# TOPAS
## Hot water

## Applications

The TOPAS hot water meter is a velocity flowmeter based on the well-established multijet measuring principle. It operates over a wide measuring range and is used in all areas of hot water supply management.


## Features

- Insensitive to turbulences
- Nominal pressure up to 40 bar
- Operating temperature to 130°C
- Sapphire bearings on each side of the vane wheel ensure the highest possible accuracy throughout the entire operating life of the meter.

## Your 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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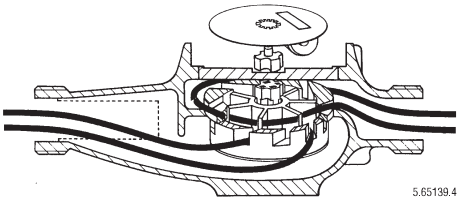
# Parts and materials

- The TOPAS series is a range of velocity flowmeters based on the well-established multijet principle which is insensitive to flow turbulences.
- Sapphire 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 totalizer housing is under vacuum and sealed by a shock-resistant cover.
- The drive star and the roller counter register even the smallest flowrates.

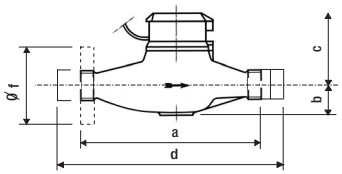


# Range

## TOPAS PMW

- multi-jet impeller meters with dry-type registers
- better than Metrological Class B
- error tolerances ±3% of flow rate in the upper measuring range Qt≤Q≤Qmax, and ±5% in the lower measuring range Qmin≤Q≤Qt
- for installation in horizontal pipes
- brass body with threaded connections
- nominal pressure PN 16 bar
- maximum temperature 90°C
- pressure loss < 0.25 bar at Qn

| **Nominal diameter** | **DN** | **mm** | **15** | **20** | **25** | **32** | **40** | **50** |
|---|---|---|---|---|---|---|---|---|
| | | inches | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
| Article No. | standard | | 93060 | 93061 | 93062 | 93063 | 93064 | 93065 |
| | with RH1 | | 89200 | 89202 | 89204 | 89206 | 89216 | 89232 |
| | with RH100 | | 89201 | 89203 | 89205 | 89207 | 89217 | 89233 |
| | with IH | | 89685 | 89680 | 89681 | 89682 | 89683 | 89684 |
| Maximum flow rate | Qmax | $m^3/h$ | 3 | 5 | 7 | 12 | 20 | 30 |
| **Nominal flow rate** | **Qn** | **$m^3/h$** | **1.5** | **2.5** | **3.5** | **6** | **10** | **15** |
| Transitional flow rate | Qt | $m^3/h$ | 0.12 | 0.12 | 0.28 | 0.28 | 0.8 | 0.8 |
| Minimum flow rate | Qmin | $m^3/h$ | 0.03 | 0.03 | 0.07 | 0.07 | 0.20 | 0.20 |
| Starting flow at approx. | | $m^3/h$ | 0.014 | 0.014 | 0.022 | 0.022 | 0.045 | 0.045 |
| Pressure loss | Kv | | 5.2 | 5.4 | 10 | 10.7 | 22 | 31 |
| Smallest readable volume[1)] | | litres | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Recording capacity | | $m^3$ | 100'000 | 100'000 | 100'000 | 100'000 | 100'000 | 100'000 |
| Threads on meter ends | | inches | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 3/8 |
| Threads on couplings | | inches | 1/2 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
| Body | | | | | lacquered | | | |
| Weight without connections | | kg | 1 | 1.8 | 2.8 | 2.8 | 5.0 | 7 |
| | Overall length | a | 165 | 190 | 260 | 260 | 300 | 300 |
| | | b | 35 | 37 | 40 | 40 | 60 | 62 |
| | | c | 63 | 63 | 72 | 72 | 80 | 87 |
| | | d | 260 | 285 | 375 | 375 | 440 | 460 |
| | | f | - | 105 | 115 | 140 | 150 | 165 |



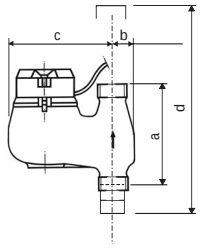

1) Water meters with roller counter.

## Pressure loss curves

(see page 11)

## TOPAS PMWF (downpipe) and PMWS (rising pipe)

- multi-jet impeller meters with dry-type registers
- better than Metrological Class B
- error tolerances: ±3% of flow rate in the upper measuring range Qt≤Q≤Qmax, and ±5% in the lower measuring range Qmin≤Q≤Qt
- for installation in horizontal pipes
- brass body with threaded connections
- nominal pressure PN 16 bar
- maximum temperature 90°C
- pressure loss < 0.25 bar at Qn

| **Nominal diameter** | **DN** | **mm** | **20** | **25** | **32** | **40** |
|---|---|---|---|---|---|---|
| | | inches | 3/4 | 1 | 1 1/4 | 1 1/2 |
| Article No. **PMWF** | standard | | 93074 | 93075 | 9376 | 93077 |
| | with RH1 | | 89240 | 89242 | 89244 | 89252 |
| | with RH100 | | 89241 | 89243 | 89245 | 89253 |
| | with IH | | 89690 | 89691 | 89692 | 89693 |
| Article No. **PMWS** | standard | | 93067 | 93068 | 93069 | 93070 |
| | with RH1 | | 89220 | 89222 | 89224 | 89270 |
| | with RH100 | | 89221 | 89223 | 89225 | 89271 |
| | with IH | | 89698 | 89699 | 89700 | 89701 |
| Maximum flow rate | Qmax | $m^3/h$ | 5 | 7 | 10 | 20 |
| **Nominal flow rate** | **Qn** | **$m^3/h$** | **2.5** | **3.5** | **5** | **10** |
| Transitional flow rate | Qt | $m^3/h$ | 0.12 | 0.28 | 0.28 | 0.8 |
| Minimum flow rate | Qmin | $m^3/h$ | 0.03 | 0.07 | 0.07 | 0.20 |
| Starting flow at approx. | | $m^3/h$ | 0.014 | 0.022 | 0.022 | 0.045 |
| Pressure loss | Kv | | 5.4 | 10 | 10.7 | 22 |
| Smallest readable volume[1)] | | litres | 0.1 | 0.1 | 0.1 | 0.1 |
| Recording capacity | | $m^3$ | 100'000 | 100'000 | 100'000 | 100'000 |
| Threads on meter ends | | inches | 1 | 1 1/4 | 1 1/2 | 2 |
| Threads on couplings | | inches | 3/4 | 1 | 1 1/4 | 1 1/2 |
| Body | | | | lacquered | | |
| Weight without connections | | kg | 1.8 | 2.8 | 2.9 | 7 |
|  | Overall length | a | 105 | 150 | 150 | 200 |
| | | b | 25 | 30 | 30 | 50 |
| | | c | 126 | 148 | 148 | 200 |
| | | d | 200 | 265 | 265 | 340 |



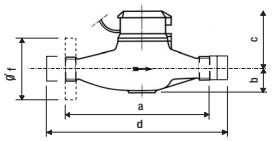
1) Water meters with roller counter.

### Pressure loss curves

(see page 12)

## TOPAS PMG

- multi-jet impeller meters with dry-type registgers
- better than Metrological Class B
- error tolerances: ±3% of flow rate in the upper measuring range Qt≤Q≤Qmax, and ±5% in the lower measuring range Qmin≤Q≤Qt
- for installation in horizontal pipes
- brass body with threaded connections
- nominal pressure PN 16 bar
- maximum temperature 130°C
- pressure loss < 0.25 bar at Qn

| **Nominal diameter** | **DN** | **mm** | **15** | **20** | **25** | **32** |
|---|---|---|---|---|---|---|
| | | inches | 1/2 | 3/4 | 1 | 1 1/4 |
| Article No. | standard | | 92935 | 92936 | 92937 | 92938 |
| | with RH1 | | 89620 | 89623 | 89626 | 89629 |
| | with RH100 | | 89621 | 89624 | 89627 | 89630 |
| Maximum flow rate | Qmax | $m^3/h$ | 3 | 5 | 7 | 12 |
| **Nominal flow rate** | **Qn** | **$m^3/h$** | **1.5** | **2.5** | **3.5** | **6** |
| Transitional flow rate | Qt | $m^3/h$ | 0.12 | 0.12 | 0.28 | 0.28 |
| Minimum flow rate | Qmin | $m^3/h$ | 0.03 | 0.03 | 0.07 | 0.07 |
| Starting flow at approx. | | $m^3/h$ | 0.014 | 0.014 | 0.022 | 0.022 |
| Pressure loss | Kv | | 5.2 | 5.4 | 10 | 10.7 |
| Smallest readable volume[1)] | | litres | 0.1 | 0.1 | 0.1 | 0.1 |
| Recording capacity | | $m^3$ | 100'000 | 100'000 | 100'000 | 100'000 |
| Threads on meter ends | | inches | 3/4 | 1 | 1 1/4 | 1 1/2 |
| Threads on couplings | | inches | 1/2 | 3/4 | 1 | 1 1/4 |
| Body | | | | lacquered | | |
| Weight without connections | | kg | 1 | 1.8 | 2.8 | 2.8 |
|  | Overall length | a | 165 | 190 | 260 | 260 |
| | | b | 35 | 37 | 40 | 40 |
| | | c | 63 | 63 | 72 | 72 |
| | | d | 260 | 285 | 375 | 375 |
| | | f | - | 105 | 115 | 140 |

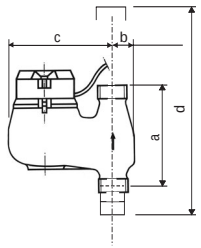
1) Water meters with roller counter.

### Pressure loss curves

(see page 11)

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

- multi-jet impeller meters with dry-type registers
- better than Metrological Class B
- error tolerances: ±3% of flow rate in the upper measuring range Qt≤Q≤Qmax, and ±5% in the lower measuring range Qmin≤Q≤Qt
- for installation in horizontal pipes
- brass body with threaded connections
- nominal pressure PN 16 bar
- maximum temperature 130°C
- pressure loss < 0.25 bar at Qn

| **Nominal diameter** | **DN** | **mm** | **20** | **25** | **32** |
|---|---|---|---|---|---|
| | | inches | 3/4 | 1 | 1 1/4 |
| Article No. **PMGF** | standard | | 92942 | 92943 | 92944 |
| | with RH1 | | 89648 | 89651 | 89654 |
| | with RH100 | | 89649 | 89652 | 89655 |
| Article No. **PMGS** | standard | | 92939 | 92940 | 92941 |
| | with RH1 | | 89636 | 89639 | 89642 |
| | with RH100 | | 89637 | 89640 | 89643 |
| Maximum flow rate | Qmax | $m^3/h$ | 5 | 7 | 10 |
| **Nominal flow rate** | **Qn** | **$m^3/h$** | **2.5** | **3.5** | **5** |
| Transitional flow rate | Qt | $m^3/h$ | 0.12 | 0.28 | 0.28 |
| Minimum flow rate | Qmin | $m^3/h$ | 0.03 | 0.07 | 0.07 |
| Starting flow at approx. | | $m^3/h$ | 0.014 | 0.022 | 0.022 |
| Pressure loss | Kv | | 5.4 | 10 | 10.7 |
| Smallest readable volume[1)] | | litres | 0.1 | 0.1 | 0.1 |
| Recording capacity | | $m^3$ | 100'000 | 100'000 | 100'000 |
| Threads on meter ends | | inches | 1 | 1 1/4 | 1 1/2 |
| Threads on couplings | | inches | 3/4 | 1 | 1 1/4 |
| Body | | | | lacquered | |
| Weight without connections | | kg | 1.8 | 2.8 | 2.9 |
|  | Overall length | a | 105 | 150 | 150 |
| | | b | 25 | 30 | 30 |
| | | c | 126 | 148 | 148 |
| | | d | 200 | 265 | 265 |



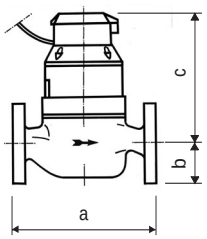
1) Water meters with roller counter.

### Pressure loss curves

(see page 12)

## TOPAS PMH

- multi-jet impeller meters with dry-type registers
- better than Metrological Class B
- error tolerances: ±3% of flow rate in the upper measuring range Qt≤Q≤Qmax, and ±5% in the lower measuring range Qmin≤Q≤Qt
- for installation in horizontal pipes
- spheroidal graphite iron body with flange connections
- nominal pressure PN 40 bar
- maximum temperature 130°C
- pressure loss < 0.25 bar at Qn

| **Nominal diameter** | **DN** | **mm** | **20** | **25** | **40**[2] |
|---|---|---|---|---|---|
| | | inches | 3/4 | 1 | 1 1/2 |
| Article No. | standard | | 92270 | 92271 | 92272 |
| | with RH1 | | 89670 | 89674 | - |
| | with IN1 | | 89672 | 89675 | - |
| Maximum flow rate | Qmax | $m^3/h$ | 5 | 7 | 20 |
| **Nominal flow rate** | **Qn** | **$m^3/h$** | **2.5** | **3.5** | **10** |
| Transitional flow rate | Qt | $m^3/h$ | 0.2 | 0.28 | 0.8 |
| Minimum flow rate | Qmin | $m^3/h$ | 0.03 | 0.07 | 0.20 |
| Starting flow at approx. | | $m^3/h$ | 0.014 | 0.022 | 0.15 |
| Pressure loss | Kv | | 5.4 | 10 | 36.5 |
| Smallest readable volume[1] | | litres | 0.1 | 0.1 | 0.1 |
| Recording capacity | | $m^3$ | 100'000 | 100'000 | 1'000'000 |
| Body | | | | spheroidal graphite iron | |
| Weight | | kg | 6.5 | 8.5 | 21 |
|  | Overall length | a | 190 | 260 | 300 |
| | | b | 55 | 61 | 75 |
| | | c | 63 | 76 | 155 |



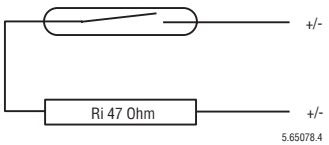
1) Water meters with roller counter.
2) Pulsers RD 02, OD AM or OD 04 must be ordered separately.

### Pressure loss curves

(see page 12)

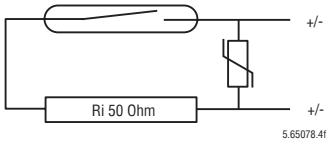
# Pulsers

## Reed pulsers RH 1 and RH 100



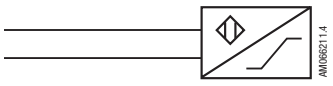

| | |
|---|---|
| Switch type | • Reed contact tube protected with an inert gas filling |
| Switch voltage | • max. 48 VAC or DC |
| Switch current | • max. 50 mA (internal resistance 47 Ω/0,5 W) |
| Quiescent current | • Contact open |
| Switch power | • max. 2 W |
| Ambient temperature | • -10 ... +70°C |
| Protection | • IP 65 to IEC 144 |
| Connection | • Fixed mounting cable, length 3 m |

## Reed pulser RD 02



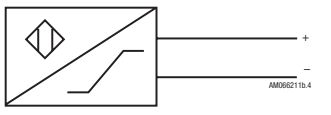

| | |
|---|---|
| Switch type | • Reed contact tube protected with an inert gas filling |
| Contact protection | • With protective resistor (50 Ω) and varistor |
| Switch voltage | • max. 48 VAC or DC |
| Switch current | • max. 200 mA |
| Quiescent current | • Contact open |
| Switch power | • max. 4 W |
| Pulse duration | • Depends on flowrate; continuous contact is possible |
| Ambient temperature | • -10 ... +70°C |
| Protection | • IP 68 to IEC 144 |
| Connection | • Fixed mounting cable, length 3 m |

## Inductive pulser IH




| | |
|---|---|
| Switch type | • Inductive proximity switch conforming to DIN 19234 |
| 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 to IEC 144 |
| Connection | • Fixed mounting cable, length 3 m |

## Inductive pulser IN




| | |
|---|---|
| Switch type | • Slot initiator according to DIN 19234 |
| 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 (IEC 144), against water-jets and dust |
| Connection | • Fixed mounting cable, length 3 m |

## Optoelectronic pulsers OD AM and OD 04

| | |
|---|---|
| Switch type | • IR reflex light barrier to DIN 19234 |
| Switch voltage | • 8.2 VDC |
| Switch current | • < 1.2 mA |
| Quiescent current | • > 2.1 mA |
| Forward/reverse flow recognition | • This is integrated in OD 04 by means of an additional current 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 to IEC 144 |
| Connection | • Fixed mounting cable, length 3 m |

## Pulse values for TOPAS PMW, PMWF/S, PMG and 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 |
| Reed pulser RH 100 | | l/pulse | 100 | 100 | 100 | 100 | 100 | 100 |
| Inductive pulser IH | | ml/pulse | 12.95 | 12.95 | 21.51 | 26.80[1)] | 74.86 | 74.86 |

1) PMWF/S and 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 can occur. 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

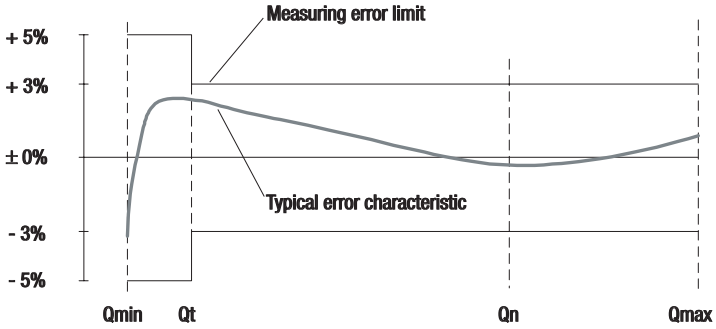
Flowmeters are dimensioned according to the flowrate and not according to the diameter of the piping. The diameter of the piping should be changed if necessary, or pipe reducers used. Flowmeters and peripherals should be dimensioned with regard to the maximum operating conditions of the system:

- operating pressure
- operating temperature
- ambient temperature
- chemical resistance of the liquid to be measured as well as ambient conditions
- flowrate

In buildings where minus temperatures may occur (e.g. holiday homes), TOPAS meters should be installed with a drainage device so that they can be fully drained before the onset of freezing temperatures.

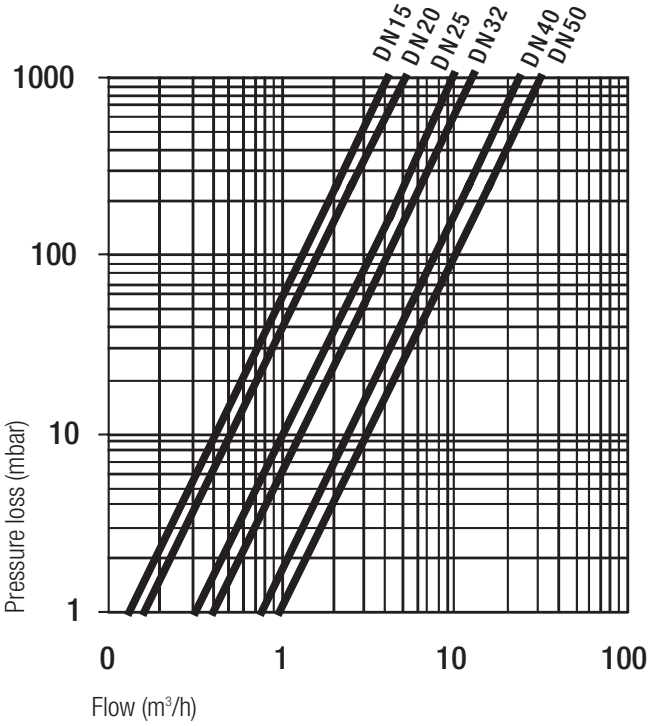
# Measurement error limits

**According to Directive 79/830/ECC**
Reference conditions: Medium = water, temperature = 55°C

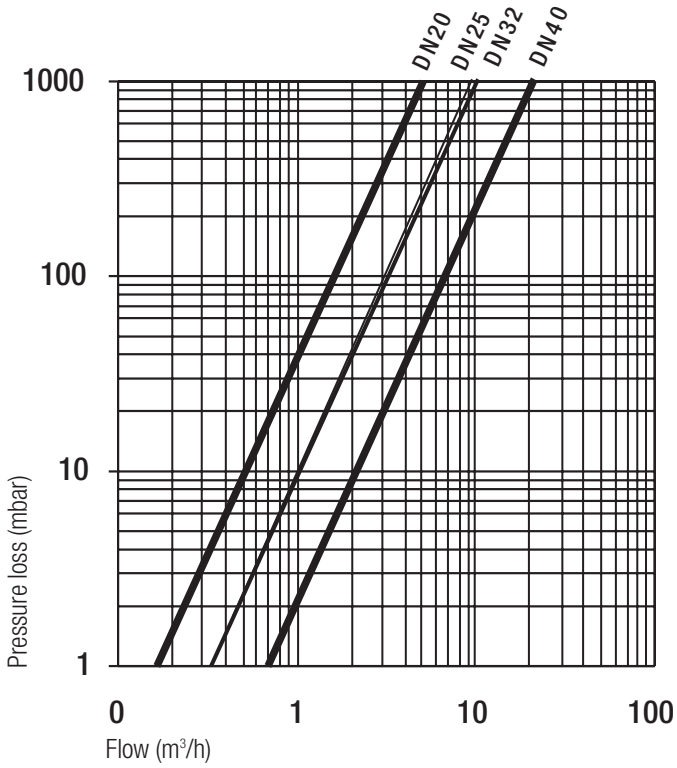



# Pressure loss curves

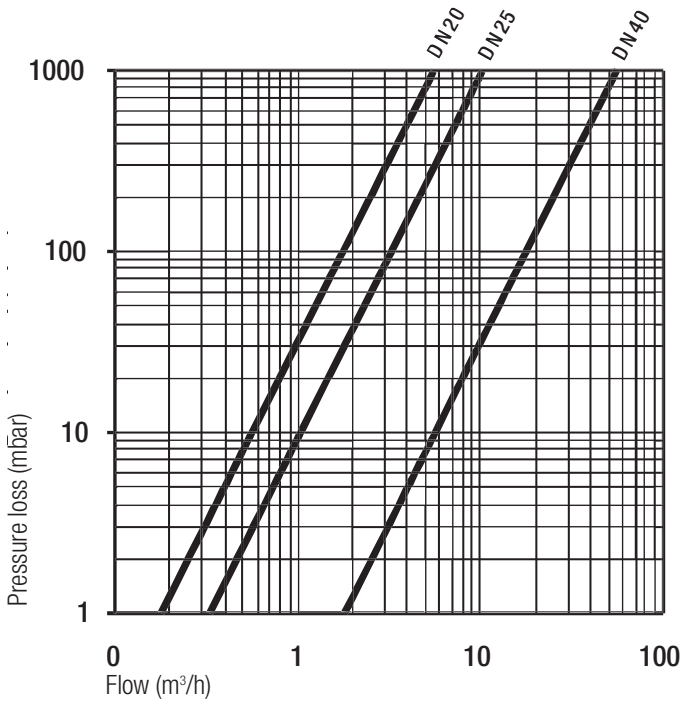
**TOPAS PMW and PMG**



## TOPAS PMWF/S and TOPAS PMGF/S




## TOPAS PMH



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