

TYPE 134**Glass tube variable area flowmeter**

A range of quality glass tube V.A. flowmeters for general purpose & industrial applications

- Robust construction
- Cost effective design
- Flanged or threaded connection
- Customised scales
- Alarm outputs
- Interchangeable tube or float without re-calibration
- Glass tube for long life
- Accurate
- Lightweight design for pipework support
- Choice of wetted materials

Philosophy

The Rotameter series 134 is a new addition to the VA meter range from Mobrey Measurement. Comprising medium to large glass tubes, it is suitable for monitoring both liquid (0.008 to 335 l/min) and gas flows (0.2 to 4200 l/min). The borosilicate glass tube coupled with the choice of other wetted parts, ensures that the 134 is compatible with most fluids. The 134's rugged chassis offers excellent protection of the tube and the availability of both flanged and threaded connections gives ease of mounting. The lightweight construction enables simple in-line pipework mounting, without the need for additional wall or bracket support, allowing use in both light and heavy industrial areas.

Principle of operation

Rotameters are utilised for the flowrate measurement of most liquids and gases with direct readout of flowrate.

A special "float" is fitted within a tapered glass tube. With the flow vertically upward through the meter, the float settles at a position where its mass is balanced by the upward forces of the flow through the annulus between the tube and float. The greater the flow the higher the float rises to increase the annulus and balance. The top edge of the float is read against the scale, giving an instantaneous reading of the flow rate.

Various methods of alarm output are available for signalling low or high flow conditions.

Flow measurement

Specification

Accuracy: scale length: Scale units: Temp. max:	+/- 2.0 % of full scale reading 300 mm nominal customer specified 90°C -nitrile seals 150°C -Fluorocarbon (FPM/FKM) seals 60°C -PVC seals 200°C on request see table below	Construction: Tube: Chassis: Float: Seals: Float stop:	borosilicate glass polyester painted aluminium, optional epoxy paint stainless steel 316L - code I or IA aluminium - code D or DA PVC - code P or PA Nitrile (90°C) standard Fluorocarbon (FPM/FKM) (150°C) & PVC (60°C) Stainless steel 316L, optional PVC
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Maximum pressure and viscosity ceiling

Tube size (see table below for flowranges)	5	7	10	14	18	24	35	47	65
Max. operating pressure (Bar)									
liquid	16	16	16	16	14	10	8	7	6
gas	4	4	4	4	3	3	3	2	1.5
gas with polycarbonate screens	8	8	8	8	7	5	4	3.5	3
Option Z7 required									
Viscosity max (centipoise)	4.5	5.5	7	9	11	14	19.5	25.5	34.5

Float material

Floats are available in three different materials as shown above, float codes with a suffix A have an encapsulated magnet within

the float, to operate an optional reed switch alarm. This option is available on tube sizes 10 to 65.

Flow Ranges, Sizing and Pressure Drop

The table below shows the nominal flow ranges available for each tube and float combination. The flow range details shown are water at 20°C for liquids and Air at 15°C and 1013 mBar.abs

(1 atm) for gases. Customised scales are available in any flow units, for most liquids or gases. For sizing assistance please consult the sales office.



According PED 2014/68/UE on under pressure equipments, glass tube flowmeters are furnished only in 4.3. Art. Tubes ≥ 24X are not compatible with group 1 gas.

Flow Range and Pressure Drop											
Tube size	Flow rate code	Liquids				Gases				Duralium float type DA	Pressure drop mBar
		St/St float type I or IA	Pressure drop mBar	PVC float type P or PA	Pressure drop mBar	Flow rate code	Duralium float type D	Pressure drop mBar	St/St float type I or IA		
5.1	M1	0.5-5 l/h	1			MG1			20-200 l/h		2
5.1	M2	1-10	4	0.6-6 l/h	2	MG2	12-120	1	30-300		5.5
5.2	M3	1.7-17	5	1-10	2	MG3	20-200	1	50-500		5.5
5.3	M4	3-30	6	2-20	2	MG4	35-350	1	0.1-1 m³/h		6.5
7 x	M5	5-50	7	2.5-25	2	MG5	50-500	1	0.15-1.5		8.5
7	M6	6-60	8	3.5-35	3	MG6	60-600	1	0.2-2		9
10 x	M7	10-100	9	5-50	4	MG7	0.1-1 m³/h	1.5	0.3-3		12
10	M8	15-150	11	8-80	4	MG8	0.15-1.5	1.5	0.5-5		14
14 x	M9	20-200	11	10-100	4	MG9	0.2-2	2	0.6-6		15
14	M10	30-300	13	18-180	4.5	MG10	0.3-3	2	1-10		17
18 x	M11	50-500	16	40-400	10	MG11	0.5-5	3	1.6-16		22
18	M12	70-700	18	50-500	10	MG12	0.8-8	3.5	2-20		25
24 x	M13	0.1-1 m³/h	20	10-100	11	MG13	1-10	4	3-30		30
24	M14	0.15-1.5	24	0.1-1 m³/h	12	MG14	1.5-15	4	4.5-45		32
35 x	M15	0.2-2	35	0.15-1.5	20	MG15	3-30	9		4-40 m³/h	18
35	M16	0.3-3.3	40	0.25-2.5	22	MG16	5-50	10		6-60	18
47 x	M17	0.6-6	50	0.45-4.5	40	MG17	6-60	8		6-60	18
47	M18	0.8-8	55	0.6-6	40	MG18	8-80	8		10-100	18
47 a	M19	1-10	60	0.8-8	45	MG19	10-100	8		15-150	20
65 x	M20	1.5-15	75	2-12	50	MG20	15-150	9		20-200	20
65	M21	4-20	75	2-15	50	MG21	20-200	11		25-250	22
65	M22			3.5-18	55	MG22	25-250	22			

For higher or lower flow ranges consult the sales office.

Float types I, IA, D, DA, are guided when used in tube sizes 47 & 65.

The flow range of each tube/float combination given above is the nominal range available. Please check with the sales office for the maximum and minimum scale values for your application.

Technical data sheet

50466-607
July 2017

Flow measurement

Alarm options:

A range of flowrate alarms are available for use with the 134, most are latching i.e. the relay status indicates whether the flow is above or below the switch point. Meters can be supplied with 1, 2 or more sensors for high, low and intermediate switching.

Sensor types S2 & S3 can be used with a power supply/amplifying relay (S4 & S5), whereas the S1 reed switch is an integral sensor and switch.

Type	S1 reed switch	S2 photoelectric sensor	S3 inductive sensor	S4 power supply relay for S2	S5 amplifying relay for S3
Output	SPDT latching (Bi stable)	V or I pulse or via S4	current switching <3 or >5 mA or via S5 latching	SPDT	SPDT latching (Bi-stable)
Fluid types	all	all translucent	all	all translucent	all
Float types	IA, DA, PA with magnet	all	St Steel or PVC	all	as S3
Tube sizes	10 to 63	all	5 & 7 with S5	all	as S3
Hazardous area use	Yes - with barrier*	No	25 to +70°C	No	[IEEx ia/ib] II B/IIC
Temp fluid ambient	-16 to +120°C	-25 to +55°C	-25 to +70°C	n/a	n/a
Protection	IP65	IP65	IP67	-10 to +55°C	-25 to +60°C
Switch rating					IP30
Max voltage	250VAC/250VDC	24VDC**		250VAC	35mm rail mount
Max current	1A*	80 mA**		3A	
Max power	60VA / 30W resistive				
Power supply	not required	12 to 24VDC +10% (via S4)	5 to 25VDC max ripple 5%	110/220V +/-10% 50/60Hz (via S5)	220V -10% +15% 45-65Hz (110VAC or 24VDC optional)
Power consumption	n/a	0.96W max	0.125W nominal	8VA max	3.5 VA nominal
Max. no. of sensors per tube	8	3	6	n/a	n/a
Min. distance between sensors	40mm	80mm	40mm	n/a	n/a
Specification sheet	1040	1033	1067	1028	1068

Refer to specification sheets for further information.

* Simple apparatus, maximum current 0.1A for hazardous area use.

** S2 can be used without S4, for current or voltage logic output.

Dimensions, Connections & Weight

Tube size	Connection Type	Dimensions (mm)										Weight
		L	H	Ø	P1	B	J	P	N	T	E	
5 to 14	1/2" BSP.P C1,C2 & C4	454	430	58	26							1.5
	PVC ISO 727 Ø20mm, C5	450	430	58								1.5
	DN15 NP16 st/st	540	430	58	95	47	65	4	14	14		2.3
	1/2" ANSI 150 st/st	540	430	58	89	35	60.3	4	16	16		2.3
	PVC NP10 DN15 C8	540	430	58	95	34	65	4	14	11		2
18 & 24	1" BSP.P C1,C2 & C4	462	432	78	38							2.8
	PVC ISO 727 Ø32mm, C5	462	432	78								2.8
	DN25 NP16 st/st	540	432	78	115	58	85	4	14	14		4
	1" ANSI 150 st/st	540	432	78	108	50.8	79.4	4	16	17		4
	PVC NP10 DN25 C8	540	432	78	54	115	50	95	4	14	14	3.5
35	1½" BSP.P C1,C2 & C4	476	434	93								5
	PVC ISO 727 Ø50mm, C5	480	434	93								5
	DN40 NP16 st/st	540	434	93	150	88	110	4	18	16		7.5
	1½" ANSI 150 st/st	540	434	93	127	73	98.4	4	16	22		7.5
	PVC NP10 DN40 C8	540	434	93	150	73	110	4	18	16		6.5
47 & 65	2" BSP.P C1,C2 & C4	494	450	133	68							10
	PVC ISO 727 Ø63mm, C5	506	450	133								10
	DN50 NP16 st/st	560	450	133	165	102	125	4	18	16		13
	2" ANSI 150 st/st	560	450	133	152	92.1	120.6	4	18	25		13
	PVC NP10 DN50 C8	560	450	133	165	90	124	4	18	16		12

Installation and maintenance

For satisfactory operation the following points should be considered:

Install the flowmeter vertically with the flow upward, keep it clean and avoid water-hammer.

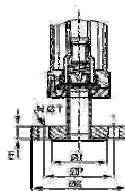
Spare parts

The following spares are available, please quote the serial number in all cases:

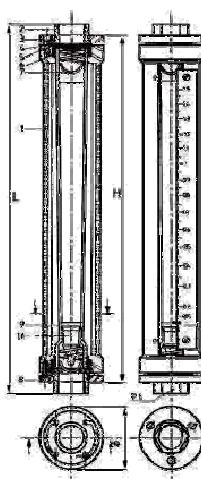
- Glass tube
- Float stops
- Float
- Scale plate
- Seal kit

Parts

1. Painted aluminium chassis.
2. Connection - depending on model.
3. Painted aluminium end plate.
4. Flat seal (nitrile, FPM/FKM or PVC).
5. Stainless steel disc.
6. Tube seal (nitrile, FPM/FKM or PVC).
7. Float stop (stainless steel or PVC).
8. Stainless steel retaining screw.
9. Borosilicate glass measuring tube.
10. Painted aluminium graduated scale.
11. Float (stainless steel, aluminium or PVC).

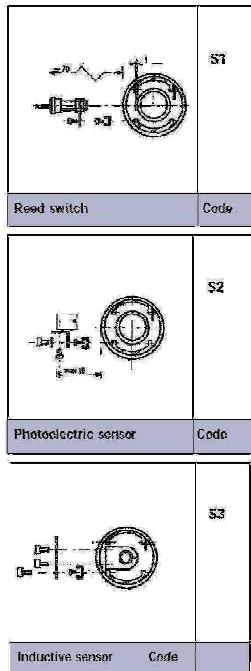


Flanged connection



Screwed connection

Sensor Mounting



Dimensional drawings

Flow measurement

Ordering information

134		Series 134 Rotameter		
	Code	End connections - size e.g. 1 1/2" C1		
	-- C1	BSP.P cast iron		
	-- C2	BSP.P stainless steel, 316L.		
	-- C4	BSP.P PVC		
	-- C5	PVC glued connection (to PVC pipe - ISO 727)		
	-- C6	NP16, NFE29203 316L stainless steel collar and loose epoxy painted carbon steel flange		
	-- C7	ANSI 150 316L stainless steel collar and loose epoxy painted carbon steel flange		
	-- C8	ISO 2084 PN10 PVC flange		
	-- CX	Special construction		
	Code	Flow range and float type (see flowrate chart)		
	M1-I to M21-I	Liquid	stainless steel float	
	M7-IA to M21-IA	Liquid	stainless steel float + magnet	(for alarm S1)
	M2-P to M22-P	Liquid	PVC float	
	M7-PA to M22-PA	Liquid	PVC float - magnet	(for alarm S1)
	MG2-D to MG22-D	Gas	aluminium float	
	MG15-DA to MG21DA	Gas	aluminium float plus magnet	(for alarm S1)
	MG1-I to MG21-I	Gas	stainless steel float	
	MG7-IA to MG14-IA	Gas	stainless steel float + magnet	(for alarm S1)
	M.. -x to MG.. -x	For special flow rates consult sales		
	Code	Flow alarms		
	S0	Not required		
	S1	Reed switch alarm (with float type IA, DA or PA)		
	S2	Photoelectric alarm (without relay)		
	S3	Inductive alarm, stainless steel and PVC floats M1 to M6		
	S4	Power supply relay for S2		
	S5	Amplifying relay for S3		
	Sx	Special contact		
	Code	Options		
	Z0	None		
	Z1	Fluorocarbon (FPM/FKM) seals	(Nitrile as standard)	
	Z3	PVC seals	(Nitrile as standard)	
	Z5	PVC float stops	(316L st st as standard)	
	Z6	1 polycarbonate screen	(Front only)	
	Z7	2 polycarbonate screens	(if no alarms fitted)	
	Z8	2nd scale plate, for different fluid/conditions		
	Z9	Epoxy paint	(Polyester as standard)	
	Z10	Degreasing	(for oxygen service)	
	Z11	Customised scale	(not as table opposite)	

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134 1/2" C1 MG10 - IA S1 Z1 1 to 10m³/h - air 20°C 1013 mBar abs

Example ordering code

Please specify: Flow range, fluid details, density of fluid, viscosity, working temperature, working pressure.

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