



## Static Heat Meter ULTRAHEAT

**2WR5...**

Version of firmware: 2.14 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<sup>3</sup>**.

## 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** with two outputs (heat and volume/ cold/ unit status), isolated and bounce-free transistor switches
- **Current loop module** (CL, 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** (analog modem for connection to PSTN)
- **Analog module (selected value as an analog value)**
- **Radio module (readout via radio)**

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 factory 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. This is 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 PappaWin software. In this case **only one output at terminals 16 and 17 is active**, independent 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 (changes only possible in calibration mode or ex works). The user loop display (level 1) is advanced cyclically each time the button is pressed briefly.

### User loop

1594967 MWh	Accum. qty of thermal energy
0012456 MWh	Tariff register, here, e.g. cold
1307148 m <sup>3</sup>	Accumulated volume
8888888 MWh	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  $\_$ ,  $\equiv$  or  $\equiv$ .

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

00P 1	Service loop 1
00P 2	Service loop 2
00P 3	Service loop 3

One of the service loops is preselected by pressing the button briefly. By pressing the button for another 3s the contents of the selected service loop will be displayed. Each time the button is pressed briefly the next information is displayed.

**The service loops are exited** by holding the button pressed for 3s or automatically after 30 minutes.

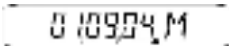

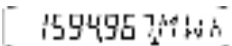
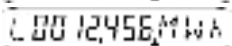
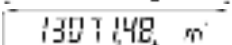
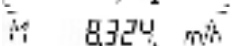
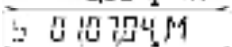
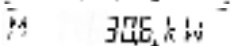
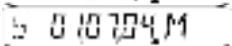
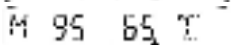
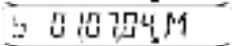
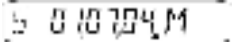

### Service loop 1

8324 m <sup>3</sup> /h	Current flowrate
306 kW	Current heat output
92 55 °C	Current flow and return temperature
79 00020 °C	Threshold value for the tariff, e.g. T <sub>v</sub>
XXXXXXXX	Customer number, 7-digit
0 15.10.04	Date
S 0101--	Annual set day (dd.mm) *
1594967 MWh	Heat for previous year on set day *
0012456 MWh	Tariff register for previous year on set day *
1307148 m <sup>3</sup>	Volume for previous year on set day *
2-03 FW	Version of firmware

\* with firmware versions 2.12 and 2.13 the function of the „yearly set day“ is not possible together with fast pulses! The display of S 00,01,-- means that the set day is deactivated

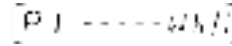


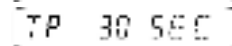
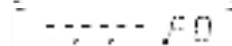
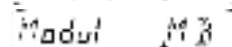


In service loop 2 the **monthly values** are displayed. One of the previous 36 monthly values can be selected by pressing the button briefly. The corresponding data are then opened by pressing the button for 3 s. Each time the button is pressed briefly the next value for the selected month is displayed.

### Service loop 2

	Set day previous month Sep. 2004
	Set day previous month Aug. 2004
...	Set day previous month xxxx 2005
pressing the button for more than 3s: ↓	
	Qty of thermal energy on this set day
	Tariff register on this set day, e.g. cold
	Volume on this set day
	Max. flowrate in Jul. 2004,
	changing with date stamp every 2s
	Maximum heat output in Jul.,
	changing with date stamp every 2s
	Max. temperatures in Jul.,
	changing with date stamps of flow and return
	every 2s
	Status of missing hour counter on this set day

After the last item is shown, the current set day is again displayed. The next set day can be selected by pressing the button briefly.

### Service loop 3

	Parameter of fast pulses, significance of energy pulses
	Significance of volume pulses
	Pulse length in ms
	Interval of temperature measurement
	Date stamp for F0 warning
	Type of built in module
	M-bus primary address *)
	M-bus secondary address *)

\*) only shown if module is of type MB

### Monthly values

The calculator stores for 36 months at the set day at 00:00h the values of

- Heat (meter reading)
- 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 6/12°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, 11 or 16 year **battery** or  
230 V AC or 115 V AC or 24V ACDC **power supply unit**

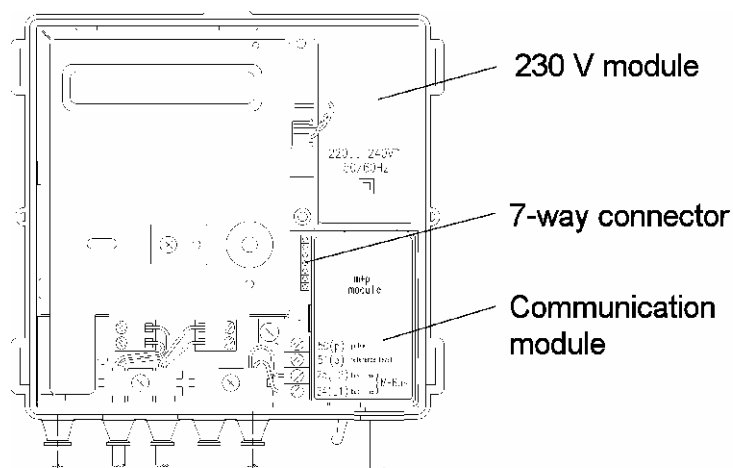
The available battery life times are shown in the table below (dependant of battery size and certain mode of operation).

Mode:	used type of battery:			
	C cell *	D cell		
	6 year - battery	6 year - battery	11 year - battery **	16 year - battery**
standard functions	√	√	√	√
„short T intervall“	√	√	√	not allowed
„fast pulses“	not allowed	√	√	
„fast M-Bus readout“		√	not allowed	
with radio module		√		
with analog module		√		

\* MLFB-digit 11 = „7“

\*\* MLFB-digit 11 = „1“ or „3“; battery life time of 11 or 16 years is only available for heat meters which are configured accordingly during the production process.

Installation of a 230V power supply module:



**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.

**Parameterisation** Directly at the meter or with software PappaWin

**Technical data of Calculator**

Temperature range	2 to 180°C if integrated in return 10 to 130°C if integrated in flow
Temperature difference range $\Delta\Theta$	3 to 120 K
Switch-off limit	0.2 K
Heat coefficient	sliding compensation
$\Delta t$ 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
Dimensions	132 x 132 mm <sup>2</sup>

**Volume measuring units**

$q_p$ m <sup>3</sup> /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)
2,5	130	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	$q_p$	<b>0.6</b>	<b>1.0</b>	<b>1.5</b>	<b>2.5</b>	$m^3/h$
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 ***		2,4	4,0	6,0	10	l/h
Pressure drop at $q_p$ , (110 resp. 130/190mm)	$\Delta p$	140/176	60/76	130/162	205/140	mbar
Flowrate at $\Delta p = 1$ bar, (110/190mm)	$K_V$	1.6/2.6	4.1/2.7	4.2/4.2	5.5/6.7	$m^3/h$
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)				
approved 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 heat meters:

Nominal flowrate	$q_p$	<b>3,5</b>	<b>6</b>	<b>10</b>	<b>15</b>	<b>25</b>	<b>40</b>	<b>60</b>	$m^3/h$
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 ***		14	24	40	60	100	160	240	l/h
Pressure drop at $q_p$ ,	$\Delta p$	65	152	120	120	70	120	140	mbar
Flowrate at $\Delta p = 1$ bar	$K_V$	14	14	28	42	95	115	160	$m^3/h$
Mounting orientation		any							
Temperature range		10 to 130°C							
Maximum temperature	$t_{max}$	150°C for 2000 h							
Nominal pressure	PN	1.6 MPa 2.5 MPa					2,5 MPa (PN 25)	1,6 MPa (PN16) 2,5 MPa (PN25)	
approved measuring error acc. to EN1434 (class 2)		2+ 0,02 $q_p/q$ max. 5%						%	

\*\*\* standard setting, meters with 50% of the value are also available

## Preferred types ULTRAHEAT® heat meters (international version)

### ULTRAHEAT®

$q_p$  0,6 -  $q_p$  2,5 m<sup>3</sup>/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
$q_p$ 2,5	130	G 1	16	2WR5361-5BC70-0AB3
Mounting element for temperature sensor DS, M 10 x 1/2", with Cu seal				WZT-A12
Fitting R 1/2 ", with seals			pair	WZM-E34

#### 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



**Preferred types ULTRAHEAT® heat meters (international version)**

**ULTRAHEAT®**  
**q<sub>p</sub> 3,5 - q<sub>p</sub> 60 m<sup>3</sup>/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 <sub>p</sub> (Qn)	Overall length mm	Connection	Pressure stage PN	Order No.
q <sub>p</sub> 3.5	260	G 1 1/4	16	2WR5450-5MC70-0TB2
q <sub>p</sub> 6	260	G 1 1/4	16	2WR5500-5MC70-0TB2
q <sub>p</sub> 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 <sub>p</sub> 3,5 und 6			pair	WZM-E54
Fitting R 1 1/2", with seal for q <sub>p</sub> 10			pair	WZM-E2.1

**Ultrasonic heat meter ULTRAHEAT<sup>□</sup> in standard design with flange connection**

Incl. temperature sensor Pt 500, to q<sub>p</sub> 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, plus 2 protection pockets.

Nominal size q <sub>p</sub> (Qn)	Overall length mm	Connection	Pressure stage PN	Order No.
q <sub>p</sub> 3.5	260	DN25	25	2WR5460-5MC70-0TB2
q <sub>p</sub> 6	260	DN 25	25	2WR5520-5MC70-0TB2
q <sub>p</sub> 10	300	DN 40	25	2WR5610-5MC70-0TB2
q <sub>p</sub> 15	270	DN 50	25	2WR5650-5MC70-0TB2
q <sub>p</sub> 25	300	DN 65	25	2WR5700-5MC70-0TB2
q <sub>p</sub> 40	300	DN 80	25	2WR5740-5PC70-0TB2
q <sub>p</sub> 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

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.

\* With this module the pulse output **must** be parametrized by means of the free software "PappaWin light" in order to start working.

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.*

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 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 1 1/4";	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 1 1/4";	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																

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.

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																
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 <sub>p</sub> 6):							1											
Mounting in return, return sensor mounting external or integrated into the volume measuring unit, (only possible for threaded connection up to q <sub>p</sub> 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 <sub>p</sub> 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 <sub>p</sub> 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 <sub>p</sub> 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/ immersion 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 (PN16) or for protection pocket, diam. 5.2x45 mm, cable length 1.5 m;								5	H									
Sensor Pt500, replaceable, directly in water (PN16) 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									

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.*

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																	
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 fast pulses or analog module or radio module);										7							
With 11-year battery (not for fast M-Bus reading(4s) / analog module / radio module);										3							
With 16 year battery (only for standard measurement cycle, standard pulses, not for controller-coupling)										A							
With 6-year battery (for all applications);										1							
Power pack 24V ACDC, 1.5m cable										M							
Power pack 24V ACDC, with plug										N							
With 24 V alternating voltage, cable length 1.5 m; not for radio module >>> phase out type!										5							
With 230 V alternating voltage, cable length 1.5 m;										6							
With 110 V alternating voltage, cable length 1.5 m (not for radio module)										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 M-bus module, guaranteed data set can be selected										T							
With combi module (M-bus and fast pulses); ***										6							
With combi module (M-bus and fast pulse output), guaranteed data set can be selected ***										U							
With CL module (current loop);										7							
With modem module										8							
With analog module										L							
With radio module ...integrated antenna ...external antenna										R S							
Logo ULTRAHEAT														0			
Logo Siemens														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	

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.

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	
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 Kazakhstan																	Z*	
Dial plate for Belarus																	Z*	
Dial plate for Bosnia Herzegovina																	Z*	
Dial plate for Spain																	Z*	
Dial plate for Lithuania																	Z*	
Dial plate for Yugoslavia																	Z*	
Dial Plate for Slovenia																	Z*	
Dial plate for Ukraine/Techprylad;																	Z*	
Dial plate for South Tyrol;																	Z*	
Dial plate for Macedonia;																	Z*	
Dial plate for Armenien																	Z*	
Dial plate for Aqua Ukraine																	Z*	
Dial plate for Russland																	Z*	
Dial plate for Usbekistan																	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: MJ (to $q_p$ 3);																		C
Display: GJ with 3 decimal places (as of $q_p$ 6 with 2 decimal places);																		D
Display: m <sup>3</sup> (for the condensate meter);																		V
Tested according to national regulations ( $\neq$ 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 ( $\neq$ 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 acc. To CEN applies only to Germany, Austria in this case.

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

**Attention:** fast pulses / analog module / radio module 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	x	x	x		x	x	x	x		x	x	x	x		x
Nominal flowrate	xxxxxx	x	x		x	x	x	x		x	x	x	x		x
Integration	xxxxxxxxxxxx		x		x	x	x	x		x	x	x	x		x
Temperature sensor	xxxxxxxxxxxxxxxxxxxxxxxx				x	x	x	x		x	x	x	x		x
Calculator design	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx					x	x	x		x	x	x	x		x
Power supply	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx						x	x		x	x	x	x		x
Communication module	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx							x		x	x	x	x		x
Manufacturer's label	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx									x	x	x	x		x
Country	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx										x	x	x		x
Unit of energy	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx											x	x		x
Certification	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx												x		x
ATG(s)	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx														x

**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 Kazakhstan	P 3 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
14th digit is Z	Dial Plate for Slovenia;	P 1 B
14th digit is Z	Dial plate for Ukraine/Techprylad;	P 2 B
14th digit is Z	Dial plate for South Tyrol;	P 3 B
14th digit is Z	Dial plate for Macedonia;	P 4 B
14.Stelle ist Z	Zifferblatt für Armenien	P 5 B
14.Stelle ist Z	Zifferblatt für Aqua Ukraine	P 6 B
14.Stelle ist Z	Zifferblatt für Russland	P 7 B
14.Stelle ist Z	Zifferblatt für Usbekistan	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

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

Condition in the MLFB	Meaning	suppl. text (with -Z)
<b>Cold meter:</b>		
	Cold meter (6/12°C) , water as medium	K 0 0
	Cold meter (6/12°C) , water as medium, meter for 4 wire temperature measurement	K 0 1
	Combined cold / heat meter with separate registers for heat and cold, water as medium	K 1 0
	Combined cold / heat meter with separate registers for heat and cold, water as medium, meter for 4 wire temperature measurement	K 1 1
<b>4-wire connection:</b>		
	Heat meter for 4 wire temperature measurement;	W 0 1
<b>Degree of protection:</b>		
	Flow measuring tube with IP 65	W 0 2
<b>Pulse module:</b>		
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
<b>M-bus address</b>		
	Primary address 001 (standard: 000)	M B 001

<b>Set days:</b>		
	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
<b>Dimension of times:</b>		
	(Operating / missing) times in days instead of hours	Z A T
<b>Measuring intervals:</b>		
	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
<b>Display loops:</b>		
	With display list No. 16	A 1 6
	Permanent display (not flashing after 15 min)	LCDE
<b>Threshold tariffs with thresholds:</b>		
	for flow rate, in m <sup>3</sup> /h (TFQ xx.xxx_yy.yyy_zz.zzz)	TFQ...
	for demand, in kW (TFP xx.x_yy.y_zz.z)	TFP...
	for return temperature, in °C (TFRT xx_yy_zz)	TFRT...
	for temperature difference, in K (TFTD xx.x_yy.y_zz.z)	TFTD...
<b>Operating limit:</b>		
	Operating limit at 20% of q <sub>i</sub> (standard: 40%)	ALS20
<b>Special variant:</b>		
	Dynamic range q <sub>i</sub> : q <sub>p</sub> = 1 : 25 (for Germany only)	D 2 5
	Dynamic range q <sub>i</sub> : q <sub>p</sub> = 1 : 50 (for Austria only)	D 5 0
<b>Saving daylight time:</b>		
	automatically summer-/wintertime	SWU

\* standard

\*\* D-cell battery necessary

## Accessories for 2WR5

### For mounting of temperature sensors

Description	Ordering No.
Mounting element with drill-hole M10 x 1 in T-element 1/2", with Cu seal	WZT-A12
Mounting element with drill-hole M10 x 1 in T-element 3/4", with Cu seal	WZT-A34
Mounting element with drill-hole M10 x 1 in T-element 3/8", with Cu seal	WZT-A38
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	WZT-M35
Protection pocket G 1/2", high-grade steel, Ø 5.2 x 37mm	WZT-S43V
Protection pocket G 1/2" MS, 5.2 x 50 mm	WZT-M50
Tube for protection pocket	WZT-R32
Seal for temperature sensors DS	9060944001
Mounting set G1/2" for direct mounting of long sensors	WZT-A100
Ball valve Rp 1" for sensor DS M10x1	WZT-K1
Ball valve Rp 1/2" for sensor DS M10x1	WZT-K12
Ball valve 3/4" 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



**Mounting accessories  
for tubes**

Kit extension from 110 mm G3/4 B to 130 mm G 1 B (in pairs with seals)	WZM-V130.G1
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 (with seals)	WZM-V165
Meter fittings for flow sensor in pipe 1/2" (2 pces with 2 sealings)	WZM-E34
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-E2.1
Spacer for heat meter G 3/4 - 110 mm, incl. sealing disks	WZM-G110
Spacer for heat meter G 1 - 130 mm, incl. sealing disks	WZM-G130
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-G300.1
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
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-F300.1
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  
Communications  
modules**

Plate for mounting on DIN rail	WZM-MH
Pulse module (Parameterization of fast pulses with PappaWin)	WZR-P2
M-bus module for fixed or variable data structure (via coding connector)	WZR-MB
M-bus module, guaranteed data set can be selected;	WZR-MB-GR
CL (current loop) module according to EN 1434-3	WZR-CL
Combi-module (pulses and CL-module), not for fast pulses	WZR-CP
Combi module for M-bus and one pulse output (Parameterization with PappaWin)	WZR-MP
Combi module (M-bus and fast pulse output), guaranteed data set can be selected;	WZR-MP-GR
Combi module for one pulse output and M-bus (Parametrisation with PappaWin), 30 s reading cycle	WZR-MP-30
Modem module	WZR-MO
Analog module	WZR-AM
Radio module with integrated antenna	WZR-RM
Radio module with external antenna	WZR-RM-ext
Radio modem with Comfort software	WZR-RW
Radio modem with Workabout Pro and Comfort software	WZR-RW-WORK

**Temperature sensors  
(without screening)**

Temperature sensor Pt 500 (pair), length 27,5 mm, DS M10x1, cable length 1,5 m	WZR5-2815
Temperature sensor Pt 500 (pair), length 27,5 mm, DS M10x1, cable length 2,5 m	WZR5-2825
Temperature sensor Pt 500 (pair), length 100 mm x Ø 6 mm, cable length 2 m	WZR5-1020
Temperature sensor Pt 500 (pair), length 100 mm x Ø 6 mm, cable length 5 m	WZR5-1050
Temperature sensor Pt 500 (pair), length 150 mm x Ø 6 mm, cable length 2 m	WZR5-1520
Temperature sensor Pt 500 (pair), length 150 mm x Ø 6 mm, cable length 5 m	WZR5-1550
Temperature sensor Pt 100 (pair), length 27,5 mm, DS M10x1, cable length 1,5 m	WZR1-2815

Temperature sensor Pt 100 (pair), length 100 mm x Ø 6 mm, cable length 2 m	WZR1-1020
Temperature sensor Pt 100 (pair), length 150 mm x Ø 6 mm, cable length 2 m	WZR1-1520

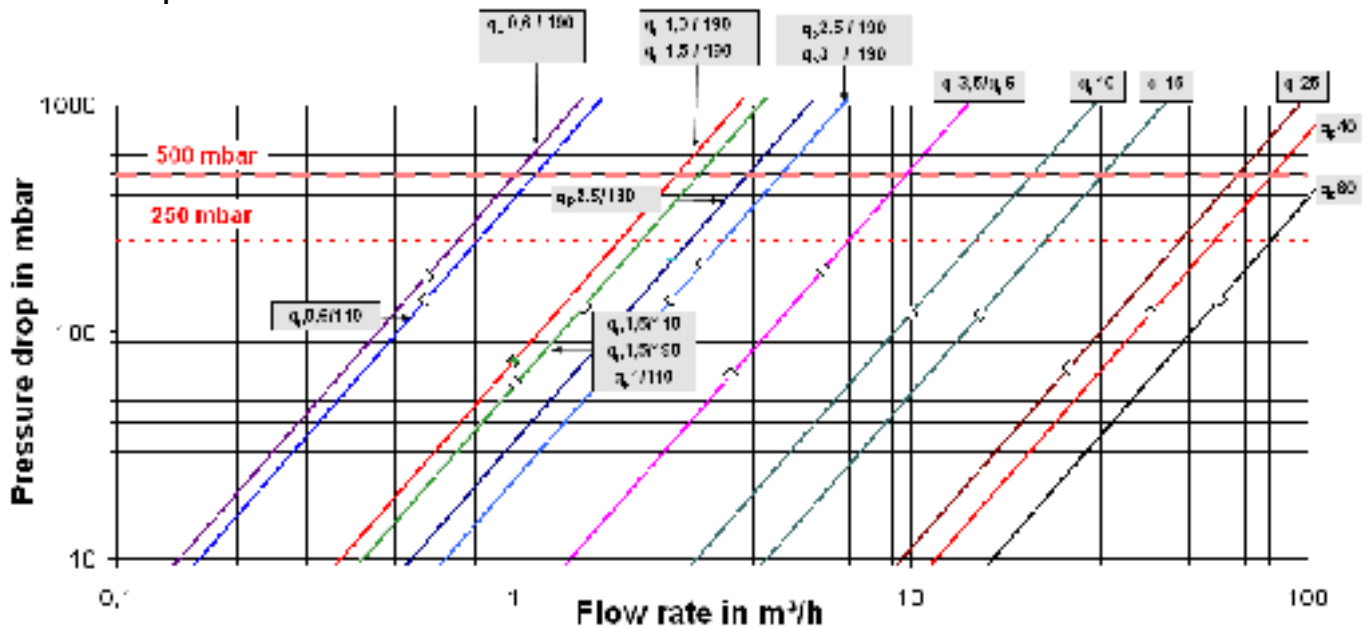
### Power supply

Standard battery for a 6-year service life (not for special M-bus reading or frequent temperature measurement or analog module or radio module)	WZR-BC
Battery for a 6-year service life, for special M-bus reading or frequent temperature measurement or analog module or radio module	WZR-BD
Power pack 230 V AC for analog module	WZR-NE
Power pack 230 V AC, 1.5 m cable	WZR-AC230-15
Power pack 110 V AC, 1.5 m cable	WZR-AC110-15
Power pack 12..24 V AC, 1.5 m cable >>> phase out type!	WZR-AC24-15
Power pack 24 V ACDC, 1.5 m cable	WZR-ACDC24-15
Power pack 24 V ACDC, with plug	WZR-ACDC24-00

### Software and related accessories

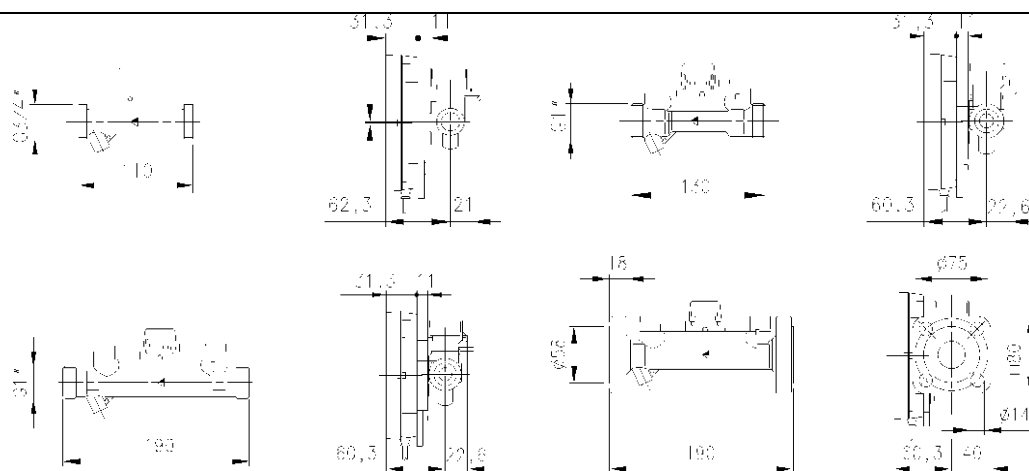
Optical read head with 9 pin plug for PC (COM) interface (PappaWin) not for pulsing interface on test rigs	9956467001
Optical read head with 9 pin plug for PC (COM) interface, suitable for pulse interface on test rigs	9956499001
Optical read head for NOWA / SIWAP with 15 pin plug, suitable for pulse 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

### Pressure drop characteristics:

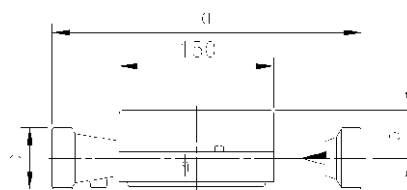


## Dimensions

### Small heat meters

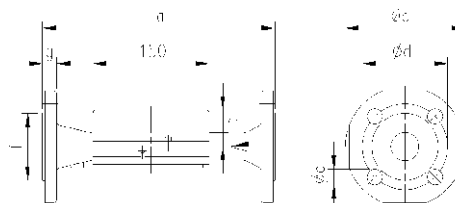


### Large heat meters with thread



Best.-Nr.	$q_p$ m <sup>3</sup> /h	FN bar	a	b	c
2WR5 4b	3,5	16	280	31	1 1/4"
2WR5 60	6	16	280	31	1 1/4"
2WR5 60	10	16	300	38	2"

### Large heat meters with flange



Best.-Nr.	$q_p$ m <sup>3</sup> /h	FN bar	DN	a	b	$\varnothing c$	$\varnothing d$	$\varnothing e$	Anzahl Löcher	I	c
2WR5 43	3,5	25	25	260	51	115	85	14	4	68	18
2WR5 62	6	25	25	260	51	115	85	14	4	68	18
2WR5 84	6	40	25	260	51	115	85	14	4	68	18
2WR5 81	10	25	40	300	48	150	110	8	4	88	18
2WR5 67	10	40	40	300	48	150	110	8	4	88	18
2WR5 65	15	25	50	270	46	165	125	8	4	102	20
2WR5 88	15	40	50	270	46	165	125	8	4	102	20
2WR5 67	15	25	50	300	46	165	125	8	4	102	20
2WR5 82	15	40	50	300	46	165	125	8	4	102	20
2WR5 70	25	25	65	300	52	185	145	8	8	122	22
2WR5 71	25	40	65	300	52	185	145	8	8	122	22
2WR5 74	40	25	80	300	56	200	160	8	8	138	24
2WR5 87	60	16	100	360	68	235	180	8	8	158	24

Landis+Gyr GmbH  
P.O. Box 4806  
D-90026 Nürnberg  
Germany  
[www.landisgyr.com](http://www.landisgyr.com)