

## All stainless steel differential pressure gauges standard New: as multifunctional pressure instrument

with or without electrical alarm contacts or current outputs

with or without liquid filling

Accuracy class 1.6

Nominal size ND 100, 160

Connection position bottom, radial



### Description

The process medium chambers (+) and (-) are separated by a diaphragm (see functional diagram). The difference in pressure between the (+) and (-) -medium chambers deflects the diaphragm. This deflection (measured travel) is transmitted to the pointer via a push rod causing a pointer deflection in proportion to the difference in pressure. Metal bellows seal the two pressure chambers off from the gauge case.

Metal supporting elements guarantee overload protection.

The two downward outgoing process connections (G1/4 i) are made of corrosion resistant solid materials.

For mounting purposes, it should be noted that: (+) represents high pressure and (-) low pressure.

The pressure connection position may be varied according to the installation conditions.

The measuring element is tamper proof.

The gauges can be used: with gaseous, liquid and also chemically aggressive media as well as in aggressive environments. In case of highly viscous or crystallizing media, please consult us for recommendation.

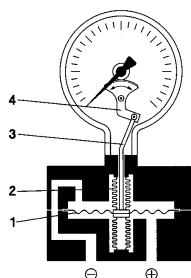
If an output signal is expected by the measuring point, „the multifunctional instrument“ **P2704 ND 100** rather **P2714 ND 160** can be used.

It connects the pressure measurement without auxiliary energy with the possibility of a sensor signal for the remote transmission of the upcoming pressure values.

This instrument is particularly suitable for pressure control rather regulation.

### Functional details

1. Measuring diaphragm
2. Metal bellows
3. Connecting rod
4. Movement



### Special features

- o Corrosion resistant to aggressive media and environment
- o High overload protection
- o Solid front design
- o Alarm contact or current output
- o Precise display resulting from liquid dampening
- o Flushing and vent connection for the measuring chamber
- o Output signals:
  - 4...20mA, 0...20mA, 0...10V
  - 4...20mA, optional acc. to NAMUR NE 43

### Measuring ranges

0 ... 16 mbar up to 0 ... 25 bar



0 ... 400 mbar up to 0 ... 40 bar

### Applications

Level measurement,  
Filter monitoring,  
Flow measurement,  
Chemical and process engineering,  
Food industry,  
Applications for measuring points with a high differential pressure overload.

**Models: P2700, P2701, P2703, P2704, P2710, P2711, P2713, P2714**

## Technical data

Models	P2700	P2710	P2701	P2711	P2703	P2713	P2704	P2714	Options
Nominal size	100	160	100	160	100	160	100	160	
symbol									
Liquid filling	without Option: Glycerine/Water		without						Model P2700 / P2710: <b>Glycerine</b> Model P2701/P2711/P2703/P2713 P2704/P2714: <b>Silicon oil M50</b>
Contact type	without		Magnetic snap contact		Inductive contact		Multifunctional		
Accuracy class	1.6 acc. to EN 837-3								Cl. 1.0 (higher display accuracy)
Ranges	0 ... 16 mbar up to 0 ... 25 bar (flange-Ø160) 0 ... 400 mbar up to 0 ... 40 bar (flange-Ø100) negative or positive / negative and positive gauge pressure								
Overload capacity	(+ ) - and (- ) - side: 10 x full scale value, but only up to max. total pressure (static pressure); see also table								
Max. total gauge pressure (static pressure)	Range 0 ... 16 mbar to 0 ... 250 mbar: max. 2.5 / 6 bar Range 0 ... 400 mbar to 0 ... 25 bar: max. 25 bar							max. 10 bar max. 40 bar	
Application	Constant load: up to full scale value Alternating load: up to 0.9 x full scale value								
Case	Stainless steel 1.4301 with pressure relief opening								Solid front version
Bezel	Bayonet ring, stainless steel 1.4301, natural finish								
Mounting	According to affixed symbols: (+) high pressure, (-) lower pressure								
Attachment	Rigid test lead, mounting holes in the measuring flange							Mounting flange, front side; mounting bracket for wall or pipe mounting	
Window	Laminated safety glass								
Dial	Aluminium white, scale and imprint black								
Pointer	Adjustable pointer, Aluminium black								
Movement	Stainless steel								Zero-point adjustment
Measuring element	≤ 250mbar: Stainless steel 1.4571, >250mbar NiCrCo alloy (Duratherm)								
Measuring chamber with connection	Stainless steel 1.4571							Ventilation of measuring box: ≥0.4 bar Connection position: left, right, rear Pressure connection, male thread	
- Position	bottom								
- thread	2 x G 1/4 f								
Temperatures	- Media: Tmin. -20°C, Tmax. 100°C - Ambient: Tmin. -20°C, Tmax. 60°C								Media: 130°C
Temperature drift	0.3% / 10K if deviation from normal temperature 20°C								
Protection	IP 54 to EN 60 529 / EC 529							By <b>filled</b> instruments: IP 65 acc. to EN 60 529 / EC 529	
CE-Conformity	ATEX: 94/4								
Pressure Equipment Directive	97/23/EG								
Accessories	without							Valve block (3 spindle pressure balancing and shut-off valve), attachment of diaphragm seals on request	

Note for instalation: (-) low pressure; (+) high pressure

## Maximum total gauge pressure/ overload protection

range	Maximum total gauge pressure (static pressure)	Option	Overload protection max.	Options
0 ... 16 mbar to 0 ... 40 mbar	2,5 bar	10 bar	2,5 bar	6 bar
0 ... 60 mbar to 0 ... 250 mbar	6 bar	10 bar	2,5 bar	6 bar
0 ... 400 mbar	25 bar	40 bar	4 bar	40 bar
0 ... 0,6 bar	25 bar	40 bar	6 bar	40 bar
0 ... 1 bar	25 bar	40 bar	10 bar	40 bar
0 ... 1,6 bar	25 bar	40 bar	16 bar	40 bar
0 ... 2,5 bar to 0 ... 25 bar	25 bar	40 bar	25 bar	40 bar



<sup>1)</sup> Accuracy class: 2.5

## Special accessories:

Pressure equalization valve (one-to five spindle), see data sheet AE1215

Electrical data and switching functions see data sheet DE1231 and DE 728

## Technical data

Models	P2700	P2710	P2701	P2711	P2703	P2713	P2704	P2714	Options
Nominal size	100	160	100	160	100	160	100	160	
Design									
Contact	without		Magnetic snap contact		Inductive contact		Multifunctional		
Contact function	without		1.1		3.2		without		
Electrical output	without		without				4 ... 20 mA 0 ... 10 V 0 ... 20 mA		<i>Limit value switch</i> : additional contact-functions see tab. "installation option" (see page 4+5)
Electrical connection	without		Cable connector right hand side 6 screw terminals + PE, cross section of the conducting wire 2.5 mm <sup>2</sup> ; Screw type conduit fitting M20x1.5, Screw type conduit fitting M20x1.5, out going downwards			Angle connector, 180 ° rotatable, max. 1.5 mm <sup>2</sup> , wire protection, cable screw M20x1,5, cable external diameter 7 - 13 mm, incl. strain relief			
Power supply - influence of power supply - permitted residual ripple	without		12 < UB ≤ 30 VDC ≤ 0.1 % of EW/10 V ≤ 10 % ss						
Output signal	without		4 ... 20 mA, 2 - wire, passiv, acc. to NAMUR NE 43 4 ... 20 mA, acc. to ATEX Ex II 2G Ex ia IIC T4 / T5 / T6 or Ex I M2 Ex ia I 0 ... 20 mA, 3 - wire; 0 ... 10 V, 3 - wire						
Permissible max. burden	without		RA ≤ (UB - 12 V)/0.02 A with RA in ohm and UB in Volt, but max. 600 Ω						
Effect of load	without		≤ 0.1 % of EW						
Electrical Zero point	without		By bridging the terminals 5 and 6						
Long-term stability	without		< 0.3 % of EW/a						
Electr. output signal	without		≤ 1 % of span						
Deviation from characteristic	without		≤ 1.0 % of span (limit point adjustment)						
Maximum values - Power supply - Short-circuit current - Performance	without		Ex-version 14 ... 30 VDC 100 mA 1000 mW						
Internal capacitance Internal inductance			Ci ≤ 12 nF mH - negligible						
EMC Directive	without		2004/108/EG emission ( limit class B) and immunity acc. to EN 61 326-1						

## Clockwise pointer motion: open or close

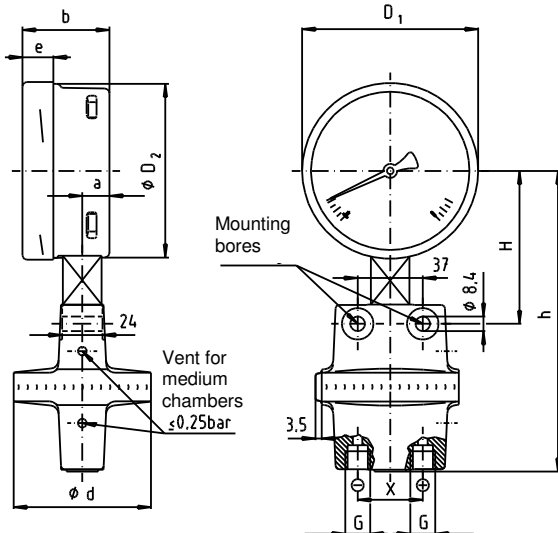
- Code number <b>before</b> the point of contact function	- Code number <b>after</b> the point specifies switching operation
1,--- : Magnetic snap contact	---.1 : close
	---.2 : open
3,--- : Inductive contact	---.3 : at the same time open and close (changer)
- <b>Number</b> of code number <b>after</b> the point specifies the number of contacts	

## Dimensions

Standard version:

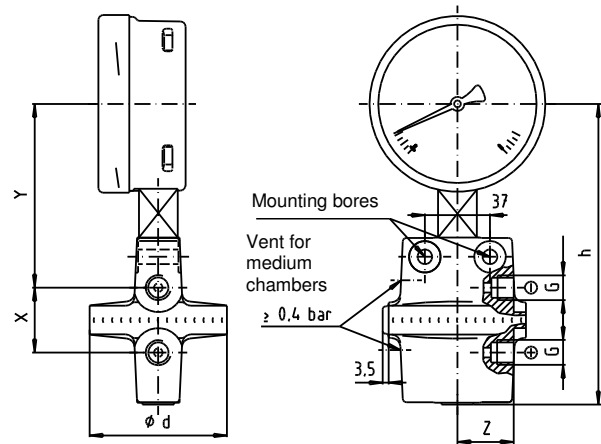
### Model P2700, P2710

Connection 2 x G 1/4 female threads, below



### Option:

Connection 2 x G 1/4 female threads, right



ND	ranges [ bar ]	Dimensions mm											Weight [ kg ]	
		a	b	D <sub>1</sub>	D <sub>2</sub>	d	e	G	h ± 1	H	X	Y		Z
100	≤ 0.25	15.5	49.5	101	99	140	17.5	G1/4	171	90	37	104	69	2.70
	78					87				32				
160	≤ 0.25	15.5	49.5	161	159	140	17.5	G1/4	201	120	37	134	69	3.40
	78					117				32			2.40	

## Installation options for alarm contacts

Pressure gauge		Alarm contact							
Model	Nominal size	magnetic snap action contact (slow action contact) <sup>4)</sup>				inductive contact			
		Number of contacts							
		1	2	3	4 <sup>5)</sup>	1	2	3 <sup>6)</sup>	--
		full scale from ... bar							
P2701 P2711 P2703 P2713	100	0.025	0.025	0.040	0.040				
	160					0.025	0.025	0.025	
	100	0.025	0.025	0.040	0.040				
	160					0.025	0.025	0.025	

<sup>4)</sup> only on request

<sup>5)</sup> possible only as a special version

<sup>6)</sup> possible only as a special version

## Installation options for current outputs

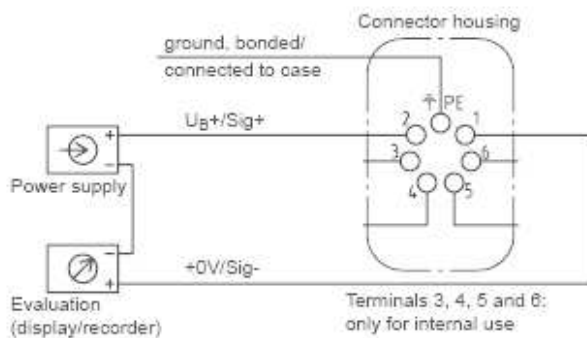
Pressure gauge		Current output		Current output and alarm contact			
Model	Nominal size	Standard	EX- certified	current output			
				Standard		EX- certified	
				Magnetic snap action			
				magnetic snap action	inductive	magnetic snap action	inductive
P2704 P2714	100 160	X	X	X	X	--	X
	100 160	X	X	X	X	--	X

## Terminal assignment

Terminals 1 and 2 are the terminals for the signal output and for the power supply. The terminal marked with PE (protective earth) is connected internally to the housing. The connections 3 to 6 or 4 to 6 (for the 3-wire version), must remain free and must not be used as connection points (also see Chapter 10 "Technical data").

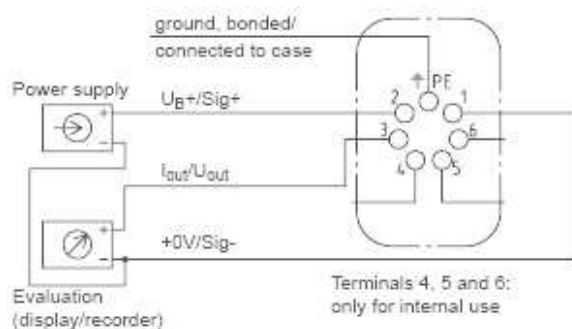
### 2-wire-design

i.e. 4 ... 20 mA



### 3-wire-design

i.e. 0 ... 20 mA / 0 ... 10 V



An un stabilised DC voltage, with a residual ripple of max. 10 % peak-to-peak in the range of the indicated supply voltage limits, is sufficient as a power supply. Make sure that the supply voltage applied exceeds the maximum required voltage by at least the value of the voltage drop across the external display or evaluation devices; i.e. the transmitter can operate using a non-stabilised supply voltage within the given limits, so long as the voltage available to the transmitter does not fall below 12 V, or below 14 V for the Ex-version.