SDP600 Series (SDP6xx/5xx)

Low-cost Digital Differential Pressure Sensor

- Accuracy better than 0.2% FS near zero
- Digital output (I^2C)
- Excellent repeatability, even below 10 Pa
- Calibrated and temperature compensated
- Excellent long-term stability
- Flow measurement in bypass configuration

Product Summary

The SDP600 sensor family is Sensirion's series of digital differential pressure sensors designed for high-volume applications. They measure the pressure of **air and non-aggressive gases** with superb accuracy and no offset drift. The sensors cover a **pressure range of up to ±500 Pa** (±2 inch H_2O / ±5 mbar) and deliver **outstanding accuracy** even at the bottom end of the measuring range.

The SDP600 series operates from a 3.3 Vdc supply voltage and features a digital 2-wire interface, which makes it easy to connect directly to a microprocessor. The signal is internally **linearized** and **temperature compensated**.

The outstanding performance of these sensors is based on Sensirion's **patented CMOSens® sensor technology**, which combines the sensor element, signal processing and digital calibration on a tiny microchip. The differential pressure is measured by a thermal sensor element using flow-through technology. Compared with membrane-based sensors, the SDP600 features an **extended dynamic range**, better **long-term stability**, and improved repeatability, especially near zero.

The well-proven CMOS technology is perfectly suited for high-quality mass production and is the ideal choice **for demanding** and **cost-sensitive OEM applications.**

Applications

- Medical
- HVAC
- Automotive
- Process automation
- Burner control

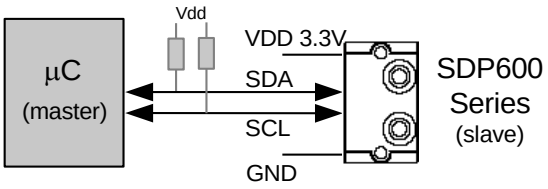
New versions

- Low pressure versions SDP600/610-125Pa and SDP600/610-25Pa are suited to measure very low and ultra low differential pressure.
- Low power versions (SDP606/SDP616) are developed especially for low power battery operation.
- Special calibration to measure a massflow in bypass configuration (SDP601/SDP611).

OEM options

A variety of custom options can be implemented for high-volume OEM applications. Ask us for more information.

Connection diagram



SDP600 series with bidirectional digital communication (I^2C bus)

Sensor chip

The SDP600 series features a fourth-generation silicon sensor chip called SF04. In addition to a thermal mass flow sensor element, the chip contains an amplifier, A/D converter, EEPROM memory, digital signal processing circuitry, and interface. The highly sensitive chip requires only a minuscule amount of gas flow through the sensor.

1. Sensor Performance

1.1 Physical specifications[1]

Parameter	SDP500 SDP510	SDP600-500Pa SDP610-500Pa	SDP600-125Pa SDP610-125Pa	SDP600-25Pa SDP610-25Pa	SDP601 SDP611	SDP606 SDP616
Short Description	Low cost	Standard	Low DP	Lowest DP	"Mass Flow"	Low Power[2]
Calibrated range[3]	0 Pa to +500 Pa (0 to 2.0 in. H_2O)	– 500 Pa to + 500 Pa (± 2.0 in. H_2O)	– 125 Pa to + 125 Pa (± 0.5 in. H_2O)	– 25 Pa to + 25 Pa (± 0.1 in. H_2O)	– 500 to + 500 Pa (± 2.0 in. H_2O)	
Measurement range	– 500 to + 500 Pa (± 2.0 in. H_2O)		– 125Pa to + 125 Pa (± 0.5 in. H_2O)	– 25 Pa to + 25 Pa (± 0.1 in. H_2O)	– 500 to + 500 Pa (± 2.0 in. H_2O)	
Temperature-compensation	yes	yes	yes	yes	mass flow[4]	yes
Resolution	12 bits preset[5] (adjustable from 9 to 16 bit)					16 bit
Zero point accuracy[6,7]	0.2 Pa		0.1 Pa		0.2 Pa	
Span accuracy[6,7]	4.5% of reading	3% of reading				
Zero point repeatability[6,7]	0.1 Pa		0.05 Pa	0.03 Pa	0.1 Pa	
Span repeatability[6,7]	0.5% of reading					
Offset shift due to temperature variation	None (less than resolution)					
Span shift due to temperature variation	< 0.5% of reading per 10°C					
Offset stability	< 0.1 Pa/year					
Response time[5]	4.6 ms typical at 12-bit resolution					70 ms typical
Warm-up time for first reliable measurement	Typ. 50 ms (first measurement typically after 16 ms)					N/A

[1] Unless otherwise noted, all sensor specifications are valid at 25°C with Vdd = 3.3 Vdc and absolute pressure = 966 mbar.
[2] Low Power version are specified at 25°C with Vdd = 3.0 Vdc and absolute pressure = 966 mbar.
[3] The SDP500/SDP510 sensors do measure in the full range from -500 to +500 Pa. But in contrast to the SDP600/SDP610 we do not guarantee the specified accuracy for the negative measurement range for SDP500/SDP510.
[4] Please see chapter 5.3 for details.
[5] See Aplication Note for response times with other resolutions, e.g. 1.3 ms with 10 bits.
[6] With 12-bit resolution; includes repeatability and hysteresis.
[7] Total accuracy/repeatability is a sum of zero-point and span accuracy/repeatability.