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 1/2" for pasty and polluted media

Optional versions

- IS-version
  Ex ia = intrinsically safe for gases and dust
- 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 completes 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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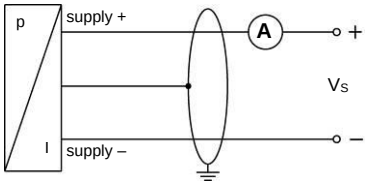
Pressure ranges																
Nominal pressure	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH_2O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Permissible vacuum	[bar]	-0.2		-0.3		-0.5				-1						

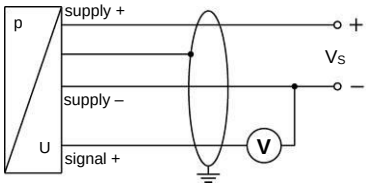
Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / V_S = 9 ... 32 V_{DC}	
Option IS-version	2-wire: 4 ... 20 mA / V_S = 14 ... 28 V_{DC}	
Option 3-wire	3-wire: 0 ... 10 V / V_S = 12.5 ... 32 V_{DC}	
Performance		
Accuracy [1]	standard: ≤ ± 0.35 % FSO	option for p_N ≥ 0.6 bar: ≤ ± 0.25 % FSO
Permissible 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 at reference conditions	
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, hysteresis, repeatability)		
Thermal effects (offset and span)		
Tolerance band	≤ ± 1 % FSO	
in compensated range	-20 … 80 °C	
Permissible temperatures		
Permissible temperatures [2]	medium: -40 ... 125 °C electronics / environment: -40 ... 85 °C storage: -40 ... 100 °C	
[2] for pressure port in PVDF the medium temperature is -30 … 60 °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
Option compact field housing	stainless steel 1.4301 (304); cable gland M12x1.5, brass, nickel plated (clamping range 2 … 8 mm)	
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	
Explosion protection (only for 4 ... 20 mA / 2-wire)		
Approval DX14-LMK 351	IBExU05ATEX1070 X stainless steel-pressure port with connector: zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T110 °C Da plastic-pressure port with connector: zone 0/1: II 1/2G Ex ia IIC T4 Ga/Gb zone 20/21: II 1/2D Ex ia IIIC T110 °C Da/Db	
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	
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)	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	
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 million load cycles	
CE-conformity	EMV-directive: 2014/30/EU	
ATEX Directive	2014/34/EU	

Wiring diagram

2-wire-system (current)



3-wire-system (voltage)

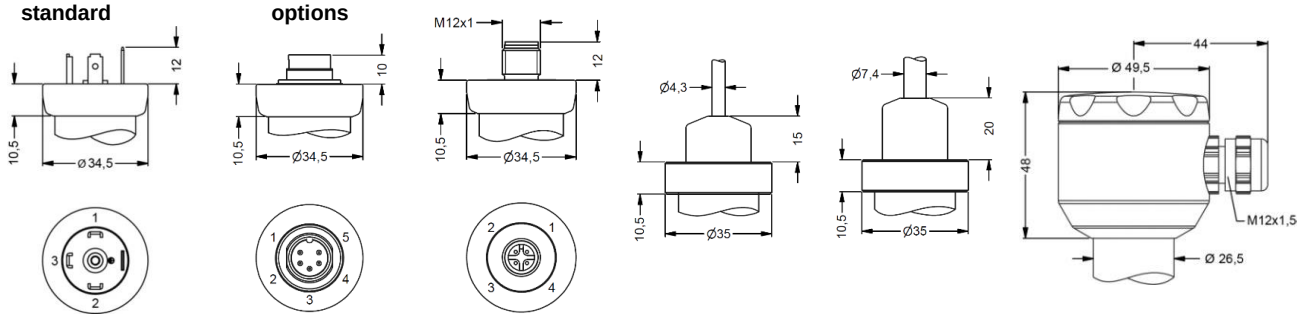


Pin configuration

Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 (4-pin)	compact field housing	cable colours (IEC 60757)
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	⏚	GNYE (green-yellow)

Electrical connections (dimensions in mm)

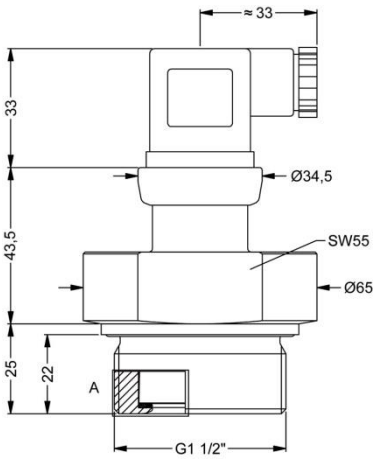
standard **options**

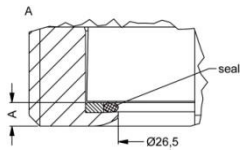


ISO 4400 (IP 65) | Binder series 723 5-pin (IP 67) | M12x1 4-pin (IP 67) | cable outlet with PVC cable (IP 67) [3] | cable outlet, cable with ventilation tube (IP 68) [4] | compact field housing (IP 67)

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

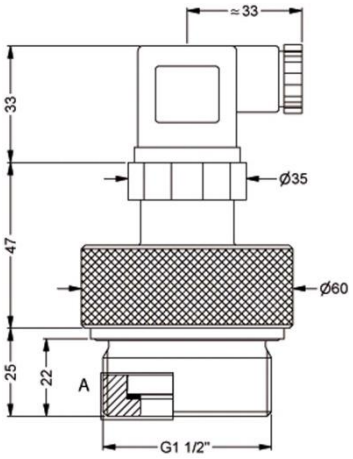
Dimensions (in mm)

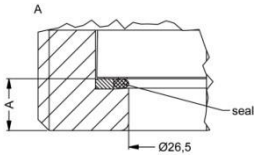




G1 1/2" flush (DIN 3852) stainless steel

material	A
stainless steel	approx. 3
PVDF	approx. 6





G1 1/2" flush (DIN 3852) PVDF [5]

[5] not possible in combination with compact field housing

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BD|SENSORS pressure measurement

Ordering code LMK 351

LMK 351 ☐☐☐-☐☐☐☐-☐-☐-☐☐☐-☐☐☐-☐-☐-☐-☐☐☐

Section	Option		Code	
Pressure				
		in bar	4 7 0	
		in mH_2O	4 7 1	
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
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 % FSO	3	
	option for $p_N \geq 0.6$ bar:	0.25 % FSO	2	
		customer	9	consult
Electrical connection				
		male and female plug ISO 4400	1 0 0	
		male plug Binder series 723 (5-pin)	2 0 0	
		cable outlet with PVC cable (IP67) [1]	T A 0	
		cable outlet, cable with ventilation tube (IP68) [2]	T R 0	
		male plug M12x1 (4-pin) / metal	M 1 0	
		compact field housing stainless steel 1.4301 (304)	8 5 0	
		customer	9 9 9	consult
Mechanical connection				
		G1 1/2" DIN 3852 with flush sensor	M 0 0	
		customer	9 9 9	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	0 0 0	
		customer	9 9 9	consult

[1] standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C); others on request
[2] code TR0 = PVC cable, cable with ventilation tube available in different types and lengths
[3] not possible in combination witn compact field housing; permissible medium temperature: -30 … 60 °C

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