



**AccuSense™ Model ASM**  
**High Performance Pressure Transducer**

## Installation Guide

### Description

The AccuSense™ Model ASM pressure transducer is a high performance pressure transducer designed for accurate, reliable pressure measurements. It has a high level analog output signal, excellent stability, and secure calibration which makes it ideal for high performance industrial, laboratory, and engine test cell applications.

### 1.0 General information

Every Model ASM has been tested and calibrated before shipment. Specific performance specifications are shown on page 3 of this Guide. Setra Systems ASM pressure transducers sense gauge, absolute, or vacuum gauge pressure and convert this pressure difference to a proportional high level analog output. Voltage outputs of 0 to 5 VDC or 0 to 10 VDC, and current output of 4 to 20 mA are offered.

### 2.0 Electrical installation

#### 2.1 Media Compatibility

Model ASM transducers are designed for use with gases and liquids compatible with 17-4PH stainless steel.

#### 2.2 Environment

The operating temperature limits of the ASM are -40°C to +85°C (-40°F to +185°F)  
The compensated temperature range is -20°C to +60°C (-4°F to +140°F)

#### 2.3 Pressure Fittings

Available pressure fittings are given in table below:

<b>Pressure port code</b>	<b>Fitting description: process port / ref port</b>
1F	1/8"-27 NPT Internal
1M	1/8"-27 NPT External
2F	1/4"-18 NPT Internal
2M	1/4"-18 NPT External
J7	7/16"-20 SAE External
J8	7/16"-20 SAE Internal

## 2.4 Installation of Pressure Fittings

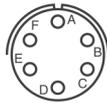
Your transducer is designed for the most accurate operation when subjected to pressures within the designated pressure range. Refer to page 4 for proof pressure limits.

Standard sealants such as Teflon pipe tape generally are satisfactory on NPT threads. For the most sensitive pressure ranges, excessive high torquing of a metal pressure fitting may cause slight zero shift which may be trimmed out using the zero adjustment. Use of a plastic fitting often shows no noticeable zero shift. The torquing effect does not appreciably affect linearity or sensitivity. The 3/4 in. wrench flat (Hex) on the unit must be used when installing the positive pressure fitting.

## 3.0 Electrical installation

### 3.1 Electrical Connections

ASM is available with a cable, or bayonet connector options having different connector pin-outs shown in table below:



**Connector  
Viewed from Front**

Electrical Connection			Code B3 (Standard)	Code B4 Option	Code B5 Option	Code B6 Option	Code B7 Option	Code B8 Option
Current	Voltage	Wire Color	Bayonet Connector Pinout					
+ EXC	+ EXC	Red	A	A	A	C	A	D
- EXC	- EXC	Black	D	B	B	D	C	C
NA	+ Sig Out	Green	B	C	D	A	F	B
NA	- Sig Out	White	C	D	C	B	E	A
Reserved for communication with SecureCal™ calibration module								
	SecureCal™	Blue	E	E	E	E	B	E
	SecureCal™	Brown	F	F	F	F	D	F
	Shield drain wire	Ex-posed	Case	Case	Case			

#### CAUTION:

Connecting -EXC to positive excitation and +SIG to negative excitation at the same time may damage the unit.

### 3.2 Voltage Output Units

The Model ASM voltage units are a four-wire type circuit energized thru +EXC and -EXC terminal with 0-5 VDC or 0-10 VDC analog output through the +SIG Out and -SIG Out terminals.

### 3.3 Current Output Units

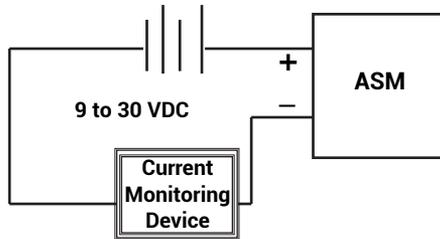
The Model ASM current units are a two-wire loop-powered 4 to 20mA current output and deliver rated current into any external load of 0 to 800 ohms.

The current flows into the +EXC terminal and returns back to the power supply through the -EXC terminal (See Diagram 1). Note: The +SIG Out and -SIG Out terminals are not used. The power supply must be a DC voltage source with a voltage range between 9 and 30 VDC measured between the + and - terminals. The unit is calibrated at the factory with a 24 VDC loop supply voltage.

### 3.4 Cable for Bayonet Connectors

For good EMC performance, shielded cable shall be used and grounded to earth ground. Cable shall only be used within a building and not be longer than 30 m (100 ft.).

**Diagram 1:**



#### Electrical data:

<b>Signal output ranges</b>	0-5 VDC, 0-10 VDC (4-wire), 4-20mA (2-Wire)
<b>Nominal excitation</b>	24 VDC
<b>Excitation range</b>	9-30V DC (5V DC & 4-20mA output) 15-30V DC (10V DC Output)
<b>Current/Power consumption*</b>	<23mA
<b>Circuit response time</b>	<10ms (Voltage Version), <80ms (4-20mA Version)
<b>Warm-up, environmental</b>	Within +/-0.02%FS after 15 min Warm-up Time
<b>Miswiring</b>	Reverse Excitation Protection

## 4.0. Calibration

The ASM transducer is factory calibrated and should require no field adjustment if mounted in a vertical position. Whenever possible, any zero and/or span offsets should be corrected by software adjustment in the user's control system. However, fine zero and span adjustments can be made through use of Secure-Cal™ accessory (purchased separately) for calibration access. The Model ASM transducer zero offset is trimmed in the vertical position (pressure port pointing downward) prior to shipping from factory.

### 4.1 Zero/Span Adjustments with Secure-Cal™

To make secure zero and span adjustments, attach SecureCal™ accessory to ASM pressure transducer. (See Diagram 2).

## 4.2 Zero Adjustment

While applying zero pressure, zero offset may be adjusted by pressing the send button to tare zero. If fine adjustment is needed on analog output, turn the encoder wheel until desired compensation is seen on display.

### Example for Voltage Output:

If 0.0025 VDC is measured, where 0 VDC is desired, turn wheel until -2.5 mV is attained, then press send button.

### Example for Current Output:

If 3.990 mA is read on current meter, turn wheel until +0.01 mA is attained, then press send button.

Zero adjustment should be done prior to span. To get better results, always wait until unit has warmed-up before making any adjustment.

## 4.3 Span Adjustment

Span or full scale output adjustments should only be performed by using an accurate pressure standard (electronic calibrator, dead weight tester, digital pressure gauge, etc.) with greater or at least comparable accuracy to the ASM transducer. With full range pressure applied to the high pressure port, the span may be adjusted by pressing the send button to set span. If fine adjustment is needed on span, and control pressure is applied at full pressure range, turn encoder until target correction is achieved on LCD then press send button.

**Diagram 2:  
Pressure Ranges/Proof Pressure Specifications**



## Performance Data:

Pressure Ranges		Standard Code "00"	High Over pressure Option Code "01"
Full Scale Range (PSI)	Burst Pressure* (PSI)	Proof Pressure** (PSI)	High Proof Pressure (PSI)
15	3000	30 (2x)	150 (10x)
25	3000	50 (2x)	250 (10x)
50	8000	100 (2x)	500 (10x)
100	10,000	200 (2x)	1000 (10x)
150	10,000	300 (2x)	1200 (8x)
200	10,000	400 (2x)	1200 (6x)
300	10,000	600 (2x)	1500 (5x)
500	10,000	800 (1.5x)	2000 (4x)
750	10,000	1200 (1.5x)	2250 (3x)
1000	10,000	1500 (1.5x)	3000 (3x)

\* Burst Pressure: the maximum pressure that may be applied to the positive pressure port without rupturing the sensing element.

\*\* Proof Pressure: The maximum recoverable pressure that may be applied without changing performance beyond specification:  $\pm 0.5\%$  Zero Shift, Typical

## Accuracy data:

Accuracy code	A	B	C	D
<b>Accuracy</b>	< $\pm 0.05\%$ FS RSS*	< $\pm 0.1\%$ Reading**	< $\pm 0.1\%$ FS RSS*	< $\pm 0.1\%$ FS RSS*
<b>Non-Linearity, End-point</b>	< $\pm 0.025\%$ FS Typ.		< $\pm 0.05\%$ FS Typ.	< $\pm 0.05\%$ FS Typ.
<b>Hysteresis</b>	< $0.03\%$ FS Typ.		< $\pm 0.03\%$ FS Typ.	< $\pm 0.03\%$ FS Typ.
<b>Non-repeatability</b>	< $\pm 0.02\%$ FS Typ.		< $\pm 0.02\%$ FS Typ.	< $\pm 0.02\%$ FS Typ.
<b>Span setting tol.</b>	< $\pm 0.5\%$ FS		< $\pm 0.1\%$ FS	< $\pm 0.1\%$ FS
<b>Zero offset tol.</b>	< $\pm 0.5\%$ Typ.	< $\pm 0.5\%$ FS Typ.	< $\pm 0.1\%$ FS	< $\pm 0.1\%$ FS
<b>Thermal total error band</b>	< $\pm 0.25\%$ FS (-20°C to 60°C)	< $\pm 0.25\%$ FS (-20°C to 60°C)	< $\pm 0.50\%$ FS (-20°C to 60°C)	< $\pm 1.5\%$ FS Typ. (-20°C to 60°C)

\*RSS: Root Sum Square of endpoint linearity, Hysteresis and Non-repeatability at constant temperature.

\*\* % of Reading accuracy achieved down to 20% of pressure range when zero offset is removed. Below 20% of pressure range uncertainty is  $\pm 0.02\%$  FS.

## Specifications:

### Zero offset position effect (Unit factory calibrated in vertical position; pressure port downward)

Ranges $\geq$ 100 PSI	<0.05%/g
Ranges $\leq$ 50 PSI	<0.1%/g
Long-term stability	< 0.1% FS/year typical
Response time	<10ms for voltage output
(From 100% to 10% of pressure range)	<80ms for current input

### Environmental data

Temperature Calibrated °F (°C)	-4 to 140 (-20 to 60)
Operating °F (°C)	-40 to +185 (-40 to +85)
Storage °F (°C)	-40 to +185 (-40 to +85)

### Pressure media

Gases or liquids compatible with 17-4 PH stainless steel. Note: Hydrogen not recommended for use with 17-4 PH stainless steel.

### Physical description

Weight	9 oz. (254 g)
Case materials	Stainless steel
Moisture/splash resistance	NEMA 4X IP65

### Electrical data

Signal output ranges	0-5 VDC, 0-10 VDC (4-wire), 4-20mA (2-Wire)
Nominal excitation	24 VDC
Excitation range	9-30 VDC (5 VDC & 4-20mA output) 15-30 VDC (10 VDC Output)
Current consumption*	<23 mA
Warm-up, environmental	Within $\pm$ 0.02% FS after 15 min. warm-up time
Miswiring	Reverse excitation protection

### Configurations

Electrical terminations	6-conductor cable, pigtail; 6-pin bayonet connector
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### Regulatory compliance

RoHS, CE

\* $\geq$ 70mA of inrush current for approximately 5ms.

## 5.0 Ordering information:

Example: Part No. ASM1015PG1F2B03A00;

ASM Transducer, 0 to 15 PSI pressure range, Gauge, 1/8" NPT internal pressure port, 0 to 5 VDC output, 3 ft. cable,  $\pm 0.05\%$  FS accuracy, No options

### Part number configurator:

[1]		[2]				[3]	[4]	[5]		[6]	[7]	[8]						

[1] Model	
<b>ASL1</b>	Model ASL

[2] Pressure ranges	
<b>Z01P</b>	0 to -14.7 PSI
<b>015P</b>	0 to 15 PSI
<b>025P</b>	0 to 25 PSI
<b>050P</b>	0 to 50 PSI
<b>100P</b>	0 to 100 PSI
<b>150P</b>	0 to 150 PSI
<b>250P</b>	0 to 250 PSI
<b>300P</b>	0 to 300 PSI
<b>500P</b>	0 to 500 PSI
<b>750P</b>	0 to 750 PSI
<b>10CP</b>	0 to 1000 PSI
<b>Z01B</b>	-1 Bar
<b>001B</b>	1 Bar
<b>002B</b>	2 Bar
<b>005B</b>	5 Bar
<b>010B</b>	10 Bar
<b>020B</b>	20 Bar
<b>040B</b>	40 Bar
<b>050B</b>	50 Bar
<b>070B</b>	70 Bar

[3] Type	
<b>G</b>	Gauge
<b>C</b>	Compound
<b>A</b>	Absolute
<b>V</b>	Vacuum*

[4] Process/reference port	
<b>1F</b>	1/8" NPT Int./ Barb
<b>1M</b>	1/8" NPT Ext.
<b>2F</b>	1/4" NPT Int.
<b>2M</b>	1/4" NPT Ext.
<b>J7</b>	7/16"-20 SAE Ext.
<b>J8</b>	7/16"-20 SAE Int.

[5] Output	
<b>2B</b>	0 to 5 VDC
<b>2C</b>	0 to 10 VDC
<b>1I</b>	4 to 20 mA

\*Range code "Z01B" only.

[6] Elec. termination	
<b>03</b>	3 ft./1 m std. cable
<b>B3</b>	Std. 6-pin ext. bayonet connect, std. wiring
<b>B4</b>	6-pin external bayonet connector, optional wiring (see wiring code table)
<b>B5</b>	
<b>B6</b>	
<b>B7</b>	
<b>B8</b>	

[7] Accuracy	
<b>A</b>	< $\pm 0.05\%$ FS RSS <0.25% TEB
<b>B</b>	< $\pm 0.10\%$ Reading <0.25% TEB
<b>C</b>	< $\pm 0.1\%$ FS RSS <0.5% TEB
<b>D</b>	< $\pm 0.1\%$ FS RSS <1.5% TEB

[8] Option	
<b>00</b>	None, standard
<b>01</b>	High overpressure (See table)