

## MS12 || Digital Pressure Switch / Transmitter

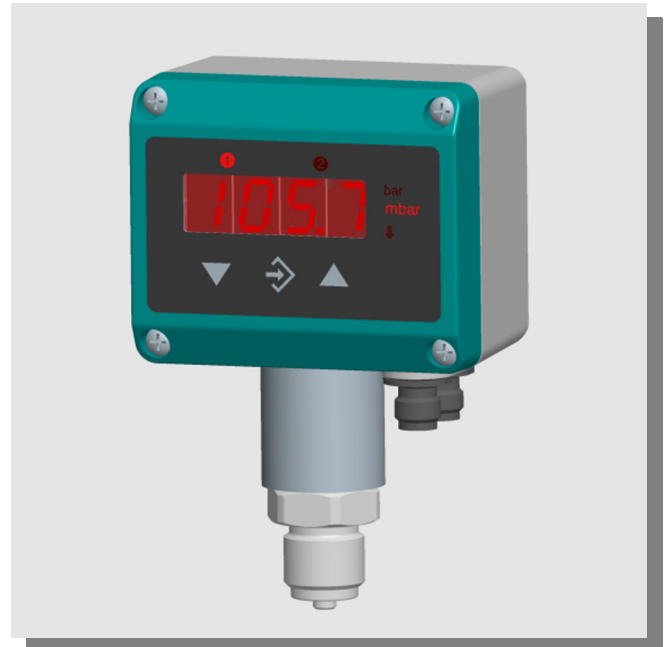
### Application

Compact parameter driven pressure switch / transmitter for positive and negative pressure control.

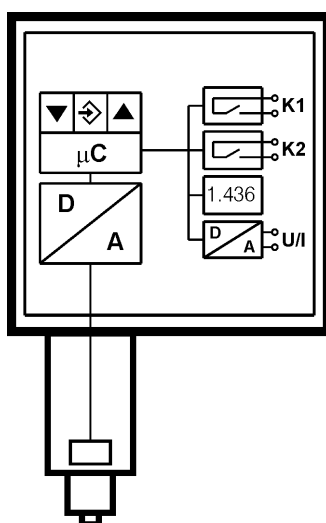
### Construction and Operation

The MS12 processes the output signal of the integrated pressure sensor digitally. A versatile parameter driven micro controller actuates on the display and the switching outputs. Optionally it produces a new output signal. The signal can be slewrate limited, spreaded, inverted, and transformed nonlinearly by means of a table fuction.

The parameters may be entered directly using the membrane sealed keypad or using a PC connected with a serial interface adaptor.



### Functional Scheme



### Main Features

- Large bright LED display
- Selectable pressure units
- 2 independent limits with a choice of logic modes
- optional analogue signal output, with user-programmable scaling, linearization, inversion, and offset adjustment
- User-defined look-up table for signal conversion, with up to 30 points
- Fully programmable from a PC, using the optional Model EU03 PC Adaptor

### Typical Applications

- Pressure switch / pressure display for inconvenient accessible measuring places
- Level measurement
- Simplified pump control
- Monitoring of pumps and compressors

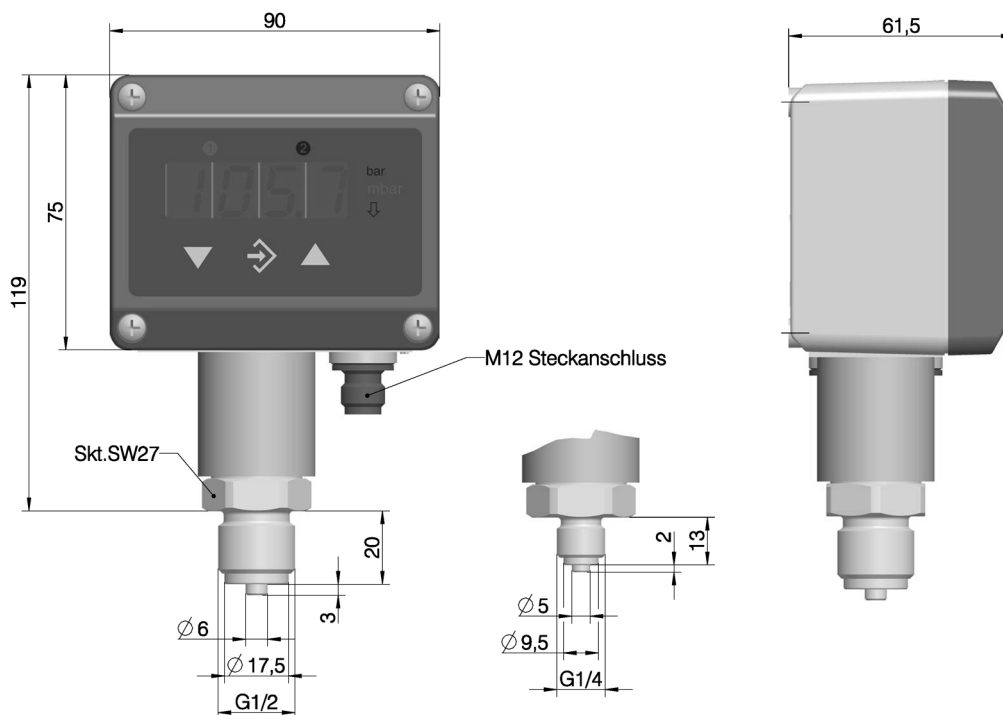


## Specifications

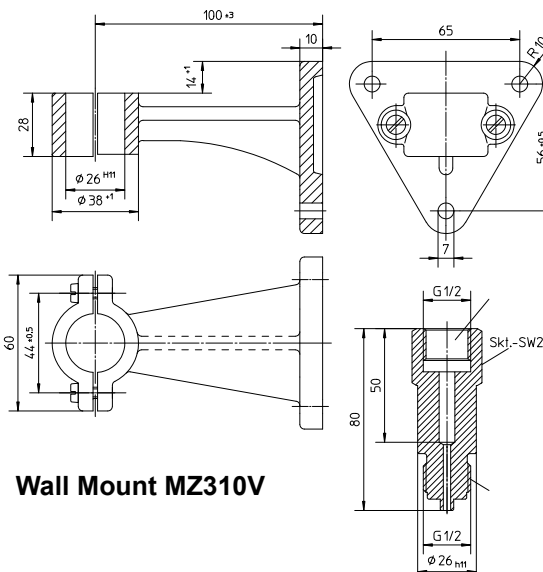
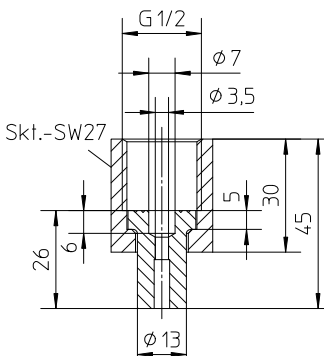
		<b>General</b>								
Measuring range (bar)		0-1.6	0-2.5	0-4	0-6	0-10	0-16	0-25	0-40	0-60
Max. pressure (bar)		3.2	5	8	12	20	32	50	80	120
Linearity		< 1% FS )°								
Hysteresis		< 0,5% FS )°								
Perm. ambient temp.		-10 .. +70°C								
Perm. media temperature		depending on the used gasket Viton®: -15 .. +80°C (Standard) H-NBR: -25 .. +80°C CR: -15 .. +80°C Kalrez: -15 .. +80°C EPDM: -10 .. +80°C Pay regard to the media stability!								
Perm. storage temperature		-20 .. +70°C								
Protection class		IP65 acc. to DIN EN 60529								
		<b>Electrical Data</b>								
Nominal supply voltage		24 V DC / AC								
Operating supply voltage		12 ... 32 V DC / AC								
Output signal		0 ... 20 mA, 4 ... 20 mA, or 0 ... 10 V DC (3-wire)								
Output signal load		For current output $R_L \leq (U_B - 4 \text{ V}) / 0,02 \text{ A}$ ( $U_B \leq 26\text{V}$ ), else $R_L \leq 1100 \Omega$ For voltage output $R_L \geq 2 \text{ K}\Omega$ ( $U_B \geq 15 \text{ V}$ ), $R_L \geq 10 \text{ K}\Omega$ ( $U_B = 12 \dots 15\text{V}$ )								
Power consumption		Approx. 2 W / VA								
Switching contacts		2 sets of programmable voltage free relay contacts: N/O or N/C $U_{\max} = 32 \text{ V DC/AC}$ , $I_{\max} = 2 \text{ A}$ , $P_{\max} = 64 \text{ W/VA}$ Optional, instead of relay outputs: 2 programmable voltage free MOSFET switch outputs, NO/NC $U = 3 \dots 32 \text{ V DC/AC}$ , $I_{\max} = 0.25 \text{ A}$ , $P_{\max} = 8 \text{ W/VA}$ , $R_{\text{ON}} \leq 4 \Omega$								
Display		3½ digit LED								
		<b>Connections</b>								
Supply		fused via PTC (approx. 8 $\Omega$ )								
Max. Power consumption		$\leq 250 \text{ mA}$ (limited by PTC)								
Electrical connection		Two round-shell multi-pin connector sockets (M12, male) Connector 1: 5-pin: power input and analogue signal output Connector 2: 4-pin: relay contacts / solid-state switch outputs								
Pressure connection		Male connection shank G1/4 B, 1.4305 or Male connection shank G1/2 B, 1.4305								
		<b>Materials, Mounting</b>								
Materials, housing		Polyamide PA 6,6 / 1.4305								
Materials, media contact		1.4305 chrome-nickel-steel, ceramics Al <sub>2</sub> O <sub>3</sub> , Viton® (standard)								
Mounting		Pipe mounting: union nut MZ230V of 1.4404 (orientation adjustable) Wall mounting: wall mount with manometer adaptor MZ310V For further accessories see data sheet MZ (Accessories for measuring instruments) If the instrument is intended for outdoor application, we highly recommend using an adequate protective housing (or at least a big enough shelter) as protection against UV-radiation on the membrane keyboard and against exposure of the instrument to rain or snow.								

)°: Straight line error  
 (nonlinearity + hysteresis) at 25°C  
 and nominal voltage,  
 pressure within specified range  
 (characteristic linear, not spreaded)

## Dimensions (all units in mm unless otherwise stated)

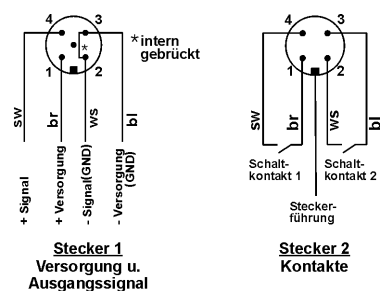


### Union Nut MZ230V



### Wall Mount MZ310V

### Electrical Connection / Switching Function



Stecker 1  
Versorgung u.  
Ausgangssignal

Stecker 2  
Kontakte

## Programming

Via membrane key-switches or by using PC-programming interface (accessory). Programming mode can be password protected.

### Settings

Input filtering	0.0...100.0s (10/90% step response time) for signal output, display separated
Relay / switch	1/2
Measurement unit selection	bar, kPa, „free unit“ start value, end value and decimal place for „free unit“
Output signal start/end value	Can be set at any point of measuring range (2)
Zero suppression	0...100 counts (1)
Zero pressure calibration	±100 counts (3)
Output characteristic	Linear, square rooted, horizontal cylindr. tank, table (3...30 entries)
Password range	001 ... 999 (000 = password protection disabled)

(1) Measured value deviations up to 100 counts, symmetric about zero, are set to zero. Used for zero drift suppression.

(2) Maximum effective turn-down ratio = 4:1. Only the output signal is affected. Transfer function is inverted if start value > end value.

(3) Zero calibration setting may change with mounting orientation.

## Ordering Code

### Digital Pressure Switch / Transmitter

MS12

								0			0
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#### Measuring Range

0 ... 1.6 bar	> 0 3
0 ... 2.5 bar	> 0 4
0 ... 4 bar	> 0 5
0 ... 6 bar	> 0 6
0 ... 10 bar	> 0 7
0 ... 16 bar	> 0 8
0 ... 25 bar	> 0 9
0 ... 40 bar	> 1 0
0 ... 60 bar	> 1 1
-1 ... 0 bar	> 3 1
-1 ... 0.6 bar	> 3 2
-1 ... 1.5 bar	> 3 3
-1 ... 3 bar	> 3 4
-1 ... 5 bar	> 3 5
-1 ... 9 bar	> 3 6
-1 ... 15 bar	> 3 7
-1 ... 24 bar	> 3 8
0 ... -1 bar	> 3 9

#### Accuracy

Linearity error, gauge pressure 1.0 ..... > M

#### Pressure Connection

Male connection shank G 1/4 B, 1.4305 ..... > 8 5

Male connection shank G 1/2 B, 1.4305 ..... > 8 7

#### Electrical Output Signal

without electrical output signal ..... > 0

0 - 20 mA 3-wire (STANDARD) ..... > A

0 - 10 V DC 3-wire (STANDARD) ..... > C

4 - 20 mA 3-wire (STANDARD) ..... > P

#### Power Supply

24 V DC/AC (12-32 V DC/AC) ..... > K

#### Display and Limit Switching Outputs

3½ digit LED display, 2 sets of voltage-free relay contacts ..... > 3

3½ digit LED display, 2 sets of solid-state switch outputs ..... > 6

#### Electrical Connection

M12 plug connection ..... > M

#### Gasket (in touch with medium)

FKM (Viton®) Standard ..... > V

CR (neoprene, chloroprene) ..... > C

EPDM (ethylene, propylene-dien, rubber) ..... > E

H-NBR (applicable up to - 25°) ..... > H

FFPM (Kalrez®) ..... > K

### Accessories

Bestellnummer	Bezeichnung	Polzahl	Verwendung	Länge
06401993	cabl with M12 connector	4-pin	for relay / switch	2 m
06401994	cabl with M12 connector	4-pin	for relay / switch	5 m
06401995	cabl with M12 connector	5-pin	for supply / signal	2 m
06401996	cabl with M12 connector	5-pin	for supply / signal	5 m
MZ310V	wall mount			
EU03F300	PC-programming interface with SW			
MZ230V	union nut			

Technische Änderungen vorbehalten • Subject to change without notice • Changements techniques sous réserve