



## Gear Wheel Flow Meter for Viscous Fluids



measuring  
•  
monitoring  
•  
analysing

DZR



- Measuring range:  
0.008-2 ... 3-700 l/min
- Measuring accuracy:  
 $\pm 0.3 \dots \pm 1\%$  of actual flow
- $p_{\max}$ : 400 bar
- $t_{\max}$ : 150 °C
- Process connection:  
G 1/8, G 3/8, G 1/2, G 1 F
- Material:  
Cast iron or stainless steel

S4



KOBOLD companies worldwide:

ARGENTINA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHILE, CHINA, COLOMBIA, CZECHIA, DOMINICAN REPUBLIC, EGYPT, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, ROMANIA, SINGAPORE, SOUTH KOREA, SPAIN, SWITZERLAND, TAIWAN, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

KOBOLD Messring GmbH  
Nordring 22-24  
D-65719 Hofheim/Ts.  
Head Office:  
+49(0)6192 299-0  
+49(0)6192 23398  
info.de@kobold.com  
www.kobold.com



### Description

The KOBOLD Gear Wheel Flow Meter series DZR have been designed for a flow measurement for viscous fluids. The measuring unit consists of a pair of gear wheels which is moved by the flow according to the principle of gear wheel motor. The bearings are – according to the material combination – either ball bearings or gliding bearings.

The movement of the gears is sampled without contact by means of two sensors located in the cover. Between sensor compartment and measuring chamber is located a pressure-resistant, non-magnetic separator plate.

The different versions vary through housing materials, bearing assembly, through the medium being used and the accuracy. The mounting position and flow direction is arbitrary.

### Version

- DZR-1 Flow measurement, hydraulic test rigs for: Oil, brake fluid, Diesel, Skydrol lubricating, low viscous
- DZR-2 Oil batching, batching installations gear box oil, lubricating, mid viscous
- DZR-3 Consumption measurement printing machines, offset colour, lubricating, high viscous
- DZR-4 Ratio control, 2-component plant, Polyol, Isocyanate, glue, resin, silicone, low lubricating, mid viscous
- DZR-5 Batch control, painting plant, clear paint, clearance volume sealing, low lubricating, mid viscous
- DZR-6 Flow measurement, painting plant, solvent, lubricating, mid viscous

### Technical Data

|                          |  |
|--------------------------|--|
| Accuracy:                | See specifications table   |
| Recommended filter size: | 20 µm  |
| Repeatability:           | < 0.1% of measured value   |
| Max. pressure:           | 400 bar (DZR-x001 ... DZR-x010 and DZR-017/-018)<br>315 bar (DZR-x011 ... DZR-x015)  |
| Max. pressure loss:      | $\Delta p = 16$ bar  |
| Media temperature:       | See specifications table   |
| Ambient temperature:     | -15 ... +80 °C (seal: FPM)<br>-30 ... +80 °C (other seals))  |
| Viscosity range:         | 1 ... 1 000 000 mm <sup>2</sup> /s, according to the flow rate. The max. pressure loss of 16 bar must not be exceeded. See pressure loss diagrams. |

### Materials

|              |                               |
|--------------|-------------------------------|
| Housing:     |                               |
| DZR-1/2/3/4: | Spheroidal iron EN-GJS-400-15 |
| DZR-5/6:     | Stainless steel 1.4404        |
| Gear wheels: |                               |
| DZR-1/2/3/4: | Steel 1.7139                  |
| DZR-5/6:     | Stainless steel 1.4462        |
| Bearings:    | See specifications table      |
| Seals:       | FPM, EPDM or FEP              |

### Electrical Data

|                                 |   |
|---------------------------------|---|
| Output signal:                  | 2 pulse output signals<br>90° ± 30° phase shift   |
| Pulse form:                     | Rectangular<br>duty cycle 1:1 (±15%),<br>short circuit proof, signal PNP                        |
| Pulse amplitude:                | ≥ 0.8 U <sub>s</sub>  |
| Supply voltage U <sub>s</sub> : | 24 V <sub>DC</sub> (±20%)<br>12 V <sub>DC</sub> (±20%) (option)<br>reversed polarity protection |

|                           |   |
|---------------------------|---|
| Max. power consumption:   | 0.9 W   |
| Max. output capacity:     | 0.3 W   |
| Electric connection:      | Plug acc. DIN 43650   |
| Protection:               | IP 65   |
| ATEX-approval (option A): | II 2 G Ex ia IIC T4<br>II 2 D Ex ia D21 T125 °C<br>I M2 Ex ia I |
| Weight:                   | See dimensions table  |

### Plug-on display

|                             |   |
|-----------------------------|---|
| Display:                    | 4-digit LED display digit height 7.62 mm mit, floating point                            |
| Protection:                 | IP 65   |
| Electrical connection:      | Plug acc. DIN 43650 (4 pin)   |
| Fluid temperature:          | 0 ... 80 °C   |
| Ambient temperature:        | 0 ... 60 °C   |
| Max. current consumption:   | 120 mA  |
| Analogue output (Option 3): | 0-20 mA, 4-20 mA<br>max. load 250 Ω (18 V <sub>DC</sub> )<br>50 Ω (10 V <sub>DC</sub> ) |
| Relay contact (Option 4):   | 2×N.O. max. 24 V / 1 A  |



**Fluid Temperature**

| Model                               | Sealing Material |               |               |
|-------------------------------------|------------------|---------------|---------------|
|                                     | FPM              | EPDM          | FEP           |
| DZR-1/2/6                           | -15...+120 °C    | -30...+120 °C | -30...+120 °C |
| DZR-3/4/5                           | -15...+80 °C     | -30...+80 °C  | -30...+80 °C  |
| DZR-1/2/6<br>(Elektronic<br>H or T) | -15...+150 °C    | -30...+130 °C | -30...+150 °C |

Higher fluid temperature up to +220 °C on request

**Pulse output rate**

| Model                | Resolution [pulses/l] |
|----------------------|-----------------------|
| DZR-x001/-x002       | 40000                 |
| DZR-x003             | 25000                 |
| DZR-x004             | 10000                 |
| DZR-x005             | 4082                  |
| DZR-x006/-x007       | 2500                  |
| DZR-x008/-x009/-x010 | 965                   |
| DZR-x011/-x012       | 333                   |
| DZR-x013/-x014/-x015 | 191.5                 |
| DZR-x017             | 83.3                  |
| DZR-x018             | 62.5                  |

**Specifications**

|  | DZR-1                               | DZR-2                               | DZR-3                              | DZR-4                                | DZR-5                                | DZR-6                               |
|--|-------------------------------------|-------------------------------------|------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|
| Media viscosity  | low                                 | medium                              | high                               | medium                               | medium                               | low                                 |
| Lubrication properties of media                            | good                                | good                                | good                               | bad                                  | bad                                  | good                                |
| Max. particle size   | <20 µm                              | <20 µm                              | <50 µm                             | <30 µm                               | <30 µm                               | <20 µm                              |
| Bearing  | ball bearing                        | ball bearing                        | bronze gliding bearing             | tungsten c.gl. bearing               | tungsten c.gl. bearing               | ball bearing                        |
| Material   | cast iron                           | cast iron                           | cast iron                          | cast iron                            | stainless steel                      | stainless steel                     |
| Accuracy of measured value                                 | ±0.3%<br>from 20 mm <sup>2</sup> /s | ±0.5%<br>from 50 mm <sup>2</sup> /s | ±1%<br>from 100 mm <sup>2</sup> /s | ±0.5%<br>from 100 mm <sup>2</sup> /s | ±0.5%<br>from 100 mm <sup>2</sup> /s | ±0.3%<br>from 20 mm <sup>2</sup> /s |
| Start of rotation at 20 mm <sup>2</sup> /s approx. [l/min] | Measuring range [l/min]             |                                     |                                    |                                      |                                      |                                     |
| 001  | 0.001                               | 0.008...2                           | -                                  | -                                    | -                                    | 0.008...2                           |
| 002  | 0.001                               | -                                   | -                                  | -                                    | 0.02...2*                            | -                                   |
| 003  | 0.004                               | 0.02...4                            | -                                  | -                                    | -                                    | 0.02...4                            |
| 004  | 0.01                                | 0.04...8                            | -                                  | 0.04...8                             | -                                    | 0.04...8                            |
| 005  | 0.01                                | 0.16...16                           | 0.16...16                          | -                                    | 0.16...16                            | 0.16...16                           |
| 006  | 0.01                                | -                                   | -                                  | 0.2...30                             | 0.2...30                             | -                                   |
| 007  | 0.01                                | 0.2...40                            | -                                  | -                                    | -                                    | -                                   |
| 008  | 0.02                                | -                                   | -                                  | 0.6...40                             | -                                    | -                                   |
| 009  | 0.02                                | -                                   | -                                  | -                                    | 0.3...60                             | 0.3...60                            |
| 010  | 0.02                                | 0.4...80                            | 0.4...80                           | -                                    | -                                    | 0.4...80                            |
| 011  | 0.03                                | -                                   | -                                  | -                                    | 0.6...100                            | 0.6...100                           |
| 012  | 0.03                                | 0.6...160                           | 0.6...160                          | -                                    | -                                    | 0.6...160                           |
| 013  | 0.04                                | -                                   | -                                  | 1.2...80                             | -                                    | -                                   |
| 014  | 0.04                                | -                                   | -                                  | -                                    | 1...160                              | 1...160                             |
| 015  | 0.04                                | 1...250                             | 1...250                            | -                                    | -                                    | 1...250                             |
| 017  | 0.1                                 | 2...600                             | -                                  | -                                    | -                                    | -                                   |
| 018  | 0.2                                 | 3...700                             | -                                  | -                                    | -                                    | -                                   |

\* Accuracy: ±3%, linearity ±1.5%



Oder Details (Example: DZR-1 001 S10 F S 0)

| Model      | Range <sup>1)</sup>      | Mech. connection<br>(female thread)   | Seal                           | Sensor <sup>5)</sup>   | Elektronic<br>electr. connection   |                                |  |  |  |  |  |                                |  |  |
|------------|--------------------------|---|--------------------------------|--|--|--------------------------------|--|--|--|--|--|--------------------------------|--|--|
| DZR-1      | 001<br>003<br>004<br>005 | S10 = G 3/8 side<br>H10 = G 3/8 back  | F = FPM<br>E = EPDM<br>P = FEP | S = up to 120°C/<br>24 V <sub>DC</sub><br>H <sup>2)</sup> = up to 150°C/<br>24 V <sub>DC</sub><br>R = up to 120°C/<br>12 V <sub>DC</sub><br>T <sup>2)</sup> = up to 150°C/<br>12 V <sub>DC</sub> | V = mating plug<br>without cable with<br>pre amplifier<br>1 = mating plug with<br>5 m cable with pre<br>amplifier<br>2 = mating plug with<br>10 m cable with<br>pre amplifier<br>3 <sup>4)</sup> = plug-on display<br>with 0(4) ... 20 mA<br>output<br>4 <sup>4)</sup> = plug-on display with<br>2 x Relay<br>contacts |                                |  |  |  |  |  |                                |  |  |
|            | 007<br>010               | S15 = G 1/2 side<br>H15 = G 1/2 back  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 012<br>015               | S25 = G 1 side<br>H25 = G 1 back  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 017<br>018               | S40 = flange SAE 1 1/2" side  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
| DZR-2      | 005                      | S10 = G 3/8 side<br>H10 = G 3/8 back  |                                |  |  | F = FPM<br>E = EPDM<br>P = FEP | S = up to 120°C/<br>24 V <sub>DC</sub><br>H <sup>2)</sup> = up to 150°C/<br>24 V <sub>DC</sub><br>R = up to 120°C/<br>12 V <sub>DC</sub><br>T <sup>2)</sup> = up to 150°C/<br>12 V <sub>DC</sub> | V = mating plug<br>without cable with<br>pre amplifier<br>1 = mating plug with<br>5 m cable with pre<br>amplifier<br>2 = mating plug with<br>10 m cable with<br>pre amplifier<br>3 <sup>4)</sup> = plug-on display<br>with 0(4) ... 20 mA<br>output<br>4 <sup>4)</sup> = plug-on display with<br>2 x Relay<br>contacts |  |  |  |                                |  |  |
|            | 010                      | S15 = G 1/2 side<br>H15 = G 1/2 back  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 015                      | S25 = G 1 side<br>H25 = G 1 back  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
| DZR-3      | 008                      | S15 = G 1/2 side<br>H15 = G 1/2 back  |                                |  |  |                                |  |  | F = FPM<br>E = EPDM<br>P = FEP   | S = up to 120°C/<br>24 V <sub>DC</sub><br>H <sup>2)</sup> = up to 150°C/<br>24 V <sub>DC</sub><br>R = up to 120°C/<br>12 V <sub>DC</sub><br>T <sup>2)</sup> = up to 150°C/<br>12 V <sub>DC</sub> | V = mating plug<br>without cable with<br>pre amplifier<br>1 = mating plug with<br>5 m cable with pre<br>amplifier<br>2 = mating plug with<br>10 m cable with<br>pre amplifier<br>3 <sup>4)</sup> = plug-on display<br>with 0(4) ... 20 mA<br>output<br>4 <sup>4)</sup> = plug-on display with<br>2 x Relay<br>contacts |                                |  |  |
|            | 013                      | S25 = G 1 side<br>H25 = G 1 back  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
| DZR-4      | 004<br>005               | S10 = G 3/8 side<br>H10 = G 3/8 back  |                                |  |  |                                |  |  |  |  |  | F = FPM<br>E = EPDM<br>P = FEP | S = up to 120°C/<br>24 V <sub>DC</sub><br>H <sup>2)</sup> = up to 150°C/<br>24 V <sub>DC</sub><br>R = up to 120°C/<br>12 V <sub>DC</sub><br>T <sup>2)</sup> = up to 150°C/<br>12 V <sub>DC</sub> | V = mating plug<br>without cable with<br>pre amplifier<br>1 = mating plug with<br>5 m cable with pre<br>amplifier<br>2 = mating plug with<br>10 m cable with<br>pre amplifier<br>3 <sup>4)</sup> = plug-on display<br>with 0(4) ... 20 mA<br>output<br>4 <sup>4)</sup> = plug-on display with<br>2 x Relay<br>contacts |
|            | 006<br>009               | S15 = G 1/2 side<br>H15 = G 1/2 back  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 011<br>014               | S25 = G 1 side<br>H25 = G 1 back  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 002                      | R06 = G 1/8 side  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
| DZR-5      | 005                      | R10 = G 3/8 side  | F = FPM<br>E = EPDM<br>P = FEP | S = up to 120°C/<br>24 V <sub>DC</sub><br>H <sup>2)</sup> = up to 150°C/<br>24 V <sub>DC</sub><br>R = up to 120°C/<br>12 V <sub>DC</sub><br>T <sup>2)</sup> = up to 150°C/<br>12 V <sub>DC</sub> | V = mating plug<br>without cable with<br>pre amplifier<br>1 = mating plug with<br>5 m cable with pre<br>amplifier<br>2 = mating plug with<br>10 m cable with<br>pre amplifier<br>3 <sup>4)</sup> = plug-on display<br>with 0(4) ... 20 mA<br>output<br>4 <sup>4)</sup> = plug-on display with<br>2 x Relay<br>contacts |                                |  |  |  |  |  |                                |  |  |
|            | 006<br>009               | R15 = G 1/2 side  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 011<br>014               | R25 = G 1 side  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 001                      | R06 = G 1/8 side  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
| DZR-6      | 003                      | R08 = G 1/4 side  |                                |  |  | F = FPM<br>E = EPDM<br>P = FEP | S = up to 120°C/<br>24 V <sub>DC</sub><br>H <sup>2)</sup> = up to 150°C/<br>24 V <sub>DC</sub><br>R = up to 120°C/<br>12 V <sub>DC</sub><br>T <sup>2)</sup> = up to 150°C/<br>12 V <sub>DC</sub> | V = mating plug<br>without cable with<br>pre amplifier<br>1 = mating plug with<br>5 m cable with pre<br>amplifier<br>2 = mating plug with<br>10 m cable with<br>pre amplifier<br>3 <sup>4)</sup> = plug-on display<br>with 0(4) ... 20 mA<br>output<br>4 <sup>4)</sup> = plug-on display with<br>2 x Relay<br>contacts |  |  |  |                                |  |  |
|            | 004<br>005               | R10 = G 3/8 side  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 010                      | R15 = G 1/2 side  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 012<br>015               | R25 = G 1 side  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 002                      | R06 = G 1/8 side  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
|            | 003                      | R08 = G 1/4 side  |                                |  |  |                                |  |  |  |  |  |                                |  |  |
| 004<br>005 | R10 = G 3/8 side         | A <sup>3)</sup> = ATEX (only in<br>combination<br>with electr.<br>connection 0) |                                |  |  |                                |  |  | 0 = mating plug without<br>cable without pre<br>amplifier (only in<br>combination with<br>ATEX option A) |  |  |                                |  |  |
| 010        | R15 = G 1/2 side         |   |                                |  |  |                                |  |  |  |  |  |                                |  |  |
| 012<br>015 | R25 = G 1 side           |   |                                |  |  |                                |  |  |  |  |  |                                |  |  |

<sup>1)</sup> the range of the corresponding model can be taken from the schedule »Specifications«

<sup>2)</sup> electronic H/T only for DZR-1, DZR-2, DZR-6, not possible with plug-on display

<sup>3)</sup> only permitted with Ex-separator K130/3-E-10

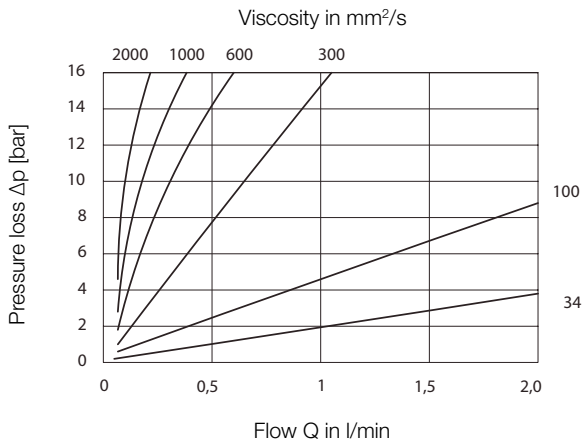
<sup>4)</sup> max. fluid temperature 80 °C

<sup>5)</sup> pay attention to temperature limits due to sealing material selection

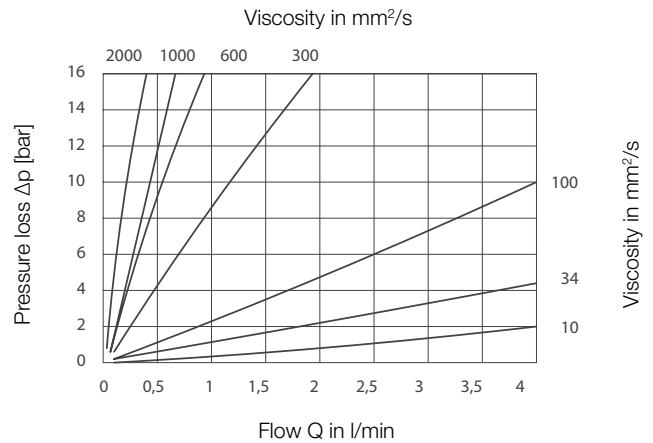


**Pressure Loss Diagrams**

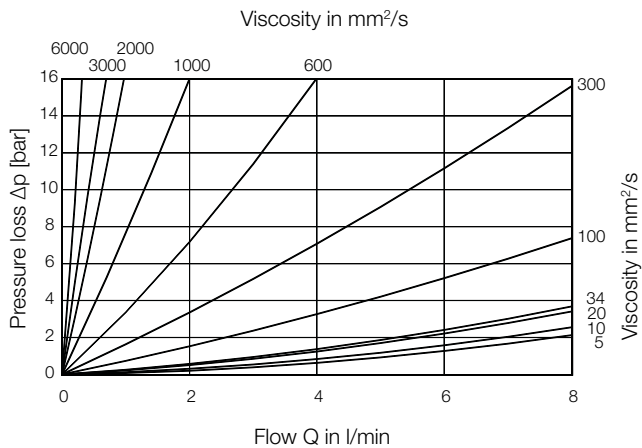
**DZR-1001, DZR-6001**



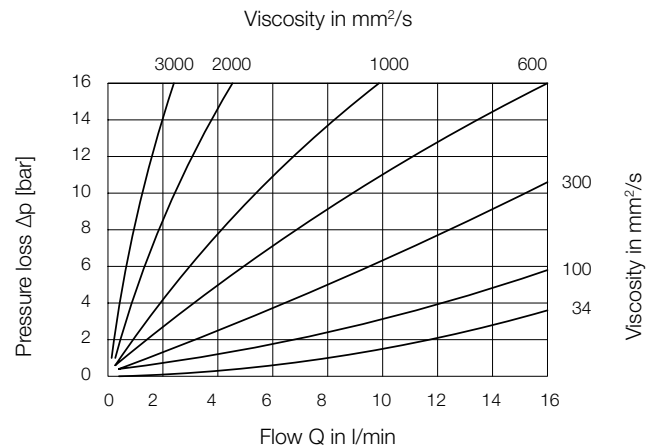
**DZR-1003**



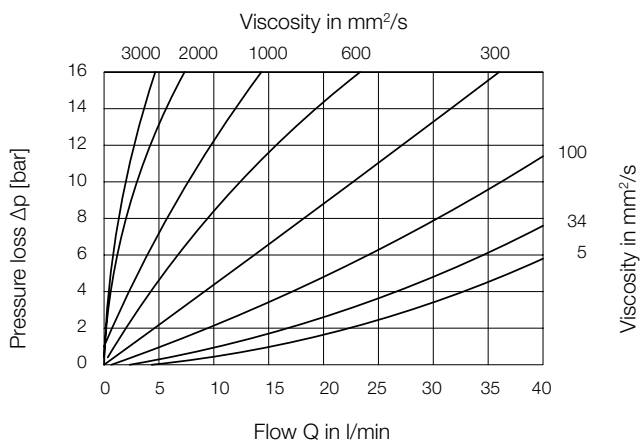
**DZR-1004, DZR-4004, DZR-6004**



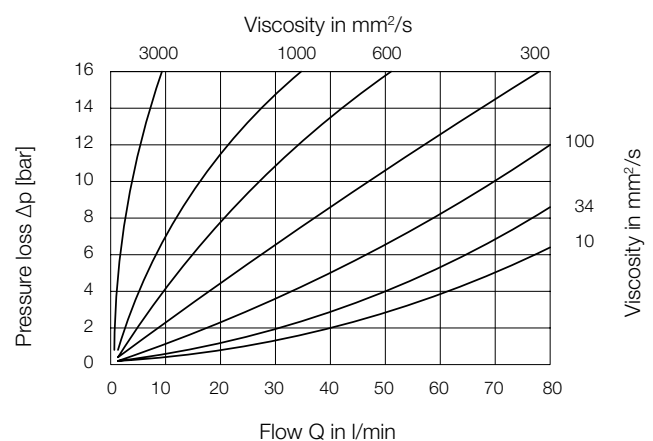
**DZR-1005, DZR-2005, DZR-6005**



**DZR-1007**

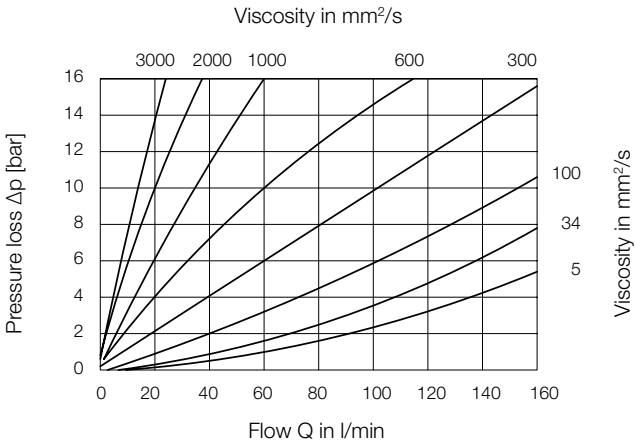


**DZR-1010, DZR-2010, DZR-6010**

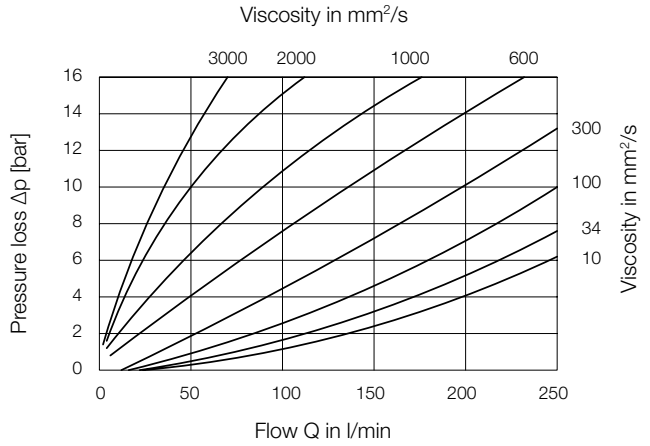




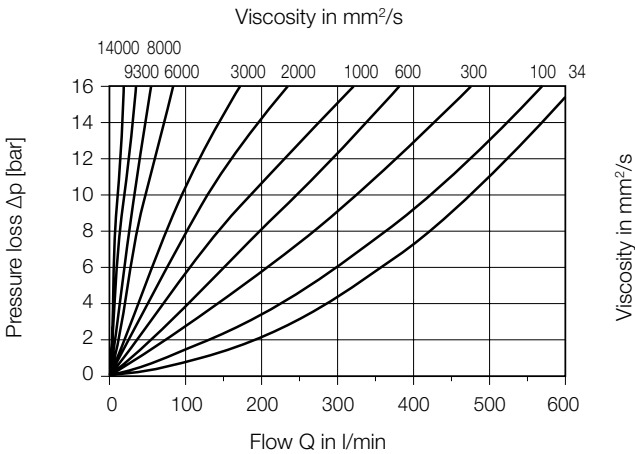
DZR-1012, DZR-6012



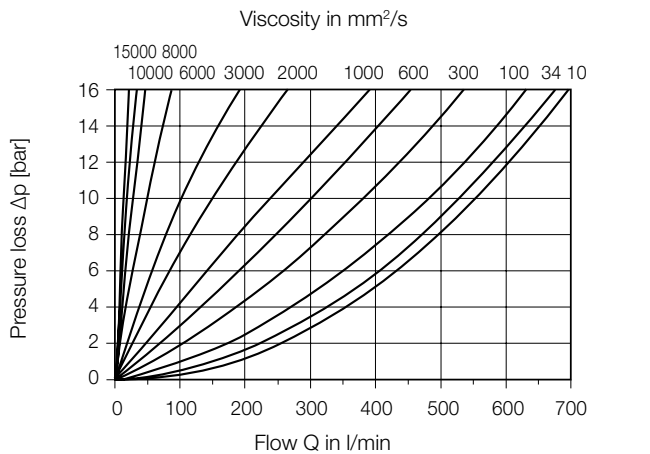
DZR-1015, DZR-2015, DZR-6015



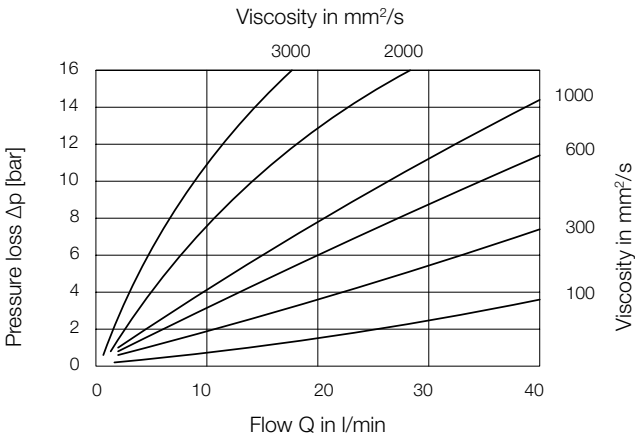
DZR-1017



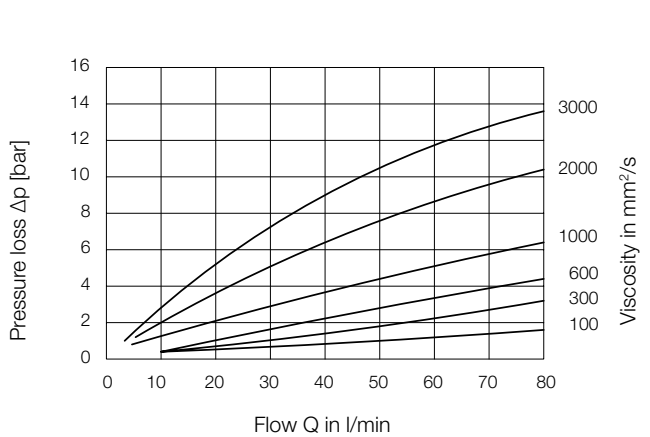
DZR-1018



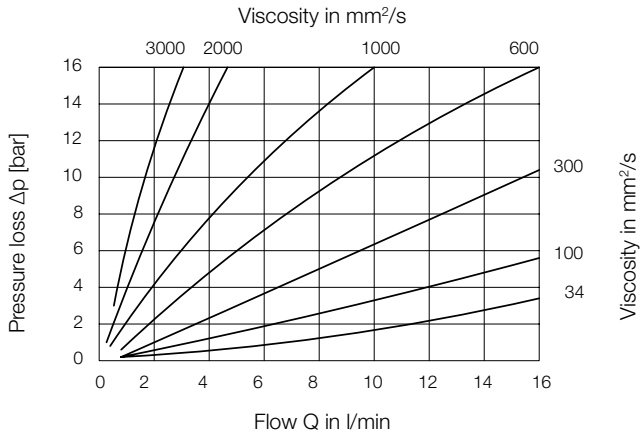
DZR-3008



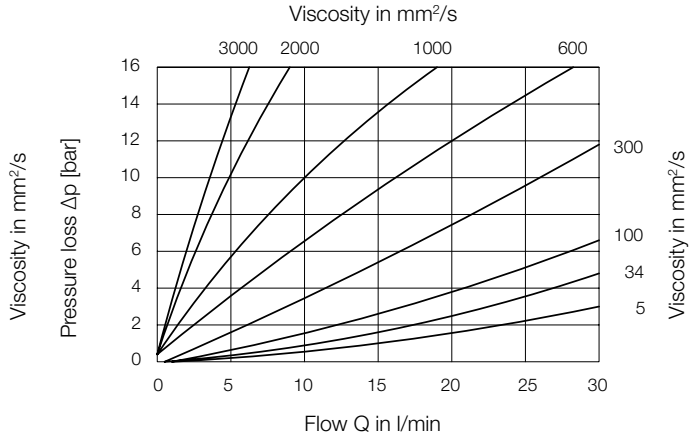
DZR-3013



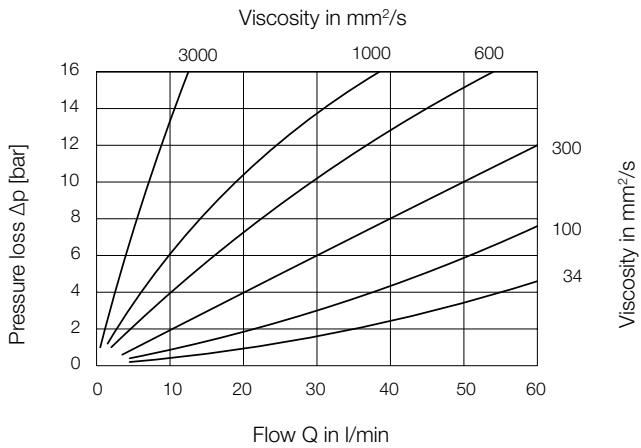
**DZR-4005, DZR-5005**



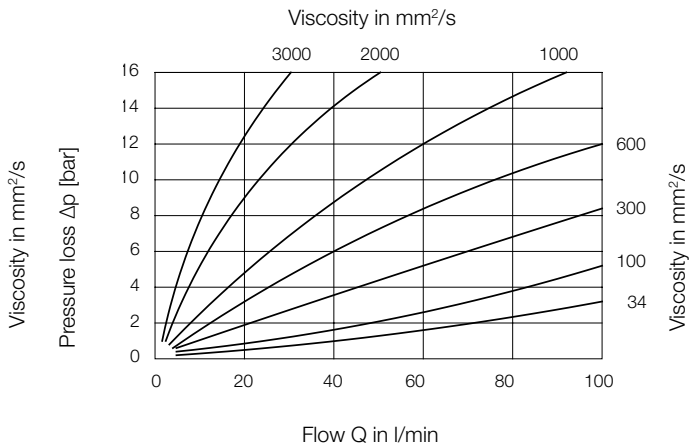
**DZR-4006**



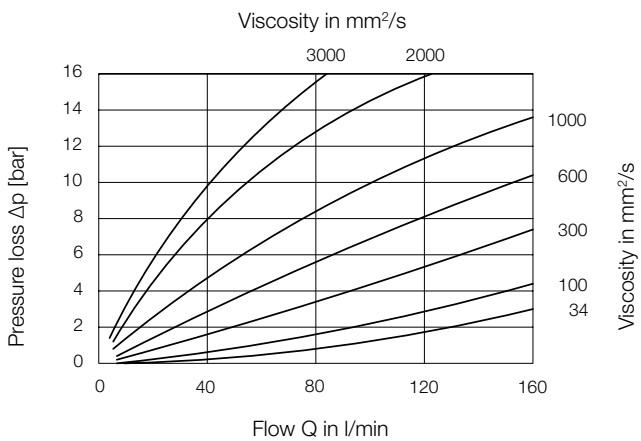
**DZR-4009, DZR-5009**



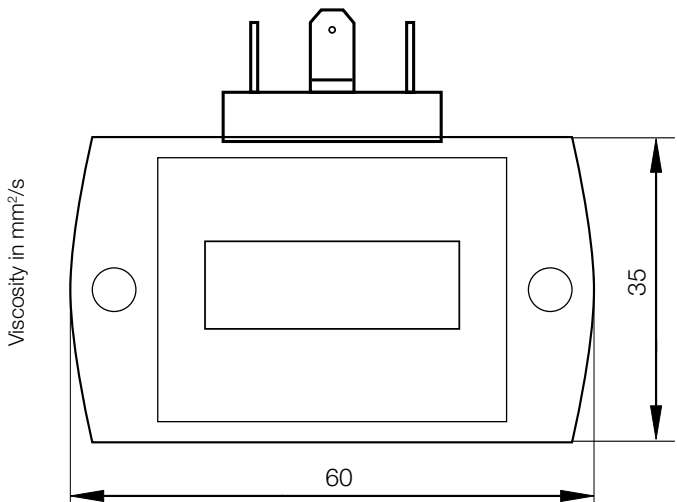
**DZR-4011, DZR-5011**



**DZR-4014, DZR-5014**



**Dimensions of plug-on display (Option 3,4) [mm]**

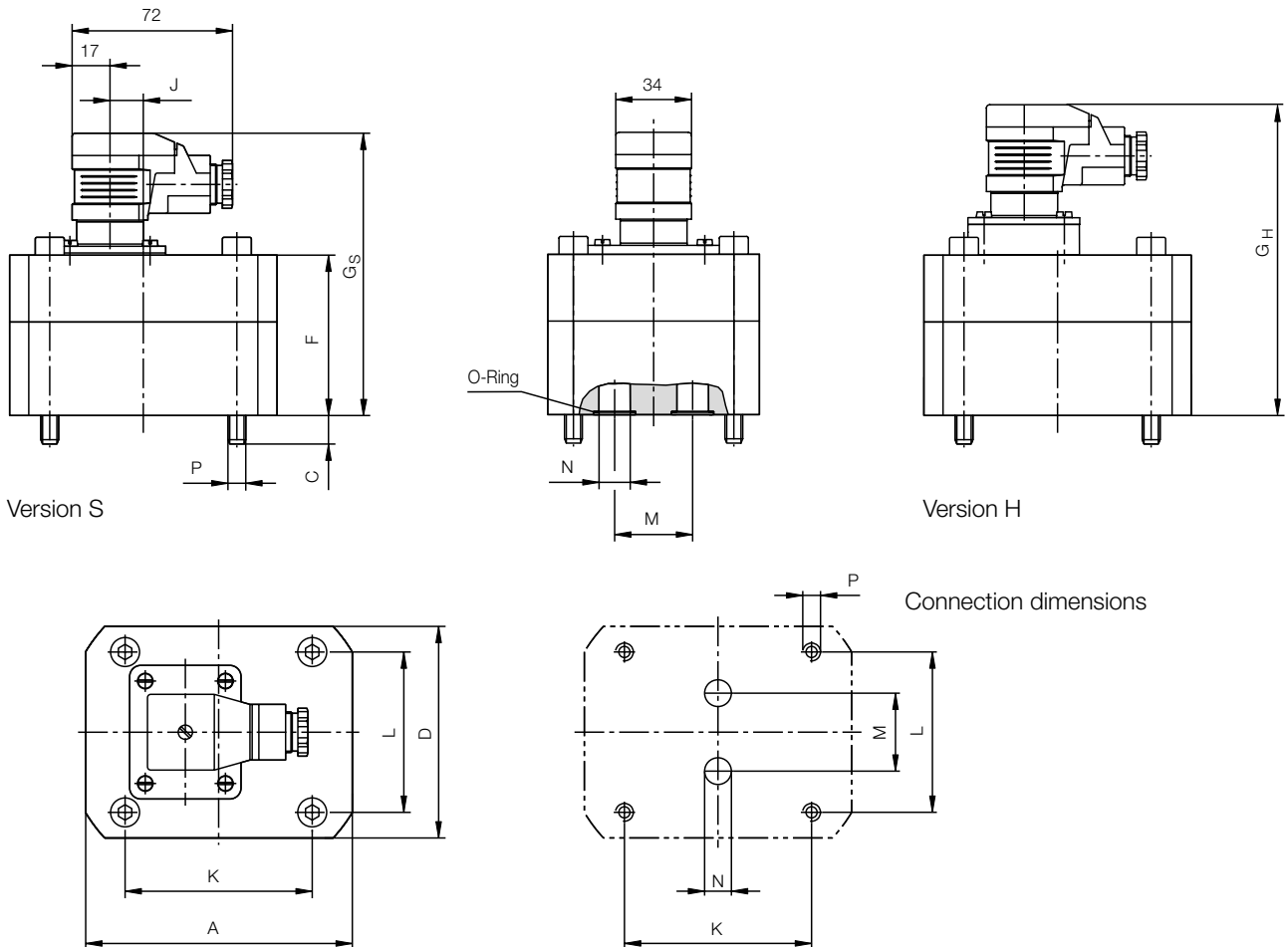




**Dimensions** DZR-1, DZR-2, DZR-3, DZR-4, without connection assembly

| Measuring range code | Weight [kg] | Dimensions [mm] |    |     |     |                |                |      |    |    |    |     |     |
|----------------------|-------------|-----------------|----|-----|-----|----------------|----------------|------|----|----|----|-----|-----|
|                      |             | A               | C  | D   | F   | G <sub>S</sub> | G <sub>H</sub> | J    | K  | L  | M  | N   | P   |
| 001/002              | 1.8         | 85              | 10 | 60  | 50  | 101            | 114            | -    | 70 | 40 | 20 | 6.5 | M6  |
| 003                  | 2           | 85              | 9  | 60  | 56  | 107            | 120            | -    | 70 | 40 | 20 | 6.5 | M6  |
| 004                  | 2           | 85              | 9  | 60  | 56  | 107            | 120            | -    | 70 | 40 | 20 | 6.5 | M6  |
| 005                  | 2           | 85              | 13 | 60  | 57  | 108            | 121            | -    | 70 | 40 | 20 | 9   | M6  |
| 006/007              | 3.7         | 100             | 17 | 90  | 63  | 114            | 127            | -    | 80 | 38 | 34 | 16  | M8  |
| 008/009/010          | 5.2         | 120             | 13 | 95  | 72  | 123            | 136            | 15.5 | 84 | 72 | 35 | 16  | M8  |
| 011/012              | 9           | 170             | 18 | 120 | 89  | 140            | 153            | 46.5 | 46 | 95 | 50 | 25  | M12 |
| 013/014/015          | 13          | 170             | 22 | 120 | 105 | 156            | 169            | 46.5 | 46 | 95 | 50 | 25  | M12 |

**DZR-1, DZR-2, DZR-3, DZR-4** without connection assembly



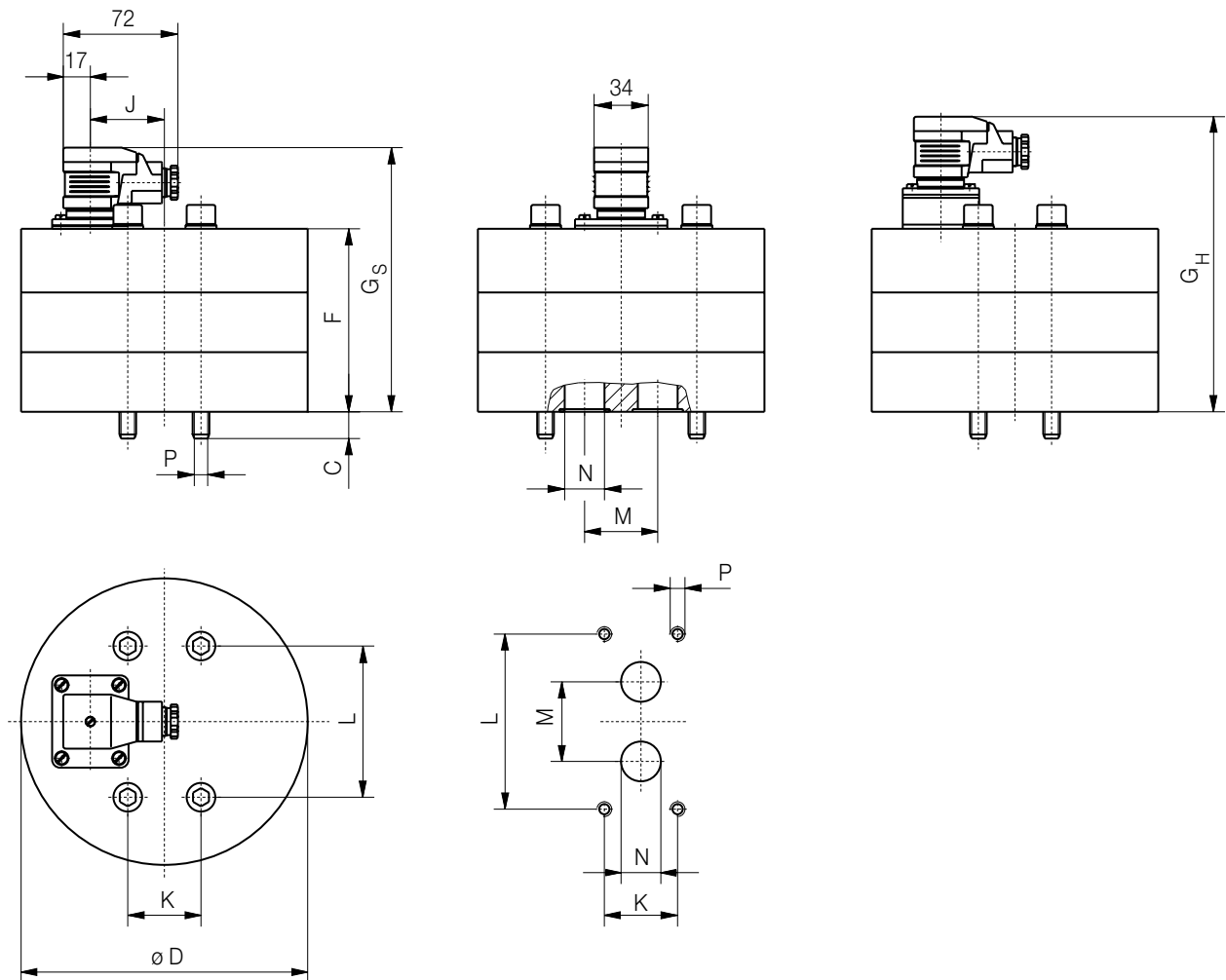


Dimensions DZR-1

| Measuring range code | Weight [kg] | Dimensions [mm] |     |     |     |                |                |     |     |    |    |     |
|----------------------|-------------|-----------------|-----|-----|-----|----------------|----------------|-----|-----|----|----|-----|
|                      |             | m               | C   | D   | F   | G <sub>S</sub> | G <sub>H</sub> | J   | K   | L  | M  | N   |
| 017                  | 53.5        | 44              | 249 | 168 | 219 | 232            | 77             | 120 | 140 | 70 | 38 | M20 |
| 018                  | 57.4        | 44              | 249 | 184 | 235 | 248            | 77             | 120 | 140 | 70 | 38 | M20 |

Standard temperature version S and R

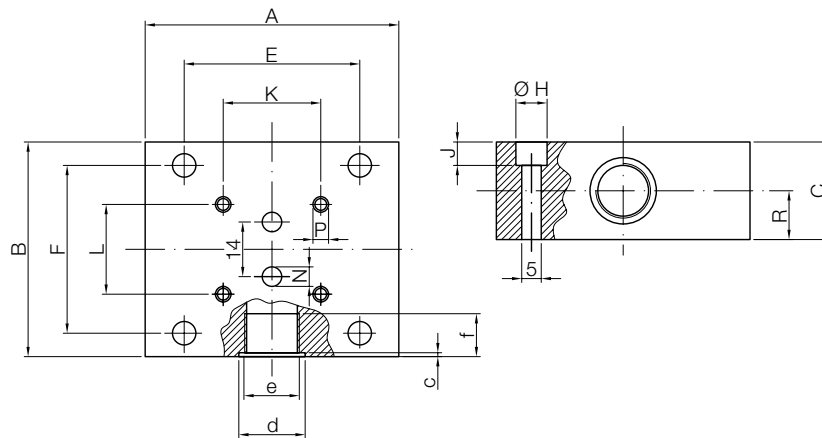
High temperature version H and T



**Dimensions** of connection assembly for DZR-1, DZR-2, DZR-3, DZR-4

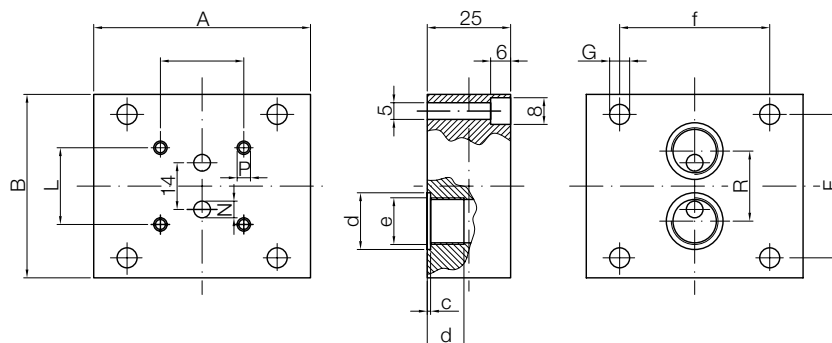
**Side Connection**

| Meas. range code | Weight [kg] | Dimensions [mm] |     |    |     |     |   |    |   |    |    |    |     |     |      |     |    |                 |    |
|------------------|-------------|-----------------|-----|----|-----|-----|---|----|---|----|----|----|-----|-----|------|-----|----|-----------------|----|
|                  |             | A               | B   | C  | E   | F   | G | H  | J | K  | L  | M  | N   | P   | R    | c   | d  | e               | f  |
| 001-005          | 1.8         | 85              | 90  | 35 | 65  | 76  | 7 | 11 | 7 | 70 | 40 | 20 | 6,5 | M6  | 17   | 0.7 | 25 | G $\frac{3}{8}$ | 13 |
| 006-007          | 2.7         | 100             | 110 | 37 | 86  | 96  | 7 | 11 | 7 | 80 | 38 | 34 | 16  | M8  | 18.5 | 0.7 | 29 | G $\frac{1}{2}$ | 15 |
| 008-010          | 2.9         | 100             | 120 | 37 | 80  | 106 | 7 | 11 | 7 | 84 | 72 | 35 | 12  | M8  | 17.5 | 0.7 | 29 | G $\frac{1}{2}$ | 15 |
| 011-015          | 14          | 160             | 165 | 80 | 140 | 145 | 9 | 15 | 9 | 46 | 95 | 50 | 25  | M12 | 28   | 1   | 42 | G1              | 19 |



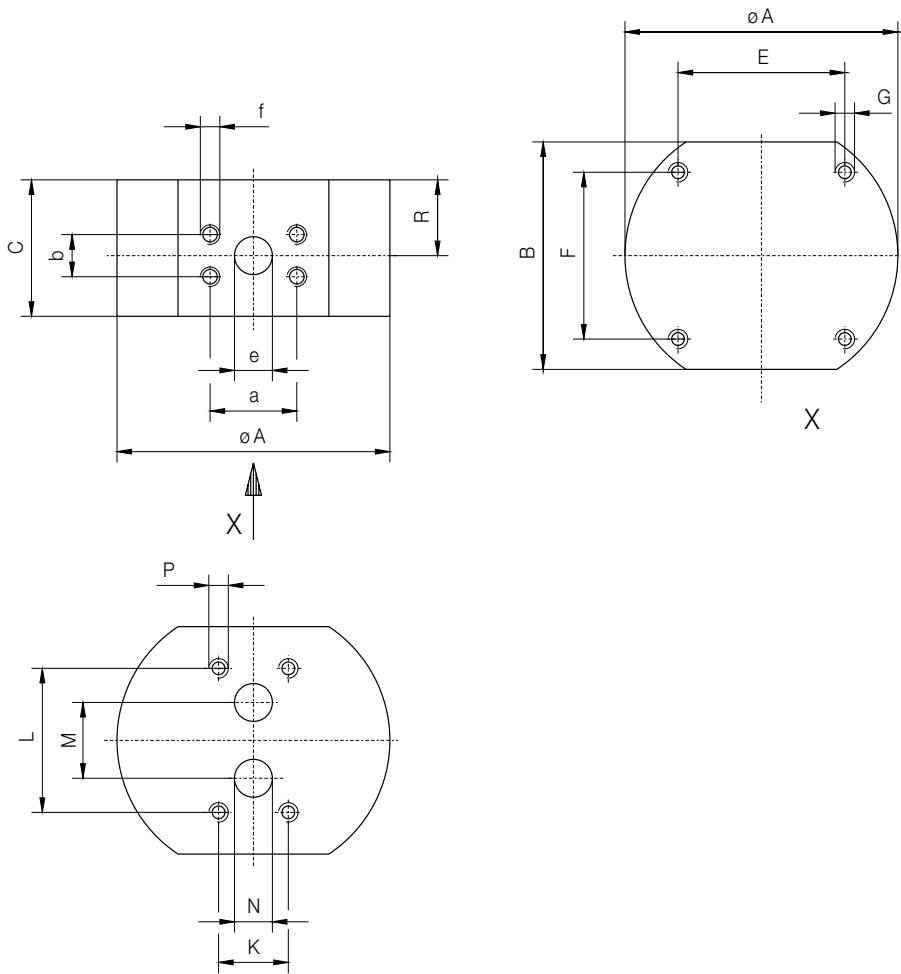
**Connection back**

| Meas. range code | Weight [kg] | Dimensions [mm] |     |    |     |     |   |    |   |    |    |    |     |     |    |     |    |                 |    |
|------------------|-------------|-----------------|-----|----|-----|-----|---|----|---|----|----|----|-----|-----|----|-----|----|-----------------|----|
|                  |             | A               | B   | C  | E   | F   | G | H  | J | K  | L  | M  | N   | P   | R  | c   | d  | e               | f  |
| 001-005          | 1.6         | 85              | 90  | 35 | 65  | 76  | 7 | -  | - | 70 | 40 | 20 | 6,5 | M6  | 28 | 0.7 | 25 | G $\frac{3}{8}$ | 12 |
| 006-007          | 2.7         | 100             | 110 | 37 | 86  | 96  | 7 | 11 | 7 | 80 | 38 | 34 | 16  | M8  | 46 | 0.7 | 29 | G $\frac{1}{2}$ | 15 |
| 008-010          | 2.9         | 100             | 120 | 37 | 80  | 106 | 7 | -  | - | 84 | 72 | 35 | 12  | M8  | 50 | 0.7 | 29 | G $\frac{1}{2}$ | 14 |
| 011-015          | 9.6         | 160             | 165 | 55 | 140 | 145 | 9 | 15 | 9 | 46 | 95 | 50 | 25  | M12 | 55 | 1   | 42 | G1              | 18 |



**Dimensions** of connection assembly for DZR-1 / connection sideways

| Meas. range code | Weight [kg]<br>m | Dimensions [mm] |     |     |     |     |         |     |     |    |    |         |    |      |      |    |         |
|------------------|------------------|-----------------|-----|-----|-----|-----|---------|-----|-----|----|----|---------|----|------|------|----|---------|
|                  |                  | A               | B   | C   | E   | F   | G       | K   | L   | M  | N  | P       | R  | a    | b    | e  | f       |
| 017/018          | 41.2             | 249             | 200 | 140 | 120 | 140 | M10/20t | 120 | 140 | 70 | 38 | M20/45t | 70 | 79.4 | 36,5 | 38 | M16/25t |

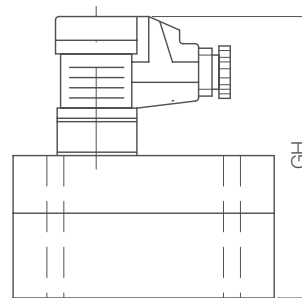
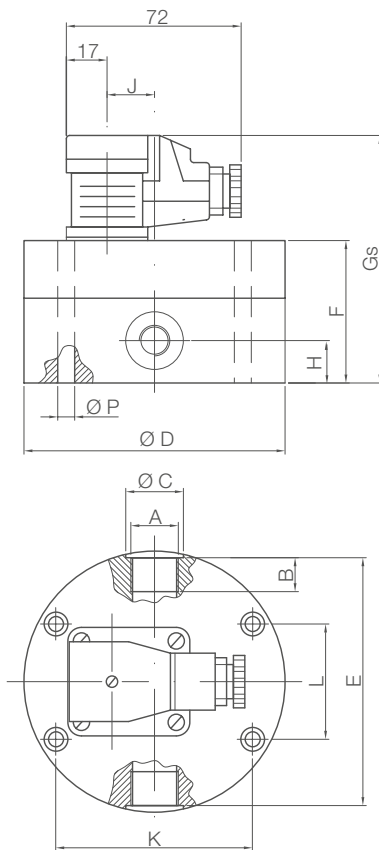


**Dimensions** DZR-5, DZR-6

| Meas. range code | Weight [kg] | Dimensions [mm] |    |    |     |     |     |                |                |    |      |    |    |     |
|------------------|-------------|-----------------|----|----|-----|-----|-----|----------------|----------------|----|------|----|----|-----|
|                  |             | A               | B  | C  | D   | E   | F   | G <sub>s</sub> | G <sub>H</sub> | H  | J    | K  | L  | P   |
| 001-002          | 3           | G $\frac{1}{8}$ | 9  | 17 | 94  | 86  | 55  | 106            | 119            | 15 | -    | 70 | 40 | 6.7 |
| 004-005          | 3.1         | G $\frac{3}{8}$ | 13 | 25 | 94  | 90  | 57  | 108            | 121            | 16 | -    | 70 | 40 | 6.7 |
| 008-010          | 7           | G $\frac{1}{2}$ | 15 | 29 | 124 | 120 | 72  | 123            | 136            | 22 | 15.5 | 84 | 72 | 9   |
| 011-012          | 15.9        | G1              | 19 | 42 | 170 | 162 | 89  | 140            | 153            | 30 | 46.5 | 46 | 50 | 13  |
| 013-015          | 18.7        | G1              | 19 | 42 | 170 | 162 | 105 | 156            | 169            | 30 | 46.5 | 46 | 50 | 13  |

with sensor ... S/R/A without plug-on display

with sensor ... H/T without plug-on display



**Gear wheel flow meter for viscous fluids Model DZR ATEX version**

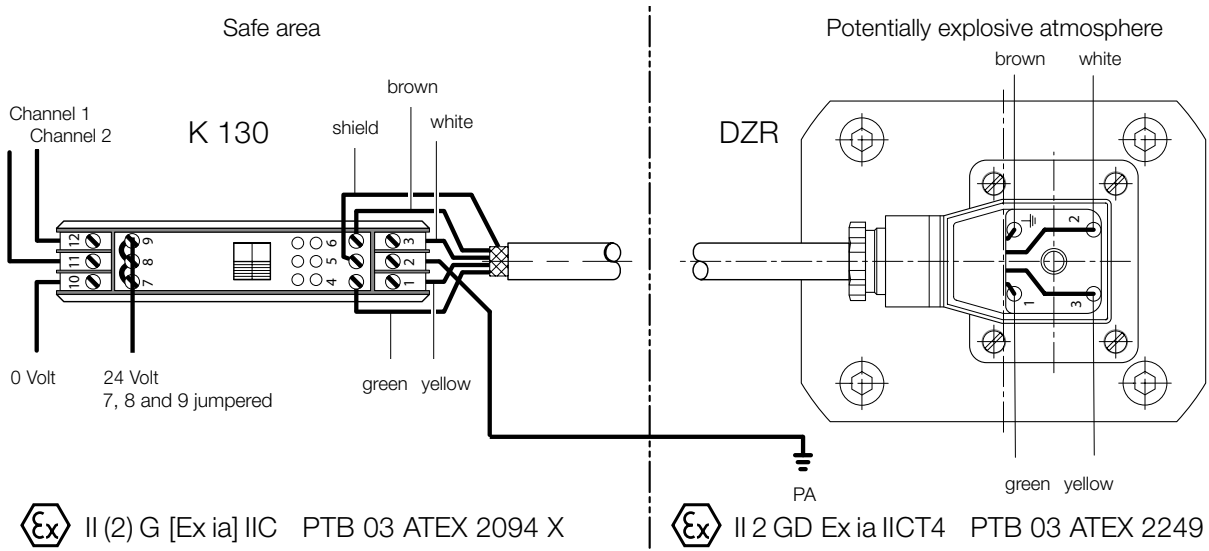
**Operation in ATEX area**

- All volume counters are available in explosion-proof design according to ATEX.
- The explosion-proof design consists of the volume counter (intrinsically safe electrical apparatus) and the switching amplifier K 130 (associated electrical apparatus). The type of protection „intrinsic safety“ applies to this construction.
- The volume counter is installed in the potentially explosive atmosphere.
- The mounting of the amplifier K 130 is carried out in the safe area.
- Volume counter and switching amplifier are electrically connected to each other. The switching amplifier evaluates the sensor signals and converts them to square-wave signals.
- Without switching amplifier, the volume counter must not be operated in the potentially explosive atmosphere.
- Cable lengths of up to 400 m are possible between volume counter and switching amplifier.
- LEDs for monitoring line breaks / short circuits, channel switching state and power supply are located on the switching amplifier.

**Technical Data**

**Switching Amplifier K-130 /3-E-10**

|                                   |  |
|-----------------------------------|--|
| Supply voltage:                   | 24 V <sub>DC</sub> ± 20%                         |
| Ripple content white WSS:         | <10%   |
| Outputs (non-intrinsically safe): | Electrically isolated via optoelectronic coupler |
| Short-circuit current:            | Approximately 25 mA                              |
| Signal level 1-signal:            | 0.8 × supply voltage with RL > 2 k Ω             |
| Signal level 0-signal:            | Inhibited output, residual current < 10 μA       |
| Ambient temperature:              | -25 °C... +60 °C                                 |
| Dimensions:                       | 107.5 × 92 × 22 mm                               |
| Weight:                           | Approximately 150 g                              |



**Note:** This graph is an example only for connection of flow meter with isolation amplifier K 130. National laws for potentially explosive areas must be considered.