



# LMK 351

## Screw-in Transmitter with Capacitive Ceramic Sensor

- ▶ flush mounted sensor
- ▶ diaphragm  
96% or 99.9% ceramics
- ▶ accuracy:  
0.175 % / 0.125 % FSO BFSL  
(0.35 % / 0.25 % FSO IEC 60770)
- ▶ nominal pressure ranges from  
0 ... 40 mbar up to 0 ... 10 bar  
(0 ... 40 cmH<sub>2</sub>O up to 0 ... 100 mH<sub>2</sub>O)

The screw-in transmitter LMK 351 has been designed especially for level and process measurement. The pressure sensors are flush mounted allowing the use also in viscous or contaminated media.

By using a capacitive ceramic sensor an excellent measuring performance is being achieved. Because of its material the capacitive ceramic sensor features high compatibility against aggressive media. Sealing of the sensor against the pressure port is made with a FKM seal. Other elastomers are available on request.

The pressure port can be made of stainless steel 1.4571 (316Ti) or – for very aggressive media – of PVDF or PVC. Additionally it is possible to suit the screw-in-transmitter LMK 351 in explosive area (zone 0).

Preferred areas of use are:

- ▶ level measurement
- ▶ chemical industry
- ▶ medical technology
- ▶ pharmaceutical technology

- ▶ ceramic sensor without oil filling and with high resistance against aggressive media such as acids and lyes
- ▶ small thermal effect
- ▶ good long term stability
- ▶ option Ex version  
(only for 4 ... 20 mA / 2-wire)  
IBExU 05 ATEX 1070 X
- ▶ customer specific versions:
  - special pressure ranges
  - other designs on request

Characteristics

LMK 351  
Screw-in Transmitter



# LMK 351

Screw-in Transmitter

Technical Data

Input pressure range <sup>1</sup>													
Nominal pressure gauge [bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10
Level [mH <sub>2</sub> O]	0.4	0.6	1.0	1.6	2.5	4.0	6.0	10	16	25	40	60	100
Permissible overpressure [bar]	2	2	4	4	6	6	8	8	15	25	25	35	35
Permissible vacuum [bar]	-0.2		-0.3		-0.5						-1		

Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V <sub>s</sub> = 9 ... 36 V <sub>DC</sub> Ex-protection: V <sub>s</sub> = 12 ... 28 V <sub>DC</sub>
Optional	3-wire: 0 ... 10 V / V <sub>s</sub> = 14 ... 36 V <sub>DC</sub> (on request)

Performance	
Accuracy	IEC 60770 <sup>2</sup> standard: ≤ ± 0.35 % FSO option: ≤ ± 0.25 % FSO
	BFSL standard: ≤ ± 0.175 % FSO option: ≤ ± 0.125 % FSO
Permissible load	current 2-wire: R <sub>max</sub> = [(V <sub>s</sub> - V <sub>smin</sub> ) / 0.02] 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
Response time	< 200 msec      measuring rate 5/s

Thermal effects	
Temperature error for offset and span in compensated range	≤ ± 0.1 % FSO / 10 K 0 ... 85 °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
Option Ex-protection only with 4 ... 20 mA / 2-wire DX14-LMK 351	stainless steel pressure port with plug: zone 0 <sup>3</sup> : II 1 G EEx ia IIC T4 zone 20: II 1 D IP6X T=85°C stainless steel pressure port with cable: zone 0 <sup>3</sup> : II 1 G EEx ia IIB T4 zone 20: II 1 D IP6X T=85°C plastic pressure port with plug: zone 0/1 <sup>4</sup> : II 1/2 G EEx ia IIC T4 zone 20/21 <sup>4</sup> : II 1/2 D IP6X T=85°C plastic pressure port with cable: zone 0/1 <sup>4</sup> : II 1/2 G EEx ia IIB T4 zone 20/21 <sup>4</sup> : II 1/2 D IP6X T=85°C 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

Mechanical stability	
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 ms

<sup>1</sup> version with Al<sub>2</sub>O<sub>3</sub> 99,9% possible for pressure ranges from 0.1 bar up to 1 bar

<sup>2</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

<sup>3</sup> approved for atmospheric pressure from 0.8 bar up to 1.1 bar

<sup>4</sup> 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!

# LMK 351

## Screw-in Transmitter

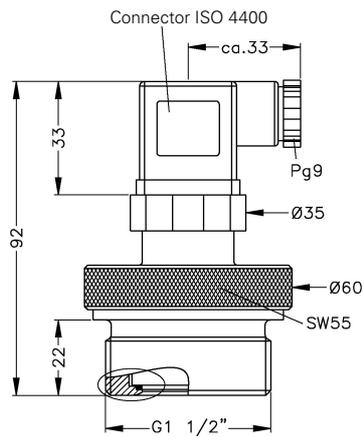
## Technical Data

### Permissible temperatures <sup>5</sup>

Medium	-25 ... 125 °C		
Electronics / environment	-25 ... 85 °C	Ex-protection:	application in zone 0: -20 ... 60 °C application in zone 1 or higher: -25 ... 70 °C
Storage	-40 ... 100 °C		

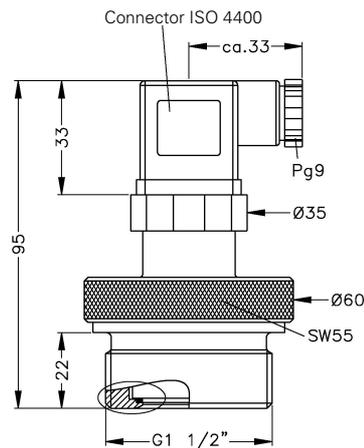
### Mechanical connection (dimensions in mm)

#### Standard

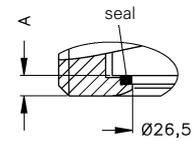


G1 1/2" flush (DIN 3852)  
stainless steel version

#### Optional



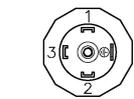
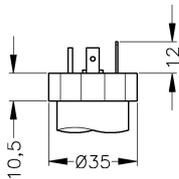
G1 1/2" flush (DIN 3852)  
PVC- and PVDF version



material	A
stainless steel	approx. 3
PVC / PVDF	approx. 6

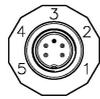
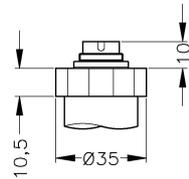
### Electrical connection (dimensions in mm)

#### Standard

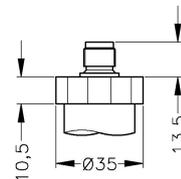


ISO 4400 (IP 65)

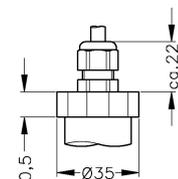
#### Optional



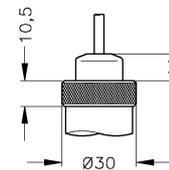
Binder Serie 723 (IP 67)



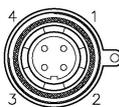
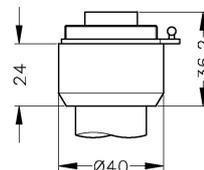
M12x1 4-pin (IP 67)



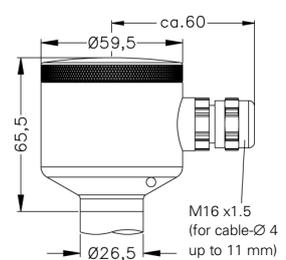
Cable gland (IP 67) <sup>6,7</sup>



cable outlet (IP 68) <sup>6</sup>



Buccaneer (IP 68) <sup>8</sup>



Field housing (IP 67)

<sup>5</sup> for pressure port of PVC the maximum permissible temperature is 50 °C

<sup>6</sup> different cable types and lengths available

<sup>7</sup> standard: 2m PVC cable without ventilation tube, optionally cable with ventilation tube

<sup>8</sup> cable with ventilation tube required

# LMK 351

## Screw-in Transmitter

## Technical Data

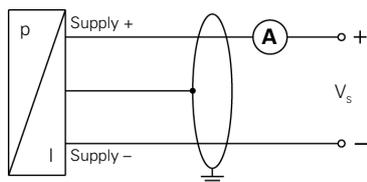
Materials	
Pressure port	standard: stainless steel 1.4571 (316Ti) optional: PVC grey / PVDF
Housing	stainless steel 1.4305 (303)
Seals (media wetted)	FKM / EPDM / FFKM
Diaphragm	Standard: ceramics $Al_2O_3$ 96 % Option: ceramics $Al_2O_3$ 99.9 % (for pressure ranges from 0.1 bar up to 1 bar)
Media wetted parts	pressure port, seals, diaphragm

Miscellaneous	
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m cable inductance: signal line/shield also signal line/signal line: 1 $\mu$ H/m
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 <sup>6</sup> cycles

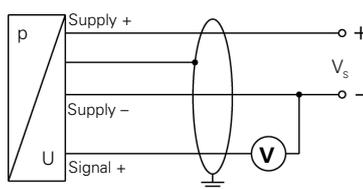
Pin configuration		ISO 4400	Binder 723 (5-pin)	M12x1 (4-pin)	Buccaneer (4-pin)	Field housing	Cable colours (DIN 47100)
2-wire -system	Supply +	1	3	1	1	IN +	white
	Supply -	2	4	2	2	IN -	brown
	Ground	ground pin	5	4	4	≡	yellow / green (shield)
3-wire -system	Supply +	1	3	1	1	N +	white
	Supply -	2	4	2	2	IN -	brown
	Signal +	3	1	3	3	OUT +	green
	Ground	ground pin	5	4	4	≡	yellow / green (shield)

## Wiring diagrams

2-wire-system (current)



3-wire-system (voltage)



This data sheet contains product specification, properties are not guaranteed. Subject to change without notice.

