
Glass flowmeter



Variable area flowmeters are basically vertical internally tapered tubes mounted with the large end at the top. A float or rotor with an outer diameter slightly less than the minimum diameter of the tube is placed inside the tube. The clearance space between the float and the tube forms an annular passage or orifice. As the tube is tapered, the area of this orifice is larger when the float is near the top than it is when the float is near the bottom. By connecting the tube into a fluid flow line so flow direction is from bottom to top, the float will move upward and be supported at a point where the orifice is just large enough to pass the fluid flowing through the system.

Suitable for corrosive gases and fluids.

Technical data:

Process conn.:	Threads: ½" BSP-Female up to 3" BSP-Female, depending on the range. Flanges according to DIN DN15 ... DN80, depending on the range.
Materials:	Measuring tube: Borosilicate glass. Connections: Carbon steel, PVC, AISI-316, PTFE Float: AISI-316, PVDF, PVC, PTFE.
Temperature service:	-10°C a +70°C. The difference of temperature between the internal and external of the tube may not exceed 80 °C, according to the Directive 97/23/CE of pressure equipment. CE
Pressure service:	- Glass tubes between 25 and 1000 l/h: PN-15 - Glass tubes between 1600 and 2500 l/h: PN-10 - Glass tubes between 4000 and 6300 l/h: PN-8 - Glass tubes between 10 and 14 m³/h: PN-6 - Glass tubes between 16 and 40 m³/h: PN-5
Accuracy:	±1,6% f.s. Class 1,6 according to VDE/VDI 3513

Ranges water in litres/hour

2,5...25	4...40	6...60	10...100	16...160
25...250	40...400	60...630	100...1000	160...1600
250...2500	400...4000	500...6300	1000...10000	2000...14000
1600...16000	2000...20000	2500...25000	3000...30000	6000...40000

Ranges air (atm. Press.) in N m³/hour

0,07...0,7	0,11...1,1	0,18...1,8	0,3...3	0,45...4,5
0,7...7	1,1...11	1,8...18	3...30	4,5...45
7...70	11...110	18...180	30...300	120...420
45...450	60...600	90...900	180...1200	

Note: also available in litres/minute upon request.

Operating principle

The flow meter is basically composed of a conic tube and a float. The upward flow propels the float to a point of balance defined by the area obtained between the float and the tube.

This balance point depends on:

Flow weight: P_f
Thrust of the fluid: E
Free pass area: A_l

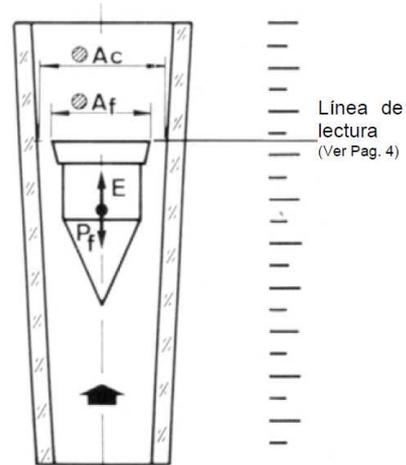
The proportional area related to flow is:

$$A_l = A_c - A_f$$

Where:

A_c = tube section
 A_f = Float section

Each position of the float is related to a flow rate, which is engraved on the measuring tube.



Installation

The instrument should be mounted taking in account the following points:

- The fluid inlet is the lower part of the flowmeter (minimum value of the scale).

- The flowmeter should be installed completely vertical; a slight deviation of around 5-10° related to the vertical may cause errors up to 10%.
- It is recommended to install the flowmeter between two straight pipelines, with no bends, before the inlet and after the outlet, of approximate five times the height of the flowmeter, in order to avoid turbulences.
- Do not forget to install seals when installing the flowmeter in the process.
- WARNING: Do not open abruptly the regulation valve: the float may hit the glass tube damaging it.

Models

Tubo de medida série C	Escalas de medida						Flotador AC 	Presión máxima	Pérdida de carga mm H ₂ O		Tubo	Séries 6001 6002
	AISI-316 7,95 g/cm ³			ALUMINIO 2,85g/cm ³					FLOTADOR			
	Agua 20°C l/h		Nm ³ /h Aire 20°C 1,013 bar abs		Nm ³ /h Aire 20°C 1,013 bar abs				bars	AISI-316		
Min.	Máx.	Min.	Máx.	Min.	Máx.							
C31-00251	2,5	25	0,07	0,7	0,04	0,4	15	55	22	300	1/2" DN-15	
C31-00401	4	40	0,11	1,1	0,07	0,7	15	55	22	300		
C31-00601	6	60	0,18	1,8	0,10	1	15	55	22	300	(M ₁)	
C32-01001	10	100	0,30	3	0,17	1,7	15	90	35	300	1/2" DN-15	
C32-01601	16	160	0,45	4,5	0,25	2,5	15	90	35	300	3/4" DN-20	
C32-02501	25	250	0,7	7	0,4	4	15	90	35	300	(M ₁)	
C33-04001	40	400	1,1	11	0,7	7	15	125	50	300	3/4" DN-20	
C33-06301	60	630	1,8	18	1	10	15	125	50	300		
C33-10001	100	1000	3	30	1,7	17	15	125	50	300	1" DN-25 (M ₂)	
C34-16001	160	1600	4,5	45	2,5	25	10	175	75	300	1 1/2" DN-40	
C34-25001	250	2500	7	70	4	40	10	175	75	300	(M ₃)	
C35-40001	400	4000	11	110	7	70	8	230	95	300		
C35-63001	500	6300	18	180	10	100	8	230	95	300	(M ₃)	
C36-M0101	1000	10000	30	300	17	170	6	300	125	300	2" DN-50	
C36-M0141	2000	14000	120	420	45	200	6	300	125	300	(M ₄)	
C37-M0161	1600	16000	45	450	25	250	5	400	170	300	2 1/2" DN-65	
C37-M0201	2000	20000	60	600	35	350	5	400	170	300		
C37-M0251	2500	25000	70	700	40	400	5	400	170	300		
C37-M0301	3000	30000	90	900	50	500	5	400	170	300	3" DN-80	
C37-M0401	6000	40000	180	1200	100	712	5	400	170	300	(M ₅)	