

# 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 or PP-HT 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<sub>2</sub>O<sub>3</sub>
- ▶ 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.

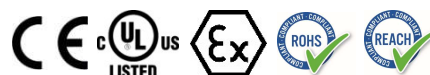
For the usage in aggressive media a pressure port in PVDF and the diaphragm in Al<sub>2</sub>O<sub>3</sub> 99.9 % is available. An intrinsically safe version completes the range of possibilities.

### Preferred areas of use are

-  Plant and machine engineering
-  Environmental engineering (water – sewage – recycling)

### Preferred used for

-  Fuel and oil
-  Viscous and pasty media



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 <sub>2</sub> 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
Permissible vacuum	[bar]	-0.2		-0.3		-0.5			-1							
Output signal / Supply																
Standard		2-wire: 4 ... 20 mA / V <sub>S</sub> = 9 ... 32 V <sub>DC</sub>														
Option IS-version		2-wire: 4 ... 20 mA / V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>														
Option 3-wire		3-wire: 0 ... 10 V / V <sub>S</sub> = 12.5 ... 32 V <sub>DC</sub>														
Performance																
Accuracy <sup>1</sup>		standard: ≤ ± 0.35 % FSO								option for p <sub>N</sub> ≥ 0.6 bar: ≤ ± 0.25 % FSO						
Permissible load		current 2-wire: R <sub>max</sub> = [(V <sub>S</sub> - V <sub>S min</sub> ) / 0.02 A] Ω								voltage 3-wire: R <sub>min</sub> = 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						
<sup>1</sup> 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 <sup>2</sup>		medium: -40 ... 125 °C electronics / environment: -40 ... 85 °C storage: -40 ... 100 °C														
<sup>2</sup> for pressure port in PVDF the operation medium temperature is -30 ... 60 °C and in PP-HT 0 ... 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		20 g RMS / 10 ... 2000 Hz								according to DIN EN 60068-2-6						
Shock		500 g / 1 msec half sine								according to DIN EN 60068-2-27						
Materials (media wetted)																
Pressure port / housing		standard: stainless steel 1.4404 (316L) option: PVDF (p <sub>max</sub> = 20 bar @ t <sub>max</sub> = 60 °C) PP-HT (p <sub>max</sub> = 10 bar @ t <sub>max</sub> = 60 °C)														
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 <sub>2</sub> O <sub>3</sub> 96 %								options: ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %						
Media wetted parts		pressure port, seals, diaphragm														
Explosion protection (only for 4 ... 20 mA / 2-wire)																
Approval DX14-LMK 351		IBE <u>X</u> U05ATEX1070 X stainless steel-pressure port with connector/cable outlet: zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T110 °C Da plastic-pressure port with connector/cable outlet: 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 <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW, C <sub>i</sub> = 14 nF, L <sub>i</sub> ≈ 0 μH, C <sub>gnd</sub> = 27 nF														
Max. permissible temperature for environment		in zone 0: -20 ... 60 °C for p <sub>atm</sub> 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 diagrams

**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 $\oplus$	5	4	$\oplus$	GNYE (green-yellow)

### Electrical connections (dimensions in mm)

**standard**

ISO 4400 (IP 65)

**options**

Binder series 723 5-pin (IP 67)

M12x1 4-pin (IP 67)

cable outlet with PVC cable (IP 67)<sup>3</sup>

cable outlet, cable with ventilation tube (IP 68)<sup>4</sup>

compact field housing (IP 67)

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

### Dimensions (mm / in)

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

**G1 1/2" flush (DIN 3852) PVDF / PP-HT<sup>5</sup>**

<sup>5</sup> not possible in combination with compact field housing

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