# TOPAS PMG / PMH
## Hydraulic sensor
## Hot water

## Applications

The hydraulic sensors form part of a heat meter and operate according to the multiple-jet measuring principle.


## Features

- Insensitive to turbulences
- Correct mounting ensures high accuracy and long-term stability
- No inlet or outlet paths required

## Benefits

- The dial can be turned through 360° for ease of reading
- Available with a reed, inductive or optoelectronic pulser
- Accurate flow measurement significantly increases the value of the system

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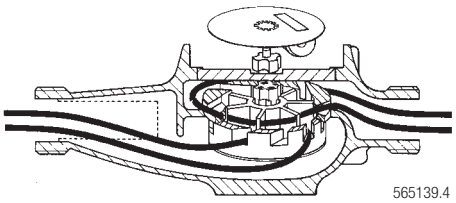
# Design

- The TOPAS series is a range of velocity flowmeters based on the well-established multijet principle which is insensitive to flow turbulences.
- Saphire bearings on each side of the vane wheel (DN 15 - 32) rotate on a thin film of water in swivel units to ensure smooth and accurate motion and excellent longterm measuring stability.
- The (hydraulic) sensor is completely separated from the roller counter and from an electronic (dry running) meter. The speed of the vane wheel is transmitted by a pressure-resistant closure plate via a magnetic coupling.
- The adjusting elements for verification purposes are located inside the instrument (DN 15 - 32) and cannot be manipulated externally.
- The measuring chamber is protected by a robust cover
- The drive star and the roller counter register even the smallest flowrates.



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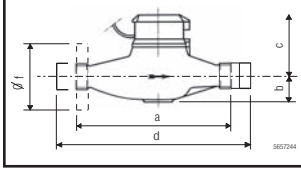
# Product range

## TOPAS PMG


- Multi-jet turbine meters with dry-type registers
- Type approval as hydraulic sensorsfor hot water meters conforming to Directive 2004/22/EC (EN 1434)
- Accuracy class 3 and ambient temperature class C according to EN 1434
- Suitable for horizontal mounting
- Brass housing with threaded connections according to ISO 228-1
- Nominal pressure PN 16
- Maximum temperature 90 °C / 120 °C / 130 °C
- No inlet or outlet paths required

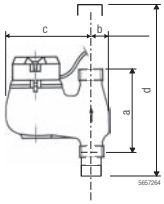
| **Nominal diameter** | **DN** | **mm** | **15** | **20** | **25** | **32** | **40** | **50** |
|---|---|---|---|---|---|---|---|---|
| | | inches | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
| With reed pulser RH 1 (1 litre), | Art. No. | | 94246 | 94247 | 94248 | 94249 | 94351 | 94354 |
| Tmax | | °C | 130 | 130 | 130 | 130 | 120 | 120 |
| With inductive pulser IH, | Art. No. | | 89686 | 89687 | 89688 | 89689 | 94228 | 94229 |
| Tmax | | °C | 90 | 90 | 90 | 90 | 90 | 90 |
| Maximum flow rate | qs | m³/h | 3 | 5 | 7 | 12 | 20 | 30 |
| **Permanent flow rate** | **qp** | **m³/h** | **1.5** | **2.5** | **3.5** | **6** | **10** | **15** |
| Minimum flow rate | qi | m³/h | 0.031 | 0.031 | 0.07 | 0.075 | 0.2 | 0.2 |
| Starting flow at approx. | | m³/h | 0.014 | 0.014 | 0.022 | 0.022 | 0.045 | 0.045 |
| Max. pressure loss at qp | | bar | 0.15 | 0.2 | 0.22 | 0.22 | 0.2 | 0.2 |
| Flowrate at $\Delta p$ = 1bar | | m³/h | 4.5 | 5.2 | 9.5 | 12.7 | 25.6 | 32.5 |
| Measuring range | qp/qi | | 50 | 80 | 50 | 80 | 50 | 80 |
| Smallest readable volume | | litre | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Recording capacity | | m³/h | 99'999 | 99'999 | 99'999 | 99'999 | 99'999 | 99'999 |
| Thread size: Body | G...B | inches | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 3/8 |
| Thread size: Connector | R... | inches | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
| Body surface finish | | | lacquered | | | | | |
| Weight without connections | | kg | 1 | 1.8 | 2.8 | 2.8 | 5 | 7 |
| Dimensions | | | | | | | | |
|  | a | mm | 165 | 190 | 260 | 260 | 300 | 300 |
| | b | mm | 35 | 37 | 40 | 40 | 60 | 62 |
| | c max. | mm | 76 | 84 | 93 | 93 | 102 | 109 |
| | d | mm | 260 | 285 | 375 | 375 | 440 | 460 |
| | f [1] | mm | - | 105 | 115 | 140 | 150 | 165 |

[1] Diameter with threaded flange

**Pressure loss curves:** page 9

## TOPAS PMGF (downpipe) and PMGS (riser pipe)

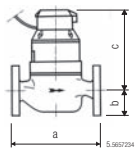
- Multi-jet turbine meters with dry-type registers
- Type approval as hydraulic sensorsfor hot water meters conforming to Directive 2004/22/EC (EN 1434)
- Accuracy class 3 and ambient temperature class C according to EN 1434
- Suitable for vertical mounting
- Brass housing with threaded connections according to ISO 228-1
- Nominal pressure PN 16
- Maximum temperature 90 °C / 120 °C / 130 °C
- No inlet or outlet paths required

| **Nominal diameter** | **DN** | **mm** | **20** | **25** | **32** | **40** |
|---|---|---|---|---|---|---|
| | | inches | 3/4 | 1 | 1 1/4 | 1 1/2 |
| **PMGF (downpipe)** | | | | | | |
| With reed pulser RH 1 (1 litre), | Art. No. | | 94250 | 94251 | 94252 | 94352 |
| Tmax | | °C | 130 | 130 | 130 | 120 |
| With inductive pulser IH, | Art. No. | | 94616 | 94617 | 94618 | 94237 |
| Tmax | | °C | 90 | 90 | 90 | 90 |
| **PMGS (riser pipe)** | | | | | | |
| mit Reed-pulser RH1 (1 litre), | Art. No. | | 94253 | 94254 | 94255 | 94353 |
| Tmax | | °C | 130 | 130 | 130 | 120 |
| With inductive pulser IH | Art. No. | | 89694 | 89695 | 89696 | 94245 |
| Tmax | | °C | 90 | 90 | 90 | 90 |
| Maximum flow rate | qs | m³/h | 3.1 | 4.4 | 6.3 | 12.5 |
| **Permanent flow rate** | **qp** | **m³/h** | **2.5** | **3.5** | **5** | **10** |
| Minimum flow rate | qi | m³/h | 0.031 | 0.07 | 0.1 | 0.2 |
| Starting flow at approx. | | m³/h | 0.014 | 0.022 | 0.022 | 0.045 |
| Max. pressure loss at qp | PMGF | bar | 0.22 | 0.18 | 0.26 | 0.23 |
| Max. pressure loss at qp | PMGS | bar | 0.18 | 0.14 | 0.14 | 0.23 |
| Flowrate at $\Delta p$ = 1bar | PMGF | m³/h | 5.4 | 8.6 | 10.3 | 22.2 |
| Flowrate at $\Delta p$ = 1bar | PMGS | m³/h | 6 | 9.7 | 13.6 | 20.8 |
| Measuring range | qp/qi | | 80 | 50 | 50 | 50 |
| Smallest readable volume | | litre | 0.1 | 0.1 | 0.1 | 0.1 |
| Recording capacity | | m³/h | 99'999 | 99'999 | 99'999 | 99'999 |
| Thread size: Body | G...B | inches | 1 | 1 1/4 | 1 1/2 | 2 |
| Thread size: Connector | R... | inches | 3/4 | 1 | 1 1/4 | 1 1/2 |
| Body surface finish | | | lacquered | | | |
| Weight without connections | | kg | 1.8 | 2.8 | 2.9 | 7 |
| Dimensions | | | | | | |
|  | a | mm | 105 | 150 | 150 | 200 |
| | b | mm | 25 | 30 | 30 | 50 |
| | c | mm | 126 | 148 | 148 | 200 |
| | d | mm | 200 | 265 | 265 | 340 |

**Pressure loss curves:** page 9

## TOPAS PMH

- Multi-jet turbine meters with dry-type registers
- Better than class B
- Error tolerance ±3 % of measured value in upper range Qt ≤Q ≤Qmax and ±5 % in lower range Qmin ≤Q ≤Qt
- Suitable for horizontal mounting
- Spheroidal graphite iron body with flange connections
- Nominal pressure 40 bar
- Maximum temperature 130 °C
- No inlet or outlet paths required

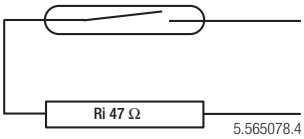
| **Nominal diameter** | **DN** | **mm**<br>inches | **20**<br>3/4 | **25**<br>1 | **40** [1]<br>1 1/2 |
|---|---|---|---|---|---|
| Standard | Art. No. | | 92270 | 92271 | 92272 |
| With reed pulser RH 1 (1 litre) | Art. No. | | 89670 | 89674 | - |
| With inductive pulser IN | Art. No. | | 89672 | 89675 | - |
| Maximum flow rate | Qmax | m³/h | 5 | 7 | 20 |
| **Nominal flow rate** | **Qn** | **m³/h** | **2.5** | **3.5** | **10** |
| Transitional flow rate | Qt | m³/h | 0.2 | 0.28 | 0.8 |
| Minimum flow rate | Qmin | m³/h | 0.03 | 0.07 | 0.2 |
| Starting flow at approx. | | m³/h | 0.014 | 0.022 | 0.15 |
| Max. pressure loss at Qn | | bar | 0.2 | 0.12 | 0.022 |
| Flowrate at $\Delta$p = 1bar | | m³/h | 5.4 | 10 | 55 |
| Smallest readable volume | | litre | 0.1 | 0.1 | 0.1 |
| Recording capacity | | m³/h | 100’000 | 100’000 | 1’000’000 |
| Body surface finish | | | lacquered | | |
| Weight | | kg | 6.5 | 8.5 | 21 |
| Dimensions<br>  | | a<br>b<br>c | 190<br>55<br>63 | 260<br>61<br>76 | 300<br>75<br>155 |

[1] Pulsers RD 02, OD AM or OD 04 must be ordered separately.

**Pressure loss curves:** page 10

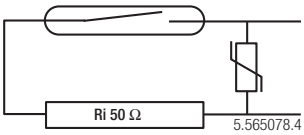
# Pulsers

## Reed pulser RH 1



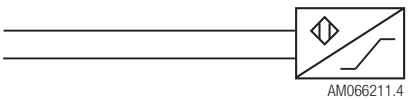

| | |
|---|---|
| Switch type | • Reed contact tube protected with an inert gas filling |
| Switch voltage | • max. 48 VAC or DC |
| Switch current | • max. 50 mA (internal resistance 47 Ω / 0,5 W) |
| Quiescent current | • Contact open |
| Switch power | • max. 2 W |
| Ambient temperature | • -10 ... +70 °C |
| Protection | • IP 65 |
| Connection | • Fixed mounting cable, length 3 m |

## Reed pulser RD 02 for PMH 40



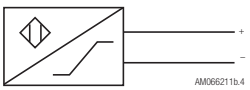

| | |
|---|---|
| Switch type | • Reed contact tube protected with an inert gas filling |
| Contact protection | • With protective resistor (50 Ω) and varistor |
| Switch voltage | • max. 48 VAC or DC |
| Switch current | • max. 200 mA |
| Quiescent current | • Contact open |
| Switch power | • max. 4 W |
| Pulse duration | • Depends on flowrate; continuous contact is possible |
| Ambient temperature | • -10 ... +70 °C |
| Protection | • IP 68 |
| Connection | • Fixed mounting cable, length 3 m |

## Inductive pulser IH




| | |
|---|---|
| Switch type | • Inductive proximity switch conforming to EN 50227 |
| Switch voltage | • 5 ... 15 VDC |
| Switch current | • >3 mA (at 8 V, 1 kΩ) |
| Quiescent current | • <1.35 mA (at 8 V, 1 kΩ) |
| Ambient temperature | • -10 ... +70 °C |
| Protection | • IP 65 |
| Connection | • Fixed mounting cable, length 3 m |

## Inductive pulser IN




| | |
|---|---|
| Switch type | • Slot initiator according to EN 50227 |
| Switch voltage | • 5 ... 15 VDC |
| Residual ripple | • max. 5 % |
| Switch current | • max. 50 mA (internal resistance 47 Ω / 0,5 W) |
| Quiescent current | • Contact open |
| Switch power | • max. 2 W |
| ON-time | • 50 % ±10 % |
| Ambient temperature | • -10 ... +70 °C |
| Protection | • IP 65 |
| Connection | • Fixed mounting cable, length 3 m |

## Optoelectronic pulser OD AM and OD 04 for PMH 40

| | |
|---|---|
| Switch type | • IR reflex light barrier to EN 50227 |
| Switch voltage | • 8.2 VDC |
| Switch current | • <1.2 mA |
| Quiescent current | • >2.1 mA |
| Forward/reverse flow | • This is integrated in OD 04 by means of an additional current recognition threshold at 1.5 mA<br>• OD AM has an integrated florward/reverse flow recognition feature and it only emits forward flow pulses (jitter suppression) |
| Ambient temperature | • -10 ... +70 °C |
| Protection | • IP 68 |
| Connection | • Fixed mounting cable, length 3 m |

## Pulse values for TOPAS PMG und PMGF/S

| **Nominal diameter** | **DN** | **mm** | **15** | **20** | **25** | **32** | **40** | **50** |
|---|---|---|---|---|---|---|---|---|
| | | inches | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
| Reed pulser RH 1 | | l/pulse | 1 | 1 | 1 | 1 | 1 | 1 |
| Inductive pulser IH | | ml/pulse | 12.95 | 12.95 | 21.51 | 26.80 [1)] | 65.34 | 66.96 |

[1)] PMGF/S = 21.51

## Pulse values for TOPAS PMH

| **Nominal diameter** | **DN** | **mm** | **20** | **25** | **40** |
|---|---|---|---|---|---|
| | | inches | 3/4 | 1 | 1 1/2 |
| Reed pulser RH 1 | | l/pulse | 1 | 1 | - |
| Reed pulser RD 02 | | l/pulse | - | - | 100 |
| Inductive pulser IN | | l/pulse | 1 | 1 | - |
| Optoelectronic pulser OD AM | | l/pulse | - | - | 1 |
| Optoelectronic pulser OD 04 | | l/pulse | - | - | 10 |

# Installation notes

### Piping

Ensure that all measuring and auxiliary instruments can be easily operated and values read off. Measuring instruments must be installed so that the dial is horizontal and facing upwards. The layout of the piping must ensure that all measuring instruments are filled with liquid at all times and that no air bubbles or pockets canoccur. All consumption values are to be registered by the flowmeter. TOPAS vane wheel counters require no straight inlet or outlet paths.

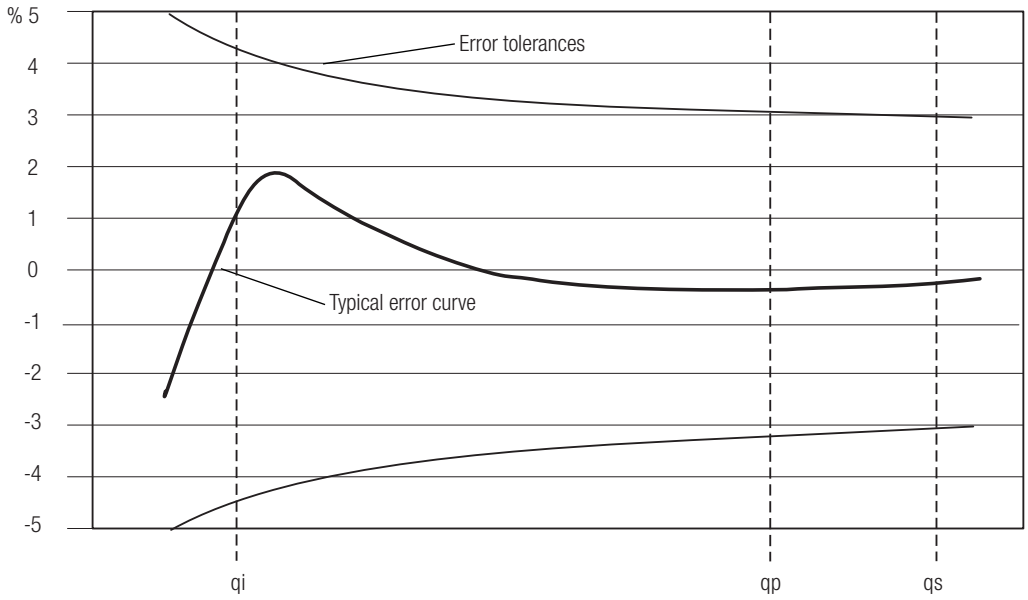
### Dimensioning flowmeters and accessories

Flowmeters are dimensioned according to the flowrate and not according to the diameter of the piping. The diameter of the piping should be changed if necessary, or pipe reducers used. Flowmeters and peripherals should be dimensioned with regard to the maximum operating conditions of the system:

- flowrate
- operating pressure
- operating temperature
- ambient temperature

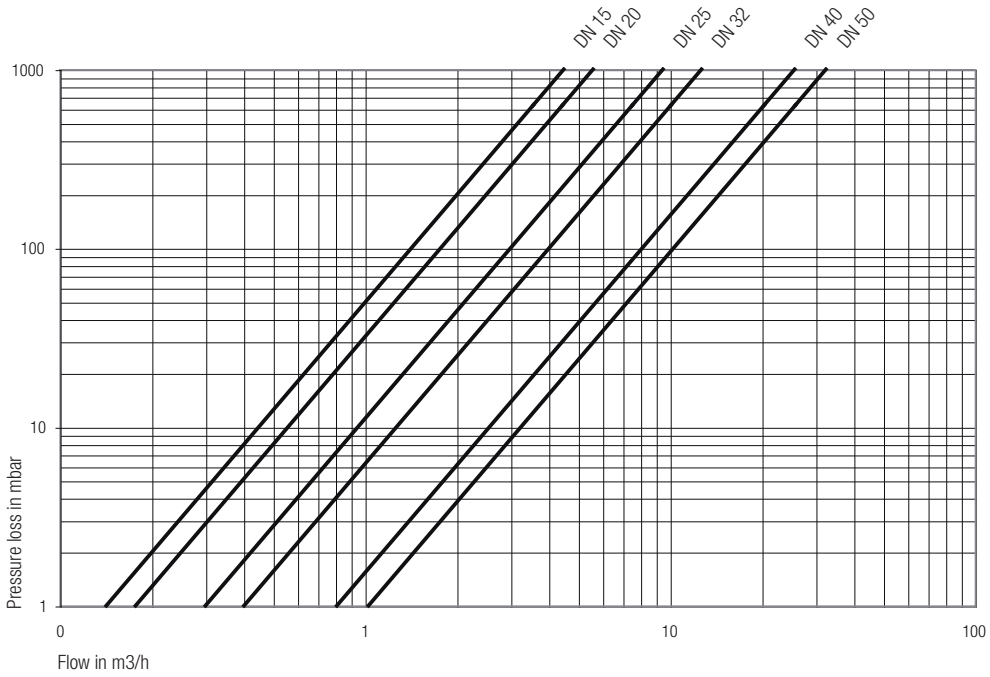
# Measurement error limits

### Hydraulic sensor: accuracy class 3 to EN 1434

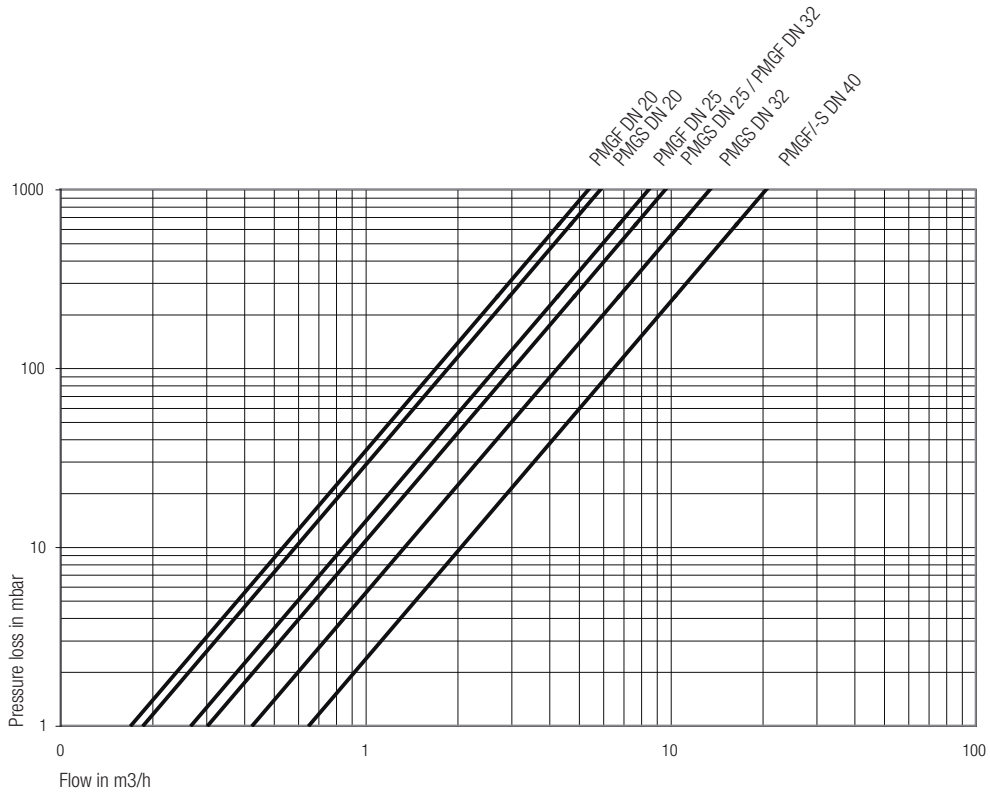


# Pressure loss curves

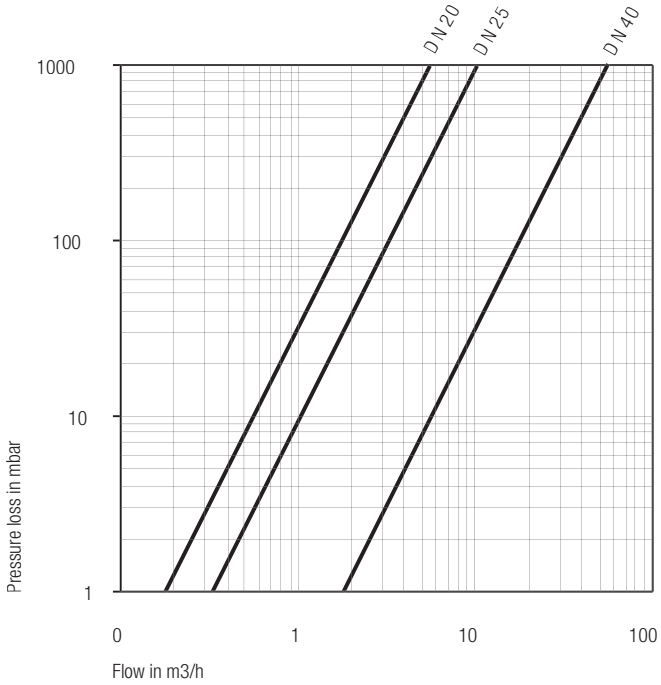
## TOPAS PMG




## TOPAS PMGF/-S



## TOPAS PMH


DN20
DN25
DN40
1000
100
10
1
Pressure loss in mbar
0
1
10
100
Flow in m3/h

**SALES PARTNER:**

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