VA Flow Meters

RA 60/FA 60

Design and applications

Measuring units RA 60 and FA 60 are based on the variable area float principle. In pipelines the RA 60 is installed by means of screwed pipe joints and the FA 60 is mounted between flanges. The borosilicate glass measuring cone is located inside a protective steel tube with an inspection window.

VA flow meters RA 60 and FA 60 are most suitable for the flow measurement of transparent fluids and gases. Each unit is customized with a scale specific for the medium to be measured. RA 60 and FA 60 are used in plant engineering (e.g. furnace construction and water treatment).

By installation of electrical limit switches, which are adjustable throughout the entire measuring range, these units can be employed as detectors too.

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

- calibrated borosilicate measuring cone
- armature with protective steel tube
- Perspex half-shell as shatter protection
- reliable due to simple mode of operation
- with limit switches usable as detectors
- scales specific for the media to be measured
- optionally explosion-protected design

Kirchner und Tochter

A. Kirchner & Tochter GmbH · Dieselstraße 17 · D-47228 Duisburg
Fon: +49 2065 9609-0 · Fax: +49 2065 9609-22 · www.kirchnerundtochter.de · info@kirchnerundtochter.de

Version 3.3

RA 60/FA 60

Types

Design	Description
RA 60	With threaded connection
FA 60	With flange connection

Technical data

Nominal pressure	FA 60: PN 10 at 20 °C RA 60: PN 10 at 20 °C
Max. operating pressure	see table measuring ranges on page 3
Thermal endurance	80 °C, optionally 100 °C
Ambient temperature	90 °C
Turn-down ratio	1:10
Accuracy class Error limit (G) Liniar limit (qG)	VDE/VDI 3513 page 2 (08/2008) 1,6 % 50 %
Connection RA 60	Two-part pipe fitting: Insert with cylindrical internal thread to ISO 7-1
Connection FA 60	Flange PN 10 acc. to DIN EN 1092-1, other connections on request
Corrosion protection Corrosion class	Epoxy paint kiln-dried, traffic blue (RAL 5017), satin-finished C2

Materials

Protective sleeve	Precision steel tube made of P235
Heads RA 60	Grey cast iron, (Aluminium from size 43)
Threaded joint	Malleable cast iron, galvanized
Flanges FA 60	S355
Measuring glass	Borosilicate glass
Splinter shield	Perspex
Gaskets	Standard: NBR, optionally FPM, EPDM
Floats for liquids [1]	Standard: 1.4571, Special design: PVC, PP, PVDF or PTFE with lead core
Floats for gases [1]	Standard: Aluminium anodized, optionally: PVC, PP, PTFE, PVDF or 1.4571
with limit contacts [1]	Standard: 1.4571 with magnetic core or PVC with magnetic core

[1] With small sizes VA flow meters floats unguided, from size 30 partly with guide rod. We will send you a detailed table on request.

Dimensions

RA 60					
Size	Pipe fitting	S	d [1]	L	H
10	Rp ¼ Rp 3/8 Rp ½	28 32 39	12 16 20	388 390 393	28
19	Rp ½ Rp ¾ Rp 1	39 48 55	20 25 32	405 407 415	45
30	Rp 1 Rp 1 ¼ Rp 1 ½	55 67 74	32 40 50	415 430 436	60
36	Rp 1 ¼ Rp 1 ½ Rp 2	67 74 90	40 50 63	430 436 446	75
43	Rp 1 ½ Rp 2 Rp 2 ½ Rp 3	74 90 111 131	50 63 75 90	440 446 460 470	95
100	Rp 2 Rp 2 ½ Rp 3	90 111 131	63 75 90	446 458 470	115
110	Rp 2 ½ Rp 3	111 131	75 90	462 474	133

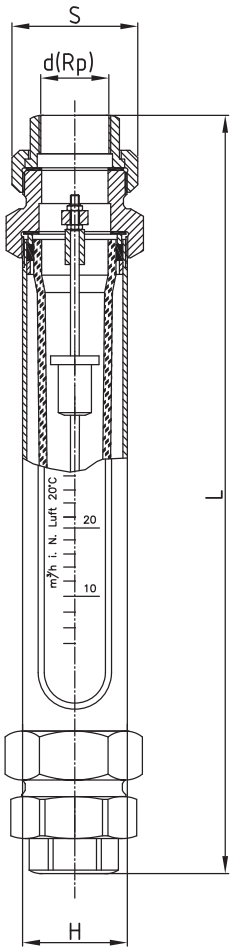
[1] d for bonding and welding sleeves

FA 60								
Size	DN	L	H	D	k	Screws		d_2
						Qty	Thread	
10	10 15 20 25	340	28	90 95 105 115	60 65 75 85	4 4 4 4	M12 M12 M12 M12	M12 M12 M12 M12
19	10 15 20 25	340	45	90 95 105 115	60 65 75 85	4 4 4 4	M12 M12 M12 M12	M12 M12 M12 M12
30	25 32 40	340	60	115 140 150	85 100 110	4 4 4	M12 M16 M16	M12 M16 M16
36	32 40 50	340	75	140 150 165	100 110 125	4 4 4	M16 M16 M16	M16 M16 M16
43	40 50 65	340	95	150 165 185	110 125 145	4 4 4	M16 M16 M16	M16 M16 M16
100	65 80 100	340	115	185 200 220	145 160 180	4 8 8	M16 M16 M16	M16 M16 M16
110	65 80 100	340	133	185 200 220	145 160 180	4 8 8	M16 M16 M16	M16 M16 M16
150	80[1] 100 125 150	640	178	220 220 250 285	160 180 210 240	8 8 8 8	M16 M16 M16 M20	M16 M16 M16 M20
180	150 200	640	219	285 340	240 295	8 8	M20 M20	M20 M20

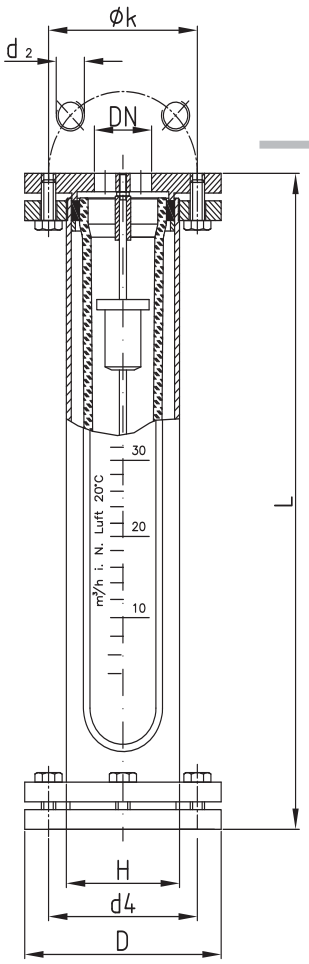
[1] Installation length: 655 mm

A. Kirchner & Tochter GmbH Dieselstraße 17 · D-47228 Duisburg
Fon: +49 2065 9609-0 · Fax: +49 2065 9609-22 www.kirchnerundtochter.de · info@kirchnerundtochter.de
Version 3.3

RA 60



FA 60



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

Size	Measuring range m³/h H20			Measuring range m³/h air at STP [1]			RA 60 Threaded connection	FA 60 Flange-connection DN	max. operating pressure bar
10	0,1 15	–	1 l/h 150 l/h	0,001 0,22	–	0,01 2,2	Rp ¼ Rp 3/8 Rp ½	10 15 20 25	10
19	0,012 0,12	– –	0,12 1,2	0,15 1,6	– –	1,5 16	Rp ½ Rp ¾ Rp 1	10 15 20 25	10
30	0,1 0,3	– –	1 3	1,3 3,6	– –	13 36	Rp 1 Rp 1¼ Rp 1 ½	25 32 40	10
36	0,4 0,8	– –	4 8	4 8	– –	40 80	Rp 1 ¼ Rp 1 ½ Rp 2	32 40 50	8
43	0,9 1,6	– –	9 16	5 16	– –	50 160	Rp 1 ½ Rp 2 Rp 2 ½ Rp 3	40 50 65	8
100	1,6 2	– –	16 20	12 28	– –	120 280	Rp 2 Rp 2 ½ Rp 3	65 80 100	6
110	2,5 3	– –	25 30	14 44	– –	140 440	Rp 2 ½ Rp 3	65 80 100	5
150	— —			30 100	– –	300 1000	—	80 100 125 150	4
180	— —			30 150	– –	300 1500	—	150 200	3

Measuring ranges for other substances and operating conditions on request

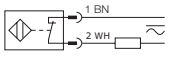
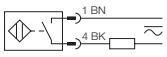
[1] at STP: at standard conditions (0 °C and 1,013 bar abs.)

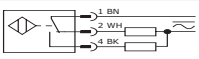
RA 60/FA 60

Limit switches MSK1/MSK12/MSKW

In order to realize a local display with a monitoringfunction the flowmeter can be equipped with limit switches. The limit switch consists of a connectorhousing 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		

Desing	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

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.

Kirchner und Tochter

A. Kirchner & Tochter GmbH Dieselstraße 17 · D-47228 Duisburg
Fon: +49 2065 9609-0 · Fax: +49 2065 9609-22 www.kirchnerundtochter.de · info@kirchnerundtochter.de
Version 3.3