



Flow meter / Flow switch RA 87 / FA 87

Measuring units RA 87 and FA 87 are based on the variable area float principle.



- Calibrated borosilicate measuring cone
- Armature completely made of stainless steel
- Perspex half-shell as shatter protection
- Reliable due to simple mode of operation
- Scales specific for the media to be measured
- Optionally:
 - limit value switches
 - analogue output 4 ... 20 mA
 - explosion-proof design
 - PVDF lining for flow measurement of aggressive fluids

D-EN-RA87-20220627



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Design and applications

Measuring units RA 87 and FA 87 are based on the variable area float principle. In pipelines the RA 87 is installed by means of pipe unions and the FA 87 is mounted between flanges. The borosilicate glass measuring cone is located inside a protective stainless steel tube with an inspection window. All parts in contact with the measured medium are made of stainless steel 1.4571.

VA flow meters RA 87 and FA 87 are most suitable for the flow measurement of transparent liquids and gases. Each unit is customized with a scale specific for the medium to be measured. RA 87 and FA 87 are mainly used in the chemical industry, in water treatment plants, in the food industry, and in other plant engineering applications. By installation of electrical limit value switches, which are adjustable throughout the entire measuring range, this devices can be used as detectors.

By installing an linear displacement sensor an output signal can be generated which is proportional to the height setting of the flow meter.

Our technical documents provide a detailed explanation of the function and measuring principle of VA flow meters.

Technical data	
Nominal pressure rating	FA 87: PN 10 at 20°C RA 87: PN 10 at 20°C
Max. operating pressure	see table measuring ranges
Temperature resistance	80°C, optionally 100°C
Ambient temperature	90°C
Measuring range	1:10
Accuracy class	VDE/VDI 3513 page 2 (08/2008)
Error limit (G) Linear limit (qG)	1,6 % 50%
Connection RA 87	<ul style="list-style-type: none"> G: cylindrical female fastening thread acc. to ISO 288 Rp: two-part pipe union: insert with cylindrical internal thread acc. to DIN EN 10226-1 (ISO 7-1)
Connection FA 87	flanges PN 10 acc. to DIN EN 1092-1, others (ANSI, JIS, ...) on request



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Materials	
Protective tube	1.4301
Heads RA 87	1.4571, optionally PVDF ¹
2-part fitting	1.4571, optionally PVDF ¹
Flanges FA 87	1.4571, optionally with PVDF inlay ¹
Measuring cone	Borosilicateglass
Splinter shield	Perspex
Seals	<ul style="list-style-type: none"> • Standard: FPM • Optionally: EPDM, FFKM (Perlast), silicone
Floats for liquids ²	Standard: 1.4571 Optionally: Hastelloy C4
Floats for gases ²	Standard: PTFE Optionally: PVC, PVDF, PP, Aluminium
With limit switches ²	Standard: 1.4571 with metal core For air: PTFE with metal core Optionally: PP, PVDF, PTFE (each with magnetic core)
Special design ¹	Protection of all parts in contact with media

1) PVDF lining: All wetted parts, except the measuring glass, are made from PVDF

2) Floats of small sizes are nonguided. Size 30 and larger: Partly with guided float. Optionally sizes 9,5 (without limit value switches only) and 19 are deliverable.

A detailed table is available on request.

Type series	
RA 87 G	With female thread
RA 87 Rp	With two part pipe union
FA 87	With flange connections
RA / FA 87-MSK1	With switching switch (normally closed)
RA / FA 87-MSK12	With switching switch (normally open)
RA / FA 87-EM	With analogue output 4 – 20 mA
RA / FA 87...Ex	Explosion-proof design

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Flow meter / Flow switch RA 87 / FA 87

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Dimensions: RA 87 with female thread						
Size	G	DN	SW1 ²	d ¹	L	H
9,5	¼	10	20	12	266	25
	⅜	15		16		
19	½	15	40	20	366	44,5
	¾	20		25		
	1	25		30		
30	1	25	55	32	366	60
	1¼	32		40		
36	1¼	32	65	40	366	70
	1½	40		50		
43	1½	40	82	50	366	89
	2	50		63		

1) only with PVC gluing sleeves and PP-, PVDF welding sleeves

2) only with sst (1.4571) design



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Dimensions: FA 87									
Size	DN	L	H	D	d ₄	k	Screws		d ²
							Qty.	Thread	
9,5	10	260	25	90	40	60	4	M12	14
	15			95	45	65	4	M12	14
19	10	360	44,5	90	40	60	4	M12	M12
	15			95	45	65	4	M12	14
	20			105	58	75	4	M12	14
	25			115	68	85	4	M12	14
30	25	360	60	115	68	85	4	M12	14
	40			150	88	110	4	M16	18
36	40	360	70	150	88	110	4	M16	18
	50			165	102	125	4	M16	18
43	50	360	89	165	102	125	4	M16	18
	65			185	122	145	4	M16	18



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Dimensions: RA 87 with tube fittings								
Size	(1.4571) Design			Plastic versions				H
	Thread	L	SW ²	DN	d ¹⁾	L (PVC)	L (PP, PVDF)	
9,5	Rp ¼	306	27	10	16	302	304	25
	Rp ⅜	309	32	15	20	305	305	
	Rp ½	314	41					
19	Rp ½	414	41	15	20	405	405	44,5
	Rp ¾	416	15	20	25	411	409	
	Rp 1	422	55	25	32	417	413	
30	Rp 1	422	55	25	32	423	419	60
	Rp 1¼	428	70	32	40	432	424	
	Rp 1½	429	75	40	50	442	430	
36	RP 1¼	428	70	32	40	432	424	70
	Rp 1½	429	75	40	50	442	430	
	Rp 2	433	90	50	63	456	438	
43	Rp 1½	429	75	40	50	448	436	89
	Rp 2	433	90	50	63	462	444	

1) only with PVC gluing sleeves and PP-, PVDF welding sleeves



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Measuring range [min. and max. measuring range; all intermediate measuring ranges are possible]						
Size	Measuring range H ₂ O	Measuring range air at STP ¹		Connections		Max. Operating pressure in bar at 20°C
	Float all materials	Float PTFE, PVDF	Float PVC, PP	RA 87 female thread	FA 87 flange connection DN	
9,5	0,5 – 5 l/h	8 – 80 l/h	8 – 80 l/h	¼	10	10
	20 – 200 l/h	0,28 – 2,8 m ³ /h	0,2 – 2 m ³ /h	⅜	15	
19	12 – 120 l/h	0,15 – 1,5 m ³ /h	0,14 – 1,4 m ³ /h	½	15	10
	0,12 – 1,2 m ³ /h	1,6 – 16 m ³ /h	1,2 – 12 m ³ /h	¾	20	
				1	25	
30	0,1 – 1 m ³ /h	1,2 – 12 m ³ /h	0,85 – 8,5 m ³ /h	1	25	10
	0,3 – 3 m ³ /h	3 – 30 m ³ /h	2 – 30 m ³ /h	1¼	40	
36	0,4 – 4 m ³ /h	3,5 – 35 m ³ /h	2,5 – 25 m ³ /h	1¼	40	8
	0,8 – 8 m ³ /h	8 – 80 m ³ /h	5 – 50 m ³ /h	1½	50	
43	0,9 – 9 m ³ /h	8 – 80 m ³ /h	6 – 60 m ³ /h	1½	50	8
	1,6 – 16 m ³ /h	16 – 160 m ³ /h	12 – 120 m ³ /h	2	65	

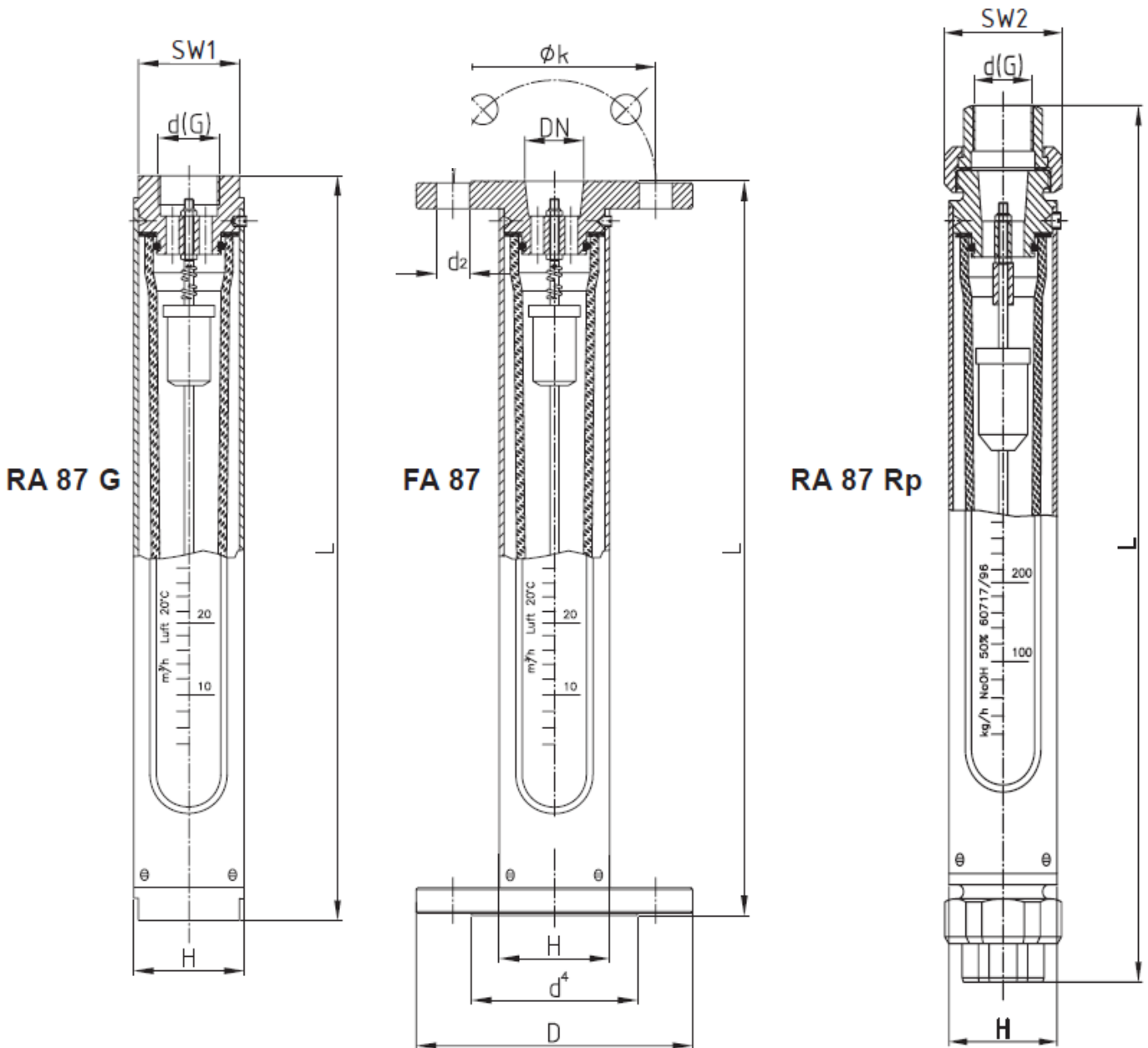
measuring ranges for other substances and operating conditions on request

¹at STP: at standard conditions (0 °C and 1013 mbar abs.)



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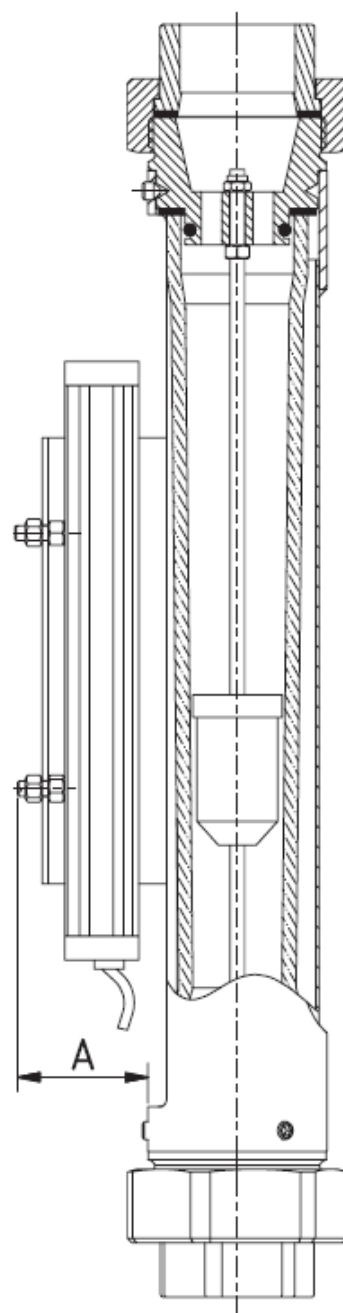
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RA / FA 87-EM	
Glasgröße	A
9,5	45
19	37
20	45
36	46
43	47



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Limit value switches MSK1/MSK12/MSKW

In order to realize a local display with a monitoring function the flowmeter can be equipped with limit value switches. The limit value switch consists of a connector housing and a bistable reed switch. A magnet integrated in the float switches this reed switch. The limit value switch is guided in a guide slot on the back of the protective tube and can be adjusted throughout the entire measuring range. In case of inductive or capacitive load applications, e.g. caused by contactors or solenoid valves, uncontrolled current and voltage peaks may occur. In dependence on their geometry such peaks also occur in lines if they exceed a certain length. It is therefore recommended to use an additionally available arc suppression relay "MSR". This increases the switching capacity and avoids the appearance of inductive and capacitive peaks. It thereby ensures a long lifetime of the contact.

Linear displacement sensor EM

The linear displacement sensor based on the Hall principle delivers an output signal proportional to the height setting of the flow meter. This signal can be displayed in 4 ... 20 mA or 0 ... 10 V to realize a remote indication. The sensor is connected via the enclosed M12 x 1 plug.

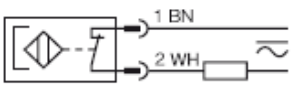
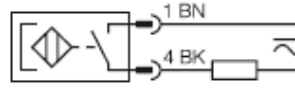
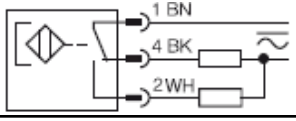
- Compact Design
- High level of reproducibility
- Measuring range indication via LED
- Most helpful for SPS integration
- Realise remote indication

Please notice that the sensor has a blind zone in the range of 3.7 mA to around 4 mA and only performs stable operation from approx. 4 mA.



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Technical data of the limit value switches			
Design	MSK1	MSK12	MSKW
Switching voltage	50 V AC/75 V DC	50 V AC/75 V DC	50 V AC/75 V DC
Switching current	0,5 A	0,5 A	0,5 A
Switching capacity	10 W/VA	10 W/VA	5 W/VA
Dielectric strength	230 V AC/400 V DC	230 V AC/400 V DC	110 V AC/200 V DC
Temperature range ¹	-20°C bis +90°C	-20°C bis +90°C	-20°C bis +90°C
Switching function	Normally closed	Normally open	Change over
Connection			
1) The thermal endurance of the flow meter is crucial.			

Important instructions!

Technical changes and errors reserved.

Pictures can be similar.

The operating instructions belonging to this device must be observed! Download at www.schmidt-messtechnik.com.