



VA Flow Meters

RA 77/FA 77

Design and application

The VA flow meter RA 77/FA 77 consists of a PVC armature with a measuring cone made of borosilicate glass.

With these design features the RA77/FA 77 combines the advantages of the classical VA flow meter with those of purely synthetic measuring units: Cost-effective, resistant against almost all aggressive media, as well as a high accuracy of the measuring glass, which can be calibrated to suit any requirement. Especially with water and aggressive media this design has proved worthwhile. Therefore the RA77/FA 77 is frequently used in the chemical industry and in water treatment plants.

By installation of electrical limit switches (min/max), which are adjustable throughout the entire measuring range, the unit can be employed as a detector too.

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



- calibrated borosilicate measuring cone
- armature made of PVC
- perspex half-shell as shatter protection
- reliable due to simple mode of operation
- resistant against aggressive media
- cost-effective
- with limit switches usable as detectors
- scales specific for the media to be measured



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RA 77/FA 77

Types

Design	Description
RA 77	With thread connection / gluing sleeve
FA 77	With flange connection

Technical data

Nominal pressure rating and temperature resistance of the armature	PVC: PN 10 at 0 to +20 °C / max. 6 bar at 40 °C PP: PN 10 at 0 to +20 °C / max. 1,5 bar at 80 °C PVDF: PN 10 at 0 to +20 °C / max. 5,5 bar at 80 °C
Max. operating pressure	see table of measuring ranges on page 3
Measuring range	1:10
Accuracy class	VDE/VDI 3513 page 2 (08/2008)
Error limit (G)	1,6 %
Linear limit (qG)	50 %
Connection RA77	Spigot nut and gluing sleeve acc. to DIN 8063, optionally thread acc. to DIN ISO 228 T1
Connection FA77	Flange PN 10 acc. to DIN EN 1092-1, others on request

Materials

Protective tube	PVC-tube with with insp. window, quality PVC-CAW dark grey
Fittings and inserts RA 77	Standard: PVC optionally: PP, PVDF
Flanges FA 77	Standard: PVC optionally: PP, UP-GF
Measuring glass	Borosilicate glass
Splinter shield	Perspex
Gaskets	Standard: EPDM optionally: Viton
Floats for fluids	Standard: PVC red (lead weighted) optionally: 1.4571, PP,PVDF
Floats for gases	Standard: PVC red optionally: Aluminium anodized, PP, PVDF
With limit switch	PVC red with magnetic core

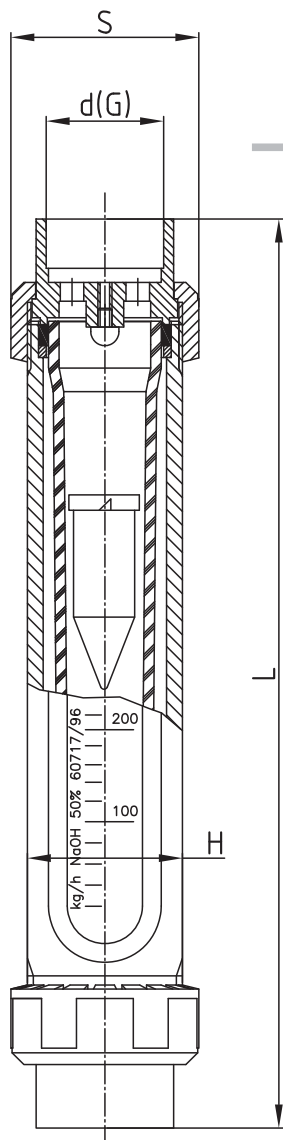
Dimensions

RA 77						
Size	Glued DN	d	G	H	S	L
9,5	10	16	¼	1	43	250
	15	20	3/8			
10	10	16	¼	1	43	350
	15	20	3/8			
19	15	20	¼	1 ½	60	350
	20	25	3/8			
	25	32	½			
30	25	32	1	2 ¼	80	385
	32	40	1 ¼			
	40	50				
36	32	40	1 ¼	2 ¾	98	385
	40	50	1 ½			
	50	63				
43	40	50	1 ½	3 ½	120	385
	50	63	2			
	65	75				
100	50	63	2	4 ½	140 ¹⁾	385
	65	75	2 ½			
	80	90	3			

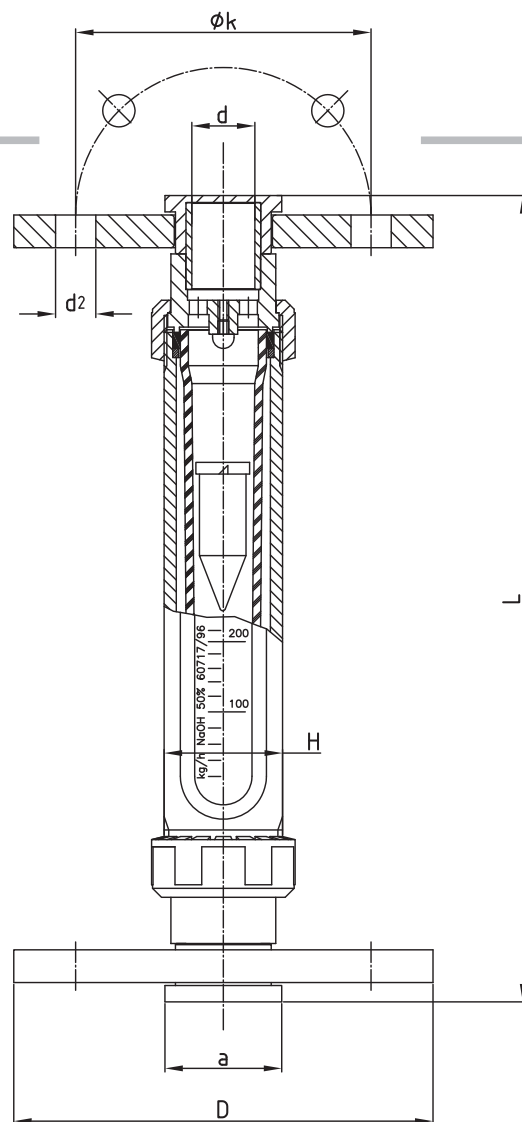
¹⁾ Spigot nut: Aluminium hexagon

FA77										
Size	DN	d	d _p	D	H	L	k	a	Screws	
									Qty	Thread
9,5	10	16	14	90	1	284	60	29	4	M 12
	15	20	14	95		288	65	34	4	M 12
10	10	16	14	90	1	384	60	29	4	M 12
	15	20	14	95		388	65	34	4	M 12
19	15	20	14	95	1 ½	388	65	34	4	M 12
	20	25	14	105		394	75	41	4	M 12
	25	32	14	115		400	85	50	4	M 12
30	25	32	14	115	2 ¼	435	85	50	4	M 12
	32	40	18	140		443	100	61	4	M 16
	40	50	18	150		453	110	73	4	M 16
36	32	40	18	140	2 ¾	443	100	61	4	M 16
	40	50	18	150		453	110	73	4	M 16
	50	63	18	165		467	125	90	4	M 16
43	40	50	18	150	3 ½	453	110	73	4	M 16
	50	63	18	165		467	125	90	4	M 16
	65	75	18	185		479	145	106	8	M 16
100	50	63	18	165	4 ½	467	125	90	4	M 16
	65	75	18	185		479	145	106	8	M 16
	80	90	18	200		497	160	125	8	M 16

RA 77



FA 77



Measuring range (min. and max. measuring range; all intermediate measuring ranges are possible)

Size	Measuring range m ³ /h H ₂ O	Measuring range m ³ /h HCL 30%	Measuring range m ³ /h NaOH 30%	Measuring range m ³ /h NaOH 50%	Measuring range m ³ /h air at STP ¹⁾	max. operating pressure in bar at 20 °C
9,5	0,3 – 3 ²⁾ 10 – 100 ²⁾	0,3 – 3 ²⁾ 10 – 100 ²⁾	on request	on request	0,002 – 0,02 0,22 – 2,2	10
10	0,1 – 1 ²⁾ 15 – 150 ²⁾	1 – 10 ²⁾ 10 – 100 ²⁾	on request	on request	0,004 – 0,04 to 2,2	10
19	0,012 – 0,12 0,2 – 1,6	0,01 – 0,1 0,11 – 1,1	0,004 – 0,04 0,08 – 0,8	0,004 – 0,04 0,02 – 0,2	0,17 – 1,7 1,5 – 15	10
30	0,1 – 1 0,3 – 3	0,09 – 0,9 0,28 – 2,8	0,1 – 1 0,2 – 2	0,038 – 0,38 0,1 – 1	1 – 10 3 – 30	10
36	0,35 – 3,5 0,6 – 6	0,3 – 3 0,55 – 5,5	0,3 – 3 0,5 – 5	0,15 – 1,5 0,35 – 3,5	3,6 – 36 7 – 70	8
43	0,6 – 6 3 – 16	0,56 – 5,6 0,95 – 9,5	0,6 – 6 1 – 10	0,45 – 4,5 0,8 – 8	6 – 60 12 – 120	8
100	1,5 – 15 2 – 20	–	–	–	13 – 130 20 – 200	5

Measuring ranges for other measuring substances and operating conditions on request

¹⁾ at STP: at standard conditions (0 °C and 1,013 bar abs.)

²⁾ in l/h



RA 77/FA 77

Limit switches MSK1/MSK12/MSKW

In order to realize a local display with a monitoring function the flowmeter can be equipped with limit switches. The limit switch consists of a connector housing and a bistable reed contact.

A magnet integrated in the float switches this reed contact. The limit 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.

Technical data of the limit switches

Design	MSK1	MSK12
Switching voltage	50V AC/75V DC	50V AC/75V DC
Switched current	0,5 A	0,5 A
Switching capacity	10 W/VA	10 W/VA
Dielectric strength	230V AC/400V DC	230V AC/400V DC
Temperature range ¹⁾	-20 to +90°C	-20 to +90°C
Switching function	Normally closed	Normally open
Connection		

Design	MSKW
Switching voltage	50V AC/75V DC
Switched current	0,5 A
Switching capacity	5 W/VA
Dielectric strength	110V AC/200V DC
Temperature range ¹⁾	-20 to +90°C
Switching function	change over
Connection	

¹⁾ the deciding factor is the thermal endurance of the flow meter

¹⁾ entscheidend ist die Temperaturbeständigkeit des Durchflussmessgerätes.

Low voltage directive

Above 50 V AC/ 75 V DC, contacts are subject to the EU Low-Voltage Directive. The user is required to verify their use accordingly.

Proper use

The user is responsible for assessing the suitability of the flow meters for his case of application, for use as prescribed, and for material compatibility as regards the liquid product used in his process.

The manufacturer shall not be liable for any damage arising from incorrect or improper use of the devices.

Pressure surges can cause glass breakage, and should therefore generally be avoided. The limit values given in the data sheet should be observed.

In all other respects we advise following the installation recommendations specified in Code VDI/VDE 3513, Sheet 3.

The equipment from **Kirchner und Tochter** has been tested in compliance with applicable CE-regulations of the European Community.

The respective declaration of conformity is available on request.

Technical data supplied without liability. The current valid version of our documents can be found under this URL: www.kt-web.de

The **Kirchner und Tochter** QM-System is certified in accordance with DIN-EN-ISO 9001:2008. The quality is systematically adapted to the continuously increasing demands.



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