

SenSym

AMPLIFIED SCX SERIES

0 to 1 psi to 0 to 150 psi

SIGNAL CONDITIONED PRESSURE SENSORS

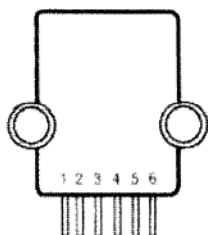
FEATURES

- 5 Volt Supply
- High Level Voltage Output
- Field Interchangeable
- Calibrated and Temperature Compensated
- Small Form Factor
- Low Power
- Offset Adjust

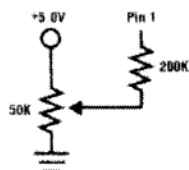
APPLICATIONS

- Medical Equipment
- Industrial Controls
- Pneumatic Equipment

ELECTRICAL CONNECTION



- Pin 1. External Offset Adj.
Pin 2. V_s
Pin 3. Output (+)
Pin 4. Ground
Pin 5. N/C
Pin 6. Do Not Use



External Offset Adjustment

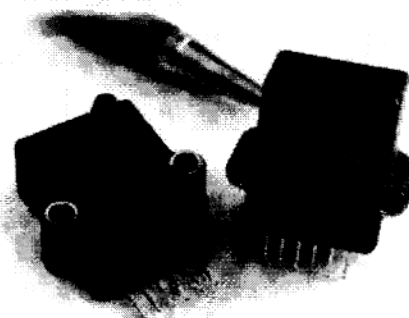
GENERAL DESCRIPTION

This series is a signal conditioned version of SenSym's proven performer and industry leading SCX series.

The amplified version is in a package with the same footprint as the SCX and provides a high level output (4.5V span) on a very cost effective basis. This family is temperature compensated over the range of 0°C to 70°C but can be operated from -40°C to +85°C. Like the companion SCX Series, these sensors are intended for use with non-corrosive, non-ionic working fluids; such as, air and dry gasses.

Devices are available to measure absolute, differential, and gage pressures from 1 psi (ASCX01) to 150 psi (ASCX150). The Absolute (A) devices have an internal vacuum reference and an output voltage proportional to absolute pressure. The Differential (D) devices allow application of pressure to either side of the pressure sensing diaphragm and can be used for gage or differential pressure measurements.

The Amplified SCX devices feature an integrated circuit sensor element and laser trimmed thick film ceramic housed in a compact nylon case. This package provides excellent corrosion resistance and provides isolation from external package stresses. The package has convenient mounting holes and pressure ports for ease of use with standard plastic tubing for pressure connection.



All ASCX devices are calibrated for span to within $\pm 1\%$ (typically $\pm 0.2\%$) of FSO. Typical offset is 0.25V but provision is made to connect an external offset adjustment pot to pin 1.

The sensitivity is ratiometric to the supply voltage and operation from any D.C. supply from +5V to +16V is acceptable.

The ASCX series requires very low quiescent current compared to other signal conditioned pressure sensors, thus, this series is ideal for battery powered applications.

Because these devices have very low noise and excellent temperature compensation, they are ideal for medical and other high performance applications. The 100 microsecond response time also makes this series an excellent choice for computer peripherals and pneumatic control applications.

For further technical information on the Amplified SCX series, please contact your local SenSym office or the factory.

ATTENTION! STATIC SENSITIVE

Proper Handling and Grounding Precautions Required.

PRESSURE SENSOR CHARACTERISTICS

MAXIMUM RATINGS

Supply Voltage, V_S	+4.5V _{DC} to +16V _{DC}
Output Current Source	5mA
Sink	3mA
Lead Temperature (2-4 sec)	250°C
Maximum Pressure On Any Port	150 psi
Quiescent Current	4mA

PARAMETER REFERENCE CONDITIONS

Supply Voltage	5.01 ± 0.01V _{DC}
Reference Temperature	25°C
Load Condition	200 Kohms
Common-Mode Pressure	0 psig

Note: Sensitivity is ratiometric to supply voltage.

ENVIRONMENTAL SPECIFICATIONS

Temperature Ranges	
Compensated	0°C to 70°C
Operating	-25°C to 105°C
Storage	-55°C to 125°C

STANDARD PRESSURE RANGES

Part Number	Operating Pressure	Proof Pressure*	Sensitivity
ASCX01DN	0 – 1 psid	20 psid	4.5V/psi
ASCX05DN	0 – 5 psid	20 psid	0.9V/psi
ASCX15AN	0 – 15 psia	30 psia	0.3V/psi
ASCX15DN	0 – 15 psid	30 psid	0.3V/psi
ASCX30AN	0 – 30 psia	60 psia	0.15V/psi
ASCX30DN	0 – 30 psid	60 psid	0.15V/psi
ASCX100AN	0 – 100 psia	150 psia	45mV/psi
ASCX100DN	0 – 100 psid	150 psid	45mV/psi
ASCX150AN	0 – 150 psia	150 psia	30mV/psi
ASCX150DN	0 – 150 psid	150 psid	30mV/psi

*Maximum Pressure above which causes permanent sensor failure.

AMPLIFIED SCX PERFORMANCE CHARACTERISTICS (1)

Characteristic	ASCX15/30/100/150xN			ASCX01/05DN			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	
Offset ⁽²⁾	0.205	0.250	0.295	0.180	0.250	0.320	Volts
Span (FSO) ⁽³⁾	4.455	4.500	4.545	4.430	4.500	4.570	Volts
Output @ FS Pressure	—	4.750	—	—	4.750	—	Volts
Linearity & Hysteresis ⁽⁴⁾	—	±0.1	±0.5	—	±0.1	±0.5	%FSO
Span TC (0°C to 70°C) ⁽⁷⁾	—	±0.2	±1.0	—	±0.2	±1.5	%FSO
Offset TC (0°C to 70°C) ⁽⁷⁾	—	±0.5	±1.0	—	±0.5	±1.5	%FSO
Repeatability ⁽⁵⁾	—	±0.2	±0.5	—	±0.2	±0.5	%FSO
Response Time ⁽⁶⁾	—	100	—	—	100	—	µs

Specification Notes:

Note 1: Performance specifications shown are at reference conditions. Specifications apply for absolute pressure devices with pressure applied to Port A. For gage devices pressure is applied to Port B and Port A is left open to ambient. For differential pressures, Port B is the high pressure port. All SenSym differential devices feature dual pressure ports and can be used as gage or differential sensors. For absolute devices, Port B is inactive.

Note 2: Offset calibration is at the lowest pressure for each given device.

Note 3: Full-scale span is the algebraic difference between the output voltage at full-scale pressure and the output at the lowest operating pressure.

Note 4: Linearity refers to the best straight line fit as measured for offset, full-scale and 1/2 full-scale pressure.

Note 5: Maximum difference in output at any pressure with the operating pressure range and temperature within 0°C to +70°C after:

a) 100 temperature cycles, 0°C to +70°C

b) 1.0 million pressure cycles, 0 psi to full-scale span.

Note 6: Response time for a 0 psi to full-scale span pressure step change, 10% to 90% rise time.

Note 7: Temperature errors are the maximum shift over 0 – 70°C, relative to the 25°C reading.

GENERAL DISCUSSION

The Amplified SCX series devices provide voltage output which is directly proportional to applied pressure. The devices will give an increasing positive going output when increasing pressure is applied to pressure port B. If the input pressure connections are reversed, the output will increase with decreasing pressure. The sensitivity is ratiometric to the supply voltage. Changes in the supply voltage will cause non proportional changes in the offset voltage and proportional changes in full-scale span. For absolute devices pressure is applied to port A, thus, the polarity will be reversed.

USER CALIBRATION

The Amplified SCX devices are fully calibrated for offset and span and should therefore require little if any user adjustment in most applications. For precise span and offset adjustments, refer to the applications section herein.

VACUUM REFERENCE (Absolute Devices)

Absolute sensors have a hermetically sealed vacuum reference chamber. The offset voltage on these units

is therefore measured at vacuum, 0 psia. Since all pressure is measured relative to a vacuum reference, all changes in barometric pressure or changes in altitude will cause changes in the device output.

MEDIA COMPATIBILITY

Amplified SCX devices are compatible with most non-corrosive gases. Because the circuitry is coated with a protective silicon gel, many otherwise corrosive environments can be compatible with the sensors. As shown in the physical construction diagram below, fluids must generally be compatible with silicon gel, plastic, aluminum, RTV, silicon, and glass for use with Port P_B. **For questions concerning media compatibility, contact the factory.**

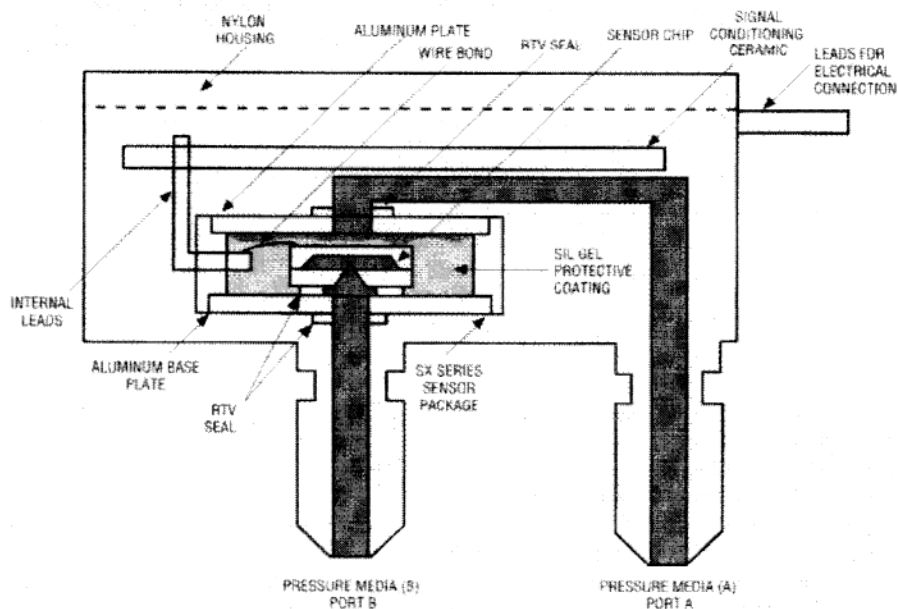
MECHANICAL AND MOUNTING CONSIDERATIONS

The Amplified SCX nylon housing is designed for convenient pressure connection and easy PC board mounting. To mount the device horizontally to a PC board, the leads can be bent downward and the package attached to the board using either tie

wraps or mounting screws. For pressure attachment, tygon or silicon tubing is recommended.

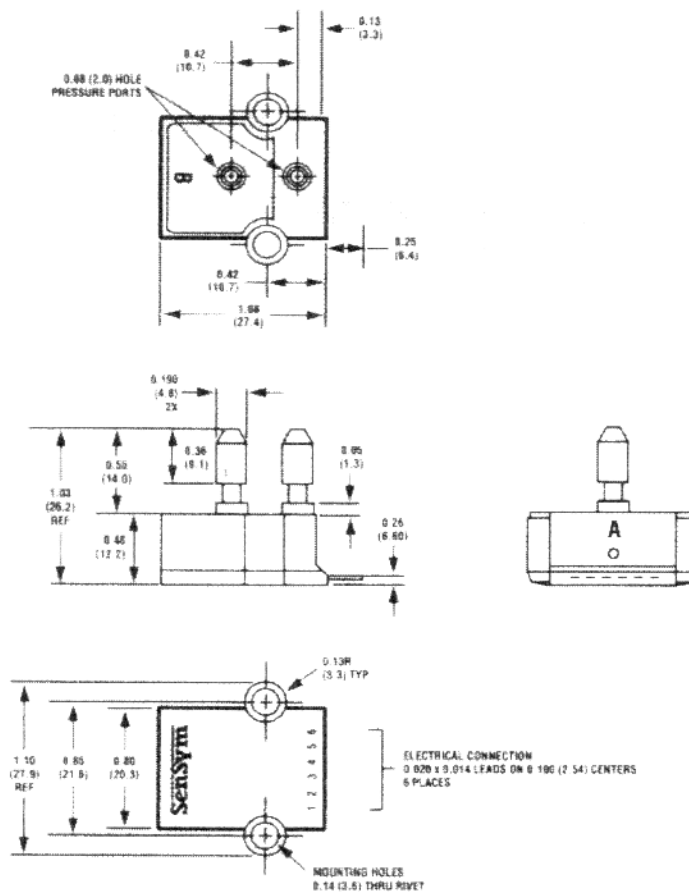
All versions of the Amplified SCX sensors have two (2) tubes available for pressure connection. For absolute devices, only port P_A is active. Applying pressure through the other port will result in pressure dead ending into the backside of the silicon sensor and the device will not give an output signal with pressure.

For gage applications, pressure should be applied to port P_B. Port P_A is then the vent port which is left open to the atmosphere. For differential pressure applications, to get proper output signal polarity, port P_B should be used as the high pressure port and P_A should be used as the low pressure port.



Physical Construction (Cutaway Diagram — Not drawn to scale)

PHYSICAL DIMENSIONS



Tolerances, unless otherwise noted

± 0.010 For Two Decimal Places
± 0.005 For Three Decimal Places

ORDERING INFORMATION

To order, use the following part number(s):

Description	Part Number
0 to 1 psi Differential/Gage	ASCX01DN
0 to 5 psi Differential/Gage	ASCX05DN
0 to 15 psi Absolute	ASCX15AN
0 to 15 psi Differential/Gage	ASCX15DN
0 to 30 psi Absolute	ASCX30AN
0 to 30 psi Differential/Gage	ASCX30DN
0 to 100 psi Absolute	ASCX100AN
0 to 100 psi Differential/Gage	ASCX100DN
0 to 150 psi Absolute	ASCX150AN
0 to 150 psi Differential/Gage	ASCX150DN