



## DCT 533P

### Industrial Pressure Transmitter with IO-Link Interface

Process Connections with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 61298-2:  
standard:  $\leq \pm 0.35 \% \text{ FSO}$   
option:  $\leq \pm 0.25 \% \text{ FSO}$



#### Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

#### Output signal

- IO-Link according to specification V 1.1
- data transfer rate 38.4 kbit/sec
- smart sensor profile

#### Special characteristics

- ▶ hygienic version
- ▶ diaphragm with low surface roughness
- ▶ CIP / SIP-cleaning up to 150 °C
- ▶ ingress protection IP 67 / IP 69

#### Optional versions

- ▶ different process connections
- ▶ cooling element for media temperatures up to 300 °C

The DCT 533P is suitable for food / beverage and pharmaceutical industry as well as, for applications where a totally flush pressure port is required. The special design prevents condensation inside the pressure transmitter and thus a failure in applications with large temperature changes.

The integrated, standardised IO-Link interface increases productivity and supports the operator in service and maintenance. Properties can be read and qualified via IO-Link, which helps the user to assess the state of system or process.

#### Preferred areas of use are



Food and beverage



Pharmaceutical industry

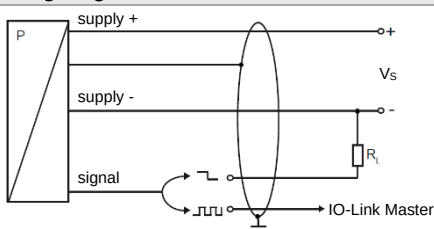
#### Material and test certificates

- ▶ Inspection certificate 3.1 according to EN 10204
- ▶ Test report 2.2 according to EN 10204

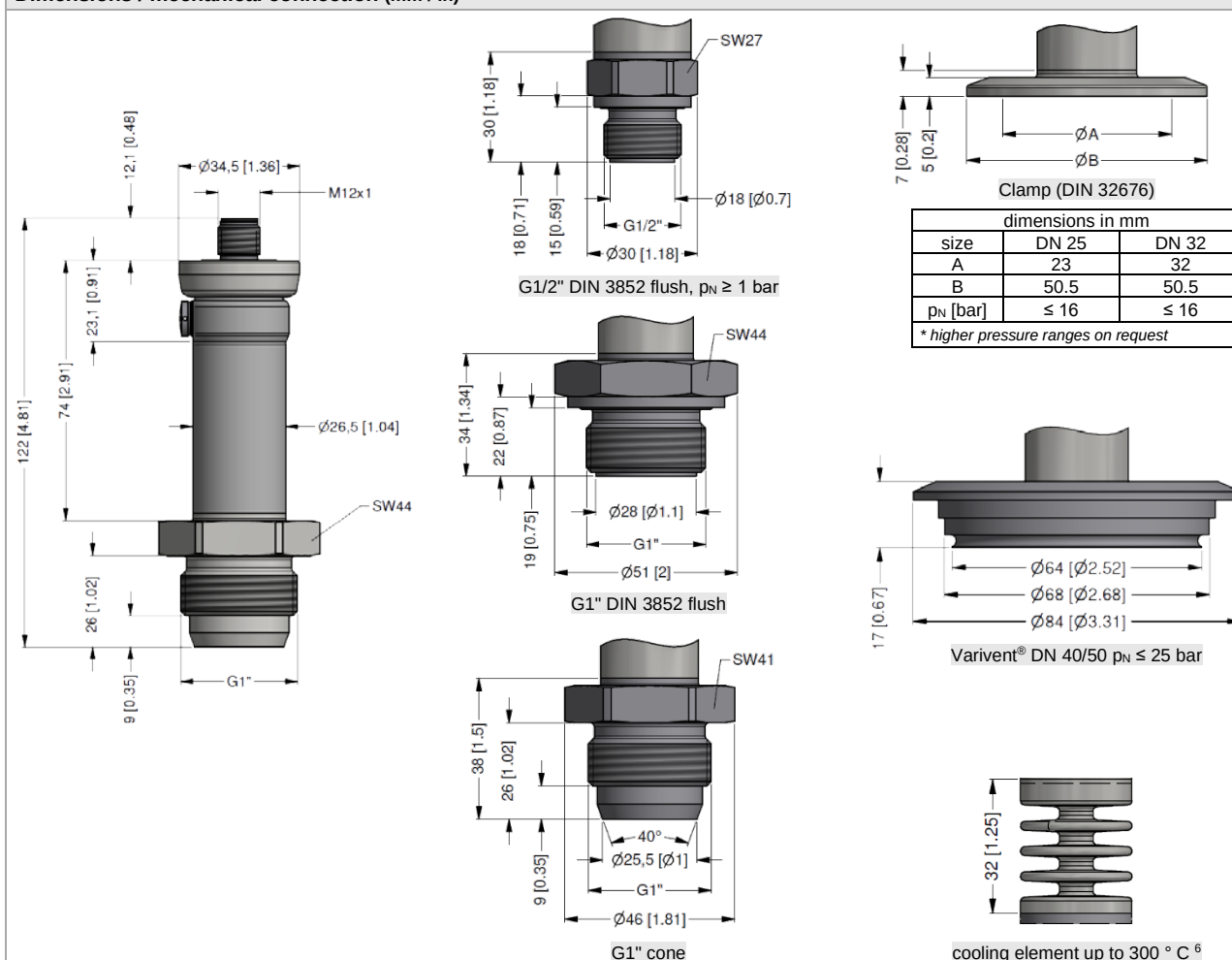


| Input pressure range <sup>1</sup>                                                                                                                    |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|----------|------|---------------------------------------------------------------------|--------------------------------------------|-----|-----|----|----|
| Nominal pressure gauge                                                                                                                               | [bar]   | -1...0                                                                                                                                                                     | 0.10 | 0.16 | 0.25     | 0.40 | 0.60                                                                | 1                                          | 1.6 | 2.5 | 4  | 6  |
| Nominal pressure absolute                                                                                                                            | [bar]   | -                                                                                                                                                                          | -    | -    | -        | 0.40 | 0.60                                                                | 1                                          | 1.6 | 2.5 | 4  | 6  |
| Overpressure                                                                                                                                         | [bar]   | 5                                                                                                                                                                          | 0.5  | 1    | 1        | 2    | 5                                                                   | 5                                          | 10  | 10  | 20 | 40 |
| Burst pressure ≥                                                                                                                                     | [bar]   | 7.5                                                                                                                                                                        | 1.5  | 1.5  | 1.5      | 3    | 7.5                                                                 | 7.5                                        | 15  | 15  | 25 | 50 |
| Nominal pressure gauge / abs.                                                                                                                        | [bar]   | 10                                                                                                                                                                         |      | 16   |          |      | 25                                                                  |                                            |     | 40  |    |    |
| Overpressure                                                                                                                                         | [bar]   | 40                                                                                                                                                                         |      | 80   |          |      | 80                                                                  |                                            |     | 105 |    |    |
| Burst pressure ≥                                                                                                                                     | [bar]   | 50                                                                                                                                                                         |      | 120  |          |      | 120                                                                 |                                            |     | 210 |    |    |
| Vacuum resistance                                                                                                                                    |         | p <sub>N</sub> > 1 bar: unlimited vacuum resistance                                                                                                                        |      |      |          |      |                                                                     | p <sub>N</sub> ≤ 1 bar: on request         |     |     |    |    |
| <sup>1</sup> consider the pressure resistance of fitting and clamps                                                                                  |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Output signal / Supply                                                                                                                               |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Standard                                                                                                                                             |         | IO-Link (measured value transmission)<br>SIO (switching output)                                                                                                            |      |      |          |      |                                                                     | V <sub>S</sub> = 18 ... 30 V <sub>DC</sub> |     |     |    |    |
| IO-Link                                                                                                                                              |         | V 1.1 / slave / smart sensor profile                                                                                                                                       |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Data transfer                                                                                                                                        |         | COM 2 38.4 kbit/sec                                                                                                                                                        |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Mode                                                                                                                                                 |         | SIO / IO-Link                                                                                                                                                              |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Standard                                                                                                                                             |         | IEC 61131-9                                                                                                                                                                |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Performance                                                                                                                                          |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Accuracy <sup>2</sup>                                                                                                                                |         | standard: for p <sub>N</sub> ≥ 0.4 bar: ≤ ± 0.35 % FSO / for p <sub>N</sub> < 0.4 bar: ≤ ± 0.50 % FSO<br>option for p <sub>N</sub> ≥ 0.4 bar: ≤ ± 0.25 % FSO               |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Switching current (SIO-Mode)                                                                                                                         |         | max. 200 mA                                                                                                                                                                |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Switching frequency                                                                                                                                  |         | max. 200 Hz                                                                                                                                                                |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Switching cycles                                                                                                                                     |         | > 100 x 10 <sup>6</sup>                                                                                                                                                    |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Long term stability                                                                                                                                  |         | ≤ ± 0.1 % FSO / year at reference conditions                                                                                                                               |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Turn-on time                                                                                                                                         |         | SIO mode: approx. 20 msec                                                                                                                                                  |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Response time                                                                                                                                        |         | SIO mode: < 4 msec                                                                                                                                                         |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Measuring rate                                                                                                                                       |         | 400 Hz                                                                                                                                                                     |      |      |          |      |                                                                     |                                            |     |     |    |    |
| <sup>2</sup> accuracy according to IEC 61298-2 – limit point adjustment (non-linearity, hysteresis, repeatability)                                   |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Thermal effects (offset and span) <sup>3</sup>                                                                                                       |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Nominal pressure p <sub>N</sub>                                                                                                                      | [bar]   | -1 ... 0                                                                                                                                                                   |      |      | < 0.40   |      |                                                                     | ≥ 0.40                                     |     |     |    |    |
| Tolerance band                                                                                                                                       | [% FSO] | ≤ ± 0.75                                                                                                                                                                   |      |      | ≤ ± 1    |      |                                                                     | ≤ ± 0.75                                   |     |     |    |    |
| In compensated range <sup>4</sup>                                                                                                                    | [°C]    | -20 ... 85                                                                                                                                                                 |      |      | 0 ... 70 |      |                                                                     | -20 ... 85                                 |     |     |    |    |
| <sup>3</sup> an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| <sup>4</sup> the minimum compensation temperature depends on the filling fluid used                                                                  |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Permissible temperatures                                                                                                                             |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Filling fluid                                                                                                                                        |         | silicone oil                                                                                                                                                               |      |      |          |      | food compatible oil                                                 |                                            |     |     |    |    |
| Medium <sup>5</sup>                                                                                                                                  |         | -40 ... 125 °C                                                                                                                                                             |      |      |          |      | -10 ... 125 °C                                                      |                                            |     |     |    |    |
| Medium with cooling element <sup>6</sup>                                                                                                             |         | overpressure: -40 ... 300 °C<br>vacuum: -40 ... 150 °C <sup>7</sup>                                                                                                        |      |      |          |      | overpressure: -10 ... 250 °C<br>vacuum: -10 ... 150 °C <sup>7</sup> |                                            |     |     |    |    |
| Electronics / environment                                                                                                                            |         | -40 ... 85 °C                                                                                                                                                              |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Storage                                                                                                                                              |         | -40 ... 100 °C                                                                                                                                                             |      |      |          |      |                                                                     |                                            |     |     |    |    |
| <sup>5</sup> max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| <sup>6</sup> max. temperature depends on the used sealing material and type of seal and installation                                                 |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| <sup>7</sup> also for p <sub>abs</sub> ≤ 1 bar                                                                                                       |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Electrical protection                                                                                                                                |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Short-circuit protection                                                                                                                             |         | permanent                                                                                                                                                                  |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Reverse polarity protection                                                                                                                          |         | on supply connection no damage, but also no function                                                                                                                       |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Electromagnetic compatibility                                                                                                                        |         | emission and immunity according to EN 61326                                                                                                                                |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Mechanical stability                                                                                                                                 |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Vibration                                                                                                                                            |         | 20 g RMS / 10 ... 2000 Hz according to DIN EN 60068-2-6<br>10 g RMS / 10 ... 2000 Hz according to DIN EN 60068-2-6 (with cooling element)                                  |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Shock                                                                                                                                                |         | 500 g / 1 msec half sine according to DIN EN 60068-2-27                                                                                                                    |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Filling fluids                                                                                                                                       |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Standard                                                                                                                                             |         | silicone oil                                                                                                                                                               |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Option                                                                                                                                               |         | food compatible oil according to 21CFR178.3570<br>(Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) others on request                                  |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Materials                                                                                                                                            |         |                                                                                                                                                                            |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Housing / electrical connection                                                                                                                      |         | stainless steel 1.4404 (316 L)                                                                                                                                             |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Pressure port                                                                                                                                        |         | stainless steel 1.4435 (316 L), R <sub>a</sub> < 0.8 µm (media wetted parts and weld seam)                                                                                 |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Diaphragm                                                                                                                                            |         | stainless steel 1.4435 (316 L), R <sub>a</sub> < 0.15 µm                                                                                                                   |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Seals                                                                                                                                                |         | standard: FKM (recommended for medium temperatures ≤ 200 °C)<br>option: FFKM (recommended for medium temperatures < 260 °C) others on request<br>Clamp, Varivent®: without |      |      |          |      |                                                                     |                                            |     |     |    |    |
| Media wetted parts                                                                                                                                   |         | pressure port, seal, diaphragm                                                                                                                                             |      |      |          |      |                                                                     |                                            |     |     |    |    |

| Miscellaneous                                            |                                                                                                                                                                                                                   |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EHEDG certificate<br>Type EL Class I<br>(in preparation) | EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for<br>- Clamp (C61, C62): T-ring-seal from Combifit International B.V.<br>- Varivent® (P41): EPDM-O-ring which is FDA-listed |
| Weight                                                   | approx. 200 g                                                                                                                                                                                                     |
| Current consumption                                      | max. 15 mA                                                                                                                                                                                                        |
| Operational life                                         | 100 million load cycles                                                                                                                                                                                           |
| Installation position                                    | any (standard calibration in a vertical position with the pressure port connection down;<br>differing installation position for $p_N \leq 2$ bar have to be specified in the order)                               |
| CE-conformity                                            | EMC Directive: 2014/30/EU                                                                                                                                                                                         |

**Wiring diagram****Pin configuration / electrical connection**

| Electrical connection | M12x1 / metal (4-pin) |  |
|-----------------------|-----------------------|--|
| Supply +              | 1                     |  |
| Supply -              | 3                     |  |
| SIO / IO Link         | 4                     |  |
| Shield                | plug housing          |  |

**Dimensions / mechanical connection (mm / in)**

⇒ metric threads and other versions on request

<sup>6</sup> max. temperature depends on the used sealing material and type of seal and installation

# Ordering code DCT 533P

DCT 533P

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| Pressure                        |                                            |   |   |   |   |   |   |   |   |   |         |
|---------------------------------|--------------------------------------------|---|---|---|---|---|---|---|---|---|---------|
|                                 | gauge                                      | D | C | H |   |   |   |   |   |   |         |
|                                 | absolute                                   | D | C | G |   |   |   |   |   |   |         |
| Input                           |                                            |   |   |   |   |   |   |   |   |   |         |
|                                 | [bar]                                      |   |   |   |   |   |   |   |   |   |         |
|                                 | 0.10                                       | 1 |   |   | 1 | 0 | 0 | 0 |   |   |         |
|                                 | 0.16                                       | 1 |   |   | 1 | 6 | 0 | 0 |   |   |         |
|                                 | 0.25                                       | 1 |   |   | 2 | 5 | 0 | 0 |   |   |         |
|                                 | 0.40                                       |   |   |   | 4 | 0 | 0 | 0 |   |   |         |
|                                 | 0.60                                       |   |   |   | 6 | 0 | 0 | 0 |   |   |         |
|                                 | 1.0                                        |   |   |   | 1 | 0 | 0 | 1 |   |   |         |
|                                 | 1.6                                        |   |   |   | 1 | 6 | 0 | 1 |   |   |         |
|                                 | 2.5                                        |   |   |   | 2 | 5 | 0 | 1 |   |   |         |
|                                 | 4.0                                        |   |   |   | 4 | 0 | 0 | 1 |   |   |         |
|                                 | 6.0                                        |   |   |   | 6 | 0 | 0 | 1 |   |   |         |
|                                 | 10                                         |   |   |   | 1 | 0 | 0 | 2 |   |   |         |
|                                 | 16                                         |   |   |   | 1 | 6 | 0 | 2 |   |   |         |
|                                 | 25                                         |   |   |   | 2 | 5 | 0 | 2 |   |   |         |
|                                 | 40                                         |   |   |   | 4 | 0 | 0 | 2 |   |   |         |
|                                 | -1 ... 0                                   |   |   |   | X | 1 | 0 | 2 |   |   |         |
|                                 | customer                                   |   |   |   | 9 | 9 | 9 | 9 |   |   | consult |
| Output                          |                                            |   |   |   |   |   |   |   |   |   |         |
|                                 | IO-Link / SIO                              |   |   |   |   |   |   | I | O |   |         |
| Accuracy                        |                                            |   |   |   |   |   |   |   |   |   |         |
| standard for $p_N \geq 0.4$ bar | 0.35 % FSO                                 |   |   |   |   |   |   | 3 |   |   |         |
| standard for $p_N < 0.4$ bar    | 0.50 % FSO                                 |   |   |   |   |   |   | 5 |   |   |         |
| option for $p_N \geq 0.4$ bar   | 0.25 % FSO                                 |   |   |   |   |   |   | 2 |   |   | consult |
|                                 | customer                                   |   |   |   |   |   |   | 9 |   |   | consult |
| Electrical connection           |                                            |   |   |   |   |   |   |   |   |   |         |
|                                 | male plug M12x1 (4-pin) / metal            |   |   |   |   |   |   | M | 1 | 7 |         |
|                                 | customer                                   |   |   |   |   |   |   | 9 | 9 | 9 | consult |
| Mechanical connection           |                                            |   |   |   |   |   |   |   |   |   |         |
|                                 | G1/2" DIN 3852 flush ( $p_N \geq 1$ bar)   |   |   |   |   |   |   | Z | 0 | 0 |         |
|                                 | G1" DIN 3852 flush                         |   |   |   |   |   |   | Z | S | 1 |         |
|                                 | G 1" cone                                  |   |   |   |   |   |   | K | S | 1 |         |
|                                 | Clamp DN 25 DIN 32676 ( $p_N \leq 16$ bar) |   |   |   |   |   |   | C | 6 | 1 |         |
|                                 | Clamp DN 32 DIN 32676 ( $p_N \leq 16$ bar) |   |   |   |   |   |   | C | 6 | 2 |         |
|                                 | Varivent® DN 40/50 ( $p_N \leq 25$ bar)    |   |   |   |   |   |   | P | 4 | 1 |         |
|                                 | customer                                   |   |   |   |   |   |   | 9 | 9 | 9 | consult |
| Diaphragm                       |                                            |   |   |   |   |   |   |   |   |   |         |
|                                 | stainless steel 1.4435 (316L)              |   |   |   |   |   |   |   | 1 |   |         |
|                                 | customer                                   |   |   |   |   |   |   |   | 9 |   | consult |
| Seal                            |                                            |   |   |   |   |   |   |   |   |   |         |
|                                 | for clamp, Varivent®:                      |   |   |   |   |   |   |   | 0 |   |         |
|                                 | for inch thread - standard:                |   |   |   |   |   |   |   | 1 |   |         |
|                                 | for inch thread - option:                  |   |   |   |   |   |   |   | 7 |   |         |
|                                 | customer                                   |   |   |   |   |   |   |   | 9 |   | consult |
| Filling fluid                   |                                            |   |   |   |   |   |   |   |   |   |         |
|                                 | silicone oil                               |   |   |   |   |   |   |   | 1 |   |         |
|                                 | food compatible oil (FDA)                  |   |   |   |   |   |   |   | 2 |   |         |
|                                 | customer                                   |   |   |   |   |   |   |   | 9 |   | consult |
| Special version                 |                                            |   |   |   |   |   |   |   |   |   |         |
|                                 | standard                                   |   |   |   |   |   |   |   | 0 | 3 | P       |
|                                 | with cooling element up to 300°C           |   |   |   |   |   |   |   | 2 | 3 | P       |
|                                 | customer                                   |   |   |   |   |   |   |   | 9 | 9 | 9       |
|                                 |                                            |   |   |   |   |   |   |   |   |   | consult |

<sup>1</sup> absolute pressure possible from 0.4 bar

Varivent® is a brand name of GEA Tuchenhausen GmbH