Pressure transmitter UNIVERSAL

for general application

Type series CB1(2)02./CE1(2)01.

Features

- Measuring ranges 0...160 mbar up to 0...160 bar rel.
  0...0.4 bar up to 0...25 bar abs
- Piezoresistive sensor element
- Measuring system overload protected
- Zero point and measuring span can be adjusted externally by means of a potentiometer
- Internal diaphragm type series CB1(2)02 .
- Flush mounted diaphragm type series CE1(2)02 .
- Wetted parts of stainless steel, completely welded
- Stainless steel housing as standard or field housing
- Degree of protection IP 65, option: IP 67
- Output signal: 4...20 mA, option: 0...20 mA, 0...10 V DC

Options

- Explosion protection for gases
- As per UKCA regulations
- DNV-GL approval

Application area

· Chemical and petrochemical industry
· Process engineering
· Shipping
· General process technology

Application

The analog pressure transmitter UNIVERSAL is suited for measuring the relative and absolute pressure of gases, vapors and liquids.
The area of application lies in general process measurement technology. There are two different designs of housings available: standard housing with right angle plug or stainless steel field housing for use in tough environments.

Technical Data

Housing designs
Standard housing with right angle plug
material: st. steel mat.-no. 1.4301 (304)
degree of protection: IP 65
silicon cover plate for trimming potentiometers.
Right angle plug as per DIN EN 175301-803-A (DIN 43650, form A) with cable gland M16x1.5 mm, cable diameter 4...10 mm.
Inner chamber aeration for measuring ranges ≤ 10 bar.

Field housing, solid design
material: st. steel mat.-no. 1.4301 (304)
degrees of protection:
· standard
  IP 65, inner chamber aeration via integrated sintered filter, only for excess pressure measuring ranges ≤ 10 bar, if aeration via cable is impossible.
Option:
  IP 67, inner chamber aeration via connection cable for excess pressure measuring range ≤ 10 bar.
Screwable cover ring with O-ring seal for the externally accessible trimming poten-ti-ometers.
Screwable case cap for connection chamber.
Connection terminals 4 mm².
Cable gland M16x1.5 for cable diameter 4.5...10 mm, material polyamide.

Process connection
· G 1/2 B, DIN EN 837-1
· G 1/2 B, flush mounted**Measuring system**
piezoresistive measuring bridge, protected by integrated stainless-steel diaphragm.
Completely welded system

Filling material
silicone-free, synthetic oil

Material
diaphragm: st. steel mat.-no. 1.4404 (316L)
socket: st. steel mat.-no. 1.4404 (316L)

Weights
standard housing: approx. 300 g
field housing: approx. 750 g

Storage temperature range
-25...+80 °C

Limiting temperature range
-25...+70 °C

Rated temperature range
-10...+70 °C

Temperature influence
on zero point and meas. span:
≤ 0.02 % of meas. span/K

Auxiliary power supply
standard version:
· nominal voltage 24 V DC
· function range
  2-wire technology 14...30 V DC
  3-wire technology 16...30 V DC
· max.permiss.operating voltage 30 V DC
Ex design:
· permiss. voltage range of 2-wire circuitry 15...30 V DC
Ex design:
· permiss. voltage range of 3-wire circuitry 16...30 V DC

Standard measuring ranges
see order details

Overload limits UE
for short-time overload.
See order details

Overload influence
≤ 0.1 % f.s.

Output signal
4...20 mA, 2-wire technology, standard.
Further possibilities see order details

Test output (with field housing only)
non interruptible output current measurement via integrated LOC diode

Current limitation in output signal
max. output current approx. 30 mA

Supply voltage influence
≤ 0.2 % f.s. / 10 V

Linearity error incl. hysteresis
≤ 0.3 % f.s. (limit point calibration)

Adjustable range
zero point and measuring span approx. ± 10 %

Response time
≤ 20 ms

Ex-approval
The limit values detailed in the EC-Type Examination Certificate are to be observed!

EC-Type Examination Certificate
TÜV 02 ATEX 1971 X and
IECEx TUN 04.0008X
type of ex-protection:
Ⓔx II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb
Ⓔx II 2G Ex ia IIC T4/T5/T6 Gb

IECEx TUN 04.0008X
type of ex-protection:
Ex ia IIC T4/T5/T6 Ga/Gb
Ex ia IIC T4/T5/T6 Gb
Ex ia I Ma

Since the intrinsically safe circuits are connected with the earth potential for safety reasons, potential equalization has to exist in the complete course of the erection of the intrinsically safe circuits.

Ambient temperatures
II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb
Ⓔx Ex ia IIC T4/T5/T6 Ga/Gb

Ta [°C]	TM [°C]	temperature class
70	40	T6
70	60	T5
70	60	T4

Ambient temperatures
II 2G Ex ia IIC T4/T5/T6 Gb
Ⓔx Ex ia IIC T4/T5/T6 Gb

Ta [°C]	TM [°C]	temperature class
70	55	T6
70	70	T5
70	70	T4

Ambient temperatures Ex ia I Ma:
Ta = Tm 70°C max

Electrical data
Sum of maximum values in the intrinsically safe circuits
Ui = 30 V
Ii = 100 mA
Pi = 0,7 W

The table shows the values for different pressure transmitter signals:

signal mode	Ci [nF]	Li [µH]
2-wire 4...20 mA	33	20
3-wire 0(2)...10 V	43	30
3-wire (0)4...20 mA	43	30

Caution:
Make sure that there is equipotential bonding along the entire wiring run both inside and outside the explosion hazardous area.

Switch off device if it is installed in zone 0 and in temperature class T5 and T6 and it fails!

Burden
- current output
  2-wire circuitry
  standard version $R_a = \frac{U_B - 14\ V}{20\ mA}$ (KOhm)
  with explosion protection $R_a = \frac{U_B - 15\ V}{20\ mA}$ (KOhm)
- voltage output
  a current of 20 mA can be obtained in the case of devices with power output.

Burden influence
for 500 Ohm burden of change: ≤ 0.1 % f.s.

DNV GL approval per certificate no. TAA00002MV

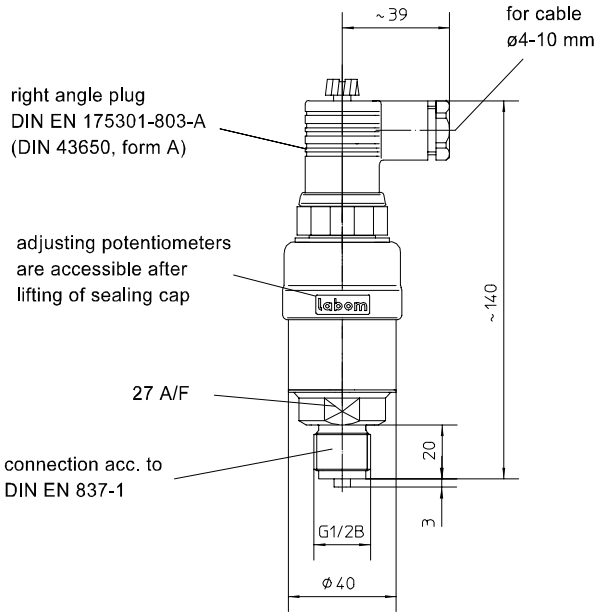
EMC-Test
- noise immunity as per EN 50082, section 2, March 95 issue for industry
- emitted interference as per EN 50081, section 1, 1993 issue for residential and industrial areas

Information on other models see order details or upon request.

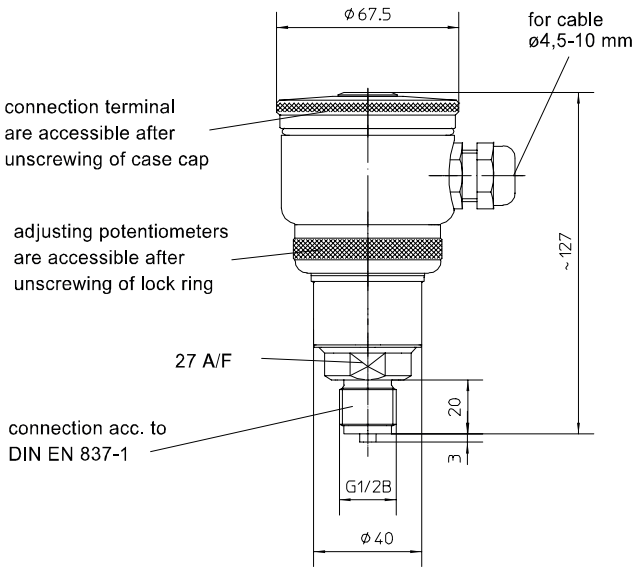
Dimensions

Pressure transmitter UNIVERSAL with internal diaphragm type series CB 1(2)02.

design standard housing

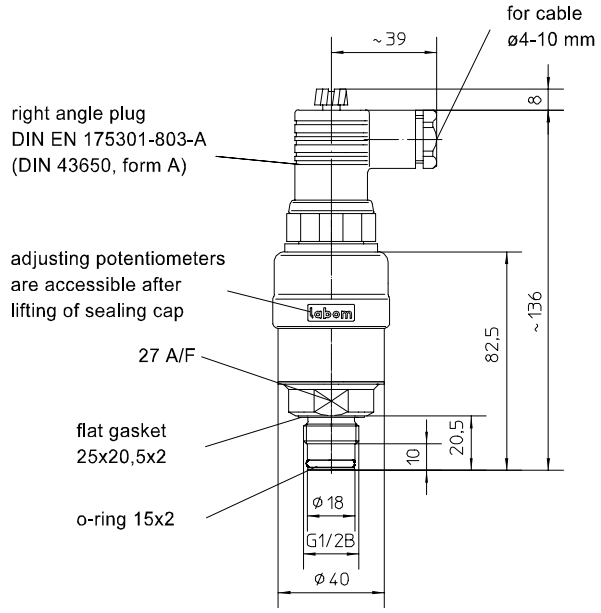


design field housing

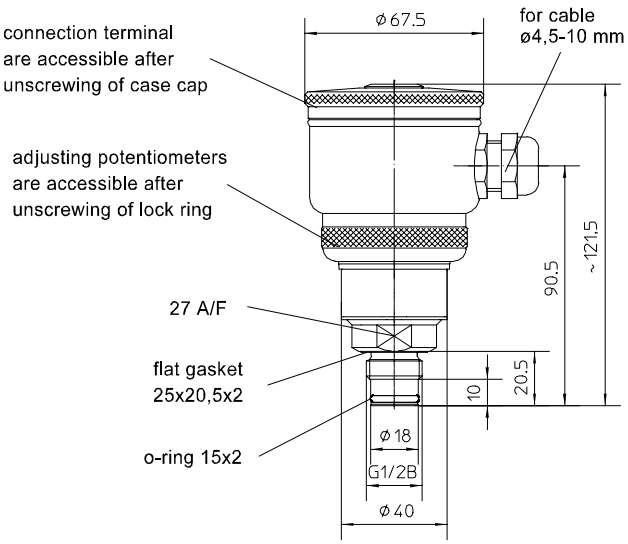


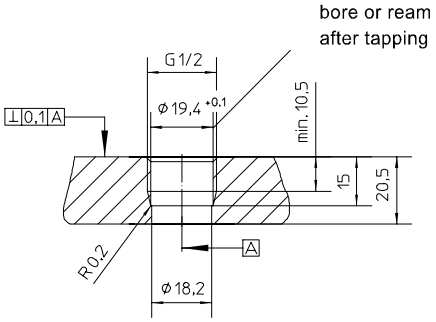
Pressure transmitter UNIVERSAL with flush mounted diaphragm type series CE 1(2)01.

design standard housing

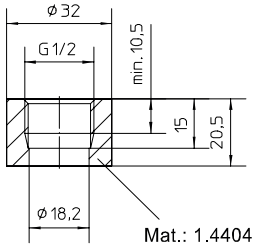


design field housing



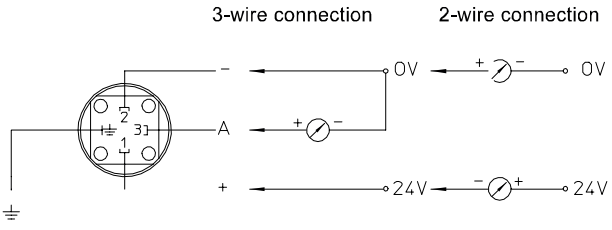


screw-in hole
(example)

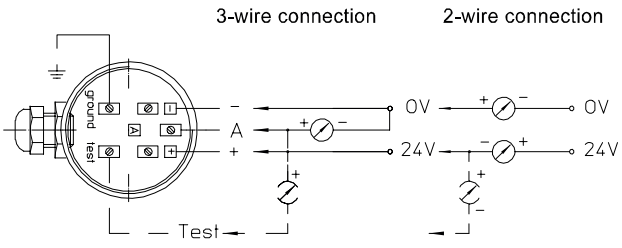


welded socket
(option)

Connection diagram



standard housing



field housing

Order details

Pressure transmitter UNIVERSAL with internal diaphragm												
design	· standard housing	CB102 .										
	· field housing	CB202 .										
version	· standard	0										
	· explosion protection, type of ex-protection s. below	1										
meas. range	· per table		.....									
output signal	· 4...20 mA, 2-wire technology				H1							
	· 0...20 mA, 3-wire technology				H2							
	· 0...10 V, 3-wire technology				H4							
	· 0...5 V, 3-wire technology				H6							
additional features (to be indicated in case of need, only)												
degree of protection [3]	· IP 65 (standard) [5]					T2						
	· IP 67 [2]					T1						
type of ex-protection (for ex-protection only)	· ⟨Ex⟩ II 2G Ex ia IIC T4 Gb						S69					
	· ⟨Ex⟩ II 2G Ex ia IIC T5/T6 Gb, standard						S68					
	· ⟨Ex⟩ II 1/2G Ex ia IIC T4 Ga/Gb						S62					
	· ⟨Ex⟩ II 1/2G Ex ia IIC T5/T6 Ga/Gb						S66					
	IECEx · Ex ia IIC T4/T5/T6 Ga/Gb						S76					
	IECEx · Ex ia IIC T4/T5/T6 Gb						S76					
	IECEx · Ex ia I Ma						S76					
DNV GL approval								W2652				
as per UKCA regulations								W2660				
Order code (example):		CB1021	A1010	H4								

standard measuring ranges and overload protection UE

meas. range	UE bar [1]	order code
-1...0.6 bar [4]	10	A1087
-1...1.5 bar [4]	10	A1088
-1...3 bar [4]	20	A1089
-1...5 bar [4]	20	A1090
-1...9 bar [4]	60	A1091
-1...15 bar [4]	60	A1092
0...160 mbar	1	A1009
0...250 mbar	1	A1010
0...0.4 bar	3	A1051
0...0.6 bar	3	A1052
0...1 bar	3	A1053
0.2...1 bar	3	A1080
0...1.6 bar	10	A1054
0...2.5 bar	10	A1055
0...4 bar	20	A1056
0...6 bar	60	A1057
0...10 bar	60	A1058
0...16 bar	60	A1059
0...25 bar	60	A1060
0...40 bar	100	A1061
0...60 bar	200	A1062
0...100 bar	200	A1063
0...160 bar	250	A1064
0...0.4 bar abs	3	B1051
0...0.6 bar abs	3	B1052
0...1 bar abs	3	B1053
0...1.6 bar abs	10	B1054
0...2.5 bar abs	10	B1055
0...4 bar abs	10	B1056
0...6 bar abs	60	B1057
0...10 bar abs	60	B1058
0...16 bar abs	60	B1059
0...25 bar abs	60	B1060

Pressure transmitter UNIVERSAL with flush mounted diaphragm

design	· standard housing	CE101 .										
	· field housing	CE201 .										
version	· standard	0										
	· explosion protection, type of ex-protection s. below	1										
measuring range	UE bar[1]											
	-1...1.5 bar [4] 10				A1088							
	-1...3 bar [4] 20				A1089							
	-1...5 bar [4] 20				A1090							
	-1...9 bar [4] 60				A1091							
	-1...15 bar [4] 60				A1092							
	0...2.5 bar 10				A1055							
	0...4 bar 20				A1056							
	0...6 bar 60				A1057							
	0...10 bar 60				A1058							
	0...16 bar 60				A1059							
	0...25 bar 60				A1060							
	0...2.5 bar abs 10				B1055							
	0...4 bar abs 10				B1056							
	0...6 bar abs 60				B1057							
	0...10 bar abs 60				B1058							
	0...16 bar abs 60				B1059							
	0...25 bar abs 60				B1060							
output signal	· 4...20 mA, 2-wire technology					H1						
	· 0...20 mA, 3-wire technology					H2						
	· 0...10 V, 3-wire technology					H4						
	· 0...5 V, 3-wire technology					H6						
additional features (to be indicated in case of need, only)												
type of ex-protection (for ex-protection only)	· ⟨Ex⟩ II 2G Ex ia IIC T4 Gb						S69					
	· ⟨Ex⟩ II 2G Ex ia IIC T4/T5/T6 Gb, standard						S68					
	· ⟨Ex⟩ II 1/2G Ex ia IIC T4 Ga/Gb						S62					
	· ⟨Ex⟩ II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb						S66					
	IECEx · Ex ia IIC T4/T5/T6 Ga/Gb						S76					
	IECEx · Ex ia IIC T4/T5/T6 Gb						S76					
	IECEx · Ex ia I Ma						S76					
degree of protection [3] (field housing)	· IP 65 (standard), measuring range ≤ 16 bar [5]							T2				
	· IP 67 [2]							T1				
welded socket to process connection									V2			
DNV GL approval										W2652		
as per UKCA regulations										W2660		
Order code (example):		CE1010	A1057	H2								

[1] special overload protection (UE) upon request

[2] aerated cable with < 10 bar is required

[3] design field housing only

[4] negative relative pressure ranges (e.g. -1...+1 bar) are adjusted at works to 0...100%, e.g. 4...20mA.
Temporary operation up to -1 bar at room temperature and continuous operation up to -500 mbar at max. 50°C is admissible.
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

[5] not valid for absolute pressure