DS15

Plastic Variable Area Flowmeter

- **for liquid and gaseous media**
- **simple and robust construction with high reliability**
- **measuring tubes in PVC, PA, PSU und PVDF**
- **low pressure drop, simple mounting**
- **scale with high resolution**
- **alarm contacts or analogue output optionally**
- **optional special scales are available depending on medium properties**
- **ranges air: 0,2...1 Nm³/h - 700...2900 Nm³/h**
  ranges water: 3...24 l/h – 10.000-50.000 l/h
- **P_{max}: 10 bar, T_{max}: 110 °C**

Description:

The flowmeters model DS15 works according to the proven variable area principle. The float is moved upward by the flowing medium and its upper edge indicates the flow rate by means of a scale affixed onto the measuring tube. By using a float with an integrated magnet optional alarm contacts or an analogue output transmitter may be operated.

All flowmeters have a male thread on the measuring tube and are additionally equipped with PVC glue-in connectors. Also possible are connectors with female thread (BSP) made of PVC, PP, PVDF or stainless steel.

Typical applications:

The variety of different materials used and the simple to exchange measuring scales make these meters universally suitable for most liquid and gaseous media, also suitable for very aggressive media. Main applications are in the water treatment industry, in waste water applications, chemical and food industry and many more.

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Subject to technical changes

Models:

Measuring tube: PVC-U transparent, Polyamid, Polysulfon, or PVDF semi transparent

Float: PVDF or PVDF with integrated magnet

Gaskets: EPDM or FPM

Tube connections: PVC, optionally PP, PVDF, stainless steel

Technical Data:

Max. pressure: PN 10 at 20 °C

Max. media-temperature:

Without threaded connection:

PVC:	60 °C
Polyamid:	75 °C
Polysulfon:	100 °C
PVDF:	110 °C

with threaded connection made of:

PVC:	60 °C
PP:	acc. to the temperature ranges for the particular measuring tube, but max. 80 °C
PVDF, brass, stainless steel:	acc. to the temperature ranges for the particular measuring tube

Mounting position: vertical, flow from bottom to top

Mounting: inlet and outlet pipe 5-7 x DN

Accuracy: class 4 (VDI/VDE 3513, page. 2)

Output Signals:

Limit switch:
N/O, N/C 230 V, 0,5 A, 10 VA, bistable with plug
acc. to DIN EN 175301-803
Ambient temperature 0 °C... +55 °C
Protection class IP65

Transmitter type 50 - Hall sensor:
Analogue output 4...20 mA, 2 wire
11 point calibration is factory set
Power supply 8...28 V_{DC}
Ambient temperature: -20 °C...+65 °C
Protection class IP 67

Transmitter type 51 - Reed chain:
Analogue output 4...20 mA, 2 wire, for measuring ranges 101 to 404 (corresponds to the height of the float)
not linearized
Power supply 18...30 V_{DC}
Ambient temperature: -20 °C...+70 °C
Protection class IP 65

Note:
Limit switches or transmitters only work in conjunction with a float with integrated magnet.

Order Code:

Order number:	**DS15.**	**2.**	**1.**	**202W.**	**102.**	**1.**	**00.**	**0**

Plastic Variable Area Flowmeter

Material (measuring tube):
1 = PVC-U (only with scales for water)
2 = Polyamide
3 = Polysulfon
4 = PVDF

Scales:
1 = Water
2 = Air (0 bar g)
3 = Air (1 bar g)
4 = Air (2 bar g)
5 = Air (3 bar g)
9 = Special scale

Measuring ranges:
101 … 612 = acc. to table 1
please add letter “W” for water or “Lx” for air (example: 101W, 401L2)

Process connection:
acc. to table 2

Float:
1 = PVDF (without magnet for devices without contacts)
3 = PVDF (with magnet for devices with contacts)

Options:
00 = None

Gaskets:
0 = EPDM (standard at DS15.1, -2. or -3.)
F = FPM (standard at DS15.4)

Accessories:

DS15-Z.11 = 1 limit switch (N/C)
DS15-Z.21 = 2 limit switch (N/C)
DS15-Z.12 = 1 limit switch (N/O)
DS15-Z.22 = 2 limit switch (N/O)
DS15-Z.50 = transmitter, 4 – 20 mA – Hall sensor
DS15-Z.51 = transmitter, 4 – 20 mA – Reed chain (non linear, only for range 101 up to 404)

Scales:

Water scales (in l/h) and air scales (in Nm^3/h) referenced to 0, 1, 2 and 3 bar are standard.
For other media, i.e, gases with higher pressures, HCl (30 %), NaOH (30 %), as well as other units of measurement (m^3/h, l/sec., l/min, USGPM or IGPM) special scales may be supplied.

Also special scales for other media and operating conditions may be calculated if the following data are known:

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

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Measuring Range (Table 1):

Tube L [mm]	Range No.	Measuring range				
		Water [l/h]	Air at 20 °C [Nm³/h] not for PVC-measuring tubes			
			0 bar rel.	1 bar rel.	2 bar rel.	3 bar rel.
1 (165)	**101**	3-24	0,2-1	0,2-1,2	0,25-1,55	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	0,6-3,6	0,6-5,0	0,75-6,0	0,8-7,0
	104	25-250	0,5-9,0	1,0-13,0	1,0-16,0	1,5-19,5
2 (170)	**201**	5-50	0,4-2,8	0,2-3,2	0,4-3,6	0,3-4,0
	202	15-150	0,8-6,2	1,0-9,0	1,0-11,0	1,5-12,0
	203	25-250	0,9-9,5	1,0-13,0	1,0-16,0	2,0-20,0
	204	40-400	2,0-15,0	2,0-20,0	3,0-26,0	3,0-30,0
3 (185)	**301**	15-150	0,5-5,5	1,0-9,0	1,0-11,0	1,0-10,5
	302	40-400	2,0-14,0	2,0-20,0	3,0-26,0	3,0-30,0
	303	60-600	2,5-22,0	4,0-31,0	4,0-38,0	5,0-45,0
	304	100-1000	4,0-34,0	5,0-45,0	6,0-58,0	7,5-67,5
4 (200)	**401**	25-250	1,0-8,0	1,5-13,0	1,5-16,0	1,5-19,5
	402	40-400	2,0-14,0	2,0-20,0	3,0-26,0	3,0-30,0
	403	100-1000	4,0-34,0	5,0-45,0	5,0-55,0	6,0-66,0
	404	150-1500	5,0-50,0	6,0-70,0	7,5-86,0	7,5-98,0
6 (350)	**603**	60-600	2,5-20	3,5-28	4-35	5-40
	604	100-1000	4-34	5-50	8-60	8-70
	605	150-1500	5-50	7,5-67	9,5-83	11-96
	606	250-2500	8,5-76	10-115	14-131	17-152
	691A	200-2000	8-70	10-100	10-120	12-135
	692A	300-3000	10-100	15-140	20-160	20-190
	607	400-4000	14-125	10-170	24-210	28-245
	608	600-6000	22-190	30-260	40-380	40-400
	609	1000-10000	35-300	50-420	60-510	70-600
	609A	1500-15000	--	--	--	--
	610	1500-15000	50-500	80-700	85-760	102-880
	611	2500-25000	80-720	115-1050	140-1240	166-1400
	612	10000-50000	400-1500	500-2100	600-2500	700-2900

*Reference standard: ISO 1217 (20 °C, 1 bar abs.)
Other scales on special request.

Limit Switch:

Model: reed contact, bistable
Contact function: N/O or N/C with increasing flow
Mounting: adjustable on measuring tube
Contact rating: max. 220 VAC, max. 0,5 A, max. 10 A / 10 VA
Operating temperature: 0...+55 °C
Hysteresis: 3 mm of float height
Electrical connection: 2-wire, independent of polarity

Analogue output transmitter:

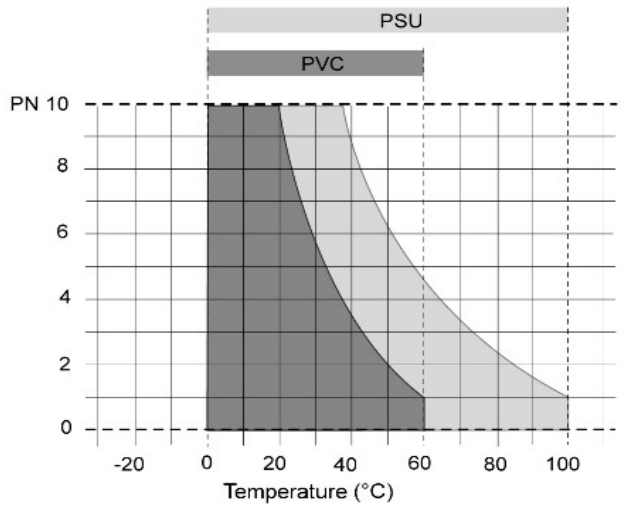
The optional analogue output transmitter mounted on to the measuring tube of the DS15 flowmeter and registers the height of the float by means of an analogue Hall sensor. The integrated electronic converts this signal to a 4-20 mA output.
To operate the analogue output transmitter, the standard float must be exchanged with a float with an integrated magnet.
The transmitter is equipped with an EPROM which is programmed especially for the application. Therefore it is not possible to change the transmitter without consulting the manufacturer.

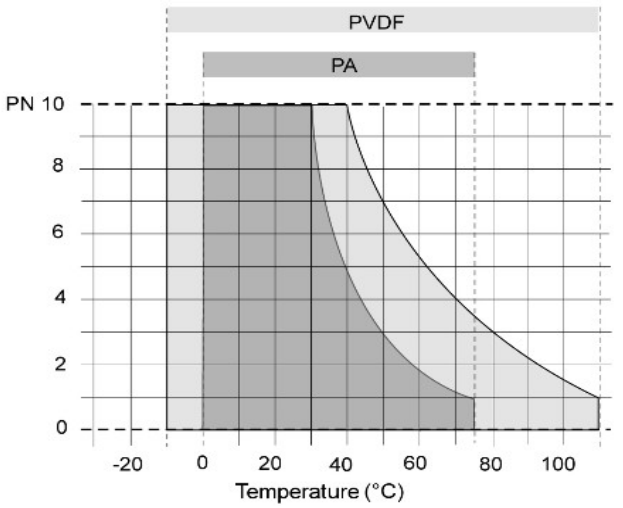
Features:

- 4...20 mA analogue output, 2-wire, 8..28 V_{DC}
- programmed individually to DS15
- 11 point calibration, non volatile storage of parameters
- 0-push button for compensation of environmental magnetic influences
- factory set low-cutoff value 0-99 % custom specific
- factory set low-pass-filter 0,1...2,5 s custom specific
- accuracy better than 0,5 % F.S.

Low Cost version with Reed chain
Also a low cost version equipped with a Reed chain is available for the measuring ranges 101 – 404. Output is non linear acc. to flowrate but proportional to height of float.
Resolution: 3,5 mm

Pressure- Temperature- Diagram:





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Process Connections (table 2):

Tube L [mm]	Range No.	Male (G)	Process connection					Connec. No. (Weight) [kg] **	Pressure loss	
			PVC-Glue in fitting Standard [mm]	Female thread (G)			PVDF weld in fitting (at PVDF tube only)		Water 20°C	Air 20°C
				PVC	PP	VA*				
			Material No:						[mbar]	
			1	2	3	6	8			
1 (165)	**101 102 103 104**	3/4	d: 16 DN: 10 L1: 171	3/8			DN: 10	**01** 0,8	3,3	4,8
2 (170)	**201 202 203 204**	1	d: 20 DN: 15 L1: 176	1/2			DN: 15	**02** 0,10	2,5	4,3
3 (185)	**301 302 303 304**	1 1/4	d: 25 DN: 20 L1: 191	3/4			DN: 20	**03** 0,13	6,1	8,3
4 (200)	**401 402 403 404**	1 1/2	d: 32 DN: 25 L1: 206	1			DN: 25	**04** 0,25	6,1	8,3
6 (350)	**603 604**	1 1/2	d: 32 DN: 25 L1: 356	1			DN: 25	**09** 0,48	12,3	15,9
	605 606	2	d: 40 DN: 32 L1: 356	1 1/4			DN: 32	**10** 0,71	12,3	15,9
	691A 692A	2 1/4	d: 50 DN: 40 L1: 356	1 1/2			DN: 40	**10A** 1,05	12,3	15,9
	607 608 609 609A	2 3/4	d: 63 DN: 50 L1: 356	2			DN: 50	**11** 1,53	22,2	27,1
	610 611 612	3 1/2	d: 75 DN: 65 L1: 356	2 1/2 nicht in PP			DN: 65	**12** 2,10	33,7	40,0

PVDF measuring tubes have different dimensions L and L1.

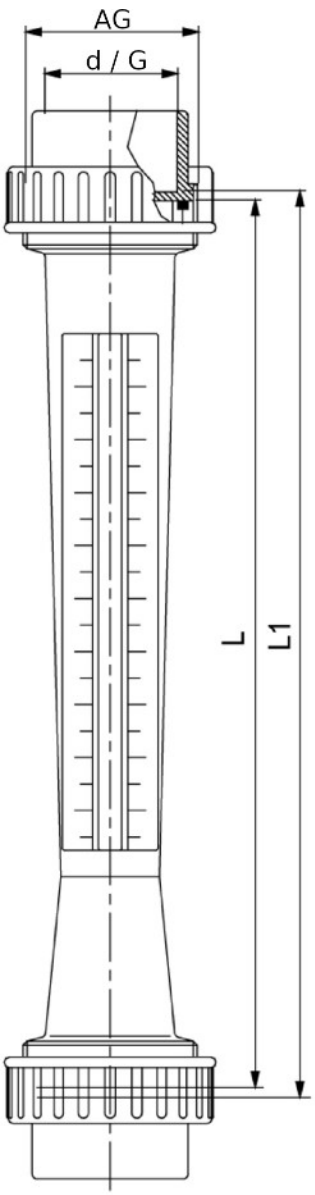
*For process connection with female thread made of stainless steel, the union nut is made of PVC. A union nut made of stainless steel is available on request.

**Weight with PVC glue in fitting

The connection code is build from material number and connection number

Example:
PVC-female thread G 1 for measuring tube no. 6:
Material-No.: 2, Connection-No.: 09
Connection code: 209

Dimensions Measuring Tube:



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