



# 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 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 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



<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	6	8	8	15	25	25	35	35	45	45
Low pressure	[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 Ex-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:	$\leq \pm 0.35\% \text{ FSO}$						option for P <sub>N</sub> ≥ 0.6 bar:	$\leq \pm 0.25\% \text{ FSO}$																	
Permissible load	current 2-wire:	$R_{\max} = [(V_S - V_{S\min}) / 0.02 \text{ A}] \Omega$						voltage 3-wire:	$R_{\min} = 10 \text{ k}\Omega$																	
Influence effects	supply:	$0.05\% \text{ FSO} / 10 \text{ V}$						load:	$0.05\% \text{ FSO} / \text{k}\Omega$																	
Long term stability	$\leq \pm 0.1\% \text{ FSO} / \text{year at reference conditions}$																									
Turn-on time	700 msec																									
Mean measuring time	5/sec																									
Response time	mean response time: $\leq 200 \text{ msec}$						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) / Permissible temperatures

Tolerance band	$\leq \pm 0.1\% \text{ FSO} / 10 \text{ K}$	in compensated range - 20 ... 80 °C
Permissible temperatures <sup>2</sup>	medium: -40 ... 125 °C	electronics / environment: -40 ... 85 °C

<sup>2</sup> 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 <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	

#### 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 1G Ex ia IIC T4 Ga Zone 20: II 1D Ex ia IIIC T85 °C Da plastic-pressure port with male (connector): Zone 0/1 <sup>3</sup> : II 1/2G Ex ia IIC T4 Ga/Gb Zone 20/21 <sup>4</sup> : II 1/2D Ex ia IIIC T85 °C Da Db
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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> = 27 nF, L<sub>i</sub> = 5 µH, C<sub>gnd</sub> = 27 nF  
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)  
capacity: signal line / shield also signal line / signal line: 160 pF/m  
inductance: signal line / shield also signal line / signal line: 1 µH/m

<sup>3</sup> The designation depends on the used pressure range. With nominal pressure ranges ≤ 60 mbar the designation is „2G“.

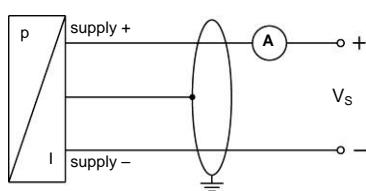
<sup>4</sup> With nominal pressure ranges > 60 mbar and < 10 bar (see item 17 of the type-examination certificate) must be attended!

#### Miscellaneous

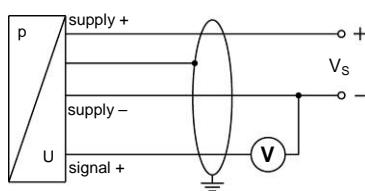
Current consumption	signal output current: max. 21 mA	signal output voltage: max. 5 mA
Weight	approx. 200 g	
Installation position	any	
Operational life	> 100 × 10 <sup>6</sup> loading cycles	
CE-conformity	EMV-directive: 2014/30/EU	
ATEX Directive	2014/34/EU	

## Wiring diagram

2-wire-system (current)



3-wire-system (current/voltage)

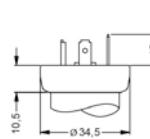


## Pin configuration

Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 (4-pin)	field housing	cable colours (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)

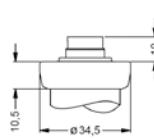
## Electrical connections (dimensions in mm)

### standard

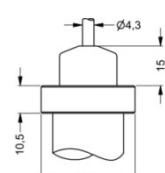


ISO 4400  
(IP 65)

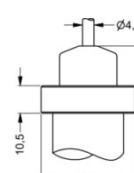
### option



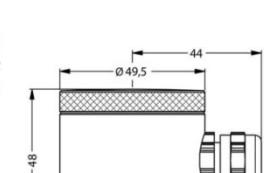
ISO 4400  
(IP 65)



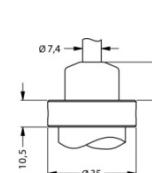
Binder Series 723 5-pin  
(IP 67)



M12x1 4-pin  
(IP 67)



cable outlet with PVC cable  
(IP 67)<sup>4</sup>



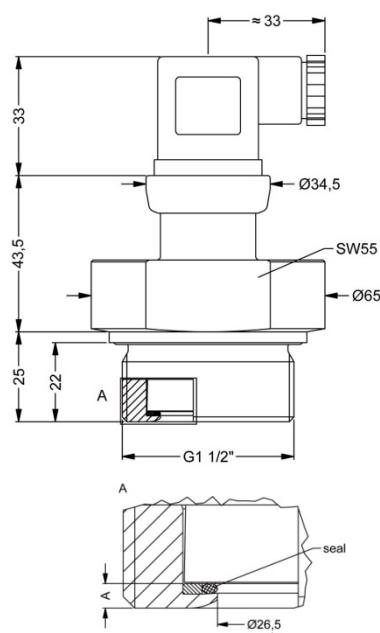
compact field housing  
(IP 67)

cable outlet, cable with  
ventilation tube (IP 68)<sup>5</sup>

<sup>4</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)

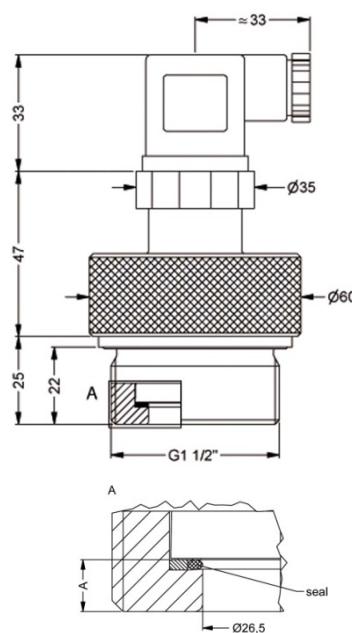
<sup>5</sup> different cable types and lengths available, permissible temperature depends on kind of cable

## 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<sup>6</sup>

<sup>6</sup> not possible in combination with compact field housing

## Ordering code LMK 351

LMK 351										
<b>Pressure</b>										
		in bar	4   7   0							
		in mH <sub>2</sub> O	4   7   1							
<b>Input</b>	[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   9							consult
<b>Output</b>										
4 ... 20 mA / 2-wire				1						
0 ... 10 V / 3-wire				3						
Intrinsic safety 4 ... 20 mA / 2-wire				E						
customer				9						consult
<b>Accuracy</b>										
standard		0.35 %		3						
option for P <sub>N</sub> ≥ 0.6 bar:		0.25 %		2						
customer				9						consult
<b>Electrical connection</b>										
Male and female plug ISO 4400				1   0   0						
Male plug Binder series 723 (5-pin)				2   0   0						
Cable outlet with PVC- cable <sup>1</sup>				T   A   0						
Cable outlet <sup>2</sup>				T   R   0						
Male plug M12x1 (4-pin) / metal				M   1   0						
compact field housing				8   5   0						
customer				9   9   9						consult
<b>Mechanical connection</b>										
G1 1/2" DIN 3852 with					M   0   0					
flush sensor					9   9   9					consult
customer										
<b>Seals</b>										
FKM						1				
EPDM						3				
FFKM						7				
customer						9				consult
<b>Pressure port</b>										
Stainless steel 1.4404 (316L)						1				
PVDF <sup>3</sup>						B				
customer						9				consult
<b>Diaphragm</b>										
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
<b>Special version</b>										
standard						0   0   0				
customer						9   9   9				consult

<sup>1</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)

<sup>2</sup> cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available, price without cable

<sup>3</sup> not possible in combination with compact field housing; min. permissible temperature -30 °C

