

## Features

- Two wire system
- Piezoresistive measuring element
- Output signal 4-20 mA
- Conformity error  $\leq \pm 0.5\%$  FS or  $\leq \pm 0.25\%$  FS
- Standard DIN measuring ranges from 0 ... 100 mbar up to 0 ... 25 bar or selection of measuring ranges in mWC or psi
- Temperature compensation within  $-5^{\circ}\text{C} \dots +50^{\circ}\text{C}$  [ $+23^{\circ}\text{F} \dots +122^{\circ}\text{F}$ ]
- 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,  $R_L = 100 \Omega$ ,  $T_{\text{amb}} = 25^{\circ}\text{C}$  [ $77^{\circ}\text{F}$ ].

### Measurement Range Independent Technical Data

Type	Two wire current transmitter
Output signal	4 ... 20 mA
Response time 10 ... 90% FS	1 ms
Supply voltage	DC 9 ... 33 V
Reverse polarity protection	integrated
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 6P)
Medium temperature range	$-5^{\circ}\text{C} \dots +50^{\circ}\text{C}$ [ $+23^{\circ}\text{F} \dots +122^{\circ}\text{F}$ ]
Compensated temperature range	$-5^{\circ}\text{C} \dots +50^{\circ}\text{C}$ [ $+23^{\circ}\text{F} \dots +122^{\circ}\text{F}$ ]
Storage temperature range	$-5^{\circ}\text{C} \dots +50^{\circ}\text{C}$ [ $+23^{\circ}\text{F} \dots +122^{\circ}\text{F}$ ]
Acid resistance	pH5 ... pH9
Weight of submersible transmitter without cable	approx. 160g [0.35 lb.] without surge protection approx. 210g [0.47 lb.] with surge protection plus approx. 260 g [0.57 lb.] with weight extension
Measuring cell, diaphragm, housing	Stainless steel 1.4435 (316L)
Seals	Viton
<b>Cable</b>	Choice of PE / PUR / FEP cable with integrated pressure equalising pipe
Outer diameter	6 mm [0.24"] PE / PUR; 5 mm [0.2"] FEP
Leads	0.22 mm <sup>2</sup> [AWG 24], Cu wire 7 x 0.20 tinned
Resistance	$\leq 82.9 \text{ m}\Omega/\text{m}$ [ $25.3 \text{ m}\Omega/\text{ft.}$ ] (one conductor)
Minimum cable bending radius	100 mm [4"]
Tensile load	$< 400 \text{ N}$ [90 lbf] (PE / PUR cables) $< 15 \text{ N}$ [3.4 lbf] (FEP cables)
Tensile strength	$> 500 \text{ N}$ [112 lbf]

Pressure equalising pipe diameter  $\varnothing$  1.4 / 0.8 mm [0.055" / 0.03"] PE / PUR;  
 $\varnothing$  1.1 / 0.6 mm [0.04" / 0.02"] FEP

PE cable (foodstuffs approved / drinking water)

Halogen-free

Permitted environmental temperature

-20°C ... +70°C [-4°F ... +158°F]

Weight

Approx. 41 g/m [0.44 oz./ft.]

PUR cable (mechanically robust)

Halogen-free

Permitted environmental temperature

-20°C ... +95°C [-4°F ... +203°F]

Weight

Approx. 45 g/m [0.48 oz./ft.]

FEP cable (high temperature range)

Permitted environmental temperature

-40°C ... +90°C [-40°F ... +194°F]

Weight

Approx. 55 g/m [0.59 oz./ft.]

### Electromagnetic Compatibility

#### Emissions

Basic specification emissions

EN 61000-6-3

Emissions class B

EN 55022

#### Immunity

Basic specification noise immunity

EN 61000-6-2

Electrostatic discharge

EN 61000-4-2 (4 kV contact, 8 kV air)

Radiated electromagnetic field

EN 61000-4-3 (10 V/m, 80 ... 1000 MHz, 80% AM 1 kHz)

Radiated electromagnetic 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 electromagnetic interference

EN 61000-4-6 (10 V/m, 0,15 ... 80 MHz, 80% AM 1 kHz)

Impulse voltage (surge)

EN 61000-4-5 (10 kA 8/20 $\mu$ s)

[only with the option overvoltage (lightning) protection]

### Quality Tests



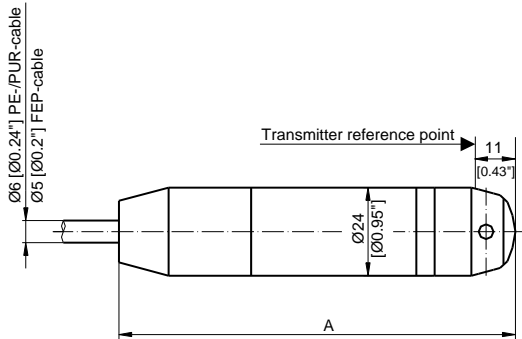
The transmitters fulfil the requirements for noise immunity and emissions of the EMC directive 89/336/EEC.

## Measurement Range Specific Technical Data

Pressure ranges	0.1 ... 0.5 bar [1.4 ... 7.25 psi]	> 0.5... 2 bar [7.25 ... 29 psi]	> 2 ... 25 bar [29 ... 362.6 psi]
Overload	3 bar [43.5 psi]	3 x FS min. 3 bar [43.5 psi]	3 x FS
Bursting pressure	> 200 bar [2900 psi]	> 200 bar [2900 psi]	> 200 bar [2900 psi]
Conformity error *	standard option	$\leq \pm 0.5$ % FS $\leq \pm 0.25$ % FS	$\leq \pm 0.5$ % FS $\leq \pm 0.25$ % FS
Temperature error			
Zero -5°C ... +50°C [+23°F...+122°F]	$\leq \pm 0.06$ % FS/°C	$\leq \pm 0.03$ % FS/°C	$\leq \pm 0.015$ % FS/°C
Span -5°C ... +50°C [+23°F...+122°F]	$\leq \pm 0.015$ % FS/°C	$\leq \pm 0.015$ % FS/°C	$\leq \pm 0.015$ % FS/°C
Long term drift	typ. $\leq 0.5$ % FS/a	$\leq 0.2$ % FS/a	$\leq 0.1$ % FS/a

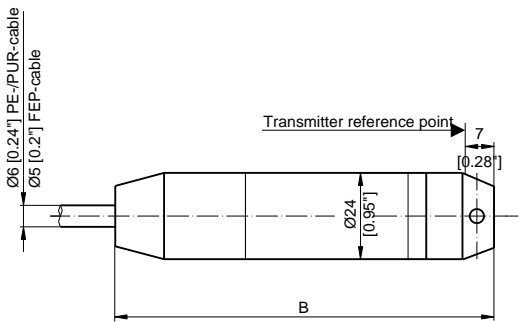
\* Zero based non-conformity according to DIN 16086, including hysteresis and repeatability

**Dimensions [mm]**



**Closed version (standard):**

A = 108 mm [4.25"] without overvoltage protection  
 A = 157 mm [6.2"] with overvoltage protection  
 Plus 87 mm [3.4"] with weight extension



**Open version:**

B = 104 mm [4.1"] without overvoltage protection  
 B = 153 mm [6.0"] with overvoltage protection  
 Plus 87 mm [3.4"] with weight extension

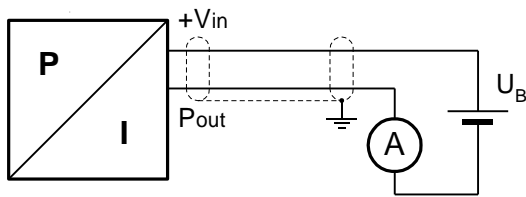
## Ordering Information

Table 1:

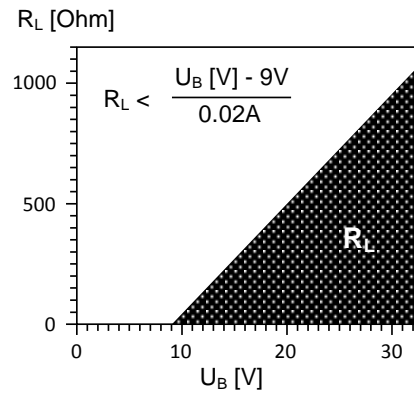
The exact order number for an article is formed from the individual options codes according to the table (with the BAAN-Configurator PCF or manually).

MPA	PCF Order Number															
	1/2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
<b>Type</b>																
MPA	PA															
<b>Pressure type</b>																
Gauge		1														
<b>Pressure range</b>																
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												
<b>Version</b>																
Closed version					5	5										
<b>Electrical connection</b>																
PE cable (food approved)							1	3								
PUR cable (robust)							1	5								
FEP cable (large temperature range)							2	1								
<b>Output signal</b>																
4 ... 20 mA without overvoltage protection									0	5						
4 ... 20 mA with overvoltage (lightning) protection									0	8						
<b>Accuracy</b>																
±0.5 %											0					
±0.25 %											1					
<b>Temperature range</b>																
Compensated -5°C ... +50°C (medium -5 ... 50°C)												4				
<b>Cable length</b>																
Cable length in meter (always ≥ 001)														x	x	x

### Block Diagram / Electrical Connections



+Vin ↔ white  
 Pout ↔ yellow



### Note

- The load resistance  $R_L$  is the sum of load and cable resistance.
- If the submersible transmitter is used at temperatures, where the medium can freeze over a longer time, we recommend the version with open protective cap. The version with open protective cap is recommended also in dirty water.
- In order to prevent destruction, the membrane must not be touched.
- The cable must not be tight bend or flat squeezed (because of the integrated pressure equalising pipe).
- Moisture must not be allowed to enter the pressure equalisation pipe. It is recommended that a junction box with dehumidifying agent is used.
- For applications in the field with extension cables having a cable length  $\geq 5$  m [16 ft] or inside a building with cable lengths  $\geq 100$  m [330 ft], a transmitter with the overvoltage protection option and an external overvoltage protection PT1x2-24DC-SET or a junction box NLAD.MPAB (at other end of the cable) must be used.
- The cable shield must be connected 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 <sup>2</sup>	bar	mWC	ftWC	mmHg (Torr)	psi	kp/cm <sup>2</sup> = at
Pa = 1 N/m <sup>2</sup>	1	10 <sup>-5</sup>	1.02 x 10 <sup>-4</sup>	3.35	7.5 x 10 <sup>-3</sup>	1.45 x 10 <sup>-4</sup>	1.02 x 10 <sup>-5</sup>
bar	10 <sup>5</sup>	1	10.2	33.5	750	14.5	1.02
mWC	9.81 x 10 <sup>3</sup>	9.81 x 10 <sup>-2</sup>	1	3.28	73.6	1.42	0.1
ftWC	2.99 x 10 <sup>3</sup>	2.99 x 10 <sup>-2</sup>	0.305	1	22.4	0.433	3.05 x 10 <sup>-2</sup>
mmHg (Torr)	1.33 x 10 <sup>2</sup>	1.33 x 10 <sup>-3</sup>	1.36 x 10 <sup>-2</sup>	4.46 x 10 <sup>-2</sup>	1	1.93 x 10 <sup>-2</sup>	1.36 x 10 <sup>-3</sup>
psi	6.89 x 10 <sup>3</sup>	6.89 x 10 <sup>-2</sup>	0.703	2.31	51.7	1	7.03 x 10 <sup>-2</sup>
kp/cm <sup>2</sup> = at	9.81 x 10 <sup>4</sup>	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.
Extension cable 2-wire, shielded (L [m])	MPZVK	04 60 502
Junction box for submersible transmitter IP66 (~NEMA 6)	NLAD.TSKL8	00 65 190.101
Junction box for submersible transmitter IP66 (~NEMA 6), 1 OVP	NLAD.MPAB	00 65 190.102
Spare desiccant bag, 2 pieces	ZWE.BEUT	00 29 201.003
OVP complete for analogue signal	PT1x2-24DC-SET	22 50 215
Suspension arrangement for submersible pressure transmitter	MPZHVT	00 65 717.001
Protection tube 2 m [6.6 ft.] (still waters)	MPZSRR	00 65 720.001
Protection tube 2 m [6.6 ft.] (running waters)	MPZSRF	00 65 721.001
Protection tube extension 2 m [6.6 ft.] for MPZSRR, MPZSRF	MPZSRV	00 65 722.001
Sensing cabinet for submersible pressure transmitter	MPZFK	00 65 543.001