SCHNEIDER
MESSTECHNIK

LMK 358

Detachable Stainless Steel Probe

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 ... 100 mH_2O

Output signals

2-wire: 4 ... 20 mA
3-wire: 0 … 10 V
others on request

Special characteristics

- cable assembly and sensor head detachable
- diameter 39.5 mm
- especially suitable for sewage, viscous and pasty media

Optional versions

- IS-version
  Ex ia = intrinsically safe for gas and dust
- cable protection with stainless steel corrugated pipe
- diaphragm 99.9 % Al_2O_3
- different kinds of cables and elastomers

The detachable stainless steel probe LMK 358 has been designed for level measurement in waste water, waste and higher viscosity media. Basic element is a capacitive ceramic sensor.

In order to facilitate stock-keeping and maintenance the sensor head is plugged to the cable assembly with a connector and can be changed easily.

Preferred areas of use are

Water
ground water level measurement
rain spillway basin

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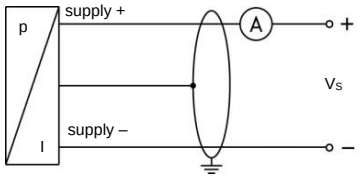
Input pressure range													
Nominal pressure gauge [bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10
Level [mH_2O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100
Overpressure [bar]	2	2	4	4	6	6	8	8	15	25	25	35	35
Max. ambient pressure (housing): 40 bar													

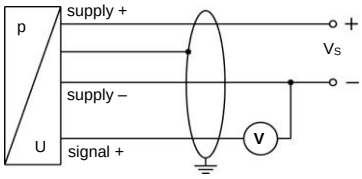
Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / V_S = 9 ... 32 V_{DC}	
Option IS-version	2-wire: 4 ... 20 mA / V_S = 14 ... 28 V_{DC}	
Option 3-wire	3-wire: 0 ... 10 V / V_S = 12.5 ... 32 V_{DC}	
Performance		
Accuracy [1]	standard: ≤ ± 0.35 % FSO option: ≤ ± 0.25 % FSO	
Permissible load	$R_{max} = [(V_S - V_{S\,min}) / 0.02\ A]\ \Omega$	
Influence effects	supply: 0.05 % FSO / 10 V	load: 0.05 % FSO / kΩ
Long term stability	≤ ± 0.1 % FSO / year at reference conditions	
Turn-on time	700 msec	
Mean response time	≤ 200 msec	measuring rate 5/sec
Max. response time	380 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 /electronic / environment: -25 ... 125 °C storage: -40 ... 125 °C	
Electrical protection [2]		
Short-circuit protection	permanent	
Reverse polarity protection	no damage, but also no function	
Lightning protection	2-wire: integrated	3-wire: without
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]	PVC (-5 … 70 °C) grey Ø 7.4 mm PUR (-25 … 70 °C) black Ø 7.4 mm FEP [4] (-25 … 70 °C) black Ø 7.4 mm TPE-U (-25 … 125 °C) blue Ø 7.4 mm	
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 *[4] do not use freely suspended probes with an FEP cable if effects due to highly charging processes are expected*		
Materials (media wetted)		
Housing	stainless steel 1.4404 (316L)	
Seals	FKM EPDM others on request	
Diaphragm	standard: ceramics Al_2O_3 96 % option: ceramics Al_2O_3 99.9 %	
Protection cap	POM-C	
Cable sheath	PVC, PUR, FEP, TPE-U	
Explosion protection (only for 4 ... 20 mA / 2-wire)		
Approval DX14-LMK 358	IBExU05ATEX1070 X Zone 0 [5]: II 1G Ex ia IIB T4 Ga Zone 20: II 1D Ex ia IIIC T110 °C Da	
Safety technical maximum values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, C_i = 14 nF, L_i ≈ 0 µH, C_{gnd} = 27 nF	
Permissible temperature	in zone 0: -20 ... 60 °C with p_{atm} 0.8 bar up to 1.1 bar zone 1 or higher: -25 ... 70 °C	
Connecting cables (by factory)	cable capacity: signal line / shield also signal line / signal line: 220 pF/m cable inductance: signal line / shield also signal line / signal line: 1.5 µH/m	
[5] for optional stainless steel corrugated pipe following designation is valid: "II 1G Ex ia IIC T4 Ga" (zone 0)		
Miscellaneous		
Current consumption	max. 21 mA	
Weight	approx. 650 g (without cable)	
Ingress protection	IP 68	
CE-conformity	EMC Directive: 2014/30/EU	
ATEX Directive	2014/34/EU	

Wiring diagram

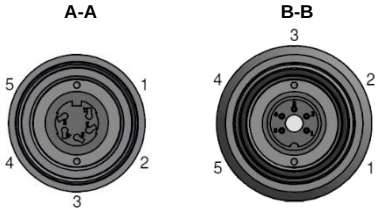
2-wire-system (current)



3-wire-system (voltage)



connector



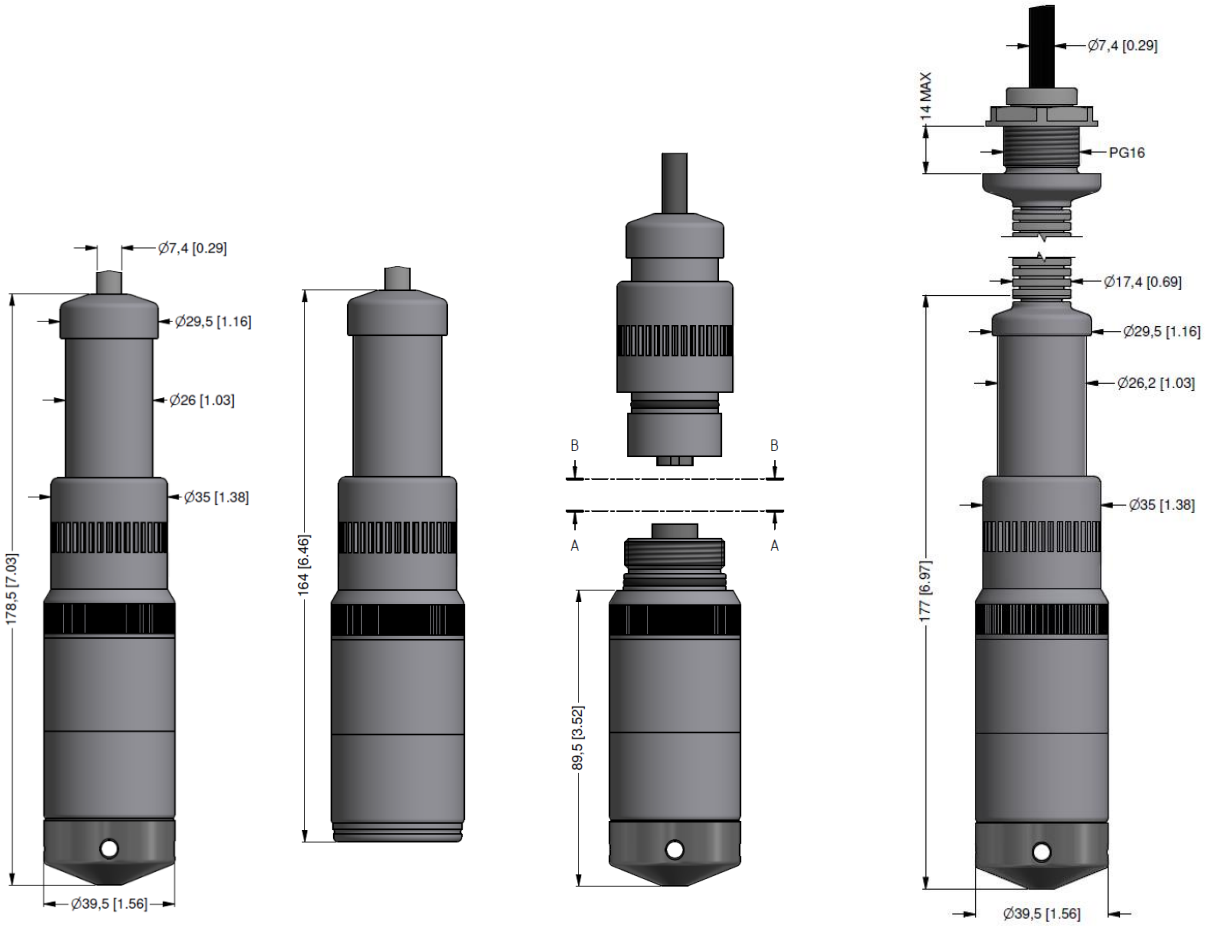
Pin configuration

Electrical connection	Binder series 723 [6] (5-pin)		cable colours (IEC 60757)
	2-wire	3-wire	
Supply +	3	3	WH (white)
Supply –	1	4	BN (brown)
Signal + (only for 3-wire)	-	1	GN (green)
Shield	5	5	GNYE (green-yellow)

[6] *if detached*

Dimensions (mm / in)

standard **option**

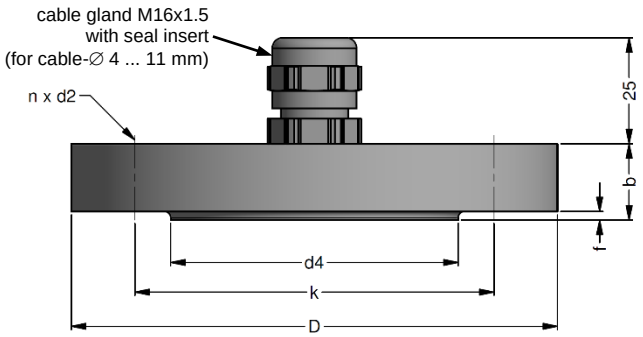


protection cap removable

sensor head and cable detached

corrugated pipe

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	

Display program

CIT 200 Process display with LED display

CIT 250 Process display with LED display and contacts

CIT 300 Process display with LED display, contacts and analogue output

CIT 350 Process display with LED display, bargraph, contacts and analogue output

CIT 400 Process display with LED display, contacts, analogue output and Ex-approval

CIT 600 Multichannel process display with graphics-capable LC display

CIT 650 Multichannel process display with graphics-capable LC display and datalogger

CIT 700 / CIT 750 Multichannel process display with graphics-capable TFT monitor, touchscreen and contacts

PA 440 Field display with 4-digit LC display

Ordering code LMK 358

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Pressure		
in bar	4 4 5	
in mH_2O	4 4 6	

Input [mH_2O]	[bar]	Code	
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	
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

Output		
4 … 20 mA / 2-wire	1	
0 … 10 V / 3-wire	3	
intrinsic safety 4 … 20 mA / 2-wire	E	
customer	9	consult

Seals		
FKM	1	
EPDM	3	
customer	9	consult

Electrical connection		
PVC-cable (grey, Ø 7.4 mm) [1]	1	
PUR-cable (black, Ø 7.4 mm) [1]	2	
FEP-cable (black, Ø 7.4 mm) [1]	3	
TPE-U-cable (blue, Ø 7.4 mm) [1]	4	
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		
cable protection with stainless steel corrugated pipe with pipe length in m	1 0 3	9 9 9	consult
customer	9 9 9		consult

[1] shielded cable with integrated ventilation tube for atmospheric pressure reference