

Features

- Two Wire technique
- Piezoresistive sensing element
- Output signal 4-20 mA
- Pressure type Gauge, Absolute
- Accuracy ± 0.1 % FS
- Calibration in bar / psi / mWC
- Indent for the remaining pressure ranges from 0 - 0.1 up to 25 bar or correspondent pressure ranges in psi (from 0 - 1.5 psi up to 0 - 400 psi)
- Adjustable within 1 : 4 of the nominal pressure range
- Temperature compensated within -10°C ... +50°C [+14°F ... +122°F] or -25°C ... +85°C [-13°F ... +185°F]
- Compact and robust

Picture



Specifications

All specifications, unless otherwise noted, at DC 24 V supply voltage, $R_L = 100 \Omega$, $T_{amb} = 25^\circ\text{C}$ [77°F].

Measurement Range Independent Technical Data

| | |
|-----------------------------------|---|
| Type | Two wire current transmitter |
| Output signal | 4 ... 20 mA |
| Resolution | 12 bit (< 0.025 % FS) |
| Interface for adjustment | HART-like |
| Output zero adjustability | -5% of original FS ... +100% of original FS |
| Output span adjustability | $\geq 25\%$ of original FS (≥ 50 mbar [0.725 psi = 0.51 mWC]) +105% of original FS |
| Delay adjustability | ~30 ms (default), 100 ms, 1 s, 10 s |
| Supply voltage | DC 9 ... 33 V |
| Reverse polarity protection | integrated, standard |
| Surge (lightning) protection | optional |
| Supply voltage influence | < 0.1 % FS |
| Dielectric strength case / supply | 500 V |
| Load resistance limitation | $R_L [\Omega] \leq (+U_B [V] - 9 [V]) / 0.02 [A]$ |
| Load resistance influence | < 0.1 % FS |
| Protection class | IP68 (NEMA 4X) |
| Operating media temperature range | -10°C ... +50°C [+14°F ... +122°F] standard -25°C ... +85°C [-13°F ... +185°F] option |
| Compensated temperature range | = operating temperature range |
| Storage temperature range | = operating temperature range |
| Acid resistance | pH5 ... pH9 |

Weight approx. 160 g [0.35 pounds] without surge protection
 approx. 170 g [0.37 pounds] with surge protection
 Measuring cell, diaphragm, housing Stainless steel 1.4435 (316L)
 Seals Viton

Connecting cable

by choice PE / PUR / Teflon cable with integrated pressure compensation tube
 Outside diameter 6 mm [0.24"] PE / PUR; 5 mm [0.2"] Teflon
 Conductor 0.22 mm² [AWG 24], Cu-wire 7 x 0.20 tin-plated
 Resistance ≤ 82.9 mΩ/m [25.3 mΩ/ft] (one way)
 Minimum cable bending radius 100 mm [4"]
 Tearforce > 500 N [112 lbf]
 Pressure compensation tube diameter Ø 1.4 / 0.8 mm [0.055" / 0.03"] PE / PUR;
 Ø 1.1 / 0.6 mm [0.04" / 0.02"] Teflon

PE-cable food approved
 allowable media temperature ≤ 50°C [+122°F]
 Weight approx. 41 g/m [0.44 oz/ft]
 Stretchforce < 15 N [3.37 lbf]

PUR-cable mechanical robust
 allowable media temperature ≤ 50°C [+122°F]
 Weight approx. 43 g/m [0.46 oz/ft]
 Stretchforce ≤ 334 N [75 lbf]

Teflon-cable
 allowable media temperature ≤ 85°C [+185°F]
 Weight approx. 55 g/m [0.59 oz/ft]
 Stretchforce < 15 N [3.37 lbf]


Electromagnetic compability

Emission
 Generic emission standard EN 50081-1:1992
 Emission, class B EN 55022:1994

Immunity
 Generic immunity EN 50082-2:1995
 Electrostatic discharge EN 61000-4-2:1995 (4 kV contact, 8 kV air)
 Radiated electro-magnetic field ENV 50140:1993 (10 V/m, 80 ... 100 MHz, 80% AM 1 kHz)
 Radiated electro-magnetic field (GSM) ENV 50204:1995 (10 V/m, 950 MHz, 200 Hz on/off)
 Fast transients (burst) EN 61000-4-4:1995 (2 kV)
 Conducted radio-frequency ENV 50141:1993 (10 V, 0.15 ... 80 MHz, 80% AM 1 kHz)

Surge EN 61000-4-5:1995 (10 kA 8/20µs)
 [only with optional surge (lightning) protection]

Quality Tests

 Complies with the EMC directive 89/336/EEC.

Measurement Range Specific Technical Data

| | | |
|---|--|--|
| Pressure range | ... 0.1 bar [1.45 psi] | > 0.1 ... 25 bar [1.45 psi...362.5 psi] |
| Overpressure | 3 bar [43.5 psi] | 3 x FS (at least 3 bar [43.5 psi]) |
| Burst pressure | > 200 bar [2900 psi] | > 200 bar [2900 psi] |
| Accuracy incl. hysteresis and repeatability | | |
| -10°C ... +50°C [+14°F...+122°F] | ≤ ±0.2 % FS | ≤ ±0.1 % FS |
| -25°C ... +85°C [-13°F...+185°F] | ≤ ±0.2 % FS | ≤ ±0.1 % FS |
| Thermal shift Zero / Span | | |
| -10°C ... +50°C [+14°F...+122°F] | ± 100 ppm FS/°C typ. ± 150 ppm FS/°C max. | ± 60 ppm FS/°C typ. ± 100 ppm FS/°C max. |
| -25°C ... +85°C [-13°F...+185°F] | ± 200 ppm FS/°C typ. ± 250 ppm FS/°C max. | ± 150 ppm FS/°C typ. ± 200 ppm FS/°C max. |
| Long term stability (1 yr) | < 4 mbar [0.058 psi] | < 4 mbar [0.058 psi] |

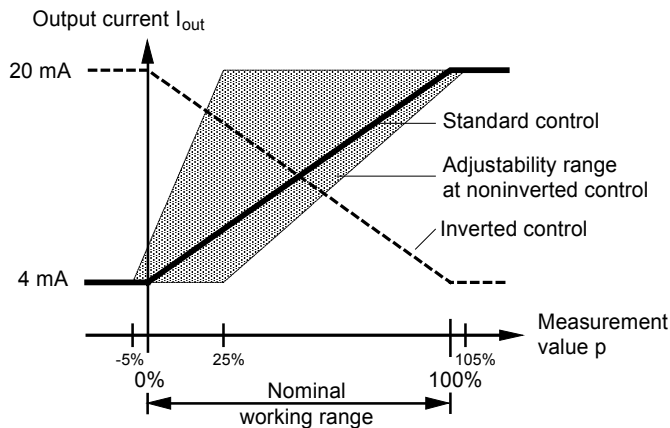
Parametrization

With the help as an accessory available Programmig kit MPPKIT, consisting of interface box and programming software under Windows 9x / ME / NT / 2000 / XP, parametrization of the transmitter can be undertaken (see also data sheet 21.210.0066900.001 and operation manual 21.810. 0066900.001).

- Range selection for the output current 4 ... 20mA (Programming)

With the range selection 4 ... 20mA is it possible to allocate other measurement values to the 4 mA and 20 mA output values as the standard 0% FS and 100% FS. (Typicaly at 4 mA a value from range -5% FS ... +25% FS, at 20 mA a value from range +25% FS ... +105% FS.) On this way a subrange or negative pressure can also be measured.

By exchange the values for 4 mA and 20 mA one another an inverted control will be reached. (Rising pressure thereby produces falling output current.)



The adjustability range is diagrammed on the picture on the left.

In the case of inverted control there are always the same adjustability possibilities as at the noninverted control. For clearness reasons is the correspondig range not displayed.

- Programmable Low Pass Filter on current output.
The analog output can be attenuated with a low-pass filter of 1st order in the range of ~30 ms (default) and 10s.
Hint: Select the minimum value during start-up.

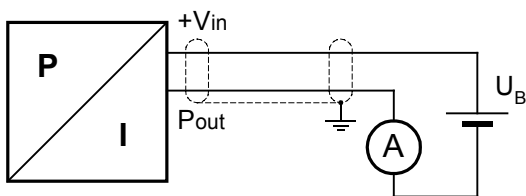
- Recalibration 0% and 100%
 The transducer is calibrated to the nominal measurement range (FS) ex works. On detection of an inevitable long-term drift, the transducer could be recalibrated. It is possible to compensate either only zero point drift, or only span drift or both together. The origin calibration is nonvolatile saved in the transmitter and can be reestablish on demand.
 Setting range 0%: -5% ... +5% of nominal measurement range (FS)
 Setting range 100%: 95% ... 105% of nominal measurement range (FS)

Standard Settings

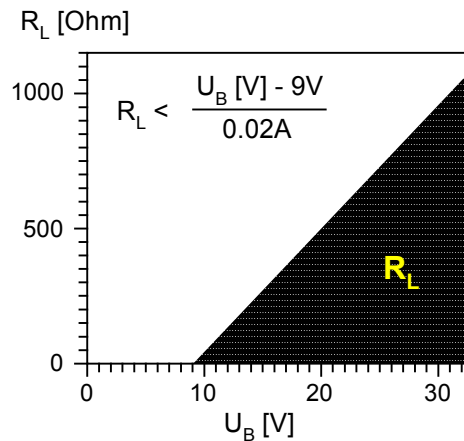
The transducers have the following standard parameterization:

- Current range: 4 ... 20mA
- Measurement range begin: 4 mA = 0% of nominal measurement range (FS)
- Measurement range end: 20 mA = 100% of nominal measurement range (FS)
- Damping: ~30 ms

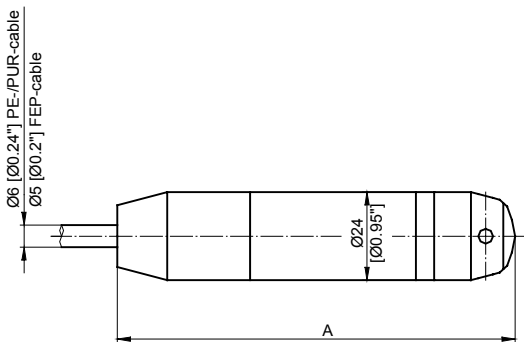
Standard Schematic / Electrical Connections



+Vin ↔ white
 Pout ↔ yellow



Dimensions



A = 137 mm (5.4") with / without surge (lightning) protection

Ordering information

Table 1:

The exact order number for an article is formed from the individual optionscodes according to the table (with the BAAN-Configurator PCF or manually).

| MPB | PCF Order Number | | | | | | | | | | | | | | | |
|---|------------------|---|---|---|---|---|---|---|----|----|----|----|----|----|----|---|
| | 1/2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| Type | | | | | | | | | | | | | | | | |
| MPB | PB | | | | | | | | | | | | | | | |
| Pressure type | | | | | | | | | | | | | | | | |
| Gauge | | 1 | | | | | | | | | | | | | | |
| Absolut | | 2 | | | | | | | | | | | | | | |
| Measurement range | | | | | | | | | | | | | | | | |
| 0 ... 100 mbar = 0 ... 1.45 psi | | | 0 | 0 | | | | | | | | | | | | |
| 0 ... 160 mbar = 0 ... 2.32 psi | | | 0 | 1 | | | | | | | | | | | | |
| 0 ... 250 mbar = 0 ... 3.63 psi | | | 0 | 2 | | | | | | | | | | | | |
| 0 ... 400 mbar = 0 ... 5.8 psi | | | 0 | 3 | | | | | | | | | | | | |
| 0 ... 600 mbar = 0 ... 8.7 psi | | | 0 | 4 | | | | | | | | | | | | |
| 0 ... 1.0 bar = 0 ... 14.5 psi | | | 0 | 5 | | | | | | | | | | | | |
| 0 ... 1.6 bar = 0 ... 23.2 psi | | | 0 | 6 | | | | | | | | | | | | |
| 0 ... 2.5 bar = 0 ... 36.25 psi | | | 0 | 7 | | | | | | | | | | | | |
| 0 ... 4.0 bar = 0 ... 58 psi | | | 0 | 8 | | | | | | | | | | | | |
| 0 ... 6.0 bar = 0 ... 87 psi | | | 0 | 9 | | | | | | | | | | | | |
| 0 ... 10 bar = 0 ... 145 psi | | | 1 | 0 | | | | | | | | | | | | |
| 0 ... 16 bar = 0 ... 232 psi | | | 1 | 1 | | | | | | | | | | | | |
| 0 ... 25 bar = 0 ... 362.5 psi | | | 1 | 2 | | | | | | | | | | | | |
| 0 ... 1 mWC | | | 6 | 0 | | | | | | | | | | | | |
| 0 ... 2 mWC | | | 6 | 1 | | | | | | | | | | | | |
| 0 ... 5 mWC | | | 6 | 2 | | | | | | | | | | | | |
| 0 ... 10 mWC | | | 6 | 3 | | | | | | | | | | | | |
| 0 ... 20 mWC | | | 6 | 4 | | | | | | | | | | | | |
| 0 ... 50 mWC | | | 6 | 5 | | | | | | | | | | | | |
| 0 ... 1.5 psi | | | 7 | 0 | | | | | | | | | | | | |
| 0 ... 3.0 psi | | | 7 | 1 | | | | | | | | | | | | |
| 0 ... 7.5 psi | | | 7 | 2 | | | | | | | | | | | | |
| 0 ... 15 psi | | | 7 | 3 | | | | | | | | | | | | |
| 0 ... 30 psi | | | 7 | 4 | | | | | | | | | | | | |
| 0 ... 75 psi | | | 7 | 5 | | | | | | | | | | | | |
| 0 ... 150 psi | | | 7 | 6 | | | | | | | | | | | | |
| 0 ... 300 psi | | | 7 | 7 | | | | | | | | | | | | |
| Special range | | | 9 | 9 | | | | | | | | | | | | |
| Version | | | | | | | | | | | | | | | | |
| Closed version | | | | | 5 | 5 | | | | | | | | | | |
| Electrical connection | | | | | | | | | | | | | | | | |
| PE cable (food approved) | | | | | | | 1 | 3 | | | | | | | | |
| PUR cable | | | | | | | 1 | 5 | | | | | | | | |
| Teflon cable (temp. > +50°C [+122°F]) | | | | | | | 2 | 1 | | | | | | | | |
| Output signal | | | | | | | | | | | | | | | | |
| 4 ... 20 mA without surge (lightning) protection | | | | | | | | | 0 | 5 | | | | | | |
| 4 ... 20 mA with surge (lightning) protection | | | | | | | | | 0 | 8 | | | | | | |
| Accuracy | | | | | | | | | | | | | | | | |
| ±0.2 % FS, only for FS = 100 mbar | | | | | | | | | | | 4 | | | | | |
| ±0.1 % FS, only for FS > 100 mbar | | | | | | | | | | | 2 | | | | | |
| Temperature range | | | | | | | | | | | | | | | | |
| Compensated -10°C ... +50°C [+14°F ... +122°F] (Medium 0 ... 80°C [+32°F ... +176°F]) | | | | | | | | | | | | 0 | | | | |
| Compensated -25°C ... +85°C [-13°F ... +185°F] (Medium -25°C ... +85°C [-13°F ... +185°F]) | | | | | | | | | | | | 1 | | | | |
| Cable length | | | | | | | | | | | | | | | | |
| Cable length in meter (always ≥ 001) | | | | | | | | | | | | | | x | x | x |

Hints

- The load resistance R_L is the sum of load and cable resistance.
- The cable must not be tight bend or flat squeezed (because of the integrated pressure compensation tube).
- Note that humidity should not penetrate into the venting tube. Therefore do not remove the humidity-brake, that is mounted on the pressure compensation tube. Use of branch box with desiccator is recommended.
- To avoid damage of the separating membrane, do not touch the membrane.
- For field use with extension cables lengths ≥ 5 m (16 ft) or within a building with cable lengths ≥ 100 m (330 ft), a transmitter with the surge (lightning) protection option and an overvoltage protection ASBG.48 or similar (on the other side of cable) must be used.
- Connect the cable-shield to a good ground potential.
- Conversion table for pressure units
(value in new unit) = coefficient x (value in old unit)

| coefficient | new unit | | | | | | |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------|-------------------------|-------------------------|
| old unit | Pa = 1 N/m ² | bar | mWC | ftWC | mmHg (Torr) | psi | kp/cm ² = at |
| Pa = 1 N/m ² | 1 | 10 ⁻⁵ | 1.02 x 10 ⁻⁴ | 3.35 | 7.5 x 10 ⁻³ | 1.45 x 10 ⁻⁴ | 1.02 x 10 ⁻⁵ |
| bar | 10 ⁵ | 1 | 10.2 | 33.5 | 750 | 14.5 | 1.02 |
| mWC | 9.81 x 10 ³ | 9.81 x 10 ⁻² | 1 | 3.28 | 73.6 | 1.42 | 0.1 |
| ftWC | 2.99 x 10 ³ | 2.99 x 10 ⁻² | 0.305 | 1 | 22.4 | 0.433 | 3.05 x 10 ⁻² |
| mmHg (Torr) | 1.33 x 10 ² | 1.33 x 10 ⁻³ | 1.36 x 10 ⁻² | 4.46 x 10 ⁻² | 1 | 1.93 x 10 ⁻² | 1.36 x 10 ⁻³ |
| psi | 6.89 x 10 ³ | 6.89 x 10 ⁻² | 0.703 | 2.31 | 51.7 | 1 | 7.03 x 10 ⁻² |
| kp/cm ² = at | 9.81 x 10 ⁴ | 0.981 | 10 | 32.8 | 736 | 14.2 | 1 |

Application example 2 bar = ? psi:

bar = "old unit", psi = "new unit", \Rightarrow "coefficient" = 14.5

2 bar = 14.5 x 2 psi = 29 psi

Accessories

| | Abbreviation | Order No. * |
|---|--------------|---------------|
| Programming-Kit consisting of interface box and programming software under Windows 9x / ME / NT / 2000 / XP | MPPKIT | 00 66 900.001 |
| Extension cable 2-wire, shielded (L [m]) | MPZVK | 04 60 502 |
| Branch box (small) IP54 (NEMA3) | MPZAD | 00 65 195.001 |
| Branch box complete, IP65 (IP67) (NEMA4), with desiccator | MPZAD.002 | 00 65 194.001 |
| Surge protection AC/DC 48 V | ASBG.48 | 00 32 721.003 |
| Suspension arrangement for submersible probe | MPZHVT | 00 65 717.001 |
| Protection tube 2 m [6.6 ft] (in still waters) | MPZSRR.002 | 00 65 720.002 |
| Protection tube 2 m [6.6 ft] (in running waters) | MPZSRF.002 | 00 65 721.002 |
| Protection tube extension 2 m [6.6 ft] for MPZSRR.002, MPZSRF.002 | MPZSRV.002 | 00 65 722.002 |
| Sensor cabinet | MPZFK | 00 65 543.001 |
| Protection tube for sensor cabinet | MPZSRU | 00 65 549.001 |
| Desiccant box | MPZDES | 00 65 191.001 |

* The declaration of order numbers is only informative and doesn't mean any statement about keeping in stock or general availability of an article.

| | | | | | |
|--|--|---|---|---|---|
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|--|--|---|---|---|---|