

# TOPAS PMW-basic

## Hot water meter

### Applications

The TOPAS PMW-basic product line covers a wide range of applications in hot water measurement. This innovative system offers all types of water measurement right up to data integration into your specific management software.



### Features

- Integrated key technologies
- Adaptable for future developments
- Rugged hot water meters with high accuracy and long service life
- Correct mounting ensures high accuracy and long-term stability
- Reliable Swiss precision

### Benefits

- Innovative technology from a single source
- Open system for future concept
- Significant increase in added value with accurate flow measurement

## TOPAS PMW-basic

The TOPAS PMW-basic hot water meter has an ergonomically-designed roller counter and a non-reactive interface as standard and can be incorporated into the aquaconcept® series at any time.

## aquapuls® / aquapuls® NAMUR

The aquapuls® system module supplies pulses for controlling instruments, remote display, transmission and filling control units.

## aquadata® M-Bus

The aquadata® M-Bus system module supplies an M-Bus protocol and pulses for triggering devices controlling remote displays, data transmission and filling procedures. The system module has an internal battery when there is a power failure to the M-Bus.

## aquatarif®

The aquatarif® system module stores values on actual consumption and those of the previous year, peaks, the previous 400 days and 15 months as well as days with downtimes and leakages.

## aquaonline® / aquaonline® CS

The aquaonline® system module reads off the current meter values, the identification number, the nominal width and the serial number as required. For reading and one-time calibration, the AMBILL® pocket and desktop computer or the Pocket PC is to be used. (See AMBILL® documentation for system requirements.)

## aquaradio® / aquaradio® smart

The aquaradio® system module is used for reading data transmitted in the 433 MHz range. The aquaradio® remote modem is required for reading these data.

## radio controller CS

The radio controller CS unit is designed for the wireless reading of consumption data from electricity, water and gas meters with CS interface, pulse or NAMUR output. A maximum of 5 addressable devices can be connected to the CS input. In addition, there are two inputs for pulsers. The radio controller CS unit has two programmable fixed days and 16 logger values and is thus able to store 18 preset values. Suitable for broadcast readings, which automatically reads all radio units in the receiving range.

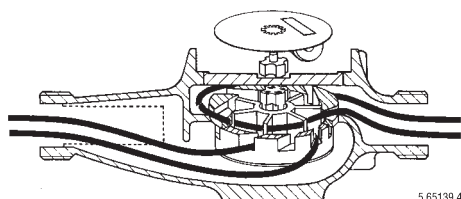
## aquainfo® / aquainfo® CS

The aquainfo® mounting set and appropriate system module is used in combination with aquaonline® and gasdata® for remote and on-site readings. The aquainfo® CS mounting set is used in combination with aquatarif® and aquaonline® CS for remote and on-site readings of CS interface values.

# Design

The TOPAS PMW-basic hot water meter is the key unit in the modular principle. This completely new rotating roller counter is the core unit for all system modules.

- The TOPAS PMW-basic series consists of multi-jet (dry register) meters. This measuring principle has proven its excellence over long periods of time and is insensitive to turbulences in the liquid flow.
- The impeller is supported on both sides by glass bearings (DN 15-32). This enables them to turn on a thin film of water within the casing and allows the impeller to turn both easily and accurately to ensure long-term stability.
- The measuring sensor (hydraulic part) is entirely separated from the roller. The impeller rotations are transmitted across a sturdy sealing plate by a magnetic coupling.
- The adjuster for calibrating the instrument is located inside the meter (DN 15-32) so that no accidental or unauthorised manipulation is possible.
- The measuring chamber is protected by a robust cover.
- The roller counter shows water consumption in m<sup>3</sup> with even the smallest flows displayed.



## Product range

### TOPAS PMW-basic



- Multi-jet turbine meters with dry-type registers
- Type approval as hot water meter according to 2004/22/EG (OIML R49)
- Accuracy class 2 according to OIML R49
- Suitable for horizontal mounting
- Brass housing with threaded connections according to ISO 228-1
- Nominal pressure PN 16
- Maximum temperature 90 °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
Standard	Art. No.		94595	94596	94600	94604	94607	94610
Flow on overload	Q <sub>4</sub>	m <sup>3</sup> /h	3.1	5	7.9	12.5	20	31
<b>Continuous flow</b>	<b>Q<sub>3</sub></b>	<b>m<sup>3</sup>/h</b>	<b>2.5</b>	<b>4</b>	<b>6.3</b>	<b>10</b>	<b>16</b>	<b>25</b>
Transitional flow rate	Q <sub>2</sub>	m <sup>3</sup> /h	0.04	0.064	0.101	0.16	0.256	0.4
Min. flow	Q <sub>1</sub>	m <sup>3</sup> /h	0.025	0.04	0.063	0.1	0.16	0.25
Starting flow at approx.		m <sup>3</sup> /h	0.014	0.014	0.022	0.022	0.045	0.045
Max. pressure drop at Q <sub>3</sub>		bar	0.3	0.5	0.5	0.6	0.4	0.6
Flowrate at Δp = 1bar		m <sup>3</sup> /h	4.5	5.2	9.5	12.7	25.6	32.5
Measuring range	Q <sub>3</sub> /Q <sub>1</sub>		R100	R100	R100	R100	R100	R100
Smallest recordable volume		litres	0.1	0.1	0.1	0.1	0.1	0.1
Recording capacity		m <sup>3</sup>	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	1.4	1.6	2.4	2.7	5.4	6.7
Dimensions								
	a	mm	165	190	260	260	300	300
	b	mm	35.5	36.5	40	40	60	62
	c	mm	79	88	96	96	106	113
	d	mm	259	314	374	374	440	460

Pressure loss curves: page 14

## TOPAS PMWF-basic (downpipe) and PMWS-basic (riser pipe)



- Multi-jet turbine meters with dry-type registers
- Type approval as hot water meter according to 2004/22/EG (OIML R49)
- Accuracy class 2 according to OIML R49
- Suitable for vertical mounting
- Brass housing with threaded connections according to ISO 228-1
- Nominal pressure PN 16
- Maximum temperature 90 °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
Standard	Art. No.	PMWF-basic	94598	94602	94606 <sup>1)</sup>	94609
	Art. No.	PMWS-basic	94597	94601	94605	94608
Flow on overload	Q <sub>4</sub>	m <sup>3</sup>	5	7.9	12.5	20
<b>Continuous flow</b>	<b>Q<sub>3</sub></b>	<b>m<sup>3</sup>/h</b>	<b>4</b>	<b>6.3</b>	<b>10</b>	<b>16</b>
Transitional flow rate	Q <sub>2</sub>	m <sup>3</sup> /h	0.064	0.101	0.16	0.256
Min. flow	Q <sub>1</sub>	m <sup>3</sup> /h	0.04	0.063	0.1	0.16
Starting flow at approx.		m <sup>3</sup> /h	0.014	0.022	0.022	0.045
Max. pressure drop at Q <sub>3</sub>	bar	PMWF-basic	0.5	0.6	0.9	0.6
Max. pressure drop at Q <sub>3</sub>	bar	PMWS-basic	0.5	0.5	0.6	0.6
Flowrate at Δp = 1bar	m <sup>3</sup> /h	PMWF-basic	5.4	8.6	10.3	22.2
Flowrate at Δp = 1bar	m <sup>3</sup> /h	PMWS-basic	6	9.7	13.6	20.8
Measuring range	Q <sub>3</sub> /Q <sub>1</sub>		R100	R100	R100	R100
Smallest recordable volume		litres	0.1	0.1	0.1	0.1
Recording capacity		m <sup>3</sup>	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	2.4	2.7	5
Dimensions						
	a	mm	105	150	150	200
	b	mm	25	30	30	54
	c	mm	126	148	148	198
	d	mm	200	265	265	340

<sup>1)</sup> without CE marking

**Pressure loss curves:** page 14 and 15

## System modules

### aquapuls® / aquapuls® NAMUR

The aquapuls® system module supplies pulses for controlling instruments, remote display, transmission and filling control units.



<b>aquapuls®</b>	
Pulse weighting <b>1 litre</b>	Art. No. 80113
Pulse weighting <b>100 litres</b>	Art. No. 80115
Power supply	internal battery
Operating life	MnO <sub>2</sub> /Li 3 V battery 15 years
Pulse duration	1 litre = 50 ms / 100 litres = 5 s
Maximum switching capacity	48 VDC, 220 mA
Reverse flow monitoring	yes, with compensation
Ingress protection	IP 68
Ambient temperature	0 to 50 °C
Transport and storage temperature	-20 to 70 °C
Permissible ambient humidity	max. 98 % relative humidity, condensation permitted
Cable length, permanently attached	1.5 m

<b>aquapuls® NAMUR</b>	
Pulse weighting <b>1 litre</b>	Art. No. 80117
Pulse weighting <b>100 litres</b>	Art. No. 80119
Power supply	NAMUR DIN 19234
Pulse duration	50 ms
Maximum switching capacity	27 VDC, 27 mA
Reverse flow monitoring	yes, with compensation
Can be used as transmitter for SO interface	acc. to DIN 43 864
Ingress protection	IP 68
Ambient temperature	0 to 50 °C
Transport and storage temperature	-20 to 70 °C
Permissible ambient humidity	max. 98 % relative humidity, condensation permitted
Cable length, permanently attached	1.5 m

## aquadata® M-Bus

The aquadata® M-Bus system module supplies an M-Bus protocol and pulses for triggering devices controlling remote displays, data transmission and filling procedures. The system module has an internal battery when there is a power failure to the M-Bus.



aquadata® M-Bus	Art. No. 80517
Pulse value	<b>1 litre*</b> ; can be set to 1 - 1'000 litres
Power supply	max. 1.5 mA (standard load), battery rating
Internal battery	3 V Li, 6 + 4 reserve years operating life
<b>Pulse output</b>	Open Collector, max. 27 VDC, 27 mA
Reverse flow monitoring	yes, with compensation
Can be used as transmitter for SO interface	acc. to DIN 43 864
Pulse duration	50 ms
<b>Data interface</b>	M-Bus to EN 13757 (EN 1434-3), 300/2400 baud
Address	primary address 0-250 / secondary address 8-digit extended secondary address with manufacturer's ID
M-Bus data readout Telegram 1 (FCB:0)	current meter reading, due date, next due date, consumption at due date, identification number
M-Bus data readout Telegram 2 (FCB:1)	as Telegram 1 including 12 values of previous month
Protocol	production number, medium, pulse value, primary address, meter reading, date, time, due date, meter reading on due date
Meter reading	0 m <sup>3</sup> ; format: 00000,000 m <sup>3</sup> ; freely selectable
Medium	water*, cold water, hot water freely selectable
Due date	31.12.*; freely selectable
Parameterisation software	AMBUS® WIN
Ingress protection	IP 68
Ambient temperature, operation	0 °C to 50 °C
Ambient temperature, storage	- 20 °C to 60 °C
Ambient humidity	max. 98 % relative humidity, condensation permitted
Cable length	1.5 m, permanently attached
Pin assignment	M-Bus: white/black pulse: brown (+) / blue (-)

\* factory setting

## aquatarif®

The aquatarif® system module stores values on actual consumption and those of the previous year, peaks, the previous 400 days and 15 months as well as days with downtimes and leakages.



aquatarif®	Art. No. 80191	Art. No. 80220
Optical interface acc. to IEC 62056-21 (IEC 1107) for reading data	yes	-
CS interface with permanently attached 5 m cable	-	yes
Power supply	internal battery operating life >10 years	internal battery operating life >10 years
Ingress protection	IP66	IP68
Ambient temperature	0 to 50 °C	0 to 50 °C
Transport and storage temperature	-20 to 70 °C	-20 to 70 °C
Permissible ambient humidity	max. 98 % relative humidity	max. 98 % relative humidity, condensation permitted

### Art. No. 80192 additional CS interface for Art. No. 80119;

This consists of a plug-in terminal and a screwed cable connection. Maximum cable length 100 m, cross-section 0.5 mm<sup>2</sup>, cable to be supplied by the customer

## aquaonline® / aquaonline® CS

The aquaonline® system module reads off the current meter values, the identification number, the nominal width and the serial number as required. For reading and one-time calibration, the AMBILL® pocket and desktop computer or the Pocket PC is to be used. (See AMBILL® documentation for system requirements.)



<b>aquaonline®</b>		<b>Art. No. 80112</b>
Reading	With aquaoci® reading head or direct on the device or remote via the aquainfo® mounting set with 2-wire connection, telephone cable U72 0.5 mm, max. 25 m / 0.8 mm, max. 100 m	
Interface	IEC 62056-21 (IEC 1107)	
Ingress protection	IP 66	
Power supply	aquaoci® reading head with replaceable battery	
Ambient temperature	0 to 50 °C	
Transport and storage temperature	-20 to 70 °C	
Permissible ambient humidity	max. 98 % relative humidity	



<b>aquaonline® CS</b>		
Connection	Version	Art. No.
CS interface according IEC 62056-21 (IEC 1107)	with socket system Volag and two-wire lead	80251
"	with socket system BKW and two-wire lead	80323
"	with blanking cover and two-wire lead	80324
Reading	Via CS-Interface on the meter, via remote transmission with the radio controller CS or remote readout via the aquainfo® CS mounting set	
Ingress protection	IP 66	
Power supply	Alimentation par l'interface CS	
Ambient temperature	0 to 50 °C	
Transport and storage temperature	-20 to 70 °C	
Permissible ambient humidity	max. 98 % relative, humidity	

## Product Range

### radio controller CS

The radio controller CS unit is designed for the wireless reading of consumption data from electricity, water and gas meters with CS interface, pulse or NAMUR output. A maximum of 5 addressable devices can be connected to the CS input. In addition, there are two inputs for pulsers. The radio controller CS unit has two programmable fixed days and 16 logger values and is thus able to store 18 preset values. Suitable for broadcast readings, which automatically reads all radio units in the receiving range.

<b>radio controller CS</b>	<b>Art. No. 80250</b>
Power supply	230 VAC
Radio frequency	433 MHz, bidirectional
Inputs	- 1 CS input according to IEC 62056-21 (IEC 1107) - 2 pulse inputs, max. 20 Hz, suitable for Reed, Open Collector, aquapuls® and NAMUR IEC 60947-5-6 (DIN 19234)
Fixed days	2
Logger functions	- 16 logger values per pulse input with meter reading, peak value and time - 16 logger values per CS-unit at 120 bytes - the logger values can be formed daily, weekly or monthly
Type of protection	IP 54
Ambient temperature	-5 to 55 °C
Transport and storage temperature	0 to 60 °C
Permissible ambient humidity	5 to 98 % relative humidity, no condensation
Clock power reserve	1 h
Mounting type	Wall mounting or on DIN rail

### aquaradio®

The aquaradio® module has a high degree of IP68 protection, its own power supply and a metal casing. It is suitable for the following applications:

- high standards regarding type of protection
- rugged environmental conditions
- network-independent operation
- shaft applications with occasional immersion in water

<b>aquaradio®</b>	<b>Art. No. 80188</b>
Power supply	Battery, operating life approx. 12 years
Radio frequency	433 MHz, bidirectional
Inputs	2 pulse inputs, max. 10 Hz, suitable for Reed, Open Collector and aquapuls®
Type of protection	IP 68
Ambient temperature	-5 to 50 °C
Transport and storage temperature	-20 to 55 °C
Permissible ambient humidity	5 to 98 % relative humidity, dewing permitted
Mounting type	Wall mounting with mounting set Art. No. 80190

<b>aquaradio®</b>	<b>Art. No. 80176</b>
Power supply	Battery, operating life approx. 12 years
Radio frequency	433 MHz, bidirectional
Input	aquaonline® / gasdata®
Cable length	permanently attached 1.5 m, can be lengthened
Type of protection	IP 68
Ambient temperature	-5 to 50 °C
Transport and storage temperature	-20 to 55 °C
Permissible ambient humidity	5 to 98 % relative humidity, dewing permitted
Mounting type	Wall mounting with mounting set Art. No. 80190



<b>aquaradio®</b>	<b>Art. No. 80189</b>
Power supply	Battery, operating life approx. 12 years
Radio frequency	433 MHz, bidirectional
Input	Permanently attached with transmitter for aquabasic®, cable 2 m, resolution 100 litre
Type of protection	IP 68
Ambient temperature	0 to 50 °C
Transport and storage temperature	-20 to 55 °C
Permissible ambient humidity	5 to 98 % relative humidity, condensation permitted
Mounting type	Wall mounting with mounting set Art. No. 80190

## Radio modem

The radio modem is required, together with a PDA, to read the data and set the parameters of the radio modules once.

<b>Radio modem</b>	<b>Art. No. 93885</b>
Version	aquaradio® / radio controller CS
For use with	aquaradio® radio module / radio controller CS
Power supply	battery
Radio frequency	433 MHz
Ambient temperature	-20 to 50 °C
Transport and storage temperature	-20 to 70 °C
Permissible ambient humidity	5 to 98 % relative humidity

## aquaradio® smart

The aquaradio® smart radio module is designed for the following applications:

- mobile logging of water, electricity, heat and gas meters with hand terminals for “walk or drive-by” operation
- high degree of protection
- independent of local power supply

<b>aquaradio® smart</b>	<b>Art. No. 80539</b>
Power supply	Battery, operating life approx. 15 years
Radio frequency	868 MHz
Transmitting power	7 mW
<b>Input</b>	Open Collector, Reed, aquapuls®, max. 10 Hz
Cable length	3 m, can be lengthened to 10 m <sup>1)</sup>
Billing date	Weekly, monthly, yearly
Optical interface	IrDa for programming
Type of protection	IP 68
Ambient temperature	-15 to 55 °C
Transport and storage temperature	-20 to 55 °C
Permissible ambient humidity	5 to 98 % relative humidity, condensation permitted
Mounting type	Wall or pipe mounting
Dimensions	104 x 42 x 70 mm

<sup>1)</sup> Complies with European Directives regarding electromagnetic compatibility. Any lengthening of cable may deviate from these directives.

<b>aquaradio® smart</b>	<b>Art. No. 80540</b>
Power supply	Battery, operating life approx. 15 years
Radio frequency	868 MHz
Transmitting power	7 mW
<b>Input</b>	incl. transmitter for aquabasic®, cable 3 m, resolution 100 litre
Billing date	Weekly, monthly, yearly
Optical interface	IrDa for programming
Type of protection	IP 68
Ambient temperature	-15 to 55 °C
Transport and storage temperature	-20 to 55 °C
Permissible ambient humidity	5 to 98 % relative humidity, condensation permitted
Mounting type	Wall or pipe mounting
Dimensions (without transmitter)	104 x 42 x 70 mm

## Bluetooth wireless receiver

The wireless receiver is used in conjunction with a PDA and readout software and is thus a complete wireless readout system for "walk or drive-by" operation.

- Stores up to 256 wireless telegrams
- Continuous data transmission to the PDA
- High-capacity batteries for 15 h continuous operation

<b>aquaradio® smart</b>	<b>Art. No. 80542</b>
<b>Bluetooth wireless receiver</b>	
Reception range	868 MHz
Internal memory	256 wireless telegrams
Bluetooth interface	2.4 GHz, range approx. 10 m
Display	5 LED to indicate status
Power supply	Quick-charging battery, charger supplied
Operating time	15 h
Type of protection	IP 44
Ambient temperature	0 to 60 °C
Permissible ambient humidity	10 to 70 % relative humidity
Weight	350 g
Dimensions	155 x 95 x 27 mm (without antenna)

## Option

Car mounting set for "drive-by" applications, consisting of an external magnet foot antenna and charging cable.

<b>Auto installation set</b>	<b>Art. No. 80543</b>
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For one-time activation and programming, the IZAR OH BT reading head is required with a Bluetooth interface and both a PDA and appropriate software.

<b>Reading head IZAR OH BT</b>	<b>Art. No. 80544</b>
Bluetooth interface	2.4 GHz, range approx. 10 m
Display	4 LED to indicate status
Power supply	Li-ion battery, charger supplied
Operating time	12 h
Type of protection	IP 40
Ambient temperature	0 to 40 °C

## Accessories

<b>Accessories</b>	<b>Art. No.</b>
Mounting set for wall mounting of aquaradio®	80190
Terminal box VD-22, for universal application as a connecting box to take cross-sections 0.14...1.5 mm <sup>2</sup> , max. 48 VAC	80212
Mounting set for wall mounting incl. VD-22 terminal box for aquaradio®	80303

### aquaoci®



The combined aquaoci® optical reading head with a PDA is used for optical and galvanic readings from devices with an interface according to IEC 62056-21 (IEC 1107). An external power supply is required for galvanic readings.

- |                       |                                  |
|-----------------------|----------------------------------|
| Reading head          | • Art. No. 80152                 |
| Plug for reading head | • Please refer to the price list |

### aquaoci® 9600



The aquaoci® optical reading head is used for reading from devices with an optical (EN 61107) interface - IEC 62056-21 (IEC 1107).

- |                       |                                  |
|-----------------------|----------------------------------|
| Reading head          | • Art. No. 80153                 |
| Plug for reading head | • Please refer to the price list |

### K01-Blue



The readout unit „K01-Blue“ converts optical signals of devices with interface „IEC 62 056-21 (IEC 1107)“ in Bluetooth signals, which can be read by any PDA/PC with Bluetooth interface. Additionally it has a CS/CL-interface.

- |                                    |                  |
|------------------------------------|------------------|
| Readout unit<br>(incl. recharger ) | • Art. No. 80249 |
|------------------------------------|------------------|

# Mounting instructions

## Piping

Ensure that the measuring and ancillary devices can be easily accessed for reading and operation. The measuring instruments should be mounted with the dial horizontal.

The piping must be designed so that the measuring instrument is always filled with fluid when in operation and that no air bubbles are present. The TOPAS PMW-basic hot water meter requires no straight inlet or outlet paths.

## Installing measuring instruments and accessories

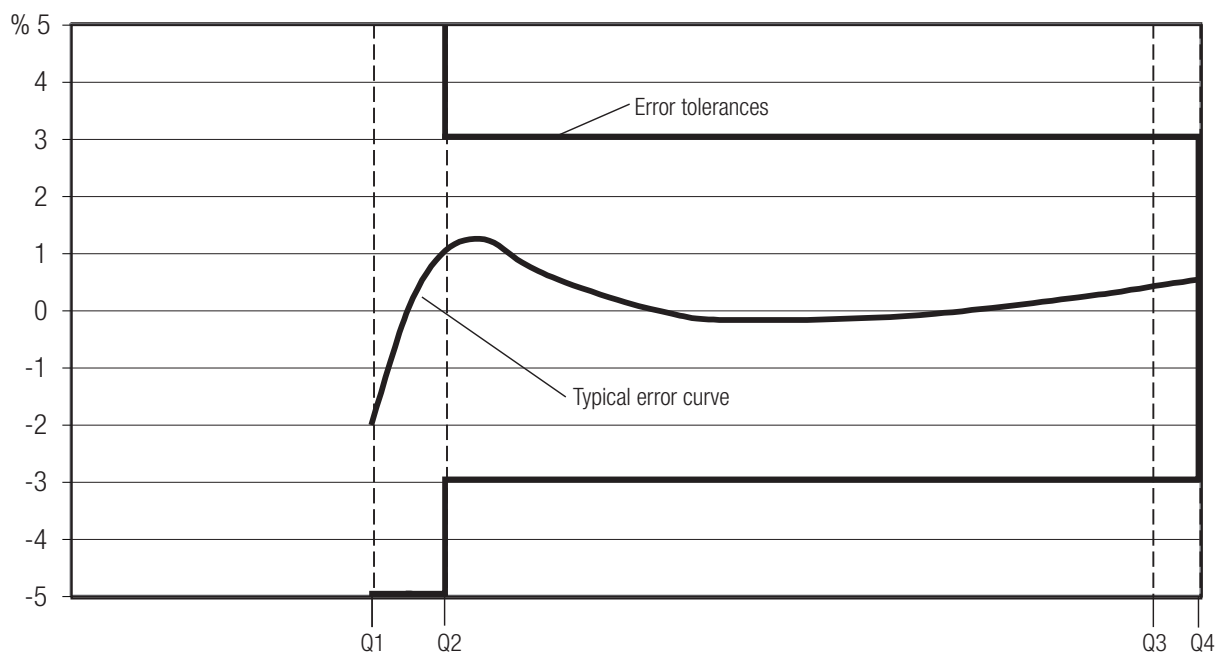
The flowmeters are laid out according to the load values and the piping is to be altered where required. The type of measuring instruments and accessories used depends on the maximum operating conditions to be expected:

- Flowrate
- Operating pressure
- Operating temperature
- Ambient temperature

## Error tolerances and metrological classes 2

### According to Directive OIML R 49

Reference conditions: liquid measured: water, temperature: 20 °C

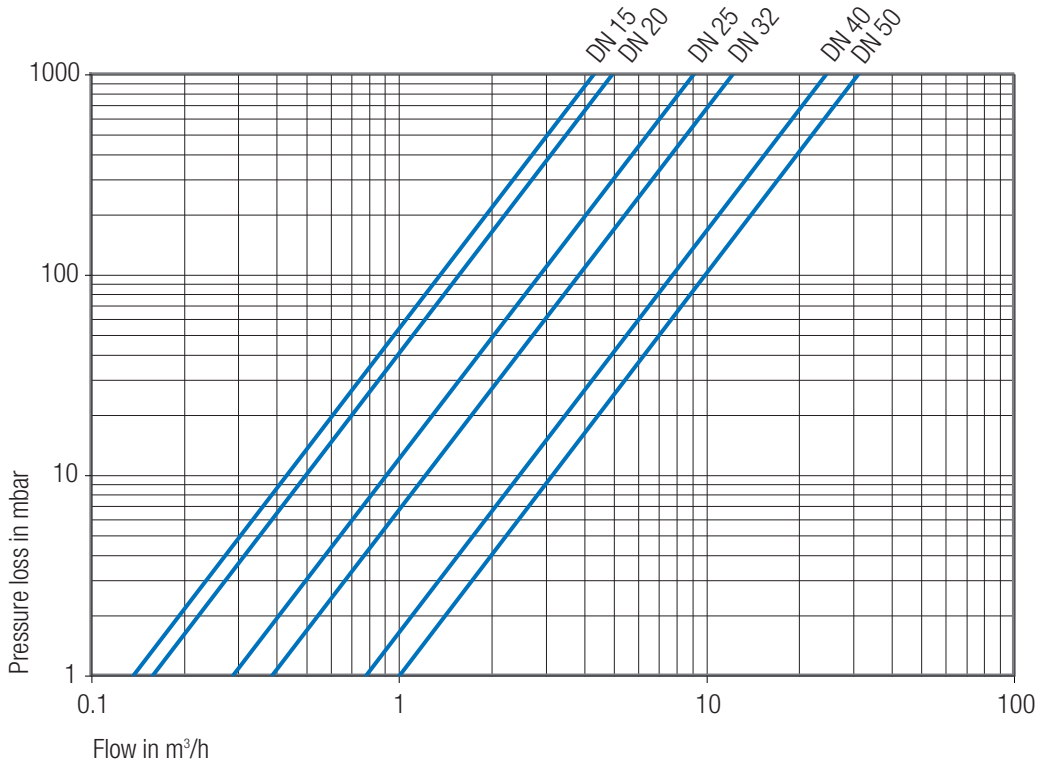


$Q_1 < Q < Q_2$  lower measuring range

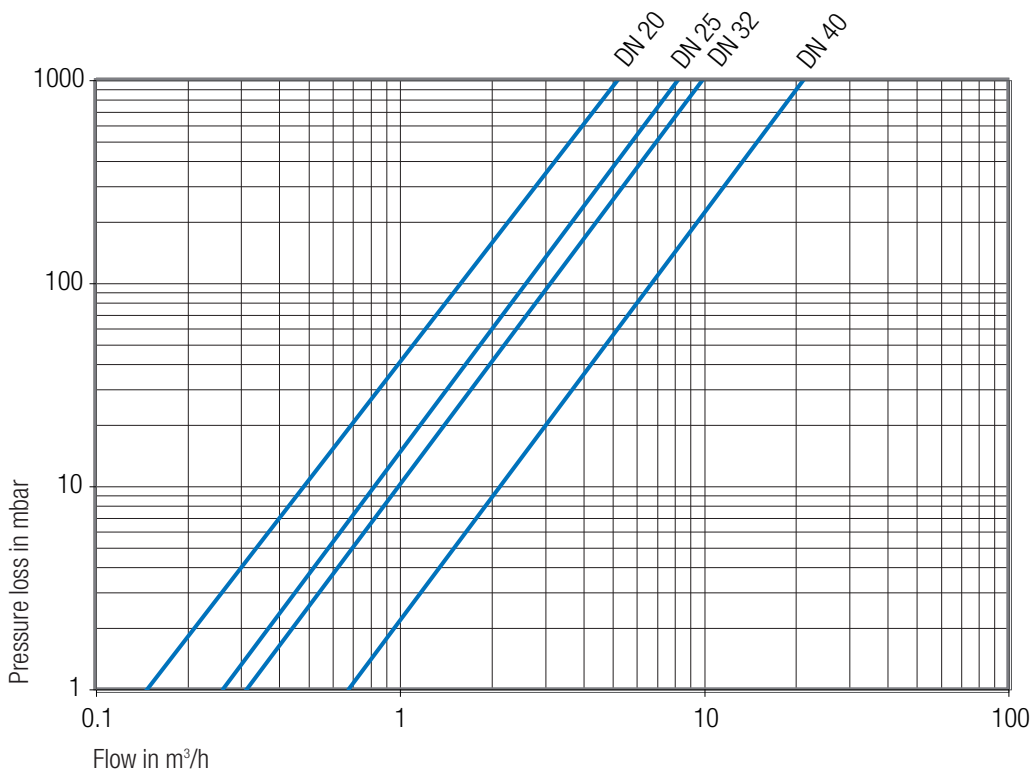
$Q_2 \leq Q < Q_4$  upper measuring range

# Pressure loss curves

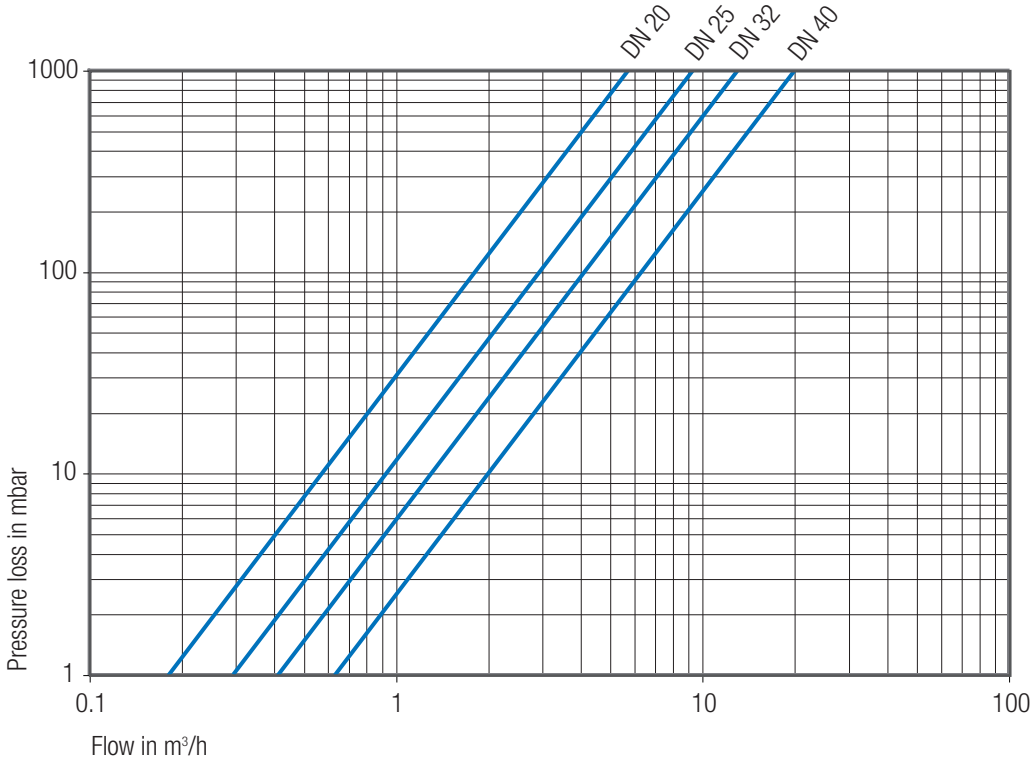
## TOPAS PMW-basic



## TOPAS PMWF-basic



**TOPAS PMWS-basic**



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