



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 **m³**.

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**, 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. 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 \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

| | |
|---------------|----------------|
| 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**

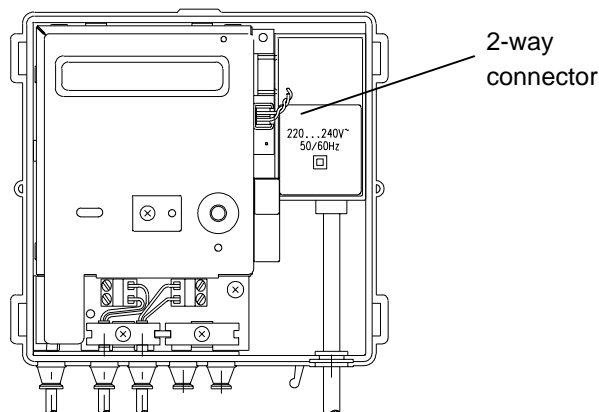
The available battery life times are shown in the table below (dependant of battery size and certain modi of operation):

| 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:



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 |
| Δt 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 m ³ /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 $\Delta p = 1$ 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 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) | | | | | |
| 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 $\Delta p = 1$ 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 (PN 25) | 1,6 MPa (PN16) | | | |
| | | 2.5 MPa | | | 4,0 MPa (PN 40) | 2,5 MPa (PN25) | | | |
| Measuring error acc. to EN1434 (class 2) | | 2+ 0,02 q_p/q max. 4% at q_i | | | | | % | | |

Preferred types ULTRAHEAT® heat meters (international version)

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 |

**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.

| | | | | | | | | | | | | | | | | | | |
|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 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 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 | | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | | |

| MLFB-digit: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | - | 8 | 9 | 10 | 11 | 12 | - | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|----|----|----|---|----|----|----|----|
| <i>Preferred types with light background.</i> | | | | | | | | | | | | | | | | | | |
| 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/ 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 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 | | | | | | | | | | | | | | | | | | |

| MLFB-digit: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | - | 8 | 9 | 10 | 11 | 12 | - | 13 | 14 | 15 | 16 | |
|--|---|---|---|---|---|---|---|---|---|---|----|----|----|---|----|----|----|----|--|
| <i>Preferred types with light background.</i> | | | | | | | | | | | | | | | | | | | |
| 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 measurement(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 | |

| MLFB-digit: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | - | 8 | 9 | 10 | 11 | 12 | - | 13 | 14 | 15 | 16 |
|--|---|---|---|---|---|---|---|---|---|---|----|----|----|---|----|----|----|----|
| <i>Preferred types with light background.</i> | | | | | | | | | | | | | | | | | | |
| 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: m ³ (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 | 2WR5 |
| Nominal flowrate | 21 |
| Integration | 1 |
| Temperature sensor | 5B |
| Calculator design | C |
| Power supply | 7 |
| Communication module | 1 |
| Manufacturer's label | 0 |
| Country | T |
| Unit of energy | B |
| Certification | 2 |
| ATG(s) | -Z A13 |

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 | 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 |
| | | |
| 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 m ³ /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, Ø 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 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 |
| 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 |

| | |
|--|-----------------|
| 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

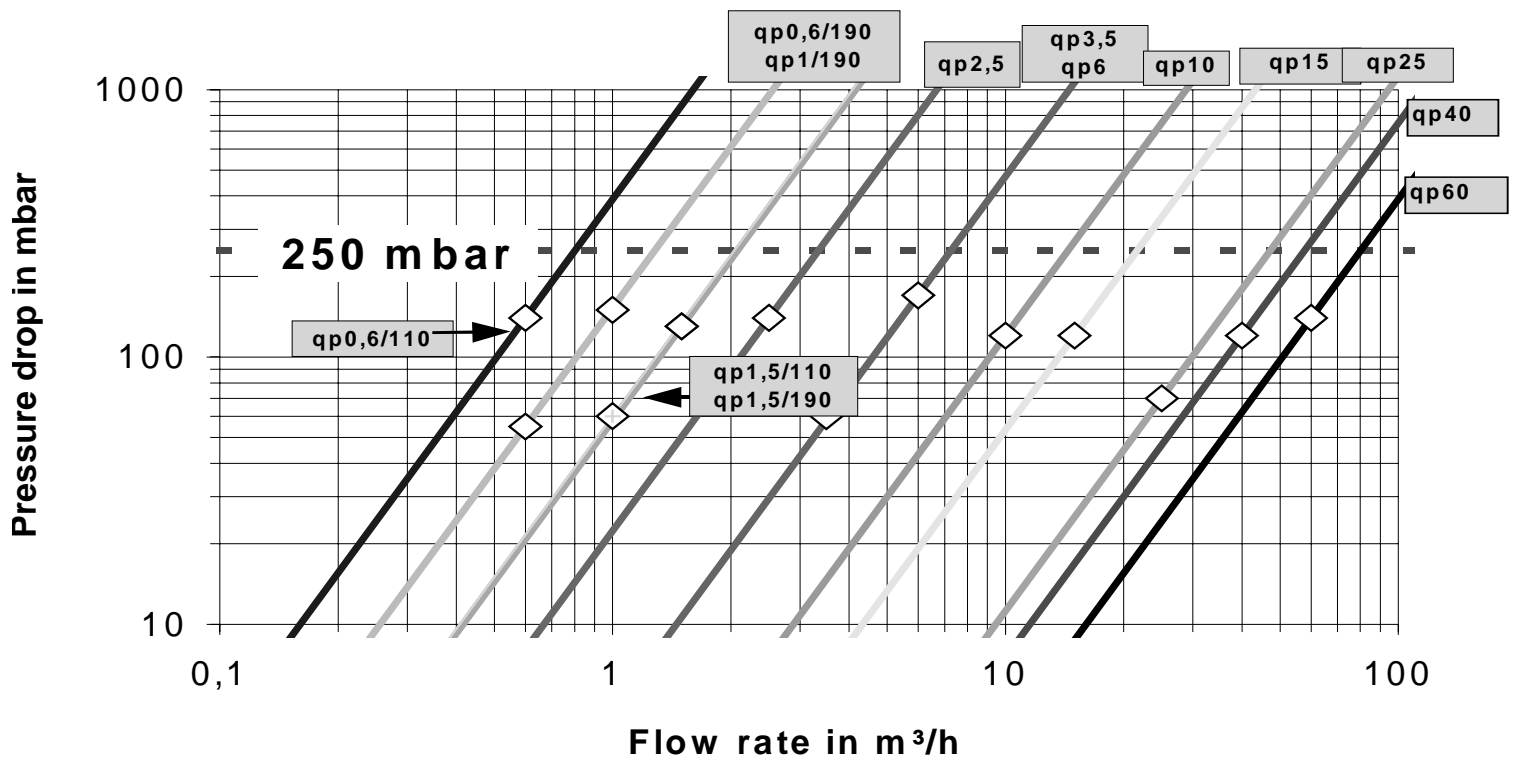
| | |
|---|------------|
| Standard battery for a 6-year service life (not for special M-bus reading and not for frequent temperature measurement) | 9979058001 |
| Battery for a 6-year service life, for special M-bus reading and for frequent temperature measurement | 9979057001 |
| Power pack 220...240 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 |

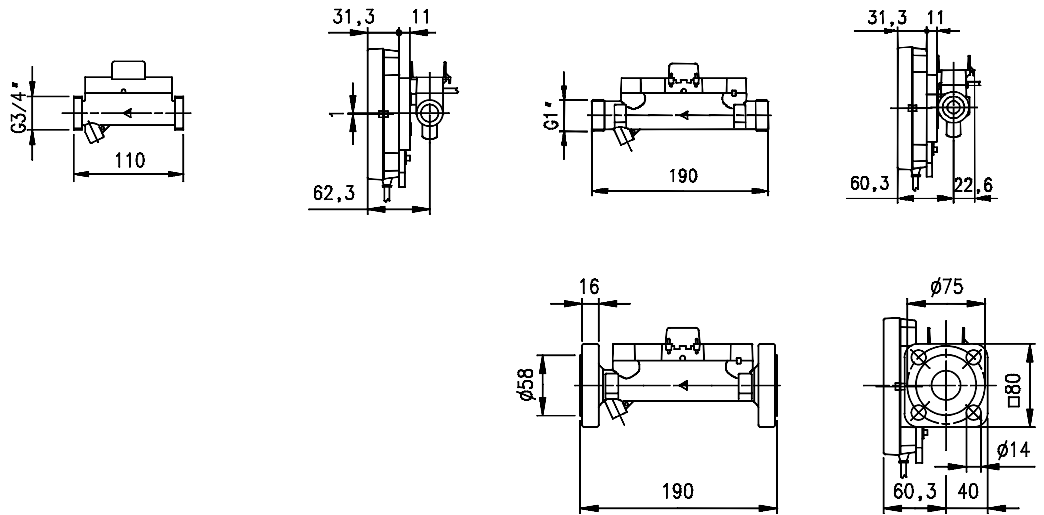
| | |
|---|------------------|
| Software PappaWin Profi, first license, CD-ROM, with dongle for parallel port | 2WR9300-2AA11-0A |
| Software PappaWin Profi, second license, CD-ROM, with dongle for parallel port | 2WR9300-3AA11-0A |
| Software PappaWin, first license, CD-ROM, with dongle as pcmcia card | 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:

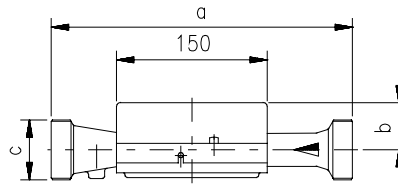


Dimensions

Small heat meters

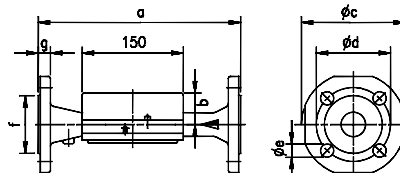


Large heat meters with thread



| Order No. | q_p m ³ /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 m ³ /h | PN bar | DN | a | b | ϕc | ϕd | ϕe | 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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