

DCT 531

Industrial Pressure Transmitter with RS485 Modbus RTU

Stainless Steel Sensor

accuracy according to IEC 60770:
standard: 0.35 % FSO
option: 0.25 % FSO



Nominal pressure

from 0 ... 100 mbar up to 0 ... 400 bar

output signal

RS485 with Modbus RTU protocol

Special characteristic

- ▶ perfect thermal behaviour
- ▶ excellent long term stability

Optional versions

- ▶ pressure port
G 1/2" flush up to max. 40 bar
- ▶ pressure sensor welded
- ▶ customer specific versions

The DCT 531 with RS485 interface uses the communication protocol Modbus RTU which has found the way in industrial communication as an open protocol. The Modbus protocol is based on a master Slave architecture with which up to 247 Slaves can be questioned by a master – the data will transfer in binary form.

Due to the usage of high quality materials and components, the DCT 531 is suitable for almost every industrial application, if medium is compatible with stainless steel 316L.

The modular concept of the pressure transmitter allows customized electrical or mechanical connections, so it is easy to adapt the DCT 531 to different conditions on-site.

Preferred areas of use are



Plant and Machine Engineering



Energy Industry



| Input pressure range | | | | | | | | | | | | | |
|--|--|-----------------|------|------|------|--------------|------|------|------|-----------------|----|----|--|
| 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 abs. | [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 | 60 | 100 | 160 | 250 | 400 | | | |
| Overpressure | [bar] | 40 | 80 | 80 | 105 | 210 | 600 | 600 | 1000 | 1000 | | | |
| Burst pressure ≥ | [bar] | 50 | 120 | 120 | 210 | 420 | 1000 | 1000 | 1250 | 1250 | | | |
| Vacuum resistance | $P_N \geq 1$ bar: unlimited vacuum resistance $P_N < 1$ bar: on request | | | | | | | | | | | | |
| Output signal | | | | | | | | | | | | | |
| Digital (pressure) | RS 485 with Modbus RTU protocol | | | | | | | | | | | | |
| Supply | | | | | | | | | | | | | |
| Direct current | $V_S = 9 \dots 32 V_{DC}$ | | | | | | | | | | | | |
| Performance | | | | | | | | | | | | | |
| Accuracy ¹ | standard for $P_N \geq 0.4$ bar: $\leq \pm 0.35$ % FSO standard for $P_N < 0.4$ bar: $\leq \pm 0.5$ % FSO option for $P_N \geq 0.4$ bar: $\leq \pm 0.25$ % FSO | | | | | | | | | | | | |
| Long term stability | $\leq \pm 0.1$ % FSO / year at reference conditions | | | | | | | | | | | | |
| Measuring rate | 500 Hz | | | | | | | | | | | | |
| ¹ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability) | | | | | | | | | | | | | |
| Thermal effects (Offset and Span) | | | | | | | | | | | | | |
| Nominal pressure P_N | [bar] | -1 ... 0 | | | | < 0.40 | | | | ≥ 0.40 | | | |
| Tolerance band | [% FSO] | $\leq \pm 0.75$ | | | | $\leq \pm 1$ | | | | $\leq \pm 0.75$ | | | |
| in compensated range | [°C] | -20 ... 85 | | | | 0 ... 70 | | | | -20 ... 85 | | | |
| Permissible temperatures | | | | | | | | | | | | | |
| Permissible temperatures | medium: -25 ... 125 °C electronics / environment: -25 ... 85 °C storage: -40 ... 85 °C | | | | | | | | | | | | |
| Electrical protection | | | | | | | | | | | | | |
| Short-circuit protection | permanent | | | | | | | | | | | | |
| Reverse polarity protection | by exchanged supply connections no damage, but also no function | | | | | | | | | | | | |
| Electromagnetic compatibility | emission and immunity according to EN 61326 | | | | | | | | | | | | |
| Mechanical stability | | | | | | | | | | | | | |
| Vibration | 10 g RMS (25 ... 2000 Hz) according to DIN EN 60068-2-6 | | | | | | | | | | | | |
| Shock | 500 g / 1 msec according to DIN EN 60068-2-27 | | | | | | | | | | | | |
| Materials | | | | | | | | | | | | | |
| Pressure port / housing | stainless steel 1.4404 (316 L) | | | | | | | | | | | | |
| Seals (media wetted) | standard: FKM options: EPDM welded version ² (for $P_N \leq 40$ bar) others on request | | | | | | | | | | | | |
| Diaphragm | stainless steel 1.4435 (316 L) | | | | | | | | | | | | |
| Media wetted parts | pressure port, seal, diaphragm | | | | | | | | | | | | |
| ² welded version only with pressure ports according to EN 837, $P_N \leq 40$ bar | | | | | | | | | | | | | |
| Miscellaneous | | | | | | | | | | | | | |
| Current consumption | typ. 7 mA | | | | | | | | | | | | |
| Weight | approx. 210 g | | | | | | | | | | | | |
| Installation position | any ³ | | | | | | | | | | | | |
| Operational life | > 100 x 10 ⁶ pressure cycles | | | | | | | | | | | | |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁴ | | | | | | | | | | | | |
| ³ Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges $P_N \leq 1$ bar. | | | | | | | | | | | | | |
| ⁴ This directive is only valid for devices with maximum permissible overpressure > 200 bar | | | | | | | | | | | | | |

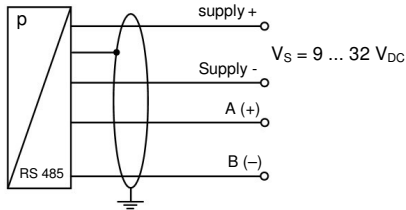
DCT 531

Industrial Pressure Transmitter with RS485 Modbus RTU

Technical Data

Wiring diagrams

RS 485 / Modbus RTU

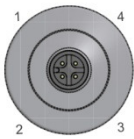
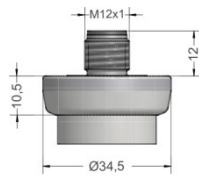


Pin configuration

| Electrical connection | M12x1 / metal (4-pin) | Binder 723 (5-pin) | cable colour (IEC 60757) |
|-----------------------|-----------------------|--------------------|--------------------------|
| Supply + | 1 | 3 | wh (white) |
| Supply - | 3 | 4 | bn (brown) |
| A + | 2 | 1 | gn (green) |
| B - | 4 | 2 | ye (yellow) |
| Shield | Pressure port | 5 | gnye (green-yellow) |

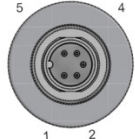
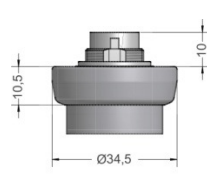
Electrical connections (dimensions in mm)

standard

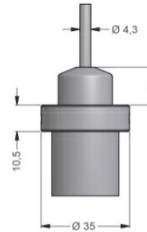


M12x1 4-pin (IP 67)

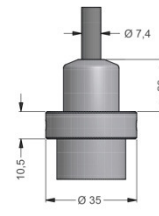
option



Binder Series 723 5-pin (IP 67)



cable outlet with PVC cable (IP 67)⁵ (on request)



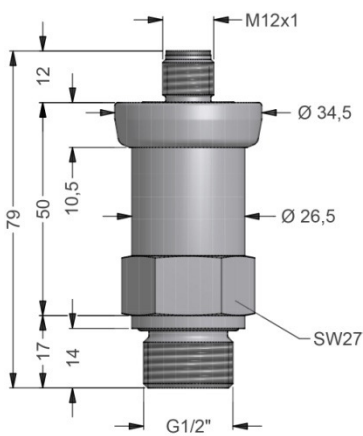
cable outlet, cable with ventilation tube (IP 68)⁶ (on request)

⁵ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)

⁶ different cable types and lengths available, permissible temperature depends on kind of cable

Mechanical connections (dimensions in mm)

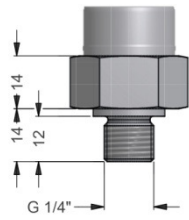
standard



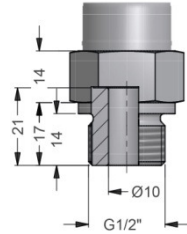
G1/2" DIN 3852 with M12x1

Mechanical connections (dimensions in mm)

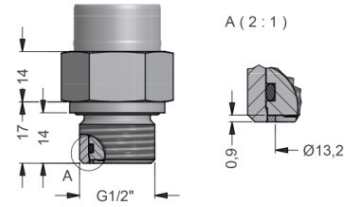
option



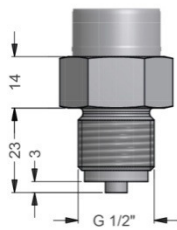
G1/4" DIN 3852



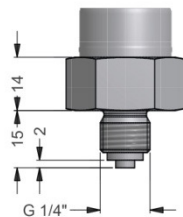
G1/2" DIN 3852 open port,
P_N ≤ 40 bar



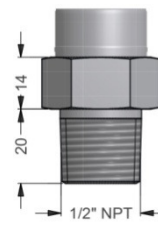
G1/2" DIN 3852
with flush sensor, P_N ≤ 40 bar



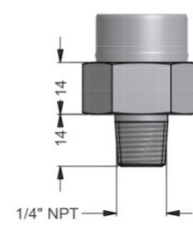
G1/2" EN 837



G1/4" EN 837



1/2" NPT



1/4" NPT

⇒ metric threads and other versions on request

| Configuration Modbus RTU | | | | | |
|--------------------------|-----|---|---|---|---|
| Standard configuration | 001 | - | 1 | - | 1 |
| Address | | | | | |
| address | 001 | | | | |
| | ... | | | | |
| | 247 | | | | |
| Baud Rate | | | | | |
| 4800 Bd | | | 0 | | |
| 9600 Bd | | | 1 | | |
| 19200 Bd | | | 2 | | |
| 38400 Bd | | | 3 | | |
| Parity | | | | | |
| None | | | | | 0 |
| Odd | | | | | 1 |
| Even | | | | | 2 |

© 2017 BD/SENSORS GmbH – The specifications given in this document represent the state of engineering at the time of publishing. We reserve the right to make modifications to the specifications and materials.

Ordering code DCT 531

DCT 531



| | | | | | | | | | | |
|------------------------------|--|---|---|--------|---|---|----|---|---|---------|
| Pressure | | | | | | | | | | |
| | gauge | D | C | 7 | | | | | | |
| | absolute ¹ | D | C | 8 | | | | | | |
| Input | | | | | | | | | | |
| | [bar] | | | | | | | | | |
| | 0.1 ¹ | | | 1 | 0 | 0 | 0 | | | |
| | 0.16 ¹ | | | 1 | 6 | 0 | 0 | | | |
| | 0.25 ¹ | | | 2 | 5 | 0 | 0 | | | |
| | 0.4 | | | 4 | 0 | 0 | 0 | | | |
| | 0.6 | | | 6 | 0 | 0 | 0 | | | |
| | 1 | | | 1 | 0 | 0 | 1 | | | |
| | 1.6 | | | 1 | 6 | 0 | 1 | | | |
| | 2.5 | | | 2 | 5 | 0 | 1 | | | |
| | 4 | | | 4 | 0 | 0 | 1 | | | |
| | 6 | | | 6 | 0 | 0 | 1 | | | |
| | 10 | | | 1 | 0 | 0 | 2 | | | |
| | 16 | | | 1 | 6 | 0 | 2 | | | |
| | 25 | | | 2 | 5 | 0 | 2 | | | |
| | 40 | | | 4 | 0 | 0 | 2 | | | |
| | 60 | | | 6 | 0 | 0 | 2 | | | |
| | 100 | | | 1 | 0 | 0 | 3 | | | |
| | 160 | | | 1 | 6 | 0 | 3 | | | |
| | 250 | | | 2 | 5 | 0 | 3 | | | |
| | 400 | | | 4 | 0 | 0 | 3 | | | |
| | -1 ... 0 | | | X | 1 | 0 | 2 | | | |
| | customer | | | 9 | 9 | 9 | 9 | | | consult |
| Output | | | | | | | | | | |
| | Modbus RTU | | | | | | L5 | | | |
| Accuracy | | | | | | | | | | |
| | standard for P _N ≥ 0.4 bar | | | 0.35 % | | | | 3 | | |
| | standard for P _N < 0.4 bar | | | 0.5 % | | | | 5 | | |
| | option for P _N ≥ 0.4 bar | | | 0.25 % | | | | 2 | | |
| | | | | 0.1 % | | | | 1 | | consult |
| | customer | | | | | | | 9 | | consult |
| Electrical connection | | | | | | | | | | |
| | Male plug M12x1 (4-pin) / metal | | | | | | | M | 1 | 3 |
| | Male plug Binder series 723 (5-pin) | | | | | | | 2 | 0 | 7 |
| | Cable outlet with PVC cable ² | | | | | | | T | A | 0 |
| | Cable outlet (IP68) ³ | | | | | | | T | R | 0 |
| | customer | | | | | | | 9 | 9 | 9 |
| | | | | | | | | | | consult |
| Mechanical connection | | | | | | | | | | |
| | G1/2" DIN 3852 | | | | | | | 1 | 0 | 0 |
| | G1/2" EN 837 | | | | | | | 2 | 0 | 0 |
| | G1/4" DIN 3852 | | | | | | | 3 | 0 | 0 |
| | G1/4" EN 837 | | | | | | | 4 | 0 | 0 |
| | G1/2" DIN 3852 with flush sensor ⁴ | | | | | | | F | 0 | 0 |
| | G1/2" DIN 3852 open pressure port ⁴ | | | | | | | H | 0 | 0 |
| | 1/2" NPT | | | | | | | N | 0 | 0 |
| | 1/4" NPT | | | | | | | N | 4 | 0 |
| | customer | | | | | | | 9 | 9 | 9 |
| | | | | | | | | | | consult |
| Seals | | | | | | | | | | |
| | FKM | | | | | | | 1 | | |
| | EPDM | | | | | | | 3 | | |
| | without (welded version) ⁵ | | | | | | | 2 | | consult |
| | customer | | | | | | | 9 | | consult |
| Special version | | | | | | | | | | |
| | standard | | | | | | | 0 | 0 | 0 |
| | customer | | | | | | | 9 | 9 | 9 |
| | | | | | | | | | | consult |

¹ absolute pressure possible from 0.4 bar

² standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C), others on request

³ cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable

⁴ not possible for nominal pressure P_N > 40 bar

⁵ welded version only with pressure ports according to EN 837, possible for P_N ≤ 40 bar

