

## Differential pressure and level transmitter

PASCAL Ci4 Delta P, highly overload protected

Type series CI4350



### Application area

- General process engineering
- Chemical industry
- Petrochemical industry
- General process technology
- Power generation
- Environmental engineering
- Water / wastewater

### Application

The digital differential pressure transmitter PASCAL Ci4 Delta P with diaphragm seal is suitable for pressure measurement of aggressive, high viscous and high-temperature media. Also available as an option is the operating software LAB4Level that allows the measuring of filling height, filling volume and filling weight (mass).

### Features

- Differential pressure transmitter with diaphragm seal
- Simultaneous display of differential pressure and static pressure
- Reference accuracy 0.07 %
- Long-term stability 0,1 % within 5 years
- Nominal ranges 100 mbar to 16 bar
- Turndown up to 100:1
- Stainless steel case in sturdy design, degree of protection IP 65/67
- High-resolution display with intuitive 4-button operation and backlight
- Comprehensive parameterising functions
- Comprehensive simulation and diagnostic functions
- Quick access to device data
- Development according to SIL2
- Maximum working pressure 160 bar
- Measuring rate up to 50 Hz
- Output signal 4...20 mA with HART® protocol
- Media temperature -90...400 °C
- Configuration memory
- Digital communication via PDM, FDT/DTM, 375/475 Field Communicator
- Output functions: linear, invers, square root, table function with up to 64 support points
- Wetted parts stainless steel

### Options

- Labom REconnect quick coupling device for easy and safe separation and connection of diaphragm seal systems; Type series MK1000, see data sheet D6-022
- Approvals/Certificates
  - Explosion protection (ATEX/IECEX/UKEX) for gases and dust
  - Classification per SIL2 (in preparation)
  - Material certificate per EN 10204-3.1
  - Calibration certificate per EN 10204-3.1
- As per UKCA regulations
- Operating software LAB4Level for level measurements
- Removable display and control unit
- Degree of protection IP 69K
- Maximum working pressure 400 bar (upon request)

## Technical data

### Measuring ranges

Up to a turndown of 100:1 the measuring span can be freely selected.

| Nominal range | Measuring span |           | Measuring limits |             | Static excess pressure and overload capacity |
|---------------|----------------|-----------|------------------|-------------|--|
|               | min. span      | max. span | lower limit      | upper limit |  |
| 100 mbar      | 1 mbar         | 200 mbar  | -100 mbar        | 100 mbar    | one-sided (+/-) / double-sided<br>160 bar    |
| 500 mbar      | 5 mbar         | 1 bar     | - 500 bar        | 500 mbar    | 160 bar                                      |
| 3 bar         | 30 mbar        | 6 bar     | -3 bar           | 3 bar       | 160 bar                                      |
| 16 bar        | 160 mbar       | 32 bar    | - 16 bar         | 16 bar      | 160 bar                                      |

Minimum permissible static pressure: 5 mbar abs (at reference conditions)

### Constructional design / case

|                                      |  |
|--------------------------------------|--|
| Design:                              | Two-chamber case, continuously rotatable by $\pm 170^\circ$<br>Case surface blasted  |
| Material case:                       | <ul style="list-style-type: none"> <li>■ Stainless steel mat.no. 1.4301/1.4305 (304/303)</li> <li>■ Stainless steel mat.no. 1.4404 (316L)</li> </ul>   |
| Material front cover:                | <ul style="list-style-type: none"> <li>■ Stainless steel mat.no. 1.4305 (303)</li> <li>■ Stainless steel mat.no. 1.4404 (316L)</li> <li>■ Polypropylene, black</li> </ul>  |
| Gaskets:                             | Silicone / NBR   |
| Degree of protection per EN 60529:   | IP 65 / IP 67<br>Option: IP 69K  |
| Climatic category:                   | 4K4H per EN 60721 3-4  |
| Vibration resistance per EN 61298-3: | 10...60 Hz: $\pm 0.35$ mm<br>60...1000 Hz: 5 g   |
| Material window:                     | <ul style="list-style-type: none"> <li>■ Macrolon</li> <li>■ Non-splintering glass (requires front cover of stainless steel)</li> </ul>  |
| Elec. connection:                    | <ul style="list-style-type: none"> <li>■ Circular connector M12</li> <li>■ Cable gland M16x1.5, PA black</li> <li>■ Cable gland M16x1.5, stainless steel</li> <li>■ Cable gland M20x1.5, PA black</li> <li>■ Cable gland M20x1.5, stainless steel</li> <li>■ 1/2" NPT, PA black</li> </ul> <p>Further connections upon request</p> |
| Terminal blocks:                     | <ul style="list-style-type: none"> <li>■ Spring clamp terminals up to 1.5 mm<sup>2</sup></li> <li>■ Pole terminals up to 2.5 mm<sup>2</sup></li> <li>■ Screw terminals up to 2.5 mm<sup>2</sup></li> </ul>   |
| Weight:                              | approx. 2.9 kg   |
| Type plate:                          | Laser marking  |

### Process connection plus-sided

|         |   |
|---------|---|
| Design: | <ul style="list-style-type: none"> <li>■ Diaphragm seal direct with distance tube</li> <li>■ Diaphragm seal with stainless steel capillary and stainless steel protective tube</li> </ul> |
|---------|---|

Design of diaphragm seals see order code.

### Process connection minus-sided

|         |   |
|---------|---|
| Design: | <p><b><u>Process flange</u></b><br/>connection dimension per EN 61518, with mounting thread 7/16 – 20 UNF</p> <ul style="list-style-type: none"> <li>- Process connection 1/4 – 18 NPT</li> <li>- Process connection 1/2 – 14 NPT via oval flange (see accessories)</li> </ul> <p>Material:<br/>Stainless steel mat.-no. 1.4404 (316L)</p> <p><b><u>Ventilation:</u></b></p> <ul style="list-style-type: none"> <li>- without ventilation, with sealing plug 1/4" NPT</li> <li>- with ventilation valve 1/4" NPT</li> </ul> <p><b><u>Gasket:</u></b></p> <ul style="list-style-type: none"> <li>- EPDM, standard temperature range -40...85 °C</li> <li>- FKM temperature range -20...85 °C</li> </ul> <p>Diaphragm material:<br/>Stainless steel mat.-no. 1.4404 (316L)</p> <p>Further connections and materials upon request.</p> |
| Design: | <p><b><u>Diaphragm seal</u></b><br/>with stainless steel capillary and stainless steel protective tube</p> <p>Design of diaphragm seals see order code.</p>   |

### Material wetted parts

- Stainless steel mat.-no. 1.4404/1.4435 (316L)
- Hastelloy C276
- Tantal
- PTFE coating, vacuum-resistant

Further materials upon request.

### Measuring system

- Sensor: Piezoresistive measuring element
- System filling:
  - Silicone oil
  - Halocarbon oil upon request

### Pressure transmission fluids

- Synthetic oil, free of silicon
- High temperature oil
- Halocarbon oil

### Accuracy

Reference cond. per EN 61298-1:  $T_U = \text{const. (15...25) } ^\circ\text{C}$   
 $\varphi = \text{const. (45...75) \% r.F.}$   
 $p_U = \text{const. (860...1060) mbar}$   
 $U_B = 24 \text{ V DC } (\pm 3 \text{ V DC})$   
 $R_B = 50 \ \Omega, \text{ HART: } 250 \ \Omega$   
 Ground connected  
 Lower range value = 0 bar

Calibration position: Druckmittler auf gleicher Höhe

Reference accuracy:

Per EN 61298-2 incl. non-linearity, hysteresis and repeatability refer to the adjusted measuring span:

| Nominal range | Turn-down < 10:1   | Turndown > 10:1                                   |
|---------------|--------------------|---|
| 100 mbar      | $\leq \pm 0.07 \%$ | $\leq \pm(0.01 \% \times \text{TD} - 0.0325 \%)$  |
| 500 mbar      |                    | $\leq \pm(0.005 \% \times \text{TD} + 0.0175 \%)$ |
| 3 bar         |                    | $\leq \pm(0.005 \% \times \text{TD} + 0.0175 \%)$ |
| 16 bar        |                    | $\leq \pm(0.01 \% \times \text{TD} - 0.0325 \%)$  |

Long-term drift: Refer to nominal range  
 $\leq 0.1 \% \text{ within } 5 \text{ years}$

Temperature influence of ambient temperature:

| Refer to measuring range (per IEC 61298-3): |  |
|---|--|
| Nominal range                               | Temperature range: -10...60 °C                 |
| 100 mbar                                    | $\leq \pm(0.15 \% + 0.15 \% \times \text{TD})$ |
| 500 mbar                                    | $\leq \pm(0.15 \% + 0.05 \% \times \text{TD})$ |
| 3 bar                                       | $\leq \pm(0.15 \% + 0.05 \% \times \text{TD})$ |
| 16 bar                                      | $\leq \pm(0.15 \% + 0.15 \% \times \text{TD})$ |
| Nominal range                               | Temperature range: -40...80 °C                 |
| 100 mbar                                    | $\leq \pm(0.15 \% + 0.2 \% \times \text{TD})$  |
| 500 mbar                                    | $\leq \pm(0.2 \% + 0.06 \% \times \text{TD})$  |
| 3 bar                                       | $\leq \pm(0.2 \% + 0.06 \% \times \text{TD})$  |
| 16 bar                                      | $\leq \pm(0.15 \% + 0.2 \% \times \text{TD})$  |

Temperature influence output (-40...80 °C):  $\leq \pm(0,04 \% / 10 \text{ K})$

Temperature influence diaphragm seal: Depends on design and profile of requirements.  
 We provide a detailed error analysis upon request.

### Indication

- Display:
- High-resolution graphic display with backlight
  - 4-button operation
  - Freely configurable display modes
  - continuously rotatable by  $\pm 170$  (detent every  $90^\circ$ )
  - Optional: Remote display and control unit, can be used up to 10 m away from measuring point
- Configuration memory:
- All parameterisation data can be copied from the device into the configuration memory in the display module. The data is permanently stored there, even in the event of power failure.
  - The parameters can be transferred simply and quickly to other devices.

## Output

|                       |   |                          |
|-----------------------|---|--------------------------|
| Signal:               | 2-wire technology   | 4...20 mA                |
|                       | Lower limit   | 3.8...4 mA               |
|                       | Upper limit   | 20...21 mA               |
|                       | Lower alarm current   | < 3.6 mA                 |
|                       | Upper alarm current   | > 21 mA                  |
|                       | Current limitation  | 22 mA                    |
|                       | Operational availability  | < 12 s                   |
|                       | Response time $t_{90}$ at current output  | typically 200 ms         |
|                       | Digitale communication  | HART®protocol, version 7 |
|                       | Communication via:  |                          |
|                       | ■ Siemens PDM   |                          |
|                       | ■ Pactware or compatible systems (FDT/DTM)  |                          |
|                       | ■ 375 / 475 Field Communicator  |                          |
| Function:             | ■ linear  |                          |
|                       | ■ inverse response  |                          |
|                       | ■ by square root  |                          |
|                       | ■ table function with up to 64 support points   |                          |
| Turndown:             | max. 100:1  |                          |
| Damping:              | 0...999.9 s selectable in steps of 0.1 s  |                          |
| Measuring rate:       | 50 Hz   |                          |
| Resolution:           | 0.5 $\mu$ A   |                          |
| Current sensing func. | 3.55...21.5 mA selectable in steps of 0.001 mA  |                          |
| Load R:               | $R \leq (U-12V \text{ DC})/0.022 \text{ A} [\Omega]$<br>U = supply voltage<br>for HART communication: $R \geq 230 \Omega$ |                          |

## Supply voltage

|                   |   |
|-------------------|---|
| Functional range: | 12...30 V DC, protected against polarity reversal |
| Ripple:           | < 5 %   |

## Temperature ranges

|                 |  |
|-----------------|--|
| Ambient:        | -40...80 °C<br>(Display visibility is limited at temperatures below - 30 °C)                 |
| Measuring cell: | -40...85 °C  |
| Media:          | -90...400 °C<br>The temperature range of the pressure transmission fluid has to be observed. |
| Storage:        | -40...80 °C  |

## Tests and certificates

### Ex approvals

|        |  |
|--------|--|
| ATEX:  | TÜV 13 ATEX 120264 X<br>⊕ II 1/2G Ex ia IIC TX Ga/Gb<br>⊕ II 1/2D Ex ia IIIC Txx °C Da/Db<br>⊕ II 2G Ex ia IIC TX Gb<br>⊕ II 2D Ex ia IIIC Txx °C Db |
| IECEX: | IECEX TUN 13.0018X<br>Ex ia IIC TX Ga/Gb<br>Ex ia IIIC Txx °C Da/Db<br>Ex ia IIC TX Gb<br>Ex ia IIIC Txx °C Db                                       |
| UKEX:  | CML 21UKEX21179X<br>⊕ II 1/2G Ex ia IIC TX Ga/Gb<br>⊕ II 1/2D Ex ia IIIC Txx °C Da/Db<br>⊕ II 2G Ex ia IIC TX Gb<br>⊕ II 2D Ex ia IIIC Txx °C Db     |

For more detailed information see Ex Safety Instruction XA\_022.

|       |   |
|-------|---|
| EMC : | per EN 61326-1, NAMUR NE21  |
| SIL2: | In preparation:<br>Functional safety per EN 61508, classification per SIL2. |

# Parameterisation, simulation and adjustment

## Parameterisation

|   | Standard device  | Device with operating software LAB4Level  |  |
|---|--|---|--|
| Parameter                               | Values   | Values  | Default setting                        |
| device ID                               | 16 digits, freely selectable   |   | LABOM PASCAL Ci4                       |
| lower range value                       | at any value within nominal range  |   | 0 bar                                  |
| upper range value                       | at any value within nominal range  |   | end of nominal range                   |
| damping                                 | 0.0...999.9 s  |   | 0.0 s                                  |
| <b>Display and control unit</b>         |  |   |  |
| pressure unit                           | mbar, bar, Pa, hPa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , psi, atm, torr, mmH <sub>2</sub> O, mH <sub>2</sub> O, inH <sub>2</sub> O, ftH <sub>2</sub> O, mmHg, inHg |   | bar                                    |
| static pressure unit <sup>1</sup>       | mbar, bar, Pa, hPa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , psi, atm, torr, mmH <sub>2</sub> O, mH <sub>2</sub> O, inH <sub>2</sub> O, ftH <sub>2</sub> O, mmHg, inHg |   | bar                                    |
| filling height unit                     |  | mm, cm, m, ft, in, yd   | m                                      |
| volume unit                             |  | l, hl, m <sup>3</sup> , in <sup>3</sup> , ft <sup>3</sup> , gal   | l                                      |
| weight unit (mass)                      |  | g, kg, t, lb  | kg                                     |
| density unit                            |  | g/cm <sup>3</sup> , kg/cm <sup>3</sup> , t/m <sup>3</sup> , kg/l, lb/in <sup>3</sup> , lb/ft <sup>3</sup> | g/cm <sup>3</sup>                      |
| temperature unit                        | °C, °F, °R, K  |   | °C                                     |
| lighting                                | on, off  |   | on                                     |
| language                                | English, German  |   | German                                 |
|   | English, Chinese   |   | as ordered                             |
|   | English, Spanish, French   |   | as ordered                             |
|   | English, Polish, German  |   | as ordered                             |
|   | English, Turkish, German   |   | as ordered                             |
| decimal point                           | auto, x.xxxx, xx.xxx, xxx.xx, xxxx.x, xxxxx  |   | auto                                   |
| display mode (Δ p)                      | five values, four values, three values, two values, big display  |   | 4 value                                |
| display mode (level)                    |  | level 4 values, level 2 values, five values, four values, three values, two values, big display           | level 4 value                          |
| main value (Δ p)                        | pressure (Δ p), current in %, current in mA  |   | pressure                               |
| main value (level)                      |  | filling height, volume, weight, pressure (Δ p), current in %, current in mA                               | filling height                         |
| secondary values (Δ p)                  | pressure (Δ p), static pressure, current in %, current in mA, sensor temperature, device ID, HART-TAG, HART-Descriptor, <leer>   |   | current in %, current in mA, device ID |
| secondary values (Level)                | filling height, volumen, weight, pressure (Δ p), static pressure, current in %, current in mA, sensor temperature, density, device ID, HART-TAG, HART-Descriptor, <leer>         |   | current in %, current in mA, device ID |
| level                                   |  |   |  |
| density                                 |  | 0,1...20 g/cm <sup>3</sup>  | 1 g/cm <sup>3</sup>                    |
| offset height                           |  | max 99.999 m  | 0 m                                    |
| tank shape table                        |  | on, off   | off                                    |
| Table function (Δ p)                    | 64 support points (% from measuring range/current)   |   |  |
| Table funktion (level)                  |  | 64 support points (filling height/volume)   |  |
| <b>Current output</b>                   |  |   |  |
| measured value (Δ p)                    | pressure   |   | pressure                               |
| measured value (level)                  |  | hight, volume, weight, pressure   | height                                 |
| output function (Δ p)                   | linear, invers, square root, table function  |   | linear                                 |
| output function (level)                 |  | linear, tank function   | linear                                 |
| lower current limit                     | 3.8...4.0 mA   |   | 3.8 mA                                 |
| upper current limit                     | 20...21 mA   |   | 2.5 mA                                 |
| alarm current                           | low (<3.6 mA), high (> 21.0 mA)  |   | low (<3.6 mA)                          |
| position correction (mounting position) | on, off  |   | off                                    |
| <b>Maintenance counter</b>              |  |   |  |
| maintenance interval                    | 0...9999 days  |   | 0 days                                 |
| status                                  | on, off  |   | off                                    |
| <b>HART data</b>                        |  |   |  |
| HART address                            | 0...63   |   | 0                                      |
| number of response preambels            | 5...20   |   | 5                                      |
| current mode                            | proportional, constant   |   | proportional                           |

<sup>1</sup>The static pressure will be displayed as absolute pressure by default, adjusted to 0 bar abs.

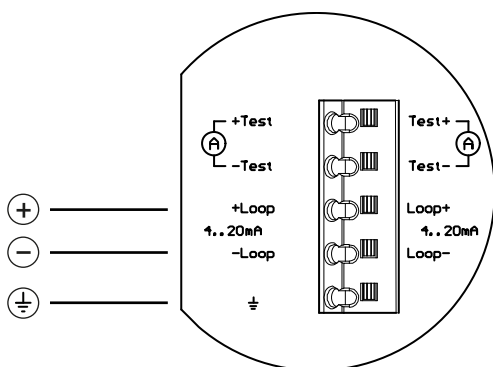
## Diagnostic functions

|                                      | Standard device  | Device with operating software LAB4Level                                 |                    |
|--------------------------------------|--|--|--------------------|
| <b>Eigendiagnose</b>                 | <b>Description</b>   |  | <b>Value range</b> |
| RAM-Test                             | Permanent check of the read/write memory                             |  | /                  |
| ROM-Test                             | Permanent check of the checksum via the program memory               |  | /                  |
| Bridge circuit test                  | Permanent check of the bridge circuit                                |  | /                  |
| CRC parameterisation test            | Permanent check of the checksum via the parameter memory             |  | /                  |
| Electronics temperature monitoring   | Permanent check of the electronics temperature                       |  | /                  |
| <b>Process diagnostics</b>           |  |  |                    |
| Maintenance timer                    | Check of the maintenance cycles                                      |  | /                  |
| Operating hours counter              | Capture of operating hours   |  | /                  |
| Min/Max values                       | Check of minimum and maximum process pressure and sensor temperature |  | /                  |
| <b>Measuring circuit diagnostics</b> |  |  |                    |
| simulation function                  | pressure ( $\Delta p$ ), current                                     | pressure ( $\Delta p$ ), filling height, volumen, weight (mass), current |                    |

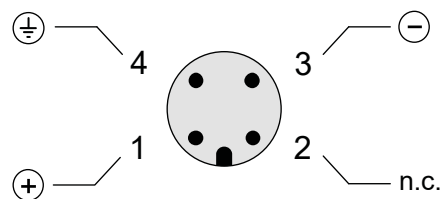
## Adjustment

| Type                                    | Description  |
|---|--|
| zero point correction ( $\Delta p$ )    | adjusts reading to 0 bar at same pressure on both connections                          |
| position correction ( $\Delta p$ )      | adjusts reading of 0 bar at same pressure on both connections and installed conditions |
| lower adjustment ( $\Delta p$ )         | adjusts reading to applied pressure (affects zero point)                               |
| upper adjustment ( $\Delta p$ )         | adjusts reading to applied pressure (affects span only)                                |
| current adjustment                      | adjusts current output to achieve 4 resp. 20 mA at the end of the measurement chain    |
| zero point correction (static pressure) | adjusts Pstat. to 0 bar relative   |

## Connection diagram

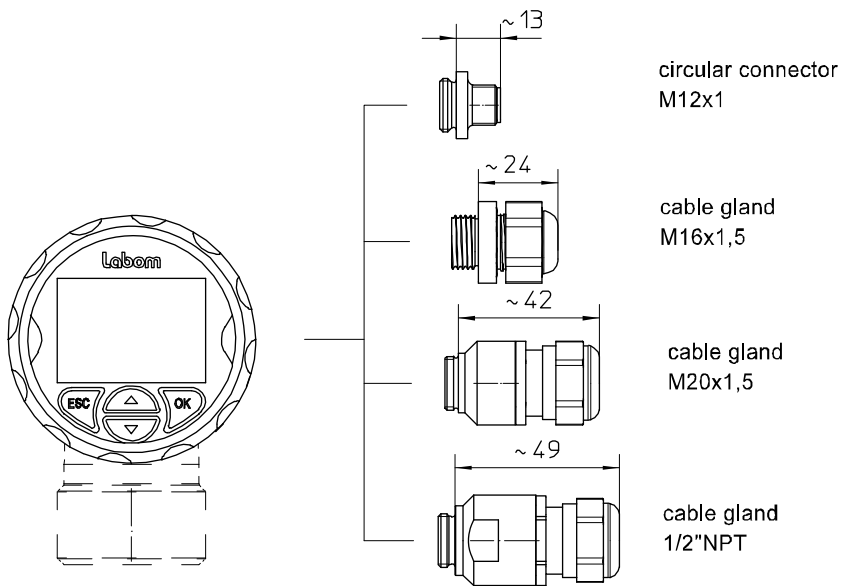


Cable gland



Circular connector M12 x 1

## Electrical connection



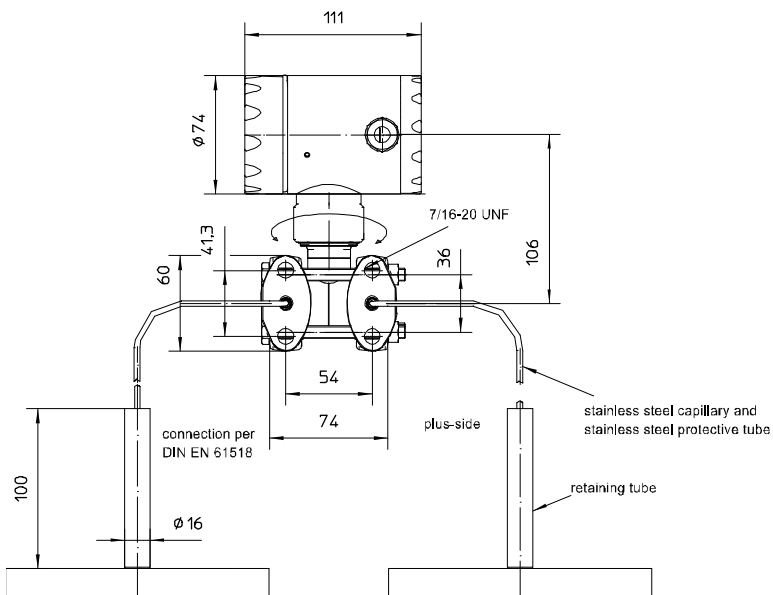
All dimensions are in mm.

## Dimensions

### Case and design

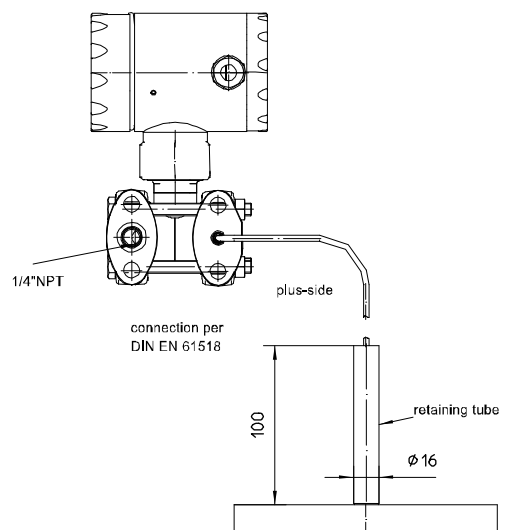
#### Capillary connection double-sided

(see order code variation A)



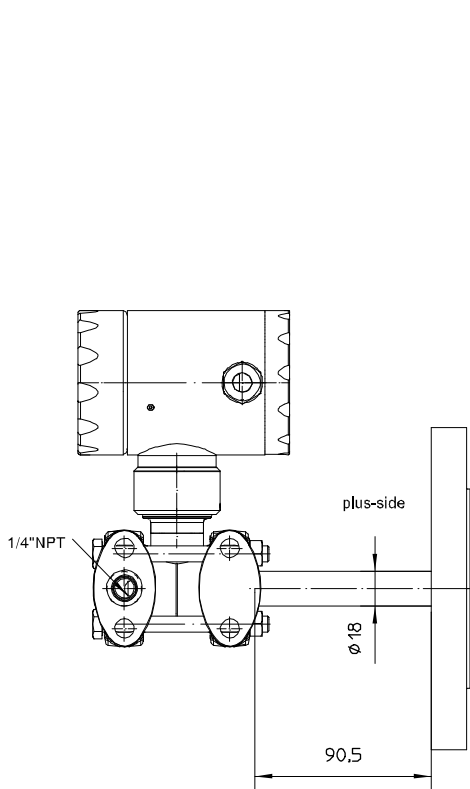
#### Capillary connection plus-sided

(see order code variation B)



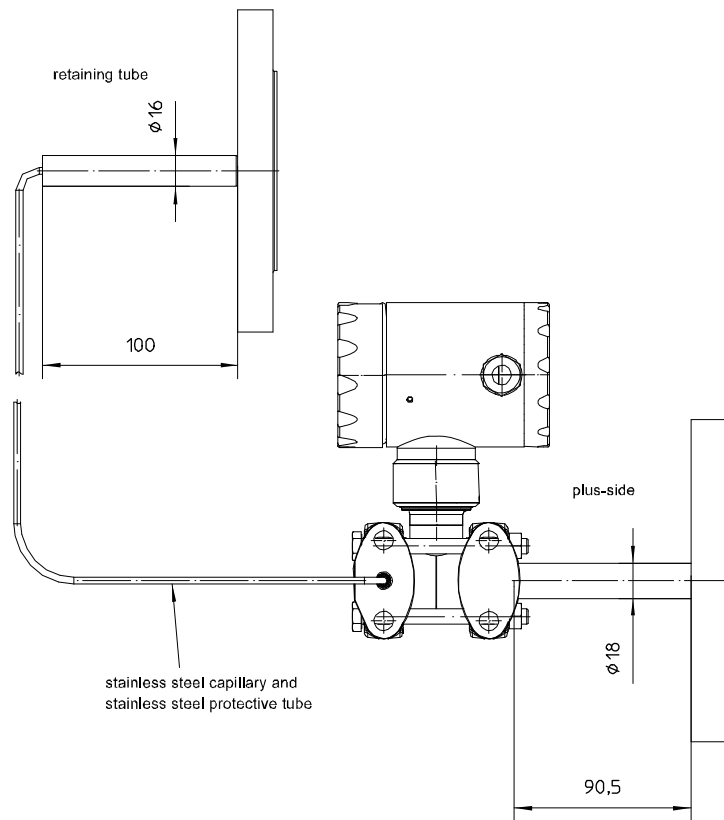
**Direct connection plus-sided with distance tube**

(see order code variation C)



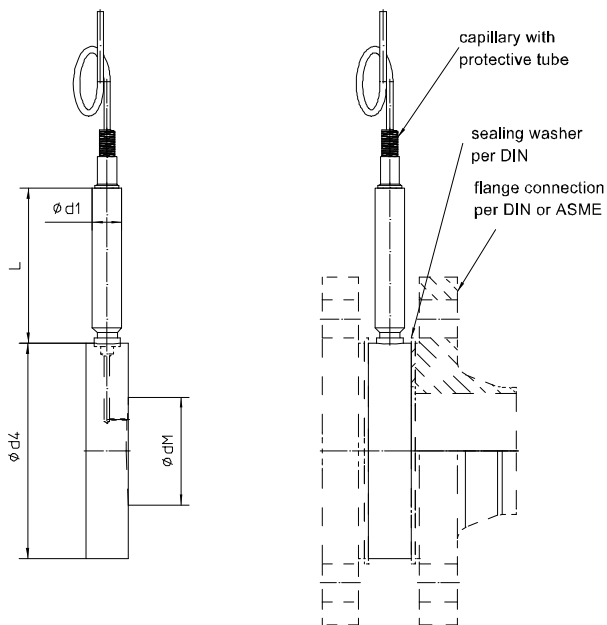
**Direct connection plus-sided with distance tube, capillary connection minus-sided**

(see order code variation D)



**Process connections**

**Cell diaphragm seal**



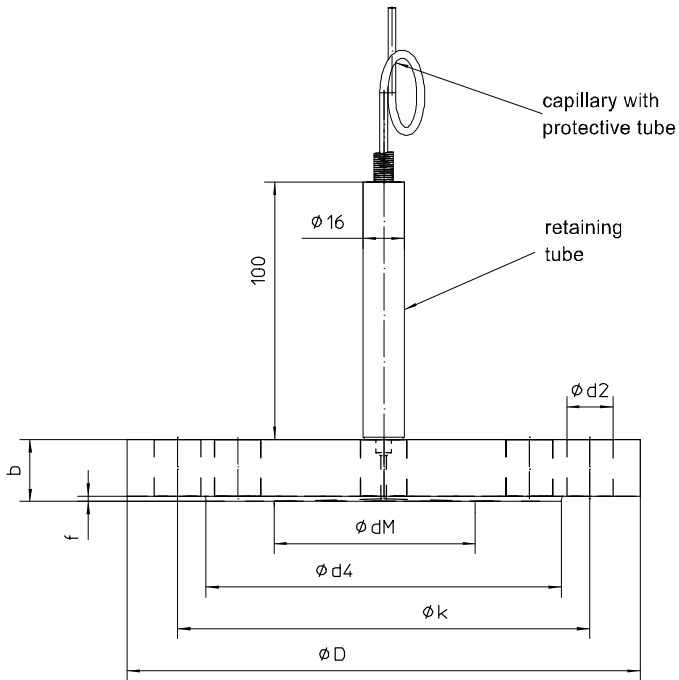
| Dimensions (mm) following EN 1092-1 |          |     |    |    |      |    |
|-------------------------------------|----------|-----|----|----|------|----|
| DN                                  | PN       | d4  | dM | b  | L    | d1 |
| 50                                  | 16...400 | 102 | 51 | 20 | 73.5 | 14 |
| 80                                  | 16...400 | 138 | 86 | 20 | 73.5 | 14 |
| 100                                 | 16...400 | 158 | 86 | 20 | 73.5 | 14 |

| Dimensions (mm) following ASME B 16.5 |            |     |    |    |      |    |
|---------------------------------------|------------|-----|----|----|------|----|
| DN                                    | Class      | d4  | dM | b  | L    | d1 |
| 2"                                    | 150...2500 | 100 | 51 | 22 | 73.5 | 14 |
| 3"                                    | 150...2500 | 134 | 86 | 22 | 73.5 | 14 |
| 4"                                    | 150...2500 | 158 | 86 | 20 | 73.5 | 14 |

Optionally available with extended diaphragm



## Flange-type diaphragm seal



Dimensions (mm) following EN 1092-1

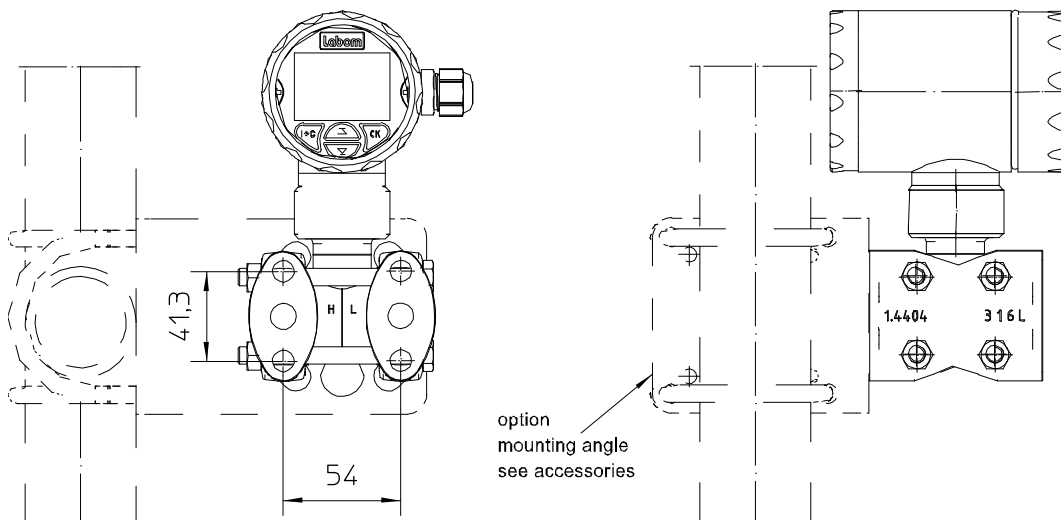
| DN  | PN      | D   | dM | d4  | k   | d2 | bore holes | b  | f | Weight approx. |
|-----|---------|-----|----|-----|-----|----|------------|----|---|----------------|
| 50  | 10...40 | 165 | 51 | 102 | 125 | 18 | 4          | 20 | 2 | 3.2 kg         |
| 50  | 100     | 180 | 51 | 102 | 135 | 22 | 4          | 26 | 2 | 4.0 kg         |
| 80  | 10...40 | 200 | 86 | 138 | 160 | 18 | 8          | 24 | 2 | 5.0 kg         |
| 80  | 100     | 215 | 86 | 138 | 170 | 22 | 8          | 28 | 2 | 5.6 kg         |
| 100 | 10...16 | 220 | 86 | 158 | 180 | 18 | 8          | 20 | 2 | 6.0 kg         |

Dimensions (mm) following ASME B 16.5

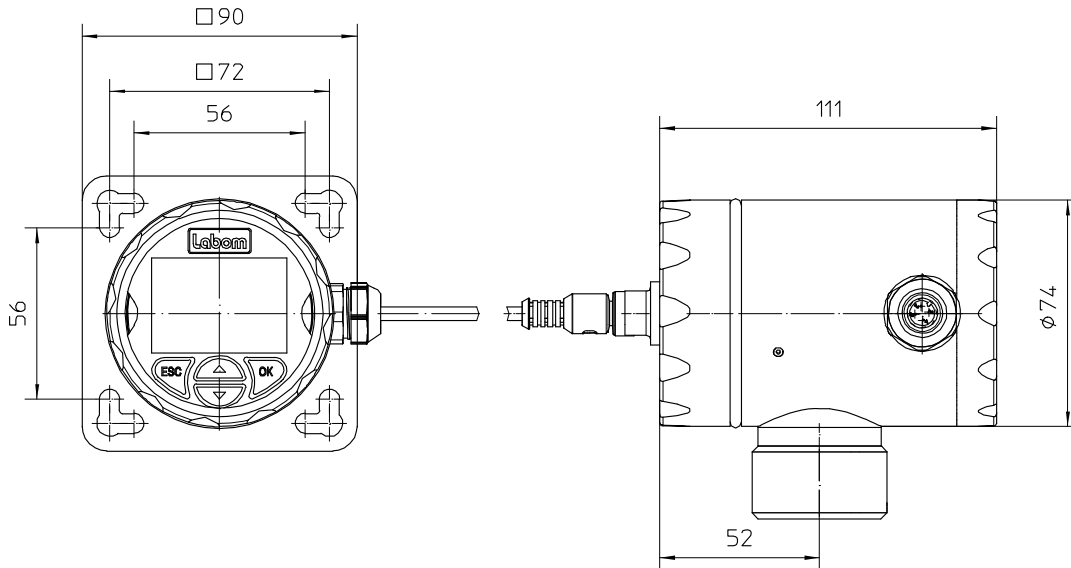
| DN | Class | D   | dM  | d4  | k     | d2 | bore holes | b    | f | Weight approx. |
|----|-------|-----|-----|-----|-------|----|------------|------|---|----------------|
| 2" | 150   | 150 | 51  | 92  | 120.7 | 19 | 4          | 19.5 | 2 | 3.2 kg         |
| 2" | 300   | 165 | 51  | 92  | 127.0 | 19 | 8          | 22.7 | 2 | 4.1 kg         |
| 3" | 150   | 190 | 86  | 127 | 152.4 | 19 | 4          | 24.3 | 2 | 5.2 kg         |
| 3" | 300   | 210 | 86  | 127 | 168.3 | 22 | 8          | 29.0 | 2 | 5.7 kg         |
| 4" | 150   | 230 | 116 | 158 | 190.5 | 19 | 8          | 24.3 | 2 | 7.0 kg         |
| 4" | 300   | 255 | 116 | 158 | 200.0 | 22 | 8          | 32.2 | 2 | 11.0 kg        |

Optionally available with extended diaphragm

## Mounting

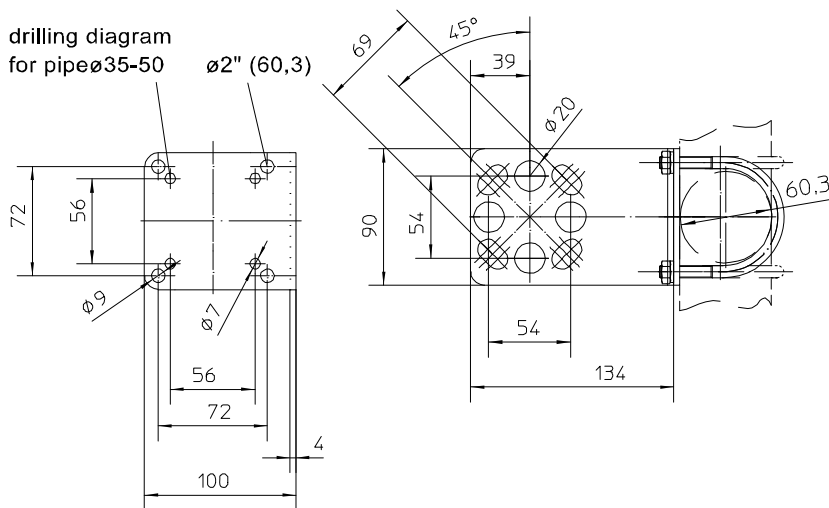


### Remote display and control unit (Type series MC1140)



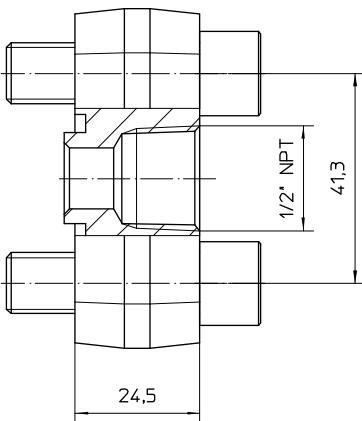
All dimensions are in mm

### Mounting angle for wall and pipe-mounting (Type series MM1500)



All dimensions are in mm

### Oval flange (Type series MC1060)



All dimensions are in mm

## Order details

### Pressure and level transmitter PASCAL Ci4 Delta P highly overload protected, Type series CI4350

| Order details PASCAL Ci4 Delta P CI4350 |  |   |   |   |         |
|---|--|---|---|---|---------|
| CI4350                                  | Pressure and level transmitter PASCAL Ci4 Delta P, highly overload protected |   |   |   |         |
| A1008.2                                 | nominal range  | 100 mbar  | turndown up to 100:1<br>please note the min. measuring span | static overload and overload protection up to 160 bar |         |
| A1573.2                                 |  | 500 mbar  |   |   |         |
| A1618.2                                 |  | 3 bar   |   |   |         |
| A1059.2                                 |  | 16 bar  |   |   |         |
| F1                                      | parameterisation   | factory settings (standard)   |   |   |         |
| F2                                      |  | as per customer's specification   |   |   |         |
| H21                                     | output signal pressure   | 4...20 mA, with HART-protocol   |   |   |         |
| Y1.                                     | material case  | stainless steel mat.-no. 1.4301/1.4305 (304/303)  |   |   |         |
| Y2.                                     |  | stainless steel mat.-no. 1.4404 (316L)  |   |   |         |
| 1                                       | material front cover   | polypropylene (black), window Macrolon  |   |   |         |
| 2                                       |  | stainless steel (see case), window non-splintering glass  |   |   |         |
| 3                                       |  | stainless steel (see case), closed, without window  |   |   |         |
|   |  |   | default language  | available language                                    |         |
|   | display  | High-resolution graphic display with backlight, intuitive 4-button operation, quick access to device data | German (Standard)   | English, German                                       |         |
| M21.1                                   |  |   | English   |   |         |
| M22.1                                   |  |   | English   | English, Chinese                                      |         |
| M22.2                                   |  |   |   |   | Chinese |
| M23.1                                   |  |   | English   | English, Spanish, French                              |         |
| M23.2                                   |  |   |   |   | Spanish |
| M23.3                                   |  |   |   |   | French  |
| M25.1                                   |  |   | English   | English, Polish, German                               |         |
| M25.2                                   |  |   |   |   | Polish  |
| M25.3                                   |  |   |   |   | German  |
| M26.1                                   |  |   | English   | English, Turkish, German                              |         |
| M26.2                                   |  |   |   |   | Turkish |
| M26.3                                   |  |   |   |   | German  |
| M1                                      |  |   | without display   |   |         |
| T20.                                    | electrical connection  | cable gland   | M16 x 1.5 polyamide, for cable Ø 4.5-10 mm                  |   |         |
| T22.                                    |  |   | M16 x 1.5 stainless steel, for cable Ø 5-9.5 mm             |   |         |
| T15.                                    |  |   | M20 x 1.5 polyamide, for cable Ø 7-13 mm                    |   |         |
| T17.                                    |  |   | M20 x 1.5 stainless steel, for cable Ø 8-13 mm              |   |         |
| T27.                                    |  | 1/2" NPT polyamide, for cable Ø 6-12 mm   |   |   |         |
| 0                                       |  | cable clamps  | spring clamp terminals up to 1.5 mm <sup>2</sup> (Standard) |   |         |
| 5                                       |  |   | pole terminals 2.5 mm <sup>2</sup>                          |   |         |
| 6                                       | screw terminals 2.5 mm <sup>2</sup>  |   |   |   |         |
| T30                                     | circular connector M12 x 1 (4-polig)   |   |   |   |         |

| Additional features (to be indicated in case of need, only): |  |  |  |  |
|--|--|--|--|--|
| S62  | Ex marking <sup>1</sup>  | ATEX   | ⊕ II 1/2G, II 2G Ex ia IIC TX Ga/Gb, Gb      |  |
|  |  |  | ⊕ II 1/2D, II 2D Ex ia IIIC Txx °C Da/Db, Db |  |
| S77  |  | IECEX  | Ex ia IIC TX Ga/Gb, Gb                       |  |
|  |  |  | Ex ia IIIC Txx °C Da/Db, Db                  |  |
| S87  | UKEX   | ⊕ II 1/2G, II 2G Ex ia IIC TX Ga/Gb, Gb      |  |  |
|  |  | ⊕ II 1/2D, II 2D Ex ia IIIC Txx °C Da/Db, Db |  |  |
| T4   | degree of protection   | IP 69K <sup>1</sup>                          |  |  |
| X4   | software LAB4Level for level application                                 |  |  |  |
| W1020  | material certificate   | per EN 10204-3.1, wetted parts               |  |  |
| W1201  | calibration certificate  | per EN 10204-3.1, 5 measuring points         |  |  |
| W2602  | functional safety per EN 61508, classification per SIL2 (in preparation) |  |  |  |
| W2660  | as per UKCA regulations  |  |  |  |

<sup>1</sup> requires front cover of stainless steel

| Process connection variation A: Capillary connection double-sided |                                |   |   |   |
|---|--------------------------------|---|---|---|
| Diaphragm seals identical on both sides                           |                                |   |   |   |
| DA1...  | desig per EN 1092-1            | raised face   | model B1  |   |
| DA2...  |                                |   | model B2 (necessary in case of special materials) |   |
| 420   | nominal width/nominal pressure | DN 50, PN 10...40   |   |   |
| 450   |                                | DN 50, PN 100   |   |   |
| 620   |                                | DN 80, PN 10...40   |   |   |
| 650   |                                | DN 80, PN 100   |   |   |
| 710   |                                | DN 100, PN 10...16  |   |   |
| DA51...   | flange-type per ASME B16.5     | raised face   | RF 125-250 AA                                     |   |
| DA5...  |                                |   | RFSF (necessary in case of special materials)     |   |
| 310   | nominal width/class            | DN 2", class 150  |   |   |
| 320   |                                | DN 2", class 300  |   |   |
| 510   |                                | DN 3", class 150  |   |   |
| 520   |                                | DN 3", class 300  |   |   |
| 610   |                                | DN 4", class 150  |   |   |
| 620   |                                | DN 4", class 300  |   |   |
| DC4...  | cell-type per EN 1092-1        | raised face   | model B1  |   |
| DC1...  |                                |   | model B2 (necessary in case of special materials) |   |
| 480   | nominal width/nominal pressure | DN 50, PN 16...400  |   |   |
| 680   |                                | DN 80, PN 16...400  |   |   |
| 780   |                                | DN 100, PN 16...400   |   |   |
| DC31...   | cell-type per ASME B16.5       | raised face   | RF 125-250 AA                                     |   |
| DC3...  |                                |   | RFSF (necessary in case of special materials)     |   |
| 310   | nominal width/class            | DN 2", class 150...2500   |   |   |
| 510   |                                | DN 3", class 150...2500   |   |   |
| 610   |                                | DN 4", class 150...2500   |   |   |
| B52...  | measuring device connection    | diaphragm seale with capillary and stainless steel protective tube                                  |   |   |
| 11  |                                | capillary length  | 1 m   |   |
| 12  |                                |   | 1,6 m   |   |
| 13  |                                |   | 2,5 m   |   |
| 14  |                                |   | 4 m   |   |
| 15  |                                |   | 6 m   |   |
| 16  |                                |   | 8 m   |   |
| 17  |                                |   | 10 m  |   |
| 22  |                                |   | 12 m  |   |
| 1   | material wetted parts          |   | stainless steel mat.-no. 1.4404/1.4435 (316L)     |   |
| 3   |                                | Hasteloy  |   |   |
| 2   |                                | Tantal  |   |   |
| 62  |                                | stainless steel 316L with PTFE coating (max. PN 40), high vacuum-resistant, max. temperature 260 °C |   |   |
|   |                                | <u>pressure transmission fluid</u>  | <u>design temperature process</u>                 |   |
| L22   | system filling                 | synthetic oil, free of silicone FD1   | -10...140 °C                                      | standard<br>max. design temperature, please specify different temperatures. Code T... |
| L23   |                                |   | -50...230 °C                                      |   |
| L31   |                                | vacuum- and high temperature oil FV3H   | -10...400 °C                                      |   |
| L10   |                                | Low temperature oil FM5   | -90...160 °C                                      |   |
| L30   |                                | Halocarbon oil FC   | -30...190 °C                                      |   |
|   | ambient temperature            | -40...80 °C (Please note the temperature limits of the pressure transmission fluid)                 |   |   |
| U2  |                                | -10...50 °C   |   |   |
| U...  |                                | different ambient temperature, please specify in writing  |   |   |

| Process connection variation B: Capillary connection plus-sided |                                |   |   |   |
|---|--------------------------------|---|---|---|
| <b>Diaphragm seal plus-sided</b>                                |                                |   |   |   |
| DA1...  | flange-type per EN 1092-1      | raised face   | model B1  |   |
| DA2...  |                                |   | model B2 (necessary in case of special materials) |   |
| 420   | nominal width/nominal pressure | DN 50, PN 10...40   |   |   |
| 450   |                                | DN 50, PN 100   |   |   |
| 620   |                                | DN 80, PN 10...40   |   |   |
| 650   |                                | DN 80, PN 100   |   |   |
| 710   |                                | DN 100, PN 10...16  |   |   |
| DA51...   | flange-type per ASME B16.5     | raised face   | RF 125-250 AA                                     |   |
| DA5...  |                                |   | RFSF (necessary in case of special materials)     |   |
| 310   | nominal width/class            | DN 2", class 150  |   |   |
| 320   |                                | DN 2", class 300  |   |   |
| 510   |                                | DN 3", class 150  |   |   |
| 520   |                                | DN 3", class 300  |   |   |
| 610   |                                | DN 4", class 150  |   |   |
| 620   |                                | DN 4", class 300  |   |   |
| DC4...  | cell-type per EN 1092-1        | raised face   | model B1  |   |
| DC1...  |                                |   | model B2 (necessary in case of special materials) |   |
| 480   | nominal width/nominal pressure | DN 50, PN 16...400  |   |   |
| 680   |                                | DN 80, PN 16...400  |   |   |
| 780   |                                | DN 100, PN 16...400   |   |   |
| DC31...   | cell-type per ASME B16.5       | raised face   | RF 125-250 AA                                     |   |
| DC3...  |                                |   | RFSF (necessary in case of special materials)     |   |
| 310   | nominal width/class            | DN 2", class 150...2500   |   |   |
| 510   |                                | DN 3", class 150...2500   |   |   |
| 610   |                                | DN 4", class 150...2500   |   |   |
| B52...  | measuring device connection    | diaphragm seal with capillary and stainless steel protective tube   |   |   |
| 11  |                                | capillary length  | 1 m   |   |
| 12  |                                |   | 1,6 m   |   |
| 13  |                                |   | 2,5 m   |   |
| 14  |                                |   | 4 m   |   |
| 15  |                                |   | 6 m   |   |
| 16  |                                |   | 8 m   |   |
| 17  |                                |   | 10 m  |   |
| 22  |                                |   | 12 m  |   |
| 1   | material wetted parts          |   | stainless steel mat.-no. 1.4404/1.4435 (316L)     |   |
| 3   |                                | Hasteloy  |   |   |
| 2   |                                | Tantal  |   |   |
| 62  |                                | stainless steel 316L with PTFE coating (max. PN 40), high vacuum-resistant, max. temperature 260 °C                   |   |   |
|   |                                | <u>pressure transmission fluid</u>  | <u>design temperature process</u>                 |   |
| L22   | system filling                 | synthetic oil, free of silicone FD1   | -10...140 °C                                      | standard<br>max. design temperature, please specify different temperatures. Code T... |
| L23   |                                |   | -50...230 °C                                      |   |
| L31   |                                | vacuum- and high temperature oil FV3H   | -10...400 °C                                      |   |
| L10   |                                | Low temperature oil FM5   | -90...160 °C                                      |   |
| L30   |                                | Halocarbon oil FC   | -30...190 °C                                      |   |
|   |                                | -40...80 °C (Please note the temperature limits of the pressure transmission fluid)                                   |   |   |
| U2  | ambient temperature            | -10...50 °C   |   |   |
| U...  |                                | different ambient temperature, as in writing  |   |   |
| <b>Process flange minus-sided</b>                               |                                |   |   |   |
| K511..  | process flange                 | stainless steel 316L, connection per DIN EN 61518<br>process connection 1/4 – 18 NPT<br>mounting thread 7/16 – 20 UNF |   |   |
| 3   | ventilation                    | without, with sealing plug of stainless steel 316L  |   |   |
| 4   |                                | with vent valve of stainless steel 316L   |   |   |
| 2   | gasket                         | EPDM, temperature range -40...85 °C   |   |   |
| 1   |                                | FKM, temperature range -20...85 °C  |   |   |
| G1  | diaphragm material             | stainless steel mat.-no. 1.4404 (316L)  |   |   |

| Process connection variation C: Direct connection plus-sided with distance tube |   |  |   |   |
|---|---|--|---|---|
| <b>Diaphragm seal plus-sided</b>  |   |  |   |   |
| DA1...  | flange-type per EN 1092-1   | raised face  | model B1  |   |
| DA2...  |   |  | model B2 (necessary in case of special materials) |   |
| 420   | nominal width/nominal pressure  | DN 50, PN 10...40  |   |   |
| 450   |   | DN 50, PN 100  |   |   |
| 620   |   | DN 80, PN 10...40  |   |   |
| 650   |   | DN 80, PN 100  |   |   |
| 710   |   | DN 100, PN 10...16   |   |   |
| DA51...   | flange-type per ASME B16.5  | raised face  | RF 125-250 AA                                     |   |
| DA5...  |   |  | RFSF (necessary in case of special materials)     |   |
| 310   | nominal width/class   | DN 2", class 150   |   |   |
| 320   |   | DN 2", class 300   |   |   |
| 510   |   | DN 3", class 150   |   |   |
| 520   |   | DN 3", class 300   |   |   |
| 610   |   | DN 4", class 150   |   |   |
| 620   |   | DN 4", class 300   |   |   |
| 1   |   | material wetted parts  | stainless steel mat.-no. 1.4404/1.4435 (316L)     |   |
| 3   | Hasteloy  |  |   |   |
| 2   | Tantal  |  |   |   |
| 62  | stainless steel 316L with PTFE coating (max. PN 40), high vacuum-resistant, max. temperature 260 °C |  |   |   |
|   |   | <u>pressure transmission fluid</u>   | <u>design temperature process</u>                 |   |
| L22   | system filling  | synthetic oil, free of silicone FD1  | -10...140 °C                                      | standard<br>max. design temperature, please specify different temperatures. Code T... |
| L23   |   |  | -50...230 °C                                      |   |
| L31   |   | vacuum- and high temperature oil FV3H  | -10...400 °C                                      |   |
| L10   |   | Low temperature oil FM5  | -90...160 °C                                      |   |
| L30   |   | Halocarbon oil FC  | -30...190 °C                                      |   |
|   | ambient temperature   | -40...80 °C (Please note the temperature limits of the pressure transmission fluid)                              |   |   |
| U2  |   | -10...50 °C  |   |   |
| U...  |   | different ambient temperature, as in writing   |   |   |
| <b>Process flange plus-sided</b>  |   |  |   |   |
| K511..  | process flange  | stainless steel 316L, connection per DIN EN 61518, process connection 1/4 – 18 NPT mounting thread 7/16 – 20 UNF |   |   |
| 3   | ventilation   | without, with sealing plug of stainless steel 316L   |   |   |
| 4   |   | with vent valve of stainless steel 316L  |   |   |
| 2   | gasket  | EPDM, temperature range -40...85 °C  |   |   |
| 1   |   | FKM, temperature range -20...85 °C   |   |   |
| G1  | diaphragm material  | stainless steel mat.-no. 1.4404 (316L)   |   |   |

| Process connection variation D: Direct connection plu-sided with distance tube, capillary connection minus-sided |                                |   |   |   |
|--|--------------------------------|---|---|---|
| Diaphragm seal plus-sided  |                                |   |   |   |
| DA1...   | flange-type per EN 1092-1      | raised face   | model B1  |   |
| DA2...   |                                |   | model B2 (necessary in case of special materials) |   |
| 420  | nominal width/nominal pressure | DN 50, PN 10...40   |   |   |
| 450  |                                | DN 50, PN 100   |   |   |
| 620  |                                | DN 80, PN 10...40   |   |   |
| 650  |                                | DN 80, PN 100   |   |   |
| 710  |                                | DN 100, PN 10...16  |   |   |
| DA51...  | flange-type per ASME B16.5     | raised face   | RF 125-250 AA                                     |   |
| DA5...   |                                |   | RFSF (necessary in case of special materials)     |   |
| 310  | nominal width/class            | DN 2", class 150  |   |   |
| 320  |                                | DN 2", class 300  |   |   |
| 510  |                                | DN 3", class 150  |   |   |
| 520  |                                | DN 3", class 300  |   |   |
| 610  |                                | DN 4", class 150  |   |   |
| 620  |                                | DN 4", class 300  |   |   |
| A413..   | measuring device connection    | Direct diaphragm seal with distance tube 90,5 mm  |   |   |
| 1  | material wetted parts          | stainless steel mat.-no. 1.4404/1.4435 (316L)   |   |   |
| 3  |                                | Hasteloy  |   |   |
| 2  |                                | Tantal  |   |   |
| 62   |                                | stainless steel 316L with PTFE coating (max. PN 40), high vacuum-resistant, max. temperature 260 °C |   |   |
|  |                                | <u>pressure transmission fluid</u>  | <u>design temperature process</u>                 |   |
| L22  | system filling                 | synthetic oil, free of silicone FD1   | -10...140 °C                                      | standard<br>max. design temperature, please specify different temperatures. Code T... |
| L23  |                                |   | -50...230 °C                                      |   |
| L31  |                                | vacuum- and high temperature oil FV3H   | -10...400 °C                                      |   |
| L10  |                                | Low temperature oil FM5   | -90...160 °C                                      |   |
| L30  |                                | Halocarbon oil FC   | -30...190 °C                                      |   |
|  | ambient temperature            | -40...80 °C (Please note the temperature limits of the pressure transmission fluid)                 |   |   |
| U2   |                                | -10...50 °C   |   |   |
| U...   |                                | different ambient temperature, as in writing  |   |   |

| Diaphragm seal plus-sided with capillary |                                |   |   |   |
|--|--------------------------------|---|---|---|
| DA1...                                   | flange-type per EN 1092-1      | raised face   | model B1  |   |
| DA2...                                   |                                |   | model B2 (necessary in case of special materials) |   |
| 420                                      | nominal width/nominal pressure | DN 50, PN 10...40   |   |   |
| 450                                      |                                | DN 50, PN 100   |   |   |
| 620                                      |                                | DN 80, PN 10...40   |   |   |
| 650                                      |                                | DN 80, PN 100   |   |   |
| 710                                      |                                | DN 100, PN 10...16  |   |   |
| DA51...                                  | flange-type per ASME B16.5     | raised face   | RF 125-250 AA                                     |   |
| DA5...                                   |                                |   | RFSF (necessary in case of special materials)     |   |
| 310                                      | nominal width/class            | DN 2", class 150  |   |   |
| 320                                      |                                | DN 2", class 300  |   |   |
| 510                                      |                                | DN 3", class 150  |   |   |
| 520                                      |                                | DN 3", class 300  |   |   |
| 610                                      |                                | DN 4", class 150  |   |   |
| 620                                      |                                | DN 4", class 300  |   |   |
| DC4...                                   | cell-type per EN 1092-1        | raised face   | model B1  |   |
| DC1...                                   |                                |   | model B2 (necessary in case of special materials) |   |
| 480                                      | nominal width/nominal pressure | DN 50, PN 16...400  |   |   |
| 680                                      |                                | DN 80, PN 16...400  |   |   |
| 780                                      |                                | DN 100, PN 16...400   |   |   |
| DC31...                                  | cell-type per ASME B16.5       | raised face   | RF 125-250 AA                                     |   |
| DC3...                                   |                                |   | RFSF (necessary in case of special materials)     |   |
| 310                                      | nominal width/class            | DN 2", class 150...2500   |   |   |
| 510                                      |                                | DN 3", class 150...2500   |   |   |
| 610                                      |                                | DN 4", class 150...2500   |   |   |
| B52...                                   | measuring device connection    | diaphragm seale with capillary and stainless steel protective tube                                  |   |   |
| 11                                       |                                | capillary length  | 1 m   |   |
| 12                                       |                                |   | 1,6 m   |   |
| 13                                       |                                |   | 2,5 m   |   |
| 14                                       |                                |   | 4 m   |   |
| 15                                       |                                |   | 6 m   |   |
| 16                                       |                                |   | 8 m   |   |
| 17                                       |                                |   | 10 m  |   |
| 22                                       |                                |   | 12 m  |   |
| 1  | material wetted parts          |   | stainless steel mat.-no. 1.4404/1.4435 (316L)     |   |
| 3  |                                | Hasteloy  |   |   |
| 2  |                                | Tantal  |   |   |
| 62                                       |                                | stainless steel 316L with PTFE coating (max. PN 40), high vacuum-resistant, max. temperature 260 °C |   |   |
|  |                                | <u>pressure transmission fluid</u>  | <u>design temperature process</u>                 |   |
| L22                                      | system filling                 | synthetic oil, free of silicone FD1   | -10...140 °C                                      | Standard<br>max. design temperature, please specify different temperatures. Code T... |
| L23                                      |                                |   | -50...230 °C                                      |   |
| L31                                      |                                | vacuum- and high temperature oil FV3H   | -10...400 °C                                      |   |
| L10                                      |                                | Low temperature oil FM5   | -90...160 °C                                      |   |
| L30                                      |                                | Halocarbon oil FC   | -30...190 °C                                      |   |
|  | ambient temperature            | -40...80 °C (Please note the temperature limits of the pressure transmission fluid)                 |   |   |
| U2                                       |                                | -10...50 °C   |   |   |
| U...                                     |                                | different ambient temperature, as in writing  |   |   |



| Accessories        |                               |  |
|--------------------|-------------------------------|--|
| <b>MM1500-A11</b>  | mounting angle                | for wall and pipe-mounting Ø 35-50 mm of stainless steel, incl. screws 7/16-20 UNF   |
| <b>MM1500-A12</b>  |                               | for wall and pipe-mounting Ø 2" of stainless steel, incl. screws 7/16-20 UNF   |
| <b>MC1060-A134</b> | oval flange                   | oval flange 1/2-14 NPT per EN 61518, modal A of stainless steel mat.-no. 1.4404 (316L), incl. 2 screws 7/16-20 UNF, material stainless steel, incl. gasket EPDM        |
| <b>MC1060-A133</b> |                               | oval flange 1/2-14 NPT per EN 61518, modal A of stainless steel mat.-no. 1.4404 (316L), incl. 2 screws 7/16-20 UNF, material stainless steel, incl. gasket FKM         |
| <b>MC1140</b>      | wall bracket                  | PASCAL Ci4 remote display and control unit including device holder<br>material stainless steel, incl. front ring with seal and blind cap with circular connector M12x1 |
| <b>A1.</b>         | connection cable              | length: 10 m, material: PUR, with circular connector M12 x1, completely wired  |
| <b>1</b>           | internal cable clamps         | spring clamp terminals up to 1.5 mm <sup>2</sup>   |
| <b>2</b>           |                               | pole terminals 2.5 mm <sup>2</sup>   |
| <b>3</b>           |                               | screw terminals 2.5 mm <sup>2</sup>  |
| <b>T4</b>          | degree of protection          | IP 69 K <sup>1</sup>   |
| <b>MZ8120-A11</b>  | mounting set for wall bracket | 2 mounting brackets for pipe and frame mounting Ø 30-50 mm, incl. nuts and washers   |
| <b>MZ8120-A12</b>  |                               | 2 mounting brackets for pipe and frame mounting Ø 40-64 mm, incl. nuts and washers   |

Order code (example): **CI4350 – A1008.2 – F1 – H21 – Y12 – T200 – DA1620 - B52111 - L22**