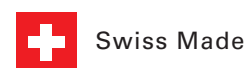


aquaconcept®

Cold water



Applications

The unique aquaconcept® modular design covers a wide range of water applications. This innovative system offers all types of water measurement right up to data integration into your specific management software.



Features

- System modules for updating domestic water meters
- Open to all future water management systems
- Integrated key technologies
- Rugged domestic water meters with high accuracy and long service life
- Reliable Swiss precision
- Internal interface for system modules

Benefits

- Innovative technology from a single source
- Design safety can be updated at any time
- Simple and user-friendly technology
- Significant increase in added value with accurate flow measurement
- Lower shelf-life costs

Product range

PMK-aquabasic®



- Multi-jet impeller meters with dry registers
- Measuring range to OIML R 49
- Error tolerance $\pm 2\%$ of measured value in upper range $Q_2 \leq Q < Q_4$ and $\pm 5\%$ in lower range $Q_1 < Q < Q_2$
- For mounting in horizontal pipes
- Brass body with threaded connections
- Nominal pressure PN 16
- Maximum temperature 40 °C
- IP 66 or IP 68
- Internal interface for system modules

Nominal diameter	DN	mm	15	20	25	32	40	50
			inches	1/2	3/4	1	1 1/4	1 1/2
Standard		Art. No.	92503	92505	92511	92517	92520	92526
IP 68		Art. No.	-	93688	93689	93690	93691	93692
with drainage unit		Art. No.	-	92509	92515	-	-	-
Flow on overload	Q ₄	m ³ /h	3	5	7.9	12.5	20	31
Continuous flow	Q₃	m³/h	2.5	4	6.3	10	16	25
Transitional flow rate	Q ₂	m ³ /h	0.032	0.04	0.063	0.1	0.16	0.25
Min. flow	Q ₁	m ³ /h	0.02	0.025	0.039	0.063	0.1	0.156
Starting flow at approx.		m ³ /h	0.008	0.008	0.022	0.022	0.045	0.045
Max. pressure drop at Q ₃		bar	0.3	0.6	0.4	0.6	0.4	0.6
Flowrate at $\Delta p = 1$ bar	Q	m ³ /h	4.5	5.2	9.5	12.7	25.6	32.5
Measuring range			R125	R160	R160	R160	R160	R160
Smallest recordable volume		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
Body thread size		inches	3/4	1	1 1/4	1 1/2	2	2 3/8
Connection thread size		inches	1/2	3/4	1	1 1/4	1 1/2	2
Body surface finish			lacquered					
Weight without connections		approx. kg	1.4	1.6	2.4	2.7	5.4	6.7
	Overall length							
	a		165	220 ¹⁾	260	260	300	300
	b		35.5	36.5	40	40	60	62
	c		79	88	96	96	106	113
d		259	314	374	374	440	460	

1) available with face-to-face length of 190 mm (d = 285), Art. No. 92504

Pressure loss curves

See page 11

Approvals

MID SVGW

PMKB-aquabasic® (bayonet connection)



- Multi-jet impeller meters with dry registers
- Measuring range to OIML R 49
- Error tolerance $\pm 2\%$ of measured value in upper range $Q_2 \leq Q < Q_4$ and $\pm 5\%$ in lower range $Q_1 < Q < Q_2$
- For mounting in horizontal or vertical pipes
- Brass body with connections for bayonet modules (quick-fit coupling); short mounting time when changing meters
- Maximum temperature 40 °C
- IP 66 / optional IP 68
- Internal interface for system modules

Nominal diameter	DN	mm	20	25
		inches	3/4	1
Standard		Art. No.	92506	92512
IP 68		Art. No.	93810	93811
Flow on overload	Q ₄	m ³ /h	5	7.9
Continuous flow	Q₃	m³/h	4	6.3
Transitional flow rate	Q ₂	m ³ /h	0.04	0.063
Min. flow	Q ₁	m ³ /h	0.025	0.039
Starting flow at approx.		m ³ /h	0.008	0.018
Max. pressure drop at Q ₃		bar	0.5	0.8
Flowrate at $\Delta p = 1$ bar	Q	m ³ /h	5.6	6.9
Measuring range			R160	R160
Smallest recordable volume		litres	0.1	0.1
Recording capacity		m ³	100'000	100'000
Body surface finish			lacquered	
Weight (with bayonet module)		approx. kg	2.0 (105 mm) 2.66 (220 mm) 2.46 (122 mm)	2.4 2.95
Overall length c		mm	162	162

Bayonet modules	Art. No.	80613	81332	81333	80615	80614
Face-to-face length a	mm	105	122	122	150	220
When used with PMKB-basic	DN	20	25	25	20/25	20
Bayonet module thread	inches	1	1 1/4 ¹⁾	1 1/2 ¹⁾	1 1/4	1
Screw thread on connection	inches	3/4	1	1 1/4	1	3/4
Face-to-face length with connection	inches	200	-	-	265	315
Accessories						
Extension nipple for face-to-face length of 190 mm		81336	-	-	-	-
Extension nipple for face-to-face length of 220 mm		81335	-	-	-	-
Extension nipple for face-to-face length of 260 mm		-	-	-	80002	-

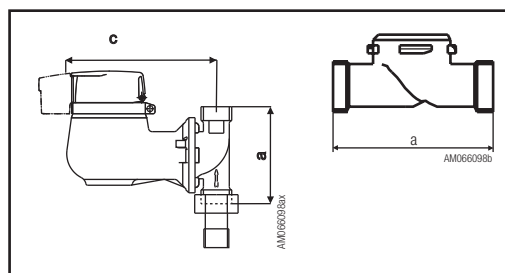
1) on the inlet side with cap nut

Pressure loss curves

See page 11

Approvals

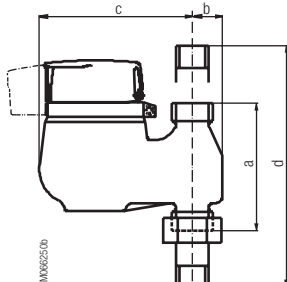
MID SVGW (DN 20)



PMKF/-S-aquabasic® PMKF (downward flow) and PMKS (upward flow)



- Multi-jet impeller meters with dry registers
- Measuring range to OIML R 49
- Error tolerance $\pm 2\%$ of measured value in upper range $Q_2 \leq Q < Q_4$ and $\pm 5\%$ in lower range $Q_1 < Q < Q_2$
- For mounting in vertical pipes (PMKF ☺ downward flow, PMKS ☻ upward flow)
- Brass body with threaded connections
- Nominal pressure PN 16
- Maximum temperature 40 °C
- IP 66 / optional IP 68
- Internal interface for system modules

Nominal diameter	DN	mm	20	25	32	40
		inches	3/4	1	1 1/4	1 1/2
standard	PMKF	Art. No.	92507	92513	92518	92521
	PMKS	Art. No.	92508	92514	92519	92522
Flow on overload	Q ₄	m ³ /h	5	7.9	12.5	20
Continuous flow	Q₃	m³/h	4	6.3	10	16
Transitional flow rate	Q ₂	m ³ /h	0.04	0.063	0.1	0.256
Min. flow	Q ₁	m ³ /h	0.025	0.039	0.063	0.16
Starting flow at approx.		m ³ /h	0.014	0.022	0.022	0.045
Max. pressure drop at Q ₃	PMKF	bar	0.5	0.5	0.9	0.5
Max. pressure drop at Q ₃	PMKS	bar	0.5	0.4	0.5	0.6
Flowrate at $\Delta p = 1$ bar	PMKF	m ³ /h	5.4	8.6	10.3	22.2
Flowrate at $\Delta p = 1$ bar	PMKS	m ³ /h	6.0	9.7	13.6	20.8
Measuring range			R160	R160	R160	R100
Smallest recordable volume		litres	0.1	0.1	0.1	0.1
Recording capacity		m ³	100'000	100'000	100'000	100'000
Body thread size		inches	1	1 1/4	1 1/2	2
Connector thread size		inches	3/4	1	1 1/4	1 1/2
Body surface finish			lacquered			
Weight without connections		approx. kg	1.8	2.4	2.7	5.0
	Overall length					
	a		105	150	150	200
	b		25	30	30	54
	c		126	148	148	198
	d		199	264	264	340

1) max. 1 hour per day

Pressure loss curves

See page 12

Approvals

MID SVGW

System modules

aquareader®

The aquareader® module is an automatic readout device with an M-Bus or CS interface. The module does not require a battery as it is supplied with energy when connected to a powered bus. If the water meter is equipped with a RFID-tag, the aquareader® will take the data from the tag, set its own parameters and thus be operational in seconds. Upon request, the aquareader® system module reads out the current meter reading, the identification number, the nominal width and the medium. It can then be disconnected again from the bus. Readouts and manual configuration require AMBUS® WIN II software for the M-Bus version and AMBILL® pocket for the CS version (for system requirements, see software documentation).



aquareader® CS	Version	Art. No.
CS interface	with socket system Volag (IP 54)	80754
	with socket system BKW (IP 32)	80756
	with cable gland (IP 66)	80755
Reading	via CS interface on the meter or via remote transmission	
Readout	actual meter reading, identification number of meter, medium, nominal width	
Data interface	CS interface according IEC 62056-21 (IEC 1107), 300 to 9600 Baud	
Parameterization	automatically from data of RFID tag or manually with parameterization software	
Parameterization software	AMBILL® pocket	
Ingress protection	IP 66	
Power supply	via the CS interface	
Ambient temperature	0 to 55 °C	
Transport and storage temperature	-20 to 70 °C	
Permissible ambient humidity	max. 98% relative humidity	



aquareader® M-Bus	Version	Art. No.
M-Bus	with socket system Volag and (IP 54)	80751
	with socket system BKW (IP 32)	80753
	with cable gland (IP 66)	80752
Reading	via M-Bus interface on the meter or via remote transmission with the radio controller aquaradio® smart M-Bus	
Readout	actual meter reading, identification number of meter, medium, nominal width	
Data interface	M-Bus according EN 13757 (EN 1434-3), 300/ 2400* /9600 Baud	
Addressing	primary address 0* -250 / secondary address 8-digit extended secondary address with manufacturer's ID	
Parameterization	automatically from data of RFID tag or manually with AMBUS® Win II	
Parameterization software	AMBUS® Win II	
Ingress protection	IP 66	
Power supply	M-Bus max. 1.5 mA (standard load)	
Ambient temperature	0 to 55 °C	
Transport and storage temperature	-20 to 70 °C	
Permissible ambient humidity	max. 98% relative humidity	

* **Factory settings**

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	Article No. 80517
Pulse value	1 litre* ; can be set to 1 – 1,000 litre
Power supply	max. 1.5 mA (standard load), battery rating
Internal battery	3 V Li, 6 + 4 reserve years operating life
Pulse output**	Open Collector, SO compatible to DIN 43864
Reverse flow monitoring	yes, with compensation
Max. switching capacity	27 VDC, 27 mA
Pulse duration	50 ms
Data interface	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 ³ ; format: 00000,000 m ³ ; 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, 4 x 0.14 mm ² with cable end sleeves
Pin assignment	M-Bus: white/black pulse: brown (+) / blue (-)

*** factory setting**

** electrically connected with 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.



aquatarif®	Article No. 80119	Article 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

Article No. 80192 additional CS interface for Article No. 80119;

This consists of a plug-in terminal and a screwed cable connection. Maximum cable length 100 m, cross-section 0.5 mm², cable to be supplied by the customer

aquapuls®/aquapuls® NAMUR

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



aquapuls®	
Pulse weighting 1 litre	Article No. 80113
Pulse weighting 10 litres	Article No. 80114
Pulse weighting 100 litres	Article No. 80115
Power supply	internal battery
Operating life	MnO ₂ /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

aquapuls® NAMUR	
Pulse weighting 1 litre	Article No. 80117
Pulse weighting 100 litres	Article 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 S0 interface	acc. to DIN 43864
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

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.



Mounting sets		
Art. No. 80121	aquainfo® mounting set	
Art. No. 80388	Volag aquainfo® CS-1 mounting set	1 channel
Art. No. 80389	Volag aquainfo® CS-2 mounting set	2 channels
Art. No. 93115	Volag aquainfo® CS-4 mounting set	4 channels
Art. No. 93116	Volag aquainfo® CS-8 mounting set	8 channels
Art. No. 80390	BKW aquainfo® CS-1 mounting set	1 channel
Art. No. 80391	BKW aquainfo® CS-2 mounting set	2 channels

The aquainfo® / aquainfo® CS mounting set can be used with the following accessories:

Art. No.	Feller surface socket with cap, IP55
Art. No.	Feller cover with cap (without flush socket), IP55
Art. No.	Hager housing for rail and wall mounting, IP10

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



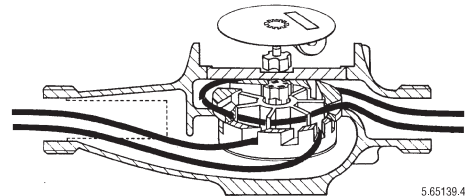
The readout unit „K01-Blue“ converts optical signals of devices with interface „IEC 62 056-21 (IEC 1107)“ in Bluetooth signals, which can be read by any PDA/PC with Bluetooth interface. Additionally it has a CS/CL-interface.

- | | |
|-------------------------------------|------------------|
| Readout unit
(incl. rechargeur) | • Art. No. 80249 |
|-------------------------------------|------------------|

Design

The aquabasic® domestic water meter is the key unit in the aquaconcept® modular principle. This completely new rotating roller counter is the core unit for all system modules.

- The aquabasic® 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 meter casing is under vacuum and protected by a shock-resistant cover.
- The roller counter shows water consumption in m³ with even the smallest flows displayed.



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 aquabasic® turbine 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

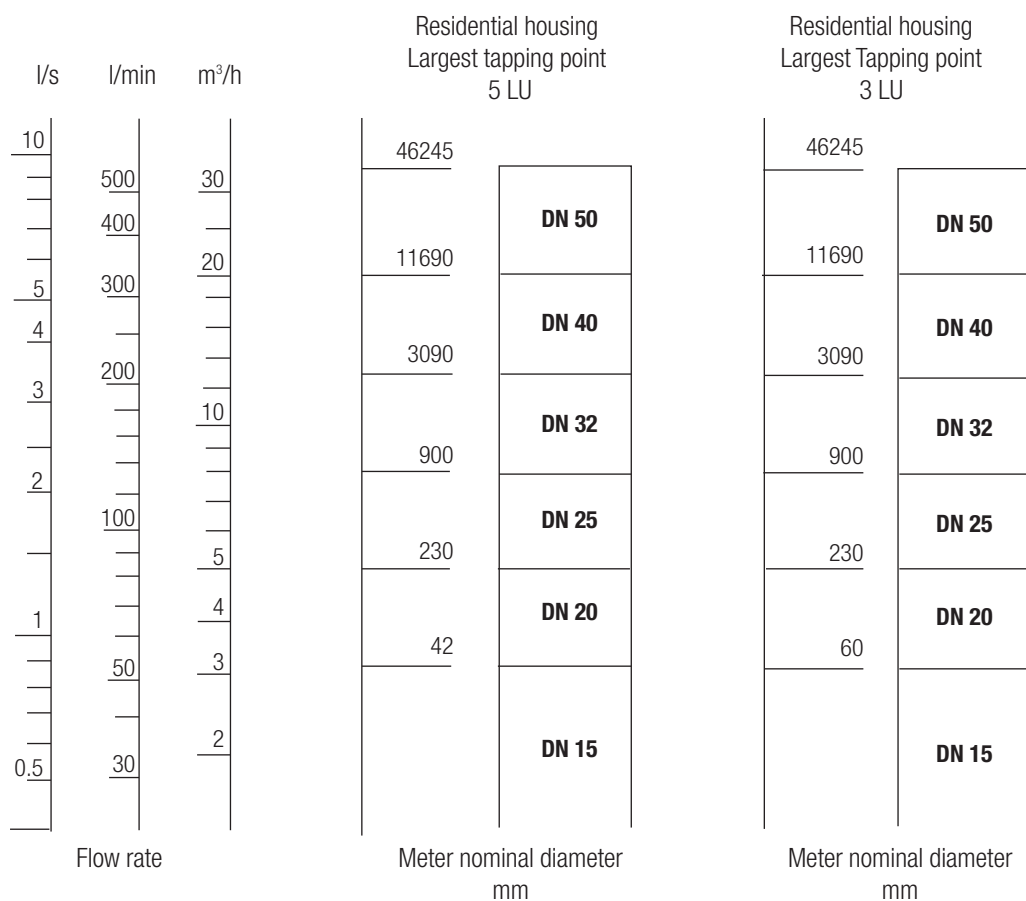
In buildings where minus temperatures can be expected (e.g. holiday homes), then aquabasic® meters with drainage units are to be fitted and to be drained before the start of the winter season.

Project work and plant design

LU connected values for fittings and devices in accordance with SVGW W3d 2013

Intended use	Q _A cold [l/s]	Q _A warm [l/s]	LU cold	LU warm
Washbasin, bidet, sluice, hairdresser's shower	0.1	0.1	1	1
Domestic dishwasher, WC cistern, drinks machine	0.1	-	1	-
Domestic washing machine, balcony tapping valve	0.2	-	2	-
Shower mixer, sink, washing trough, wall spout	0.2	0.2	2	2
Automatic urinal flushing	0.3	-	3	-
Bath tub mixer	0.3	0.3	3	3
Tapping valve for gardens and garages	0.5	-	5	-

Reference values for meter size general settings (PMK basic)



Guidelines for selecting water meters

1. Establishing the Q_T sum flow rate

Intended use	Load value [LU]			Plant data	
	cold	warm	Total (A)	Number of connections (B)	(A x B)
Washbasin	1	1	2		
WC cistern	1	-	1		
Domestic dishwasher	1	-	1		
Bidet	1	1	2		
Sluice	1	1	2		
Hairdresser's shower	1	1	2		
Drinks machine	1	-	1		
Shower mixer	2	2	4		
Sink	2	2	4		
Washing trough	2	2	4		
Domestic washing machine	2	-	2		
Balcony tapping valve	2	-	2		
Sink	2	2	4		
Standing and wall spouts	2	2	4		
Automatic urinal flushing	3	-	3		
Bath tub mixer	3	3	6		
Tapping valve for gardens and garages	5	-	5		
				Total load value [LU]	
				Q_T sum flow rate = LU x 0.1 l/s	

2. Setting the peak flow value in m^3/hr

3. Setting meter size ($Q_D \leq Q_4$)

4. Selecting meter within the permitted tolerance range (from approx. pressure drop ≥ 0.3 bar)

Load value	Sum flow rate Q_T	Peak flow rate Q_D	Peak flow rate Q_D	Pressure loss PMK aquabasic® [bar]					
				Permitted tolerance range					
				Q_4 [m^3/h]					
[LU]	[l/s]	[l/s]	[m^3/h]	3.2	5	7.9	12.5	20	31.25
				DN15	DN20	DN25	DN32	DN40	DN50
42	4.2	0.86	3.11	0.40	0.40				
50	5	0.90	3.26		0.44				
75	7.5	1.00	3.61		0.51				
100	10	1.08	3.89		0.60	0.16			
150	15	1.2	4.32		0.75	0.20			
200	20	1.32	4.76		0.82	0.23			
230	23	1.39	5.00		0.99	0.25	0.16		
250	25	1.43	5.15			0.28	0.17		
400	40	1.69	6.08			0.37	0.22		
500	50	1.83	6.57			0.42	0.25		
600	60	1.95	7.01			0.50	0.29		
830	83	2.18	7.86			0.62	0.37		
900	90	2.25	8.09			0.82	0.40	0.15	
1200	120	2.49	8.96				0.49	0.19	
1400	140	2.63	9.46				0.55	0.21	
1800	180	2.87	10.33				0.68	0.25	
2000	200	2.98	10.72				0.76	0.29	0.14
3090	309	3.47	12.50				0.99	0.37	0.18
11690	1169	5.56	20.00					0.94	0.44
46245	4624	9.02	32.50						0.99

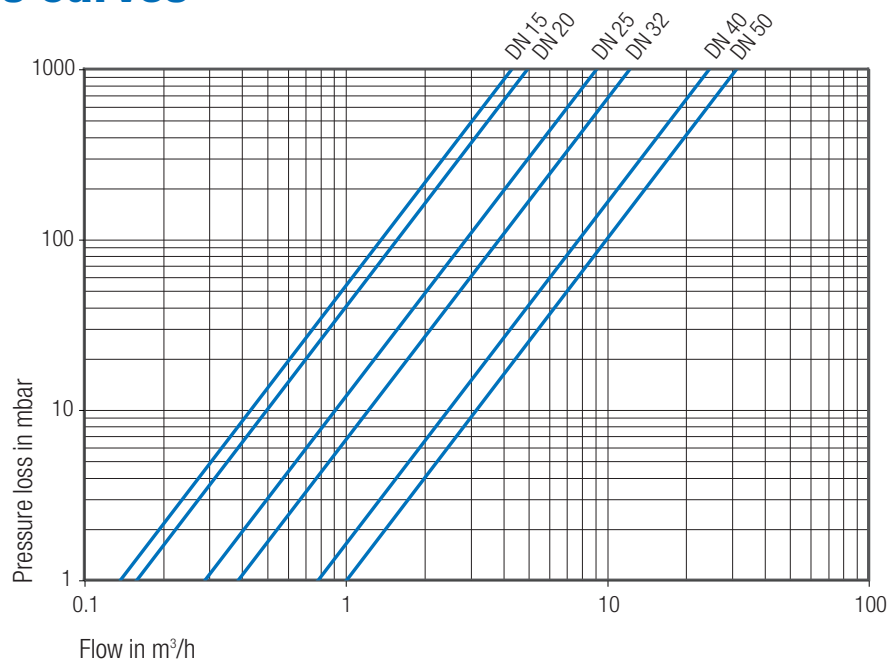
5. Checking the pressure deployment

Building			Approximated values	Real values
Supply pressure [bar]				
Δp reservoir level + Δp supply line	[bar]	-	0.3 ¹⁾	
Max. Δp house connection (external and internal)	[bar]	-	0.4 ¹⁾	
Δp water meter	[bar]	-		
Δp through height difference house connection to highest tapping point (1m ~ 0.1 bar)	[bar]		-	
Δp pipelines (up to max. 50 m)	[bar]	-	1.5	
Minimal flow pressure	[bar]	-	1	
Result	[bar]	=		

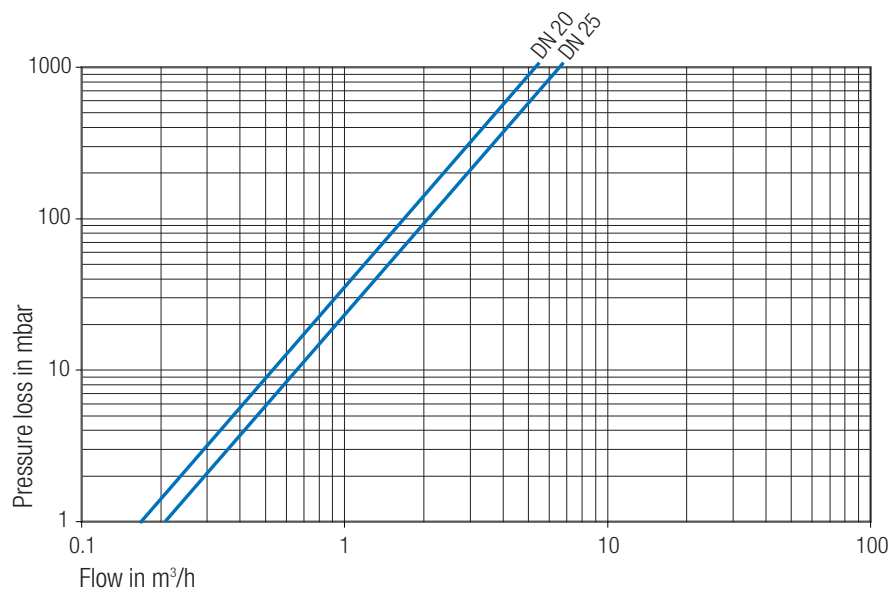
Results >0 bar mean that the construction is correct; results <0 bar mean that the pressure loss must be optimized or assumptions ¹⁾ checked.

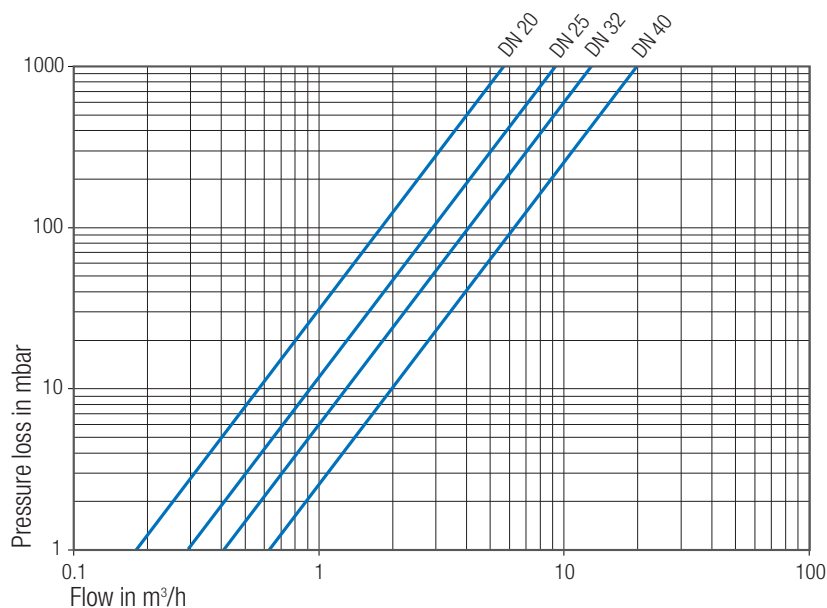
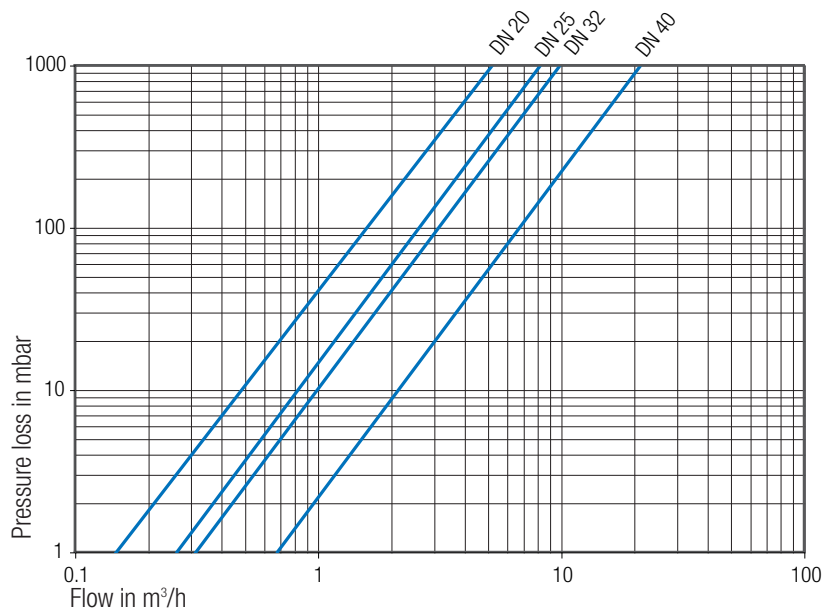
Pressure loss curves

aquabasic® PMK



aquabasic® PMKB





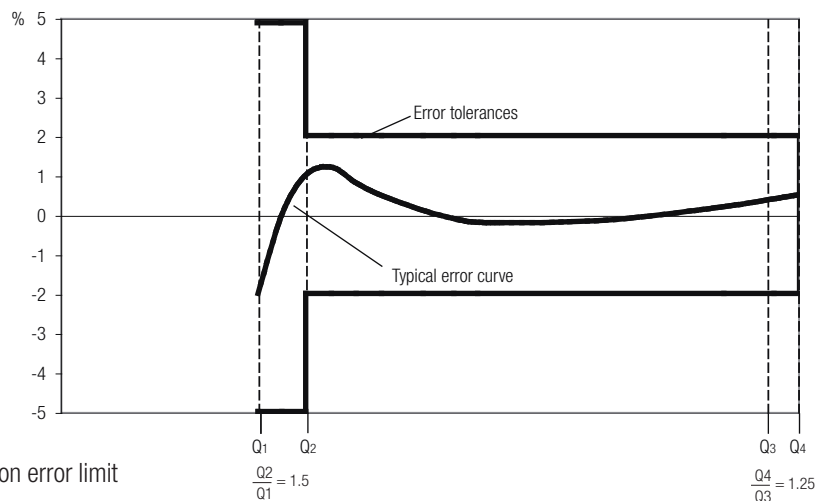
Error tolerances and metrological classes 2

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



Operation error limit = 2 x calibration error limit

SALES PARTNER:

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