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E2X-E2F Explosion-Proof Pressure Transducer

FEATURES

- E2X- Flameproof, intrinsically safe and non-incendive approval for explosion-proof/hazardous applications.
- E2F- Flameproof approval for explosion-proof/ hazardous applications.
- FM, 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

TYPICAL USES

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

E2X
Pressure Transducer

FM APPROVED

KEY BENEFITS

- **Highly configurable**
- **Easy calibration of offset and span**

PERFORMANCE SPECIFICATIONS

Reference Temperature:	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: ±0.009% /°C from -40°C to 80°C Span: ±0.009% /°C from -40°C to 80°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:	1.2× - 2× (See Table 1 on page 2)
Burst Pressure:	3× - 8× (See Table 1 on page 2)

ELECTRICAL SPECIFICATIONS

Circuit Protection:	Reverse polarity protected

EXPLOSION PROOF INSTALLATIONS
Supply Voltage Output
9-36Vdc: 4-20mA, 20-4mA (2-wire), 0-5Vdc, 1-5Vdc, 1-6Vdc, 0.1-5Vdc, 0.5-4.5Vdc
14-36Vdc: 0-10Vdc, 1-11Vdc, 0.1-10Vdc
INTRINSICALLY SAFE INSTALLATIONS
Supply Voltage Output
9-28Vdc: 0-5Vdc, 1-5Vdc, 1-6Vdc, 0-10Vdc, 1-11Vdc, 0.1-5Vdc, 0.1-10Vdc, 0.5-4.5Vdc
9-30Vdc: 4-20mA, 20-4mA (2-wire)
NON-INCENDIVE/NON-SPARKING INSTALLATIONS
Supply Voltage Output
9-28Vdc: 0-5Vdc, 1-5Vdc, 1-6Vdc, 0-10Vdc, 1-11Vdc, 0.1-5Vdc, 0.1-10Vdc, 0.5-4.5Vdc
9-30Vdc: 4-20mA, 20-4mA (2-wire)

Adjustability:	±5% of span non-interactive offset & span
Supply Current:	<8 mA (Vout)
Curent 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/Flame/Dust Ignition Proof Installations (E2X - E2F) -
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

ATEX/IECEx:
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

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

Intrinsically Safe Installations (E2X only) –
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

ATEX/IECEx:
Class I, Zone 0, AEx ia IIC T4 Ga -40°C < Ta < 80°C
Class II, Zone 20, AEx ia IIIC T135°C Da -40°C<Ta<80°C
Class I, Zone 2, AEx ic IIC T4 Gc -40°C < Ta < 80°C
Class II, Zone 22 AEx ic IIIC T135°C Dc -40°C<Ta<40°C

II 1 G Ex ia IIC T4 Ga -40°C < Ta < 80°C
II 1 D Ex ia IIIC T135°C Da -40°C<Ta<80°C
II 3 G Ex ic IIC T4 Gc -40°C < Ta < 80°C
II 3 D Ex ic IIIC T135°C Dc -40°C<Ta<40°C

Non-Incendive (E2X only) –
FM:
Class I, Division 2, Group A, B, C, D T4 -40°C < Ta < 80°C
Class II, Division 2, Group E, F, G T4 -40°C < Ta < 80°C
Class III, T4 -40°C < Ta < 80°**C**

TABLE 1: PROOF & BURST PRESSURE MULTIPLIERS

	A Sensor - 17-4PH SS		B Sensor - 316L SS		C Sensor - 316L SS ISO		D Sensor - A286	
Sensor Range	**Proof**	**Burst**	**Proof**	**Burst**	**Proof**	**Burst**	**Proof**	**Burst**
(psi)								
1.5					3.3x	5x		
5					3×	5×		
10					2×	5×		
15					2×	5×		
30					2×	5×		
45	2×	8×	1.5×	8×	2×	5×		
50	2×	8×	1.5×	8×	2×	5×		
60	2×	8×	1.5×	8×	2×	5×		
75	2×	8×	1.5×	8×	2×	5×		
100	2×	8×	1.5×	8×	2×	5×		
150	2×	8×	1.5×	8×	2×	4×		
200	2×	8×	1.5×	8×	2×	3×		
300	2×	8×	1.5×	8×	2×	3×		
500	2×	8×	1.2×	5×	2×	3×		
750	2×	8×	1.2×	5×				
1000	2×	8×	1.2×	5×				
1500	2×	8×	1.2×	5×				
2000	2×	8×	1.2×	5×				
3000	2×	5×	1.2×	5×				
5000	1.5×	5×	1.2×	5×			1.5×	5×
7500	1.5×	3×					1.5×	5×
10000	1.2×	3×					1.2×	5×
15000	1.2×	3×					1.2×	5×
20000	1.2×	3×					1.2×	5×
(Compound)								
VAC#					2×	5×		
V&15#					2×	5×		
V&30#					2×	5×		
V&45#	2×	8×	1.5×	8×	3x	7.7x		
V&60#	2×	8×	1.5×	8×	2×	5×		
V&100#	2×	8×	1.5×	8×	3.3x	6x		
V&150#	2×	8×	1.5×	8×	2×	4×		
V&200#	2×	8×	1.5×	8×	3x	4.5x		
V&300#	2×	8×	1.5×	8×	2×	3×		
(psia)								
15					2×	5×		
30					2×	5×		
70					2×	5×		
150					2×	4×		
300					2×	3×		
500					2×	3×		

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E2X-E2F Explosion-Proof Pressure Transducer

ORDERING CODE Example:	E2X	B	3	C	F02	42	CC	X	10	F	100#	-XNH
Model												
E2X - Explosion proof	E2X											
E2F - Flame proof												
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 calibration chart				C								
Pressure Connections - See Table 3 on page 5 for more options												
F02 - (¼ NPT Female)					F02							
Output Type												
05 - 0-5 Vdc												
10 - 0-10 Vdc												
11 - 1-11 Vdc												
12 - 0.1-10 Vdc												
13 - 0.1-5 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												
CC - (½ NPT conduit w/cable)							CC					
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

Accessory	Part Number
Offset and Span Adjustment Magnet	266A143-01
Accessories must be ordered separately	

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TABLE 2 - SENSOR PRESSURE RANGE

psi	Sensor Material				bar	Sensor Material				inHg	Sensor Material			
	A 17-PH SS	B 316L SS	C 316 ISO	D A286		A 17-PH SS	B 316L SS	C 316 ISO	D A286		A 17-PH 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#	•			•	VACBR			•						
10000#	•			•	V&1BR			•						
15000#	•			•	V&1.6BR	•	•	•						
20000#	•			•	V&2BR	•	•	•						
VAC#			•		V&4BR	•	•	•						
V&15#			•		V&6BR	•	•	•						
V&30#	•	•	•		1BRA			•						
V&45#	•	•	•		1.6BRA			•						
V&60#	•	•	•		2BRA			•						
V&100#	•	•	•		2.5BRA			•						
V&150#	•	•	•		4BRA			•						
V&200#	•	•	•		6BRA			•						
V&300#	•	•	•		10BRA			•						
15#A			•		16BRA			•						
30#A			•		20BRA			•						
50#A			•		25BRA			•						
100#A			•											
120#A			•											
200#A			•											
300#A			•											
500#A			•											

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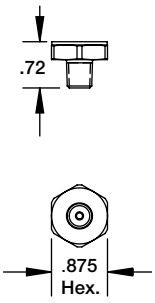
TABLE 3 - PRESSURE CONNECTION DIMENSIONS

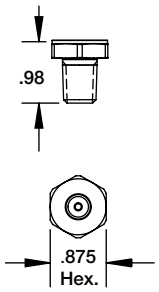
⅛ NPT Male
Code: M01

MAWP: 20,000 psi



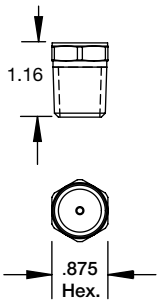
¼ NPT Male
Code: M02

MAWP: 20,000 psi



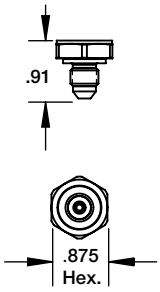
½ NPT Male
Code: M04

MAWP: 10,000 psi



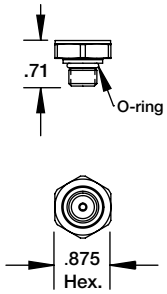
7/16-20 UNJF-3A 37° Flare (SAE AS4395)
Code: M76

MAWP: 20,000 psi



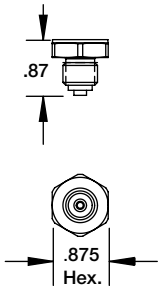
7/16-20 UNJF-2A SAE-Male (SAE J1926 O-Ring Boss seal)
Code: MEK

MAWP: 10,000 psi



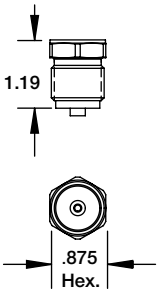
G¼ B-Male (EN837-1)
Code: MG2

MAWP: 20,000 psi



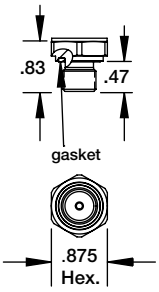
G½ B Male (EN837-1)
Code: MG4

MAWP: 20,000 psi



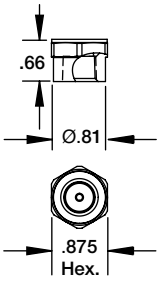
G¼ A-MALE (stud end DIN 3852-E G¼)
Code: MGA

MAWP: 10,000 psi



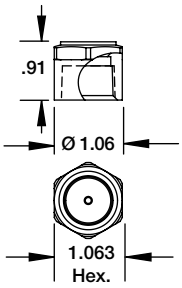
¼-18 NPT Female
Code: F02

MAWP: 10,000 psi



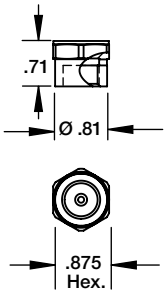
½-14 NPT Female
Code: F04

MAWP: 5,000 psi



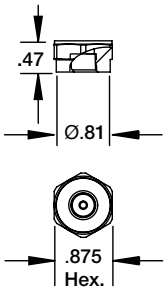
9/16-18 UNF-2B Female
Code: F09

MAWP: 25,000 psi



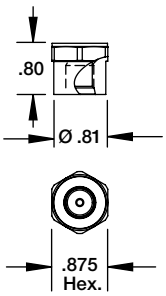
⅛ -27 NPT Female
Code: F01

MAWP: 10,000 psi



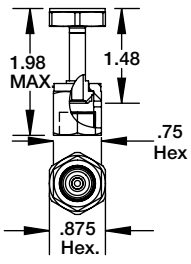
7/16-20 UNF-2B SAEJ1926
Code: FRW

MAWP: 9,100 psi



¼˝ VCR gland with 9/16-18 Female Swivel Nut
Code: FV2

MAWP: 5,100 psi



¼˝ VCR gland with 9/16-18 Male Swivel Nut
Code: MV2

MAWP: 5,100 psi

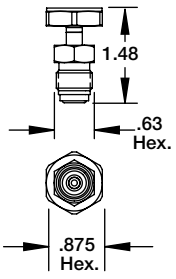


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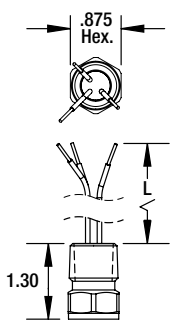
TABLE 4 - ELECTRICAL CONNECTION DIMENSIONS

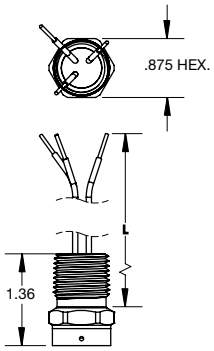
Maximum temperature range listed

½ NPT Conduit With Flying Leads

Code: CF
IP67 (NEMA 4X)
-40°F to 176°F (-40°C to 80°C)



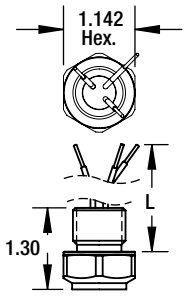
Unvented



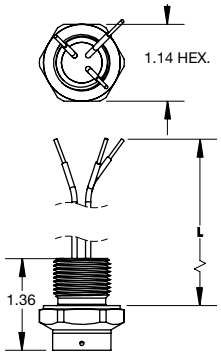
Vented

M20 Conduit With Flying Leads

Code: MF
IP67 (NEMA 4X)
-40°F to 176°F (-40°C to 80°C)



Unvented



Vented

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

TABLE 5 - PRESSURE RANGES

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

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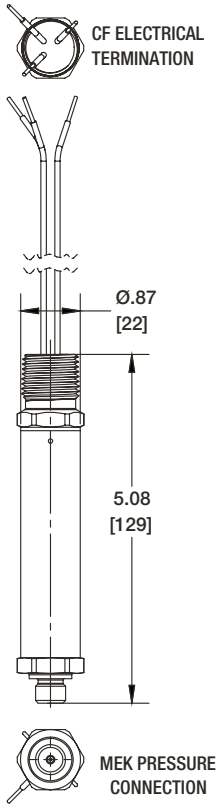
E2X-E2F Explosion-Proof Pressure Transducer

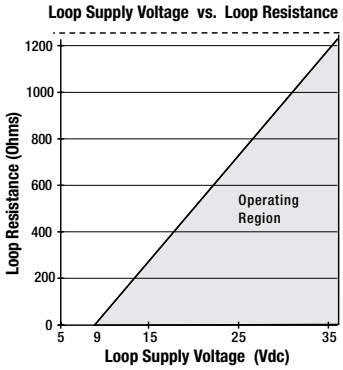
DIMENSIONS

For reference only, consult Ashcroft for specific dimensional drawings



LOOP SUPPLY VOLTAGE CHART

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



V_{MIN} = 9V + (0.022*A x R_{LOOP}) (*includes a 10% safety factor)
R_{LOOP} = R_{SENSE} + R_{WIRING}
R_{LOOP} = Loop Resistance (Ohms)
R_{SENSE} = Sense Resistance (Ohms)
R_{WIRING} = Wire Resistance (Ohms)

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

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