LMK 351

Screw-in Transmitter

Ceramic Sensor

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

Nominal pressure

from 0 ... 40 mbar up to 0 ... 20 bar

Output signal

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

Product characteristics

- pressure port PVDF-version for aggressive media
- pressure port G 1 ½" for pasty and polluted media

Optional versions

- IS-version
  Ex ia = intrinsically safe for gases and dusts
- diaphragm 99.9 % Al_2O_3
- customer specific versions

The screw-in transmitter LMK 351 has been designed for measuring small system pressure and level measurement in container. The LMK 351 is based on an own-developed capacitive ceramic sensor element. Usage in viscous and pasty media is possible because of the flush mounted sensor.

For the usage in aggressive media a pressure port in PVDF and the diaphragm in Al_2O_3 99.9 % is available. An intrinsically safe version complete the range of possibilities.

Preferred areas of use are

- Plant and Machine Engineering
- Environmental Engineering (water – sewage – recycling)

Preferred used for

- Fuel and Oil
- Viscous and Pasty Media

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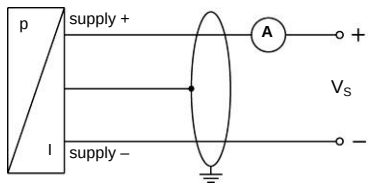
Pressure ranges																
Nominal pressure	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH_2O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Low pressure	[bar]	-0.2		-0.3		-0.5				-1						

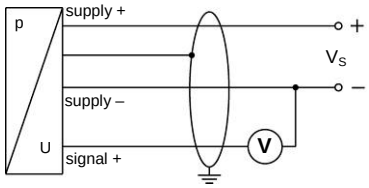
Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / V_S = 9 ... 32 V_{DC}	
Option Ex-version	2-wire: 4 ... 20 mA / V_S = 14 ... 28 V_{DC}	
Option 3-wire	3-wire: 0 ... 10 V / V_S = 12.5 ... 32 V_{DC}	
Performance		
Accuracy[1]	standard: ≤ ± 0.35 % FSO option: ≤ ± 0.25 % FSO	
Permissible load	current 2-wire: $R_{max} = [(V_S - V_{S\,min}) / 0.02\ A]\ \Omega$ voltage 3-wire: R_{min} = 10 kΩ	
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ	
Long term stability	≤ ± 0.1 % FSO / year	
Turn-on time	700 msec	
Mean measuring time	5/sec	
Response time	mean response time: ≤ 200 msec	max. response time: 380 msec
[1] accuracy according to IEC 60770 - limit point adjustment (non-linearity, hysterisis, repeatability)		
Thermal effects (Offset and Span) / -Permissible temperatures		
Tolerance band	≤ ±0.1 % FSO / 10 K	in compensated range - 20 ... 80 °C
Permissible temperatures [2]	medium: -40 ... 125 °C	electronics / environment:-40 ... 85 °C storage: -40 ... 100 °C
[2] for pressure port of PVDF the minimum permissible temperature is -30 °C		
Electrical protection		
Short-circuit protection	permanent	
Reverse polarity protection	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 / 1 msec	according to DIN EN 60068-2-27
Materials (media wetted)		
Pressure port	standard: stainless steel 1.4404 (316L)	option: PVDF
Housing	standard: stainless steel 1.4404 (316L)	option: PVDF
Seals	FKM -40 ... 125 °C FFKM -15 ... 125 °C EPDM -40 ... 125 °C	
Diaphragm	standard: ceramics Al_2O_3 96 % options: ceramics Al_2O_3 99.9 %	
Media wetted parts	pressure port, seals, diaphragm	
IS-protection (only for 4 … 20 mA / 2-wire)		
Approval DX14-LMK 351	IBExU05ATEX1070 X stainless steel-pressure port with male (connector): zone 0: II 1 G Ex ia IIC T4 Ga zone 20: II 1 D Ex iaD T 85 °C stainless steel-pressure port with cable: zone 0: II 1 G Ex ia IIB T4 Ga zone 20: II 1 D Ex iaD T 85 °C plastic-pressure port with male (connector): zone 0/1 [3]: II 1/2 G Ex ia IIC T4 Ga/Gb zone 20/21 [4]: II 1 D Ex iaD T 85 °C plastic-pressure port with cable: zone 0/1 [3]: II 1/2 G Ex ia IIB T4 Ga/Gb zone 20/21 [4]: II 1 D Ex iaD T 85 °C	
Safety technical maximum values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, C_i = 27 nF , L_i = 5 µH	
Max. permissible temperature for environment	in zone 0: -20 ... 60 °C for p_{atm} 0.8 bar up to 1.1 bar zone 1 and higher: -25 ... 70 °C	
Connecting cables (by factory)	capacity: signal line / shield also signal line / signal line: 160 pF/m inductance: signal line / shield also signal line / signal line: 1 µH/m	
[3] The designation depends on the used pressure range. With nominal pressure ranges ≤ 60 mbar the designation is „2G“. With nominal pressure ranges > 60 mbar and < 10 bar (see item 17 of the type-examination certificate) must be attended!		
Miscellaneous		
Current consumption	signal output current: max. 21 mA	signal output voltage: max. 5 mA
Weight	approx. 200 g	
Installation position	any	
Operational life	> 100 x 10^6 loading cycles	
CE-conformity	EMV-directive: 2004/108/EC	
ATEX Directive	94/9/EC	

Wiring diagram

2-wire-system (current)



3-wire-system (current/voltage)

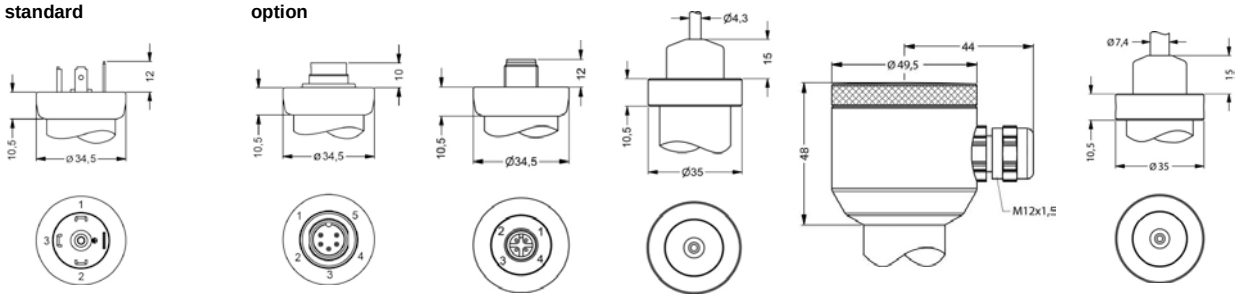


Pin configuration

Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 (4-pin)	field housing	cable colours (DIN 47100)
Supply +	1	3	1	IN +	wh (white)
Supply –	2	4	2	IN –	bn (brown)
Signal + (only for 3-wire)	3	1	3	OUT +	gn (green)
Shield	ground pin	5	4	⏚	gn/ye (green/yellow)

Electrical connections (dimensions in mm)

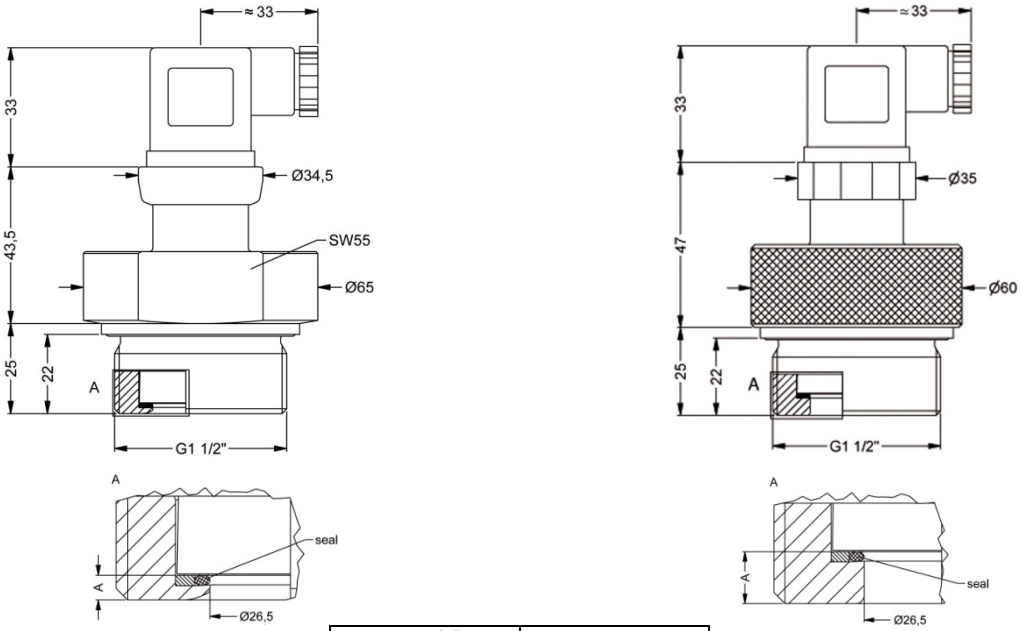
standard **option**



ISO 4400 (IP 65) | Binder Series 723 5-pin (IP 67) | M12x1 4-pin (IP 67) | cable outlet with PVC cable (IP 67) [4] | compact field housing (IP 67) | cable outlet, cable with ventilation tube (IP 68) [5]

[4] *standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)*
[5] *different cable types and lengths available, permissible temperature depends on kind of cable*

Dimensions (in mm)



G1 1/2" flush (DIN 3852) stainless steel

material	A
stainless steel	ca. 3
PVDF	ca. 6

G1 1/2" flush (DIN 3852) PVDF [6]

[6] *not possible in combination with compact field housing*

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BD|SENSORS pressure measurement

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Ordering code LMK 351

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Pressure			
	in bar	470	
	in mH_2O	471	
Input	**[mH_2O]**	**[bar]**	
	0.4	0.04	0400
	0.6	0.06	0600
	1.0	0.10	1000
	1.6	0.16	1600
	2.5	0.25	2500
	4.0	0.40	4000
	6.0	0.60	6000
	10	1.0	1001
	16	1.6	1601
	25	2.5	2501
	40	4.0	4001
	60	6.0	6001
	100	10	1002
	160	16	1602
	200	20	2002
	customer		9999 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
Accuracy			
standard	0.35 %		3
option	0.25 %		2
	customer		9 consult
Electrical connection			
	Male and female plug ISO 4400		100
	Male plug Binder series 723 (5-pin)		200
	Cable outlet with PVC- cable [1]		TA0
	Cable outlet [2]		TR0
	Male plug M12x1 (4-pin) / metal		M10
	compact field housing		850
	customer		999 consult
Mechanical connection			
	G1 1/2" DIN 3852 with flush sensor		M00
	customer		999 consult
Seals			
	FKM		1
	EPDM		3
	FFKM		7
	customer		9 consult
Pressure port			
	Stainless steel 1.4404 (316L)		1
	PVDF [3]		B
	customer		9 consult
Diaphragm			
	Ceramics Al_2O_3 96%		2
	Ceramics Al_2O_3 99.9%		C
	customer		9 consult
Special version			
	standard		000
	customer		999 consult

[1] standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 … 70 °C)

[2] cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable

[3] not possible in combination witn compact field housing; min. permissible temperature -30 °C

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