1.1 Temperature Compensation

The SDP2000-L differential pressure sensor features a sophisticated built-in temperature compensation circuit. The temperature is measured on the CMOSens chip by means of a bandgap reference temperature sensor. Its data is fed into a compensation circuit which is also integrated on the CMOSens® sensor chip. No external temperature compensation is therefore required.

1.2 Altitude Correction

The SDP2000-L differential pressure sensor achieves its unsurpassed performance by using a dynamic measurement principle, i.e. an applied differential pressure forces a small air flow through the sensor. This results in a dependence of the indicated differential pressure on the ambient air density. While the temperature effect is compensated (see Paragraph 1.1) the altitude above sea level has an influence on the SDP2000-L output. If desired, this effect can be compensated by a correction factor according to the following equation:

$$Dp_{eff} = Dp_{sensor} * P_{cal} / P_{amb}$$

where Dp_{eff} is the effective differential pressure, Dp_{sensor} the differential pressure indicated by the SDP2000-L, P_{cal} the absolute pressure during calibration (966 mbar) and P_{amb} the actual ambient absolute pressure.

Note:
For more detailed information about temperature and pressure compensation, refer to the selection guide in the differential pressure download center on the Sensirion website.

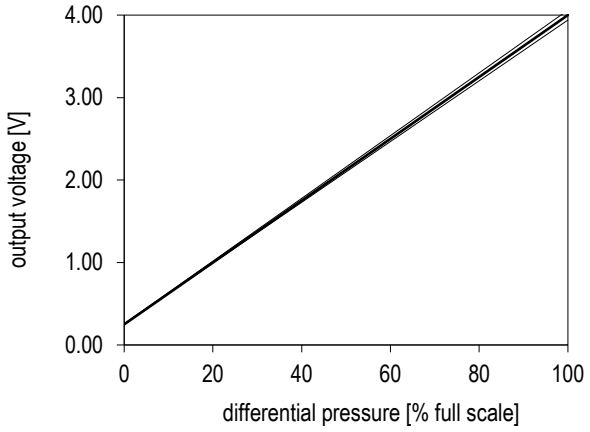
2. Electrical Specifications

2.1 Power Supply

The SDP2000-L differential pressure sensor requires a stable voltage supply of 5V. Influence of the supply voltage variation on the offset and the sensitivity are given in Table 4

2.2 Voltage Output

The SDP2000-L features a voltage output from 0.25V to 4.0V (Figure 1). An output voltage below 0.25V indicates a negative differential pressure. This range is not calibrated however.
The resistive load at the output pin should be larger than 20kOhm. The capacitive load at the output pin must not be larger than 200pF. If the design shows a larger capacity at the output pin an additional resistor is required in series at the output (e.g. 620Ohm).



Formula: P = Ifactor * (voltage(1) – 0.250)/3.750

Ifactor =	
Pascal	3500
Inch water	14

(1) voltage: measured output voltage in Volt.

Figure 1: Linear output at 5V supply of the SDP2000-L.
The fine lines indicate the maximum tolerances including a temperature variation from 0 to 50°C.

Table 3: Electrical characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Power Supply Voltage V_{DD}		4.75	5.0	5.25	VDC
Operating Current	5 V, no load, zero flow		4.3	5.2	mA
Output capacitive load C_{load}			20	200	pF
Recommended load R_{load}	To GND	20	100	∞	kΩ

Table 4: Typical power supply dependence of the offset and the sensitivity

Parameter	4.75 V	5.0 V	5.25 V	Units
Offset	- 10.3		+ 10.3	Pa
Sensitivity	1.01	1.07	1.13	mV/Pa