

# 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<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.

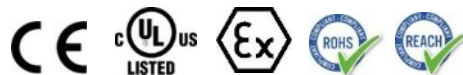
For the usage in aggressive media a pressure port in PVDF and the diaphragm in Al<sub>2</sub>O<sub>3</sub> 99.9 % is available. An intrinsically safe version completes the range of possibilities.

### Preferred areas of use are

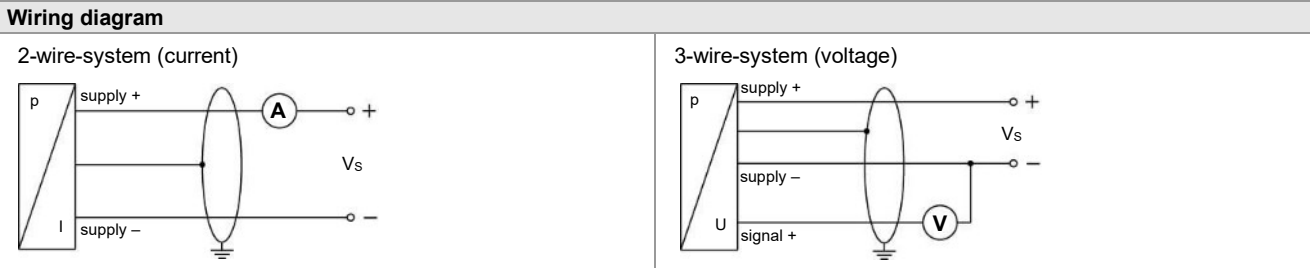
-  Plant and machine engineering
-  Environmental engineering (water – sewage – recycling)

### Preferred used for

-  Fuel and oil
-  Viscous and pasty media

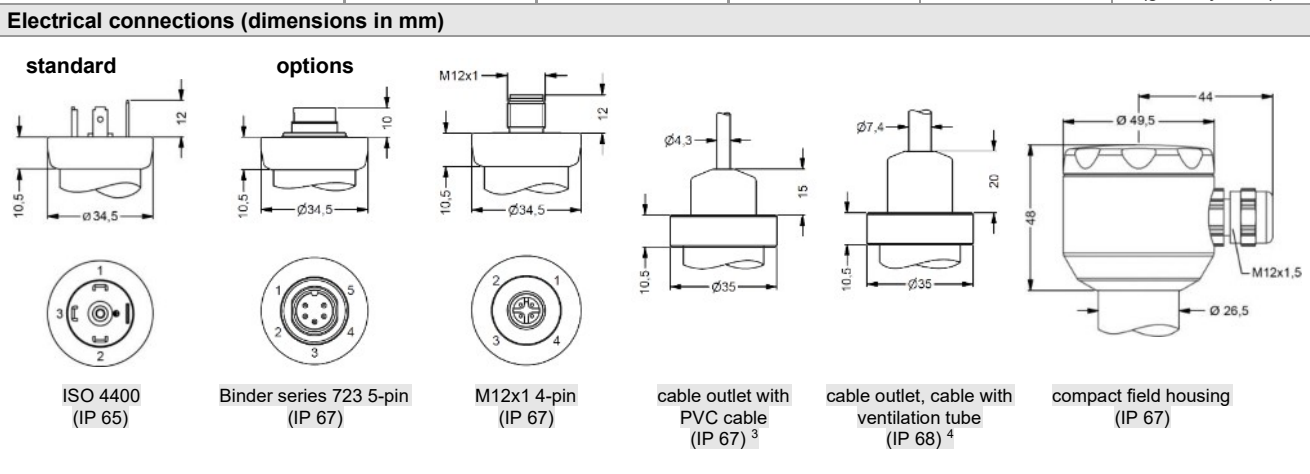


<b>Pressure ranges</b>																	
Nominal pressure	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20	
Level	[mH <sub>2</sub> O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200	
Overpressure	[bar]	2	2	4	4	6	4	8	8	15	25	25	35	35	45	45	
Permissible vacuum	[bar]	-0.2		-0.3		-0.5				-1							
<b>Output signal / Supply</b>																	
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>															
<b>Performance</b>																	
Accuracy <sup>1</sup>		standard: $\pm 0.35$ % FSO										option for p <sub>N</sub> ≥ 0.6 bar: $\pm 0.25$ % FSO					
Permissible load		current 2-wire: R <sub>max</sub> = [(V <sub>S</sub> - V <sub>Smin</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)																	
<b>Thermal effects (offset and span)</b>																	
Tolerance band		≤ ± 1 % FSO															
in compensated range		-20 ... 80 °C															
<b>Permissible temperatures</b>																	
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 medium temperature is -30 ... 60 °C																	
<b>Electrical protection</b>																	
Short-circuit protection		permanent															
Reverse polarity protection		no damage, but also no function															
Electromagnetic compatibility		emission and immunity according to EN 61326															
<b>Mechanical stability</b>																	
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					
<b>Materials (media wetted)</b>																	
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 <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															
<b>Explosion protection (only for 4 ... 20 mA / 2-wire)</b>																	
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 <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															
<b>Miscellaneous</b>																	
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															

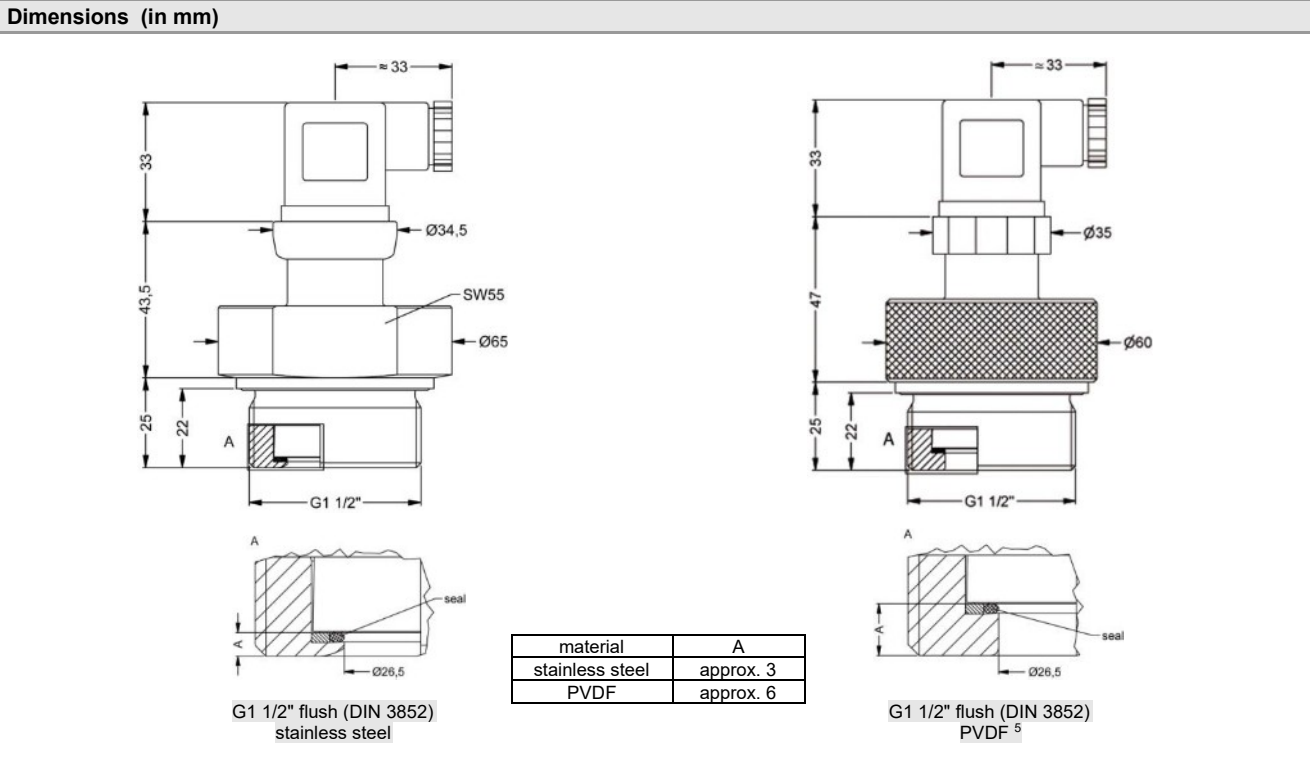


**Pin configuration**

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)



<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



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

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# Ordering code LMK 351

LMK 351



Pressure										
	in bar	4	7	0						
	in mH <sub>2</sub> O	4	7	1						
Input										
	[mH <sub>2</sub> O]	[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					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 <sub>N</sub> ≥ 0.6 bar:	0.25 % FSO							2	
	customer								9	consult
Electrical connection										
	male and female plug ISO 4400								1	0
	male plug Binder series 723 (5-pin)								2	0
	cable outlet with PVC cable (IP67) <sup>1</sup>								T	A
	cable outlet,									
	cable with ventilation tube (IP68) <sup>2</sup>								T	R
	male plug M12x1 (4-pin) / metal								M	1
	compact field housing									
	stainless steel 1.4301 (304)								8	5
	customer								9	9
										consult
Mechanical connection										
	G1 1/2" DIN 3852 with								M	0
	flush sensor									
	customer								9	9
										consult
Seals										
	FKM								1	
	EPDM								3	
	FFKM								7	
	customer								9	consult
Pressure port										
	stainless steel 1.4404 (316L)								1	
	PVDF <sup>3</sup>								B	
	customer								9	consult
Diaphragm										
	ceramics Al <sub>2</sub> O <sub>3</sub> 96 %								2	
	ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %								C	
	customer								9	consult
Special version										
	standard								0	0
	customer								9	9
										consult

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