



Ci 1000

Design Features

- Microprocessor-controlled 2-wire pressure transmitter, self monitoring
- Text-oriented operating control via graphic display with language module
- Measuring range extension 1 : 20
- Measuring ranges 100 mbar up to 400 bar
- Signal output 4..20 mA, 2-wire
- Case and wetted parts of stainless steel, protection type IP 65 or 67
- Ex-protection, EEx ia/ib
- EMC test as per valid EC guidelines

Application

The transmitters convert pressure measured values to standard analog signals, 2-wire circuitry 4..20 mA, you may exchange them with standard analog pressure transmitters. Two type series can be supplied: PASCAL Ci 1000 with text-oriented operating control via graphic display, and PASCAL Ci 2000 factory adjusted, without graphic display. You may install the transmitters in your position of choice. The housing can be variably rotated through $\pm 170^\circ$ with respect to the connection sleeve, when mounted; it is secured with a frictional grip to allow ease of installation and operation. The control panel and display field may be accessed by unscrewing the bezel; they can be mounted - offset by 90° , 180° and 270° - at the factory.

The measuring range may be chosen without using a test bench; a span spread of up to 1 : 20 can be achieved. Because of their robust design, the transmitters are suitable for use in tough environments, e.g. in the chemical industry, in process technology, and in food processing plant.

Design and Function

The process pressure acts on a piezoresistive semiconductor measuring bridge via a suitable stainless steel separating diaphragm. Pressure is transmitted by an extremely reduced oil fill. All wetted parts are welded.

The standard output signal is 4..20 mA with a linear function. Up to 11 points in a function table allows any transmission function to be set-up.

A temperature sensor - as secondary measuring element in the sensor connection sleeve - serves to compensate contents-signal temperature. The measured sensor temperature can be shown on the display field, if required.

The PASCAL series pressure transmitters also provide HART protocol logging. Communications with a PC/Laptop on Windows is thus available. This means that all functions can be set/called up at any point in the signal circuit. Please refer to data sheet D4-015/E1 for further information.

Menu types

You may use the following menus to display information and to select parameters. User guidance is available in English and German.

menu types	description	menu types	description
meas. range selection	definition of start of measuring and end of measuring, without pressure setpoint value	alarm state	definition of output current in case of malfunction
damping	signal damping selection	current balance	adaption of output signal to downstream devices
min-max-value	displaying min- and max-values for pressure, level and temperature	trimming	definition of start of measuring and end of measuring with pressure setpoint value
output function	transmission function: linear switchable, inverse or function table	table function	output signal can be selected at will with max. 11 points
engineering units	engineering unit selection with automatic conversion e.g., mmWC, mmHg, mbar or PSI	factory data	accept factory initial setting
measuring circuit test	generating a defined output signal (current sensing)	language	menu in German/English language available

Techn. Data

measuring ranges: all measuring spans within the measuring limits

nominal range	measuring span	measuring limits		overload limits
		min.	max.	
1000 mbar rel.	-1000...1000 mbar rel.	100 mbar	2000 mbar	-1...6 bar rel.
4000 mbar rel.	-1000...4000 mbar rel.	200 mbar	5000 mbar	-1...10 bar rel.
16 bar rel.	-1...16 bar rel.	0.8 bar	17 bar	-1...30 bar rel.
40 bar rel.	-1...40 bar rel.	2.0 bar	41 bar	-1...75 bar rel.
100 bar rel.	-1...100 bar rel.	5.0 bar	101 bar	-1...200 bar rel.
400 bar rel.	-1...400 bar rel. 1)	20.0 bar	401 bar	-1...500 bar rel.
1000 mbar abs.	0...1000 mbar abs.	100 mbar abs.	1000 mbar abs.	0...6 bar abs.
4000 mbar abs.	0...4000 mbar abs.	200 mbar abs.	4000 mbar abs.	0...10 bar abs.
16 bar abs.	0...16 bar abs.	0.8 bar abs.	16 bar abs.	0...30 bar abs.

1) different conformity error for spans > 200 bar

Case design

stainless steel with hardened surface
mat. no. 1.4305
protection type with closed case
· standard IP 65, inner chamber aeration via integrated filter
· optional IP 67, inner chamber aeration via connection cable (with ≥ 100 bar not necessary)

Electrical connection

Cable entry conduit thread 11 STR for cable diameter 3...10 mm
terminal screw connection up to 2.5 mm²

Materials

case mat. no. 1.4305
connection sleeve mat. no. 1.4404
diaphragm seal mat. no. 1.4404

Process connection

G 1/2 A

Positioning process connection

can be supplied below at 6 o'clock as standard, and at 3, 9 and 12 o'clock, as options

Measuring system

piezoresistive sensor element

Filling material

silicon oil

Window

safety glass (type serie Ci 1000)

Weight

1.2 kg

Power supply

standard version:
· nominal voltage 24 V DC
· function area 12...50 V DC
· max. allowable 50 V DC

Ex-protection type

· EEx ia II C T4/T5/T6 12...20 V DC
· EEx ib II C T4/T5/T6 12...30 V DC

Output signal

output signal 4...20 mA
· lower limit 3.9 mA
· upper limit 21.5 mA
· malfunction < 3.9 mA or 22.5 mA

Output function

linear, inverse or parameterized with up to 11 (HART: 12) points according to function table. This means that tank contents can be measured by taking the shape of the tank into consideration.

Load

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

Damping per digital filter

0...30 s selectable in steps of 0.2 s
basic electrical damping 0.2 s

Current sensing function

standard: 3.85...22.5 mA selectable in steps of 0.01 mA
HART: 3.7...23.0 mA selectable in steps of 0.01 mA

Measuring cycle

standard: typ. 0.5 s
HART: typ. 0.8 s

Non-conformity of a curve

with reference of nominal range for meas. ranges < 200 bar
≤ 0.2 % (fixed point adjustment)
≤ 0.1 % as option
for meas. ranges > 200 bar
≤ 0.5 % (standard)

Long-term drift

with reference to nominal range
typ. 0.1 %/year

Overload influence

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

Ambient temperature influence

with reference to nominal range
start of scale ≤ 0.1 %/10 K
start of full scale ≤ 0.1 %/10 K

Temperature ranges

storage temperature
type serie Ci 1000 -25...60 °C
type serie Ci 2000 -45...85 °C
ambient temperature
type serie Ci 1000 -10...55 °C
type serie Ci 2000 -25...65 °C
process temperature -10...55 °C

Explosion-proofing approval

certificate of conformity
ATEX-No.: TÜV 99 ATEX 1414 X
type of ex-protection: EEx ia/ib IIC T4/T5/T6

mark	max. ambient temperature	Ui	Ii	Pi
EEx ib IIC T4	70 °C	30 V	150 mA	1 W
EEx ia IIC T4	70 °C	20 V	100 mA	0.6 W
EEx ib IIC T5	60 °C	30 V	150 mA	1 W
EEx ia IIC T5	60 °C	20 V	100 mA	0.6 W
EEx ib IIC T6	40 °C	30 V	150 mA	1 W
EEx ia IIC T6	40 °C	20 V	100 mA	0.6 W

The effective inner inductivity and capacity are negligible.

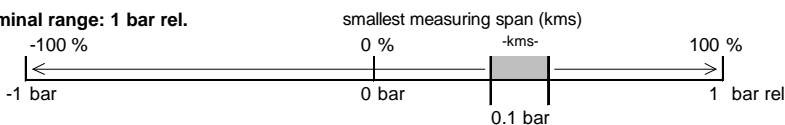
EMC-Test

· noise immunity as per EN 50082, section 2, March 95 issue for industry
· emitted interference as per EN 50081, section 1, 1993 issue for residential and industrial areas

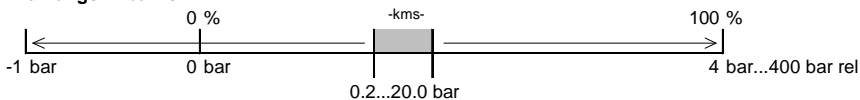
Information on other models upon request or see to order details

Measuring range/measuring span/measuring limits

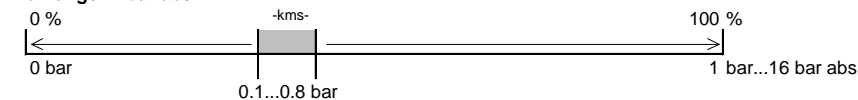
nominal range: 1 bar rel.



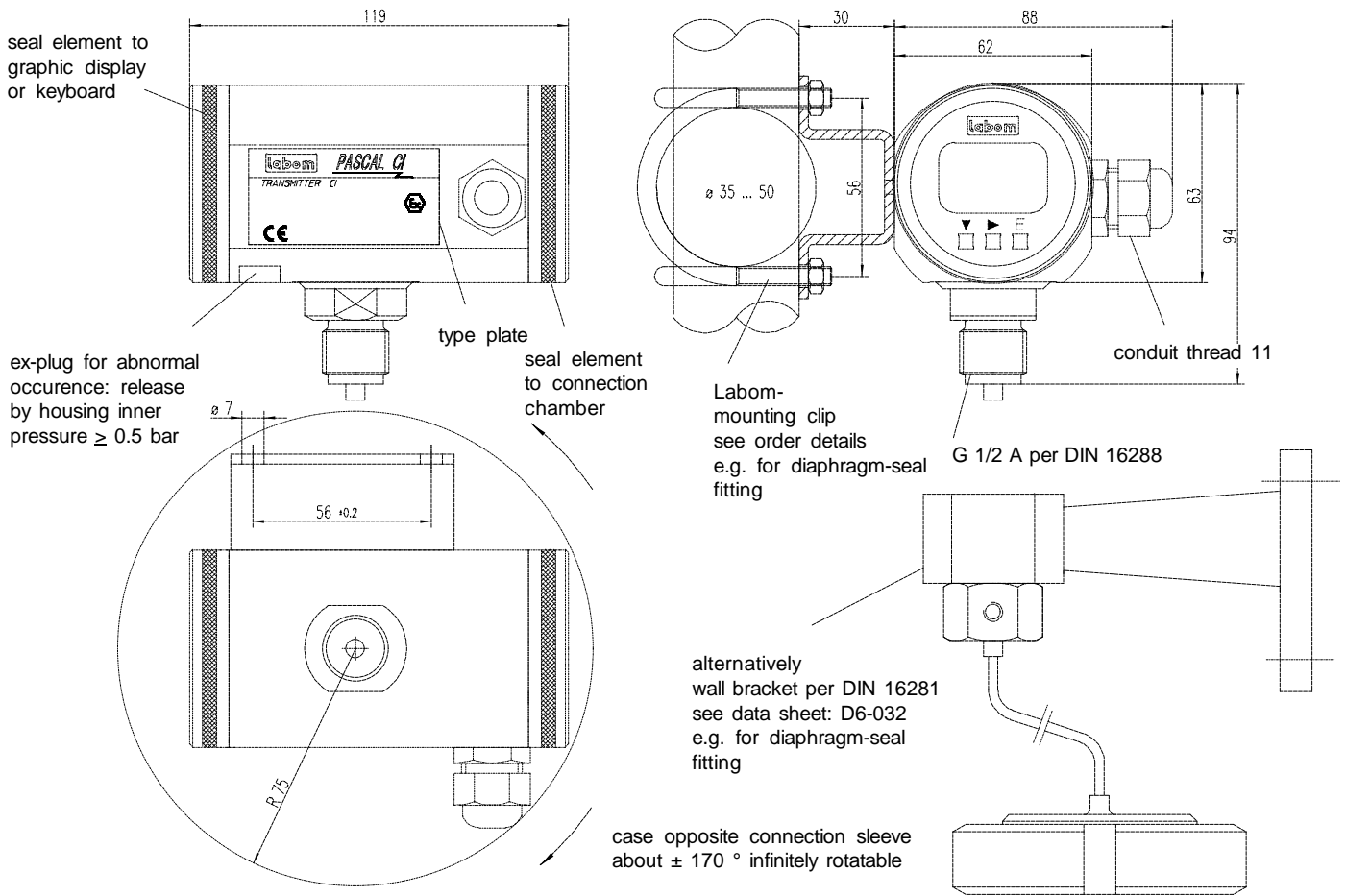
nominal range: 4 bar rel.



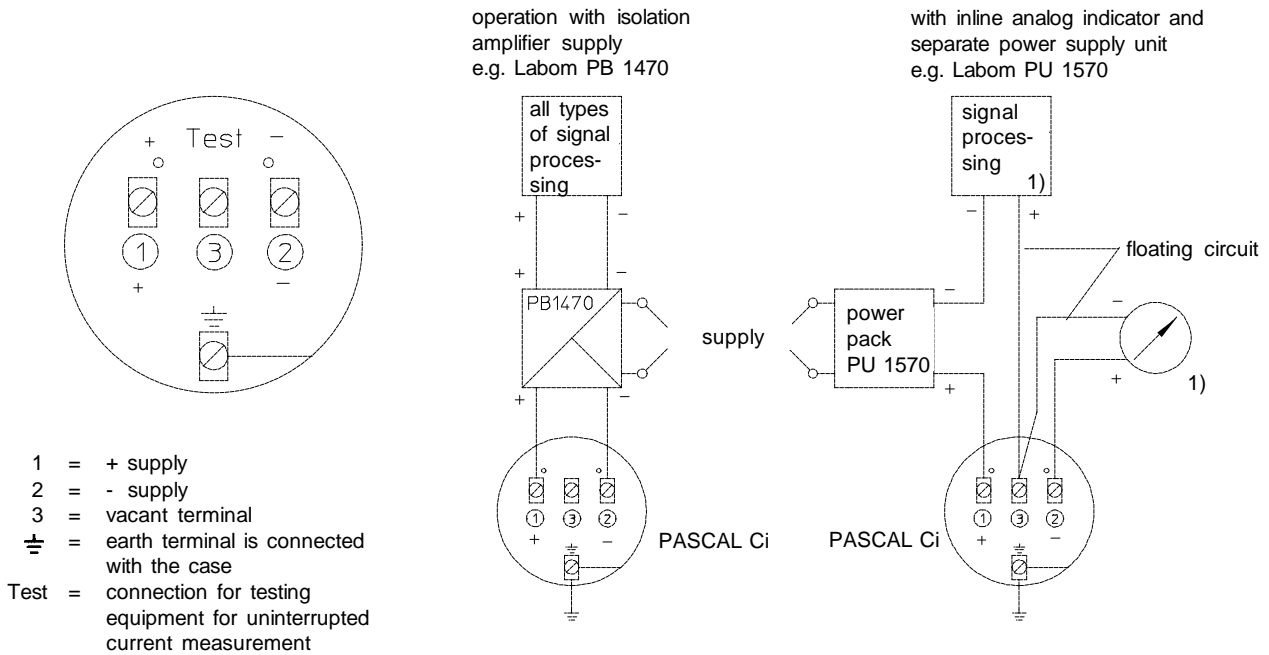
nominal range: 1 bar abs



Dimensions



Connection diagram/connection examples



1) isolated input

Mounting and operating instructions

The devices are adjusted and calibrated at the factory. They should only be installed and commissioned by competent personnel; operating instructions and data sheets should be observed. The devices do not normally require any subsequent adjusting. You may need to correct the zero point, if you alter the installation position. Please note that the measuring span is not effected by the zero-point correction.

Depending on the version, an aerated connecting cable, or an integrated filter is used to compensate the internal pressure in excess-pressure ranges up to 40 bar rel. Higher measuring ranges or absolute pressure ranges do not require any pressure compensation to atmosphere.

The named protection types are only achieved, when the device has been correctly installed, both ring nuts screwed tight, and the cable diameters correspond with the nominal sizes of the sealing inserts in the housing (conduit thread screwings).

The integral EMC measures are only effective with a correct earth connection.

State-of-the-art technology is used, and is continuously updated.

Factory adjustment: both device versions have been programmed as follows:

measuring range calibrated: 0...nominal range for 4...20 mA

damping programmed: 0 s

signal output upon error: < 3.9 mA

measuring unit: mbar/bar

signal evaluation: linear

menu guidance: german

We can also supply other basic setting, please specify with your order.

Electrical equipment in hazardous areas should only be installed and commissioned by competent personnel. Modifications to devices and connections destroy the ex-proofing and the guarantee. The complete cable run, both inside and outside the hazardous areas in intrinsically safe circuits, should be equipotentially bonded. The limit values detailed in the certificate of conformity are to be observed.

The CE designations for devices certifies compliance with European Council guidelines (89/336/EWG), EMC legislation (13.11.1992), current generic standards, and product and basic standards.

Clear operation in systems and plants is achieved when the conditions for screening, earthing, wiring and potential isolation are fulfilled.

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

Intelligent pressure transmitter		nominal ranges	order code										
design	· menu guided via graphic display	1 bar rel.	A1053										
	· without menu guidance, fix programmed												
version	· standard	4 bar rel.	A1056										
	· explosion-proof	16 bar rel.	A1059										
nominal range	· per table	40 bar rel.	A1061										
	 ←	100 bar rel.	A1063									
parameterization	· factory adjustment (standard)	400 bar rel. ¹⁾	A1066										
	· per specification	1 bar abs.	B1053										
output signal	· 4...20 mA, standard	4 bar abs.	B1056										
	· 4...20 mA, wiht HART protocol	10 bar abs.	B1058										
additional features (to be indicated in case of need, only)													
non-conformity of a curve	· ≤ 0.1 % ¹⁾		Q1										
positioning	· 9 o'clock		R2										
	· 3 o'clock		R3										
	· 12 o'clock		R4										
type of ex-protection (to be indicated for explosion proof, only)	· EEx ib II C T4		S61										
	· EEx ia II C T4		S62										
	· EEx ib II C T5		S63										
	· EEx ia II C T5		S64										
	· EEx ib II C T6		S65										
	· EEx ia II C T6		S66										
protection type	· IP 67		T1										
assembly sets ²	· mounting clip		V2										
	· second conduit thread		V3										
Order code (example):		C11010	A1053	F1	H11								

¹ different conformity error for spans > 200 bar

² wall bracket per DIN 16281 see data sheet D6-032