



# Pressure sensors

## Handling Guideline

**Series/Type:** AVD \*.\*\*\* KA D4 Z14E L ST B\*\*\*  
**Ordering code:** B58621V\*\*\*\*B\*\*\*  
**Date:** 2021-11-04  
**Version:** 1.0

## Applications

- Differential pressure measurement e.g. for flow control and filter monitoring applications
- Gauge pressure measurement e.g. for pressure level control and gas dosing in respirators

## Features

- Multiple pressure ranges available: 0 ... 16 mbar; 0 ... 100 mbar; 0 ... 7 bar
- Typical pressure signal accuracy depending on pressure range:  $\pm 1,5\%$  FS;  $\pm 0,45\%$  FS;  $\pm 0.35\%$  FS in a wide temperature range from  $-20 \dots 70 \text{ }^\circ\text{C}$
- Temperature signal accuracy typ.  $\pm 2 \text{ K}$  in a wide temperature range from  $-20 \dots 70 \text{ }^\circ\text{C}$
- Digital I<sup>2</sup>C output proportional to pressure: 10 ... 90% of digital output range (14 bit)
- Piezoresistive MEMS technology
- Measured media: air, non-aggressive gases
- Prepared for screw mounting to provide improved mechanical stability
- Barbed pressure ports for easy mounting of tubes
- RoHS-compatible, halogen free according to IEC 61249-2-21 clause 3.1

### Unpacking instructions

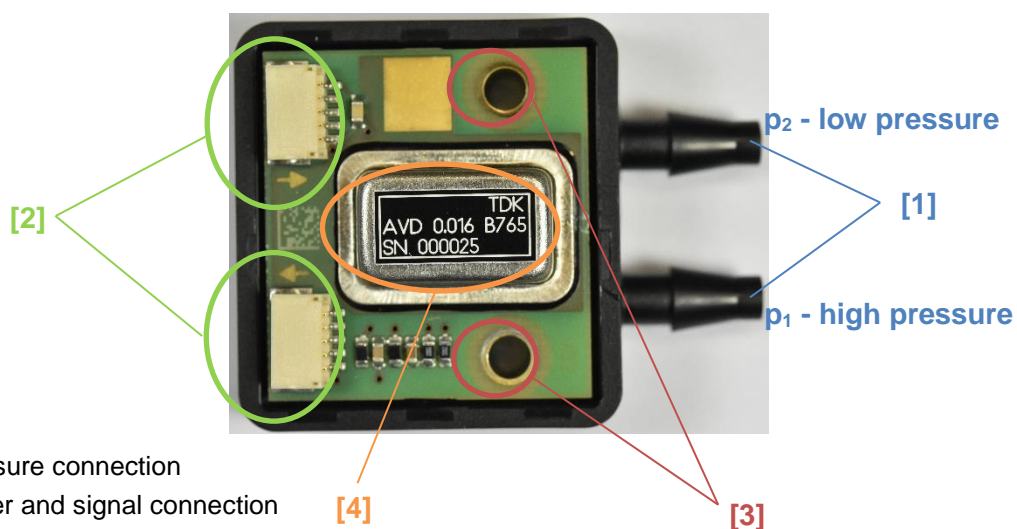


Figure 1: Pressure transmitter and packaging

The transmitter is placed inside a plastic zipper bag as transport and ESD protection. Open the zipper and take the sensor out of the bag.

Always store the product in the original package.

### Handling instructions



- [1] Pressure connection
- [2] Power and signal connection
- [3] Mounting and fastening
- [4] Label and type designation

Figure 2: Functional elements of the pressure transmitter

[1] Pressure Connection

The following diagrams show the connection of P1 (high pressure connect) and P2 (low pressure connect) in typical applications. The resulting differential pressure is  $p = p_1 - p_2$ .

Pressure ports are designed for mounting flexible tubes with an inner diameter of 4 mm. The joint of tube and pressure port has to be tested in pressure and temperature range to avoid leakage.

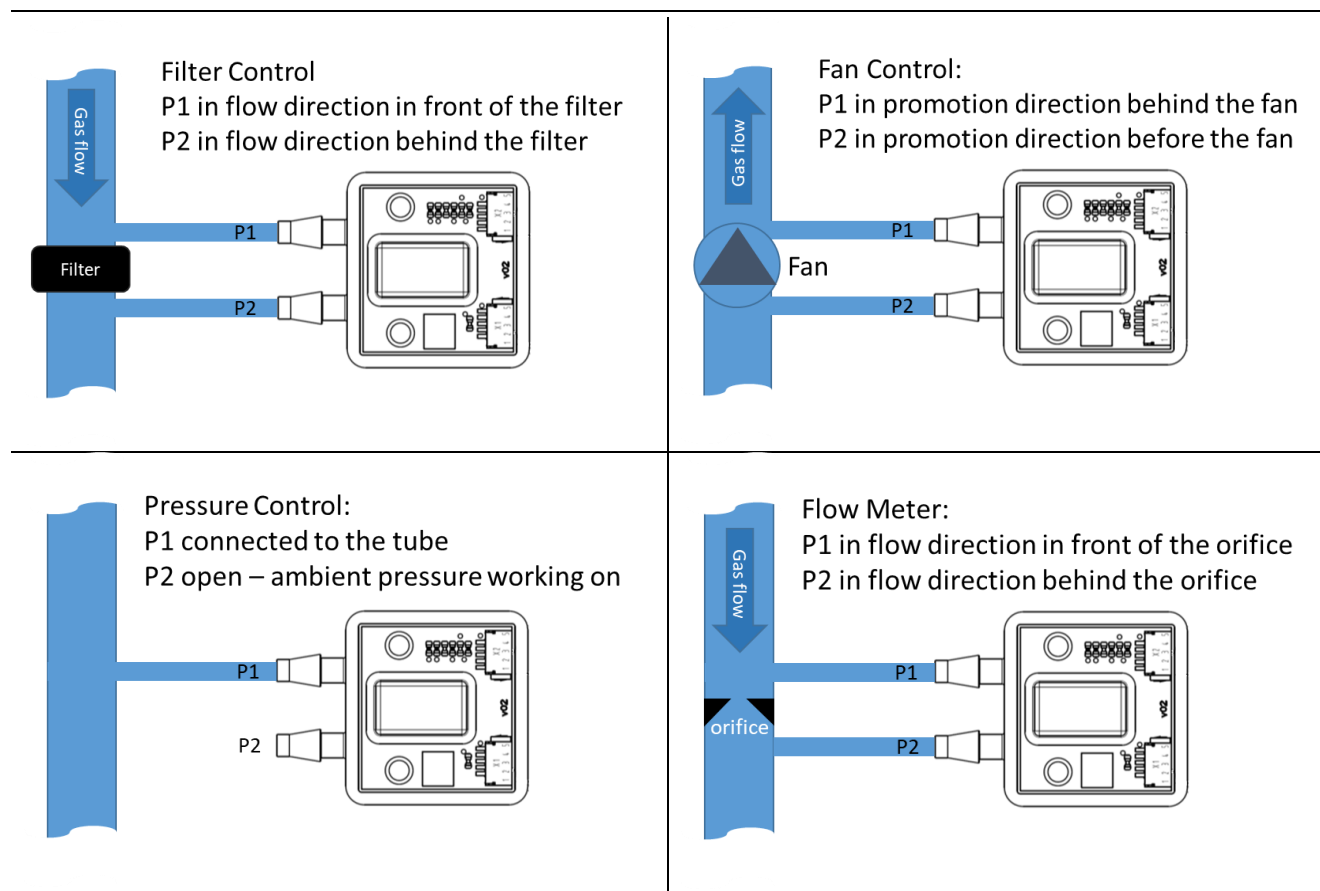


Figure 3: Typical applications for pressure transmitter

[2] Power and signal connection

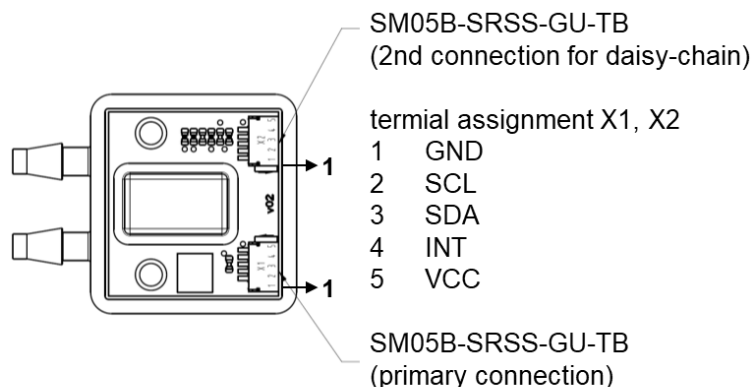


Figure 4: Electrical connection of pressure transmitter

The electrical connector on the sensor is specified as JST SM05B-SRSS-GU-TB or equivalent. Matching SR / SZ connector sockets are JST 05SR-3S or JST A05R05SR30K203B or equivalent.

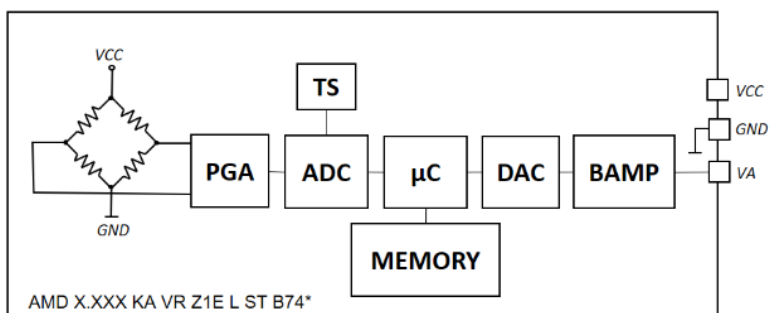
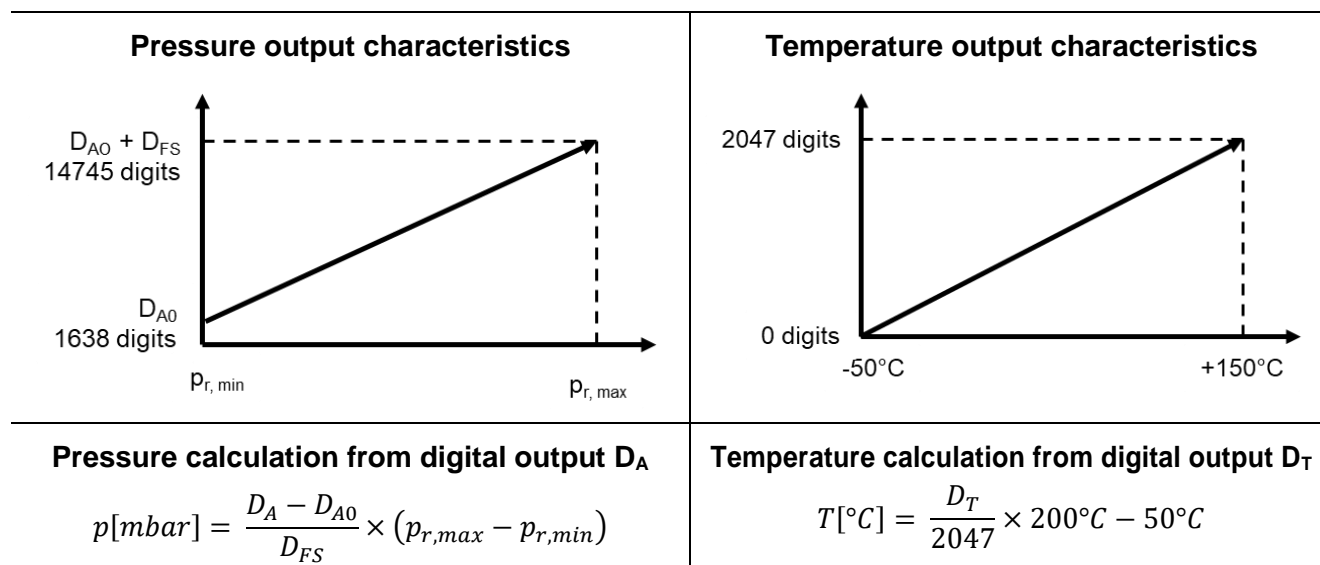


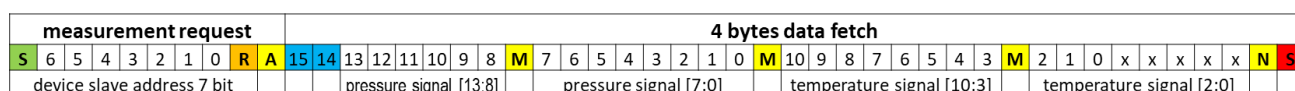
Figure 5: Block diagram of internal signal conditioning



- $D_A$  – current pressure value
- $D_{A0}$  – offset pressure value = 1638 d
- $D_{FS}$  – signal span = 13107 d

The internal signal conditioner maps the range of the differential pressure  $p_r = 0 \dots p_{r,max}$  to a digital bit value between 1638 .. 14745 digits. The temperature signal is mapped to a digital bit value between 0 .. 2047 digits for a temperature range between -50 and 200 °C.

The measured values for pressure and temperature are provided by I<sup>2</sup>C bus signal.

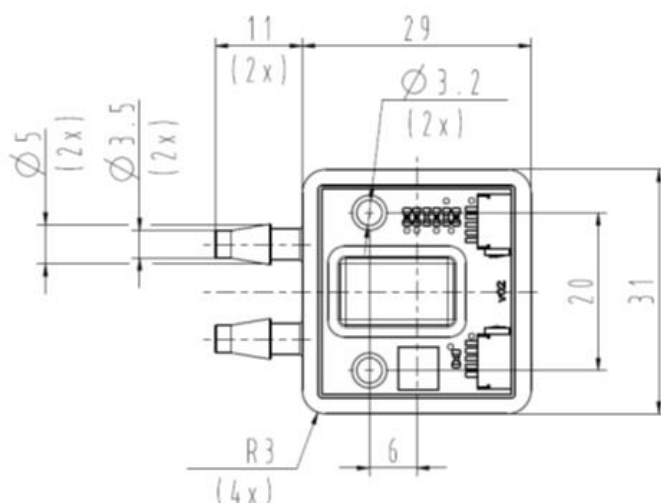


- S** start
  - R** read / Write bit (Read = 1)
  - A** wait for slave Acknowledge (ACK)
  - M** master Acknowledge (ACK)
  - N** master No Acknowledge (NACK)
  - S** stop
  - status bit
- pressure signal: 14 bit = 16384 d  
temperature signal: 11 bit = 2048 d

Figure 6: Diagram of I<sup>2</sup>C Read Operation

The supply voltage shall be stabilized between 2.7 and 5.5 V. The digital output signal is independent from supply voltage.

### [3] Mounting and fastening

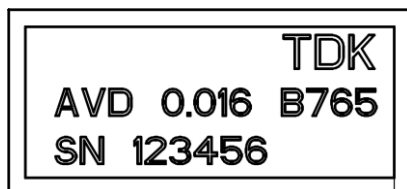


For fixation of the pressure transmitter two M3 screws with washers should be used. Cross head, hexagon socket head or star head screws should be preferred instead of slotted head screws to avoid damages during the mounting process. Maximum outer diameter of the washers is 7 mm. Tighten the screws with a maximum torque of 1.5 Nm

It is recommended to validate all mounting processes carefully and perform life testing on the set-up.

#### [4] Label and type designation

The label on the pressure transmitter only provides information for type identification and traceability.



AVD – Sensor type, product family  
 0.016 – Rated pressure range [bar] p<sub>r</sub>: 0... 16 mbar  
 B765 – Sensor type specification number  
 SN – Serial number of sensor

**Figure 7: Label on pressure transmitter (Example)**

The complete information including sensor type, pressure range and ordering code is labeled on the packaging bag shown in figure 1.

The following table shows a lineup of available types, pressure ranges and ordering codes covered by this handling guideline.

Type	Rated differential pressure		Ordering codes
	Range	Unit	
AVD 0.016 KA D4 Z14E L ST B765	0 ... 16	mbar	B58621V4121B765
AVD 0.100 KA D4 Z14E L ST B766	0 ... 100	mbar	B58621V2712B766
AVD 7.000 KA D4 Z14E L ST B767	0 ... 7	bar	B58621V2894B767

The ordering code for one and the same product can be represented differently in data sheets, data books, other publications, on the company website, or in order-related documents such as shipping notes, order confirmations and product labels. The varying representations of the ordering codes are due to different IT-systems and processes employed and do not affect the specifications of the respective products. Detailed information can be found on the Internet under [www.tdk-electronics.tdk.com/orderingcodes](http://www.tdk-electronics.tdk.com/orderingcodes).

## Cautions and warnings

Always refer to the TDK datasheet for the minimum and maximum ratings during storage and operation such as temperatures, operation voltages and pressures

### Storage

All pressure sensors should be stored in their original packaging. Maximum storage and time in original package is 2 years after the date of production. Transmitters should not be placed in harmful environments such as corrosive gases nor exposed to heat or direct sunlight, which may cause deformations. Similar effects may result from extreme storage temperatures and climatic conditions. Avoid storing the sensors in an environment where condensation may form or in a location exposed to corrosive gases, which will adversely affect their performance

### Operation (general)

Media compatibility with the pressure sensors has to be checked to prevent their failure. The use of other media can cause damage and malfunction. Never use pressure sensors in atmospheres containing explosive liquids or gases.

Ensure pressure equalization to the environment, if gauge pressure sensors are used. Avoid operating the pressure sensors in an environment where condensation may form or in a location exposed to corrosive gases. These environments adversely affect their performance.

If the operating pressure is not within the rated pressure range, it may change the output characteristics. Be sure that the applicable pressure does not exceed the over pressure, as it may damage the pressure sensor.

Do not exceed the maximum rated supply voltage nor the rated storage temperature range, as it may damage the pressure sensor.

Temperature variations in both the ambient conditions and the media (liquid or gas) can affect the accuracy of the output signal from the pressure sensors. Be sure to check the operating temperature range and thermal error specification of the pressure sensors to determine their suitability for the application.

Connections have to be wired in accordance with the terminal assignment specified in the data sheets. Care should be taken as reversed pin connections can damage the pressure transmitters or degrade their performance. Contact between the pressure sensor terminals and metals or other materials may cause errors in the output characteristics.

This listing does not claim to be complete, but merely reflects the experience of TDK Electronics AG.



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## Important notes

8. The trade names EPCOS, CarXield, CeraCharge, CeraDiode, CeraLink, CeraPad, CeraPlas, CSMP, CTVS, DeltaCap, DigiSiMic, ExoCore, FilterCap, FormFit, LeaXield, MiniBlue, MiniCell, MKD, MKK, ModCap, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, PowerHap, PQSine, PQvar, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, ThermoFuse, WindCap, XieldCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at [www.tdk-electronics.tdk.com/trademarks](http://www.tdk-electronics.tdk.com/trademarks).

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