



### Features

- Microprocessor-controlled 2-wire pressure and level transmitter
- Text-oriented operating control via graphic display with language module
- Parameterization on the transmitter or optional with a HART protocol
- Measuring ranges 0...0.16 mWC to 0...160 mWC
- Turndown up to 20:1
- Output signal: 4...20 mA, 2-wire technology, HART protocol (option)
- Accuracy linearity/hysteresis 0.2 %
- Geometrical shape of the vessel can be parameterized for contents measuring
- Housing and wetted parts of stainless steel, degree of protection IP 65 or IP 67
- EMC test as per NAMUR 21 and valid EC directives

### Options

- Explosion protection for gases
- Accuracy 0.1 %
- Material certificate acc. to DIN EN 10204-3.1

### Application area

- Food industry
- Chemicals
- Pharmaceuticals
- General process engineering

### Applications

Pressure transmitter for level and contents monitoring for open vessels and tanks. The transmitter has been specially designed for pressure measurement with diaphragm seals. The extremely reduced temperature error allows the use of diaphragm seals with minimum nominal sizes (even with negligible vessel contents).

### Menu types

You may use the following menus to display information and to select parameters (type series Ci 1000). User guidance is available in English and German.

menu types	description	menu types	description
<b>meas. range selection</b>	definition of start of measuring and end of measuring, without pressure setpoint value	<b>alarm state</b>	definition of output current in case of malfunction
<b>damping</b>	signal damping selection	<b>current balance</b>	adaption of output signal to downstream devices
<b>min-max-value</b>	displaying min- and max-values for pressure, level and temperature	<b>trimming</b>	definition of start of measuring and end of measuring with pressure setpoint value
<b>output function</b>	transmission function: linear switchable, inverse or root function or function table	<b>table function</b>	output signal can be selected at will with max. 12 points
<b>engineering units</b>	engineering unit selection with automatic conversion e.g., mWC, mmHg, mbar or PSI	<b>factory data</b>	accept factory initial setting
<b>measuring circuit test</b>	generating a defined output signal (current sensing)	<b>language</b>	menu in German/English language available

**Technical Data**

nominal range	measuring range	measuring span		overload limits max.	adjustable engineering units							
		min.	max.		mbar	bar	mmHg	mWC	KPa	psi	%	mA
1.6 mWC <sup>1</sup>	0...1.6 mWC	0.16 mWC	1.6 mWC	1 bar	x		o	o	o	o	o	o
10 mWC	0...10 mWC	1 mWC	10 mWC	6 bar	x		o	o	o	o	o	o
40 mWC	0...40 mWC	2 mWC	40 mWC	20 bar	x		o	o	o	o	o	o
160 mWC	0...160 mWC	8 mWC	160 mWC	60 bar		x	o	o	o	o	o	o
160 mbar <sup>1</sup>	-160...160 mbar <sup>2</sup>	16 mbar	320 mbar	1 bar	x		o	o	o	o	o	o
1000 mbar	-1000...1000 mbar <sup>2</sup>	100 mbar	2000 mbar	6 bar	x		o	o	o	o	o	o
4000 mbar	-1000...4000 mbar	200 mbar	5000 mbar	20 bar	x		o	o	o	o	o	o
16 bar	-1...16 bar	0.8 bar	17 bar	60 bar		x	o	o	o	o	o	o

<sup>1</sup> only with diaphragm ≥ DN 80

<sup>2</sup> Long-term vacuum measurements at temperatures above +50°C may cause changes in the properties of the measurement device. Vacuum-proof designs are available upon request.

x standard (preselected)  
o unit adjustable

**Case design**

stainless steel with hardened surface  
mat. no. 1.4305 (303)

degree of protection with closed case

- standard IP 65, inner chamber aeration via integrated filter
- optional IP 67, inner chamber aeration via connection cable

**Electrical connection**

cable entry conduit thread for cable diameter 5...10 mm  
terminal screw connection up to 2.5 mm<sup>2</sup>  
other connections upon request

**Process connection**

see order details

**Positioning process connection**

can be mounted in any position and adjusted to suit with:

- a housing that can be progressively rotated
- adjusted indicating unit (standard orientation):  
6 o'clock, options: 3, 9, and 12 o'clock)

**Measuring system**

piezoresistive sensor element

**Filling material**

see order code

**Window**

safety glass

**Weight**

device without process connection  
approx. 1.2 kg

**Operating temperature range**

ambient temperature -10...+55 °C  
process temperature -10...+90 °C  
cleaning temperature (CIP) up to 140 °C  
with horizontal flange mounting max. 1/2 h

**Allowed storage temperature**

-25...+60 °C

**Influence ambient temperature on transmitter with reference to nominal range temperature range +10...+30 °C**

nom. range	≥ 1000 mbar	160 mbar
lower range value	≤ 0.1 %/10 K	≤ 0.2 %/10 K
upper range value	≤ 0.1 %/10 K	≤ 0.2 %/10 K
temperature range	-10...+55 °C	

nom. range	≥ 1000 mbar	160 mbar
lower range value	≤ 0.2 %/10 K	≤ 0.4 %/10 K
upper range value	≤ 0.2 %/10 K	≤ 0.4 %/10 K

**Influence process temperature on transmitter**

DN 25 VA	7.4 mbar/10 K
DN 32 VA	2.1 mbar/10 K
DN 40 VA	1.4 mbar/10 K
DN 50 VA	0.7 mbar/10 K
DN 80 VA	0.4 mbar/10 K
DN 80 Hastelloy C276	0.2 mbar/10 K
DN 80 Tantal	0.2 mbar/10 K

If necessary, we can provide you with a detailed error calculation.

**Supply voltage**

standard version

- nominal voltage- 24 V DC
- function range 12...50 V DC
- max. permiss. 50 V DC

Ex-design

- permiss. voltage range 12...30 V DC
- max. permiss. 30 V DC

**Output signal**

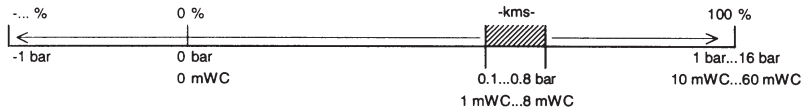
output signal (2-wire) 4...20 mA	
lower limit	3.8 mA
upper limit	20.8 mA
malfunction lower limit	< 3.6 mA
malfunction upper limit	> 21 mA

**Output function**

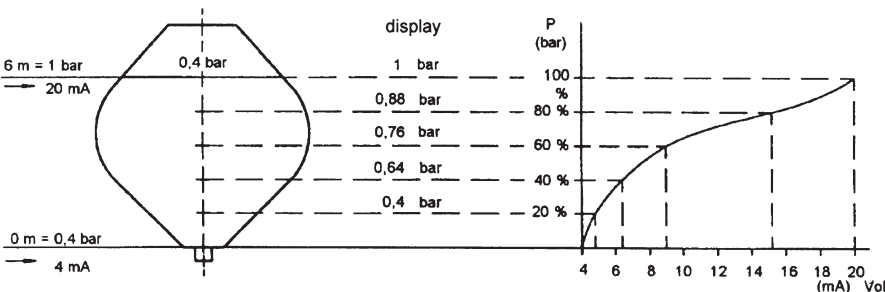
adjustable:

- linear
- inverse
- root function
- function table 12 points

smallest measuring span - kms -



**nominal range/measuring range/measuring span**  
example with 6 points



This means that tank contents can be measured by taking the shape of the tank into consideration.

**Load**  
 $R \leq \frac{U - 12 V}{23 mA}$  (Ohm)

**Damping**

digital filter (only current output)  
0...30 s selectable in steps of 0.2 s  
basic electrical damping 0.2 s

**Measuring cycle**

typ. 0.8 s

**Current sensing function**

3.6...21.5 mA selectable in steps of 0.01 mA

**Non-conformity of a curve**

with reference of nominal range  
≤ 0.2 % (fixed point adjustment)  
≤ 0.1 % as option

**Long-term drift**

with reference to nominal range  
typ. 0.1 %/year

**Overload influence**

within the overload limits, within permissible error tolerances with static loading

**EMC-Test**

emitted interference as per EN 50081 section 1  
noise immunity as per EN 50082, section 2, and industrial standard NAMUR, with 10 V/m

**Ex-approval**

EC-Type Examination Certificate  
ATEX-No: TÜV 99 ATEX 1414 X  
type of ex-protection:

II 1/2G Ex ia IIC T4/T5/T6

T <sub>a</sub> [°C]	T <sub>m</sub> [°C]	temperature class
40 °C	40 °C	T6
60 °C	50 °C	T5
70 °C	60 °C	T4

T<sub>a</sub> = ambient temperature

T<sub>m</sub> = medium temperature

extension of temperature range: see "special conditions".

**Electrical data**

input circuit for type of protection "Intrinsic safety" EEx ia IIC (terminal 1+, 2- and GND)  
only for connection to a certified intrinsically safe circuit

U<sub>i</sub> = 30 V

I<sub>i</sub> = 150 mA

P<sub>i</sub> = 1 W

The effective internal inductances and capacitances are negligibly small.

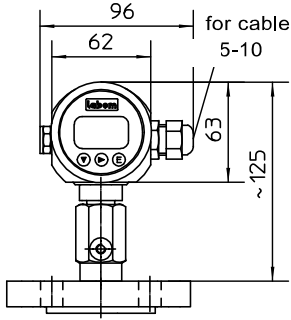
**Mounting and operating instructions**

please check separate User Guidance

**Information on other models upon request or see to order details**

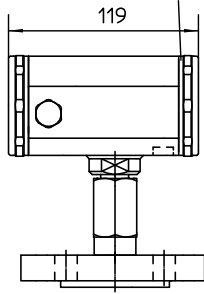
**Dimensions**

horizontal flange-mounting



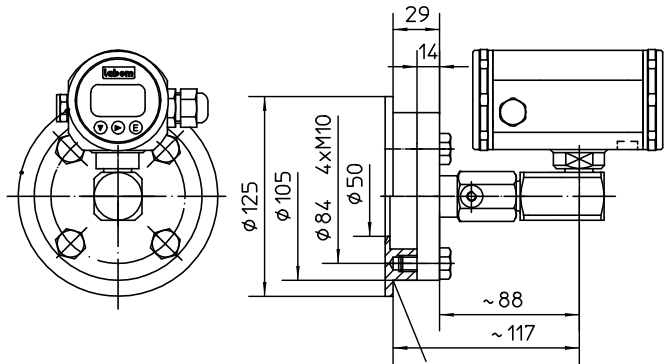
flange per DIN and ASME see order option

Pascal Ci



design direct-attachment for horizontal flange-mounting

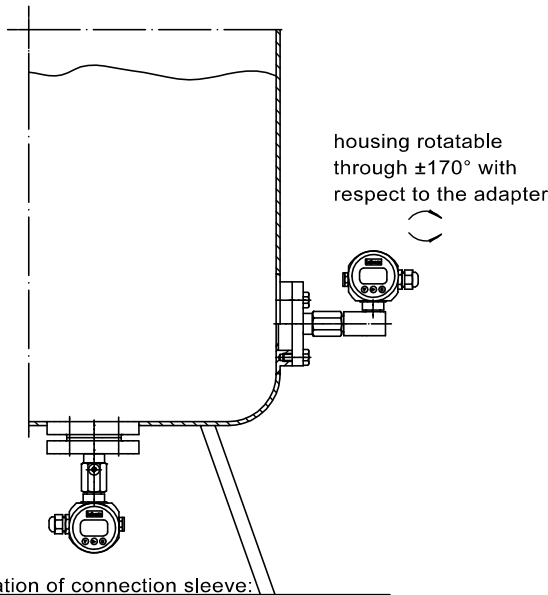
vertical flange-mounting with angle adapter



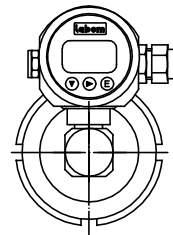
flange with diaphragm extension DRD-design DN 50

weld-in flange type MZ 2010

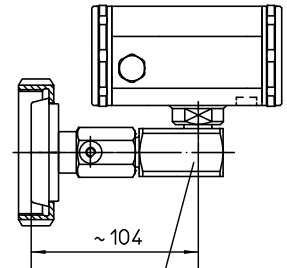
**Installation example**



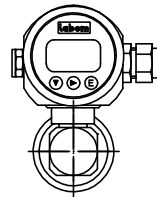
orientation of connection sleeve: 12° o'clock



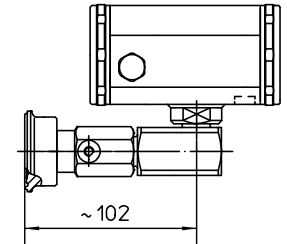
tapered coupling per DIN 11851 DN 25, DN 32, DN 40, DN 50



angle adapter type MZ2001

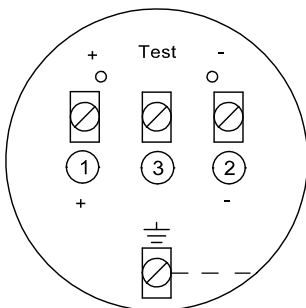


clamp-connection ISO 2852, DN2"

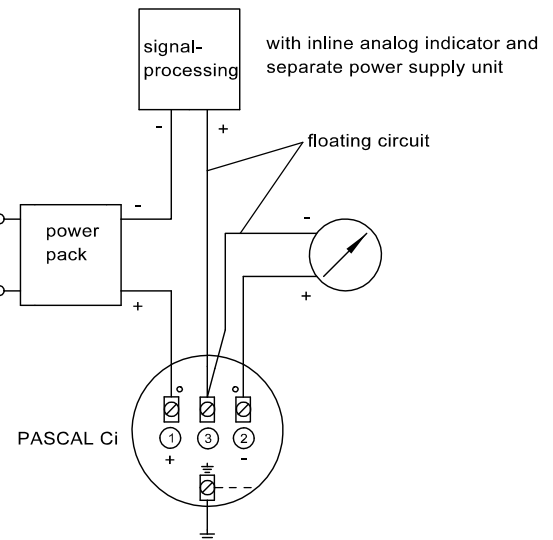
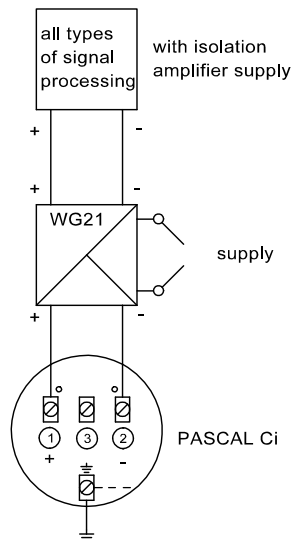


further process connections and aseptic connections available



**Connection diagram/connection examples**



- 1 = + supply
- 2 = - supply
- 3 = vacant terminal
- ⊕ = earth terminal is connected with the case
- Test = connection for testing equipment for uninterrupted current measurement



**Order Details** - please give additional specifications for models not listed -

Pressure and level transmitter PASCAL LEVEL with graphic display			CI120 .		
design	· without		0		
	· with ex-protection, types of ex-protection as follows		1		
nominal range	160 mbar rel., in combination with process conn. ( diaphragm seal )=>DN80),only		A1009		
	1000 mbar rel.		A1053		
	4000 mbar rel.		A1056		
	16 bar rel.		A1059		
	1.6 mWC		A1364		
	10 mWC		A1368		
	40 mWC		A1371		
	160 mWC		A1374		
parameterization	· factory settings (standard) <sup>2</sup>		F1		
	· as per customers' specification		F2		
output signal	· 4...20 mA, standard		H11		
	· 4...20 mA, with HART-protocol		H21		
protection type	· IP 65		T2		
	· IP 67		T1		
process connection <sup>1</sup>	screw-in thread	· G 3/4 A	DE1280		
		· G 1 A	DE1380		
		· G 1 1/2 A	DE1580		
		· G 2 A	DE1680		
	flange (flat diaphragm)	sealing surface DIN EN 1092-1 model B1 (DIN 2526 model C/D)	· DN 25, PN 10/40	DA1120	
			· DN 50, PN 10/40	DA1420	
			· DN 80, PN 10/40	DA1620	
		sealing surface ASME B16.5 RF500 RMS	· DN 100, PN 10/16	DA1710	
			· DN 1", PN 300 psi	DA51120	
			· DN 2", PN 300 psi	DA51320	
	with extended diaphragm DRD-design		· DN 3", PN 150 psi	DA51510	
	sanitary connection (sanitary conn.) (flat diaphragm)	taper connecting sleeve with groove union nut DIN 11851	· DN 50 / PN 40	DD4100	
			· DN 25	DL2100	
			· DN 32	DL2200	
			· DN 40	DL2300	
		clamp-connection ISO 2852	· DN 50	DL2400	
			· DN 1"	DL3100	
			· DN 1 1/2"	DL3200	
		clamp-connection DIN 32676	· DN 2"	DL3300	
			· DN 25	DL4100	
· DN 40			DL4300		
· DN 50	DL4400				
connection of measuring instrument	· direct attachment for horizontal flange-mounting		A300 .		
	· direct, with angle adapter for vertical flange-mounting		A702 .		
	· with capillary		B209 .		
	· with capillary and protective tube		B109 .		
	· length of capillary as in writing		.....		
wetted parts	· material stainless steel mat. no. 1.4435 (316L)		7		
	· material stainless steel mat. no. 1.4404/1.4435 (316 L)		1		
	· as in writing		9		
system filling	system filling	temperature range			
	· foodstuff oil FD1 (standard)	+10...+140 °C	L22		
	· foodstuff oil FD1, pls. specify temperature, max.	-40...+200 °C	L23		
<b>additional features (to be indicated in case of need, only)</b>					
non-conformity of a curve $\leq 0.1\%$				Q1	
mounting position	· 9° o'clock		R2		
	· 3° o'clock		R3		
	· 12° o'clock		R4		
explosion protection	·  II 2G Ex ia IIC T4/T5/T6, standard		S68		
	·  II 1/2G Ex ia IIC T4/T5/T6		S66		
order code (example)			CI1200	A1053	
accessory			F1	H11	
			T2	DE1280	
			A7027	L22	
HART-communication	· software COMLINE.HART on CDROM		MC1010		
	HART-Modem	· RS 232-Interface	MC1020		
		· USB-Interface	MC1040		
		· USB-Interface, Ex	MC1041		

<sup>1</sup> design with approval for connection to Zone 0 upon request<sup>2</sup> **Factory adjustment:**

Measuring range calibrated:	0...nominal range for 4...20 mA
Damping:	0 s
Signal output upon error:	< 3.6 mA
Pressure unit:	bar or mbar
Signal evaluation:	linear
User-guidance language:	German