



AccuSense™ Model ASL
High Performance Low-Differential Pressure Transducer

Installation Guide

Description

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

2.0 Mechanical installation

2.1 Media compatibility

Model ASL transducers are designed for use with gases compatible with 300 series and 17-4 stainless steel on Process port. Clean dry gas is required for connection to Reference port.

2.2 Environment

The operating temperature limits of the ASL 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" NPT Female / Barb
FF	1/8" NPT Female / 1/8"-27 NPT Female
1M	1/4" NPT Male / Barb
J7	7/16"- 20 SAE Male / Barb

2.4 Installation of pressure fittings

Your transducer is designed for most accurate operation when subjected to pressures within the designated pressure range. Refer to the catalog bulletin specifications 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 wrench flat on the ASL series must be used when installing the positive pressure fitting.

3.0 Electrical installation

3.1 Electrical connections

ASL is available with cable version or bayonet connector options having different connector pin outs shown in table below:

3.2 Voltage output units

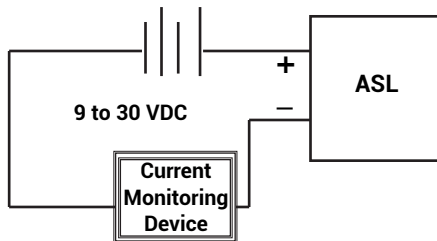
The Model ASL voltage units are four-wire type circuit with 0-5VDC or 0-10VDC analog output.

3.3 Current output units

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

The current flows into the + terminal and returns back to the power supply through the - terminal (See Diagram 1). The power supply must be a DC voltage source with a voltage range between 9 and 30 measured between the + and - terminals. The unit is calibrated at the factory with a 24 VDC loop supply voltage and a 250 ohm load.

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 +/- .02%FS after 15min Warm-up Time
Miswiring	Reverse Excitation Protection

*≥70mA of inrush current for approximately 5ms.

Wiring codes:

Electrical Connection	Wire Color	Code B3 (Standard)	Code B4 Option	Code B5 Option	Code B6 Option
		Bayonet Connector Pinout	Bayonet Connector Pinout	Bayonet Connector Pinout	Bayonet Connector Pinout
+ EXC	Red	A	A	A	C
- EXC	Black	D	B	B	D
+ Sig Out	Green	B	C	D	A
- Sig Out	White	C	D	C	B
Reserved for communication with SecureCal™ calibration module					
SecureCal™	Blue	E	E	E	E
SecureCal™	Brown	F	F	F	F

4.0. Calibration

The ASL 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 SecureCal™ accessory for calibration access. The Model ASL transducer zero offset is trimmed in the vertical position (pressure ports pointing downward) prior to shipping from factory.

4.1 Zero/Span adjustments with SecureCal™

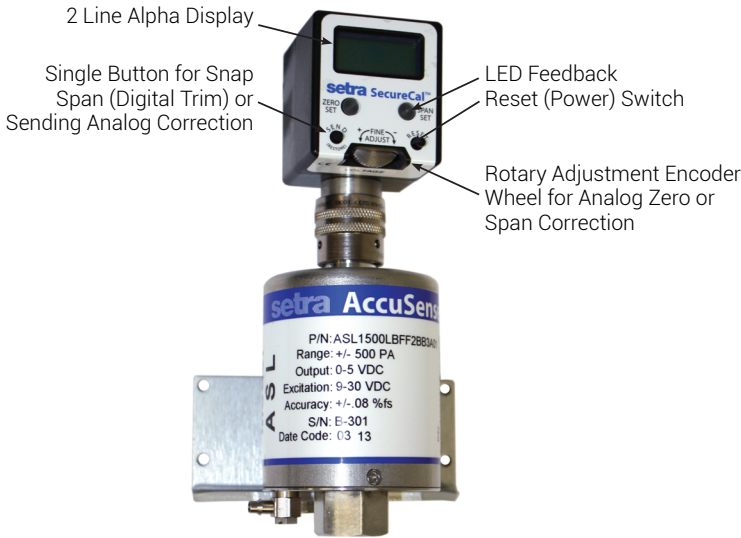
To make secure zero and span adjustments, attach SecureCal™ accessory to ASL pressure transducer. (See Diagram 2).

4.2 Zero adjustment (Current Output)

While applying zero pressure, zero 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 (if 0.0025 VDC is measured, where 0 VDC is desired, turn wheel until -2.5mV is attained) then press send button.

4.3 Span adjustment (current output)

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 ASL 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.



Pressure ranges	Burst pressure	Standard proof pressure Option Code "00"	High proof pressure Option Code "01"
0 to 2.5 in. WC, 5 mBar	200 psi, 15 Bar	±10 psi, ±700 mBar	±75 psi, ±5 Bar
0 to 5 in. WC, 10 mBar	300 psi, 20 Bar	±20 psi, ±1 Bar	±100 psi, ±7 Bar
0 to 10 in WC, 25 mBar	300 psi, 20 Bar	±30 psi, ±2 Bar	±150 psi, ±10 Bar
0 to 30 in. WC, 1 psi, 100 mbar	300 psi, 20 Bar	±50 psi, ±4 Bar	±150 psi, ±10 Bar

* Burst Pressure: The maximum pressure that may be applied to the positive pressure port without rupturing the diaphragm or reference pressure containment.

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

In the event that the unit is overpressured in the negative direction (reference port), apply equal pressure in the positive direction (process port) for optimum recovery of performance.

Accuracy data:

Accuracy code	A	B	C
Accuracy	< ±0.07% FS RSS*	< ±0.15% Reading**	≤ ±0.1% FS RSS*
Non-Linearity, End-point	< ±0.03% FS Typ.		≤ ± 0.08% FS Typ.
Hysteresis	< 0.03% FS Typ.		≤ ±0.06% FS Typ.
Non-repeatability	< ±0.02% FS Typ.		≤ ±0.04% FS Typ.
Span setting tol.	< ±0.1% FS		< ± 0.15% FS
Zero offset tol.	< ±0.1% FS	< ±0.1% FS	< ±0.20% FS
Thermal total error band	< ±0.25% FS Typ. < ±0.5% FS Max. (-20°C to 60°C)	< ±0.25% FS Typ. < ±0.5% FS Max. (-20°C to 60°C)	< ±0.5% Typ. < ±1% Max.

*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 ±0.03% FS.

Zero offset position effect

Unit factory calibrated in vertical position (pressure port downward) <0.1%g

Long-term stability	< 0.15% 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

Clean dry gases compatible with 304, 316 series and 17-4 pH stainless steel.

Physical description

Weight	13 oz. (360 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

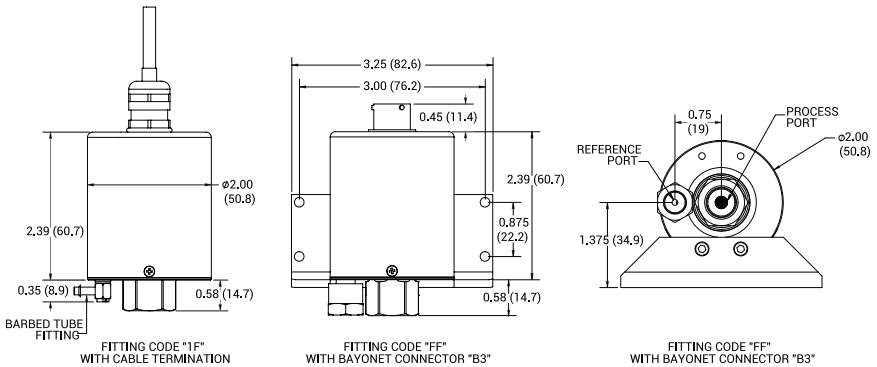
Electrical terminations 6-conductor cable, pigtail; 6-pin bayonet connector

Regulatory compliance

RoHS, CE

*≥70mA of inrush current for approximately 5ms.

Drawings:



inches (mm)

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 Ordering information:

Example part number: ASL1001WB1F2B03A00;

ASL Transducer, ±1" W.C. Pressure Range, 1/8" NPT Female Reference Port, 0 to 5 VDC Output, 3 Foot Cable, <±0.07% FS RSS Accuracy, No Options:

Part number configurator:

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

[1]

Model	
ASL1	Model ASL

[2]

or

[2]

Pressure range ¹ (unidirectional)	
R25WD ²	0 to 0.25" WC
0R5WD	0 to 0.5" WC
001WD	0 to 1" WC
002WD	0 to 2" WC
2R5WD	0 to 2.5" WC
005WD	0 to 5" WC
010WD	0 to 10" WC
030WD	0 to 30" WC
040WD	0 to 40" WC
005MD	0 to 5 mBar
010MD	0 to 10 mBar
025MD	0 to 25 mBar
050MD	0 to 50 mBar
100MD	0 to 100 mBar
001PD	0 to 1 PSID
001PD	0 to 2 PSID
050LD ²	0 to 50 Pa
100LD	0 to 100 Pa
250LD	0 to 250 Pa

Pressure range ¹ (bidirectional)	
0R1WB ²	±0.1" WC
R25WB	±0.25" WC
0R5WB	±0.5" WC
001WB	±1" WC
002WB	±2" WC
005WB	±5" WC
015WB	±15" WC
005MB	±5 mBar
010MB	±10 mBar
025MB	±25 mBar
050MB	±50 mBar
001PB	±1 PSID
002PB	±2 PSID
025LB ²	±30 Pa
050LB	±60 Pa
125LB	±125 Pa

[3]

Process/reference port	
1F	1/8" NPT Int./ Barb
FF	1/8" NPT Int./ 1/8" NPT Int.
1M	1/8" NPT Ext./ Barb
J7	7/16-20 SAE Ext./Barb

[4]

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

[5]

Elec. termination	
03	3 ft./1 m std. cable
B3	Std. 6-pin ext. bayonet connect, std. wiring

[6]

Accuracy	
A	<±0.07% FS RSS
C	<±0.1% FS RSS

[7]

Option	
00	None, standard
01	High overpressure

¹ Other ranges and engineering units are available (e.g. Pa, kPa).

² Range only available with accuracy code "C".

8.0 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, Uhlandstr 49, 78554 Aldingen, Germany (Tel: +49-7424-890; Fax: +49-7424-89500).