

## Data Sheet

# 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
- Barometric pressure ranges available (standard & custom ranges)

### TYPICAL USES

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

### 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)



**E2X**  
Pressure Transducer



### KEY BENEFITS

- Highly configurable
- Easy calibration of offset and span

### 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)

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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## E2X-E2F Explosion-Proof Pressure Transducer

### 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 < 80°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 < 80°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

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
<b>(psi)</b>								
1.5					3.3x	5x		
5					3x	5x		
10					2x	5x		
15					2x	5x		
30					2x	5x		
45	2x	8x	1.5x	8x	2x	5x		
50	2x	8x	1.5x	8x	2x	5x		
60	2x	8x	1.5x	8x	2x	5x		
75	2x	8x	1.5x	8x	2x	5x		
100	2x	8x	1.5x	8x	2x	5x		
150	2x	8x	1.5x	8x	2x	4x		
200	2x	8x	1.5x	8x	2x	3x		
300	2x	8x	1.5x	8x	2x	3x		
500	2x	8x	1.2x	5x	2x	3x		
750	2x	8x	1.2x	5x				
1000	2x	8x	1.2x	5x				
1500	2x	8x	1.2x	5x				
2000	2x	8x	1.2x	5x				
3000	2x	5x	1.2x	5x				
5000	1.5x	5x	1.2x	5x			1.5x	5x
7500	1.5x	3x					1.5x	5x
10000	1.2x	3x					1.2x	5x
15000	1.2x	3x					1.2x	5x
20000	1.2x	3x					1.2x	5x
<b>(Compound)</b>								
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		
<b>(psia)</b>								
15					2x	5x		
30					2x	5x		
70					2x	5x		
150					2x	4x		
300					2x	3x		
500					2x	3x		

# Data Sheet

## E2X-E2F Explosion-Proof Pressure Transducer

ORDERING CODE	Example:	E2X	B	3	C	F02	42	CF	X	10	F	100#	-XNH
<b>Model</b>													
E2X - Explosion proof		E2X											
E2F - Flame proof													
<b>Sensor Materials - See Table 2 on page 4 for more options</b>													
A - 17-4PH Stainless steel													
B - 316L Stainless steel			B										
C - 316L Stainless steel (liquid isolated)													
D - A286													
<b>Accuracy</b>													
3 - 0.25% span (not available with 1.5 psi range)				3									
5 - 0.50% span													
7 - 1.00% span													
<b>Calibration Chart</b>													
N - Without calibration chart													
C - With calibration chart					C								
<b>Pressure Connections - See Table 3 on page 5 for more options</b>													
F02 - (¼ NPT Female)						F02							
<b>Output Type</b>													
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													
<b>Electrical Connections - See Table 4 on page 6 for more options</b>													
CF - (½ NPT conduit w/flying leads)								CF					
<b>Mating Connector</b>													
X - Without mating connector									X				
<b>Cable Length</b>													
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			
<b>Unit of Length</b>													
F - Feet											F		
M - Meter													
N - Inches													
0 - No cable													
<b>Pressure Ranges - Coding example only, see Table 5 on page 7 for more options</b>													
100# - 100 psig												100#	
<b>Options (if choosing an option(s) must include an "X")</b>													
NN - Paper tag													-X
NH - Stainless steel tag													NH

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

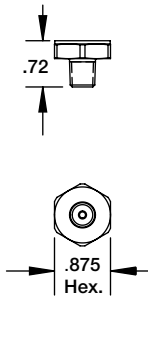
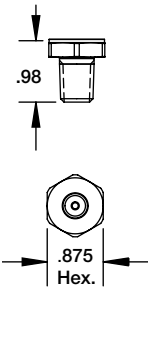
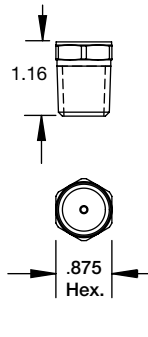
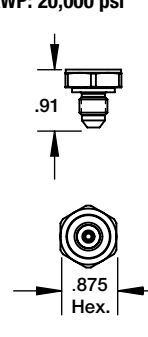
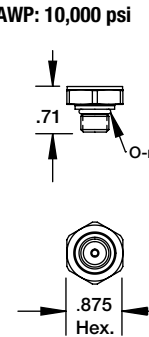
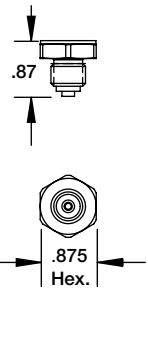
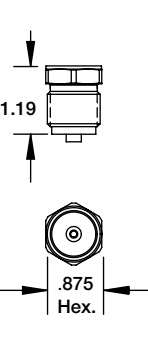
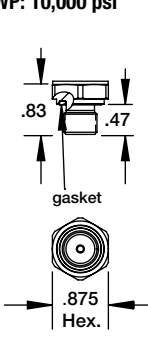
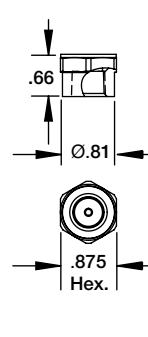
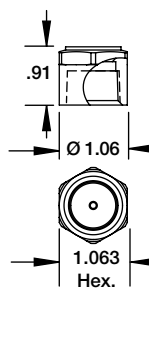
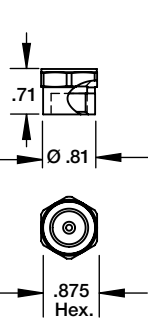
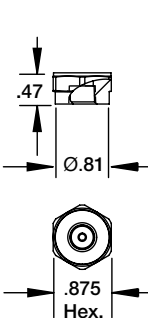
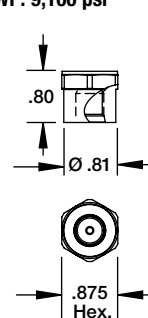
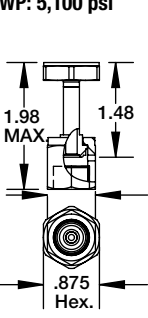
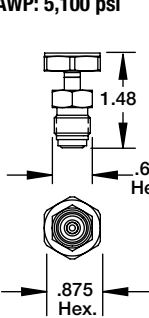
## E2X-E2F Explosion-Proof Pressure Transducer

**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#	•	•	•	•	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			•											

# E2X-E2F Explosion-Proof Pressure Transducer

**TABLE 3 - PRESSURE CONNECTION DIMENSIONS**

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

# Data Sheet

## E2X-E2F Explosion-Proof Pressure Transducer

**TABLE 4 - ELECTRICAL CONNECTION DIMENSIONS**

Maximum temperature range listed

**½ NPT Conduit  
With Flying Leads**

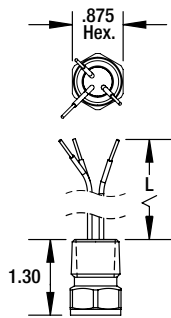
**Code: CF  
IP67 (NEMA 4X)**

**-40°F to 176°F (-40°C to 80°C)**

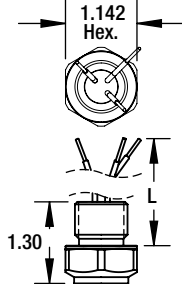
**M20 Conduit  
With Flying Leads**

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

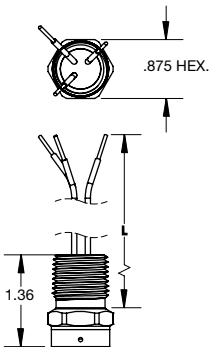
**-40°F to 176°F (-40°C to 80°C)**



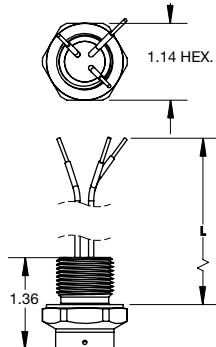
Unvented



Unvented



Vented



Vented

Vented conduit supplied on units  
with pressure range ≤ 500#

**TABLE 5 - PRESSURE RANGES**

Vac.	PSI	bar	inHg	
	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	—		

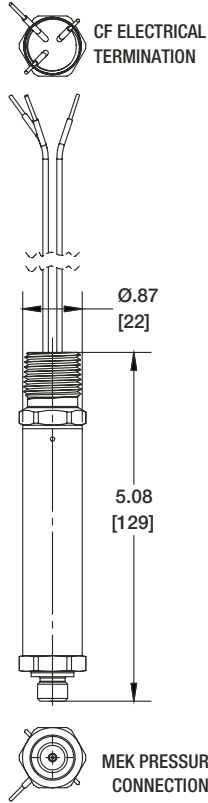


# Data Sheet

## E2X-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'.

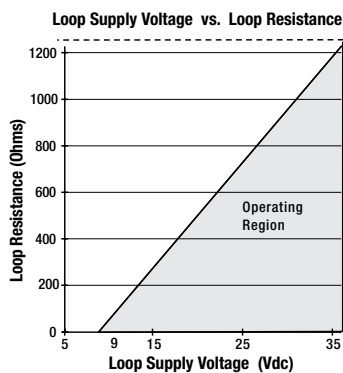
TruAccuracy™ means the Ashcroft E2X-E2F has ±0.25% accuracy out of the box. Zero and span setting errors are already included in the ±0.25% accuracy spec.

The E2X-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 4-20mA OUTPUT SIGNAL, THE MINIMUM VOLTAGE AT THE TERMINAL IS 9VDC



$V_{MIN} = 9V + (0.022 \cdot A \times R_{LOOP})$  (\*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