



CCA-Xi

- precision pressure transmitter for process industry
- nominal pressure: from 0...400 mbar up to 0...600 bar
- output signals: 2-wire: 4...20 mA
- HART® communication
- stainless steel sensor
- accuracy 0.1 % span
- turn-down 10:1
- two chamber aluminium die cast case or stainless field housing
- internal or flush welded diaphragm
- optional: integrated display and operating module, special materials as Hastelloy® and Tantalum, cooling element for media temp. up to 300°C

The process pressure transmitter **CCA-Xi** has been especially designed for the process industry as well as food and pharmaceutical industry (version stainless steel field housing) and measures vacuum, gauge and absolute pressure ranges of gases, steam, fluids up to 600 bar. Different process connections such as threads and flanges with an internal or flush welded diaphragm are available and can be combined with a cooling element for media temperatures up to 300°C. The transmitter is as a standard equipped with HART®-communication; the customer can choose between a two chamber aluminium die cast case or a stainless field housing.

PREFERRED AREAS OF USE ARE



Oil and gas industry / Chemical and petrochemical industry



Food / Pharmaceutical industry

TECHNICAL DATA

| Pressure ranges ¹ | | | | | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----|----------|----|----------|-----|----------|-----|-----------|------|------|
| Nominal pressure gauge / abs. ^{2,*} | [bar] | 0.4 | 1 | 2 | 4 | 10 | 20 | 40 | 100 | 200 | 400 | 600 |
| Overpressure | [bar] | 2 | 5 | 10 | 20 | 40 | 80 | 105 | 210 | 600 | 1000 | 1000 |
| Burst pressure ≥ | [bar] | 3 | 7,5 | 15 | 25 | 50 | 120 | 210 | 420 | 1000 | 1250 | 1250 |
| ¹ On customer request we adjust the devices within the turn-down-possibility by software to the required pressure ranges. | | | | | | | | | | | | |
| ² absolute pressure possible from 1 bar | | | | | | | | | | | | |
| Vacuum ranges | | | | | | | | | | | | |
| Nominal pressure gauge* | [bar] | -0.4 ... 0.4 | | -1 ... 1 | | -1 ... 2 | | -1 ... 4 | | -1 ... 10 | | |
| Overpressure | [bar] | 2 | | 5 | | 10 | | 20 | | 40 | | |
| Burst pressure ≥ | [bar] | 3 | | 7,5 | | 15 | | 25 | | 50 | | |
| *for 0 ... 1 bar abs. or -1 ... 0 bar gauge max.temperature 70°C | | | | | | | | | | | | |
| Output signal / Supply | | | | | | | | | | | | |
| Standard | 2-wire: 4 ... 20 mA with HART®-communication V_S = 12 ... 28 V_{DC} | | | | | | | | | | | |
| Current consumption | max. 25 mA | | | | | | | | | | | |
| Performance | | | | | | | | | | | | |
| Accuracy ³ | ≤ ± 0.1 % span | | | | | | | | | | | |
| performance after turn-down (TD) | no change of accuracy | | | | | | | | | | | |
| - TD ≤ 5:1 | the accuracy is calculated as follows: ≤ 0.1 + 0.015 x (turn-down - 5) % span | | | | | | | | | | | |
| - TD > 5:1 | e.g. turn-down 9: ≤ 0.1 + 0.015 x (9 - 5) % span = 0.16 % span | | | | | | | | | | | |
| Permissible load | R _{max} = [(V _S - V _{S min}) / 0.02 A] Ω load during HART® communication: R_{min} = 250 Ω | | | | | | | | | | | |
| Influence effects | supply: 0.05 % span / 10 V permissible load: 0.05 % span / kΩ | | | | | | | | | | | |
| Long term stability | ≤ ± 0.1 % span / year at reference conditions | | | | | | | | | | | |
| Response time | 100 msec – without consideration of electronic damping measuring rate 10/sec | | | | | | | | | | | |
| Adjustability | electronic damping: 0 ... 100 sec offset 0 ... 90 % span; turn-down of span up to 10:1 | | | | | | | | | | | |
| ³ accuracy according to EN IEC 62828-2– limit point adjustment (non-linearity, hysteresis, repeatability) | | | | | | | | | | | | |



| Thermal errors / Permissible temperatures | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tolerance band ^{4,5} | ≤ 0.2 % span x turn-down (in compensated range -20 ... 85 °C) |
| Permissible temperatures ⁶ | medium: -40 ... 125 °C for filling fluid silicon oil -10 ... 125 °C for filling fluid food compatible oil |
| | without display: environment: -40 ... 80 °C storage: -40 ... 80 °C with display: environment: -20 ... 70 °C storage: -30 ... 80 °C |
| Permissible temperature medium for cooling element ⁷ | filling fluid silicon oil overpressure: -40 ... 300 °C low pressure: -40 ... 150 °C |
| | filling fluid food compatible oil overpressure: -10 ... 250 °C low pressure: -10 ... 150 °C |
| ⁴ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions | |
| ⁵ for flange- and DRD-version: tolerance band offset ≤ ± 1.6 % span / tolerance band span ≤ ± 0.6 % span | |
| ⁶ max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C (without cooling element). | |
| ⁷ max. temperature depends on the used sealing material, type of seal and installation | |
| Electrical protection | |
| Short-circuit protection | permanent |
| Reverse polarity protection | no damage, but also no function |
| Electromagnetic compatibility | emission and immunity according to EN 61326 |
| Mechanical stability | |
| Vibration | 5 g RMS (25 ... 2000 Hz) according to DIN EN 60068-2-6 |
| Shock | 100 g / 11 msec according to DIN EN 60068-2-27 |
| Filling fluids | |
| Standard | silicon oil |
| Options for process connections | food compatible oil with 21CFR178.3570 approval (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) Halocarbon and others on request |
| Materials | |
| Pressure port | stainless steel 1.4435 (316L) |
| Housing | aluminium die cast, powder-coated or stainless steel 1.4404 (316L) |
| Cable gland | brass, nickel plated |
| Viewing glass | laminated safety glass |
| Seals (media wetted) | thread: standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures < 260 °C; (min. permissible temperature from -15 °C, possible for nominal pressure ranges P _N ≤ 100 bar); others on request option: welded version for pressure ports according to EN 837 with P _N between 1 and 40 bar DRD and flange: none, not included in the scope of delivery |
| Diaphragm | standard: stainless steel 1.4435 (316 L) options for process connections: Hastelloy® C-276 (2.4819), Tantalum (possible from 1 bar) on request |
| Media wetted parts | pressure port, seal, diaphragm |
| Miscellaneous | |
| EHEDG certificate Type EL Class I | EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for - Clamp (C61, C62, C63): T-ring-seal from Combifit International B.V. - Varivent (P41): EPDM-O-ring which is FDA-listed |
| Display (optionally) | LC-display, visible range 32,5 x 22,5 mm; 5-digit 7-segment main display, digit height 8 mm, range of indication ±9999; 8-digit 14-segment additional display, digit height 5 mm; 52-segement bargraph; accuracy 0.1% ± 1 digit |
| Ingress protection | IP 67 |
| Installation position | any (standard calibration in a vertical position with the pressure port connection down; differing installation position have to be specified in the order) |
| Surface roughness | pressure port R _a < 0.8 µm (media wetted parts); diaphragm R _a < 0.15 µm weld seam R _a < 0.8 µm |
| Weight | min. 400 g (depending on housing and mechanical connection) |
| Operational life | > 100 x 10 ⁶ pressure cycles |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁸ |

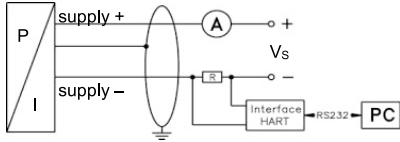
⁸ This directive is only valid for devices with maximum permissible overpressure > 200 bar

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Windows® is a registered trade mark of Microsoft Corporation



ELECTRICAL CONNECTION

Wiring diagram

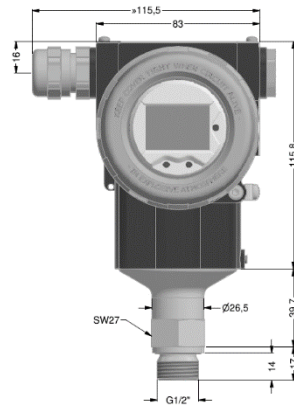
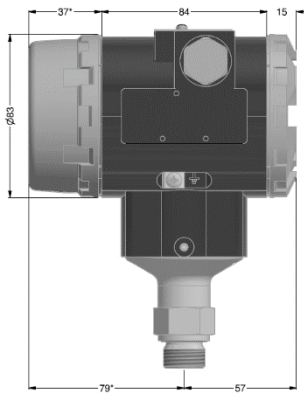


Pin configuration

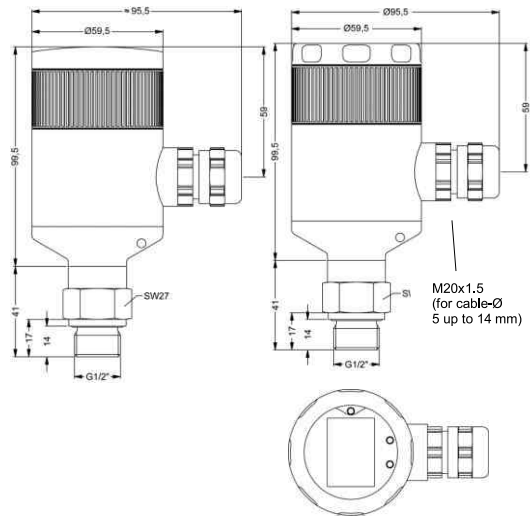
| Electrical connections | aluminium die cast case: terminal clamps (clamp section: 2.5 mm ²) | stainless steel field housing: terminal clamps (clamp section: 1.5 mm ²) |
|------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Supply + | IN+ | IN+ |
| Supply - | IN- | IN- |
| Test | Test | - |
| Shield | ⏏ | ⏏ |

DIMENSION DRAWINGS

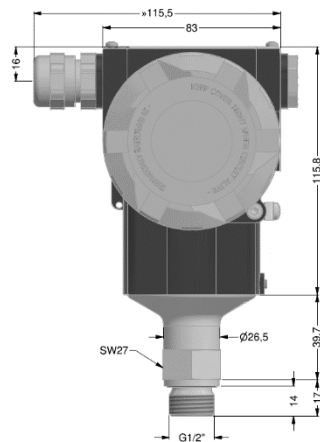
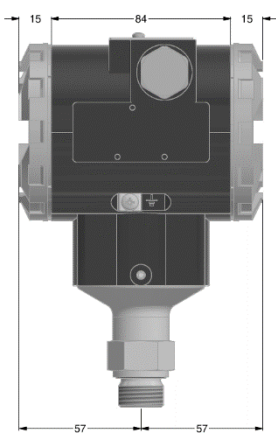
aluminium die cast case with display



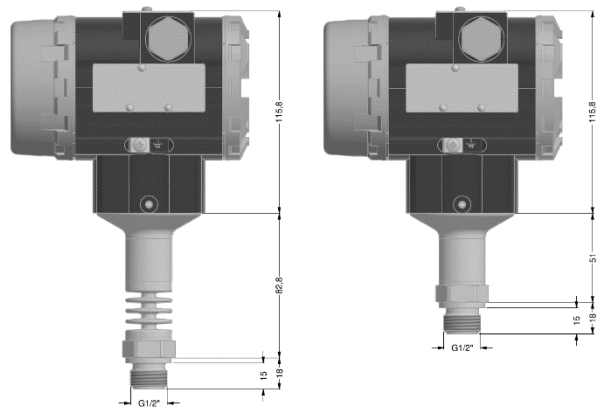
stainless steel field housing



aluminium die cast case without display



option with cooling element and without

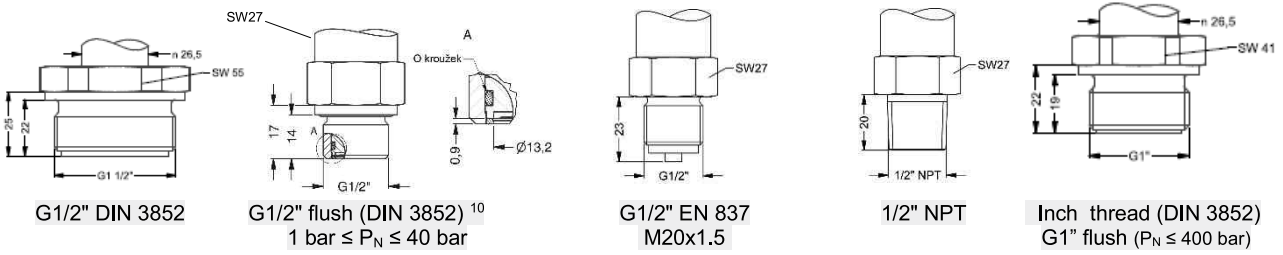


⇒ for nominal pressure $P_N > 400$ bar increases the length of devices by 3 mm

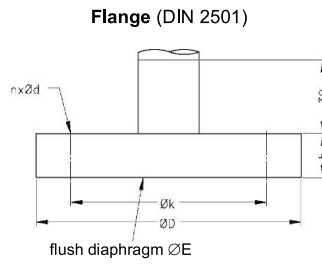
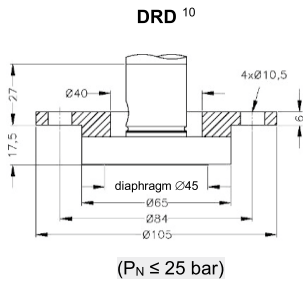
⁹aluminium case is horizontally rotatable as standard



Standard pressure ports

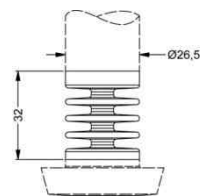


Process connections for low pressure- max. to 40 bar



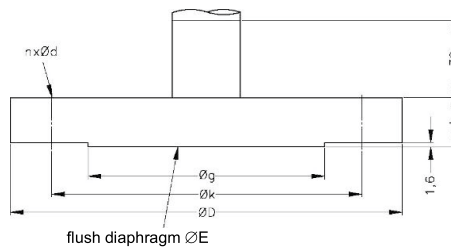
| dimensions in mm | | | |
|----------------------|------|------|------|
| size | DN25 | DN50 | DN80 |
| D | 115 | 165 | 200 |
| E | 30 | 89 | 89 |
| k | 85 | 125 | 160 |
| b | 18 | 20 | 20 |
| n | 4 | 4 | 8 |
| d | 14 | 18 | 18 |
| P _N [bar] | ≤ 40 | ≤ 40 | ≤ 16 |

Cooling element⁷



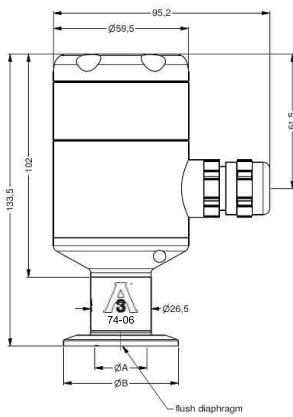
temperature range | 300° C

Flange (ANSI B16.5)



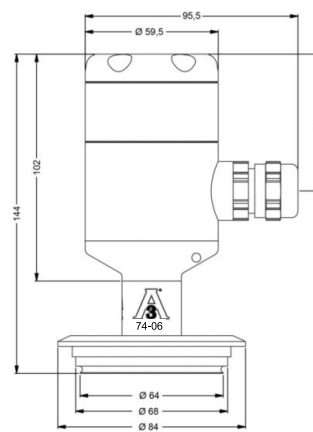
| dimensions in mm | | |
|----------------------|------------|------------|
| size | 2"/150 lbs | 3"/150 lbs |
| D | 152.4 | 190.5 |
| E | 86 | 89 |
| g | 91.9 | 127 |
| k | 120.7 | 152.4 |
| b | 19.1 | 23.9 |
| n | 4 | 4 |
| d | 19.1 | 19.1 |
| P _N [bar] | ≤ 10 | ≤ 10 |

Clamp (DIN 32676)



| dimensions in mm | | | | |
|----------------------|------------|----------------|------|------|
| size | 3/4" | DN25 | DN32 | DN50 |
| A | 14 | 23 | 32 | 45 |
| B | 25 | 50.5 | 50.5 | 64 |
| P _N [bar] | ≥ 4 ≤ 8 | ≥ 0.25 ≤ 16 | ≤ 16 | ≤ 16 |

Varivent® (DN 40/50)



⁷ max. temperature depends on the used sealing material, type of seal and installation
¹⁰ Mounting flange is included in the delivery (already pre-assembled)

ACCESSORIES

Accessories for aluminium cast (not a part of delivery)

Electrical connection

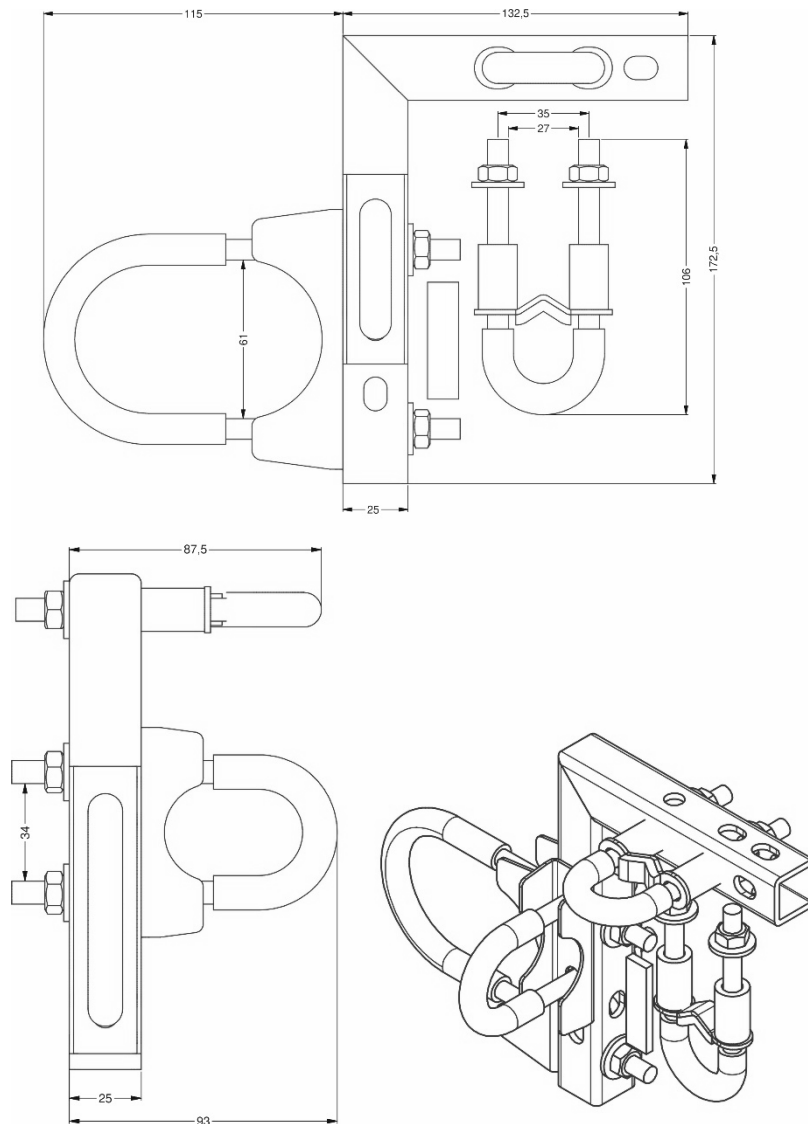
| Ordering type | Ordering code |
|----------------------------|---------------|
| plug thread M20x1.5 | 1001871 |
| cable gland thread M20x1,5 | 1001460 |

Universal holder

| | |
|----------------|-----------------------|
| Weight | cca 1 kg |
| Material | 0308 (E235) |
| Surface finish | BIS UltraProtect 1000 |
| Ordering code | 5020043 |



Dimensions (in mm)



ORDER CODE

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| | | | | | | | | | | | | |
|---------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Pressure | | | | | | | | | | | | |
| Gauge | 5 | 1 | 1 | | | | | | | | | |
| Absolute ¹ | 5 | 1 | 2 | | | | | | | | | |
| Input [bar] | | | | | | | | | | | | |
| 0 ... 0,4 bar ¹ | | | | 4 | 0 | 0 | 0 | | | | | |
| 0 ... 1,0 bar | | | | 1 | 0 | 0 | 1 | | | | | |
| 0 ... 2,0 bar | | | | 2 | 0 | 0 | 1 | | | | | |
| 0 ... 4,0 bar | | | | 4 | 0 | 0 | 1 | | | | | |
| 0 ... 10 bar | | | | 1 | 0 | 0 | 2 | | | | | |
| 0 ... 20 bar | | | | 2 | 0 | 0 | 2 | | | | | |
| 0 ... 40 bar | | | | 4 | 0 | 0 | 2 | | | | | |
| 0 ... 100 bar | | | | 1 | 0 | 0 | 3 | | | | | |
| 0 ... 200 bar | | | | 2 | 0 | 0 | 3 | | | | | |
| 0 ... 400 bar | | | | 4 | 0 | 0 | 3 | | | | | |
| 0 ... 600 bar | | | | 6 | 0 | 0 | 3 | | | | | |
| -0,4 ... 0,4 bar | | | | S | 4 | 0 | 0 | | | | | |
| -1 ... 1 bar | | | | S | 1 | 0 | 2 | | | | | |
| -1 ... 2 bar | | | | V | 2 | 0 | 2 | | | | | |
| -1 ... 4 bar | | | | V | 4 | 0 | 2 | | | | | |
| -1 ... 10 bar | | | | V | 1 | 0 | 3 | | | | | |
| Customer | | | | 9 | 9 | 9 | 9 | | | | | |
| Design | | | | | | | | | | | | |
| Aluminium housing - with display (IP 67) | | | | | | | | A | 0 | | | |
| Aluminium housing - without display (IP 67) | | | | | | | | A | N | | | |
| Stainless steel field housing - with display (IP 67) | | | | | | | | F | V | | | |
| Stainless steel field housing - without display (IP 67) | | | | | | | | F | N | | | |
| Output | | | | | | | | | | | | |
| HART® - 4 ... 20 mA / 2-wire | | | | | | | | | | H | | |
| Customer | | | | | | | | | | 9 | | |
| Accuracy | | | | | | | | | | | | |
| 0,1 % - standard range | | | | | | | | | | 1 | | |
| 0,1 % - standard range including Calibration Certificate | | | | | | | | | | P | | |
| 0,1 % - customer range | | | | | | | | | | I | | |
| 0,1 % - customer range including Calibration Certificate | | | | | | | | | | H | | |
| Customer | | | | | | | | | | 9 | | |
| Electrical connection | | | | | | | | | | | | |
| Terminal clamp - Aluminium housing | | | | | | | | | | A | K | 0 |
| Terminal clamp - Stainless Steel field housing | | | | | | | | | | 8 | 8 | 0 |
| Customer | | | | | | | | | | 9 | 9 | 9 |
| Mechanical connection | | | | | | | | | | | | |
| G 1/2" DIN 3852 | | | | | | | | | | 1 | 0 | 0 |
| G 1/2" EN 837 | | | | | | | | | | 2 | 0 | 0 |
| G 1/4" DIN 3852 | | | | | | | | | | 3 | 0 | 0 |
| M 20 x 1,5 DIN 3852 | | | | | | | | | | 5 | 0 | 0 |
| M 20 x 1,5 EN 837 | | | | | | | | | | 8 | 0 | 0 |
| 1/2" NPT | | | | | | | | | | N | 0 | 0 |
| G 1/2" DIN 3852 - open port | | | | | | | | | | H | 0 | 0 |
| G 1/2" DIN 3852 flush (P _N > 2,5 bar) (only with seals) ³ | | | | | | | | | | Z | 0 | 0 |
| M 20 x 1,5 DIN 3852 flush (P _N > 2,5 bar) (only with seals) | | | | | | | | | | D | 0 | 4 |
| G 3/4" DIN 3852 flush (P _N > 0,6 bar) (only with seals) | | | | | | | | | | Z | 3 | 0 |
| G 1" DIN 3852 flush (P _N > 0,25 bar) (only with seals) | | | | | | | | | | Z | 3 | 1 |
| G 1 1/2" DIN 3852 flush (only with seals) | | | | | | | | | | Z | 3 | 3 |
| G 2" DIN 3852 flush | | | | | | | | | | Z | 3 | 4 |
| G 1" DIN 3852 flush 2x O ring (P _N > 0,25 bar) | | | | | | | | | | Z | 3 | 7 |
| G 1/2" DIN 3852 flush 2x O ring (P _N > 1 bar) | | | | | | | | | | Z | 6 | 1 |
| G 3/4" DIN 3852 flush 2x O ring (P _N > 1 bar) | | | | | | | | | | Z | 6 | 6 |
| G1" flush cone seal (P _N > 0,25 bar) (without seals) | | | | | | | | | | K | 3 | 1 |
| 1/8" NPT (without seals, monel pressure port, tantal membrane) | | | | | | | | | | Z | 9 | 2 |
| 1" NPT flush (P _N > 0,25 bar) | | | | | | | | | | N | 5 | 4 |
| Clamp DN 3/4" (4 bar < P _N < 8 bar) (without seals) | | | | | | | | | | C | 6 | 8 |
| Clamp DN 1" (DN 25) (0,4 bar < P _N < 16 bar) (without seals) | | | | | | | | | | C | 6 | 1 |
| Clamp DN 1 1/2" (DN 32) (0,4 bar < P _N < 16 bar) (without seals) | | | | | | | | | | C | 6 | 2 |
| Clamp DN 2" (DN 50) (0,4 bar < P _N < 16 bar) (without seals) | | | | | | | | | | C | 6 | 3 |
| DIN 11851 DN 25 (P _N > 0,6 bar) (without seals) | | | | | | | | | | M | 7 | 3 |
| DIN 11851 DN 40 (P _N > 0,4 bar) (without seals) | | | | | | | | | | M | 7 | 5 |
| DIN 11851 DN 50 (P _N > 0,25 bar) (without seals) | | | | | | | | | | M | 7 | 6 |
| "sandwich" DN 25 (without seals) | | | | | | | | | | S | 6 | 1 |
| "sandwich" DN 50 (without seals) | | | | | | | | | | S | 7 | 6 |
| "sandwich" DIN 2501 DN 80 (without seals) | | | | | | | | | | S | 8 | 0 |
| M 22 x 1,5 DIN 3852 flush (P _N > 2,5 bar) (only with seals) | | | | | | | | | | D | 1 | 5 |
| Flange DN 25/PN 40 DIN 2501 (without seals) | | | | | | | | | | F | 2 | 0 |
| Flange DN 40/PN 40 DIN 2501 (without seals) | | | | | | | | | | F | 2 | 2 |
| Flange DN 50/PN 40 DIN 2501 (without seals) | | | | | | | | | | F | 2 | 3 |
| Flange DN 80/PN 16 DIN 2501 (without seals) | | | | | | | | | | F | 1 | 4 |
| Flange DN 100/PN 16 DIN 2501 (without seals) | | | | | | | | | | F | 2 | 5 |
| Varivent® DN 40/50 (without seals) | | | | | | | | | | P | 4 | 1 |
| Customer | | | | | | | | | | 9 | 9 | 9 |



Pressure transmitters

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| Diaphragm | | | |
|------------------------------------------------------------------------------------------------------------|---|---|---------|
| Stainless steel 1.4435 (316 L) | 1 | | |
| Hastelloy @ C-276 (2.4819) ⁴ | H | | |
| Tantalum ^{4,5} | T | | |
| Customer | 9 | | |
| Seals (included only in thread type connections) | | | |
| Without seals (Clamp, dairy pipe DIN, sandwich, flange, varivent) | 0 | | |
| Viton (FKM) | 1 | | |
| EPDM | 3 | | |
| FFKM (for media temperature ≤ 200 °C) ⁶ | 7 | | |
| Without seals - welded (only with EN 837) ^{7,8} | 2 | | |
| Customer | 9 | | |
| Filling Fluids | | | |
| Silicone oil | 1 | | |
| Food compatible oil (temperature max. 150 °C) ⁴ | 2 | | |
| Halocarbon ⁴ | C | | |
| Customer | 9 | | |
| Special version | | | |
| Standard | | 0 | 0 |
| With cooling element from 125 °C up to 150 °C | | 1 | 5 |
| With cooling element from 150 °C up to 300 °C (P _N ≤ 70 bar max. 200 °C permanent) ⁴ | | 2 | 0 |
| Customer | | 9 | 9 |
| Mounting Bracket | | | |
| Universal holder (for pipes ø ≤ 26,5 mm) | | | 5020043 |

if setting range shall be different from nominal range please specify in your order

- 1 - absolute pressure possible from 1 bar
- 3 - only possible for P_N ≥ 1 bar up to 40 bar
- 4 - only possible with process connections
- 5 - tantal diaphragm possible with nominal pressure ranges from 1 bar
- 6 - min. permissible temperature from -15°C, possible for nominal pressure ranges P_N ≤ 100 bar
- 7 - only for P_N ≤ 40 bar
- 8 - welded version only with pressure ports according to EN 837

!!! When you make an order it is necessary to fill the questionnaire for transmitters with separators!!!

Manufacturer reserves the right to change sensor specifications without further notice.

