



SM-15

Plastic Flowmeters as per the Variable Area Principle



Features

- / For every industrial application
- / For fluid and gaseous media
- / Simple and robust design with high operational safety
- / PVC, PA, PSU and PVDF versions
- / Low pressure drop
- / Easy to assemble
- / High resolution scale
- / Optional alarm contacts and analogue output

Description:

The SM-15 series of flowmeters operates according to the proven variable area principle. The float gets lifted by the flowing medium and indicates the flow with its upper edge on the scale attached to the device. If floats with integrated magnets are used, optionally, alarm contacts or a measuring transmitter can be attached to the device. All devices possess a male thread on the measuring tube and are additionally equipped with standard PVC adhesive sleeves. As an option, also female threaded fittings made of PVC, PP, brass or stainless steel can be supplied.

Application:

Due to a wide variety of materials and easily interchangeable measurement scales, the SM-15 series plastic flowmeters can be deployed for most of media including hostile media. The main areas of application are water treatment, effluent technology, chemical and food-processing industries and many others.



Technical Specifications:

Meas. transmitter (optional):

Materials /

| | |
|-------------------|---|
| Measuring tube: | PVC-U; transparent Polyamide; transparent, with heavily reduced humidity absorption Polysulfon; transparent PVDF; opaque (yellowish-white) |
| Float: | PVDF, optional PVDF with integrated magnet (>1% lead of the REACH candidate list) |
| Seals: | EPDM, optional FPM |
| Tube connections: | PVC, optional PP, brass, st. steel |

max. Pressure /

| | |
|---------------|----------------------------------|
| PVC: | 10 bar at +20°C, 1 bar at +60°C |
| Polyamide: | 10 bar at +30°C, 1 bar at +75°C |
| Polysulphone: | 10 bar at +40°C, 1 bar at +100°C |
| PVDF: | 10 bar at +40°C, 1 bar at +110°C |

max. Temperature without joints at 1 bar /

| | |
|---------------|--------|
| PVC: | +60°C |
| Polyamide: | +75°C |
| Polysulphone: | +100°C |
| PVDF: | +110°C |

max. Temperature with joints made of /

| | |
|-------------------|---|
| PVC: | +60°C |
| PP: | as per temperature parameters for the relevant measuring tube, but max. +80°C |
| Brass, st. steel: | as per temperature parameters for the relevant measuring tube |

Mounting position /

vertical, flow from bottom to top

Assembly /

with moderation line 5-7 x DN before and after the device

Accuracy /

Cl. 4 as per VDI/VDE 3513, Bl. 2

Accessories /

| | |
|---------------------|---|
| Limit value switch: | bistable contacts, NO-contact or NC-contact function |
| Analogue output: | Measuring device with integrated measuring transmitter, 4...20 mA |

Attention: Limit contacts or measuring transmitters operate only in combination with a float with integrated magnet.

Version /

reed chain

Housing material /

ABS

Assembly /

adjustable to dove-tail rail of the measuring tube

Supply voltage /

18...30 VDC

Analogue output signal /

4...20 mA, 2-wire
(output can be calibrated/ set)

Electrical connection /

plug connection M12, 4-pole, with counter-plug angular 90°

Measuring length /

114 mm

Resolution /

3.5 mm

max. Operating temp. /

0...+70°C

max. Ambient temp. /

-20...+70°C

max. Ambient pressure /

atmospheric 0.8...1.1 bar

max. rel. Humidity /

20...85%

CE marking /

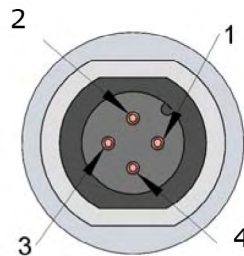
DIN EN 61326-1, DIN EN 55022/B

Protection class /

IP 65 (with plug)

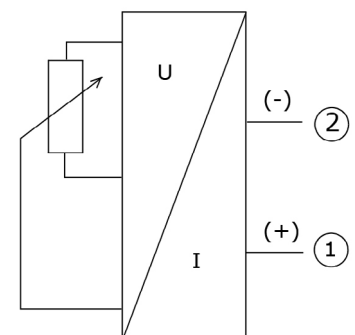
The optionally available measuring transmitter for the flowmeter SM-15 is clipped to the dove-tail rail mounted on the measuring tube. The unit comprises a reed chain, the respective evaluation and implementation. Thanks to the 2-wire technology voltage supply and output signal do not run separated from each other. The exact magnet field sensors of the receiver capture the height of the magnetic float and convert its position continually into a 4...20 mA output signal. This signal can be directly further processed.

M12 Plug



- 1. Signal (+)
- 2. Signal (-)
- 3. n.c.
- 4. n.c.

Wiring diagram





Indicator Dimensions:

For the media water (in l/h) and air (in Nm³/h) at relative operating pressures of 0, 1, 2 and 3 bar, standard scales are available.

For other media such as air at higher operating pressure, HCL (30%), NaOH (30%) and, for the units m³/h, l/sec., l/min, USGPM or IGPM, special type scales can be supplied on request.

These supplementary special type scales can be attached later easily and reliably on the flowmeter. There is no need of any modifications to the measuring device.

For other media and/or operational conditions, special type scale can be offered on request.

For this, the following data is required:

- Medium
- Operating pressure
- Operating temperature
- Operating density
- Operating viscosity

Limit contacts (optional):

| | |
|----------------------------|--|
| Version / | bistable reed contacts. |
| Contact function / | NO-contact or NC-contact for rising flow |
| Assembly / | adjustable to dove-tail rail of the measuring tube |
| Switching load / | max. 230 VAC, max. 0.5 A, max. 10 VA |
| Operating temp. / | 0...+55°C |
| Hysteresis / | 10 mm |
| Connection layout / | 2-wire, irrespective of polarity |

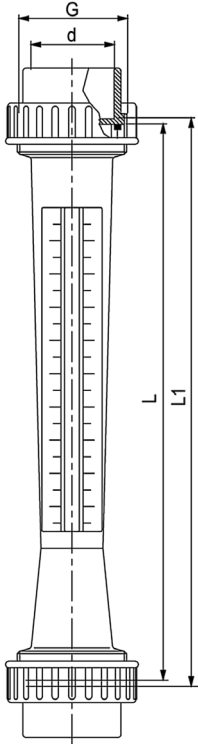
Operating Ranges (Table 1):

| Measuring tube | Operating range | | | | | |
|----------------|-----------------|-------------|---|------------|------------|------------|
| | | Water (l/h) | Air at +20°C (Nm ³ /h) not for PVC measuring tubes | | | |
| | | | 0 bar rel. | 1 bar rel. | 2 bar rel. | 3 bar rel. |
| 1 | 101 | 3...24 | 0.2...1 | 0.2...1.3 | 0.25...1.6 | 0.3...1.75 |
| | 102 | 5...60 | 0.2...2.5 | 0.4...3.2 | 0.2...3.8 | 0.3...4.4 |
| | 103 | 10...100 | 0.5...3.6 | 0.6...5 | 0.8...6 | 0.8...7 |
| | 104 | 25...250 | 0.5...9 | 1...13 | 1...16 | 1.5...18 |
| 2 | 201 | 5...50 | 0.4...2.8 | 0.4...3.2 | 0.5...4 | 0.5...4.5 |
| | 202 | 15...150 | 0.8...6.25 | 1...9 | 1...11 | 1.5...12 |
| | 203 | 25...250 | 0.9...9.5 | 1.5...13 | 2...17 | 2...20 |
| | 204 | 40...400 | 2...15 | 2...21 | 3...26 | 3...30 |
| 3 | 301 | 15...150 | 0.5...5.5 | 1...8.5 | 1...11 | 1...10.5 |
| | 302 | 40...400 | 2...14 | 2...20 | 3...26 | 4...30 |
| | 303 | 60...600 | 2.5...22 | 4...31 | 4...38 | 5...45 |
| | 304 | 100...1000 | 4...34 | 5...45 | 6...58 | 7.5...67.5 |
| 4 | 401 | 25...250 | 1...8 | 1.5...12 | 1.5...16 | 1.5...17 |
| | 402 | 40...400 | 2...14 | 2...20 | 3...26 | 3...30 |
| | 403 | 100...1000 | 4...34 | 4...46 | 5...55 | 6...66 |
| | 404 | 150...1500 | 5...50 | 6...70 | 7.5...90 | 7.5...100 |
| 6 | 603 | 60...600 | 2...21 | 3...30 | 4...36 | 4...40 |
| | 604 | 100...1000 | 3...34 | 5...50 | 5...60 | 5...70 |
| | 605 | 150...1500 | 5...50 | 5...70 | 7...85 | 8...100 |
| | 606 | 250...2500 | 7...80 | 10...110 | 10...140 | 15...160 |
| | 606a | 200...2000 | 8...70 | 10...100 | 10...120 | 12...135 |
| | 606b | 300...3000 | 10...100 | 14...125 | 20...160 | 20...190 |
| | 607 | 400...4000 | 14...125 | 20...170 | 15...220 | 20...250 |
| 608 | 600...6000 | 20...200 | 30...280 | 30...380 | 40...400 | |
| 609 | 1000...10000 | 30...320 | 40...440 | 50...540 | 60...620 | |
| 610 | 1500...15000 | 50...500 | 80...800 | 80...800 | 102...880 | |
| 611 | 2500...25000 | 80...800 | 140...1240 | 140...1240 | 166...1400 | |
| 612 | 10000...50000 | 300...1600 | 600...2500 | 600...2500 | 700...2900 | |



Types of connection (Table 2):

Measuring Tube



| Measuring Tube (L in mm) | Pressure drop mbar Water / Air at 20°C | Range | AG (R) | Connecting joints | | | | Conn. No. | |
|-----------------------------|--|--------------|----------------------------|--|-------------------|--------------|--------|--------------|--------|
| | | | | PVC- ad. sleeve standard (mm) | Female thread (G) | | | | |
| | | | | | P V C | P P | M S | | V A |
| 0 | 1 | 2 | 3 | 5 | 6 | Material-No. | | | |
| 1 (165) | 3.3 / 4.8 | 101 | 3/4" | d: 16 DN: 10 L1: 171 | 3/8" | 3/8" | 3/8" | 3/8" | 01 |
| | | 102 | | | | | | | |
| | | 103 | | | | | | | |
| | | 104 | | | | | | | |
| 2 (170) | 2.5 / 4.3 | 201 | 1" | d: 20 DN: 15 L1: 176 | 1/2" | 1/2" | 1/2" | 1/2" | 02 |
| | | 202 | | | | | | | |
| | | 203 | | | | | | | |
| | | 204 | | | | | | | |
| 3 (185) | 6.1 / 8.3 | 301 | 1 1/4" | d: 25 DN: 20 L1: 191 | 3/4" | 3/4" | 3/4" | 3/4" | 03 |
| | | 302 | | | | | | | |
| | | 303 | | | | | | | |
| | | 304 | | | | | | | |
| 4 (200) | 6.1 / 8.3 | 401 | 1 1/2" | d: 32 DN: 25 L1: 206 | 1" | 1" | 1" | 1" | 04 |
| | | 402 | | | | | | | |
| | | 403 | | | | | | | |
| | | 404 | | | | | | | |
| 6 (350) | 12.3 / 15.9 | 603 | 1 1/2" | d: 32 DN: 25 L1: 356 | 1" | 1" | 1" | 1" | 09 |
| | | 604 | | | | | | | |
| | 12.3 / 15.9 | 605 | 2" | d: 40 DN: 32 L1: 356 | 1 1/4" | 1 1/4" | 1 1/4" | 1 1/4" | 10 |
| | | 606 | | | | | | | |
| | 12.3 / 15.9 | 606a 606b | 2 1/4" | d: 50 DN: 40 L1: 356 | 1 1/2" | 1 1/2" | 1 1/2" | 1 1/2" | 10b |
| 22.2 / 27.1 | 607 608 609 | 2 3/4" | d: 63 DN: 50 L1: 356 | 2" | 2" | 2" | 2" | 11 | |
| 33.7 / 40 | 610 611 612 | 3 1/2" | d: 75 DN: 65 L1: 356 | 2 1/2" | 2 1/2" | 2 1/2" | 2 1/2" | 12 | |

Other dimensions L and L1 for PVDF measuring tube

The connection code comprises Material and Connection No.

Example: PCV female thread G1 for measuring tube 6:

Material No. 2, Connection No. 09 · Connection code 209



Ordering Codes:

| Order number | SM-15. | 2. | 1. | 202. | 102. | 1. | 11 |
|---|--------|----|----|------|------|----|----|
| SM-15 Plastic Flowmeter | | | | | | | |
| Material version (measuring tube) / | | | | | | | |
| 1 = PVC-U (only with scales for water) | | | | | | | |
| 2 = Polyamid | | | | | | | |
| 3 = Polysulfon | | | | | | | |
| 4 = PVDF | | | | | | | |
| Scale / | | | | | | | |
| 1 = water | | | | | | | |
| 2 = air (0 bar rel.) | | | | | | | |
| 3 = air (1 bar rel.) | | | | | | | |
| 4 = air (2 bar rel.) | | | | | | | |
| 5 = air (3 bar rel.) | | | | | | | |
| 9 = Special scale type | | | | | | | |
| Operating range / | | | | | | | |
| 101. . .612 = as per Table 1 | | | | | | | |
| Process connection / | | | | | | | |
| as per Table 2 | | | | | | | |
| Float / | | | | | | | |
| 1 = PVDF (standard) | | | | | | | |
| 3 = PVDF with integrated magnet | | | | | | | |
| (when using limit contacts or analogue output only) | | | | | | | |
| Options / | | | | | | | |
| 00 = none | | | | | | | |
| 11 = 1 limit contact (NC-contact) | | | | | | | |
| 21 = 2 limit contacts (NC-contact) | | | | | | | |
| 12 = 1 limit contact (NO-contact) | | | | | | | |
| 22 = 2 limit contacts (NO-contact) | | | | | | | |
| 60 = measuring transmitter, 4. . .20 mA | | | | | | | |

