 Vdc
1-11 Vdc (3 Wire)	14 Vdc	36 Vdc
0,1-5 Vdc (3 Wire)	9 Vdc	36 Vdc
0,1-10 Vdc (3 Wire)	14 Vdc	36 Vdc
0,5-4,5 Vdc (3 Wire)	9 Vdc	36 Vdc
4-20 mA (2 Wire)	9 Vdc	36 Vdc
20-4 mA (2 Wire)	9 Vdc	36 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 (1.4404)
C 316L Stainless steel, liquid isolated (1.4404)
D A286

Process Connection: Stainless steel 316L (1.4404)

NON-WETTED MATERIAL

Housing: Stainless steel 316L (1.4404)

APPROVALS

EMC: EU Directive 2014/30/EU
CE Industrial EN 61326-1, EN 61326-2-3

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

RoHS: 2011/65/EU

Emissions: EN55011 (CISPR 11) Class A, Group 1
FCC (47 CFR 15)

HAZARDOUS AREA CERTIFICATIONS

Intrinsically Safe Installations

FM

Class I, Division 1, Group A, B, C, D T4 -40 °C < Ta < 80 °C
Class II, Division 1, Group E,F,G T4, -40 °C < Ta < 80 °C
Class III, T4, -40 °C < Ta < 80 °C

Class I, Zone I, AEx db IIC T4 Gb, -40 °C < Ta < 80 °C
Class II, Zone 21, AEx tb IIIC T4 Gb, -40 °C < Ta < 80 °C

CSA

Class 1, Division 1, Groups A, B, C, D T4
Class II, Division 1, Groups E, F and G T135°C
Class III, Division 1, T135°C
Ex db IIC T4 Ga -40°C < Ta < 80°C
Ex tb IIC 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		B Sensor - 316 L		C Sensor - 316L 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	1.9x	8x	1.5x	8x	2x	3x		
300	1.9x	8x	1.5x	8x	3.0x	3x		
500	2x	8x	1.2x	5x	3x	4x		
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	7.7		
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		



E2F Explosion-Proof Pressure Transducer

ORDERING CODE		EXAMPLE:	E2F	B	3	C	MG4	42	DA	M	10	M	100BR	XNH
Model			E2F											
E2F		E2F Pressure Transducer; Flame proof												
Sensor Materials - See Table 3 on page 4 for compatible ranges														
A	17-4PH Stainless steel			B										
B	316L Stainless steel (1.4404)													
C	316L Stainless steel (1.4404); liquid isolated													
D	A286													
Accuracy														
3	0,25 % of span (not available for pressure range 0 ... 100 mbar)				3									
5	0,50 % of span													
7	1,00 % of span													
Calibration Chart														
N	Without calibration certificate													
C	Traceable calibration certificate					C								
Pressure Connections - See Table 3 on page 5 for more connection styles														
MG4	G 1/2 B Male (EN837-1)						MG4							
Output Type														
05	0-5 Vdc													
10	0-10 Vdc													
11	1-11 Vdc													
12	1-10 Vdc													
13	0.1-5 Vdc													
15	1-5 Vdc													
16	1-6 Vdc													
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														
DA	Hirschmann angle connector acc. EN175301-803 Form A								DA					
Mating Connector														
M	With mating connector									M				
X	Without mating connector													
Cable Length														
Max cable length of 9 m (30ft) for outputs 05, 10, 11, 12, 13, 15, 16 and 45. Max cable length of 30 m (99ft) for outputs 24 and 42														
00	No cable													
XX	01 to 99										10			
Unit of Length														
F	Feet											M		
M	Meter													
N	Inches													
0	No cables													
Pressure Ranges - Coding example only, see Table 5 on page 7 for more options														
100BR	100 bar												100BR	
Options (If choosing an option(s) must include a "X")														
Cleaning														
6B	Cleaned for oxygen application (not available with liquid isolated sensor)													
6W	Cleaned for oxidizing processes other than Oxygen													
Marking/Tagging														
NH	Stainless steel tag wired (Information is required by the customer)													XNH
NN	Paper tag (Information is required by the customer)													
Others														
1L	SIL certification for E2 series Transducer													
Testing/Certificates														
CD2	Certificate according to EN 10204 2.2													



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ACCESSORY

Offset and Span Adjustment Magnet

266A143-01

Accessories must be ordered separately

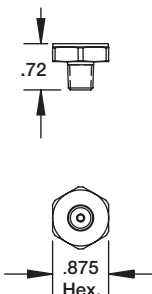
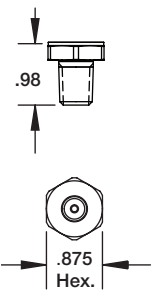
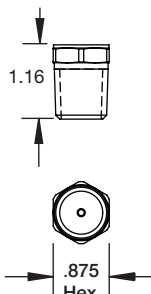
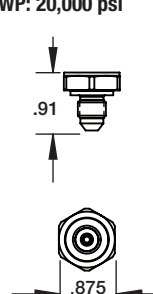
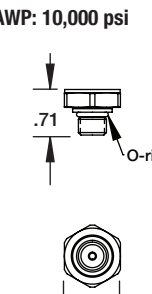
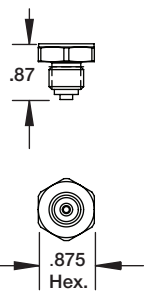
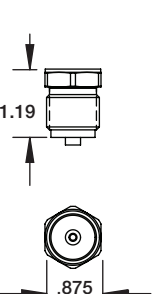
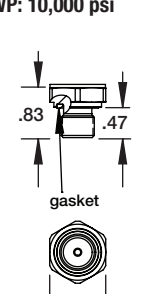
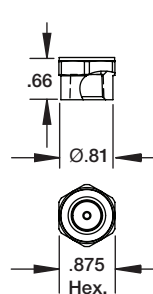
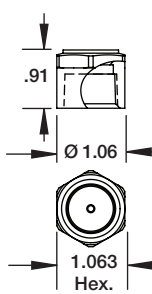
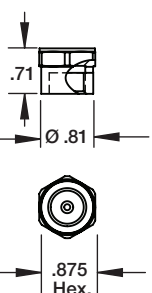
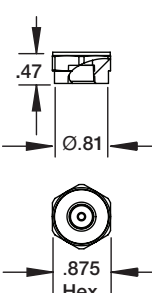
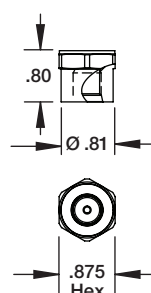
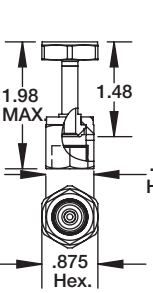
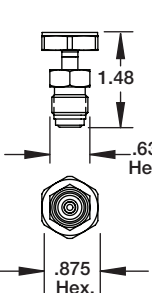
TABLE 2 - SENSOR PRESSURE RANGE

psi	Sensor Material				bar	Sensor Material				inHg	Sensor Material			
	A 17-PH	B 316L	C 316 ISO	D A286		A 17-PH	B 316L	C 316 ISO	D A286		A 17-PH	B 316L	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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TABLE 3 - PRESSURE CONNECTION DIMENSIONS IN MM [INCH]

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 	1/4" VCR® gland with 9/16-18 Female Swivel Nut Code: FV2 MAWP: 5,100 psi 	1/4" VCR® gland with 9/16-18 Male Swivel Nut Code: MV2 MAWP: 5,100 psi 

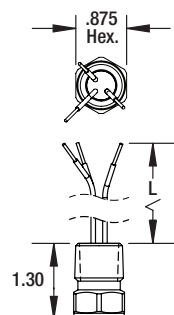


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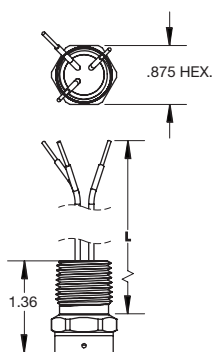
½ NPT Conduit With Flying Leads

Code: CF
IP67 (NEMA 4X)

-40 °C to 80 °C



Unvented

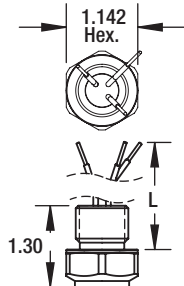


Vented

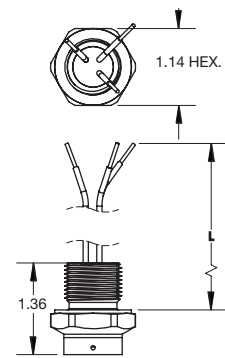
M20 Conduit With Flying Leads

Code: MF
IP67 (NEMA 4X)

-40 °C to 80 °C



Unvented



Vented

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

TABLE 5 - PRESSURE RANGES

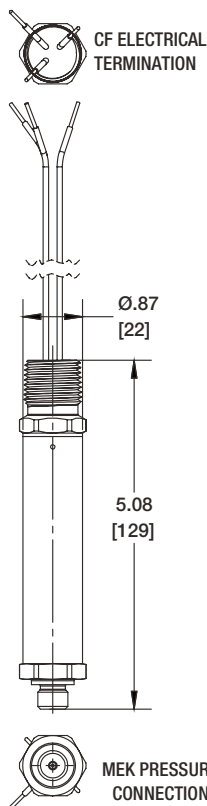
Vac.	PSI	bar	inHg
VAC#	VACBR	VACIM	VACIM
V&15#	V&1BR	V&30IM	V&30IM
—	V&1.6BR	—	—
V&30#	V&2BR	V&60IM	V&60IM
V&45#	—	V&100IM	V&100IM
V&60#	V&4BR	—	—
—	V&6BR	—	—
V&100#	—	V&200IM	V&200IM
V&150#	—	—	—
V&200#	—	—	—
V&300#	—	—	—
1.5#	100MB	3IM	3IM
5#	400MB	10IM	10IM
—	600MB	—	—
10#	—	20IM	20IM
15#	1BR	30IM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



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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'.

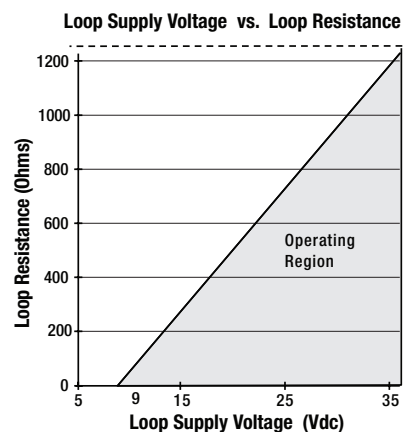
TruAccuracy™ means the Ashcroft E2F has $\pm 0.25\%$ accuracy out of the box. Zero and span setting errors are already included in the $\pm 0.25\%$ accuracy spec.

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

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

LOOP SUPPLY VOLTAGE CHART

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



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

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

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

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

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

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

