# Pressure transmitter, piezoresistive principle of measurement high overload protected, Type Series CD 102./202.

## Features

- Measuring ranges 0...2,5 bar up to 0...25 bar, relative and absolute pressure
- Piezoresistive sensor element
- Measuring system overload protected up to 250 bar
- Stainless steel housing as standard or field housing
- Output signal: 4...20 mA, 2-wire technology

## Options

- High explosion protection for gases, IECEx
- Overloaded protected up to 400 bar
- Output signal:
  0...20 mA / 0...10 VDC / 2...10 VDC / 0...5 VDC

## Application area

· Chemical industry
· Shipping
· Process engineering
· Hydraulic control technology

## Application

The device converts measured pressure values into the current or voltage unit signals that are typically used in process control technology. The transducer's sensor is a piezoresistive semiconductor bridge circuit. The integrated overload switch is designed for continuous overpressure and has no wear parts. A compensation network ensures that the output signal is largely unaffected by the process temperature.

## 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 67, inner chamber aeration via connection cable for excess pressure measuring range ≤ 10 bar.
Option:
  IP 65, inner chamber aeration via integrated sintered filter, only for excess pressure measuring ranges ≤ 10 bar, if aeration via cable is impossible.
Screwable cover ring with O-ring seal for the externally accessible trimming potentiometers.
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

**Measuring system**
piezoresistive measuring bridge, protected by integrated stainless-steel diaphragm.

**Filling material**
Silicone oil

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

**Weights**
standard housing: approx. 400 g
field housing: approx. 800 g

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

**Process temperature range**
-10...+50 °C

**Compensated temperature range**
-10...+50 °C

**Temperature influence**
on zero point and meas. span:
≤ 0.3 %/10K

**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 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

## *Technical Data (continued)*

**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
Ⓔx II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb
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
Ⓔx II 2G Ex ia IIC T4/T5/T6 Gb
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 |

**Burden**
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)

3-wire circuitry
all models with current output $R_a = \frac{U_B - 9\ V}{20\ mA}$ (KOhm)

3-wire circuitry
all models with voltage output $I_a = \leq 20\ mA$

- voltage output
  a current of 20 mA can be obtained in the case of devices with power output.

$U_B$ = operating voltage
$R_A$ = max. permissible burden resistance (incl. lead)

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

**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!

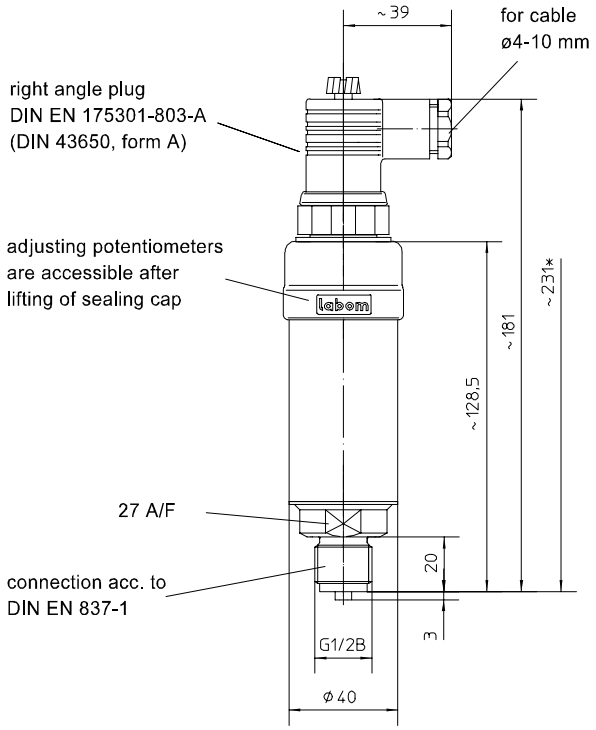
**EMC Test as per IEC 801**

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

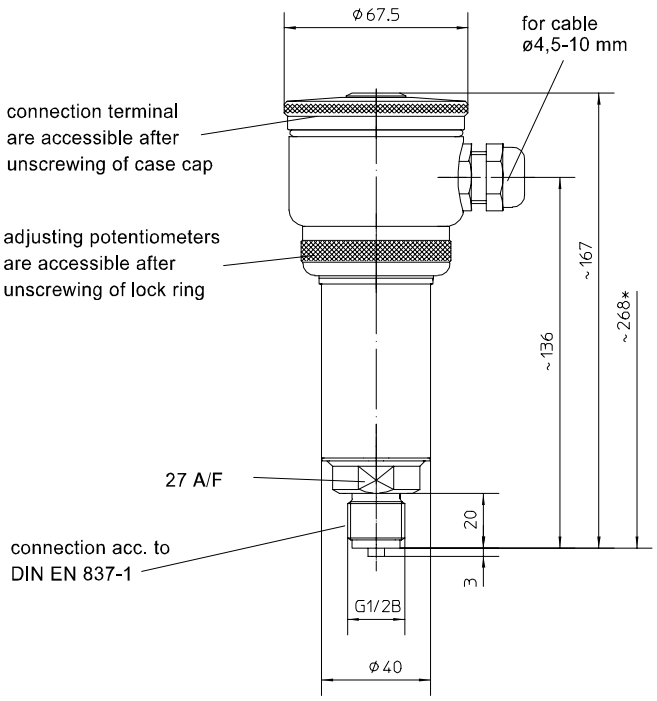
## Dimensions

Pressure transmitter

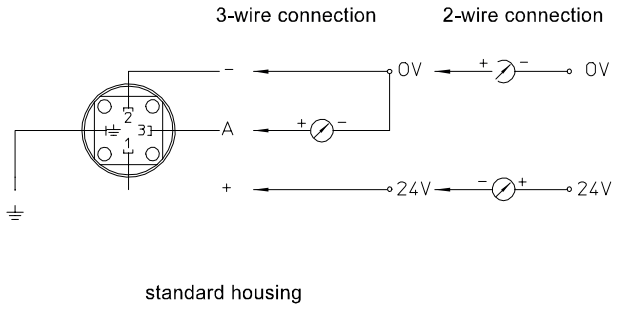
design standard housing

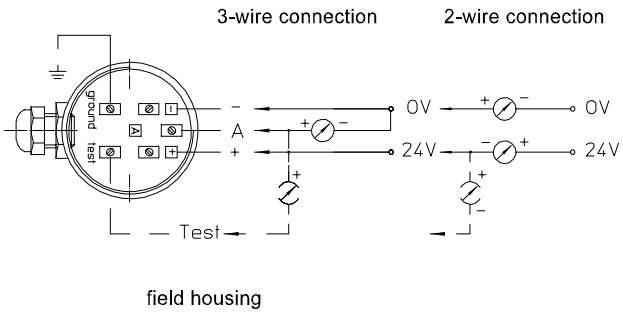



design field housing




## Connection diagram




## Mounting and operating instructions

The devices are normally for vertical mounting. Should the devices repuire re-adjustment you may access the internal potentiometers for zero point and span underneath the cover in standard housings, and by removing the knurled locking ring in fiel housing.

The inner pressure for measuring ranges up to 10 bar is compensated via the connection cable or an integrated sintered filter.
For higher measuring ranges or all measuring ranges of absolute pressure a pressure compensation is not necessary.
The specified protection types are only achieved, when the cable diameters correspond with the specified nominal size of the sealing inserts, and the screwings have been screwed tight. Hand-screw the centrally mounted fixing screws on versions with right angle plugs.
You may only mount devices with protection type IP 65 vertically (upper connection) or horizontally.

**Electrical equipment in hazardous areas should only be installed and commissioned by competend 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 are to be observed.
The certified EMC measures will only be effective if the earthing connection is correctly made.

**Note:** You may order suitable connection cables with integrated aerating channels from us.

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

**Pressure transmitter, piezoresistive principle**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| design | · standard housing | **CD102 .** | | | | | | | |
| | · field housing | **CD202 .** | | | | | | | |
| versions | · standard | **0** | | | | | | | |
| | · explosion protection, type of ex-protection s. below | **1** | | | | | | | |
| mess. 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** | | | | | |
| | · 2...10 V, 3-wire technology | | | **H5** | | | | | |
| | · 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) | · Ⓔx II 2G Ex ia IIC T5/T6 Gb, standard | | | | **S68** | | | | |
| | · Ⓔx 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** | | | | |
| field housing | · IP 67 | | | | | | | | **T1** |
| | · IP 65 (standard) measuring range ≤ 16 bar [3] | | | | | | | | **T2** |
| **Order code (example):** | | **CD1021** | **A1057** | **H2** | | | | | |

standard measuring ranges

| measuring range | | UE bar [2] | Best.-Code |
|---|---|---|---|
| -1...1.5 | bar [1] | 250 | **A1088** |
| -1...3 | bar [1] | 250 | **A1089** |
| -1...5 | bar [1] | 250 | **A1090** |
| -1...9 | bar [1] | 250 | **A1091** |
| -1...15 | bar [1] | 250 | **A1092** |
| 0...2.5 | bar | 250 | **A1055** |
| 0...4 | bar | 250 | **A1056** |
| 0...6 | bar | 250 | **A1057** |
| 0...10 | bar | 250 | **A1058** |
| 0...16 | bar | 250 | **A1059** |
| 0...25 | bar | 250 | **A1060** |
| 0...2.5 | bar abs[1] | 250 | **B1055** |
| 0...4 | bar abs[1] | 250 | **B1056** |
| 0...6 | bar abs[1] | 250 | **B1057** |
| 0...10 | bar abs[1] | 250 | **B1058** |
| 0...16 | bar abs[1] | 250 | **B1059** |
| 0...25 | bar abs[1] | 250 | **B1060** |

[1] not below 100 mbar abs. / -900 mbar rel. continuous operation

[2] upon request up to 400 bar

[3] not valid for absolute pressure

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