Features

- Two wire system
- Piezoresistive measuring element
- Pressure measurement relative or absolute
- Output signal 4-20 mA,
  adjustable within 1 : 4 of the original measuring range
- Conformity error ≤ ±0.1 % FS
- Standard DIN measuring ranges from
  0 …100 mbar up to 0 … 160 bar or selection of measuring ranges in mWC or psi
- Temperature compensation within
  -10°C ... +50°C [+14°F ... +122°F] or
  -25°C ... +85°C [-13°F ... +185°F]
- Optional overvoltage (lightning) protection according to EN 61000-4-5
- Compact and robust

Picture

Specifications

All specifications, unless otherwise noted, at DC 24 V supply voltage, R_L = 100 Ω, T_{amb} = 25°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 0% adjustability	-5% of orig. FS ... +105% of orig. FS (rel. measurement)) 0% of orig. FS ... +105% of orig. FS (abs. measurement)
Output 100% adjustability	-5% of original FS ... +105% of original FS
Difference (0% - 100%) adjustability	≥ 25% of original FS and ≥ 50 mbar [0.725 psi]
Damping adjustability	~ 30 ms (default), 100 ms, 1 s, 10 s = 30 Hz (default), 10 Hz, 1 Hz, 0.1 Hz cut-off frequency
Supply voltage	DC 9 ... 33 V
Reverse polarity protection	integrated, standard
Overvoltage (lightning) protection	optional
Supply voltage influence	< 0.1 % FS
Dielectric strength case / supply	500 V
Load resistance limitation	R_L [Ω] ≤ (+U_B [V] - 9 [V]) / 0.02 [A]
Load resistance influence	< 0.1 % FS
Protection class	IP65 (~NEMA6)
Medium temperature range	0°C ... +80°C [+32°F ... +176°F] standard -25°C ... +100°C [-13°F ... +212°F] option
Temperature Compensation range	-10°C ... +50°C [+14°F ... +122°F] standard -25°C ... +85°C [-13°F ... +185°F] option
Storage temperature range	see medium temperature range

Acid resistance	pH5 ... pH9
Weight	approx. 160 g [0.35 lb] without surge protection approx. 170 g [0.37 lb] with surge protection
Measuring cell, diaphragm, housing	Stainless steel 1.4435 (316L)
Seals	Viton
Pressure connection	by choice G 1/2 A or 1/2 NPT A
Electrical connection	by choice Connector DIN 43650 (IP65 ≈ NEMA4) or Binder 723, (IP67 ≈ NEMA6), 5-pin

Electromagnetic Compatibility

Emission	
Generic emission standard	EN 61000-6-3
Emission, class B	EN 55022
Immunity	
Generic immunity standard	EN 61000-6-2
Electrostatic discharge	EN 61000-4-2 (4 kV contact, 8 kV air)
Radiated electro-magnetic field	EN 61000-4-3 (10 V/m, 80 ... 1000 MHz, 80% AM 1 kHz)
Radiated electro-magnetic field (GSM)	EN 61000-4-3 (10 V/m, 950 MHz, 200 Hz on/off)
Fast transients (burst)	EN 61000-4-4 (2 kV)
Conducted radio-frequency	EN 61000-4-6 (10 V, 0.15 ... 80 MHz, 80% AM 1 kHz)
Surge	EN 61000-4-5 (10 kA 8/20µs) [only with the option overvoltage (lightning) protection]

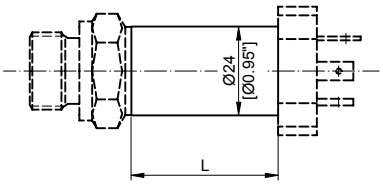
Quality Tests

CE The transmitters fulfil the requirements for noise immunity and emissions of the EMC directive 89/336/EEC.

Measurement Range Specific Technical Data

Pressure ranges		**< 0.2 bar** [2.9 psi]	**≥ 0.2 ... 1 bar** [2.9...14.5 psi]	**≥ 1 ... 160 bar** [14.5...362.6 psi]
Overload		3 bar [43.5 psi]	3 bar [43.5 psi]	3 x FS
Bursting pressure		≥ 200 bar [2900 psi]	≥ 200 bar [2900 psi]	≥ 200 bar (≤ 25 bar FS) [2900 psi (≤ 363 psi FS)] ≥ 850 bar (> 25 bar FS) [12328 psi (> 363 psi FS)]
Conformity error incl. hysteresis and repeatability				
-10°C ... +50°C [+14°F...+122°F]		≤ ±0.2 % FS	≤ ±0.1 % FS	≤ ±0.1 % FS
-25°C ... +85°C [-13°F...+185°F]		≤ ±0.2 % FS	≤ ±0.1 % FS	≤ ±0.1 % FS
Option for pressure ranges ≥ 1 bar		---	---	≤ ±0.05 % FS
Temperature error zero / span				
-10°C ... +50°C	typ.	≤ ±100 ppm FS/°C	≤ ±60 ppm FS/°C	≤ ±60 ppm FS/°C
[+14°F...+122°F]	max.	≤ ±150 ppm FS/°C	≤ ±100 ppm FS/°C	≤ ±100 ppm FS/°C
-25°C ... +85°C	typ.	≤ ±200 ppm FS/°C	≤ ±150 ppm FS/°C	≤ ±150 ppm FS/°C
[-13°F...+185°F]	max.	≤ ±250 ppm FS/°C	≤ ±200 ppm FS/°C	≤ ±200 ppm FS/°C
Long term drift	typ.	≤ 0.2 % FS/a	≤ 0.2 % FS/a	≤ 0.1 % FS/a

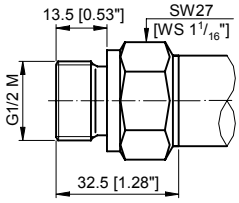
Dimensions [mm]

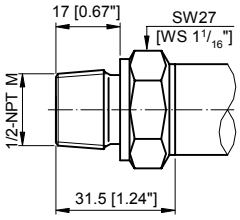


L = 74 mm [2.91"] with / without overvoltage protection

Pressure connectors:

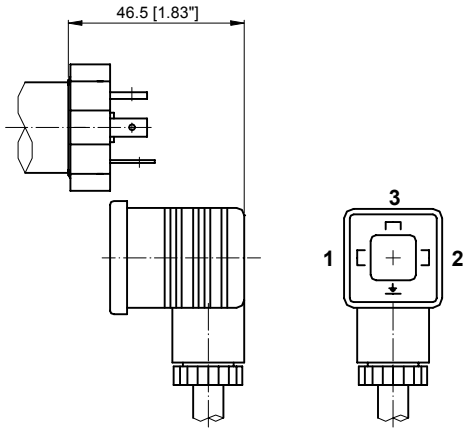
Standard



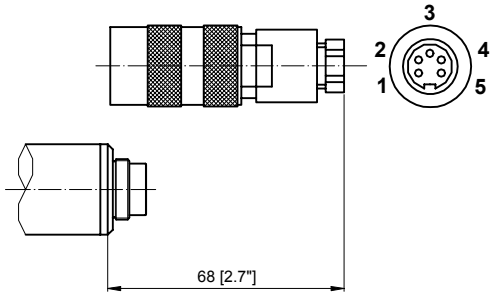


Electrical connectors:

DIN 43650 connector, standard



Binder 723, 5-pin connector



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).

MPG	**PCF Order Number**														
	1/2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Type															
MPG	PG														
Pressure type															
Gauge		1													
Absolut (vacuum)		2													
Sealed gauge		3													
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 ... 40 bar = 0 ... 580.2 psi		3	1	3											
0 ... 60 bar = 0 ... 870.2 psi		3	1	4											
0 ... 100 bar = 0 ... 1450.4 psi		3	1	5											
0 ... 160 bar = 0 ... 2320.6 psi		3	1	6											
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											
Process connection															
G1/2 M					1	3									
1/2 NPT M					1	9									
Electrical connection															
Connector DIN 43650, IP65 *							0	1							
Connector Binder 723, IP67, 5-pin *							0	3							
Output signal															
4 ... 20 mA without overvoltage (lightning) protection									0	5					
4 ... 20 mA with overvoltage (lightning) protection									0	8					
Accuracy															
±0.2 % FS, only for FS < 200 mbar											4				
±0.1 % FS, only for FS ≥ 200 mbar											2				
Temperature range															
Compensated -10°C ... +50°C (Medium 0 ... 80°C)												0			
Compensated -25°C ... +85°C (Medium -25°C ... +100°C)												1			
(Cable length)															
always = 000													0	0	0

* The pressure transmitter always requires a plug-in cable coupling that has to be ordered separately.

Parameterisation

With the aid of the programming kit MPPKIT available as an accessory, the software of the submersible transmitter can be parameterised with a PC (see also Data Sheet 21.210.0066900.001 and Operating Instructions 21.810.0066900.001).

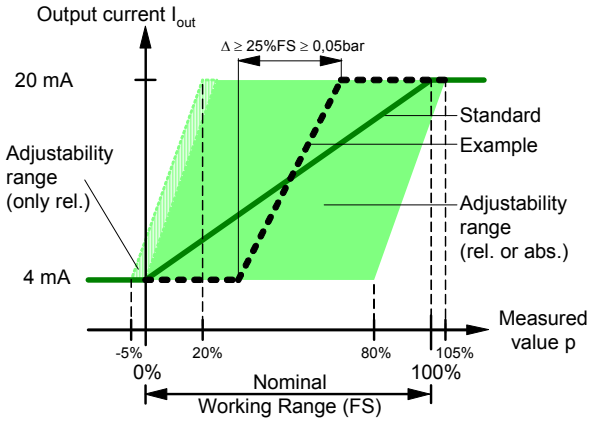
- Range selection for output current 4 ... 20 mA

  With the range selection 4 ... 20 mA, the 4 mA and 20 mA current values can be assigned to measured values other than the standard 0% and 100% of the nominal measuring range. (Typically with 4 mA a value from the range -5% ... +25% of the nominal measuring range, with 20 mA, a value from the range +25% ... +105% of the nominal measuring range.) In this way, a sub-range or even a negative pressure can be measured. The difference Δ between the minimum and maximum must amount to at least 25% of the nominal measuring range and be at least 50 mbar.

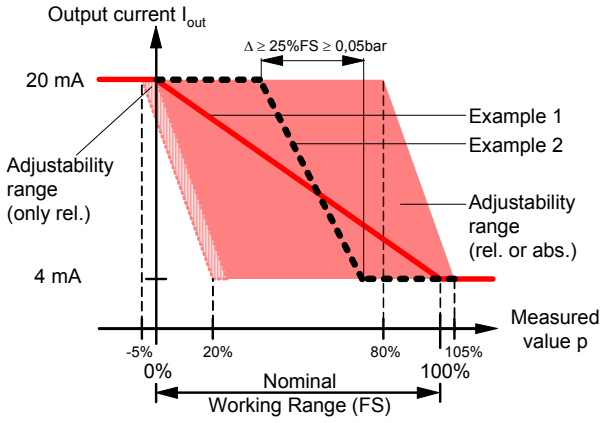
  Inverted control can be achieved by exchanging the values for 4 mA and 20 mA.

  The ranges of adjustability are presented graphically in the following illustrations:

  Non-inverted Control:



  Inverted Control:



- Programmable Damping of the Current Output
  The analog output can be damped with a low pass filter of the 1st order. The adjustability enables values between ~ 33 ms (default) and 10 s.

  Note: During commissioning, damping is preferably left at the minimum value.
- Recalibrating the transmitter (calibration 0 % or 100 %) enables compensation of the drift which inevitably occurs with resistive pressure transducers. The zero drift alone or the combination of zero drift and slope change can be compensated. In doing so, the original calibration of the transmitter is not lost and can be recalled as necessary.

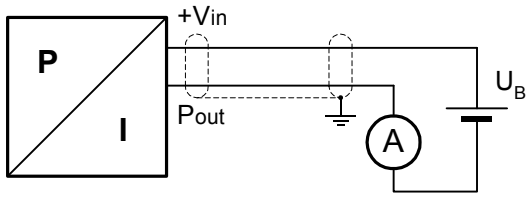
  Setting range 0%: -5% … +5% of nominal measuring range (FS) with relative measuring probes
  0% … +5% of nominal measuring range (FS) with absolute measuring probes
  Setting range 100%: 95% ... 105% of nominal measuring range (FS)

Standard Settings

The transducers have the following standard parameterisation:

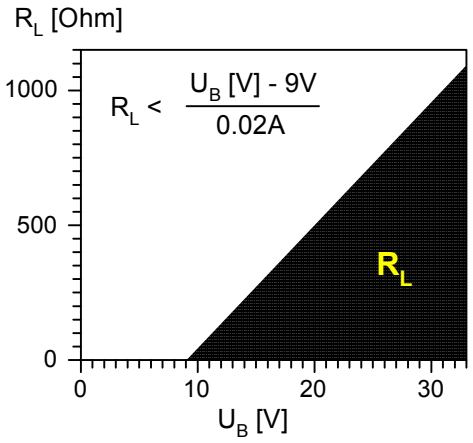
- Current range: 4 ... 20mA
- Measurement start: 4 mA = 0% of nominal measurement range (FS)
- Measurement end: 20 mA = 100% of nominal measurement range (FS)
- Damping: ~ 30 ms

Block Diagram / Electrical Connections



DIN 43650: +Vin = Pin 1
Pout = Pin 2

Binder 723: +Vin = Pin 3
Pout = Pin 1



Note

- The load resistance R_L is the sum of load and cable resistance.
- In order to prevent destruction, the membrane must not be touched.
- For applications in the field with extension cables having a cable length ≥ 5 m [16 ft] or inside a building with cable lengths ≥ 100 m [330 ft], a transmitter with the overvoltage protection option and an external overvoltage protection ASBG.48 or an branch box MPZADU (at other end of the cable) must be used.
- The cable shield must be connected to a good ground potential.
- In order to compensate the long term drift an annual zero point alignment is recommended.
- Conversion table for pressure units
  (value in new unit) = coefficient x (value in old unit)

coefficient	new unit						
old unit	Pa = 1 N/m²	bar	mWC	ftWC	mmHg (Torr)	psi	kp/cm² = at
Pa = 1 N/m²	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/cm² = 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", ⇒ "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
Cable connector without / with cable	see configurator accessories MPG / MPJ (PZ)	
Extension cable 2-wire, shielded (L in meter)	MPZVK	04 60 502
Junction box small IP54 (NEMA3)	MPZAD	00 65 195.001
Junction box medium IP54 (NEMA3), 1 OVP	MPZADU	00 65 207.001
Surge protection AC/DC 48 V	ASBG.48	00 32 721.003
Ventilation fitting complete	MPZLU	00 65 540.001

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