

DCT 531

Industrial Pressure Transmitter with RS485 Modbus RTU

Stainless Steel Sensor

accuracy according to IEC 60770:
standard: 0.35 % FSO
option: 0.25 % / 0.1 % 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
- ▶ reset function

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 the medium is compatible with stainless steel 316L.

The modular concept of the device allows customized electrical or mechanical connections, so it is easy to adapt the pressure transmitter 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 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 \geq | [bar] | 7.5 | 1.5 | 1.5 | 1.5 | 3 | 7.5 | 7.5 | 15 | 15 | 25 | 50 |

| | | | | | | | | | | | |
|-----------------------------------|-------|---|-----|-----|-----|-----|---------------------------|------|------|------|--|
| Nominal pressure gauge / absolute | [bar] | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | |
| Overpressure | [bar] | 40 | 80 | 80 | 105 | 210 | 600 | 600 | 1000 | 1000 | |
| Burst pressure \geq | [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 nominal pressure ≥ 0.4 bar: $\leq \pm 0.35$ % FSO for nominal pressure < 0.4 bar: $\leq \pm 0.50$ % FSO option 1 for nominal pressure ≥ 0.4 bar: $\leq \pm 0.25$ % FSO option 2: for all nominal pressure ranges: $\leq \pm 0.10$ % FSO |
| Long term stability | $\leq \pm 0.1$ % FSO / year at reference conditions |
| Measuring rate | 500 Hz |
| Delay time | 500 msec |

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 | 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 | 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 | |
|-----------------------|---|
| Weight | approx. 210 g |
| Current consumption | typ. 7 mA |
| Operational life | 100 million load cycles |
| Installation position | any ³ |
| 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

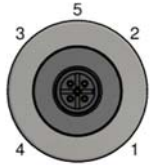


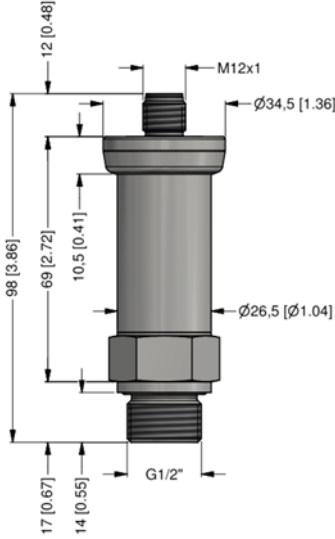
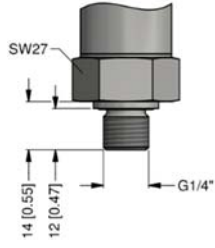
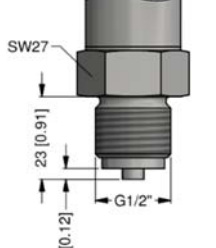
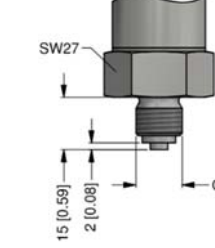
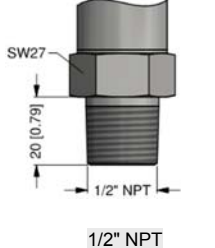
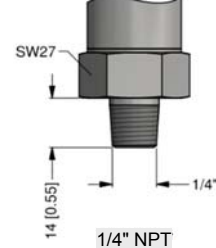
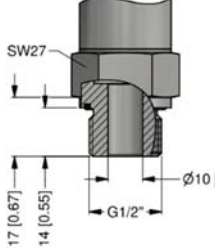
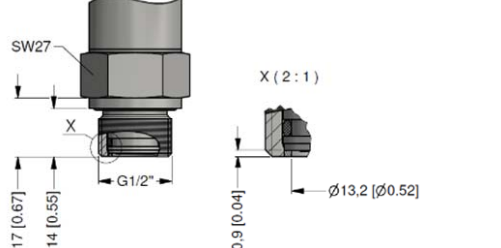
DCT 531

Industrial Pressure Transmitter with RS485 Modbus RTU

Technical Data

| Pin configuration | | | |
|-----------------------|--|----------------------|--|
| Electrical connection | | M12x1, metal (5-pin) | |
| Supply + | | 1 | |
| Supply - | | 3 | |
| A (+) | | 2 | |
| B (-) | | 4 | |
| Reset | | 5 | |
| Shield | | plug housing | |



| Dimensions (mm / in) | |
|--|---|
| <p>standard</p>  <p>G1/2" DIN 3852 with M12x1</p> | <p>options</p> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;">  <p>G1/4" DIN 3852</p> </div> <div style="width: 50%;">  <p>G1/2" EN 837</p> </div> <div style="width: 50%;">  <p>G1/4" EN 837</p> </div> <div style="width: 50%;">  <p>1/2" NPT</p> </div> <div style="width: 50%;">  <p>1/4" NPT</p> </div> <div style="width: 50%;">  <p>G1/2" DIN 3852 open port (p_N ≤ 40 bar)</p> </div> <div style="width: 50%;">  <p>G1/2" DIN 3852 with semi-flush sensor (p_N ≤ 40 bar)</p> </div> </div> |

⇒ 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 |
| Configuration code (to specify with order) | | | | | |
| | | - | | - | |

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BDSENSORS
 pressure measurement

DCT531_E_260220

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Ordering code DCT 531

DCT 531



| Pressure | | D | C | 7 | | | | | | | | | | | | | | | | |
|-----------------------|--|------------|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|---------|
| | gauge | D | C | 7 | | | | | | | | | | | | | | | | |
| | absolute ¹ | D | C | 8 | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | |
| | 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 | | | | | | | | | | | | | | | | | | | | |
| | RS485 Modbus RTU | | | | | | | | L | 5 | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | | | | | | | | | |
| | standard for p _N ≥ 0.4 bar: | 0.35 % FSO | | | | | | | | | | | | | | | | | | 3 |
| | standard for p _N < 0.4 bar: | 0.50 % FSO | | | | | | | | | | | | | | | | | | 5 |
| | option 1 for p _N ≥ 0.4 bar: | 0.25 % FSO | | | | | | | | | | | | | | | | | | 2 |
| | option 2: | 0.10 % FSO | | | | | | | | | | | | | | | | | | 1 |
| | customer | | | | | | | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | | | | | | | consult |
| Electrical connection | | | | | | | | | | | | | | | | | | | | |
| | male plug M12x1 (5-pin) / metal | | | | | | | | | | | | | | | | | | | N |
| | customer | | | | | | | | | | | | | | | | | | | 1 |
| | | | | | | | | | | | | | | | | | | | | 1 |
| | | | | | | | | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | | | | | | | consult |
| Mechanical connection | | | | | | | | | | | | | | | | | | | | |
| | G1/2" DIN 3852 | | | | | | | | | | | | | | | | | | | 1 |
| | G1/2" EN 837 | | | | | | | | | | | | | | | | | | | 2 |
| | G1/4" DIN 3852 | | | | | | | | | | | | | | | | | | | 3 |
| | G1/4" EN 837 | | | | | | | | | | | | | | | | | | | 4 |
| | G1/2" DIN 3852 | | | | | | | | | | | | | | | | | | | F |
| | with semi-flush sensor ² | | | | | | | | | | | | | | | | | | | 0 |
| | G1/2" DIN 3852 open pressure port ² | | | | | | | | | | | | | | | | | | | H |
| | 1/2" NPT | | | | | | | | | | | | | | | | | | | N |
| | 1/4" NPT | | | | | | | | | | | | | | | | | | | N |
| | customer | | | | | | | | | | | | | | | | | | | 4 |
| | | | | | | | | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | | | | | | | consult |
| Seals | | | | | | | | | | | | | | | | | | | | |
| | FKM | | | | | | | | | | | | | | | | | | | 1 |
| | EPDM | | | | | | | | | | | | | | | | | | | 3 |
| | without (welded version) ³ | | | | | | | | | | | | | | | | | | | 2 |
| | customer | | | | | | | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | | | | | | | consult |
| | | | | | | | | | | | | | | | | | | | | consult |
| Special version | | | | | | | | | | | | | | | | | | | | |
| | standard | | | | | | | | | | | | | | | | | | | 0 |
| | customer | | | | | | | | | | | | | | | | | | | 0 |
| | | | | | | | | | | | | | | | | | | | | 0 |
| | | | | | | | | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | | | | | | | consult |

¹ absolute pressure possible from 0.4 bar
² not possible for nominal pressure p_N > 40 bar
³ welded version only with pressure ports according to EN 837, possible for p_N ≤ 40 bar

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