

## 1.2 Ambient conditions

Parameter	SDP5xx / SDP6xx Series
Calibrated for <sup>8</sup>	Air, N <sub>2</sub>
Media compatibility	Air, N <sub>2</sub> , O <sub>2</sub>
Calibrated temperature range <sup>8,9</sup>	-20 °C to +80 °C
Operating temperature	-20 °C to +80 °C
Storage temperature <sup>8</sup>	-40 °C to +80 °C
Position sensitivity	Less than repeatability error

## 1.3 Materials

Parameter	SDP5xx / SDP6xx Series
Wetted materials	PBT (polybutylene terephthalate), glass (silicon nitride, silicon oxide), silicon, gold, FR4, silicone as static sealing, epoxy, copper alloy, lead-free solder
REACH, RoHS, WEEE	The SDP5xx/6xx series is REACH, RoHS and WEEE compliant

# 2. Electrical Specifications

## 2.1 Electrical characteristics

Parameter	SDP5xx / SDP6xx <sup>10</sup>
Operating voltage	3.0– 3.6 Vdc (A supply voltage of 3.3 V is recommended)
Current drain	< 6 mA typical in operation
Interface	Digital 2-wire interface (I <sup>2</sup> C)
Bus clock frequency	100 kHz typical, 400 kHz max.
Default I <sup>2</sup> C address	64 (binary: 1000 000)
<b>Scale factor<sup>11</sup></b>	
SDP6xx-500Pa	60 Pa <sup>-1</sup>
SDP6x0-125Pa	240 Pa <sup>-1</sup>
SDP6x0-25Pa	1200 Pa <sup>-1</sup>
Scale factor to alternative units <sup>12</sup>	For all 500 Pa versions: 6'000 mbar <sup>-1</sup> 413'686 psi <sup>-1</sup> 14'945 (inch H <sub>2</sub> O) <sup>-1</sup>
SDP 6x0-125Pa	24'000 mbar <sup>-1</sup> 1'654'744 psi <sup>-1</sup>

<sup>8</sup> Contact Sensirion for information about other gases, wider calibrated temperature ranges and higher storage temperatures.

<sup>9</sup> Valid for products with serial numbers starting with 1136 000 000. For older products, calibrated temperature range is 0°C to +50°C.

<sup>10</sup> For all SDP6xx sensors except for SDP606/SDP616.

<sup>11</sup> See section 5.1. The scale factor may vary with other configurations.

<sup>12</sup> Instead of the standard scale factor (to get the physical value in Pa), the sensor output may be divided by alternative scale factors to receive the physical value in another unit.

	59'780 (inch H <sub>2</sub> O) <sup>-1</sup>
SDP6x0-25Pa	120'000 mbar <sup>-1</sup> 8'273'719 psi <sup>-1</sup> 298'900 (inch H <sub>2</sub> O) <sup>-1</sup>

## 2.2 Electrical characteristics for SDP606 / SDP616 (low power version)

Parameter	SDP606 / SDP616
Operating voltage	2.7– 3.3 Vdc (A supply voltage of 3.0 V is recommended)
Current drain	< 400 µA
Current drain in sleep mode	< 1 µA
Interface	Digital 2-wire interface (I <sup>2</sup> C)
Bus clock frequency	100 kHz typical, 400 kHz max.
Default I <sup>2</sup> C address	64 (binary: 1000 000)
Scale factor <sup>11</sup>	60 Pa <sup>-1</sup> (for all 500 Pa versions)

### 3. Interface Specifications

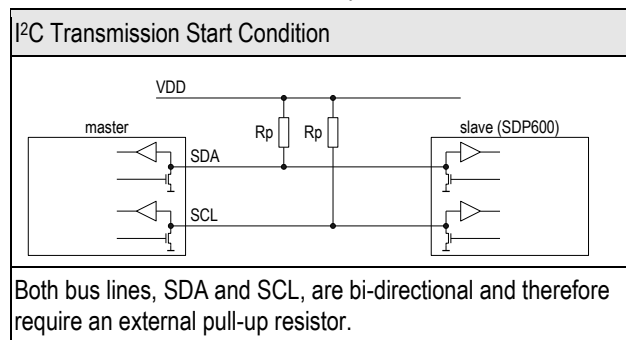
The serial interface of the SDP600 series is optimized in terms of sensor readout and power consumption. It is compatible with I<sup>2</sup>C interfaces. For detailed specifications of the I<sup>2</sup>C protocol, see *The I<sup>2</sup>C Bus Specification*, Version 2.1, January 2000 (source: NXP).

#### 3.1 Interface connection – external components

Bi-directional bus lines are implemented by the devices (master and slave) using open-drain output stages and a pull-up resistor connected to the positive supply voltage.

The recommended pull-up resistor value depends on the system setup (capacitance of the circuit or cable and bus clock frequency). In most cases, 10 kΩ is a reasonable choice.

The capacitive loads on SDA and SCL line have to be the same. It is important to avoid asymmetric capacitive loads.

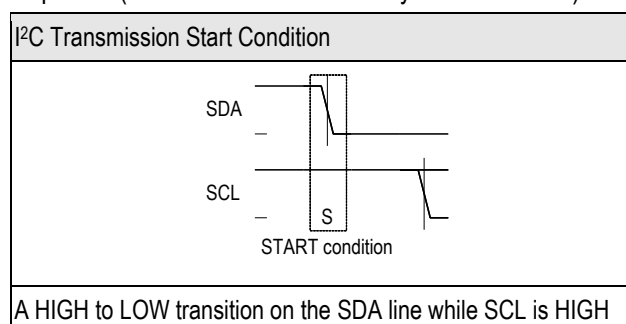


#### 3.2 I<sup>2</sup>C Address

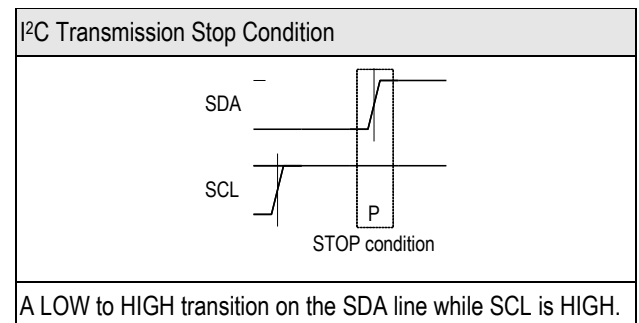
The I<sup>2</sup>C address consists of a 7-digit binary value. By default, the I<sup>2</sup>C address is set to 64 (binary: 1000 000). The address is always followed by a write bit (0) or read bit (1). The default hexadecimal I<sup>2</sup>C header for read access to the sensor is therefore h81.

#### 3.3 Transfer sequences

**Transmission START Condition (S):** The START condition is a unique situation on the bus created by the master, indicating to the slaves the beginning of a transmission sequence (the bus is considered busy after a START).

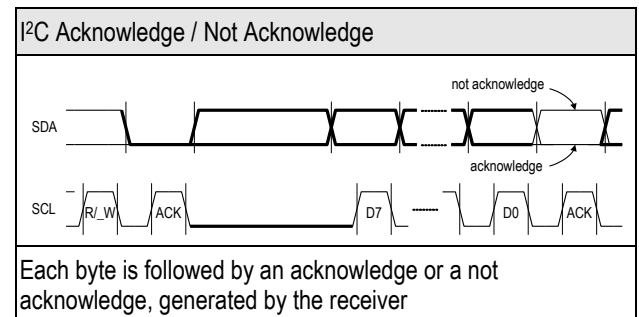


**Transmission STOP Condition (P):** The STOP condition is a unique situation on the bus created by the master, indicating to the slaves the end of a transmission sequence (the bus is considered free after a STOP).



**Acknowledge (ACK) / Not Acknowledge (NACK):** Each byte (8 bits) transmitted over the I<sup>2</sup>C bus is followed by an acknowledge condition from the receiver. This means that after the master pulls SCL low to complete the transmission of the 8th bit, SDA will be pulled low by the receiver during the 9th bit time. If after transmission of the 8th bit the receiver does not pull the SDA line low, this is considered to be a NACK condition.

If an ACK is missing during a slave to master transmission, the slave aborts the transmission and goes into idle mode.



**Handshake procedure (Hold Master):** In a master-slave system, the master dictates when the slaves will receive or transmit data. However, in some situations a slave device may need time to store received data or prepare data to be transmitted. Therefore, a handshake procedure is required to allow the slave to indicate termination of internal processing.

