Transmitter PM34

Intelligent pressure transmitter with flush mounted diaphragm

Process coupling: thread, sanitary, clamp

From 100 mbar up to 400 bar

Self monitoring

Local display and adjustment

Multiple overload

Explosion protection ATEX 100

Analogue, Smart - or Profibus-pA function

PROFILE

The transmitter measures gauge- and absolute pressure in gases, vapours and liquids and can be used in nearly all areas of process engineering.
The transmitter works on the two-wire principle and features a polysilicon-measuring element. Gauge and absolute pressures from 100 mbar up to 400 bar respectively, are converted into a standard pressure proportional 4...20 mA signal.
With the smart version remote operation is possible by means of HART protocol.
The BUS version uses digital communication for signal output.
The digital version can be equipped with a local display comprising digital display and bargraph whereas the analogue version allows only a bargraph display. The applied technology ensures reliable and simple operation.

DESCRIPTION

The transmitter comprises the measuring cell, the process coupling and the electronics housing. The connecting terminals are accessible in a separate compartment after opening the lid.
The process pressure acts onto a metallic isolating diaphragm. Via the filling media (vegetable or mineral oil) the pressure is transferred to the Polysilicon-sensor with the piezo-resistive bridge. The output signal of the bridge is being processed.
According to the process requirements is the isolating diaphragm flush mounted.

The analogue-electronic is an economic, fast and simple version. Zero and span can be adjusted locally by means of two potentiometers. With dip switches coarse setting of span with a spread of 1:1 up to 10:1 is possible. The required pressure signals must be provided as reference.

The analogue electronics features within the cell limits adjustment of Zero with ± 10 %.

Digital-electronics provides widespread operating and adjustment facilities with the corresponding hand-held terminal or via PC engineering. It realises precise signal processing and monitors the transmitter function from sensor to output function. Local operation is performed by means of push buttons and the pluggable display. The required pressure signals must be provided as reference and will be stored via push button operation.
Based upon the used measuring cell a turn down of 10:1 is possible.

The transmitter monitoring function generates an alarm if any fault is being detected. The alarm acts onto the analogue output signal and can be set in its function.

TECHNICAL DATA

INPUT

Absolute and gauge pressure in gases, vapours, liquids.
Polisilicon cell for ranges up to 400 bar

GAUGE PRESSURE

Cell		Measuring limits	Min. Span	Overload
Type	[bar]	[bar]	[bar]	[bar]
3H	1	0...1	0,1	4
3M	4	0...4	0,4	16
3P	10	0...10	1	40
3S	40*	0...40	4	160
3U	100*	0...100	10	400
3Z	400*	0...400	40	600
7H	± 1	-1...+1	0,2	4
7M	-1...4	-1...+4	0,5	16
7P	-1...10	-1...+10	1,0	40

*)Absolute pressure sensors

ABSOLUTE PRESSURE

Cell		Measuring limits	Min. Span	Overload
Type	[bar]	[bar]	[bar]	[bar]
4H	1	0...1	0,1	4
4M	4	0...4	0,4	16
4P	10	0...10	1	40
4S	40	0...40	4	160
4U	100	0...100	10	400
4Z	400	0...400	40	600

Minimum pressure: 10 mbar absolute

PROCESSMEDIA

Liquids, gases, vapour (abrasive, aggressive or corrosive with suitable material).

Fig. 1 Versions

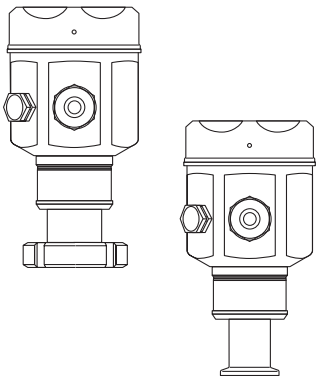
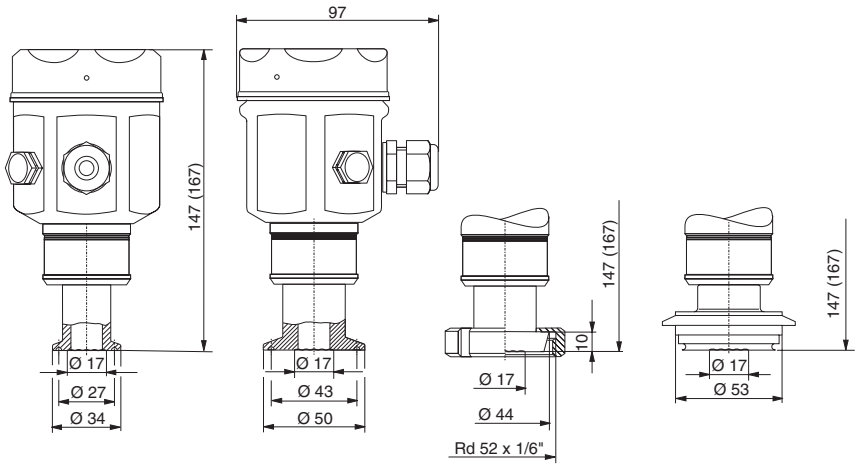


Fig. 2 Dimensions



WETTED MATERIALS

Diaphragm

– Stainless Steel SS 316 L (1.4435)

Process coupling

– Stainless Steel SS 316 L (1.4435)

PROCESS CONDITIONS

Process temperature -40.... +125 °C
(150 °C duration max 1 h)

OUTPUT

	Analogue	Smart
Signal	4...20 mA	4...20 mA, with superimposed communication protocol
Signal on alarm	> 20.5 mA or < 3.6 mA settable	settable to > 20.5 mA or < 3.6 mA or HOLD
Ripple		(HART), measured on 500 Ω 47...125 Hz U_{PP}=200 mV, Noise: 500 Hz up to 10 kHz U_{RMS} 2.2 mV (on 500 Ω)
Characteristic	Pressure proprtional	
Conformity error incl. hysterisis and reproducibility, (limit point method)	± 0.3 %	
Integration time (settable)	0s, 2 s	0s, 2s, via HART 0...40 s
Rise time	60 ms	220 ms
Response time	180 ms	600 ms
Warm-up time	200 ms	1 s
Long term drift	0.1 % (FS) year	

Output BUS: Profibus PA

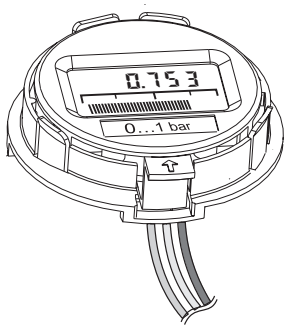
MAX. LOAD

$$R_{Load} = \frac{U_{Supply} - 11.5[V]}{0.023[V]} - R_{Lead}[\Omega]$$

DISPLAY

Analogue, bargraph with 28 segment LCD ≙ 0...100 %, smart version additional 4 digit 7 segment display.

Fig. 3 Display, smart version



OPERATION

Analogue	Adjustment of zero and span via DIP switches and two potentiometer direct. Selection of damping.
Smart	Adjustment of zero and span by means of two push buttons direct. Setting of damping. Remote operation via HART protocol
BUS	Adjustment of zero and span by means of two push buttons direct. Setting of address. Remote operation via digital protocol

SUPPLY

DIRECT CURRENT

11.5 ... 45 VDC
11.5 ... 30 VDC with EEx

Ripple of supply voltage

No effect for $U_{RMS} \leq \pm 5$ % within permissible range

Overvoltage category

II to DIN EN 61 010-1

EXPLOSION PROTECTION

Mode: ATEX 100, II 1 / 2 G, EEx ia IIC T6

Certificate of conformity

No. applied for

Mounting

Transmitter in hazarded area zone 1

Fig. 4 Metal conical seal and welded nozzle

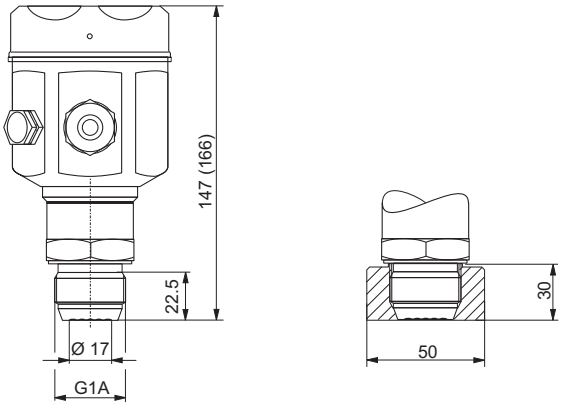


Fig. 5 ¾-in NPT process coupling

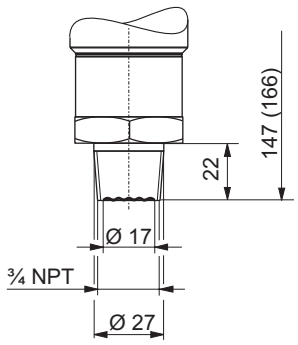


Fig. 6 Electrical connection analogue

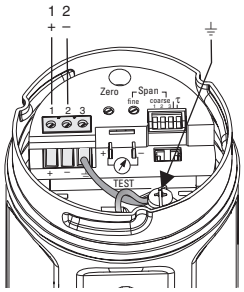
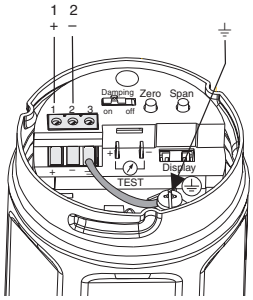


Fig. 7 Electrical connection digital



ENVIRONMENTAL CONDITIONS

PERMISSIBLE TEMPERATURES

For operation: -40... + 85 °C
For storage: -40.... +100 °C (with display +85 °C)

Temperature effect T_K*) for span start and span
(Referred to nominal value of cell)

Analogue		Smart	
-10...+60 °C	-40..10 < >+60...85 °C	-10...+60 °C	-40..10 < >+60...85 °C
± 0.15%/10 K	± 0.2 %/10 K	± 0.08%/10 K	± 0.1%/10 K

*) But not exceeding error due to thermal effects.

Thermal effect

Referred to set span

$$\pm\left(X\% \times TD + 0.3\%\right)$$

(TD = nominal value/set span)

Analogue		Smart	
-10...+60°C	-40...10 < >+60...85°C	-10...+60 °C	-40...10 < >+60...85°C
X = 0.3	X = 0.5	X = 0.2	X = 0.4

Climatic class

4K4H to DIN EN 60721-3

Vibrations

No effects with 4 mm stroke at 5...15 Hz, or
2g at 15...150 Hz, or 1 g at 150...2000 Hz

ELECTROMAGNETIC COMPATIBILITY

Complies with EN 50 081-1 and EN 50 082-2 as also
NAMUR recommendation NE21: effect < 0.5 %

GENERAL

ELECTRONIC HOUSING

stainless steel SS304 (no. 1.4301)
Cover seal: Silicone rubber
Type label: engraved with LASER in housing

MODE OF PROTECTION

IP 66 / Nema 4 with cable gland
IP 68 / Nema 6P with fixed cable (1m WG for 24 h, respectively 1.8 m WG for 30 minutes).

ELECTRICAL CONNECTION

Screw terminals for 0.5...2.5 mm^2.
selectable via
Cable gland M 20 x 1.5
Cable conduit for ½ NPT
or
Harting plug HAN 7
or
Fixed cable 5m with reference air feed

Profibus is connected via M12x1 plug

INSTALLATION CONDITIONS

Orientation as required, orientation-dependent zero shifts up to 3 mbar can be adjusted.

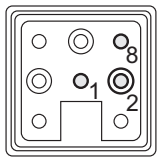
WEIGHT

approximately 1.1 kg

ACCESSORY

Analogue electronics 9499-040-64511
Smart-electronics 9499-040-64311

Fig. 8 connection Harting plug

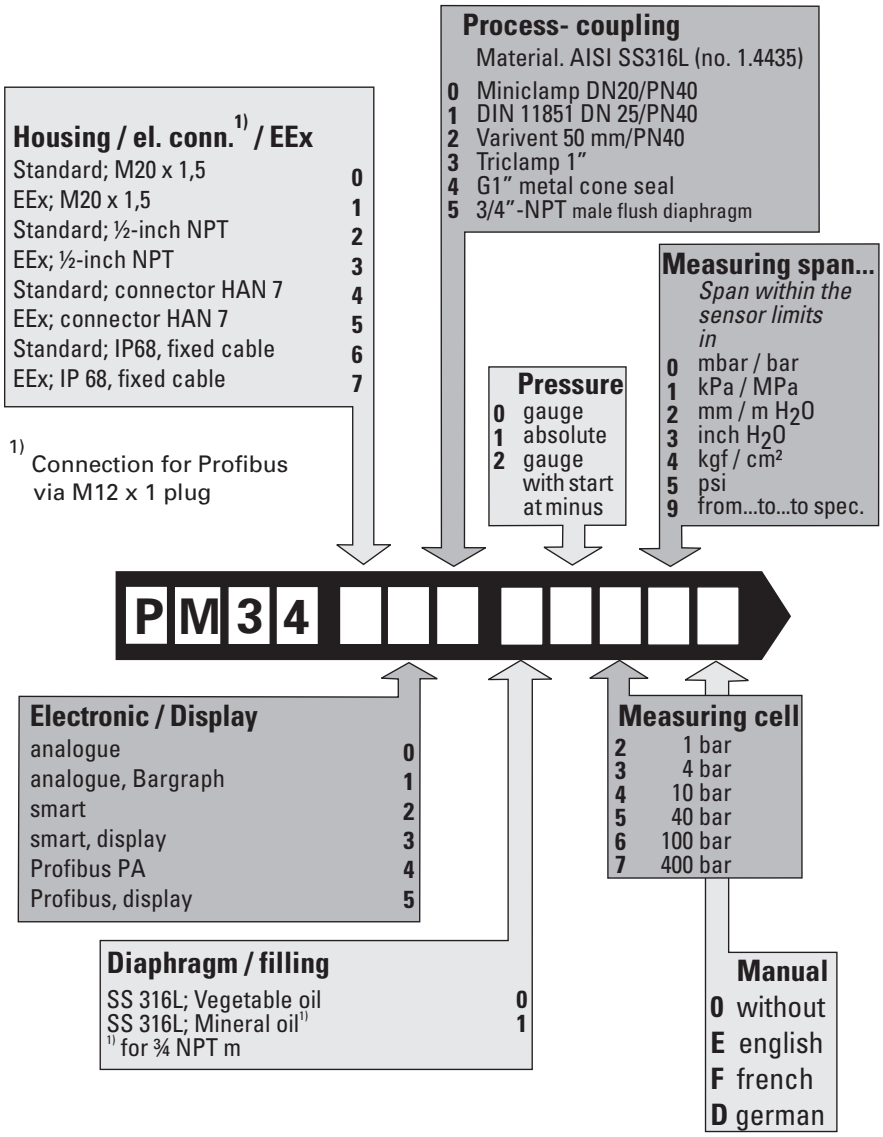


1 = + (bl)
2 = - (bn)
8 = ⏚ (gn/ye)

OPTIONAL ACCESSORIES

Welding nozzle G1A
9407-290-00061
Dummy sensor to prevent any distortion during welding of nozzle
9407-290-00071

ORDERING STRUCTURE



Deutschland
PMA Prozeß- und Maschinen- Automation GmbH
Miramstraße 87, D-34123 Kassel

Tel./Fax: (0561) 505 - 1307/-1710
E-mail: mailbox@pma-online.de
Internet: http://www.pma-online.de

Your local distributor

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