

Datasheet SDP1000

Low Range Differential Pressure Sensor for Air and Non-Aggressive Gases



- For HVAC and medical OEM applications
- Unsurpassed performance thanks to CMOSens® technology
- Offset and hysteresis free
- Excellent accuracy and reproducibility even below 10 Pa
- Fully calibrated and temperature compensated
- Linear or square root extracted output characteristics available
- Not sensitive to the mounting orientation
- Direct PCB mounting with simple snap-on system



Datasheet – v5.1

SDP1000 Product Summary

The SDP1000 differential pressure sensors for air cover the following measurement ranges: -5 to 125 Pa (0.5 inch H₂O), and -20 to 500 Pa (2 inch H₂O).

Mounted in a rugged, chemically inert PPS housing the SDP1000 differential pressure sensors feature a unique dynamic range, zero offset and unsurpassed long term stability. This makes it an ideal fit for demanding yet cost sensitive OEM applications in HVAC and medical equipment.

The devices are supplied with 5.0 V and provide a 0.25...4.0 V output. Although the output of the SDP1000 differential pressure sensor is analog, the internal linearization and temperature compensation is performed digitally. This results in a superior accuracy, outstanding resolution, and lowest temperature dependence.

Since fully exchangeable just a few external electronic components around the SDP1000 make a high quality

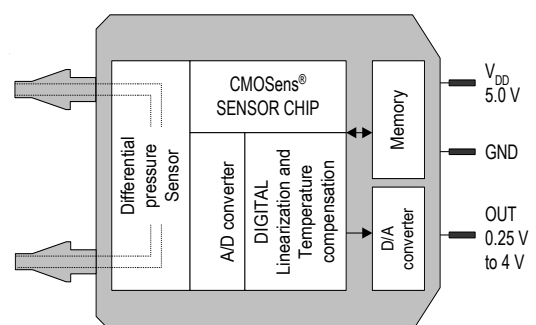
differential sensor transmitter with e.g. an 0...10 V output or other interfaces.

Its leading performance is based on Sensirion's proprietary CMOSens® sensor technology which combines the sensor element with amplification and A/D conversion on one single silicon chip. The differential pressure is measured by a thermal sensor element. In contrast to other thermal differential pressure sensors only a very small amount of air is required. This leads to a reliable operation even under harsh conditions. In comparison to membrane based sensors the SDP1000 differential pressure sensors show an extended measurement range, better offset stability and improved reproducibility even at lowest pressure ranges. In addition, the SDP1000 is robust against pressure bursts and shows no sensitivity to the mounting orientation.

Applications

- Medical
- HVAC
- Automotive
- Process Automation

Block Diagram



1 Specifications

Table 1: Sensor specifications (at 23°C and $p_{\text{absolute}} = 966\text{mbar}$, $V_{\text{DD}} = 5.0\text{ V}$ unless otherwise noted).

Parameter	SDP1000-L025			SDP1000-L05			SDP1000-L			Unit
	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Measurement range	-62		62	-5		125	-20		500	Pa
	-0.25		0.25	-0.02		0.5	-0.08		2	Inch water
Power supply (see Tab 4)	4.75	5.00	5.25	4.75	5.00	5.25	4.75	5.00	5.25	V
Full scale output (100 kΩ load)	Typ. 4.00V at +62Pa Typ. 0.20V at -62Pa						4.00			V
Zero Pressure Output	2.10			0.250			0.250			V
Accuracy (also see Figure 1)	0.5			0.2			0.1			% FS ⁽¹⁾⁽²⁾
	1.5			1.5			1			% m.v. ⁽¹⁾
Repeatability	0.3			0.3			0.3			% m.v. ⁽¹⁾
Offset stability	0			0			0			Pa / year
Additional error over temperature (T ≠ 23°C)	0.003			0.003			0			% FS/°C ⁽²⁾
	0.03			0.03			0.03			% m.v./°C
Resolution < 30% FS ⁽¹⁾							0.05			Pa
Resolution 30..70% FS ⁽¹⁾	0.05	0.1	0.2	0.05	0.1	0.2	0.2	0.5	1.5	Pa
Resolution > 70% FS ⁽¹⁾							1.5			Pa

⁽¹⁾ FS = full scale or span, m.v. = measured value, i.e. reading, whichever value is bigger

⁽²⁾ FS = full scale or span, i.e. for the SDP1000-L it is 500 Pa (2 "H2O), for the SDP1000-L025 it is 62 Pa (0.25 "H2O)

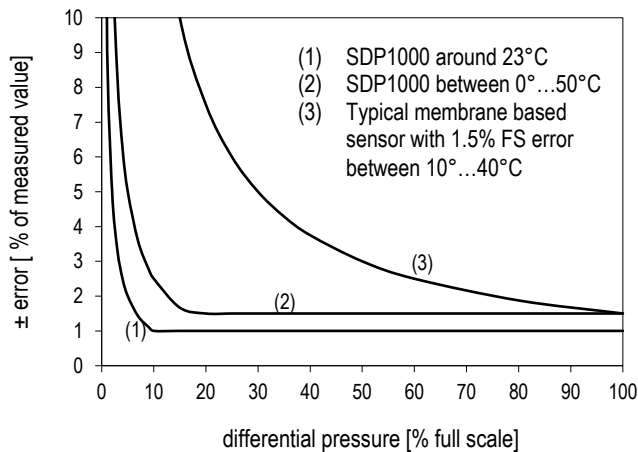


Figure 1: Accuracy (includes errors caused by offset, linearity, hysteresis and repeatability) of the SDP1000-L (1), (2) compared with typical membrane sensors (3).

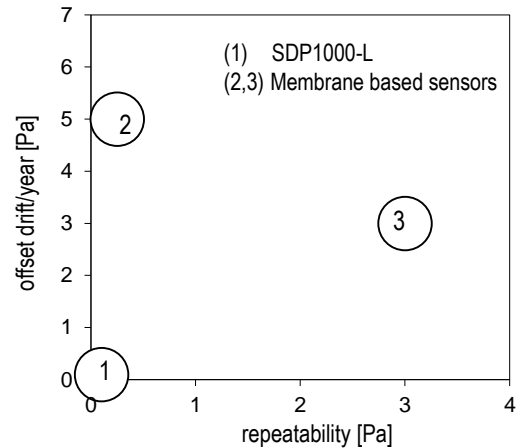


Figure 2: Max. repeatability and offset drift/year of the SDP1000-L (1) compared with two typical membrane based sensors (2,3).