

DCL 551



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 ... 40 cmH₂O up to 0 ... 200 mH₂O

Output signal

RS485 with Modbus RTU protocol

Special characteristics

- ▶ diameter 39.5 mm
- ▶ excellent long term stability
- ▶ especially for sewage,
viscous and pasty media

Optional version

- ▶ diaphragm ceramics Al₂O₃ 99,9%

The stainless steel probe DCL 551 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 are transferred in binary form.

DCL 551 has been designed for hydrostatic level measurement in sewage as well as for viscous and pasty media.

Basic element is a robust and high overpressure capable capacitive ceramic sensor.

Preferred areas of use are



Sewage

waste water treatment
water recycling



Fuel and oil

level monitoring in open tanks
with low filling heights
fuel storage
tank farms / biogas plants



Modbus®

DCL 551

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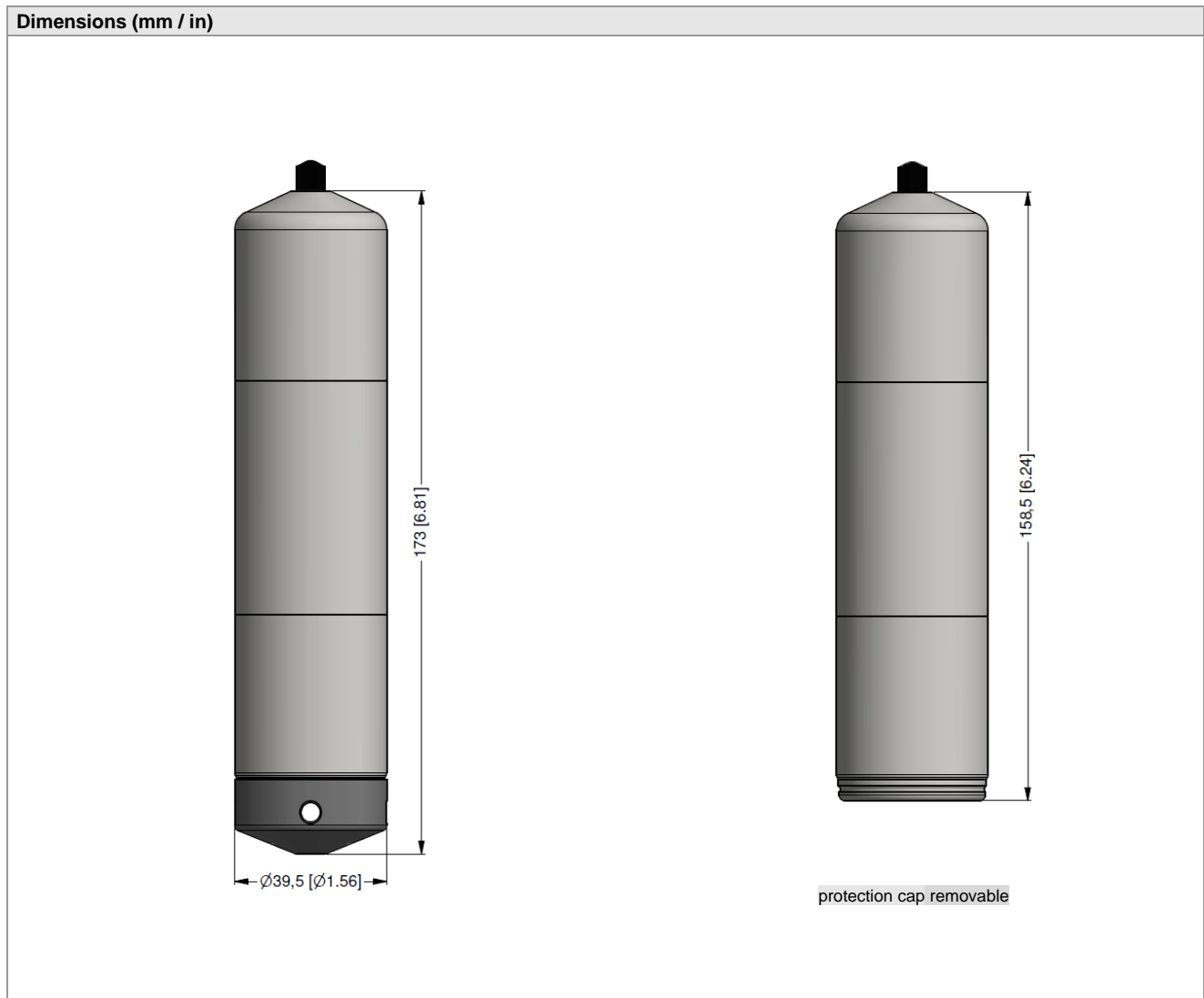
Technical Data

Input pressure range																	
Nominal pressure gauge	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20	
Level	[mH ₂ O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200	
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45	
Max. ambient pressure (housing): 40 bar																	
Output signal		Digital (pressure and temperature) RS485 with Modbus RTU protocol															
Supply		Direct current $V_s = 9 \dots 32 V_{DC}$															
Performance		Accuracy ¹ standard: $\leq \pm 0.35 \% \text{ FSO}$ option: $\leq \pm 0.25 \% \text{ FSO}$															
Long term stability		$\leq \pm 0.1 \% \text{ FSO / year}$ 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)		Tolerance band $\leq \pm 1 \% \text{ FSO}$															
in compensated range		-20 ... 80 °C															
Permissible temperatures		Permissible temperatures medium / storage: -25 ... 125 °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 PUR (-25 ... 70 °C) black $\varnothing 7.4 \text{ mm}$															
Cable capacitance		signal line/shield also signal line/signal line: 160 pF/m															
Cable inductance		signal line/shield also signal line/signal line: 1 $\mu\text{H/m}$															
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)															
Seals		FKM others on request															
Diaphragm		standard: ceramics Al ₂ O ₃ 96 % option: ceramics Al ₂ O ₃ 99.9 %															
Protection cap		POM-C															
Cable sheath		PUR															
Miscellaneous		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. 400 g (without cable)															
Ingress protection		IP 68															
CE-conformity		EMC Directive: 2014/30/EU															
Wiring diagram																	
Pin configuration		Electrical connection cable colours (IEC 60757)															
Supply +		WH (white)															
Supply -		BN (brown)															
A +		GN (green)															
B -		YE (yellow)															
Shield		GNYE (green yellow)															

DCL 551

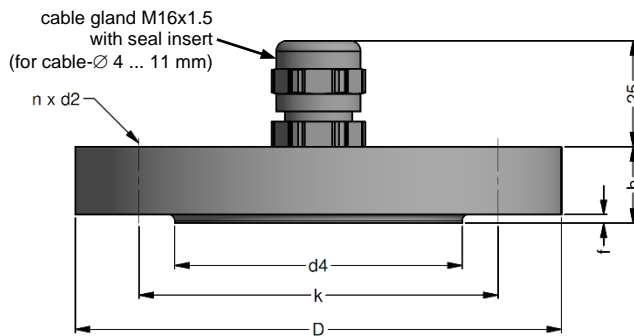
Stainless Steel Probe with RS485 Modbus RTU

Technical Data



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 551

DCL 551

[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
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Pressure		in bar	5	6	5	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
		in mH ₂ O	5	6	6	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
Input	[mH ₂ O]	[bar]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	0.4	0.04	0	4	0	0	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	0.6	0.06	0	6	0	0	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	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	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	160	16	1	6	0	2	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	200	20	2	0	0	2	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
		customer	9	9	9	9	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	consult
Housing			[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	stainless steel 1.4404 (316L)		1	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	customer		9	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	consult
Diaphragm			[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	ceramics Al ₂ O ₃ 96%		2	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	ceramics Al ₂ O ₃ 99.9%		C	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	customer		9	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	consult
Digital output			[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	RS485 Modbus RTU		L5	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
Seals			[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	FKM		1	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	customer		9	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	consult
Electrical connection			[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	PUR-cable (black, Ø 7.4 mm) ¹		2	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]	[]
	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 shielded cable with integrated ventilation tube for atmospheric pressure reference