Static Heat Meter ULTRAHEAT   2WR5...

Version 2.12 and higher

Meter for measurement of flow and heat energy in a heat exchanger circuit with water using an ultrasonic principle. Important properties are

- **Non-wearing due to non-moving parts**
- **Measuring range of flow 1:100 acc. to EN1434, 1:1000 total range**
- **Any mounting orientation, in flow or return, no settling sections or flow straighteners**
- **Demand measurements with maximum values, tariffs selectable**
- **36 monthly values**
- **Battery or mains operated**
- **Optical interface acc. to EN 61107**
- **Modules for remote readout and control**
- **Also operable as a flow meter or cold meter or heat/cold meter**
- **Self-diagnostics**

Application

2WR5 heat meters are used to measure heat consumption in district heating networks and in multi-family houses. It can be used for cold measurement at the same time (solely or together with heat measurement) and for pure flow measurement in systems using water as the medium.

Heat meter design

The heat meter comprises a calculator, a flow measuring part and two temperature sensors.

Method of operation

The quantity of thermal energy transferred from the heating water to the heat consumer over a defined period of time is proportional to the temperature difference between the flow and return and the volume of heating water that has flowed through.

The **heating water volume** is measured in the measuring tube by ultrasonic pulses which are transmitted in the direction of flow and against the direction of flow. Downstream, the delay between the transmitter and receiver is reduced, upstream it is increased. The heating water volume is then calculated using the measured values for the delay.

The **flow and return temperatures** are determined using platinum resistors.

The heating water volume and the difference in temperature between the flow and return are multiplied and its product integrated. The result which is the consumed **quantity of thermal energy or cold** is registered and displayed in the physical **units kWh / MWh, or MJ / GJ,** the quantity of flow in **m^3**.

Calculator

A standard calculator is used for all flow rate values with identical operation and an integrated service unit.

Tariffs

Alternative options are:
- Combined heat/cold metering with automatic switchover
- Tariff register with up to 3 threshold values for demand or flowrate or temperature difference or return temperature
- Tariff register with daily switch on/off times
- Tariff register switched on/off via M-bus
- Acquisition of supplied or returned quantity of thermal energy

Interfaces of the Calculator

ULTRAHEAT 2WR5 heat meters are all equipped with an optical interface to EN 61107 as a standard, e.g. for connecting the tool PappaWin for parameter setting and diagnostics.

In addition, one of the following **communications modules** can be added for remote readout:
- **Pulse module (heat and volume/ cold/ unit status),** isolated and bounce-free transistor switches
- **Current loop module** (CI, 20 mA current loop to EN 61107)
- **Combination 1: pulse and current loop module** (not suitable for "fast pulses")
- **M-bus module to EN 1434-3**, fixed or extended variable protocol (also for connection to a suitable heating programmer)
- **Combination 2: M-bus module with one pulse output**
- **Modem module** (analogue modem for connection to PSTN)

These modules do not affect acquisition of the consumption and can therefore be retrofitted at any time without affecting the calibration mark.

Standard pulses and fast pulses

"Standard pulses" are pulses for heat and volume which have got fixed pulse significances ex works which are only dependant from the nominal flow rate of the meter. The related fixed pulse width is 100 ms. Both outputs of the pulse module are active. Not possible for module combination 2. For details about the pulse significances see the Configuration manual UH 102-101.

"Fast pulses" can be (and need to be) set in the service mode of the meter within a wide range regarding pulse significance and width by using the PappaWoin software. In this case **only one output at terminals 16 and 17 is active**, independant if it is heat or volume. The pulse parameters set are displayed in service loop 3. Fast pulses are not possible with module combination 1.

Display content

The heat meter display is subdivided into several levels and may differ from the standard shown below. The user loop display (level 1) is advanced cyclically each time the button is pressed briefly.

User loop

_0054567	**kWh**	Accum. qty of thermal energy
C 0036421	**kWh**	Tariff register, here, e.g. cold
0006543	**m³**	Accumulated volume
8888888	**kWh**	Segment test
F - - -		Error with/without error digit

The tariff displays can vary depending on the tariff type. The displays shown here are for a combined heat/cold meter. The valid tariff status is displayed together with the thermal energy as _ , = or ≡.

With a pure flow meter the heat and tariff registers are not displayed.
If button is held pressed for three seconds, the display switches from the user loop to the service loops (level 2).

Service loops

LOOP	*1*	Service loop 1
LOOP	*2*	Service loop 2
LOOP	*3*	Service loop 3

One of the service loops is selected by pressing the button briefly. The button can be pressed for another 3s to display the contents of the selected service loop each time the button is pressed briefly.
The service loops are exited by holding the button pressed for 3s or automatically after 30 minutes.

Service loop 1

0,543	*m³/h*	Current flowrate
22,9	*kW*	Current heat output
84 47	*°C*	Current flow and return temperature
T 9 18,0	*°C*	Threshold value for the tariff, e.g. T_V
K 2345678		Customer number, 7-digit
D 18,02,01		Date
S 01,01,- -		Annual set day (dd.mm)
V 0034321	*kWh*	Heat for previous year on set day
C 0009468	*kWh*	Tariff register for previous year on set day
V 00923,12	*m³*	Volume for previous year on set day
2- 12	*FW*	Version of firmware

The **monthly values** are displayed in service loop 2. One of the previous 36 monthly values can be selected by pressing the button briefly. The corresponding data are then opened by pressing the button for 3s. Each time the button is pressed briefly the next value for the selected month is displayed.

Service loop 2		

01,02,01	*M*	Set day previous month Jan. 2001
01,01,01	*M*	Set day previous month Dec. 2000
01,12,00	*M*	Set day previous month Nov. 2000
		Pressing the button for more than 3s k:
0004321	*kWh*	Qty of thermal energy on this set day
C 0036421	*kWh*	Tariff register on this set day, e.g. cold
00021,20	*m³*	Volume on this set day
M 0,985	*m³/h*	Max. flowrate in Nov. 2000
S 21,11,00	*M*	changing with date stamp every 2s
M 15,9	*kW*	Maximum heat output in Nov.
S 15,11,00	*M*	changing with date stamp every 2s
M 103 39	*°C*	Max. temperatures in Nov.
S 28,11,00	*M*	Changing with date stamps of flow and
S 07,11,00	*M*	return every 2s/2s
F 0	*h*	Status of missing hour counter on this set day

Finally, the current set day is again displayed and the next set day is selected by pressing the button briefly.

Service loop 3		

P1 1000,0	*Wh/l*	Parameter of „fast pulses": significance of energy pulses
P2 0,0	*L/ l*	Parameter of „fast pulses": Significance of volume pulses
P3 20,0	*mS*	Parameter of „fast pulses": Pulse length in ms
TP 30	*SEC*	Interval of temperature measurement
- -,- -,- -	*F0*	Date stamp for F0 warning
Modul	*MB*	Type of built in module

Monthly values

The calculator stores for 36 months at the set day the values of

- Heat (meter reading on set day at 00:00h)
- Tariff (register reading)
- Volume (reading)
- Max. flowrate (monthly maximum averaged across the measurement period, standard 60 min), with date stamp
- Max. demand (monthly maximum averaged across the measuring period), with date stamp
- Max. temperatures (monthly maximum) with date stamp each for flow and return
- Missing hour counter (reading)

which can be read via the current loop module or by using the PappaWin Standard software via the optical interface.

Special versions

Thread versions are normally PN 16, but mostly also deliverable as PN 25 version on request.

The meter can be supplied for **installation in the flow** if this is specified on the order.

For use as a **flow meter** with pulse module for connecting an external calculator or as a **condensate meter** (both without temperature sensor).

For use as a **cold meter 12/6°C or combined heat/cold meter** for water.

Control cable lengths between the measuring tube and electronic unit **up to 5 m** possible

Power supply

6, 9 or 11 year **battery** or
230V or 110V AC or 24V DC, 24V AC **power supply unit**

The available battery life times are shown in the table below (dependant of battery size and certain modi of operation):

Fast pulses and/or 4s-temperature measurement cycle	Fast M-bus reading	Life time in years	
		With a C-Cell *	With a D-Cell
---	---	**6**	**6, 9, 11 ****
X	---	-----	**6, 9, 11 ****
---	**X**	-----	**6**

* MLFB-digit 11 = „7"
** Battery life times of 9 or 11 years are only available for heat meters which are configured accordingly during the production process.

Installation of a 230V power supply module:

2-way connector

220...240V~
50/60Hz

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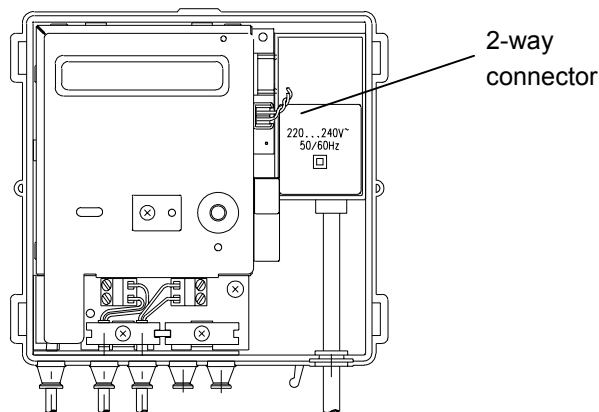
Temperature sensor

Temperature sensors Pt100 or Pt500 in the following two-wire versions are recommended:

Standard types:
- Type DS / M10x1, direct immersion, immersion length 27.5 mm, up to q_p 2.5
- Thread 1/4" / Ø 6x100 mm for pocket q_p 3.5 and larger
- Thread 1/4" / Ø 6x150 mm, for pocket q_p 40 and larger

Special versions:
- Type DS / M10x1, direct immersion, immersion length 38 mm
- Ø 5.2x45 mm, direct immersion or for pocket

The sensors are available with different cable lengths.

Integrated return sensor:
Can be ordered for sensors with length up to 45mm for volume measuring parts with thread connection (except for q_p 10).

Approval

EN 1434 class 2 or 3, PTB and in most European countries.

Technical data of calculator

Temperature range	2 to 180 °C if integrated in return 10 to 130 °C if integrated in flow (restricted due to T-range of flow unit)
Temperature difference range $\Delta\Theta$	3 to 120 K
Switch-off limit	0.2 K
Heat coefficient	sliding compensation
Δ t measurement error without sensor (EN 1434)	$\pm\ (\ 0{,}5 + \Delta\Theta_{min}/\Delta\Theta\ )$ %, max. 1,5% at $\Delta\Theta$=3K
Ambient temperature	5 – 55 °C

Volume measuring units

q_p m³/h	Length mm	Thread Flange	Pressure stage
0.6	110	Th	PN16 (or PN25)
1.0	110	Th	PN16 (or PN25)
1.5	110	Th	PN16 (or PN25)
0.6	190	Th, F	PN16 (or PN25)
1.0	190	Th, F	PN16 (or PN25)
1.5	190	Th, F	PN16 (or PN25)
2.5	190	Th, F	PN16 (or PN25)
3.5	260	Th, F	PN16 (or PN25)
6.0	260	Th, F	PN16 (or PN25)
10	300	Th, F	PN16 (or PN25)
15	270	F	PN25
25	300	F	PN25
40	300	F	PN25
60	360	F	PN16 (or PN25)

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

Technical data for flow measurement

Small heat meters:

Nominal flowrate	q_p	**0.6**	**1.0**	**1.5**	**2.5**	m^3/h
Metrological class		1:100*	1:100*	1:100*	1:100*	
Maximum flow	q_s	1.2	2.0	3,0	5,0	m^3/h
Minimum flow	q_i	6**	10**	15**	25**	l/h
Operating limit		1.2	2.0	3.0	5	l/h
Pressure drop at q_p, (110/190mm)	Δp	140/55	60/140	130/130	- /140	mbar
Flowrate at Δp = 1 bar, (110/190mm)	K_V	1.6/2.6	4.1/2.7	4.2/4.2	6.7	m^3/h
Mounting orientation		any				
Temperature range		10 to130 °C				
Maximum temperature	t_{max}	150 °C for 2000 h				
Nominal pressure	PN	1.6 MPa (PN 16) 2.5 MPa (PN 25)				
Measuring error acc. to EN 1434 (class 2)		2 + 0.02 q_p/q max. 4% at q_i			%	

* in Germany 1:50
** in Germany: multiply value by 2

Large heat meters:

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,	Δp	60	170	120	120	70	120	140	mbar
Flowrate at Δp = 1 bar	K_V	14	14	28	42	95	115	160	m^3/h
Mounting orientation					any				
Temperature range					10 to130 °C				
Maximum temperature	t_{max}				150 °C for 2000 h				
Nominal pressure	PN	1.6 MPa 2.5 MPa			2,5 MPa (PN 25) 4,0 MPa (PN 40)		1,6 MPa (PN16) 2,5 MPa (PN25)		
Measuring error acc. to EN1434 (class 2)					2+ 0,02 q_p/q max. 4% at q_i			%	

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ULTRAHEAT®
q_p 0,6 - q_p 2,5 m³/h

Ultrasonic heat meter ULTRAHEAT® in short design with thread connection
incl. temperature sensor Pt 500, M 10 x 27.5 mm, type DS to EN1434 for direct mounting, cable length 1.5 m, return sensor integrated in volume measuring unit. Removable calculator, with 1.5 m control cable, display in MWh, with 6-year battery, Installation in return, plus 2 fittings and 1 mounting element for flow sensor.

Nominal size q_p (Qn)	Overall length mm	Connection	Pressure stage PN	Order No.
q_p 0,6	110	G 3/4	16	2WR5051-5BC70-0TB2
q_p 1,5	110	G 3/4	16	2WR5211-5BC70-0TB2
Mounting element for temperature sensor DS, M 10 x 1/2", with Cu seal				WZT-A12
Fitting R 1/2 ", with seals			pair	WZM-E12

Ultrasonic heat meter ULTRAHEAT® in standard design with thread connection
incl. temperature sensor Pt 500, M 10 x 27.5 mm, type DS to EN1434 for direct mounting, cable length 1.5 m, return sensor integrated in volume measuring unit. Removable calculator, with 1.5 m control cable, display in MWh, with 6-year battery, Installation in return, plus 2 fittings and 1 mounting element for flow sensor.

Nominal size q_p (Qn)	Overall length mm	Connection	Pressure stage PN	Order No.
q_p 0,6	190	G 1	16	2WR5071-5BC70-0TB2
q_p 1,5	190	G 1	16	2WR5231-5BC70-0TB2
q_p 2,5	190	G 1	16	2WR5381-5BC70-0TB2
Mounting element for temperature sensor DS, M 10 x 1/2", with Cu seal				WZT-A12
Fitting R 3/4 ", with seals			pair	WZM-E1

Ultrasonic heat meter ULTRAHEAT® in standard design with flange connection
incl. temperature sensor Pt 500, M 10 x 27.5 mm, type DS to EN1434 for direct mounting, cable length 1.5 m, external return sensor.
Removable calculator, with 1.5 control cable, display in MWh, with 6-year battery, installation in return, plus 2 fittings for flow and return sensor.

Nominal size q_p (Qn)	Overall length mm	Connection	Pressure stage PN	Order No.
q_p 0,6	190	DN 20	25	2WR5080-5BC70-0TB2
q_p 1,5	190	DN 20	25	2WR5240-5BC70-0TB2
q_p 2,5	190	DN 20	25	2WR5390-5BC70-0TB2
Mounting element for temperature sensor DS, M 10 x 1/2", with Cu seal				WZT-A12

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Preferred types for Germany ULTRAHEAT®
q_p 3,5 - q_p 60 m³/h

Ultrasonic heat meter ULTRAHEAT® in standard design with thread connection

Incl. temp. sensor Pt 500, mounting length 100 mm, for protection pockets, cable length 2 m. Removable calculator, with 1.5 m control cable, display in MWh, with 6-year battery, Mounting in return, plus 2 fittings and 2 pockets.

Nominal size q_p (Qn)	Overall length mm	Connection	Pressure stage PN	Order No.
q_p 3.5	260	G 1 1/4	16	2WR5450-5MC70-0TB2
q_p 6	260	G 1 1/4	16	2WR5500-5MC70-0TB2
q_p 10	300	G 2	16	2WR5600-5MC70-0TB2
Pocket R 1/2" mounting size 100 mm, stainless steel, with Cu seal				WZT-S100
Fitting R 1", with seal	for q_p 3,5 und 6		pair	WZM-E54
Fitting R 1 1/2", with seal	for q_p 10		pair	WZM-E2

Ultrasonic heat meter ULTRAHEAT in standard design with flange connection

Incl. temperature sensor Pt 500, to q_p 25 with 100 mm mounting length, beyond that with 150 mm length, for protection pockets, cable length 2 m. Removable calculator with 1.5 m control cable, display in MWh, with 6-year battery, including 2 protection pockets.

Nominal size q_p (Qn)	Overall length mm	Connection	Pressure stage PN	Order No.
q_p 3.5	260	DN25	25	2WR5460-5MC70-0TB2
q_p 6	260	DN 25	25	2WR5520-5MC70-0TB2
q_p 10	300	DN 40	25	2WR5610-5MC70-0TB2
q_p 15	270	DN 50	25	2WR5650-5MC70-0TB2
q_p 25	300	DN 65	25	2WR5700-5MC70-0TB2
q_p 40	300	DN 80	25	2WR5740-5PC70-0TB2
q_p 60	360	DN 100	16	2WR5820-5PC70-0TB2
Pocket R 1/2" mounting length 100 mm, stainless steel, with Cu seal				WZT-S100
Pocket R 1/2" mounting length 150 mm, stainless steel, with Cu seal				WZT-S150

Modules for remote readout

Pulse module	9956182001
M-bus module, fixed or variable data structure	9975138001
CL module, passive 20 mA interface to EN 1434-3	9956181001
Combi module 1 comprising pulse module and CL module	9975109001
Combi module 2 comprising M-bus module and one pulse output	9975138002
Modem module, transparent analogue modem	9975137001

ULTRAHEAT 2WR5 is also supplied and approved as a volume meter (e.g. for water or steam condensate), or as a combined heat/cold meter. Please refer to the order data overview for versions available.

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

Ordering data:

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

Preferred types with light background.

Description	5	6	7	-	8	9	10	11	12	-	13	14	15	16
Nominal flowrate 0.6 m³/h, length 110mm, nominal pressure PN16, connection threaded 3/4";	0	5												
Nominal flowrate 0.6 m³/h, length 110mm, nominal pressure PN25, connection threaded 3/4";	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 1.0 m³/h, length 110mm, nominal pressure PN16, connection threaded 3/4";	1	5												
Nominal flowrate 1.0 m³/h, length 110mm, nominal pressure PN25, connection threaded 3/4";	1	6												
Nominal flowrate 1.0 m³/h, length 190mm, nominal pressure PN16, connection threaded 1";	1	7												
Nominal flowrate 1.0 m³/h, length 190mm, nominal pressure PN25, connection flanged DN 20;	1	8												
Nominal flowrate 1.0 m³/h, length 190mm, nominal pressure PN25, connection threaded 1";	1	9												
Nominal flowrate 1.5 m³/h, length 110mm, nominal pressure PN16, connection threaded 3/4";	2	1												
Nominal flowrate 1.5 m³/h, length 110mm, nominal pressure PN25, connection threaded 3/4";	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 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 11/4";	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 11/4";	4	7												
Nominal flowrate 6.0 m³/h, length 260mm, nominal pressure PN16, connection threaded 1 1/4";	5	0												
Nominal flowrate 6.0 m³/h, length 260mm, nominal pressure PN25, connection flanged DN 25;	5	2												
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 15 m³/h, length 270mm, nominal pressure PN25, connection flanged DN 50;	6	5												
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												

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MLFB-digit:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16
Preferred types with light background.																		
Mounting in return, return sensor not integrated into the volume measuring unit;							0											
Mounting in return, return sensor directly integrated into the volume measuring unit, (only possible for threaded connection up to q_p 6):							1											
Mounting in return, return sensor mounting external or integrated into the volume measuring unit, (only possible for threaded connection up to q_p 6):							2											
Mounting in flow, flow sensor not integrated into the volume measuring unit;							3											
Mounting in flow, flow sensor directly integrated into the volume measuring unit, (only possible for threaded connection up to q_p 6):							4											
Mounting in return, return sensor integrated into the volume measuring unit in a protection pocket, (only possible for threaded connection up to q_p 6):							6											
Mounting in flow, flow sensor integrated into the volume measuring unit in a protection pocket, (only possible for threaded connection up to q_p 6):							7											
Mounting as condensate meter without temperature sensor;							8											
For paired sensor Pt100, replaceable, supplied without sensor;									0	A								
Sensor Pt100, replaceable, directly in water, type DS /M10x1/immersion depth 27.5mm, cable length 1.5m;									1	B								
Sensor Pt100, replaceable, directly in water, type DS /M10x1/ mmersion depth 27.5 mm, cable length 2.5 m;									1	C								
Sensor Pt100, replaceable, thread 1/4" / diam. 6x100 mm, cable length 2.0m;									1	M								
Sensor Pt100, replaceable, thread 1/4" / diam. 6x150 mm, cable length 2.0 m;									1	P								
For paired sensor Pt500, replaceable, supplied without sensor;									4	A								
Sensor Pt500, replaceable, directly in water, type DS /M10x1/immersion depth 27.5 mm, cable length 1.5 m;									5	B								
Sensor Pt500, replaceable, directly in water, type DS /M10x1/immersion depth 27.5 mm, cable length 2.5 m;									5	C								
Sensor Pt500, replaceable, directly in water, type DS /M10x1/immersion depth 38 mm, cable length 1.5 m;									5	D								
Sensor Pt500, replaceable, directly in water, type DS /M10x1/immersion depth 38 mm, cable length 2.5 m;									5	E								
Sensor Pt500, replaceable, directly in water or for protection pocket, diam. 5.2x45 mm, cable length 1.5 m;									5	H								
Sensor Pt500, replaceable, directly in water or for protection pocket, diam. 5.2x45mm, cable length 5m;									5	J								
Sensor Pt500, replaceable, thread 1/4" / diam. 6x100 mm, cable length 2.0 m;									5	M								
Sensor Pt500, replaceable, thread 1/4" / diam. 6x100mm, cable length 5.0m;									5	N								
Sensor Pt500, replaceable, thread 1/4" / diam. 6x150 mm, cable length 2.0m;									5	P								
Sensor Pt500, replaceable, thread 1/4" / diam. 6x150mm, cable length 5.0m;									5	Q								
Sensor Pt500, not removable, directly in water, type DS /M10x1/immersion length 27.5 mm, cable length 1.5 m;									6	B								
Sensor Pt500, not removable, directly in water, type DS / M10x1/ immersion length 27.5 mm, cable length 2.5 m;									6	C								
No temperature sensor for condensate meter;									8	A								
More sensors available on request																		

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MLFB-digit:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16
Preferred types with light background.																		
Compact design with 1.5 m control cable;											A							
Split variant with 1.5 m control cable;											C							
Split variant with 3.0 m control cable;											D							
Split variant with 5.0 m control cable;											E							
With 6-year battery, standard (not for fast M-Bus reading(4s) or frequent temperature measure-ment(4s) or fast pulses);												7						
With 9-year battery (not for fast M-Bus reading(4s));												2						
With 11-year battery (not for fast M-Bus reading(4s));												3						
With 6-year battery (for all applications);												1						
With 24 V direct voltage, cable length 1.5 m;												4						
With 24 V alternating voltage, cable length 1.5 m;												5						
With 230 V alternating voltage, cable length 1.5 m;												6						
With 110 V alternating voltage, cable length 1.5 m;												8						
Communication module upgradeable;													0					
With pulse module (thermal energy quantity and volume)													1					
With pulse module (thermal energy quantity and status)													1*					
With pulse module (thermal energy quantity and cold)													1*					
With pulse module for fast pulses ***;													1					
With combi module (pulse module and CL module);													3					
With M-bus module ;													5					
With combi module (M-bus and fast pulses);													6*					
With CL module (current loop);													7					
With modem module													8					
Logo ULTRAHEAT															0			
Logo Siemens Landis & Staefa															6			
Dial plate for Germany;																A		
Dial plate for Switzerland (German and French);																B		
Dial plate for Sweden;																C		
Dial plate for Austria;																D		
Dial plate for the Netherlands;																E		
Dial plate for Denmark;																F		
Dial plate for the Czech Republic																G		
Dial plate for Poland;																H		
Dial plate for Hungary;																J		
Dial plate for Croatia;																K		
Dial plate for Bulgaria;																L		
Dial plate for Iceland;																M		
Dial plate for the Ukraine;																N		
Dial plate for China;																P		

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MLFB-digit:	1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16
Preferred types with light background.																		
Dial plate for Italy;																Q		
Dial plate for Romania;																R		
Dial plate for Mongolia;																S		
Dial plate in English, not country-specific																T		
Dial plate for Slovakia																U		
Dial plate for Finland																V		
Dial plate for Japan																W		
Dial plate for Greece																X		
Dial plate for Belgium																Z*		
Dial plate for Russia																Z*		
Dial plate for Belarus																Z*		
Dial plate for Bosnia Herzegovina																Z*		
Dial plate for Spain																Z*		
Display: kWh (to q_p 10);																	A	
Display: MWh with 3 decimal places (as of q_p 15 with 2 decimal places);																	B	
Display: GJ with 3 decimal places (as of q_p 6 with 2 decimal places);																	D	
Display: m³ (for the condensate meter);																	V	
Tested according to national regulations (≠ CEN), with lock mark.																		0
Certified according to national regulations, only for Japan																		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 (≠ 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
with test report																		9*

* Order number supplement (ATG) required

** Certified applies only to Germany, Austria in this case.

*** Parameters, such as the pulse significances, can be configured with the PappaWin software after pushing the service button for 3s (until meter firmware version 2.03 only via pushing the calibration button).

Attention: fast pulses require a D-cell battery (see the table for power supply).

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: | 2WR5 | 21 | 1 | - | 5B | C | 7 | 1 | - | 0 | T | B | 2 | -Z A13 |

Basic type

Nominal flowrate

Integration

Temperature sensor

Calculator design

Power supply

Communication module

Manufacturer's label

Country

Unit of energy

Certification

ATG(s)

Example for a combined heat/cold meter with pulse module for heat and cold:

2 W R 5 2 1 1 - 5 B C 7 1 - 0 T B 2 - **Z** K 1 0 + K W K

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

Order number supplements:

Variants of the meter via ATG:

Condition in the MLFB	Meaning	ATG
14th digit is Z	Dial plate for Belgium	P 1 A
14th digit is Z	Dial plate for Russia	P 2 A
14th digit is Z	Dial plate for Belarus	P 4 A
14th digit is Z	Dial plate for Bosnia Herzegovina	P 5 A
14th digit is Z	Dial plate for Spain	P 6 A
14th digit is Z	Dial plate for Lithuania	P 7 A
14th digit is Z	Dial plate for Yugoslavia	P 8 A
16th digit is 9	Tested according to national regulations, lock mark, with test report	R 0 P
16th digit is 9	Certifierd 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
17th/18th digit is -Z	Cold meter (12 / 6 ° C) , water as medium	K 0 0
17th/18th digit is -Z	Combined cold / heat meter with separate registers for heat and cold, water as medium	K 1 0

Variants of the meter via supplementary text:

Condition	Meaning	suppl. text
Pulse module:		(with –Z)
1 or 3 in the 12th digit	Pulses for thermal energy and volume *	K W V
1 or 3 in the 12th digit	Pulses for thermal energy quantity and meter status	K W S
1 in the 12th digit	Pulses for heat and cold, only possible in conjunction with ATG K10	K W K
Fast pulses:		
	Parameter set 0001	S I 0001
M-bus address		
	Primary address 001 (standard: 000)	M B 001
Set days:		
	Yearly set day is the July, 01 (standard: 01. Jan.)	S T 0107
	Monthly set day is the 15th (standard: 01st)	M T 1 5
Dimension of times:		
	(Operating / missing) times in days instead of hours	Z A T
Measuring intervals:		
	The measuring interval for temperature measurement is 04 s instead of 30 s **	I T 0 4
	Measuring period for maximum calculation is 15 min (7.5, 15, 30, and 60 min (standard) are possible)	P 1 5
Display loops:		
	With display list No. 16	A 1 6
	Permanent display (not flashing after 15 min)	LCDE

Threshold tariffs:		
With thresholds	for flow rate, in m³/h (TFL xx.xxx_yy.yyy_zz.zzz)	TFL...
	for demand, in kW (TPO xx.x_yy.y_zz.z)	TPO...
	for return temperature, in °C (TRT xx_yy_zz)	TRT...
	for temperature difference, in K (TTD xx.x_yy.y_zz.z)	TTD...
Special variant:		
	Dynamic range 9i : 9p = 1 : 25 (for Germany only)	D 2 5
	Dynamic range qi : qp = 1 : 50 (for Austria only)	D 5 0

* standard

** D-cell battery necessary

Accessories for 2WR5

For mounting of temperature sensors	Description	Ordering No.
	Mounting element with sensor drill-hole M10 x 1 x G 1/2	WZT-A12
	Mounting element with sensor drill-hole M10 x 1 x G3/4	WZT-A34
	Protection pocket G 1/2" mounting length 100 mm, high-grade steel	WZT-S100
	Protection pocket G 1/2" mounting length 150 mm, high-grade steel	WZT-S150
	Protection pocket G 1/2" MS, 5.2 x 35 mm	9956214
	Protection pocket G 1/2", high-grade steel, ∅ 5.2 x 37mm	WZT-S43V
	Protection pocket G 1/2" MS, 5.2 x 50 mm	9956216
	Tube for protection pocket	WZT-R32
	Seal for temperature sensors DS	9060944001
	Mounting set G1/2" for direct mounting of long sensors	9956217
	Ball valve Rp 1" for sensor DS M10x1	WZT-K1
	Ball valve Rp 1/2" for sensor DS M10x1	WZT-K12
	Ball valve ¾" for sensor M10x1	WZT-K34
	Adapter for ball valves to install temperature sensors DS length 38 mm	WZT-KA
	Welding sleeve M10 x 1 for temperature sensors DS	WZT-G10
	Threaded sleeve for welding on 1/2" 45°	WZT-G12
	Welding sleeve G1/2" x 90°, for 43, 100, 150 mm sensor	WZT-GLG
	Fastener M10 x 1 with sealing disc 10 x 13,5 Cu	WZT-V10
	Fastener M10 x 1	9038482
	O ring for temperature sensor in 110 mm tube	9089815014

Mounting accessories for tubes		
	Kit extension from 110 mm G3/4 B to 130 mm G 1 B (in pairs with seals)	WZM-V130.1
	Kit extension from 110 mm G3/4 B to 190 mm G 1 B (in pairs with seals)	WZM-V190
	Kit extension from 110 mm G3/4 B to 130 mm G 3/4 B (with seals)	WZM-V130
	Kit extension from 110 mm G3/4 B to 165 mm G 3/4 B	WZM-V165
	Meter fittings for flow sensor in pipe 1/2" (2 pces with 2 sealings)	WZM-E12
	Meter fittings for flow sensor in pipe 3/4" (2 pces with 2 sealings)	WZM-E1
	Meter fittings for flow sensor in pipe 1" (2 pces with 2 sealings)	WZM-E54
	Meter fittings for flow sensor in pipe 1 1/2" (2 pces with 2 sealings)	WZM-E2
	Spacer for heat meter G 3/4 - 110 mm, incl. sealing disks	WZM-G110
	Spacer for heat meter G 1 - 190 mm, incl. sealing disks	WZM-G190
	Spacer for heat meter G 1 1/4 - 260 mm, incl. sealing disks	WZM-G260
	Spacer for heat meter G 2 – 300 mm, incl. sealing disks	WZM-G300
	Sealing disk thread G 3/4, for threaded connection R 1/2"	9060944002
	Sealing disk thread G 1, for threaded connection R 3/4"	9060944003
	Sealing disk thread G 1 1/4, for threaded connection R 1"	9060944004
	Sealing disk thread G 2, for threaded connection R 1 1/2"	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

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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

Mounting accessories for calculator

Plate for mounting on DIN rail	WZM-MH

Communications modules

Pulse module (Parameterization of fast pulses with PappaWin)	9956182001
M-bus module for fixed or variable data structure (via coding connector)	9975138001
CL (current loop) module according to EN 1434-3	9956181001
Combi-module (pulses and CL-module), not for fast pulses	9975109001
Combi module for M-bus and one pulse output (Parameterization with PappaWin)	9975138002
Modem module	9975137001

Temperature sensors (without screening)

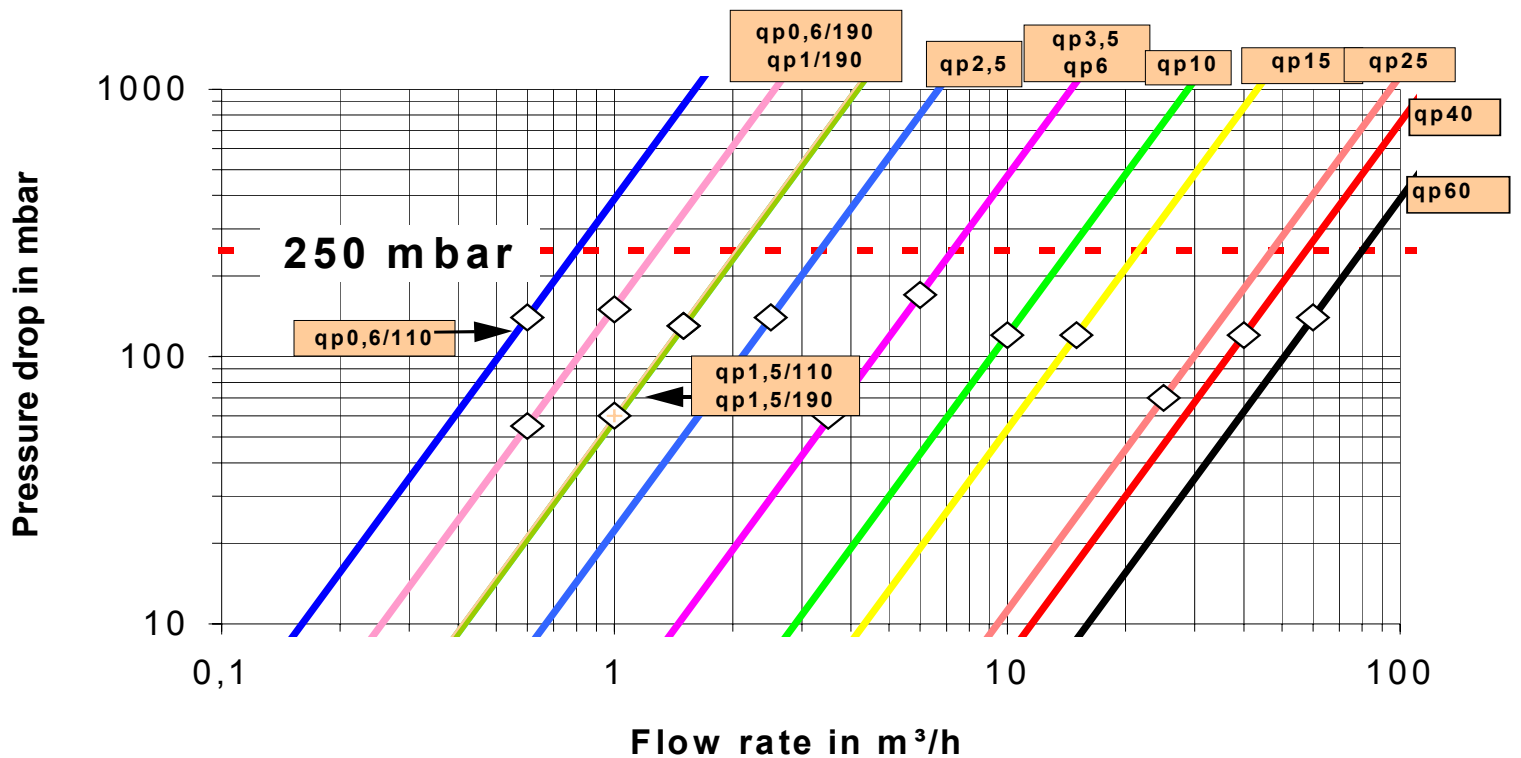|	
Temperature sensor Pt 500 (pair), length 27,5 mm, DS M10x1, cable length 1,5 m	9078360003
Temperature sensor Pt 500 (pair), length 27,5 mm, DS M10x1, cable length 2,5 m	9078360004
Temperature sensor Pt 500 (pair), length 100 mm x Ø 6 mm, cable length 2 m	9078361101
Temperature sensor Pt 500 (pair), length 100 mm x Ø 6 mm, cable length 5 m	9078361102
Temperature sensor Pt 500 (pair), length 150 mm x Ø 6 mm, cable length 2 m	9078361103
Temperature sensor Pt 500 (pair), length 150 mm x Ø 6 mm, cable length 5 m	9078361104
Temperature sensor Pt 100 (pair), length 27,5 mm, DS M10x1, cable length 1,5 m	9078360001
Temperature sensor Pt 100 (pair), length 100 mm x Ø 6 mm, cable length 2 m	9078361001
Temperature sensor Pt 100 (pair), length 150 mm x Ø 6 mm, cable length 2 m	9078361003

Power supply

Standard battery for a 6-year service life (not for special M-bus reading and not for frequent temperature measurement)	9979058001
Battery for a 6-year service life, for special M-bus reading and for frequent temperature measurement	9979057001
Power pack 220...240 V AC, 1.5 m cable	9975065016
Power pack 12 V-24 V AC, 1.5 m cable	9975065006
Power pack 12 V-24 V DC, 1.5 m cable	9975065001

Software and related accessories

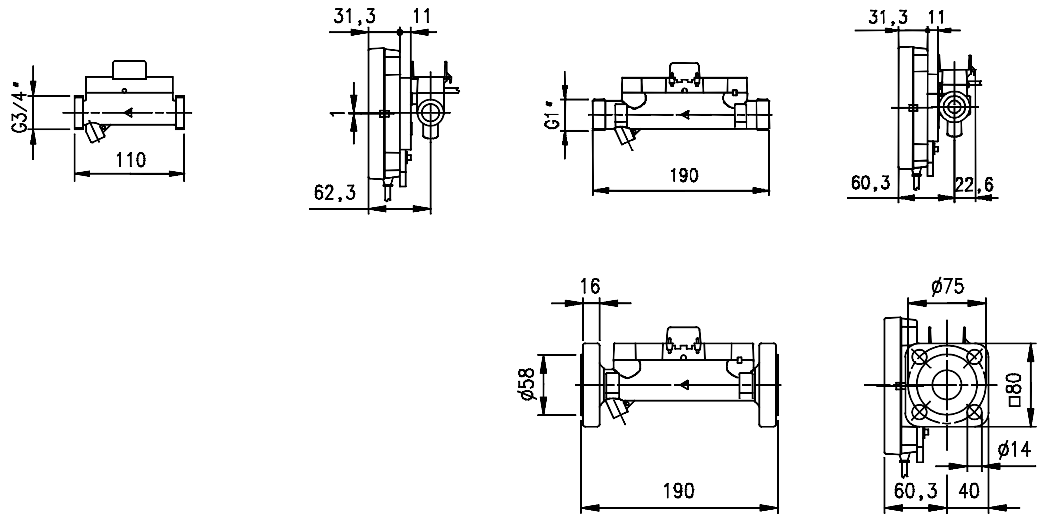|	
Optical read head with 9 pin plug for PC (COM) interface (PappaWin) or for handheld terminal (Billing Tool), not for pulsing interface on test rigs	9956467001
Optical read head with 9 pin plug for PC (COM) interface, suitable for pulse interface on test rigs	9956499001
Optical read head for NOWA / SIWAP with 15 pin plug, suitable for pulse interface on test rigs	9956499002
Software PappaWin, first license, CD-ROM, with dongle for parallel port	2WR9300-0AA11-0A
Software PappaWin, second license, CD-ROM, with dongle for parallel port	2WR9300-1AA11-0A

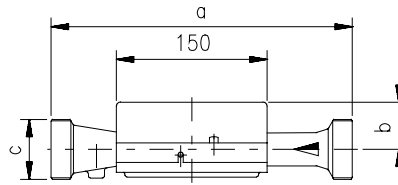|	
Software PappaWin Profi, first license, CD-ROM, with dongle for parallel port	2WR9300-2AA11-0A
Software PappaWin Profi, second license, CD-ROM, with dongle for parallel port	2WR9300-3AA11-0A
Software PappaWin, first license, CD-ROM, with dongle as pcmcia card	2WR9300-0AC11-0A
Software PappaWin, second license, CD-ROM, with dongle as pcmcia card	2WR9300-1AC11-0A
Software PappaWin Profi, first license, CD-ROM, with dongle as pcmcia card	2WR9300-2AC11-0A
Software PappaWin Profi, second license, CD-ROM, with dongle as pcmcia card	2WR9300-3AC11-0A
Billing tool software for PSION workabout, single license	2WR9305-0AA00
Billing tool complete (readout device PSION workabout and software, single license)	2WR9305-1AA00
Adapter for Psion workabout with jack connector, for reading via M-bus or CL	9956222
PSIWIN software for data transmission from PSION workabout to the PC	2WR9305-5AA00

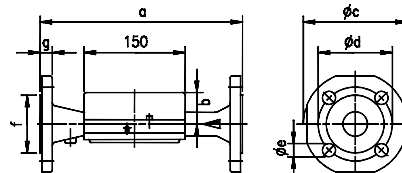**Pressure drop characteristics**:

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Dimensions

Small heat meters

Large heat meters with thread

Order No.	q_p m³/h	PN bar	a	b	c
2WR5 45	3.5	16	260	51	1 1/4"
2WR5 50	6	16	260	51	1 1/4"
2WR5 60	10	16	300	48	2"

Large heat meters with flange

Order No.	q_p m³/h	PN bar	DN	a	b	øc	ød	øe	No. of holes	f	g
2WR5 46	3.5	25	25	260	51	115	85	14	4	68	18
2WR5 52	6	25	25	260	51	115	85	14	4	68	18
2WR5 61	10	25	40	300	48	150	110	18	4	88	18
2WR5 65	15	25	50	270	46	165	125	18	4	102	20
2WR5 70	25	25	65	300	52	185	145	18	8	122	22
2WR5 74	40	25	80	300	56	200	160	18	8	138	24
2WR5 82	60	16	100	360	68	235	180	18	8	158	24
2WR5 83	60	25	100	360	68	235	190	22	8	158	24

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