



Static Flow Meter ULTRAHEAT[®] Flow

2WR7...

Configuration and ordering

Meter for measurement of flow in a heat or cold supply circuit with water using an ultrasonic principle. Important properties are

- Non-wearing due to non-moving parts
- Metrological class 1:100 acc. to EN1434, total measurement range 1:1000
- Any mounting orientation, horizontal or vertical
- No settling sections or flow straighteners
- Battery operated for 5 or 9 years
- Optical interface acc. to EN 61107
- Pulse output
- Automatic data storage on yearly set day and for 36 months
- Self-diagnostics

Application

The 2WR7 is a flow meter for connection to a calculator for heat or cold consumption measurement in systems with water. It is not appropriate for systems with water-glycol mixtures.

Flow meter design

The meter comprises a flow measuring part (completely made of metal) and an associated electronic unit. These two components are affixed with each other by cable. The flow measuring part is available also in IP 65 (Standard: IP 54).

Method of operation

Measurement is performed by the **ultrasonic flow principle**: The medium to be measured is routed through a measuring tube. Two transducers alternately generate ultrasonic waves that are propagated upstream and downstream and are received by the opposite transducers. The flow velocity and subsequently the volume flow can then be calculated from the time difference measured. Volume proportional pulses carry this information to a connected calculator.

Calculator

A standard electronic unit is used for all flow rates with identical operation.

Interfaces of the flow meter

ULTRAHEAT 2WR7 flow meters are all equipped with an optical interface to EN 61107 as a standard, e.g. for connecting the service software for parameter setting and diagnostics.

Specification of the **pulse output**:

Type:	open collector, bipolar
Polarity:	none
Pulse significance:	see dial plate
Pulse length:	see dial plate
Pulse sequence	not equally spaced, but in packages every 0.5s
Cable length:	2m
Voltage:	max. 30 V
Current:	max. 30 mA
Voltage drop:	< 0.3V at 10 mA
Dielectric strength:	500 V _{eff} against ground (galvanic insulated)

Table of standard settings for pulses dependent on the nominal flow rate:

q_p in m³/h	Significance in liter / imp.	Pulse length in ms
0,6	0,1	10
1,5	0,1	10
2,5	1	10
3,5	1	10
6	1	10
10	1	10
15	1	10
25	10	10
40	10	10
60	10	10

These standard settings can be changed with the service software at the service level. This level is accessible below a service seal after removal of the cover. An optical head is necessary for the communication with the meter.

If pulse parameters have been changed then the dial plate has to be amended, too!

Pulse cable length:

The maximum length of the pulse cable depends on the pulse length and on the electrical properties of the cable used (capacity) as well as of the attached calculator input circuit (Ri). As an example a maximum length of ca. 100m results for a simple two wire cable (2x0,75mm²) and Ri = 100 kOhm of the calculator, or ca. 10m for Ri = 1 MOhm. Additional restrictions on the part of the calculator need to be observed!

Power supply

5 or 9 year **battery**

The battery can be changed without removal of the calibration seal.

Operational data

The following data can be read through the service software:

The **operating hours** are counted from initial connection of the battery. **Missing hours** are summated if a fault is pending that prevents the flow meter from measuring.

Volume readings, maximum flow rates and missing hours are stored monthly for 36 months.

The **device number** and the **firmware version** number (as assigned by the manufacturer).

Approval

EN 1434 class 2 and 3

Technical data of calculator

Installation	In flow or in return
Control cable length	0.3m to 3m between measuring tube and electronic unit
Ambient temperature	5 to 55 °C
Storage temperature	-20 to 60°C
Protection class	IP54
Dimensions	112 x 88 mm ²

Volume measuring units

q_p m ³ /h	Length mm	Connection Thread/Flange	Pressure stage
0,6	110	T	PN16 (oder PN25)
1,5	110	T	PN16 (oder PN25)
2,5	130	T	PN16 (oder PN25)
0,6	190	T, F	PN16 (oder PN25)
1,5	190	T, F	PN16 (oder PN25)
2,5	190	T, F	PN16 (oder PN25)
3,5	260	T, F	PN16 (oder PN25)
6,0	150	G	PN 16
6,0	260	T, F	PN16 (oder PN25)
10	200	G	PN16
10	300	T, F	PN16 (oder PN25)
15	200	F	PN25
15	270	F	PN25
25	300	F	PN25
40	300	F	PN25
60	360	F	PN16 (oder PN25)

The specified lengths correspond to the overall lengths of conventional vane-type meters.

Technical data for flow measurement

Small flow sensors

Nominal flowrate	q_p	0.6	1.5	2.5	m^3/h
Metrological class		1:100*	1:100*	1:100*	
Maximum flow	q_s	1.2	3,0	5,0	m^3/h
Minimum flow	q_i	6**	15**	25**	l/h
Operating limit ***		1,2	3,0	5	l/h
Pressure drop at q_p :					
110 mm	Δp	150	150	----	mbar
130 mm	Δp	----	160	200	mbar
190 mm	Δp	150	160	200	mbar
flange	Δp	125	160	195	mbar
Flowrate at $\Delta p = 1$ bar					
110 mm	K_V	1,5	3,9	----	m^3/h
130 mm	K_V	----	3,8	5,6	m^3/h
190 mm thread	K_V	1,5	3,8	5,6	m^3/h
190 mm flange	K_V	1,7	3,8	5,7	m^3/h
Mounting orientation		any			
Temperature range		10 to 130 °C			
Maximum temperature	t_{max}	150 °C for 2000 h			
Nominal pressure	PN	1.6 MPa (PN 16) 2.5 MPa (PN 25)			
Admissible measuring error acc. to EN 1434 (class 2)		2 + 0.02 q_p/q max. 5%			%

* in Germany 1:50

** in Germany: multiply value by 2

Large flow sensors

Nominal flowrate	q_p	3,5	6	10	15	25	40	60	m^3/h
Metrological class		1:100	1:100	1:100	1:100	1:100	1:100	1:100	
Maximum flow	q_s	7.0	12	20	30	50	80	120	m^3/h
Minimum flow	q_i	35	60	100	150	250	400	600	l/h
Operating limit ***		7	12	20	30	50	80	120	l/h
Pressure drop at q_p :									
thread	Δp	60	180	100	----	----	----	----	mbar
150 / 200 mm	Δp		240	130					mbar
flange	Δp	60	180	165	100	105	160	115	mbar
200 mm	Δp				95				mbar
Flowrate at $\Delta p = 1$ bar									
thread	K_V	14	14	32	---	---	---	---	m^3/h
150 / 200 mm	K_V		12	28					
flange	K_V	14	14	25	47	77	100	177	m^3/h
200 mm	K_V				48				
Mounting orientation		any							
Temperature range		10 to 130 °C							
Maximum temperature	t_{max}	150 °C for 2000 h							
Nominal pressure	PN	1.6 MPa 2.5 MPa					2,5 MPa (PN 25)	1,6 MPa (PN16) 2,5 MPa (PN25)	
Admissible measuring error acc. to EN1434 (class 2)		2+ 0,02 q_p/q max. 5%						%	

*** standard setting, meters with 200% of the value are also available

Important Notes

- Regulations for the use of heat meters must be observed, see EN 1434, Part 6! Particularly cavitation in the system must be avoided.
- Ensure by appropriate mounting of the meter that flooding the meter or water dripping is avoided.
- Flow meter safety marks relevant for calibration must not be damaged or removed! Doing so void the warranty and calibration validity of the device.
- The transport of the flow meter is permitted only in the original package.
- If the meter needs to be sent by air freight then the battery must be removed prior to shipping! (IATA rule).
- Installation and commissioning instructions are added to each meter

Ordering data:

MLFB-digit:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16
	2	W	R	7														

Nominal flowrate 0.6 m³/h, length 110mm, nominal pressure PN16, connection threaded ¾";	0	5																
Nominal flowrate 0.6 m³/h, length 110mm, nominal pressure PN25, connection threaded ¾";	0	6																
Nominal flowrate 0.6 m³/h, length 190mm, nominal pressure PN16, connection threaded 1";	0	7																
Nominal flowrate 0.6 m³/h, length 190mm, nominal pressure PN25, connection flanged DN 20;	0	8																
Nominal flowrate 0.6 m³/h, length 190mm, nominal pressure PN25, connection threaded 1";	0	9																
Nominal flowrate 1.5 m³/h, length 110mm, nominal pressure PN16, connection threaded ¾";	2	1																
Nominal flowrate 1.5 m³/h, length 110mm, nominal pressure PN25, connection threaded ¾";	2	2																
Nominal flowrate 1.5 m³/h, length 190mm, nominal pressure PN16, connection threaded 1";	2	3																
Nominal flowrate 1.5 m³/h, length 190mm, nominal pressure PN25, connection flanged DN 20;	2	4																
Nominal flowrate 1.5 m³/h, length 190mm, nominal pressure PN25, connection threaded 1";	2	5																
Nominal flowrate 2.5 m³/h, length 130mm, nominal pressure PN16, connection threaded 1";	3	6																
Nominal flowrate 2.5 m³/h, length 130mm, nominal pressure PN25, connection threaded 1";	3	7																
Nominal flowrate 2.5 m³/h, length 190mm, nominal pressure PN16, connection threaded 1";	3	8																
Nominal flowrate 2.5 m³/h, length 190mm, nominal pressure PN25, connection flanged DN 20;	3	9																
Nominal flowrate 2.5 m³/h, length 190mm, nominal pressure PN25, connection threaded 1";	4	0																
Nominal flowrate 3.5 m³/h, length 260mm, nominal pressure PN16, connection threaded 1½";	4	5																
Nominal flowrate 3.5 m³/h, length 260mm, nominal pressure PN25, connection flanged DN 25;	4	6																
Nominal flowrate 3.5 m³/h, length 260mm, nominal pressure PN25, connection threaded 1½";	4	7																
Nominal flowrate 6.0 m³/h, length 260mm, nominal pressure PN16, connection threaded 1½";	5	0																
Nominal flowrate 6.0 m³/h, length 260mm, nominal pressure PN25, connection flanged DN 25;	5	2																
Nominal flowrate 6.0 m³/h, length 150mm, nominal pressure PN16, connection threaded 1½";	5	5																
Nominal flowrate 10 m³/h, length 300mm, nominal pressure PN16, connection threaded 2";	6	0																
Nominal flowrate 10 m³/h, length 300mm, nominal pressure PN25, connection flanged DN 40;	6	1																
Nominal flowrate 10 m³/h, length 200mm, nominal pressure PN16, connection threaded 2";	6	3																
Nominal flowrate 15 m³/h, length 270mm, nominal pressure PN25, connection flanged DN 50;	6	5																
Nominal flowrate 15 m³/h, length 200mm, nominal pressure PN25, connection flanged DN 50;	6	9																

MLFB-digit:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16
Nominal flowrate 25 m³/h, length 300mm, nominal pressure PN25, connection flanged DN 65;					7	0												
Nominal flowrate 40 m³/h, length 300mm, nominal pressure PN25, connection flanged DN 80;					7	4												
Nominal flowrate 60 m³/h, length 360mm, nominal pressure PN16, connection flanged DN 100;					8	2												
Nominal flowrate 60 m³/h, length 360mm, nominal pressure PN25, connection flanged DN 100;					8	3												
As a flow meter with removable housing;							D											
No temperature sensors;									8	A								
Compact version (until 90°C, with 0.3m control cable);											A							
Split version with 1.5m control cable;											C							
Split version with 3m control cable;											D							
Without power supply;												0						
With 9-year battery;												2						
With 5-year battery;												B						
With bipolar pulse output, especially for battery driven calculators / collectors, 2m cable;													C					
Logo Landis+Gyr ULTRAHEAT															0			
Logo neutral;															C			
Dial plate for Germany;																A		
Dial plate for Sweden;																C		
Dial plate for the Czech Republic;																G		
Dial plate for the Ukraine;																N		
Dial plate in English, not country-specific																T		
Dial plate for Teplokom Russia																Z*		
Dial plate for Kazakhstan;																Z*		
Dial plate for Belarus;																Z*		
Dial plate for Lithuania;																Z*		
Dial plate for Ukraine/Techprylad;																Z*		
Dial plate for Armenia;																Z*		
Dial plate for Aqua Ukraine;																Z*		
Dial plate for Russia;																Z*		
Dial plate for Uzbekistan																Z*		
Pulse parameters according to default table;																	M	

MLFB-digit:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	
Tested according to national regulations (not CEN), with lock mark.																			0
Certified according to national regulations (not CEN), Japan only.																			1
Tested according to CEN 1434 class 3, with lock mark.																			2
Certified according to CEN 1434 class 3. **																			3
Tested according to CEN 1434 class 2, with lock mark.																			4
Certified according to CEN 1434 class 2.																			5
Tested according to national regulations (not CEN), without lock mark.																			6
Tested according to CEN 1434 class 3, without lock mark.																			7
Tested according to CEN 1434 class 2, without lock mark.																			8
conform according to MID class 2																			S
conform according to MID class 3																			R
With test protocol, certification/test according to order number supplement (ATG).																			9

* Order number supplement (ATG) required

** Certified acc. to CEN applies only to Germany, Austria and Russia.

Certification fees according to the currently valid calibration and certification cost regulations.

Type codes and supplements:

For the exact definition of special meter versions order number supplements (ATGs) may be necessary. The structure of the ordering code is then as follows:

Example of type codes

Type reference:	2WR7	38	D	-	8F	A	B	C	-	0	A	M	2	(-Z)	xyz
Basic type	x	x	x		x	x	x	x		x	x	x	x		x
Nominal flowrate	x x x x	x	x		x	x	x	x		x	x	x	x		x
Integration			x		x	x	x	x		x	x	x	x		x
Not relevant					x	x	x	x		x	x	x	x		x
Electronics design					x	x	x	x		x	x	x	x		x
Power supply						x	x	x		x	x	x	x		x
Communication interface										x	x	x	x		x
Manufacturer's label											x	x	x		x
Country												x	x		x
Parameters													x		x
Certification															x
ATG(s)															x

Example for a special dial plate (Russia):

2 W R 7 0 5 D - 8 F C 2 C - 0 Z M 2 P 2 A

The most used ATGs can be taken from the table next page:

Order number supplements:

**Variants of the sensor
via ATG:**

Condition in the MLFB	Meaning	ATG
14th digit is Z	Dial plate for Teplokom Russia	P 2 A
14th digit is Z	Dial plate for Kazakhstan;	P 3 A
14th digit is Z	Dial plate for Belarus;	P 4 A
14th digit is Z	Dial plate for Lithuania;	P 7 A
14th digit is Z	Dial plate for Ukraine/Techprylad;	P 2 B
14th digit is Z	Dial plate for Armenia;	P 5 B
14th digit is Z	Dial plate for Aqua Ukraine;	P 6 B
14th digit is Z	Dial plate for Russia;	P 7 B
14th digit is Z	Dial plate for Uzbekistan;	P 8 B
16th digit is 9	Tested according to national regulations, lock mark, with test report	R 0 P
16th digit is 9	Certified according to national regulations (only Japan), with test report	R 1 P
16th digit is 9	Tested according to CEN 1434 class 3, lock mark, with test report	R 2 P
16th digit is 9	Certified according to CEN 1434 class 3 with test report	R 3 P
16th digit is 9	Tested according to CEN 1434 class 2, lock mark, with test report	R 4 P
16th digit is 9	Certified according to CEN 1434 class 2 with test report	R 5 P
16th digit is 9	Tested according to national regulations with test report	R 6 P
16th digit is 9	Tested according to CEN 1434 class 3 with test report	R 7 P
16th digit is 9	Tested according to CEN 1434 class 2 with test report	R 8 P
16th digit is 9	Tested according to MID class 2 with test report	R S P
16th digit is 9	Tested according to MID class 3 with test report	R R P

**Variants of the sensor
via supplementary
text:**

Condition in the MLFB	Meaning	Suppl. text (with -Z..)
	Measuring tube in IP65;	W 0 2
	For cold metering, measuring tube in IP65;	K 0 0

Special mounting accessories for tubes

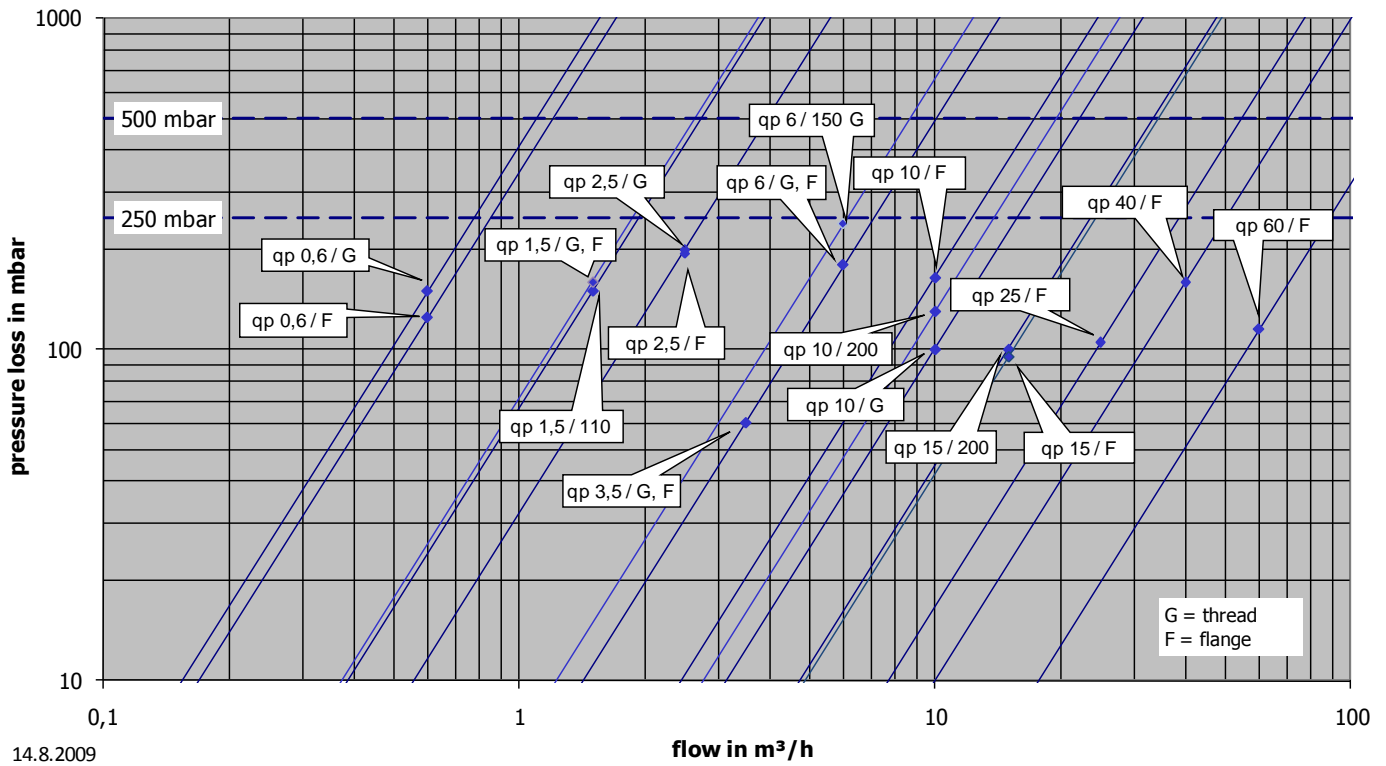
Description	Order No.
Set G ¾B – R ½ (2 meter fittings incl. 2 gaskets)	WZM-E34
Set G 1B – R ¾ (2 meter fittings incl. 2 gaskets)	WZM-E 1
Set G 5/4B - R1 (2 meter fittings incl. 2 gaskets)	WZM-E54
Set G 2B – R 3/2 (2 meter fittings incl. 2 gaskets)	WZM-E2.1
Kit extension from 110 mm G ¾ B to 130 mm G 1 B (in pairs with gaskets)	WZM-V130.G1
Kit extension from 110 mm G ¾ B to 190 mm G 1 B (in pairs with gaskets)	WZM-V190
Kit extension from 110mm G ¾ B to 130mm G ¾ B (with gaskets)	WZM-V130
Kit extension from 110mm G ¾ B to 165mm G ¾ B (two parts with gaskets)	WZM-V165
Spacer for heat meter G ¾ - 110 mm, incl. flat gaskets	WZM-G110
Spacer for heat meter G 1 - 130 mm, incl. flat gaskets	WZM-G130
Spacer for heat meter G 1 - 190 mm, incl. flat gaskets	WZM-G190
Spacer for heat meter G 1¼ - 260 mm, incl. sealing disks	WZM-G260
Spacer for heat meter G 2 – 300 mm, incl. sealing disks	WZM-G300.1
Sealing disk thread G ¾, for threaded connection R ½"	9060944002
Sealing disk thread G 1, for threaded connection R ¾"	9060944003
Sealing disk thread G 1¼, for threaded connection R 1"	9060944004
Sealing disk thread G 2, for threaded connection R 1½"	9060944006
Spacer for heat meter DN 20 - 190 mm PN 16, incl. sealing disks	WZM-F190
Spacer for heat meter DN 25 - 260 mm PN 16, incl. sealing disks	WZM-F260
Spacer for heat meter DN 50 - 270 mm PN 16, incl. sealing disks	WZM-F270
Spacer for heat meter DN 40 - 300 mm PN 16, incl. sealing disks	WZM-F300
Spacer for heat meter DN 65 - 300 mm PN 16, incl. sealing disks	WZM-F300.65
Spacer for heat meter DN 80 - 300 mm PN 16, incl. sealing disks	WZM-F300.80
Spacer for heat meter DN 100 - 360 mm PN 16, incl. sealing disks	WZM-F360.100-16
Spacer for heat meter DN 100 - 360 mm PN 25, incl. sealing disks	WZM-F360.100-25
Sealing disk for DN20 flange connection, qp 1,5 and qp 2,5	9060944021
Sealing disk for DN25 flange connection, qp 3,5 and qp 6	9060944022
Sealing disk for DN40 flange connection, qp 10	9060944024
Sealing disk for DN50 flange connection, qp 15	9060944025
Sealing disk for DN65 flange connection, qp 25	9060944026
Sealing disk for DN80 flange connection, qp 40	9060944027
Sealing disk for DN100 flange connection, qp 60	9060944028

Software and related accessories

Description	Order No.
Optical read head with 9 pin plug for PC (COM1) interface (not for pulsing interface on test rigs)	99 56 467 001
Optical read head with USB plug for PC interface (not for pulsing interface on test rigs)	WZR-OP-USB
Software UltraAssist Light, Software tool for parameterisation of tariff- and pulse values and read out for 2WR4 / 5 / 6 / 7, UH50 and UW50	INTERNET
Software UltraAssist Standard, first licence, CD with dongle for printer interface	WZX-UA-SED
Software UltraAssist Standard, second licence, with dongle for printer interface	WZX-UA-SFD
Software UltraAssist Standard, first licence, CD with pcmcia card dongle	WZX-UA-SEP
Software UltraAssist Standard, second licence, with pcmcia card dongle	WZX-UA-SFP
Software UltraAssist Standard, first licence, CD with USB dongle	WZX-UA-SEU
Software UltraAssist Standard, second licence, USB dongle	WZX-UA-SFU
Software UltraAssist Profi for test centres, first licence, CD with dongle for printer interface	WZX-UA-PED
Software UltraAssist Profi for test centres, second licence, with dongle for printer interface	WZX-UA-PFD
Software UltraAssist Profi for test centres, first licence, CD with pcmcia card dongle	WZX-UA-PEP
Software UltraAssist Profi for test centres, second licence, with pcmcia card dongle	WZX-UA-PFP
Software UltraAssist Profi for test centres, first licence, CD with USB dongle	WZX-UA-PEU
Software UltraAssist Profi for test centres, second licence, USB dongle	WZX-UA-PFU

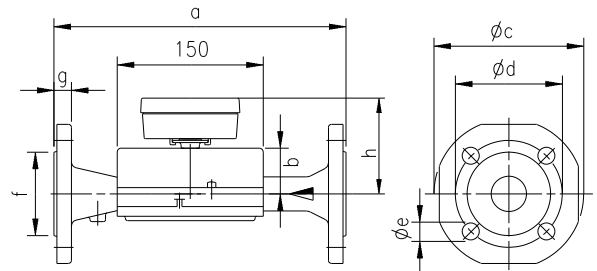
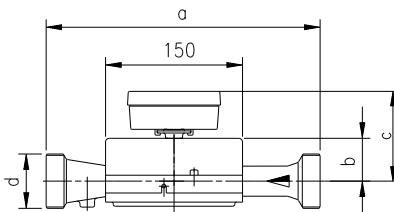
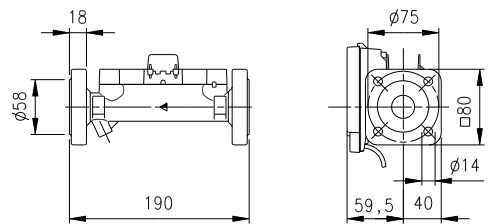
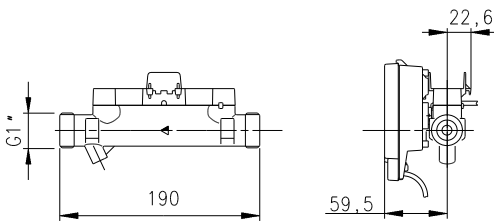
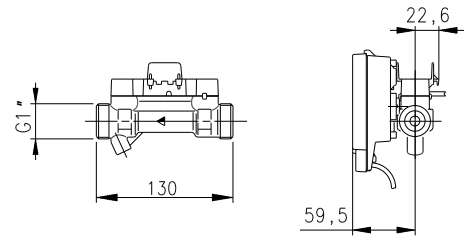
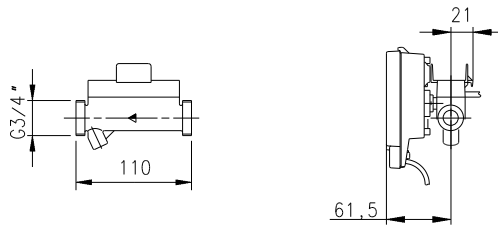
Pressure loss characteristics:

pressure loss



Dimensions

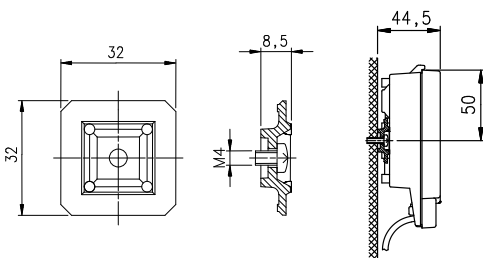
Meter dimensions:



Order No.	qp m³/h	PN bar	a	b	c	d
2WR7 45	3,5	16	260	51	96	G 1¼ B
2WR7 50	6	16	260	51	96	G 1¼ B
2WR7 55	6	16	150	22	63	G 1¼ B
2WR7 63	10	16	200	48	93	G 2 B
2WR7 60	10	16	300	48	93	G 2 B

Order No.	qp m³/h	PN bar	DN	a	b	Øc	Ød	Øe	No. of holes	f	g	h
2WR7 46	3,5	25	25	260	51	115	85	14	4	68	18	96
2WR7 52	6	25	25	260	51	115	85	14	4	68	18	96
2WR7 61	10	25	40	300	48	150	110	18	4	88	18	93
2WR7 65	15	25	50	270	46	165	125	18	4	102	20	91
2WR7 69				200								107
2WR7 70	25	25	65	300	52	185	145	18	8	122	22	97
2WR7 74	40	25	80	300	56	200	160	18	8	138	24	101
2WR7 82	60	16	100	360	68	235	180	18	8	158	24	113
2WR7 83	60	25	100	360	68	235	190	22	8	158	24	113

Wall mounting of electronic unit:



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