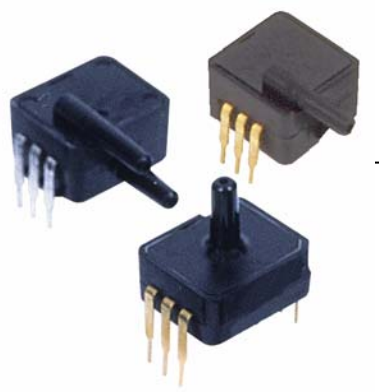
Honeywell

# SDX Series

## Plastic Silicon Pressure Sensors Low Cost, Temperature Compensated, DIP, 0 psi to 1 psi, 0 psi to 100 psi



**DESCRIPTION**

The SDX Series sensors provide a very cost-effective solution for pressure applications that require small size plus performance. These calibrated and temperature-compensated sensors give an accurate and stable output over a 0 °C to 50 °C [32 °F to 122 °F] temperature range. This series is intended for use with non-corrosive, non-ionic working fluids such as air and dry gases.

Devices are available to measure absolute and gage pressures from 1 psi (SDX01) up to 100 psi (SDX100). The absolute devices have an internal vacuum reference and an output voltage proportional to absolute pressure. The SDX devices are available in standard commercial and prime grades (SDCXXXXX**-A**) to allow optimization of accuracy and cost in any given application.

The SDX devices feature an integrated circuit (IC) sensor element and laser trimmed thick film ceramic housed in a compact solvent resistant case. The package is a double-wide, dual-inline package (DIP). This is the same familiar package used by IC manufacturers except it is only 11,94 mm [0.470 in] long and has a pressure port(s). The PC board area used by each DIP is approximately 0.26 $in^2$. This extremely small size enables the use of multiple sensors in limited available space. The DIP provides excellent corrosion resistance and isolation to external package stress.

The DIP mounts on a PC board like a standard IC with through-hole pins. The pins anchor the pressure sensor to the PC board and provide a more secure and stable unit than other types of packages.

The output of the bridge is ratiometric to the supply voltage and operation from any dc supply voltage up to 20 Vdc is acceptable.

**FEATURES**

- Low cost DIP
- Precision temperature compensation
- Calibrated zero and span
- Small size
- Low noise
- High impedance for low power applications
- Prime grade available (SDXxxxyy-A)

**POTENTIAL APPLICATIONS**

- Medical equipment
- Computer peripherals
- Pneumatic controls
- HVAC

**Table 1. Pressure Range Specifications and Ordering Information**

| Catalog Listing, Pressure Connection, Pressure Type | | | Operating Pressure | Proof Pressure [2] | Full-Scale Span [1] | | |
|---|---|---|---|---|---|---|---|
| Gage | Differential/Gage | Absolute | | | Min. | Typ. | Max. |
| SDX01G2 | SDX01D4 | - | 0 psid to 1 psid | 20 psid | 17.37 mV | 18.00 mV | 18.18 mV |
| SDX01G2-A | SDX01D4-A | - | | | 17.82 mV | 18.00 mV | 18.80 mV |
| SDX05G2 | SDX05D4 | - | 0 psid to 5 psid | 20 psid | 57.90 mV | 60.00 mV | 62.10 mV |
| SDX05G2-A | SDX05D4-A | - | | | 59.40 mV | 60.00 mV | 60.60 mV |
| SDX15G2 | SDX15D4 | - | 0 psid to 15 psid | 30 psid | 86.85 mV | 90.00 mV | 93.15 mV |
| SDX15G2-A | SDX15D4-A | - | | | 89.10 mV | 90.00 mV | 90.90 mV |
| - | - | SDX15A2 | 0 psia to 15 psia | 30 psia | 86.85 mV | 90.00 mV | 93.15 mV |
| - | - | SDX15A4 | | | 86.85 mV | 90.00 mV | 93.15 mV |
| - | - | SDX15A2-A | | | 89.10 mV | 90.00 mV | 90.90 mV |
| - | - | SDX15A4-A | | | 89.10 mV | 90.00 mV | 90.90 mV |
| SDX30G2 | SDX30D4 | - | 0 psid to 30 psid | 60 psid | 86.85 mV | 90.00 mV | 93.15 mV |
| SDX30G2-A | SDX30D4-A | - | | | 89.10 mV | 90.00 mV | 90.90 mV |
| - | - | SDX30A2 | 0 psia to 30 psia | 60 psia | 86.85 mV | 90.00 mV | 93.15 mV |
| - | - | SDX30A4 | | | 86.85 mV | 90.00 mV | 93.15 mV |
| - | - | SDX30A2-A | | | 89.10 mV | 90.00 mV | 90.90 mV |
| - | - | SDX30A4-A | | | 89.10 mV | 90.00 mV | 90.90 mV |
| SDX100G2 | SDX100D4 | - | 0 psid to 100 psid | 150 psid | 96.50 mV | 100.00 mV | 103.5 mV |
| SDX100G2-A | SDX100D4-A | - | | | 99.00 mV | 100.00 mV | 101.0 mV |
| - | - | SDX100A2 | 0 psia to 100 psia | 150 psia | 96.50 mV | 100.00 mV | 103.5 mV |
| - | - | SDX100A4 | | | 96.50 mV | 100.00 mV | 103.5 mV |
| - | - | SDX100A2-A | | | 99.00 mV | 100.00 mV | 101.0 mV |
| - | - | SDX100A4-A | | | 99.00 mV | 100.00 mV | 101.0 mV |

| Nomenclature | Pressure Connection (See Fig. 2) | Pressure Type | Grade |
|---|---|---|---|
| G2 | A2/G2 | gage | standard commercial |
| G2-A | A2/G2 | gage | prime |
| D4 | OK | differential | standard commercial |
| D4-A | OK | differential | prime |
| A2 | A2/G2 | absolute | standard commercial |
| A2-A | A2/G2 | absolute | prime |
| A4 | A4 | absolute | standard commercial |
| A4-A | A4 | absolute | prime |

**Table 2. General Specifications (Maximum)**

| Characteristic | Parameter |
|---|---|
| Supply voltage ($V_S$) | 20 Vdc |
| Common mode pressure | 150 psig |
| Lead soldering temperature (2 s to 4 s) | 250 °C [482 °F] |

**Table 3. Environmental Specifications (Maximum)**

| Characteristic | Parameter |
|---|---|
| Compensated operating temperature | 0 °C to 50 °C [32 °F to 122 °F] |
| Operating temperature | -40 °C to 85 °C [-40 °F to 185 °F] |
| Storage temperature | -55 °C to 125 °C [-67 °F to 257 °F] |
| Humidity limits | 0% RH to 100% RH |

# Plastic Silicon Pressure Sensors, Low Cost, Temperature Compensated, DIP, 0 psi to 1 psi, 0 psi to 100 psi

**Table 4. Performance Characteristics**[3]

| Characteristic | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|
| Zero pressure offset | -1.0 | 0.0 | +1.0 | mV |
| Zero pressure offset (prime grade) [4] | -0.3 | 0.0 | 0.3 | mV |
| Combined linearity and hysteresis [5] | – | ±0.2 | ±1.0 | % FSO |
| Combined linearity and hysteresis (prime grade) [5] [13] | – | ±0.1 | ±0.25 | % FSO |
| Temperature effect on span, 0 °C to 50 °C [32 °F to 122 °F] [6] | – | ±0.4 | ±2.0 | % FSO |
| Temperature effect on span, 0 °C to 50 °C [32 °F to 122 °F] [6] (prime grade) | – | ±0.4 | ±1.0 | % FSO |
| Temperature effect on offset 0, °C to 50 °C [32 °F to 122 °F] [6] | – | ±0.2 | ±1.0 | mV |
| Temperature effect on offset 0, °C to 50 °C [32 °F to 122 °F] [6] (prime grade) | – | ±0.2 | ±0.5 | mV |
| Repeatability [7] | – | ±0.2 | ±0.5 | % FSO |
| Input resistance [8] | – | 4.0 | – | kOhm |
| Output resistance [9] | – | 4.0 | – | kOhm |
| Common mode voltage [10] | 1.5 | 3.0 | 5.0 | Vdc |
| Response time [11] | – | 100 | – | µs |
| Long term stability of offset and span [12] | – | ±0.1 | – | mV |

**Notes:**

1. Full-Scale Span is the algebraic difference between the output voltage at full-scale pressure and the output at zero pressure. Full-Scale Span is ratiometric to the supply voltage.
2. Maximum pressure above which causes permanent sensor failure.
3. Reference conditions:
   - $^{T}_{A}$ = 25 °C (unless otherwise noted).
   - Supply $V_S$ = 12 Vdc, 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.
4. Maximum zero pressure offset for absolute devices is ±500 mV.
5. Hysteresis is the maximum output difference at any point within the operating pressure range for increasing and decreasing pressure.
6. Maximum error band of the offset voltage and the error band of the span, relative to the 25 °C [77 °F] reading.
7. Maximum difference in output at any pressure within the operating pressure range and the temperature within 0 °C to 50 °C [32 °F to 122 °F] after:
   - 100 temperature cycles, 0 °C to 50 °C [32 °F to 122 °F].
   - 1.0 million pressure cycles, 0 psi to full-scale span.
8. Input resistance is the resistance between $V_s$ and ground.
9. Output resistance is the resistance between the + and - outputs.
10. Common Mode voltage of the output arms for $V_s$=12 Vdc.
11. Response time for a 0 psi to Full-Scale Span pressure step change, 10% to 90% rise time.
12. Long term stability over a one-year period.
13. Maximum combined linearity and hysteresis for the SDX05 prime grade is ±0.5%.

**Figure 1. Electrical Connections**

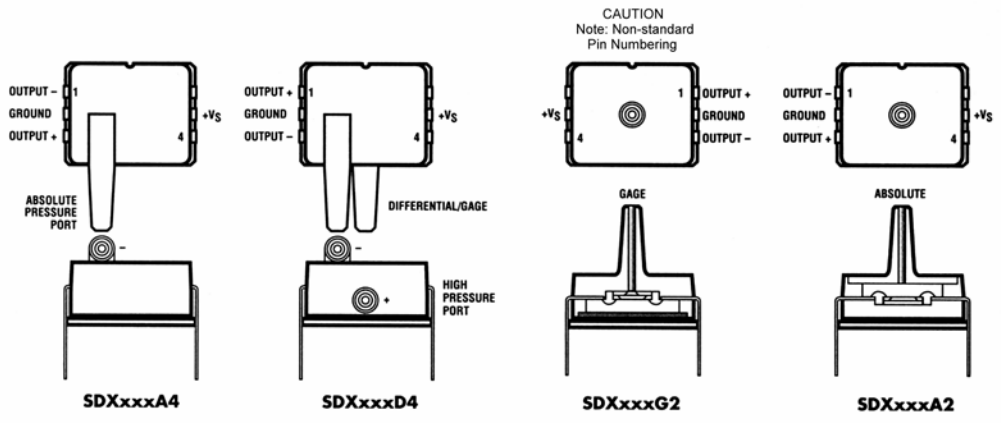
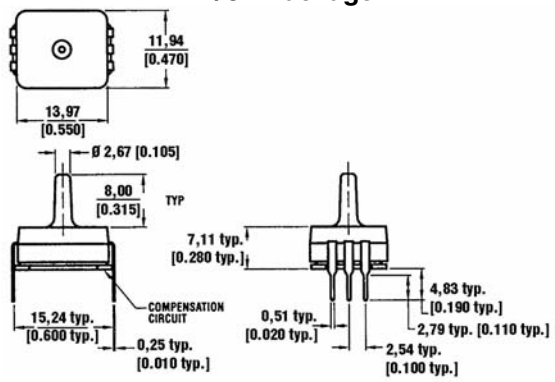
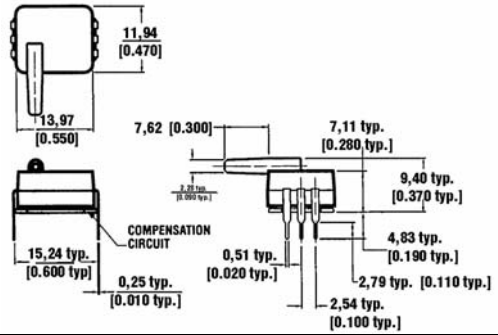


**Figure 2. Mounting Dimensions (For Reference Only. mm/[in])**

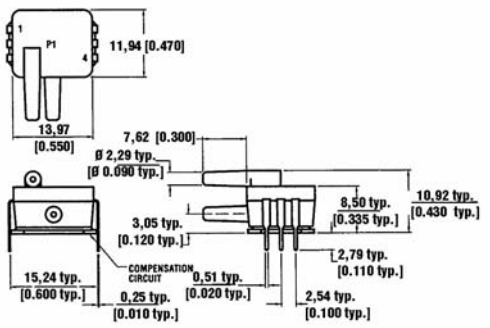
**A2/G2 Package**




**A4 Package**




**D4 Package**




## ⚠ WARNING

**PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

## ⚠ WARNING

**MISUSE OF DOCUMENTATION**

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

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