

DCL 571

Stainless Steel Probe with RS485 Modbus RTU

Ceramic Sensor

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



Nominal pressure

from 0 ... 1 mH₂O up to 0 ... 100 mH₂O

Output signal

RS485 with Modbus RTU protocol

Special characteristics

- ▶ diameter 22 mm
- ▶ good long term stability
- ▶ especially for waste water

Optional versions

- ▶ accuracy: 0.25 % FSO
- ▶ drinking water certificate according to DVGW and KTW

The stainless steel probe DCL 571 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.

The probe was developed for level measurement in waste water, sludge or water courses. The mechanical robustness of the flush ceramic diaphragm facilitates an easy disassembly and cleaning of the probe in case of service.

Compared to the level probe DCL 551 the outside-diameter is only 22 mm, which allows an easy installation and back fitting in 1" tubes or in cramped fitting conditions.

Preferred areas of use



Water

groundwater and level monitoring



Sewage

waste water treatment, water recycling



Fuel and oil

tank battery, biogas plants



Modbus®

| Input pressure range | | | | | | | | | | | | |
|--|---------------------|---|------|------|-----|-----|----|-----|-----|----|----|-----|
| Nominal pressure gauge | [bar] | 0.1 | 0.16 | 0.25 | 0.4 | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 |
| Level | [mH ₂ O] | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 |
| Overpressure | [bar] | 3 | 4 | 5 | 5 | 7 | 7 | 12 | 20 | 20 | 20 | 20 |
| Max. ambient pressure (housing): 40 bar | | | | | | | | | | | | |
| Output signal | | Digital (pressure and temperature) RS485 with Modbus RTU protocol | | | | | | | | | | |
| Supply | | Direct current V _s = 9 ... 32 V _{DC} | | | | | | | | | | |
| Performance | | Accuracy ¹ standard: ≤ ± 0.35 % FSO option: ≤ ± 0.25 % FSO others on request | | | | | | | | | | |
| Long term stability | | ≤ ± 0.1 % FSO / year | | | | | | | | | | |
| 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) | | Tolerance band ≤ ± 1 % FSO in compensated range -20 ... 80 °C | | | | | | | | | | |
| Permissible temperatures | | Permissible temperatures medium / storage: -25 ... 85 °C | | | | | | | | | | |
| Electrical protection ² | | Short-circuit protection permanent Reverse polarity protection no damage, but also no function Electromagnetic compatibility emission and immunity according to EN 61326 | | | | | | | | | | |
| ² additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on request | | | | | | | | | | | | |
| Electrical connection | | Cable with sheath material ³ TPE-U (-10 ... 70 °C) blue Ø 7.4 mm (with drinking water approval) Cable capacitance signal line/shield also signal line/signal line: 160 pF/m Cable inductance signal line/shield also signal line/signal line: 1 µH/m Bending radius static installation: 10-fold cable diameter dynamic application: 20-fold cable diameter | | | | | | | | | | |
| ³ shielded cable with integrated ventilation tube for atmospheric pressure reference | | | | | | | | | | | | |
| Materials (media wetted) | | Housing stainless steel 1.4404 (316 L) others on request Cable TPE-U, blue (with drinking water approval) others on request Seals (O-rings) EPDM (with drinking water approval) others on request Diaphragm ceramics Al ₂ O ₃ 99,9 % Protection cap POM-C Cable sheath TPE-U | | | | | | | | | | |
| Miscellaneous | | Drinking water certificate ⁴ according to DVGW W 270 and UBA KTW (with order the indication "with drinking water certificate" is necessary) Adjustable units pressure: mmH ₂ O, mmHg, psi, bar, mbar, g/cm ² , kg/cm ² , Pa, kPa, torr, atm, mH ₂ O, MPa Read out serial number, date of calibration, min- and max-value for pressure Current consumption max. 10 mA Weight approx. 180 g (without cable) Ingress protection IP 68 CE-conformity EMC Directive: 2014/30/EU | | | | | | | | | | |
| ⁴ only possible with EPDM seal in combination with TPE-U cable | | | | | | | | | | | | |
| Wiring diagram | | <p>RS485 / Modbus RTU</p> | | | | | | | | | | |

DCL 571

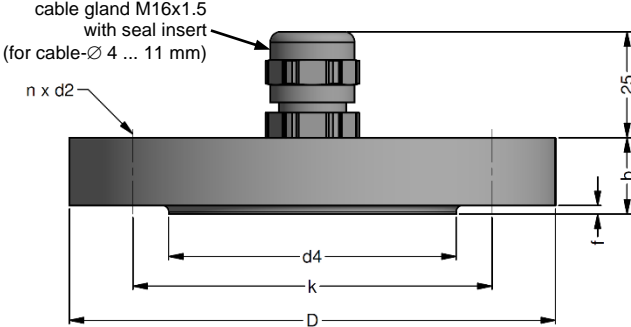
Stainless Steel Probe with RS485 Modbus RTU

Technical Data

| Pin configuration | |
|-----------------------|---------------------------|
| Electrical connection | cable colours (IEC 60757) |
| Supply + | WH (white) |
| Supply - | BN (brown) |
| A + | GN (green) |
| B - | YE (yellow) |
| Shield | GNYE (green-yellow) |
| Dimensions (mm / in) | |
| | |

| 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) | | | | | |
| | | - | | - | |

Mounting flange with cable gland




| dimensions in mm | | | |
|------------------|-------------|-------------|-------------|
| size | DN25 / PN40 | DN50 / PN40 | DN80 / PN16 |
| b | 18 | 20 | 20 |
| D | 115 | 165 | 200 |
| d2 | 14 | 18 | 18 |
| d4 | 68 | 102 | 138 |
| f | 2 | 3 | 3 |
| k | 85 | 125 | 160 |
| n | 4 | 4 | 8 |

Technical data

| | | | |
|-------------------------|---|--|--|
| Suitable for | all probes | | |
| Flange material | stainless steel 1.4404 (316L) | | |
| Material of cable gland | standard: brass, nickel plated on request: stainless steel 1.4305 (303); plastic | | |
| Seal insert | material: TPE (ingress protection IP 68) | | |
| Hole pattern | according to DIN 2507 | | |

| Ordering type | Ordering code | Weight |
|---|---------------|--------|
| DN25 / PN40 with cable gland brass, nickel plated | ZMF2540 | 1.4 kg |
| DN50 / PN40 with cable gland brass, nickel plated | ZMF5040 | 3.2 kg |
| DN80 / PN16 with cable gland brass, nickel plated | ZMF8016 | 4.8 kg |

Terminal clamp



Technical data

| | | | |
|---|--|--|--|
| Suitable for | all probes with cable Ø 5.5 ... 10.5 mm | | |
| Material of housing | standard: steel, zinc plated optionally: stainless steel 1.4301 (304) | | |
| Material of clamping jaws and positioning clips | PA (fibre-glass reinforced) | | |
| Dimensions (mm) | 174 x 45 x 32 | | |
| Hook diameter | 20 mm | | |

| Ordering type | Ordering code | Weight |
|--|---------------|---------------|
| Terminal clamp, steel, zinc plated | Z100528 | approx. 160 g |
| Terminal clamp, stainless steel 1.4301 (304) | Z100527 | |

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Ordering code DCL 571

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| | | | | | | | | | | | | |
|------------------------------|--|------|---|---|---|---|---|----|---|---|---|---------|
| Pressure | | | | | | | | | | | | |
| | gauge in bar | 3 | 6 | 0 | | | | | | | | |
| | gauge in mH ₂ O | 3 | 6 | 1 | | | | | | | | |
| Input | | | | | | | | | | | | |
| | [mH ₂ O] | | | | | | | | | | | |
| | [bar] | | | | | | | | | | | |
| | 1.0 | 0.10 | 1 | 0 | 0 | 0 | | | | | | |
| | 1.6 | 0.16 | 1 | 6 | 0 | 0 | | | | | | |
| | 2.5 | 0.25 | 2 | 5 | 0 | 0 | | | | | | |
| | 4.0 | 0.40 | 4 | 0 | 0 | 0 | | | | | | |
| | 6.0 | 0.60 | 6 | 0 | 0 | 0 | | | | | | |
| | 10 | 1.0 | 1 | 0 | 0 | 1 | | | | | | |
| | 16 | 1.6 | 1 | 6 | 0 | 1 | | | | | | |
| | 25 | 2.5 | 2 | 5 | 0 | 1 | | | | | | |
| | 40 | 4.0 | 4 | 0 | 0 | 1 | | | | | | |
| | 60 | 6.0 | 6 | 0 | 0 | 1 | | | | | | |
| | 100 | 10 | 1 | 0 | 0 | 2 | | | | | | |
| | customer | | 9 | 9 | 9 | 9 | | | | | | consult |
| Housing | | | | | | | | | | | | |
| | stainless steel 1.4404 (316L) | | | | | | 1 | | | | | |
| | customer | | | | | | 9 | | | | | consult |
| Design | | | | | | | | | | | | |
| | probe | | | | | | 1 | | | | | |
| Diaphragm | | | | | | | | | | | | |
| | ceramics Al ₂ O ₃ 99.9 % | | | | | | | C | | | | |
| | customer | | | | | | | 9 | | | | consult |
| Output | | | | | | | | | | | | |
| | RS485 Modbus RTU | | | | | | | L5 | | | | |
| | customer | | | | | | | 9 | | | | consult |
| Seals | | | | | | | | | | | | |
| DVGW / KTW: | EPDM ¹ | | | | | | | 3T | | | | |
| | customer | | | | | | | 9 | | | | consult |
| Electrical connection | | | | | | | | | | | | |
| DVGW / KTW: | TPE-U-cable (blue, Ø 7.4 mm) ^{1,2} | | | | | | | | F | | | |
| | customer | | | | | | | | 9 | | | consult |
| Accuracy | | | | | | | | | | | | |
| standard | 0.35 % FSO | | | | | | | | 3 | | | |
| option | 0.25 % FSO | | | | | | | | 2 | | | |
| | customer | | | | | | | | 9 | | | consult |
| Cable length | | | | | | | | | | | | |
| | in m | | | | | | | | | 9 | 9 | 9 |
| Special version | | | | | | | | | | | | |
| | standard | | | | | | | | | 0 | 0 | 0 |
| | customer | | | | | | | | | 9 | 9 | 9 |
| | | | | | | | | | | | | consult |

¹ drinking water certification only possible with EPDM seal (code 3T) in combination with TPE-U cable (code F)

² shielded cable with integrated ventilation tube for atmospheric pressure reference