

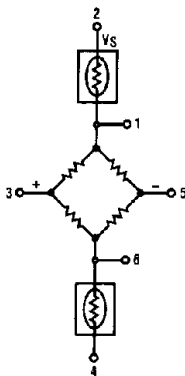
FEATURES

- Precision Temperature Compensation
- Calibrated zero and Span
- Small Size
- Low Noise
- High Accuracy
- High impedance for Low Power Applications

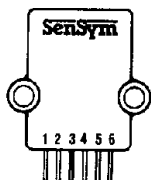
APPLICATIONS

- Medical Equipment
- Barometry
- Computer Peripherals
- Pneumatic Controls
- HVAC

EQUIVALENT CIRCUIT



ELECTRICAL CONNECTION



BOTTOM VIEW

- Pin 1) Temperature Output (+)
- Pin 2) Vs
- Pin 3) Output (+)
- Pin 4) Ground
- Pin 5) Output (-)
- Pin 6) Temperature Output (-)

Note: The polarity indicated is for pressure applied to port B.
(For Absolute devices pressure is applied to port A and the output polarity is reversed.)

GENERAL DESCRIPTION

The SCX series sensors will provide a very cost-effective solution for pressure applications that require high accuracy over a wide temperature range. These internally calibrated and temperature compensated sensors were specifically designed to provide an accurate and stable output over a 0 to 70 temperature range. This series is intended for use with non-corrosive, non-ionic working fluids such as air, dry gases, and the like.

Devices are available to measure absolute, differential, and gage pressures from 1psi (SCX01) up to 150psi (SCX150). 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 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 to external package stresses. The package has convenient mounting holes and pressure ports for ease of use with standard plastic tubing for pressure connection.

All SCX devices are calibrated for span to within $\pm 1\%$ and provide a very low zero pressure output of ± 300 mV maximum. Thus, for many applications, no trimming networks are required in the signal conditioning circuitry. If the application requires extended temperature range operation, beyond 0 to 70 , two pins which provide an output voltage proportional to temperature are available for use with external circuitry.

The output of the bridge is ratiometric to the supply voltage and operation from any D.C. supply voltage up to +30V is acceptable.

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

標準壓力範圍：

| 型號 | 操作壓力範圍 | 最大承受壓力 | 滿載輸出電壓 |
|----------|------------|----------|--------|
| SCX01DN | 0-1 psid | 20 psid | 18 mV |
| SCX05DN | 0-5 psid | 20 psid | 60 mV |
| SCX15AN | 0-15 psia | 30 psia | 90 mV |
| SCX15DN | 0-15 psid | 30 psid | 90 mV |
| SCX30AN | 0-30 psia | 60 psia | 90 mV |
| SCX30DN | 0-30 psid | 60 psid | 90 mV |
| SCX100AN | 0-100 psia | 150 psia | 100 mV |
| SCX100DN | 0-100 psid | 150 psid | 100 mV |
| SCX150AN | 0-150 psia | 150 psia | 90 mV |
| SCX150DN | 0-150 psid | 150 psid | 90 mV |

* 超過上述之最大可承受壓力時，會造成壓力 sensor 的損壞。

最大額定值：(適用所有的型號)

| | |
|--------------|---------|
| 供應電壓 Vs | +20Vdc |
| 共模壓力 | 50 psig |
| 焊接耐溫 (2-4 秒) | 250 |

環境條件：(適用所有的型號)

| | |
|--------|-------------|
| 補償溫度範圍 | 0 ~ 70 |
| 操作溫度範圍 | -40 ~ +85 |
| 儲存溫度範圍 | -55 ~ +125 |
| 濕度範圍 | 0 ~ 100% RH |

規格表：(Note 1)

| 型號 | SCX01 | SCX05 | SCX15 | SCX30 | SCX100 | SCX150 |
|---------------------------|---|-------------|-------------|-------------|--------------|---------|
| 操作壓力範圍 (psi) | 0-1 | 0-5 | 0-15 | 0-30 | 0-100 | 0-150 |
| 靈敏度 (typ.) (mV/psi) | 18 | 12 | 6 | 3 | 1 | 0.6 |
| 滿載輸出 (Note 2) (mV) | 17.82 ~ 18.18 | 59.4 ~ 60.6 | 89.1 ~ 90.9 | 89.1 ~ 90.9 | 99.0 ~ 101.0 | 89 ~ 91 |
| 零點電壓 (Note 11) | ± 300 uV | | | | | |
| 線性 & 遲滯 (Note 3) | ± 0.1%FSO (typ.), ± 0.5%FSO (max.) | | | | | |
| 增益溫度漂移 (0-70 °C) (Note 4) | ± 0.2%FSO (typ.), ± 1.0%FSO (max.) | | | | | |
| 零點溫度漂移 (0-70 °C) (Note 4) | ± 100 uV (typ.), ± 500 uV (max.) | | | | | |
| 重複性 (Note 5) | ± 0.2%FSO (typ.), ± 0.5%FSO (max.) | | | | | |
| 輸入阻抗 (Note 6) | 4.0 k | | | | | |
| 輸出阻抗 (Note 7) | 4.0 k | | | | | |
| 共模電壓 (Note 8) | 5.8Vdc (min.), 6.0Vdc (typ.), 6.2Vdc (max.) | | | | | |
| 響應時間 (Note 9) | 100 usec | | | | | |
| 穩定性 (Note 10) | ± 0.1 mV | | | | | |

Specification Notes: (For All Devices)

Note 1: Reference Conditions: Unless otherwise noted: Supply Voltage, Vs = 12Vdc, TA = 25 °C, Common-mode Line Pressure = 0 psig, Pressure applied to Port B. For absolute devices only, pressure is applied to Port A and the output polarity is reversed.

Note 2: Span is the algebraic difference between the output voltage at full-scale pressure and the output at zero Pressure. Span is ratiometric to the supply Voltage.

Note 3: See Definition of Terms.

Hysteresis - the maximum output difference at any point within the operating pressure range for increasing and decreasing pressure.

Note 4: Maximum error band of the offset voltage and the error band of the span, relative to the 25 °C reading.

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

a) 1,000 temperature cycles, 0 °C to +70 °C

b) 1.5 million pressure cycles, 0 psi to full-scale span.

Note 6: Input impedance is the impedance between pins 2 and 4.

Note 7: Output Impedance is the impedance between pins 3 and 5.

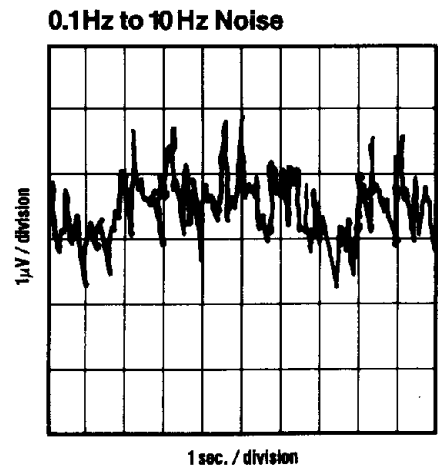
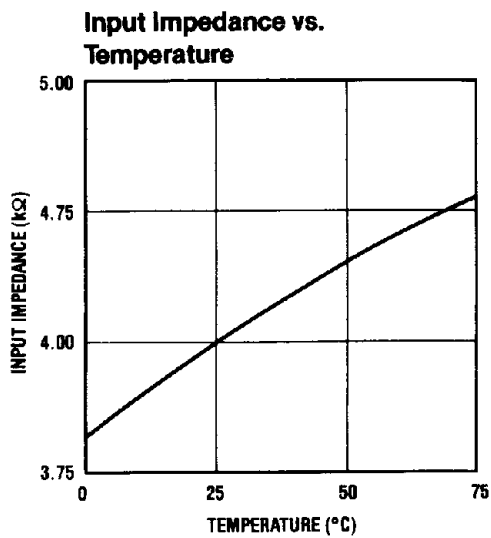
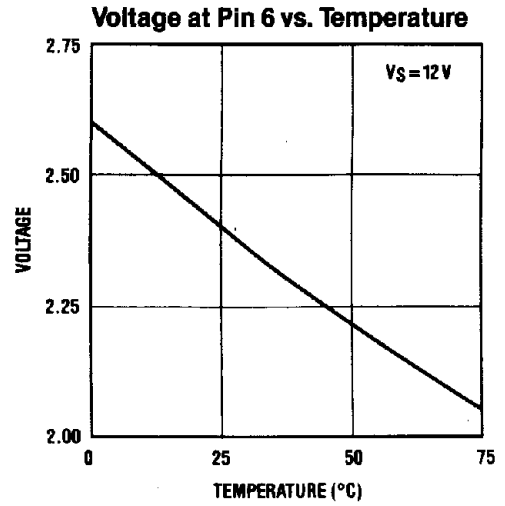
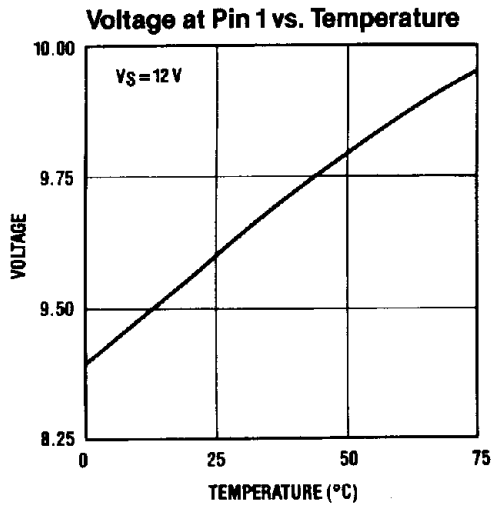
Note 8: This is the common-mode voltage of the output arms (Pins 3 and 5) for Vs = 12Vdc.

Note 9: Response time for a 0 psi to full-scale span pressure step change, 10% to 90% rise time.

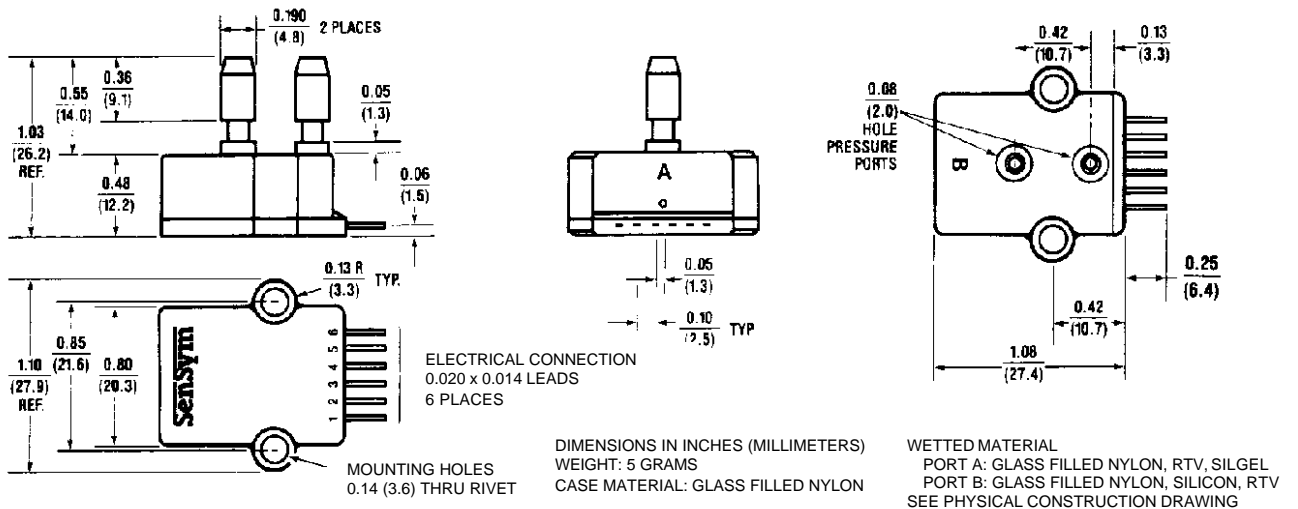
Note 10: Long term stability over a one-year period.

Note 11: Maximum zero pressure offset for absolute devices is 0 ± 500uV.

典型工作特性曲線圖：



外觀尺寸圖：



概述

SCX 系列壓力感應器能輸出一大小幅度與所施加之壓力成正比的輸出電壓。在本元件之壓力入口端 P_B 施加以遞增之壓力時，會輸出一正值而呈比例遞增的輸出電壓。若變更壓力輸入端，則輸出電壓將隨著壓力的減少而增加。本元件的輸出信號與電源電壓呈一定比例關係，輸入電壓之任何變化均將造成零點電壓 (Offset Voltage) 及全跨距 (Full-Scale Span) 的一定比例變化。就絕對壓元件而言，因壓力乃施加於 P_A 端上，所以輸出極性將顛倒之。

使用者之校正

由於 SCX 系列產品之 Offset 及 Span 的輸出皆有校正過，故在大部分的應用場合，使用者幾乎不需另行校正。若認為有必要實施精確之 Offset 及 Span 調整時，請參照“應用範例”之說明。

真空參考 (絕對壓元件)

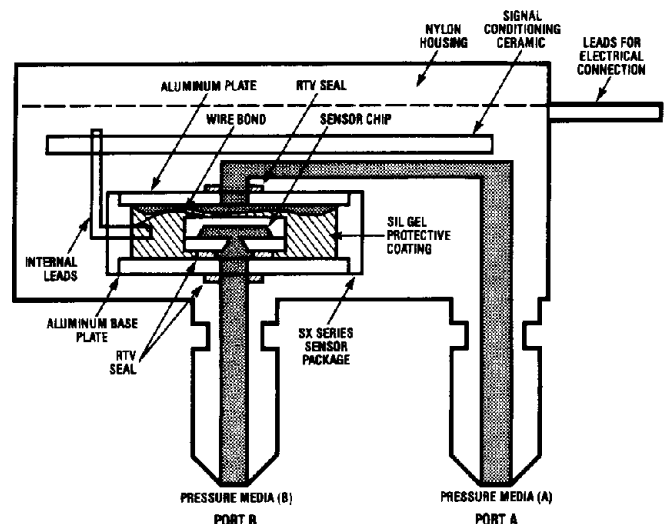
絕對壓感應器在其內部設有一密封之真空參考室，此感應器的零點電壓乃是在真空，亦即 0 psia 之狀態下的測量值。由於所有之壓力值均是以一真空參考值為基準所測得，所以，當大氣壓或安裝場合之高度變化時，均將導致感應器輸出值的變化。

介質相容性

SCX 元件能與大部份非腐蝕性氣體相容，至於電路上因塗有一層具有保護作用之矽膠，所以感應器本體能與大多數之具有腐蝕性的環境相容。由下圖之結構示意圖可看出，經由 B 端口測量之氣體，一般而言，必須能與矽膠、塑膠、鋁、RTV、矽及玻璃相容。

機械及安裝方面之考慮因素：

SCX 的外殼之所以採用尼龍製品，主要著眼點為了利於壓力之接續，及 PC 板安裝上的便利性。欲沿水平方向將感應器安裝於一 PC 板上時，引線可向下彎曲，且可以利用螺絲固定於 PC 板上。至於傳送壓力之導管，則以採用 Tygon 或矽管件較為適宜。各種不同型號之 SCX 感應器上均分別設有兩根管子，以利壓力之傳送。就絕對壓元件而言，具有動態功能之端口僅有 P_A 而已。若經由另一端口 P_B 施加壓力時，因壓力作動於矽晶片的背面非感應區。所以，在此情況下，該元件根本不會有任何訊號輸出。就錶壓 (Gage) 之應用而言，壓力應施加於 P_B 端口，在此情況下 P_A 端口即成為開放於大氣壓力狀態下之開口端。就差壓之應用情況而言，為取得適當之輸出訊號的極性， P_B 端口應作為高壓端使用，而 P_A 端口則應作為低壓端使用。



Physical Construction (Cutaway Diagram)