

## Flow Monitor & Flow Indicator

# KM-335

# KM-350



## OVERVIEW

### Operation

- Float measuring principle

### Application

- Cooling systems and cooling circuits
- Mechanical engineering
- Pharmaceutical industry
- Chemical industry
- Research & Development

### Features

- Shatterproof and corrosion resistant
- Easily removable from the pipe system
- Mounting for accessories (limit switches)
- Adhesive special scales, for liquid and gaseous media
- DN (rated width), measuring range, and material specified on the measuring tube

### Installation information

- The operating instructions for KM-335, KM-350 must be observed!
- **Download: [www.meister-flow.com](http://www.meister-flow.com)**

## OPERATING DATA

<b>Operating pressure, max.</b>	PN 10 (at 20 °C) <sup>(1)</sup>
<b>Pressure drop</b>	see table on page 6
<b>Operating temperature</b>	0 °C - 60 °C <sup>(2)</sup>
<b>Measuring accuracy</b>	see table below

<sup>(1)</sup> See also Pressure - temperature - diagram on page 8

<sup>(2)</sup> max. temperature at 1 bar

## MATERIALS

Measuring tube:	PVC, PA, PSU
Float:	PVDF
Insert, lower:	PVDF
Insert, upper:	PVDF
Coupling ring:	PVC (optional PP)
Connector:	PVC (optional PP)
O-Rings:	EPDM (optional FPM)
Limit value indicator:	PS
Guide rail <sup>(5)</sup> :	PVDF / stainless steel

<sup>(5)</sup> from DN 50 (1500 - 15000 l/h)

## MEASURING RANGES

Type	Measuring range for H <sub>2</sub> O at 20 °C <sup>(3)</sup>	
	l/h	gpm
KM-3...-500	50 – 500	0,22 – 2,2
KM-3...-1000	100 – 1000	0,44 – 4,4
KM-3...-1500	150 – 1500	0,66 – 6,6
KM-3...-2500	250 – 2500	1,1 – 11
KM-3...-2000	200 – 2000	0,88 – 8,8
KM-3...-3000	300 – 3000	1,32 – 13,2
KM-3...-6000 <sup>(4)</sup>	600 – 6000	2,64 – 26,4
KM-3...-10000	1000 – 10000	4,4 – 44,02
KM-3...-15000	1500 – 15000	6,6 – 66,04
KM-3...-20000	2000 – 20000	8,8 – 88
KM-3...-30000	3000 – 30000	13,2 – 132
KM-3...-60000	8000 – 60000	35,2 – 264

<sup>(3)</sup> The specified measuring- / switch ranges are valid for water having a density of 1.00 kg/dm<sup>3</sup>, vertical installation of the device and flow direction from bottom to top.

Other installation positions or deviation from the operating densities will increase the measurement error specified in the data sheet.

Operating density for water at 20 °C and 1.013 bar (absolute value): 1.00 kg/dm<sup>3</sup>.

Upon request, special scales for deviating media and different operating conditions, are available.

Special scales for air see page 7

Special scales for HCl 30 - 33 %, NaOH 30 % and NaOH 50 % see page 8

<sup>(4)</sup> Available in DN 40 and DN 50

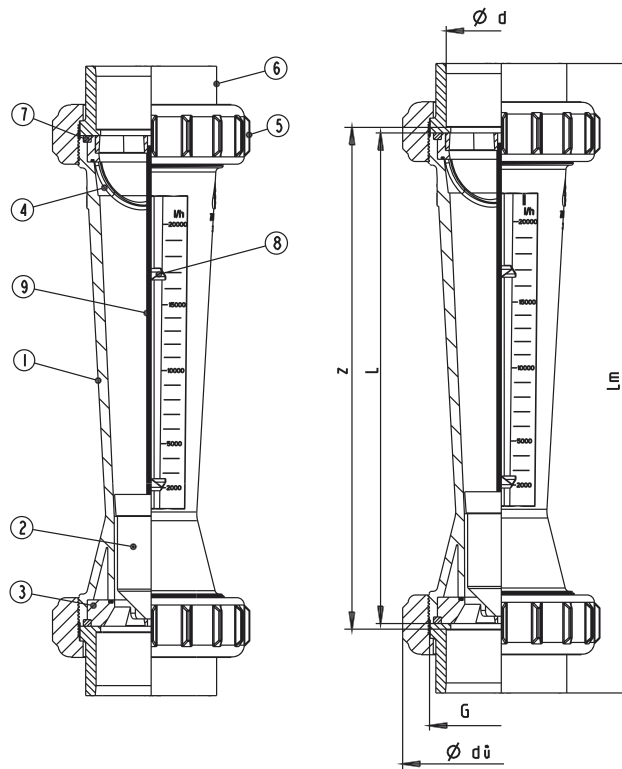
## ACCURACY

### Accuracy class 4, VDE/VDI 3513, sheet 2

Flow in %	10	20	30	40	50	60	70	80	90	100
Total error of measurement in %	13	8	6,33	5,5	5	4,67	4,43	4,25	4,11	4
Total error of full scale in %	1,3	1,6	1,9	2,2	2,5	2,8	3,1	3,4	3,7	4

# ASSEMBLY DRAWING

Process connection with solvent cement socket PVC or weld socket PP



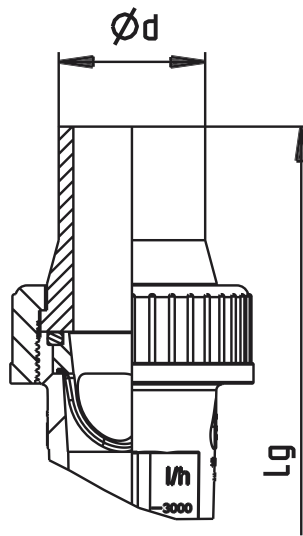
## PARTS DESCRIPTION

Item	Description	No. of pieces	Material
01	Measuring tube:	1	PVC, PA, PSU
02	Float:	1	PVDF
03	Insert, lower:	1	PVDF
04	Insert, upper:	1	PVDF
05	Coupling ring:	2	PVC (optional PP)
06	Connector:	2	PVC (optional PP)
07	O-Ring:	2	EPDM (optional FPM)
08	Limit value indicator:	2	PS
09	Guide rail <sup>(6)</sup>	1	PVDF / stainless steel

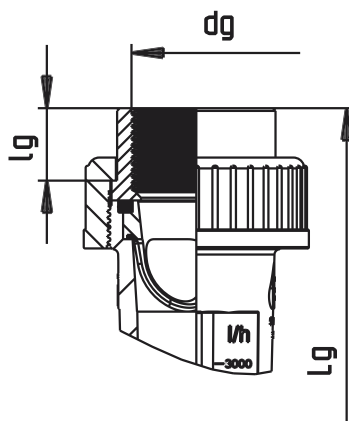
<sup>(6)</sup> from DN 50 (1500 - 15000 l/h)

# TECHNICAL DRAWING

Process connection with weld socket (butt end) PP



Process connection with threaded socket PVC, PP annealed cast iron or stainless steel



## SUMMARY OF TYPES

Type	Overall dimensions [mm]					Solvent cement socket PVC			Weld socket PP			PP-Socket (butt end)			Threaded socket			Weight approx. [g]
	DN	d	G	d <sub>u</sub>	L	d <sub>m</sub>	z	L <sub>m</sub>	d <sub>m</sub>	z	L <sub>m</sub>	d	L <sub>g</sub>	S <sup>(7)</sup>	d <sub>g</sub>	L <sub>g</sub>	l <sub>g</sub>	
KM-335-500	25	32	1 1/2"	60	335	32	341	385	32	345	381	32	455	2,9	1"	385	17	520
KM-335-1000	25	32	1 1/2"	60	335	32	341	385	32	345	381	32	455	2,9	1"	385	17	520
KM-335-1500	32	40	2"	72	335	40	341	393	40	345	385	40	461	3,7	1 1/4"	393	19	600
KM-335-2500	32	40	2"	72	335	40	341	393	40	345	385	40	461	3,7	1 1/4"	393	19	600
KM-335-2000	40	50	2 1/4"	83	335	50	341	403	50	345	391	50	467	4,6	1 1/2"	403	23	1220
KM-335-3000	40	50	2 1/4"	83	335	50	341	403	50	345	391	50	467	4,6	1 1/2"	403	23	1220
KM-335-6000	40	50	2 1/4"	83	335	50	341	403	50	345	391	50	467	4,6	1 1/2"	403	23	1220
KM-335-6000	50	63	2 3/4"	103	335	63	341	417	63	345	399	63	473	5,8	2"	417	23	1680
KM-335-10000	50	63	2 3/4"	103	335	63	341	417	63	345	399	63	473	5,8	2"	417	23	1680
KM-335-15000	50	63	2 3/4"	103	335	63	341	417	63	345	399	63	473	5,8	2"	417	23	1680
KM-335-20000	65	75	3 1/2"	122	335	75	341	429	75	345	407	75	587	6,9	2 1/2"	–	–	2900
KM-335-30000	65	75	3 1/2"	122	335	75	341	429	75	345	407	75	587	6,9	2 1/2"	–	–	2900
KM-335-60000	65	75	3 1/2"	122	335	75	341	429	75	345	407	75	587	6,9	2 1/2"	–	–	2900

Type	Overall dimensions [mm]					Solvent cement socket PVC			Weld socket PP			PP-Socket (butt end)			Threaded socket			Weight approx. [g]
	DN	d	G	d <sub>u</sub>	L	d <sub>m</sub>	z	L <sub>m</sub>	d <sub>m</sub>	z	L <sub>m</sub>	d	L <sub>g</sub>	S <sup>(7)</sup>	d <sub>g</sub>	L <sub>g</sub>	l <sub>g</sub>	
KM-350-500	25	32	1 1/2"	60	350	32	356	400	32	360	396	32	460	2,9	1"	400	17	520
KM-350-1000	25	32	1 1/2"	60	350	32	356	400	32	360	396	32	460	2,9	1"	400	17	520
KM-350-1500	32	40	2"	72	350	40	356	408	40	360	400	40	476	3,7	1 1/4"	408	19	600
KM-350-2500	32	40	2"	72	350	40	356	408	40	360	400	40	476	3,7	1 1/4"	408	19	600
KM-350-2000	40	50	2 1/4"	83	350	50	356	418	50	360	406	50	482	4,6	1 1/2"	418	23	1220
KM-350-3000	40	50	2 1/4"	83	350	50	356	418	50	360	406	50	482	4,6	1 1/2"	418	23	1220
KM-350-6000	40	50	2 1/4"	83	350	50	356	418	50	360	406	50	482	4,6	1 1/2"	418	23	1220
KM-350-6000	50	63	2 3/4"	103	350	63	356	432	63	360	414	63	488	5,8	2"	432	23	1680
KM-350-10000	50	63	2 3/4"	103	350	63	356	432	63	360	414	63	488	5,8	2"	432	23	1680
KM-350-15000	50	63	2 3/4"	103	350	63	356	432	63	360	414	63	488	5,8	2"	432	23	1680
KM-350-20000	65	75	3 1/2"	122	350	75	356	444	75	360	422	75	602	6,9	2 1/2"	444	–	2900
KM-350-30000	65	75	3 1/2"	122	350	75	356	444	75	360	422	75	602	6,9	2 1/2"	444	–	2900
KM-350-60000	65	75	3 1/2"	122	350	75	356	444	75	360	422	75	602	6,9	2 1/2"	444	–	2900

<sup>(7)</sup> Wall thickness

## COMBINATIONS

Measuring tube	Float	Insert upper and lower	O-Ring
PVC	PVDF	PVDF	EPDM (optional FPM)
PA	PVDF	PVDF	EPDM (optional FPM)
PSU	PVDF	PVDF	EPDM (optional FPM)

## CONNECTION OPTIONS

Socket	Socket (butt end)	Plastic, internal thread	Metal, internal thread
PVC solvent cement socket (standard)	PP weld socket (butt end)	PVC	Stainless steel V4A
PP weld socket		PP	Annealed cast iron

## PRESSURE DROP

Type	Measuring range	Pressure drop
	l/h	mbar
KM-335-500 / KM-350-500	50 – 500	22,84
KM-335-1000 / KM-350-1000	100 – 1000	22,84
KM-335-1500 / KM-350-1500	150 – 1500	22,84
KM-335-2500 / KM-350-2500	250 – 2500	22,84
KM-335-2000 / KM-350-2000	200 – 2000	24,99
KM-335-3000 / KM-350-3000	300 – 3000	24,99
KM-335-6000 / KM-350-6000 <sup>(*)</sup>	600 – 6000	24,99
KM-335-10000 / KM-350-10000	1000 – 10000	24,99
KM-335-15000 / KM-350-15000	1500 – 15000	28,23
KM-335-20000 / KM-350-20000	2000 – 20000	45,67
KM-335-30000 / KM-350-30000	3000 – 30000	45,67
KM-335-60000 / KM-350-60000	6000 – 60000	47,24

<sup>(\*)</sup> Available in DN 40 and DN 50

## SPECIAL SCALES

Type	Measuring range					
	H <sub>2</sub> O	Air	Air	Air	Air	Air
	l/h	0 bar Nm <sup>3</sup> /h	1 bar Nm <sup>3</sup> /h	2 bar Nm <sup>3</sup> /h	3 bar Nm <sup>3</sup> /h	4 bar Nm <sup>3</sup> /h
KM-3...-500	50 – 500	1,5 – 14	3 – 20	3 – 24	3 – 28	4 – 31
KM-3...-1000	100 – 1000	2,5 – 29	4 – 41	5 – 50	5 – 58	6 – 65
KM-3...-1500	150 – 1500	4 – 45	6 – 63	7 – 77	8 – 90	9 – 100
KM-3...-2500	250 – 2500	7 – 79	10 – 111	12 – 136	14 – 158	16 – 177
KM-3...-2000	200 – 2000	6 – 58	9 – 82	11 – 100	12 – 116	14 – 130
KM-3...-3000	300 – 3000	9 – 108	13 – 152	16 – 186	18 – 216	21 – 241
KM-3...-6000 <sup>(9)</sup>	600 – 6000	17 – 174	24 – 246	30 – 301	34 – 348	39 – 389
KM-3...-6000 <sup>(10)</sup>	600 – 6000	17 – 175	24 – 247	30 – 302	34 – 350	39 – 392
KM-3...-10000	1000 – 10000	29 – 301	41 – 425	51 – 520	58 – 602	65 – 674
KM-3...-15000	1500 – 15000	53 – 405	75 – 572	92 – 700	106 – 810	119 – 907
KM-3...-20000	2000 – 20000	55 – 545	78 – 770	96 – 942	110 – 1090	124 – 1220
KM-3...-30000	3000 – 30000	80 – 758	113 – 1072	139 – 1311	160 – 1516	180 – 1697
KM-3...-60000	6000 – 60000	140 – 840	200 – 1150	250 – 1450	300 – 1650	300 – 1850

Type	Measuring range				
	H <sub>2</sub> O	Air	Air	Air	Air
	l/h	5 bar Nm <sup>3</sup> /h	6 bar Nm <sup>3</sup> /h	7 bar Nm <sup>3</sup> /h	8 bar Nm <sup>3</sup> /h
KM-3...-500	50 – 500	4 – 34	5 – 37	5 – 39	4,5 – 42
KM-3...-1000	100 – 1000	7 – 71	7 – 76	8 – 82	7,5 – 87
KM-3...-1500	150 – 1500	10 – 110	11 – 119	12 – 127	12 – 135
KM-3...-2500	250 – 2500	18 – 193	19 – 209	20 – 223	21 – 237
KM-3...-2000	200 – 2000	15 – 142	16 – 153	17 – 164	18 – 174
KM-3...-3000	300 – 3000	23 – 264	24 – 286	26 – 305	27 – 324
KM-3...-6000 <sup>(9)</sup>	600 – 6000	42 – 426	45 – 461	49 – 492	51 – 522
KM-3...-6000 <sup>(10)</sup>	600 – 6000	42 – 428	45 – 463	49 – 495	51 – 525
KM-3...-10000	1000 – 10000	72 – 737	77 – 797	83 – 851	87 – 903
KM-3...-15000	1500 – 15000	130 – 992	141 – 1073	150 – 1146	159 – 1215
KM-3...-20000	2000 – 20000	135 – 1335	146 – 1444	156 – 1542	165 – 1635
KM-3...-30000	3000 – 30000	197 – 1857	212 – 2008	227 – 2145	240 – 2274
KM-3...-60000	6000 – 60000	350 – 2000	350 – 2200	400 – 2300	400 – 2500

<sup>(9)</sup> DN 40

<sup>(10)</sup> DN 50

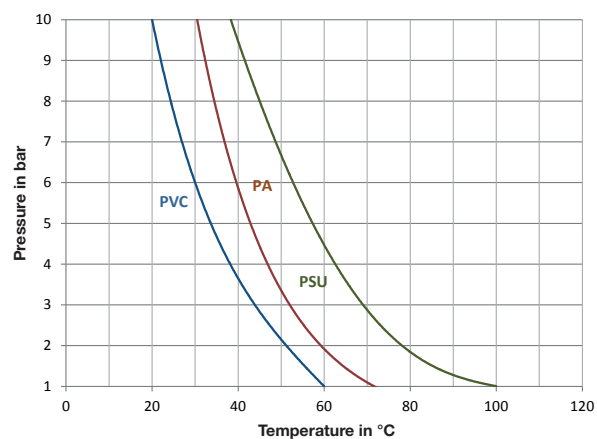
Type	Measuring range			
	H <sub>2</sub> O	HCl 30 - 33%	NaOH 30 %	NaOH 50 %
	l/h	l/h	l/h	l/h
KM-3...-500	50 – 500	20 – 405	4 – 226	1 – 55
KM-3...-1000	100 – 1000	55 – 866	15 – 600	3 – 192
KM-3...-1500	150 – 1500	90 – 1340	30 – 970	6 – 365
KM-3...-2500	250 – 2500	165 – 2310	70 – 1800	15 – 770
KM-3...-2000	200 – 2000	115 – 1660	35 – 1240	8 – 520
KM-3...-3000	300 – 3000	190 – 3050	75 – 2370	15 – 1170
KM-3...-6000 <sup>(11)</sup>	600 – 6000	420 – 4900	230 – 4000	50 – 2270
KM-3...-6000 <sup>(12)</sup>	600 – 6000	430 – 5090	240 – 4700	55 – 2300
KM-3...-10000	1000 – 10000	750 – 9460	475 – 7340	140 – 4340
KM-3...-15000	1500 – 15000	1415 – 11570	1030 – 10330	420 – 5820
KM-3...-20000	2000 – 20000	1500 – 17300	915 – 11720	245 – 7590
KM-3...-30000	3000 – 30000	2175 – 24120	1195 – 16040	400 – 11120
KM-3...-60000	6000 – 60000	5000 – 58000	3000 – 34000	1700 – 13000

<sup>(11)</sup> DN 40

<sup>(12)</sup> DN 50

## ■ PRESSURE - TEMPERATURE - DIAGRAM

The curves in the diagram represent values for the durability of three different materials in relation to the operating temperature.





# ■ LIMIT SWITCH CONTACT ZNC AND ZNO

## ■ APPLICATION

The limit switch contacts are used to monitor flow limits. They are slid onto the guide located on the flowmeter and can be set to any value of the corresponding scale.

## ■ ILLUSTRATION



## ■ OPERATION

A built-in magnet in the float closes or opens a Reed contact encapsulated in the switch housing. The switching function is bistable, that is, the switching state is maintained, even when the magnetic float is away from the contact.

## ■ SWITCHING STATE

Contact		Float (above)	Float (below)
ZNC	(Normally closed) / MIN	open	closed
ZNO	(Normally open) / MAX	closed	open

## ■ TECHNICAL DATA

Switching voltage <sup>(13)</sup>	max. 230 V~
Switching capacity <sup>(13)</sup>	max. 10 W / 12 VA
Switching current <sup>(13)</sup>	max. 0,5 A
Contact resistance	< 200 mΩ
Insulation resistance	> 10 <sup>11</sup> Ω
Permissible ambient temperature	0 °C - 55 °C
Ingress Protection	IP65 (DIN 40050)
Switch-on / -off hysteresis	1 - 2 mm

<sup>(7)</sup>Exceeding these values, even temporarily, is not allowed.

# ANALOG TRANSMITTER ZAT-300

## DESCRIPTION

The analog transmitter provides an output signal of 4 - 20 mA corresponding to the vertical position of the magnetic float in the flowmeter.

### Please note:

Since the resolution of the various scales are different, the transmitters are factory set to the respective measuring range. Therefore, when ordering, always specify the required measuring range.

## ILLUSTRATION



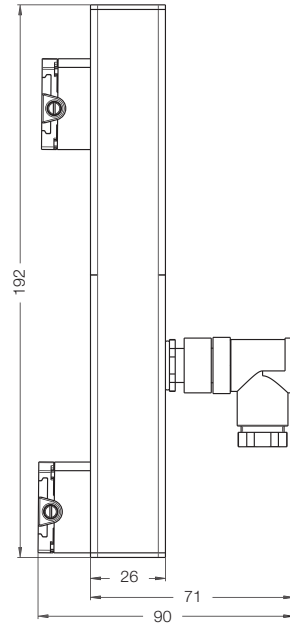
## ELECTRICAL CONNECTION

PIN 1:	Operating voltage	12 - 24 V
PIN 2:	Output signal	4 - 20 mA
PIN 3:		0 V

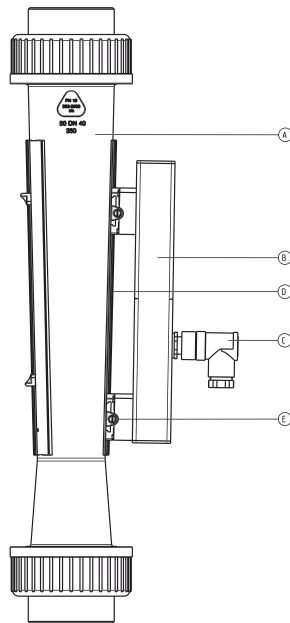
## TECHNICAL DATA

Supply voltage	2 - 24 VDC ( $\pm 10\%$ )
Power consumption	< 50 mA
Load resistance	max. 500 $\Omega$
Current output	4 - 20 mA (3-wire)
Ingress Protection	IP65
Ambient temperature	0 - 50 °C
Connection	Connector DIN 43650
Accuracy	< 1 %

## ■ TECHNICAL DRAWING

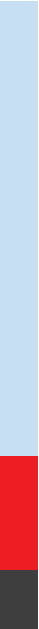


## ■ ASSEMBLY DRAWING



## ■ FUNCTIONAL ELEMENTS

Letter	Description
A:	Flow meter KM-335 / 350 with magnetic float
B:	Analog transmitter ZAT-300
C:	Connector
D:	Guide rail
E:	Screws for locking and adjusting the sensor



KM-335, KM-350 12 0001 12-15 E M

# MASTERPIECES MADE IN GERMANY

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