



Design and applications

The DDM-DS11 measuring system measures and monitors the flow rate of liquids and gases.

The device works according to the principle of differential pressure. The differential pressure at the orifice is proportional to the square of the volume rate of flow through the pipeline. The user mounts the orifice between flanges or with Rp pipe unions into the conduit. The unimpeded, straight tube length has to be 6 DN before and 4 DN behind the mounting position.

The DS11 gauge contains a rugged and uncomplicated diaphragm system. The differential pressure generates a unilateral force at the membrane which moves the diaphragm system against the measuring range springs. A centre-mounted tappet transfers motion of the diaphragm system to indicator movement and to initiating elements of the microswitches. Due to the completely mechanical functionality, no external power supply is needed.

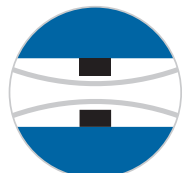
The applications of DDM-DS11 are engineering and process technology such as the monitoring of coolant streams in plants.

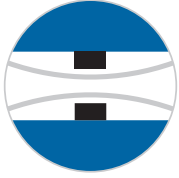
The display pressure gauge can be equipped with one or with two microswitches.

DDM-DS11



- with differential pressure gauge DS11
- installation between flanges as per DIN EN 1092-1, internal and external threads as per DIN EN ISO 228 or with pipe union as per DIN EN 10226-1 (ISO 7-1)
- one device for all installation situations and flow directions
- suitable for liquids and gases
- no moving parts, wear-free
- calibration acc. to customer specifications
- metering range 1:6
- accuracy 5 % FS
- optionally
 - up to two microswitches
 - wall attachment installation





DDM-DS11

Differential pressure flow meters

Type series

| | |
|------------------|---|
| DDM-DS11 | Measuring orifice with indicator DS11 |
| DDM-DS11 DN | Measuring orifice for in-between flange assembly |
| DDM-DS11 Rp | Measuring orifice for pipe union connection |
| DDM-DS11 Gi | Measuring orifice for internal screwed connection |
| DDM-DS11 Ga | Measuring orifice for external screwed connection |
| DDM-DS11-...-MS1 | with one microswitches |
| DDM-DS11-...-MS2 | with two microswitches |

Technical data

| | |
|---------------------------|---|
| Measuring principle | differential pressure measurement on the orifice |
| Perm. ambient temperature | -10 ... +70 °C |
| Perm. media temperature* | standard -10 ... +70 °C max. 130 °C (insulated line) optionally HT-Type above 130 °C |
| Display unit | mechanical differential pressure measuring unit |
| In-between flange (DN) | for PN 10/PN 16 flanges acc. to DIN EN 1092-1 shape A & B |
| Pipe union (Rp) | two-part pipe fitting: insert with cylindrical internal thread acc. to DIN EN 10226-1 (ISO 7-1) |
| External thread (Ga) | cyl. external thread acc. to DIN EN ISO 228 |
| Internal thread (Gi) | cyl. internal thread acc. to DIN EN ISO 228 |

*media must not freeze

Differential pressures and pressure resistance

| | |
|-----------------------------------|--|
| Differential pressure for liquids | 250 mbar ¹⁾ |
| Differential pressure for gases | 200 mbar ¹⁾ |
| Pressure loss for liquids | appr. 30 ... 60 % from the differential pressure ²⁾ |
| Pressure loss for gases | appr. 30 ... 60 % from the differential pressure ²⁾ |
| Pressure resistance | PN 16 |

¹⁾ others on request

²⁾ in case of enquiry it should be gathered from the quotation

Technical data of the gauge

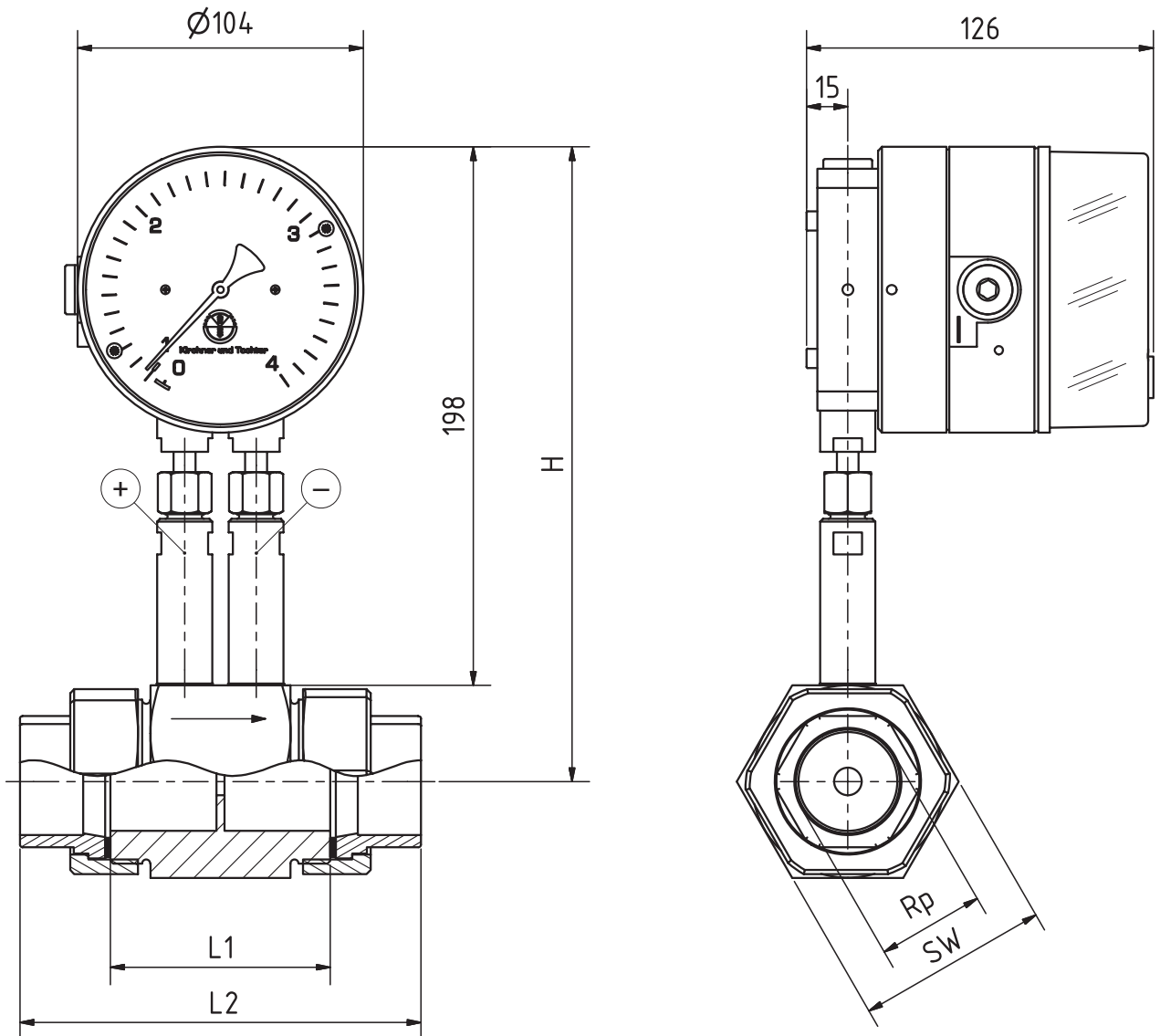
| | |
|---------------------------|--------------------------------------|
| Measuring principle | Differential pressure at the orifice |
| Perm. ambient temperature | -10 ... +70° C |
| Perm. medium temperature* | -10 ... +70° C |
| Protection class | IP54 acc. to DIN EN 60529 |
| Measuring accuracy | ± 2,5 % FS |

*media must not freeze

Materials

| | |
|--|--|
| DDM-DS11 DN | |
| Ring | S355, optionally 1.4571 |
| Corrosion protection | epoxy paint, kiln-dried, traffic blue (RAL 5017), satin finished |
| Corrosion class | C2 |
| Orifice | 1.4571 |
| DDM-DS11 Rp, Gi, Ga | |
| Pipe union (Rp) | malleable cast iron, zinc plated |
| Orifice and ring | brass |
| Gaskets | NBR |
| Connection between orifice and indicator | |
| Straight screw-in fitting 1/4" | nickel-plated brass or stainless steel |
| Screw fitting G 1/4" dia. Ø 8 | nickel-plated brass or stainless steel |
| Cutting ring, union nuts | zinc plated steel or stainless steel |
| Steel sealing | zinc plated steel with NBR gasket |
| Indicator DS11 | |
| Pressure chamber | aluminium GkAlSi12 (Cu) with HART-COAT surface protection |
| Measuring diaphragm | NBR |
| Dial cover | polycarbonate |

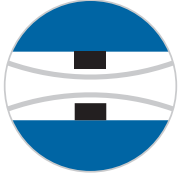
other materials on request



Dimensions for DDM-DS11 for screwed connections

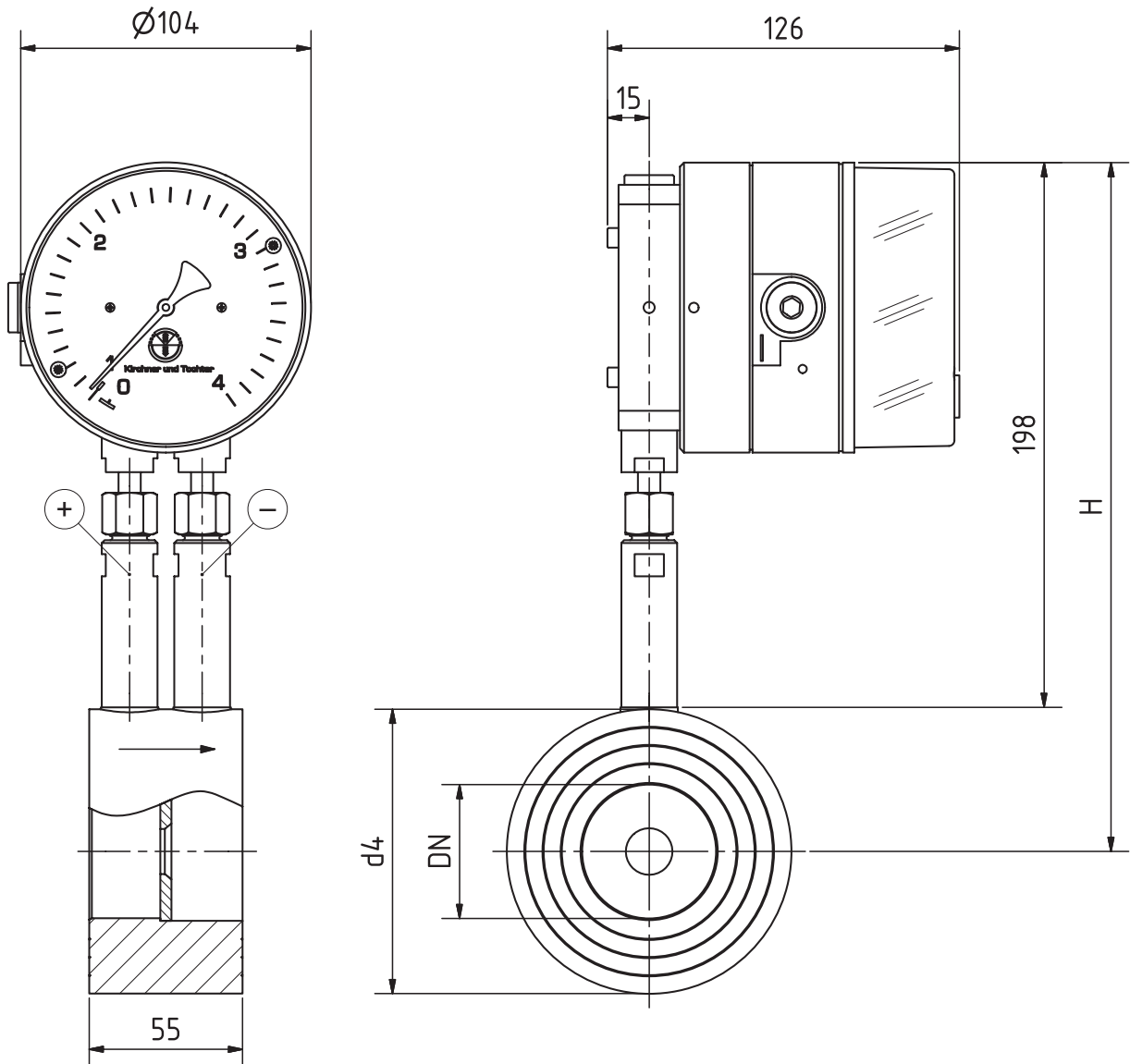
| Rp ¹⁾ | L ₁ | L ₂ | SW | H |
|------------------|----------------|----------------|----|-----|
| ¼ | 80 | 124 | 41 | 218 |
| ⅜ | 80 | 128 | 46 | 221 |
| ½ | 80 | 128 | 46 | 221 |
| ¾ | 80 | 128 | 50 | 223 |
| 1 | 80 | 136 | 60 | 228 |
| 1 ¼ | 80 | 146 | 70 | 233 |
| 1 ½ | 80 | 149 | 70 | 233 |
| 2 | 90 | 164 | 85 | 240 |

¹⁾ inside diameter is made as specified by the pipe inner diameter



DDM-DS11

Differential pressure flow meters



Dimensions for DDM-DS11 for in-between flange assembly

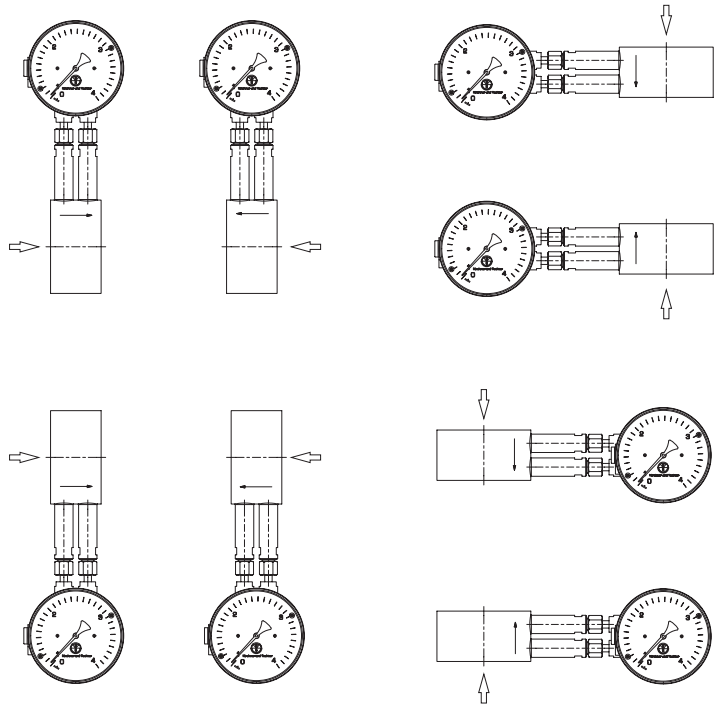
| DN ¹⁾ | d ₄ | H |
|------------------|----------------|-----|
| 40 | 88 | 246 |
| 50 | 102 | 249 |
| 65 | 122 | 259 |
| 80 | 138 | 267 |
| 100 | 158 | 277 |
| 125 | 188 | 292 |
| 150 | 212 | 304 |
| 200 | 268 | 332 |

¹⁾ Inside diameter made after details provided of inside pipe diameter.

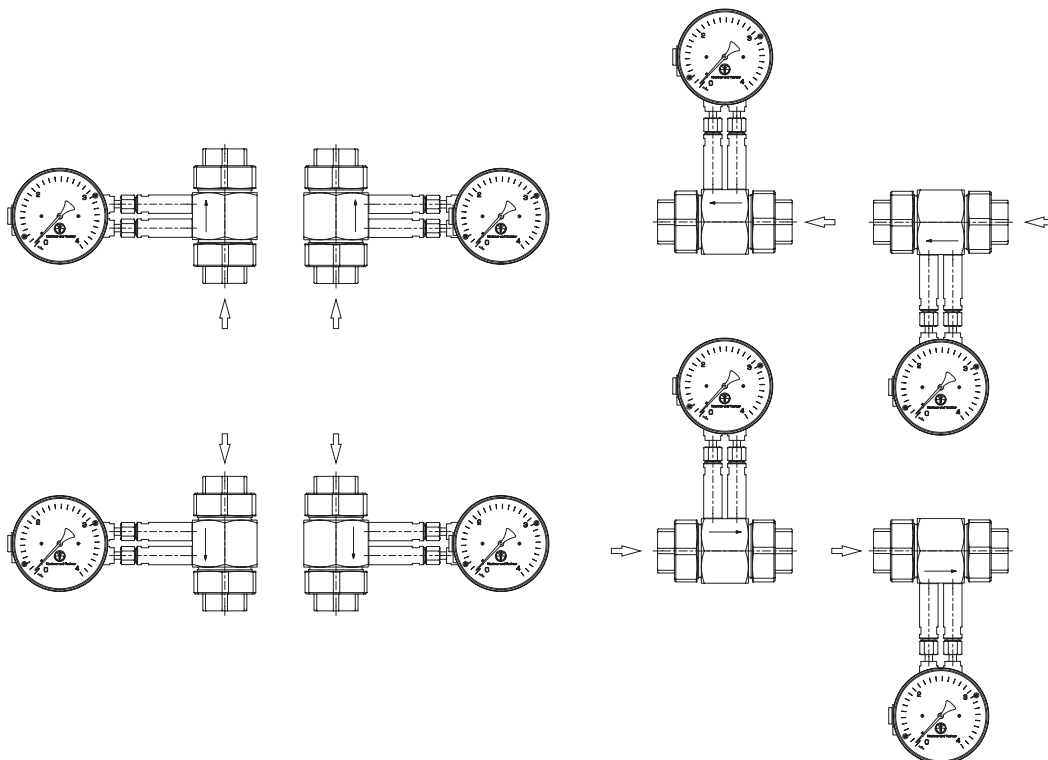
Installation variant mounted between flanges

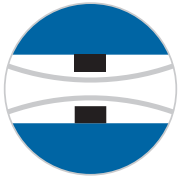
The devices are delivered in ready assembled condition to customer specifications. All displayed situations could be installed by the customer with the delivered device. For backfitting you will need appr. 20 min and requires no additional materials.

The DDM-DS11 with bottom-mounted display may only be operated with a clean and particle-free medium. Rust particles or the like can accumulate in the display mechanism and may damage it.



Installation variant with screw connections





DDM-DS11

Differential pressure flow meters

Flow rates for water

for screwed connection fittings

| RP | smallest measuring range [m ³ /h] H ₂ O | | largest measuring range [m ³ /h] H ₂ O | |
|-----|--|-------|---|--------|
| ¼ | 0,05 | - 0,3 | 0,2 | - 1,2 |
| ⅓ | 0,05 | - 0,4 | 0,4 | - 2,3 |
| ½ | 0,1 | - 0,7 | 0,75 | - 4,5 |
| ¾ | 0,2 | - 1,3 | 1,4 | - 8,5 |
| 1 | 0,35 | - 2 | 2,25 | - 13,5 |
| 1 ¼ | 0,6 | - 3,5 | 4 | - 24 |
| 1 ½ | 0,85 | - 5 | 5,35 | - 32 |
| 2 | 1,25 | - 7,5 | 8,65 | - 52 |

in-between ranges possible

for in-between flange assembly

| DN | smallest measuring range [m ³ /h] H ₂ O | | largest measuring range [m ³ /h] H ₂ O | |
|-----|--|-------|---|-------|
| 40 | 0,85 | - 5 | 5,35 | - 32 |
| 50 | 1,2 | - 7 | 8,7 | - 52 |
| 65 | 2 | - 12 | 13 | - 78 |
| 80 | 3 | - 18 | 19,7 | - 118 |
| 100 | 4,7 | - 28 | 30,7 | - 184 |
| 125 | 7,3 | - 44 | 48 | - 288 |
| 150 | 10,7 | - 64 | 68,8 | - 413 |
| 200 | 18,8 | - 113 | 122,5 | - 735 |

in-between ranges possible

Flow rates for air

for screwed connection fittings

| RP | smallest measuring range [m ³ /h] air ¹⁾ | | largest measuring range [m ³ /h] air ¹⁾ | |
|-----|---|------|--|-------|
| ¼ | 0,5 | - 3 | 1,3 | - 8 |
| ⅓ | 0,8 | - 5 | 2,3 | - 14 |
| ½ | 1 | - 6 | 3,5 | - 21 |
| ¾ | 1,3 | - 8 | 7,5 | - 45 |
| 1 | 2 | - 12 | 9 | - 54 |
| 1 ¼ | 4 | - 24 | 18 | - 108 |
| 1 ½ | 5,8 | - 35 | 25 | - 150 |
| 2 | 8,3 | - 50 | 45 | - 270 |

¹⁾ at STP (0° C and 1013 mbar)

in-between ranges possible

for in-between flange assembly

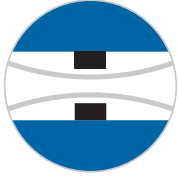
| DN | smallest measuring range [m ³ /h] air ¹⁾ | | largest measuring range [m ³ /h] air ¹⁾ | |
|-----|---|-------|--|--------|
| 40 | 5,8 | - 35 | 25 | - 150 |
| 50 | 9 | - 54 | 45 | - 270 |
| 65 | 13,5 | - 81 | 83 | - 500 |
| 80 | 20 | - 120 | 125 | - 750 |
| 100 | 35 | - 210 | 142 | - 850 |
| 125 | 60 | - 360 | 292 | - 1750 |
| 150 | 75 | - 450 | 433 | - 2600 |
| 200 | 125 | - 750 | 667 | - 4000 |

¹⁾ at STP (0° C and 1013 mbar)

in-between ranges possible

Technical data of microswitches

| | | |
|--------------------------------|---|--|
| Switch output | 1 or 2 microswitches, 1-channel change-over switch | |
| Adjustment of switching points | external adjustment by standard value scales | |
| smallest adjustable value | approx. 5 % of full scale range | |
| Switching hysteresis | approx. 2,5 % | |
| Load data/switches | AC U~ max. = 250 V AC, I max. = 5 A, P max. = 10 W | DC U~ max. = 30 V DC, I max. = 0,4 A, P max. = 10 W |
| Electrical connection | prewired numbered cable 2,5 m, optionally terminal box | |



DDM-DS11

Differential pressure flow meters

Low Voltage Directive

The DS11 gauge meets the protection requirements of the Low Voltage Directive LVD 72/23/EEC and its modification 93/68/EEC.

Proper use

The user is responsible for assessing the suitability of the flow meters for his case of application, for use as prescribed, and for material compatibility regarding the fluid product used in his process.

The manufacturer shall not be liable for any damage arising from incorrect or improper use of the devices.

The equipment from **Kirchner und Tochter** has been tested in compliance with applicable CE-regulations of the European Community. The respective declaration of conformity is available on request. Subject to change without notice. The current valid version of our documents can be found at www.kt-flow.de

The **Kirchner und Tochter** QM-System is certified in accordance with DIN EN ISO 9001:2015. The quality is systematically adapted to the continuously increasing demands.