



# 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
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 /

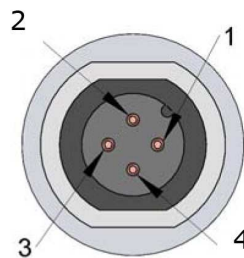
DIN EN 61326-1, DIN EN 55022/B

### Protection class /

IP 65 (with plug)

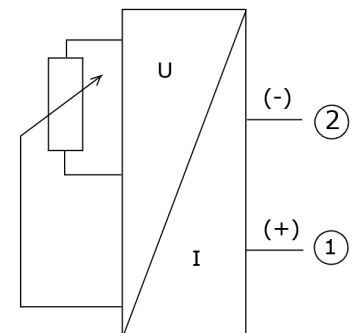
The optionally available measuring transmitter for the flowmeter SM-15 is clipped to the dove-tail rail mounted on the measuring tube. The unit comprises a reed chain, the respective evaluation and implementation. Thanks to the 2-wire technology voltage supply and output signal do not run separated from 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 Nm<sup>3</sup>/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 m<sup>3</sup>/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):

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

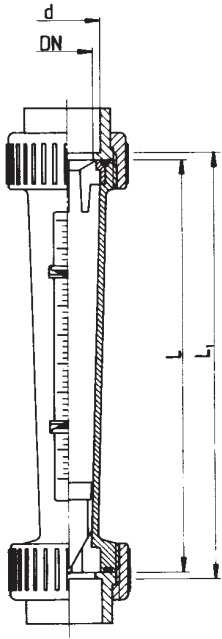
## Operating Ranges (Table 1):

Measuring tube	Operating range					
	Water (l/h)	Air at +20°C (Nm <sup>3</sup> /h) not for PVC measuring tubes				
		0 bar rel.	1 bar rel.	2 bar rel.	3 bar rel.	
<b>1</b>	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
<b>2</b>	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...0.95	1.5...13	2...17	2...20
	204	40...400	2...15	2...21	3...26	3...30
<b>3</b>	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
<b>4</b>	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
<b>6</b>	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...25000	300...1600	600...2500	600...2500	700...2900

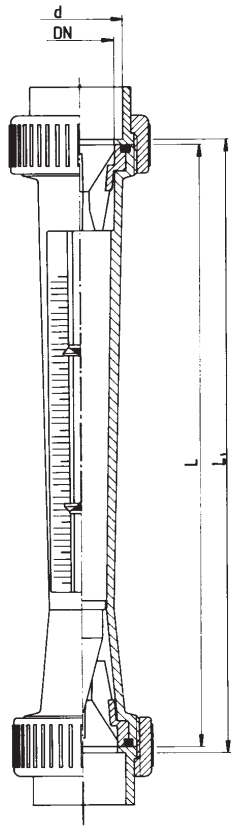


## Types of connection (Table 2):

Meas. Tube No. 1...4



Meas. Tube No. 6



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				
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	2 1/4"	d: 50 DN: 40 L1: 356	1 1/2"	1 1/2"	1 1/2"	1 1/2"	10b
606b									
22.2 / 27.1	607	2 3/4"	d: 63 DN: 50 L1: 356	2"	2"	2"	2"	11	
608									
609									
33.7 / 40	610	3 1/2"	d: 75 DN: 65 L1: 356	2 1/2"	2 1/2"	2 1/2"	2 1/2"	12	
	611								
	612								

### 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:

<b>Order number</b>	<b>SM-15.</b>	<b>2.</b>	<b>1.</b>	<b>202.</b>	<b>102.</b>	<b>1.</b>	<b>0</b>
<b>SM-15 Plastic Flowmeter</b>							
<b>Material version (measuring tube) /</b> 1 = PVC-U (only with scales for water) 2 = Polyamid 3 = Polysulfon 4 = PVDF							
<b>Scale /</b> 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							
<b>Operating range /</b> 101. . .612 = as per Table 1							
<b>Process connection /</b> as per Table 2							
<b>Float /</b> 1 = PVDF (standard) 3 = PVDF with integrated magnet (when using limit contacts or analogue output only)							
<b>Options /</b> 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							