MASTERPIECES
MADE IN GERMANY

## Flow Monitor & Flow Indicator

# KM-335

# KM-350

H2O AIR

## 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**

KM-335, KM-350 1 0004 12-15 E M

# OPERATING DATA

| | |
|---|---|
| **Operating pressure, max.** | PN 10 (at 20 °C) [1] |
| **Pressure drop** | see table on page 6 |
| **Operating temperature** | 0 °C - 60 °C [2] |
| **Measuring accuracy** | see table below |

[1] See also Pressure - temperature - diagram on page 7

[2] max. temperature at 1 bar

# MEASURING RANGES

| **Type** | **Measuring range for $H_2O$ at 20 °C** [3] | |
|---|---|---|
| | **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 [4] | 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 |

[3] The specified measuring- / switch ranges are valid for water having a density of 1.00 kg/dm³, 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/dm³.
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 7

[4] Available in DN 40 and DN 50

# 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 [5]: | PVDF / stainless steel |

[5] from DN 50 (1500 - 15000 l/h)

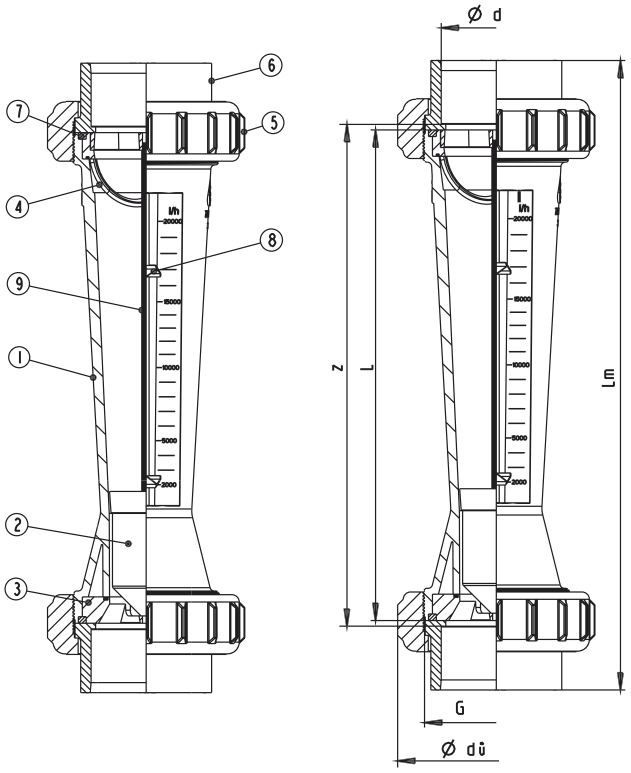
# ACCURACY

**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**



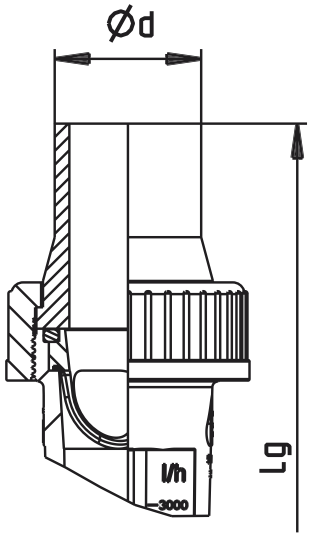

# PARTS DESCRIPTION

| 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 [6] | 1 | PVDF / stainless steel |

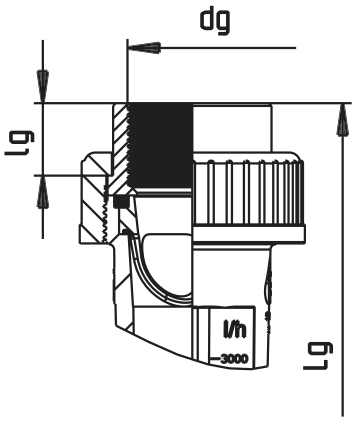
[6] from DN 50 (1500 - 15000 l/h)

# 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. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DN | d | G | $d_ü$ | L | $d_m$ | z | $L_m$ | $d_m$ | z | $L_m$ | d | $L_g$ | S [7] | $d_g$ | $L_g$ | $l_g$ | [g] PA PSU PVC |
| 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. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DN | d | G | $d_ü$ | L | $d_m$ | z | $L_m$ | $d_m$ | z | $L_m$ | d | $L_g$ | S [7] | $d_g$ | $L_g$ | $l_g$ | [g] PA PSU PVC |
| 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 |

[7] 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 [8] | 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 |

[8] Available in DN 40 and DN 50

# SPECIAL SCALES

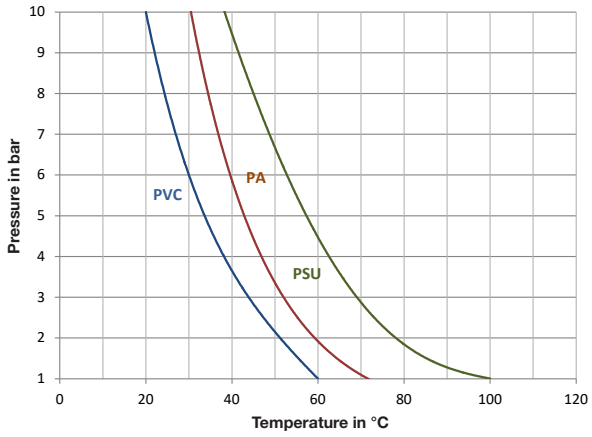
| Type | Measuring range | | | | |
|---|---|---|---|---|---|
| | $H_2O$ | Air | HCl 30 - 33 % | NaOH 30 % | NaOH 50 % |
| | | 0 bar rel. | | | |
| | l/h | Nm³/h | l/h | l/h | l/h |
| KM-3...-500 | 50 – 500 | 2 – 15 | 40 – 430 | 30 – 320 | 10 – 62 |
| KM-3...-1000 | 100 – 1000 | 3,5 – 30 | 80 – 860 | 70 – 660 | 10 – 195 |
| KM-3...-1500 | 150 – 1500 | 5 – 45 | 150 – 1250 | 100 – 900 | 20 – 350 |
| KM-3...-2500 | 250 – 2500 | 8 – 76 | 200 – 2150 | 100 – 1600 | 5 – 760 |
| KM-3...-2000 | 200 – 2000 | 7 – 60 | 200 – 1850 | 200 – 1400 | 5 – 540 |
| KM-3...-3000 | 300 – 3000 | 10 – 87 | 300 – 2500 | 300 – 1950 | 105 – 1200 |
| KM-3...-6000 [9] | 600 – 6000 | 20 – 170 | 600 – 4900 | 500 – 3800 | 400 – 2350 |
| KM-3...-6000 [10] | 600 – 6000 | 25 – 180 | 600 – 5400 | 500 – 4300 | 100 – 2200 |
| KM-3...-10000 | 1000 – 10000 | 30 – 280 | 800 – 8400 | 600 – 6600 | 100 – 4000 |
| KM-3...-15000 | 1500 – 15000 | 50 – 440 | 1000 – 12750 | 750 – 9500 | 300 – 5000 |
| KM-3...-20000 | 2000 – 20000 | 70 – 580 | 2000 – 17500 | 1300 – 13000 | 200 – 7000 |
| KM-3...-30000 | 3000 – 30000 | 100 – 900 | 3000 – 26500 | 2600 – 20000 | 400 – 9800 |
| KM-3...-60000 | 6000 – 60000 | 230 – 1650 | 6000 – 50000 | 6000 – 40000 | 2000 – 15000 |

[9] DN 40

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

[7] Exceeding these values, even temporarily, is not allowed.

# ANALOG TRANSMITTER ZAT-300

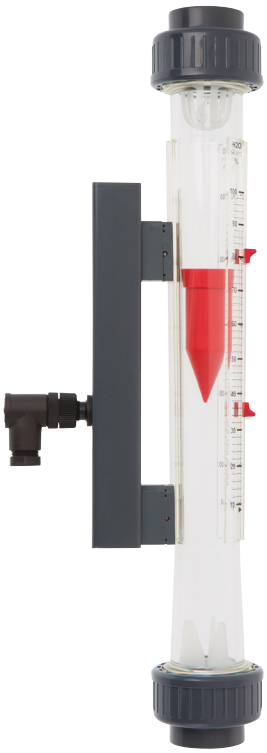
## DESCRIPTION

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



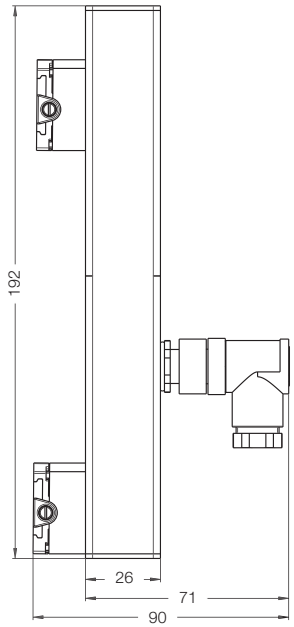
## ELECTRICAL CONNECTION

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

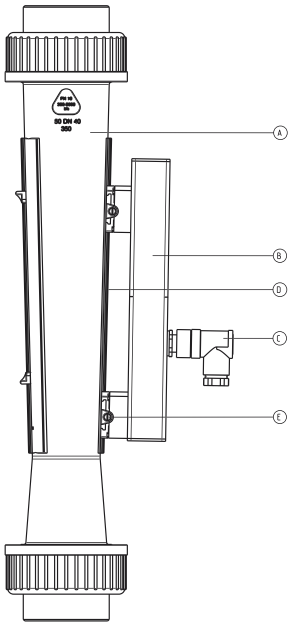
## TECHNICAL DATA

| | |
|---|---|
| Supply voltage | 12 - 24 VDC (±10 %) |
| Power consumption | < 50 mA |
| Load resistance | max. 500 Ω |
| 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 |



Meister Strömungstechnik GmbH • Im Gewerbegebiet 2 • 63831 Wiesen / Germany
Tel. +49 (0) 6096 9720-0 • Fax +49 (0) 6096 9720-30 • sales@meister-flow.com • www.meister-flow.com