



## 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 5VDC or 0 to 10VDC, and current output of 4 to 20 mA are offered.

### 2.0 MECHANICAL 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:

Pressure Fitting Code	Fitting Description
1F	1/8"-27 NPT Female
1M	1/8"-27 NPT Male
2F	1/4"-18 NPT Female
2M	1/4"-18 NPT Male
J7	7/16"- 20 SAE Male

## 2.4 Installation of Pressure Fittings

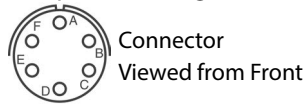
Your transducer is designed for the most accurate operation when subjected to pressures within the designated pressure range. Refer to page 4 for proof pressure limits.

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:



			Code B3 (Standard)	Code B4 Option	Code B5 Option	Code B6 Option	Code B7 Option
Electrical Connection		Wire Color	Bayonet Conn. Pinout	Bayonet Conn. Pinout	Bayonet Conn. Pinout	Bayonet Conn. Pinout	Bayonet Conn. Pinout
Current	Voltage						
+EXC	+ EXC	Red	A	A	A	C	A
-EXC	- EXC	Black	D	B	B	D	C
NA	+ Sig Out	Green	B	C	D	A	F
NA	- Sig Out	White	C	D	C	B	E
Reserved for communication with SecureCal™ calibration module							
SecureCal		Blue	E	E	E	E	B
SecureCal		Brown	F	F	F	F	D
	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 0-5VDC or 0-10VDC analog output through the +SIG Out and -SIG Out terminals.

### 3.3 Current Output Units

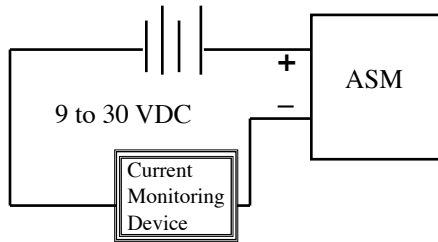
The Model ASM current units are a two-wire loop-powered 4 to 20mA current output and deliver rated current into any external load of 0 to 800 ohms.

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

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	<23mA
Circuit Response Time	<10ms (Voltage Version), <80ms (4-20mA Version)
Warm-up, Environmental Miswiring	Within +/-0.02%FS after 15 min. Warm-up Time 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 -2.5mV 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 Code			
	A	B	C	D
Accuracy	<±0.05% FS RSS*	<±0.1% Reading**	<±0.1% FS RSS*	
Non-Linearity	<±0.025% FS End Point Typ.		<±0.05% FS End Point Typ.	
Hysteresis	<0.03% FS Typ.		<0.03% FS Typ.	
Non-Repeatability	<±0.02% FS Typ.		<±0.02% FS Typ.	
Span Setting Tol.	<±0.05% FS		<±0.1% FS	
Zero Offset Tol.	<±0.05% Typ.		<±0.1% FS	
Thermal Total Error Band	<±0.25% FS (-20°C to 60°C)		<±0.50% FS (-20°C to 60°C)	<±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 ±0.02% FS.				

#### Zero Offset Position Effect

<0.05%/g (Ranges ≥ 100 psi)

<0.1%/G (Ranges ≤ 50 psi)

Unit factory calibrated in vertical position (Pressure Port downward)

Long-Term Stability: 0.1% FS/Year

Response Time to Pressure Input <10 ms for Voltage Output

(From 100% to 10% of Pressure Range) <80 ms for Current Output

#### 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 (5V DC & 4-20mA output)

15-30 VDC ( 10V DC Output)

Current Consumption <23 mA

Warm-up, Environmental Within +/-0.02%FS after 15 min. Warm-up Time

Miswiring Reverse Excitation Protection

#### Configurations

Electrical Terminations 6-Conductor Cable, Pigtail

6-Pin Bayonet Connector

Regulatory Data RoHS Compliant

CE Compliance Standards

# Model ASM ORDERING INFORMATION

Code all blocks in table.

Model	Pressure Ranges		Type	Pressure Port		Output		Elec. Termination		Accuracy		Option
ASM1	PSI	BAR	G Gauge	1F 1/8" NPT Female	2B 0 to 5 VDC	03 3 ft. 1m Std Cable	A	00 None, Standard				
	Z01P 0 to -14.7 PSI	Z01B -1 BAR	C Compound	1M 1/8" NPT Male	ZC 0 to 10 VDC	B3 Std 6-Pin Male Bayonet Connector, Std Wiring	A	01 High Overpressure (See Table)				
	015P 0 to 15 PSI	001B 1 BAR	A Absolute	2F 1/4" NPT Female	11 4 to 20 mA	B4 6-Pin Male Bayonet Connector, Optional Wiring (See Wiring Code Table)	B					
	025P 0 to 25 PSI	002B 2 BAR	V Vacuum*	2M 1/4" NPT Male		B5						
	050P 0 to 50 PSI	005B 5 BAR	*Z01 Range Only	J7 7/16-20 SAE Male		B6						
	100P 0 to 100 PSI	010B 10 BAR				B7						
	150P 0 to 150 PSI	020B 20 BAR										
	250P 0 to 250 PSI	040B 40 BAR										
	300P 0 to 300 PSI	050B 50 BAR										
	500P 0 to 500 PSI	070B 70 BAR										
	750P 0 to 750 PSI											
	100P 0 to 1000 PSI											

Example: Part No. ASM1015P-G1F2B03A00—ASM Transducer, 0 to 15 PSI pressure range, Gauge, 1/8" NPT Female Pressure Port, 0 to 5 VDC Output, 3ft Cable,  $\pm 0.05\%$  FS accuracy, No options

Note: Please reference AccuSense™ Brochure or Setra.com website for latest available configurations

## 6.0 RETURNING PRODUCTS FOR REPAIR

Please contact a Setra application engineer (800-257-3872, 978-263-1400) before returning unit for repair to review information relative to your application. Many times only minor field adjustments may be necessary. When returning a product to Setra, the material should be carefully packaged and accompanied by Setra's Calibration and Service Order Form found at [www.setra.com/tra/repairs/pdf/webrepair.pdf](http://www.setra.com/tra/repairs/pdf/webrepair.pdf), and shipped prepaid to:

Setra Systems, Inc.  
159 Swanson Road  
Boxborough, MA 01719-1304  
Attn: Repair Department

Notes: Please remove any pressure fittings and plumbing that you have installed and enclose any required mating electrical connectors and wiring diagrams.

Allow approximately 3 weeks after receipt at Setra for the repair and return of the unit. Non-warranty repairs will not be made without customer approval and a purchase order to cover repair charges.

### Calibration Services

Setra maintains a complete calibration facility that is traceable to the National Institute of Standards & Technology (NIST). If you would like to recalibrate or recertify your Setra pressure transducers, please call our Repair Department at 800-257-3872 (978-263-1400) for scheduling.

## 7.0 WARRANTY AND LIMITATION OF LIABILITY

SETRA warrants its products to be free from defects in materials and workmanship, subject to the following terms and conditions: Without charge, SETRA will repair or replace products found to be defective in materials or workmanship within the warranty period; provided that:

- a) the product has not been subjected to abuse, neglect, accident, incorrect wiring not our own, improper installation or servicing, or use in violation of instructions furnished by SETRA;
- b) the product has not been repaired or altered by anyone except SETRA or its authorized service agencies;
- c) the serial number or date code has not been removed, defaced, or otherwise changed; and
- d) examination discloses, in the judgment of SETRA, the defect in materials or workmanship developed under normal installation, use and service;
- e) SETRA is notified in advance of and the product is returned to SETRA transportation prepaid.

Unless otherwise specified in a manual or warranty card, or agreed to in writing and signed by a SETRA officer, SETRA pressure and acceleration products shall be warranted for one year from date of sale.

The foregoing warranty is in lieu of all warranties, express, implied or statutory, including but not limited to, any implied warranty of merchantability for a particular purpose.

SETRA's liability for breach of warranty is limited to repair or replacement, or if the goods cannot be repaired or replaced, to a refund of the purchase price. SETRA's liability for all other breaches is limited to a refund of the purchase price. In no instance shall SETRA be liable for incidental or consequential damages arising from a breach of warranty, or from the use or installation of its products.

No representative or person is authorized to give any warranty other than as set out above or to assume for SETRA any other liability in connection with the sale of its products.

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For all CE technical questions, contact Setra Systems, USA. EU customers may contact our EU representative Hengstler GmbH, Uhlandstr 49, 78554 Aldingen, Germany (Tel: +49-7424-890; Fax: +49-7424-89500).