



Design and range of application

The measuring device operates largely independent of viscosity and is suitable for indicating the flow rate of water, acids, alkaline solutions and gases. Every device is calibrated to customer requirement and fitted with a product-specific scale. For process control purposes, the measuring device can be equipped with limit contacts or a measuring transducer with electrical analog output. The 50 mm thick ring features a half-round plate that is fastened to a rotating spindle. The angle between flap and ring changes according to the rate of flow, and a breakaway-proof magnetic coupling transfers the movement to an external pointer.

The standard indicator is housed in a round stainless steel casing with bayonet lock and can optionally be equipped with contacts. The casing of the indicator part with integrated 4-20mA output is constructed of die-cast aluminium.



- suitable for H₂O, acids, alkaline solutions and gases
- spring-loaded flap
- horizontal or vertical direction of flow
- largely independent of viscosity
- limit contacts, optional
- analog output 4 - 20 mA, optional
- explosion-protected design, optional



Kirchner und Tochter

Flap-type flow meter



KFS

Type series

KFS	local mechanical indicator
KFS-IK1	with one inductive contact
KFS-IK2	with two inductive contacts
KFS-IKS1	with one electronic contact
KFS-IKS2	with two electronic contacts
KFS-RK1	with one reed contact
KFS-RK2	with two reed contacts
KFS-EM	with 4-20 mA output
KFS Ex	local mechanical indicator, explosion-protected design
KFS-IK1 Ex	with one inductive contact, explosion-protected design
KFS-EM EEEx	with 4-20 mA output, explosion-protected design

Technical data

Measuring accuracy	5% FS
Scale	in physical units, e.g.: l/h, m ³ /h
Length of scale	max. 95 mm
Turndown ratio	min. 1 : 10
Degree of protection, indicator part	IP 66 (IP 67 for KFS-EM)
Corrosion protection for steel version	Epoxy, stove enamelled, colour: blue, RAL 5017
Mounting length	Standard: 50 mm Special spring: 60mm
Connections	Mounting between welding neck flanges to DIN 2501
optionally	acc. to ANSI 150 lbs, JIS 150 lbs, others on request
Steel/stainless steel version ¹⁾	
Allowable media temperatures	- 70°C ... + 200°C PN 6/10 - 20°C ... + 70°C PN 6/10 (KFS Ex and KFS-IK1 Ex) ²⁾
Standard pressure stage	PN 6/10
optionally	PN 16/25/40 (no surcharge)
PVC version ¹⁾ (not suitable for hazardous areas)	
Allowable media temperatures	0°C ... + 20°C at 10 bar 0°C ... + 40°C at 6 bar
Allowable operating pressure PN 6/10	
PP version ¹⁾ (not suitable for hazardous areas)	
Allowable media temperatures	0°C ... + 20°C at 10 bar 0°C ... + 80°C at 1.5 bar
Allowable operating pressure PN 6/10	
PVDF version ¹⁾ (not suitable for hazardous areas)	
Allowable media temperatures	- 40°C ... + 20°C at 10 bar - 40°C ... + 140°C at 2 bar
Allowable operating pressure PN 6/10	

¹⁾ The process fluid must not freeze

²⁾ Where insulation measures have been carried out to pipeline and measuring part, 70°C ... + 200°C are also possible

Materials

Material, ring	Wetted internals	Wetted gasket ²⁾	DN
Steel	1.4571	Sil 4400	25-600
Stainless steel	1.4571	Sil 8200	25-600
PVC	1.4571 ¹⁾	EPDM	25-300
PP	1.4571 ¹⁾	EPDM	25-300
PVDF	1.4571 ¹⁾	Viton	25-300
Indicator part	KFS	KFS-EM	
Scale casing	Stainless steel 1.4301	Aluminium, painted	
Pointer	Aluminium, painted	Aluminium, painted	
Scale	Aluminium, coated	Aluminium, coated	
Pane	PMMA, opt. glass	Float glass	

¹⁾ optionally Hastelloy C4

²⁾ others on request

Rubber coating on request

Measuring ranges

Standard measuring ranges, water at 20°C

DN	Measuring range [m ³ /h] H ₂ O					
25	0,5-7	1-12				
32	0,5-8	1,8-18	4-40			
40	0,6-6	1,6-16	3-30	5-50		
50	0,8-8	1,8-18	3-35	5-50		
65	2-18	4-40	6-60	9-90	11-110	
80	2-20	4-40	6-60	10-100	12-120	
100	5-50	8-80	12-120	14-140	20-200	
125	5-55	8-80	12-120	14-140	20-200	35-350
150	6-60	10-100	14-140	18-180	22-220	35-350
200	12-120	15-150	20-200	25-250	40-400	
250	18-180	25-250	30-300	40-400		
300	20-220	25-250	30-300	50-500		
350	50-500					

Special measuring ranges, water at 20°C

DN	Measuring range [m ³ /h] H ₂ O			
200	60-600			
250	60-600			
300	60-650	90-900		
350	70-700	90-900		
400	60-600	75-750	110-1100	
500	70-700	100-1000	135-1350	
600	80-800	125-1250	165-1650	

Measuring ranges for other media and operating conditions on request.



Flap-type flow meter

KFS

Standard measuring ranges, air at STP (0°C and 1013 mbar)

DN	Measuring range [m³/h] air at STP	
	Minimum range	Maximum range
25	10-100	30-300
32	10-100	30-300
40	10-100	40-400
50	10-100	75-750
65	18-180	80-800
80	20-200	100-1000
100	25-250	220-2200
125	25-250	260-2600
150	30-300	300-3000
200	40-400	300-3000
250	100-1000	400-4000
300	150-1500	500-5000

Intermediate measuring ranges possible

The measuring ranges for the KFS-EM Series slightly differs from the above values. More precise details supplied on request.


Options

Limit contacts

Inductive contact IK1 and IK2

Limit contact with inductive slot initiator,
optionally explosion-protected design

The pointer in the indicator activates a built-in inductive contact by means of a metal vane. The limit contact is adjustable over the full measuring range. A maximum of 2 contacts can be built into one KFS. The contact point is indicated on the flow meter scale by a pointer.

IK1	Version with one contact
IK2	Version with two contacts
Contact data	
Function	Inductive slot initiator to NAMUR DIN 19233, two-wire
Switching function	NC or NO contact
Slot width	2.0 mm
Hysteresis	1.0 % v.E ... 10.0 % v.E
Repeat accuracy	≤ 2.0 %
Temperature drift	≤ ±10 %
Ambient temperature	-25 °C ... +70 °C
Voltage	nom. 8.2 VDC
Switching frequency	≤ 2.5 kHz
Switching performance	bistable
Nominal voltage	8 V DC via isolation switching amplifier KFA
Power consumption	
active area uncovered	≥ 2.1 mA
active area covered	≤ 1.2 mA
Ambient temperature	-25 °C ... +70 °C
Polarity reversal protection	yes
Certification to	KEMA 01 ATEX 1264X
Inner inductance (Li) / capacitance (Ci)	41 nF / 266 µH * values for cable assemblies up to 10m
Contact marking	 II 1 G EEx ia IIC T6 (max. U _i = 15V, I _i = 60 mA, P _i = 100 mW)

Limit contact with inductive slot initiator for PLCs, IKS1 and IKS2

The pointer of the flow meter activates the inductive contact that is built into the indicator casing by means of a metal vane. The limit contact is adjustable over the full measuring range. A maximum of 2 IKS contacts can be built into a KFS. The contact point is indicated on the meter scale by a pointer. The IKS version is particularly suitable for direct connection to PLCs.

IKS1	Version with one contact
IKS2	Version with two contacts
Contact	Inductive slot initiator
Switching function	NC or NO
Switching performance	bistable
Supply voltage	24 V DC
Current switched I _a	≤ 100 mA
Open-circuit power consumption	≤ 10 mA
Ambient temperature	-25 °C ... +70 °C
Explosion protection	no
Voltage drop (bei I _{max})	≤ 1.2V



Reed contact RK1 and RK2

The KFS flow meter can optionally be equipped with a limit contact RK for flow monitoring and control purposes. The limit contact is adjustable over the full measuring range.

RK1	Version with one contact
RK2	Version with two contacts
Contact	Reed contact, floating
Switching function	NC / NO
Switching performance	bistable
Voltage switched	max. 140 V AC / 200 V DC
Current switched	max. 0,25 A
Contact rating	max. 5 VA, 3 W
Ambient temperature	-25° C ... +105° C

Power supply	24V DC
Measuring signal	4 to 20 mA for 0 to 100% flow value > 20.8 mA for alarm status
Supply power influence	< 0,1 %
Ext. resistance dependence	< 0,1 %
Temperature influence	< 5 µA/K
max. external resistance / load impedance	0 (250 *) to 800 Ohm
Ambient temperature	-25° C ... +60° C

* With HART™ communication, these are minimum values.

Low-voltage directive

Above 50 VAC/75 VDC, the contacts are subject to the EC low-voltage directive. The user is required to check their application accordingly.

Electrical measuring transducer EM

The electrical measuring transducer generates a current of 4 to 20 mA in two-wire technology that is proportional to the instantaneous flow rate. The transducer is factory-calibrated on the basis of the flow measuring range. The calibration values, used for linearization of the measuring transducer, are stored in a memory chip. A protective extra-low voltage (PELV) with galvanic isolation to VDE 0100 Part 410 is required as power supply.

All instruments connected to the measuring circuit (indicators, recorders) are connected in series, and together may not exceed the maximum external resistance. The EM features reverse voltage protection.

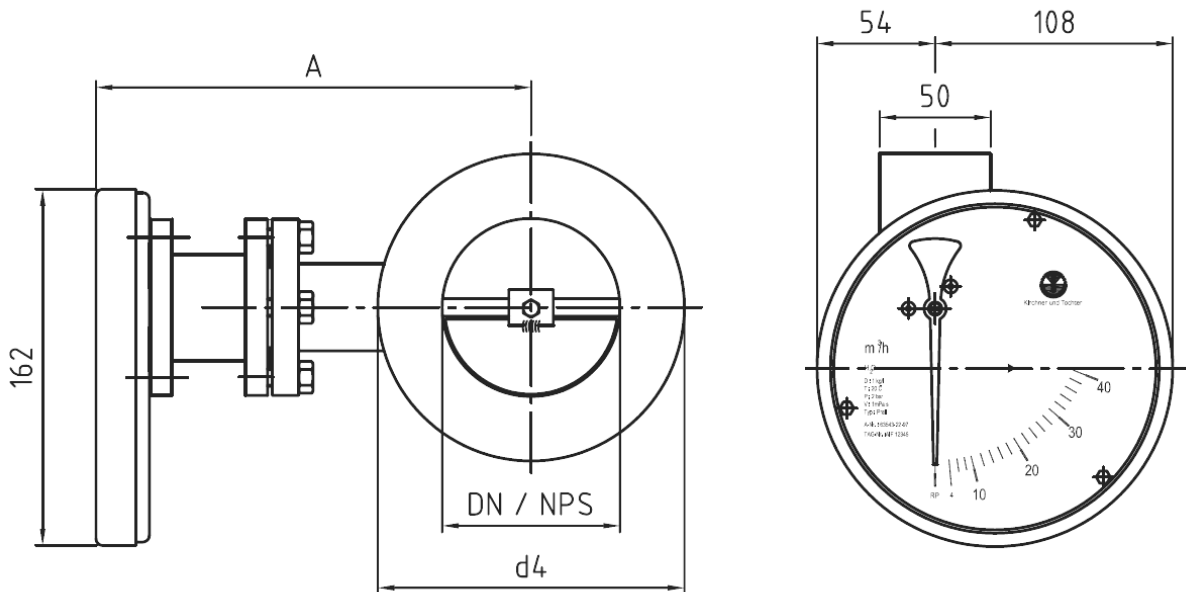
Explosion protection according to Directive 94/9/EC: ATEX

The following versions are also available in the type-tested hazardous-duty variant for Zone 1 and 2 of device categories 2 and 3, atmosphere G, in compliance with Directive 94/9/EC (ATEX 95):

KFS Ex	mechanical local indicator, explosion-protected design
KFS-IK1 Ex	with one inductive contact, explosion-protected design
KFS-EM EEx	with 4-20 mA output, explosion-protected design



Dimensions KFS Standard



Note: The flap axis for DN32 and DN25 devices is located 9mm above the ring axis!
NPS = Nominal pipe size acc. to ANSI/ASTM

DN	d ₄	A ¹⁾	Weight [kg]		NPS	d ₄	A ¹⁾
			Steel	PVC			
25	68	202	3.8	2.0	1"	51	199
32	78	206	3.8	2.0	1 1/4"	64	204
40	88	206	3.8	2.0	1 1/2"	73	206
50	102	211	3.9	2.1	2"	92	212
65	122	219	5.0	2.3	2 1/2"	105	217
80	138	226	5.6	2.5	3"	127	225
100	158	236	6.4	2.7	4"	157	237
125	188	249	8.0	2.8	5"	186	250
150	212	261	8.8	3.3	6"	216	263
200	268	286	11.4	3.7	8"	270	287
250	320	311	13.0	4.5	10"	324	313
300	370	336	22.0	4.9	12"	381	338
350	430	376	29.3	-			
400	482	401	31.5	-			
500	585	451	39.0	-			
600	685	501	45.5	-			

All dimensions in mm

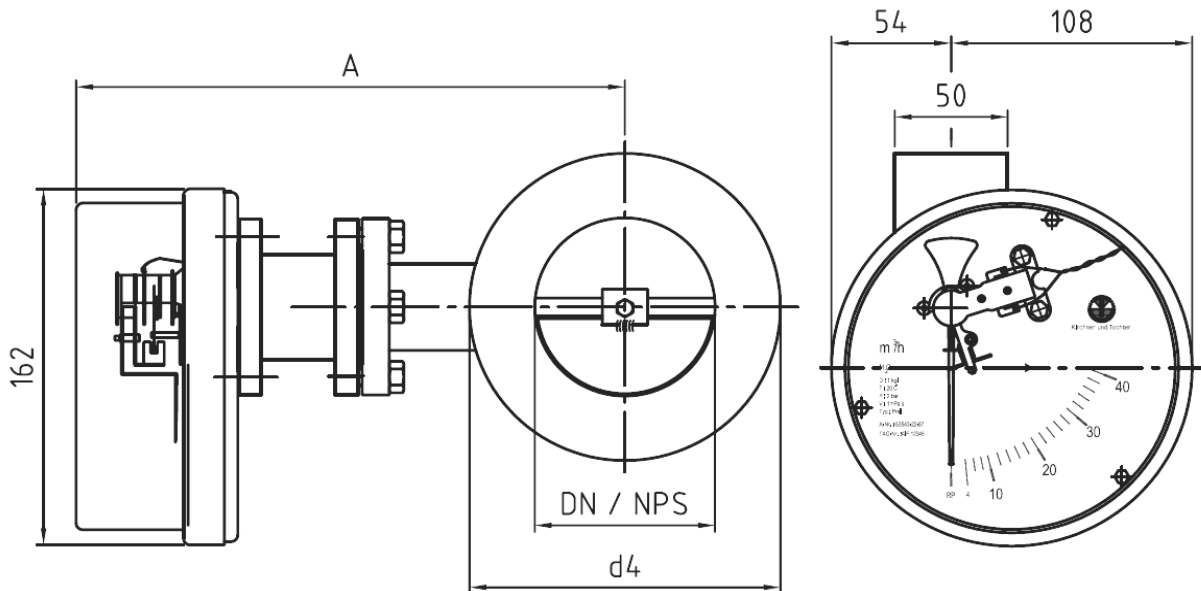
1) The PVC / PP / PVDF versions deviate in part from the standard.

Flap-type flow meter



KFS

KFS with contacts (IK1, IK2, IKS1, ...)



Note: The flap axis for DN32 and DN25 devices is located 9 mm above the ring axis!
NPS = Nominal pipe size acc. to ANSI/ASTM

DN	d ₄	A ¹⁾	Weight [kg]		NPS	d ₄	A ¹⁾
			Steel	PVC			
25	68	249	3.8	2.0	1"	51	246
32	78	253	3.8	2.0	1 1/4"	64	251
40	88	253	3.8	2.0	1 1/2"	73	253
50	102	258	3.9	2.1	2"	92	259
65	122	266	5.0	2.3	2 1/2"	105	264
80	138	273	5.6	2.5	3"	127	272
100	158	283	6.4	2.7	4"	157	284
125	188	296	8.0	2.8	5"	186	297
150	212	308	8.8	3.3	6"	216	310
200	268	333	11.4	3.7	8"	270	334
250	320	358	13.0	4.5	10"	324	360
300	370	383	22.0	4.9	12"	381	385
350	430	423	29.3	-			
400	482	448	31.5	-			
500	585	498	39.0	-			
600	685	548	45.5	-			

All dimensions in mm

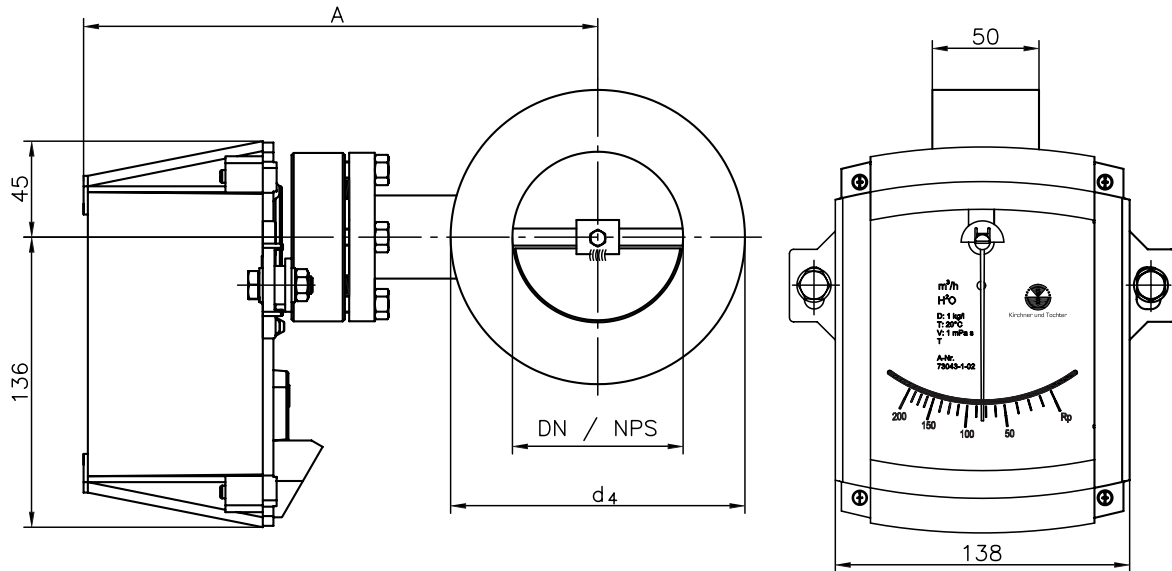
1) PVC / PP / PVDF versions deviate in part from the standard.



Flap-type flow meter

KFS

KFS-EM



Note: The flap axis for DN32 and DN25 devices is located 9mm above the ring axis!
 NPS = Nominal pipe size acc. to ANSI/ASTM

DN	d ₄	A ¹⁾	Weight [kg]		NPS	d ₄	A ¹⁾
			Steel	PVC			
25	68	233	3.8	2.0	1"	51	233
32	78	236	3.8	2.0	1 1/4"	64	238
40	88	242	3.8	2.0	1 1/2"	73	240
50	102	247	3.9	2.1	2"	92	246
65	122	253	5.0	2.3	2 1/2"	105	251
80	138	260	5.6	2.5	3"	127	259
100	158	270	6.4	2.7	4"	157	271
125	188	283	8.0	2.8	5"	186	284
150	212	295	8.8	3.3	6"	216	297
200	268	320	11.4	3.7	8"	270	321
250	320	345	13.0	4.5	10"	324	347
300	370	370	22.0	4.9	12"	381	372
350	430	395	29.3	-			
400	482	420	31.5	-			
500	585	485	39.0	-			
600	685	535	45.5	-			

All dimensions in mm

1) PVC / PP / PVDF versions deviate in part from the standard.

Flap-type flow meter



KFS

The equipment from KIRCHNER has been tested in compliance with the applicable CE-regulations of the European Community.

The respective declaration of conformity is available on request.

The KIRCHNER QM-System will be certified in accordance with DIN-EN-ISO 9001:2000. The quality is systematically adapted to the increasing demands.



Kirchner und Tochter

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