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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 cmH_2O up to 0 ... 200 mH_2O

Output signal

RS485 with Modbus RTU protocol

Special characteristics

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

Optional version

- diaphragm ceramics Al_2O_3 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

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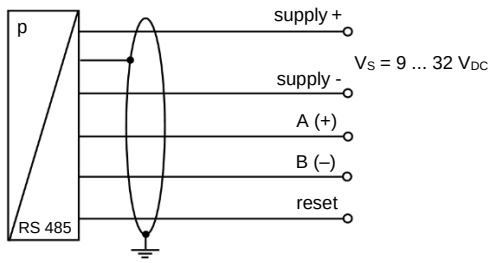
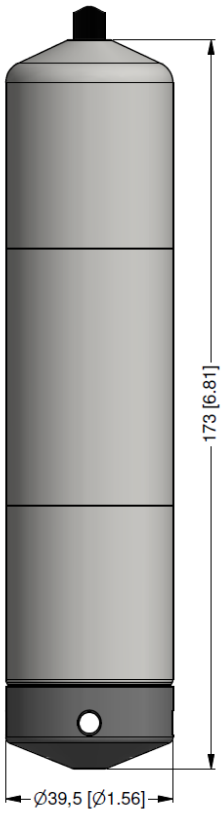
Input pressure range																
Nominal pressure gauge [bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level [mH_2O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Overpressure [bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Max. ambient pressure (housing): 40 bar															

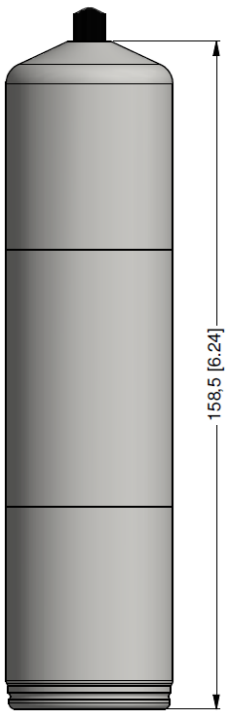
Output signal	
Digital (pressure and temperature)	RS485 with Modbus RTU protocol
Supply	
Direct current	V_S = 9 … 32 V_{DC}
Performance	
Accuracy [1]	standard: ≤ ± 0.35 % FSO option: ≤ ± 0.25 % FSO
Long term stability	≤ ± 0.1 % FSO / year at reference conditions
Measuring rate	500 Hz
Delay time	500 msec
[1] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)	
Thermal effects (offset and span)	
Tolerance band	≤ ± 1 % 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 Ø 7.4 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 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)
Seals	FKM others on request
Diaphragm	standard: ceramics Al_2O_3 96 % option: ceramics Al_2O_3 99.9 %
Protection cap	POM-C
Cable sheath	PUR
Miscellaneous	
Adjustable units	pressure: mmH_2O, mmHg, PSI, bar, mbar, g/cm^2, kg/cm^2, Pa, kPa, torr, atm, mH_2O, 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 + Supply – A + B – Reset	WH (white) BN (brown) GN (green) YE (yellow) PK (pink)
Shield	GNYE (green yellow)

Dimensions (mm / in)



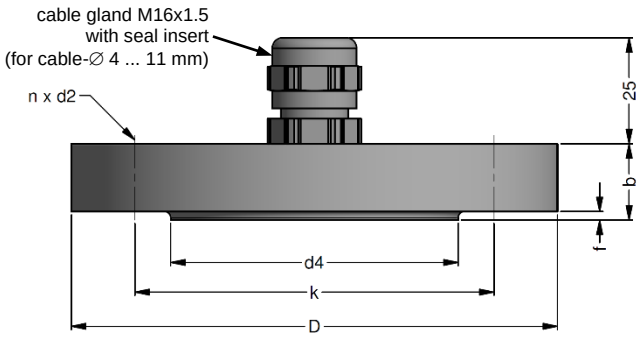


protection cap removable

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 ∅ 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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pressure measurement

Ordering code DCL 551

DCL 551 ☐☐☐ - ☐☐☐☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐☐☐ - ☐☐☐

Pressure			
in bar		5 6 5	
in mH_2O		5 6 6	
Input	**[mH_2O]**	**[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_2O_3 96%		2	
ceramics Al_2O_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

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