

# Datasheet SDP8xx-Digital

## Digital Differential Pressure Sensor

- Excellent repeatability, no drift, no offset
- Extended feature set – smart averaging
- Calibrated and temperature compensated



### Product Summary

The SDP800 sensor family is Sensirion's series of digital differential pressure sensors designed for high-volume applications. The sensors 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  $\pm 500$  Pa ( $\pm 2$  inch H<sub>2</sub>O /  $\pm 5$  mbar) and deliver outstanding accuracy, also at the bottom end of the measuring range.

The SDP800 Series features a digital 2-wire I<sup>2</sup>C interface, which makes it easy to connect directly to a microprocessor.

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 small CMOS chip. The differential pressure is measured by a thermal sensor element using flow-through technology. 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.

### Benefits of Sensirion's CMOSens® Technology

- High reliability and long-term stability
- Best signal-to-noise ratio
- Industry-proven technology with a track record of more than 15 years
- Designed for mass production
- High process capability

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## 1. Ordering Information

Use the part name and order number shown in the following table when ordering SDP800 series differential pressure sensor.

| Part name    | Form Factor     | Range                 | I <sup>2</sup> C address | Shipping Package   | Order number |
|--------------|-----------------|-----------------------|--------------------------|--------------------|--------------|
| SDP800-500Pa | Manifold mount  | 500Pa - bidirectional | 0x25                     | Trays of 80 pieces | 1-101551-01  |
| SDP801-500Pa | Manifold mount  | 500Pa - bidirectional | 0x26                     | Trays of 80 pieces | 3.000.142    |
| SDP810-500Pa | Tube connection | 500Pa - bidirectional | 0x25                     | Trays of 80 pieces | 1-101532-01  |
| SDP811-500Pa | Tube connection | 500Pa - bidirectional | 0x26                     | Trays of 80 pieces | 3.000.144    |
| SDP800-125Pa | Manifold mount  | 125Pa - bidirectional | 0x25                     | Trays of 80 pieces | 1-101599-01  |
| SDP810-125Pa | Tube connection | 125Pa - bidirectional | 0x25                     | Trays of 80 pieces | 1-101597-01  |

## 2. Sensor Performance

### 2.1 Differential Pressure Specification<sup>1</sup>

| Parameter                                  | SDP8xx-500Pa                                          | SDP8xx-125Pa                                       |
|--------------------------------------------|-------------------------------------------------------|----------------------------------------------------|
| Measurement range                          | -500 to 500 Pa<br>(-2 to 2 inH <sub>2</sub> O)        | -125 to 125 Pa<br>(-0.5 to 0.5 inH <sub>2</sub> O) |
| Zero point accuracy <sup>2,3</sup>         | 0.1 Pa                                                | 0.08 Pa                                            |
| Span accuracy <sup>2,3</sup>               | 3% of reading                                         | 3% of reading                                      |
| Zero point repeatability <sup>3</sup>      | 0.05 Pa                                               | 0.04 Pa                                            |
| Span repeatability <sup>3</sup>            | 0.5% of reading                                       | 0.5% of reading                                    |
| Span shift due to temperature variation    | < 0.5% of reading per 10 °C                           | < 0.5% of reading per 10 °C                        |
| Offset stability                           | < 0.05 Pa/year                                        | < 0.05 Pa/year                                     |
| Flow step response time (T <sub>63</sub> ) | < 3ms                                                 |                                                    |
| Resolution                                 | 16 bit                                                |                                                    |
| Calibrated for                             | Air, N <sub>2</sub>                                   |                                                    |
| Media compatibility                        | Air, N <sub>2</sub> , O <sub>2</sub> , non-condensing |                                                    |
| Temperature compensation range             | -20 °C to +85 °C                                      |                                                    |

### 2.2 Temperature Specification<sup>4</sup>

| Parameter         | Value                                              |
|-------------------|----------------------------------------------------|
| Measurement range | -40 °C to +85 °C                                   |
| Resolution        | 16 bit                                             |
| Accuracy          | 2 °C (-10 °C to +60 °C)<br>3 °C (-40 °C to +85 °C) |
| Repeatability     | 0.1 °C                                             |

<sup>1</sup> Unless otherwise noted, all sensor specifications are valid at 25 °C with VDD = 3.3 V and absolute pressure = 966 mbar.

<sup>2</sup> Includes repeatability

<sup>3</sup> Total accuracy/repeatability is a sum of zero-point and span accuracy/repeatability.

<sup>4</sup> The measured temperature is the temperature of the bulk silicon in the sensor. This temperature value is not only depending on the gas temperature, but also on the sensor's surroundings. Using the signal to measure solely the gas temperature will need special precautions, such as isolating the sensor from external temperature influences.