

# DMK 351P

## Pressure Transmitter for the Process Industry

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 ... 10 V  
others on request

### Special characteristics

- ▶ hygienic version
- ▶ different process connections (G1 1/2", diary pipe, clamp, etc.)
- ▶ high overpressure capability



### Optional versions

- ▶ IS-version  
Ex ia = intrinsically safe for gases and dusts
- ▶ diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>
- ▶ customer specific versions  
e.g. special pressure ranges



The pressure transmitter DMK 351P has been designed for measuring small system pressure in the food industry and chemical industry.

The DMK 351P is based on an own-developed capacitive ceramic sensor element. It features high overpressure resistance and high resistance against most of aggressive media. A variety of different process and electrical connections and an intrinsically safe version complete the range of possibilities.

### Preferred areas of use are

-  Food Industry
-  Chemical and Petrochemical Industry

### Preferred used for

-  Paint and Varnish
-  Viscous and Pasty Media



# DMK 351P

Process Pressure Transmitter

Technical Data

| <b>Pressure ranges</b>   |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
|--|-------|---|------|---|------|------|-----|-----|-----|-----|-----|-----|----|----|----|----|----|
| 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 | 16 | 20 |    |
| Nominal pressure absolut   | [bar] | on request  |      |   |      |      |     | 0.4 | 0.6 | 1   | 1.6 | 2.5 | 4  | 6  | 10 | 16 | 20 |
| 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  |     |     |     |    |    |    |    |    |
| <b>Output signal / Supply</b>  |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Standard   |       | 2-wire: 4 ... 20 mA / $V_S = 9 \dots 32 V_{DC}$   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Option IS-protection   |       | 2-wire: 4 ... 20 mA / $V_S = 14 \dots 28 V_{DC}$  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Option 3-wire  |       | 3-wire: 0 ... 10 V / $V_S = 12.5 \dots 32 V_{DC}$   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| <b>Performance</b>   |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Accuracy <sup>1</sup>  |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Standard   |       | $\leq \pm 0.35 \% \text{ FSO}$  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Option   |       | $\leq \pm 0.25 \% \text{ FSO}$  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Long term stability  |       | $\leq \pm 0.1 \% \text{ FSO} / \text{year}$   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Influence effects  |       | supply:   |      | 0.05 % FSO / 10 V   |      |      |     |     |     |     |     |     |    |    |    |    |    |
|  |       | load:   |      | 0.05 % FSO / k $\Omega$   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Permissible load   |       | current 2-wire:   |      | $R_{\max} = [(V_S - V_{S \min}) / 0.02 \text{ A}] \Omega$                     |      |      |     |     |     |     |     |     |    |    |    |    |    |
|  |       | voltage 3-wire:   |      | $R_{\min} = 10 \text{ k}\Omega$   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Turn-on time   |       | 700 msec  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Mean measuring rate  |       | 5 / sec   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Response time  |       | mean response time: $\leq 200 \text{ msec}$<br>max. response time: 380 msec   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| <sup>1</sup> accuracy according to IEC 60770 - limit point adjustment (non-linearity, hysteresis, repeatability) |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| <b>Thermal errors (offset and span) / -Permissible temperatures</b>  |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Thermal error  |       | $\leq \pm 0.1 \% \text{ FSO} / 10 \text{ K}$ in compensated range - 20 ... 80°C   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Permissible temperatures   |       | medium:   |      | -40 ... 125 °C  |      |      |     |     |     |     |     |     |    |    |    |    |    |
|  |       | electronics / environment:  |      | -40 ... 85 °C   |      |      |     |     |     |     |     |     |    |    |    |    |    |
|  |       | storage:  |      | -40 ... 100 °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</b>   |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Pressure port  |       | stainless steel 1.4404  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Housing  |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Standard   |       | stainless steel 1.4404  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| compact field housing  |       | stainless steel 1.4435  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Seal (media wetted)  |       | FKM<br>EPDM<br>others on request  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Diaphragm  |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Standard   |       | ceramic Al <sub>2</sub> O <sub>3</sub> 96 %   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Option   |       | ceramic Al <sub>2</sub> O <sub>3</sub> 99.9 %   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Media wetted parts   |       | pressure port, seals, diaphragm   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| <b>IS-protection (only for 4 ... 20 mA / 2-wire)</b>   |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Approval DX 14-DMK 351 P   |       | male (connector)-version:<br>zone 0: II 1 G Ex ia IIC T4<br>zone 20: II 1 D Ex IP6X T=85°C<br>cable-version:<br>zone 0: II 1 G EEx ia IIB T4<br>zone 20: II 1 D EEX IP6X T=85°C |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Safety technical maximum values  |       | $U_i = 28 \text{ V}$ , $I_i = 93 \text{ mA}$ , $P_i = 660 \text{ mW}$ , $C_i = 27 \text{ nF}$ , $L_i = 5 \mu\text{H}$   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Max. permissible temperature for environment   |       | zone 0:   |      | -20 ... 60 °C for $p_{\text{atm}}$ 0.8 bar up to 1.1 bar                      |      |      |     |     |     |     |     |     |    |    |    |    |    |
|  |       | zone 1:   |      | -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 $\mu\text{H}/\text{m}$ |      |      |     |     |     |     |     |     |    |    |    |    |    |
| <b>Miscellaneous</b>   |       |   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Current consumption  |       | max. 21 mA  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Weight   |       | min. 200 g  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Installation position  |       | any   |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| Operational life   |       | $> 100 \times 10^6$ loading cycles  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |
| CE-conformity  |       | EMC-directive: 2004/108/EC  |      |   |      |      |     |     |     |     |     |     |    |    |    |    |    |

**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 colour (DIN 47100) |
|------------------------|------------|--------------------|---------------|---------------|--------------------------|
| Supply +               | 1          | 3                  | 1             | IN +          | wh (white)               |
| Supply -               | 2          | 4                  | 2             | IN -          | bn (brown)               |
| Signal + (only 3-wire) | 3          | 1                  | 3             | OUT +         | gn (green)               |
| Shield                 | ground pin | 5                  | 4             | ⏏             | ye/gn (yellow / green)   |

**Electrical connections (dimensions in mm)**

ISO 4400 (IP 65)

Binder series 723 (IP 67)

M12x1 4-pin (IP 67)

cable outlet with PVC-cable (IP 67)<sup>2</sup>

compact field housing (IP 67)

cable outlet, cable with ventilation tube (IP 68)<sup>3</sup>

⇒ universal stainless steel field housing 1.4404 with cable gland M20x1.5 (ordering code 880) and other versions on request

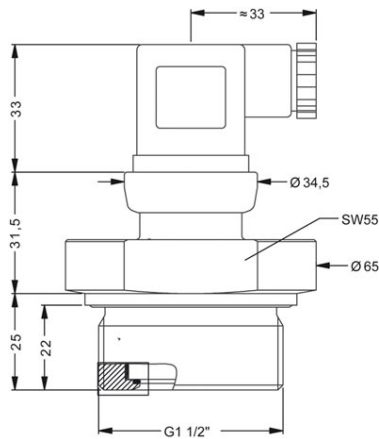
<sup>2</sup> standard: 2 m PVC-cable without ventilation tube (permissible temperature: -5 ... 70 °C)  
<sup>3</sup> different cable types and lengths available, permissible temperature depends on kind of cable

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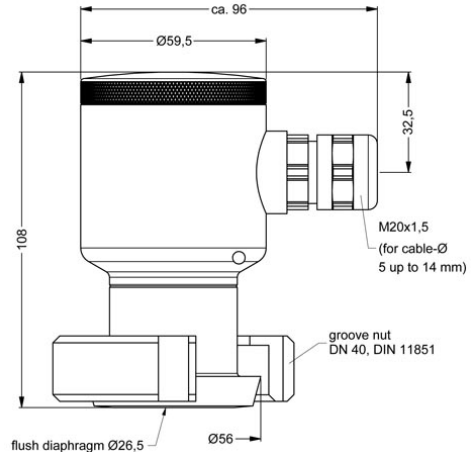
Process Pressure Transmitter

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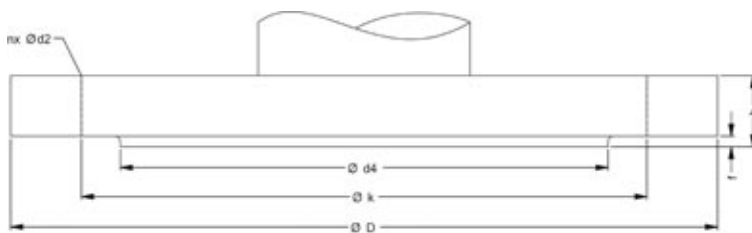
## Dimensions (in mm)



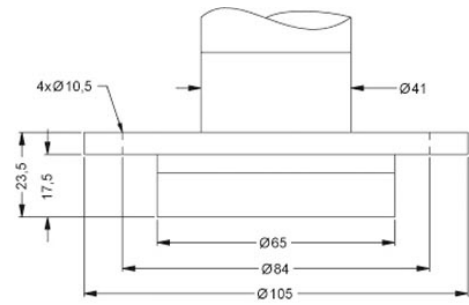
G1 1/2" EN 837



field housing  
with dairy pipe (DIN 11851)

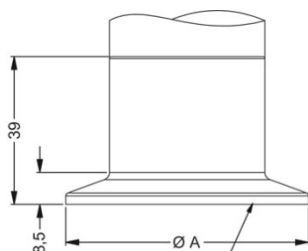


flange (DIN 2501)



flange DRD<sup>4</sup>

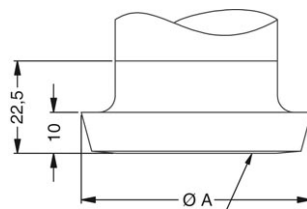
| dimensions in mm     |      |      |      |
|----------------------|------|------|------|
| size                 | DN25 | DN50 | DN80 |
| D                    | 115  | 165  | 200  |
| k                    | 85   | 125  | 160  |
| d4                   | 68   | 102  | 138  |
| b                    | 18   | 20   | 20   |
| f                    | 2    | 3    | 3    |
| n                    | 4    | 4    | 8    |
| d2                   | 14   | 18   | 18   |
| P <sub>N</sub> [bar] | ≤ 40 | ≤ 40 | ≤ 16 |



flush diaphragm Ø=26,5mm

Clamp (DIN 32676)

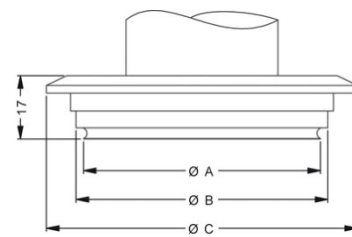
| dimensions in mm     |      |      |
|----------------------|------|------|
| size                 | DN32 | DN50 |
| A                    | 50,5 | 64   |
| P <sub>N</sub> [bar] | ≤ 16 | ≤ 16 |



flush diaphragm Ø=26,5mm

dairy pipe (DIN 11851)

| dimensions in mm |      |      |      |
|------------------|------|------|------|
| size             | DN25 | DN40 | DN50 |
| A                | 44   | 56   | 68,5 |



Varivent

| dimensions in mm |     |      |
|------------------|-----|------|
| size             | P41 | P63  |
| A                | 64  | 91   |
| B                | 68  | 96,5 |
| C                | 84  | 113  |

<sup>4</sup> mounting flange is included in the delivery (already pre-assembled)

This data sheet contains product specification, properties are not guaranteed. Subject to change with notice.

