# DCT 531i

## Precision Pressure Transmitter with RS485 Modbus RTU

Stainless Steel Sensor

accuracy according to IEC 60770:
0.1 % FSO

### Nominal pressure

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

### Output signal

RS485 with Modbus RTU protocol

### Special characteristics

- transfer of pressure and temperature value
- 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 531i is characterized by very good accuracy and excellent temperature behaviour and is therefore ideally suited for applications where precise pressure measurement is necessary (e.g. test benches, leakage tests, etc.).

Thanks to the integrated RS485 interface (based on the MODBUS RTU protocol), reliable and robust data transmission is available, which also works without problems over longer distances. Since the DCT 531i works directly with a master e.g. is coupled to a SPS, conversion losses of an analogue input card are avoided.

Different mechanical and electrical connections are available so that the DCT 531i can be used in various applications without any problems.

### Preferred areas of use are

- Plant and machine engineering
- Energy industry

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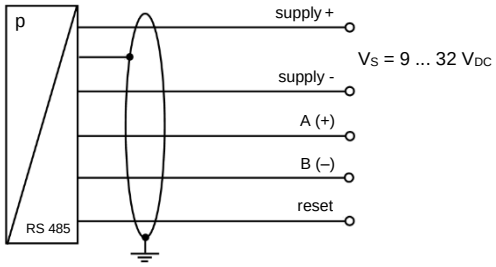
| **Input pressure range** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal pressure gauge | [bar] | -1…0 | 0.10 | 0.16 | 0.25 | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 |
| Nominal pressure absolute | [bar] | - | - | - | - | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 |
| Overpressure | [bar] | 5 | 0.5 | 1 | 1 | 2 | 5 | 5 | 10 | 10 | 20 | 40 |
| Burst pressure ≥ | [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 | | $p_N$ ≥ 1 bar: unlimited vacuum resistance | | | | $p_N$ < 1 bar: on request | | | | |

| **Output signal** | | |
|---|---|---|
| Digital | RS485 with Modbus RTU protocol (pressure & temperature) | |
| **Supply** | | |
| Direct voltage | $V_S$ = 9 … 32 $V_{DC}$ | |
| **Performance** | | |
| Accuracy [1] | ≤ ± 0.1 % FSO | |
| Long term stability | ≤ ± 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)** | | |
| Thermal error | ≤ ± 0.02 % FSO / 10 K | |
| In compensated range | -20 ... 80 °C | |
| **Permissible temperatures** | | |
| Medium | -25 ... 125 °C | |
| Electronics / environment | -25 ... 85 °C | |
| Storage | -40 ... 100 °C | |
| **Electrical protection** | | |
| Short-circuit protection | permanent | |
| Reverse polarity protection | on supply connections no damage, but also no function | |
| Electromagnetic compatibility | emission and immunity according to EN 61326 | |
| **Mechanical stability** | | |
| Vibration | 10 g RMS (20 ... 2000 Hz) | according to DIN EN 60068-2-6 |
| Shock | 100 g / 11 msec | according to DIN EN 60068-2-27 |
| **Materials** | | |
| Pressure port / housing | stainless steel 1.4404 (316 L) | |
| Seals | standard: FKM<br>option: EPDM<br>without [2] (welded version) | <br><br>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, $p_N$ ≤ 40 bar* | | |
| **Miscellaneous** | | |
| Weight | approx. 210 g | |
| Current consumption | max. 10 mA | |
| Ingress protection | IP 67 | |
| Installation position | any [3] | |
| Operational life | 100 million load cycles | |
| CE-conformity | EMC Directive: 2014/30/EU<br>Pressure Equipment Directive: 2014/68/EU (module A) [4] | |

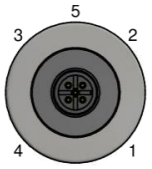
*[3] Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges $p_N$ ≤ 1 bar.*
*[4] This directive is only valid for devices with maximum permissible overpressure > 200 bar.*

## Wiring diagram



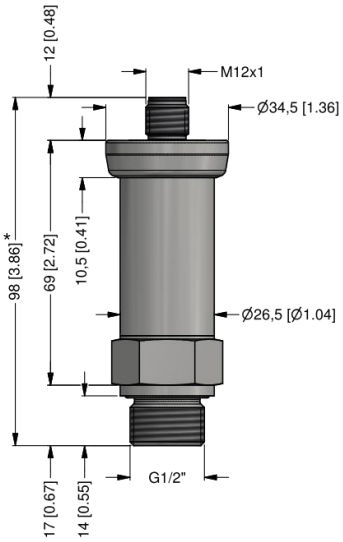

## Pin configuration / electrical connection

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



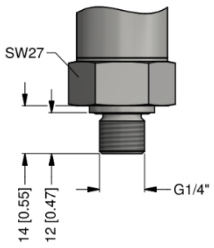

## Dimensions (mm / in)

**standard**

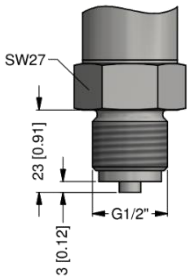



G1/2" DIN 3852
with M12x1

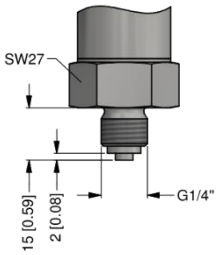
**options**



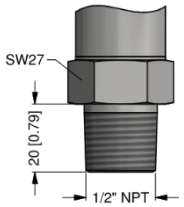

G1/4" DIN 3852



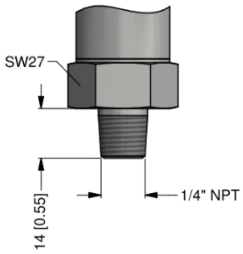

G1/2" EN 837



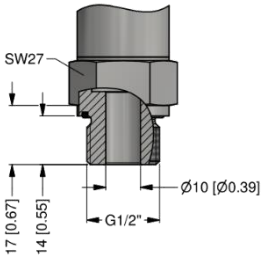

G1/4" EN 837



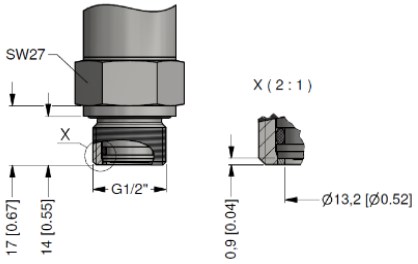

G1/2" NPT




G1/4" NPT




G1/2" DIN 3852
open port ($p_N$ ≤ 40 bar)




G1/2" DIN 3852 with
semi-flush sensor ($p_N$ ≤ 40 bar)

** with nominal pressure > 40 bar the length of devices increases by 9 mm [0.35 in]*

⇨ **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**<br>(to specify with order) | | - | | - | |





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BD|SENSORS pressure measurement

# Ordering code DCT 531i

DCT 531i □□□-□□□□-□□-□-□□□-□□□-□-□-□□□

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pressure** | | | | | | | | | | | | | | | | | | | | | |
| gauge | | D | C | 7 | | | | | | | | | | | | | | | | | |
| absolute | | 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** | | | | | | | | | | | | | | | | | | | | | |
| 0.1 % FSO | | | | | | | | | | | 1 | | | | | | | | | | |
| customer | | | | | | | | | | | 9 | | | | | | | | | | consult |
| **Electrical connection** | | | | | | | | | | | | | | | | | | | | | |
| male plug M12x1 (5-pin) / metal | | | | | | | | | | | | N | 1 | 1 | | | | | | | |
| 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 semi-flush sensor | [2] | | | | | | | | | | | | | | F | 0 | 0 | | | | |
| G1/2" DIN 3852 open pressure port | [2] | | | | | | | | | | | | | | H | 0 | 0 | | | | |
| 1/2" NPT | | | | | | | | | | | | | | | N | 0 | 0 | | | | |
| 1/4" NPT | | | | | | | | | | | | | | | N | 4 | 0 | | | | |
| customer | | | | | | | | | | | | | | | 9 | 9 | 9 | | | | consult |
| **Seal** | | | | | | | | | | | | | | | | | | | | | |
| FKM | | | | | | | | | | | | | | | | | | 1 | | | |
| EPDM | | | | | | | | | | | | | | | | | | 3 | | | |
| without (welded version) | [3] | | | | | | | | | | | | | | | | | 2 | | | consult |
| customer | | | | | | | | | | | | | | | | | | 9 | | | consult |
| **Special version** | | | | | | | | | | | | | | | | | | | | | |
| standard | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 |
| customer | | | | | | | | | | | | | | | | | | | 9 | 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 $p_N \leq 40$ bar

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