



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:

Pressure port code	Fitting description: process port / ref port
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

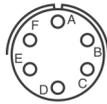
Your transducer is designed for the most accurate operation when subjected to pressures within the designated pressure range. Refer to page 4 for proof pressure limits.

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

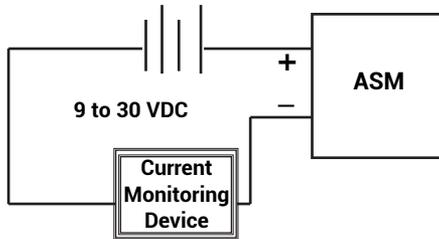
The Model ASM current units are a two-wire loop-powered 4 to 20mA current output and deliver rated current into any external load of 0 to 800 ohms.

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:

Signal output ranges	0-5 VDC, 0-10 VDC (4-wire), 4-20mA (2-Wire)
Nominal excitation	24 VDC
Excitation range	9-30V DC (5V DC & 4-20mA output) 15-30V DC (10V DC Output)
Current/Power consumption*	<23mA
Circuit response time	<10ms (Voltage Version), <80ms (4-20mA Version)
Warm-up, environmental	Within +/-0.02%FS after 15 min Warm-up Time
Miswiring	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
Accuracy	< $\pm 0.05\%$ FS RSS*	< $\pm 0.1\%$ Reading**	< $\pm 0.1\%$ FS RSS*	< $\pm 0.1\%$ FS RSS*
Non-Linearity, End-point	< $\pm 0.025\%$ FS Typ.		< $\pm 0.05\%$ FS Typ.	< $\pm 0.05\%$ FS Typ.
Hysteresis	< 0.03% FS Typ.		< $\pm 0.03\%$ FS Typ.	< $\pm 0.03\%$ FS Typ.
Non-repeatability	< $\pm 0.02\%$ FS Typ.		< $\pm 0.02\%$ FS Typ.	< $\pm 0.02\%$ FS Typ.
Span setting tol.	< $\pm 0.5\%$ FS		< $\pm 0.1\%$ FS	< $\pm 0.1\%$ FS
Zero offset tol.	< $\pm 0.5\%$ Typ.	< $\pm 0.5\%$ FS Typ.	< $\pm 0.1\%$ FS	< $\pm 0.1\%$ FS
Thermal total error band	< $\pm 0.25\%$ 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	
ASL1	Model ASL

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

[3] Type	
G	Gauge
C	Compound
A	Absolute
V	Vacuum*

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

[5] Output	
2B	0 to 5 VDC
2C	0 to 10 VDC
11	4 to 20 mA

*Range code "Z01B" only.

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

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

[8] Option	
00	None, standard
01	High overpressure (See table)

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, 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.

6.1 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 re-certify 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.

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

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