SIEMENS

Ultrasonic compact heat and heat/cooling energy meters
WSx8..

Ultrasonic heat and cooling energy meters to measure flow and energy in a hydronic heating circuit.

- Available as heat, cooling energy, or combined heat/cooling energy meters
- Non-wearing due to non-moving parts
- Calibration log book:
    - Mounting location of the flow measuring section can be changed
    - Change to energy units
    - Change sensor type
    - Update meter firmware
- Approved in accordance with EN 1434 and MID accuracy class 2
- Mounting position optional (horizontal or vertical), heat or cooling side
- Measuring range of flow 1:100 conforming to EN 1434 (total range 1:1000)
- Optical interface as per EN 62056-21
- 'Daisy-Chain' double terminal on M-bus - module
- Choice of communication modules and power supplies
- Self diagnostics

CE

The heat (WSM8..), cooling (WSB8) and combined heat/cooling energy meters (WSN5..) are measuring devices to physically acquire energy consumption. The devices consist of a flow measuring section and processor unit. The processor unit can be equipped with various sensors, different types of power supply and communication modules.

WSx8.. meters are employed to measure heat consumption and are also suitable for measuring cooling (alone or combined with thermal energy) in systems with water.

Limitations

Do not use the WSx8.. to measure potable water.

They are not suited for use in systems operating on water-glycol mixtures.

Functions

Meter design

The meter consists of an electronic unit, flow measuring section, and 2 temperature sensors. The processor can be equipped with up to four long-term batteries to operate up to 20 years.

Ultrasonic measuring principle

The flow is acquired based on the non-wear ultrasonic measuring principle, which requires no moving parts.

The amount of energy transferred from the medium to the consumer over a defined period of time is proportional to the temperature difference between the warmer and colder side and the volume of water that has passed through.

The 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 time difference between the transmitter and receiver is reduced, upstream it is increased. The water volume is calculated based on the difference in runtime.

The flow and return temperature is acquired by platinum resistors.

The water volume as well as the temperature difference between the warmer and cooler side is multiplied using a heat coefficient and the product is integrated. The result, which is the consumed amount of thermal or cooling energy, is registered and displayed in the physical unit kWh or other common unit, the volume in m^3.

The WSx777.. uses an intelligent, adaptive temperature-measuring interval. With changing system conditions (e.g. rapid increase of flow), the WSx8.. changes for a certain time to a fast temperature-measuring interval. In other words, the meter always adapts to the current situation and acquires the system temperatures very accurately.

In addition to heat energy, the meters measure cooling energy as an option that is added to a separate tariff register (uncalibrated). Heat energy is always measured if the temperature difference (>+0.2 K) and the flow is positive. Cooling energy is measured, if the temperature difference (<-0.2 K) is negative, while the flow is positive.

Processor unit

A common electronic unit applies to all flow variables.

Removable temperature sensor

Temperature sensor can be exchanged on the meters.

It must be individually calibrated or compliance certified when using temperature sensors. The maximum allowable cable length of the temperature sensors is 10 m (default 1.5 m). Further extensions are not permitted.

Optical communication interface

The meter has is equipped with an an optical communications interface which facilities readout and configuration using an optical read head.
WZR-OP-USB and the corresponding service software 'UltraAssist' is available on site.

Pulse inputs (optional)

A meter equipped with a pulse terminal can connect up to two water meters with pulse output (reed contact only, no Namur) to heat energy meters. Consumption values for the water meters are displayed on the meter and forwarded.

The meter separately adds the pulses from the connected water meters (max. two water meters) and forwards the result to a data processing system. Service software can help adjust the pulse valency.

Pulse inputs are inactive by default, i.e. the pulse valency of the water meters = 0 (not visible on the M-bus). The input becomes active as soon as the pulse input is assigned a pulse valency (using the service software).

Communication outputs (optional)

You can use one of the following communication modules to remotely read out data:

● Pulse output module
● M-bus module
● RF module (mobile or stationary read out)

The modules do not impact the acquisition of consumption data. You can upgrade the modules at any time without violating the security seal.

Power supply

The following power supplies are available:

● 1…4 AA cell (batteries)
● Power supply over M-bus (including backup battery)

The number of batteries varies depending on the desired life cycle and communication.

Calibration log book

The calibration log is a special, protected, and separately displayed area to make and log weather-related changes in the field, i.e. using a set electronic calibration seal.

A category enabled at the factory can be changed up to 5 times via the meter configuration menu or optical interface.

A change logged by the calibration log book neither changes the present state of energy nor the historical values.

The following weather-related changes are available:

- Mounting location of the flow measuring section (POS):
  Only the calculation rules for forming energy changes if the mounting location of the flow measuring section is changed.

- Change to energy units (UNIT):
  Only the calculation for displaying the internal values change if the energy unit is changed (kWh – MJ – Mbtu, or MWh – GJ – Gcal). The internal storage format remains unchanged and all historical values are is displayed in the new energy unit. The meter automatically complies with requirements for display resolution per EN1434.

- Change in sensor type PT100 – PT500 (Pt Sens):
  Calibrations values for PT100 or PT500 are used if the sensor type is changed from PT100 to PT500. The UH40 must have a duplicate temperature calibration at the factory for this function. The function is only activated on removable sensors.

- Firmware update (FLASH):
  The firmware can only be updated via the optical interface. This permits updates of meters to the latest communication technologies.

Tampering

Opening the cover of the meter destroys the user seal. The calibration seal in the interior of the meter must be destroyed to get to the calibration-related part of the meter.

Self diagnostics

The meter continuously performs self-diagnostics to detect and display various mounting or device errors.

The diagram below shows the typical metering accuracy of the WSx8.., compared to the error limits per EN 1434, class 2.

Metering accuracy as per EN 1434

Error limit per EN 1434

– – – –	EN 1434, class 3
———	EN 1434, class 2
———	WSx8.. typical (EN 1434 - ½ class 2)
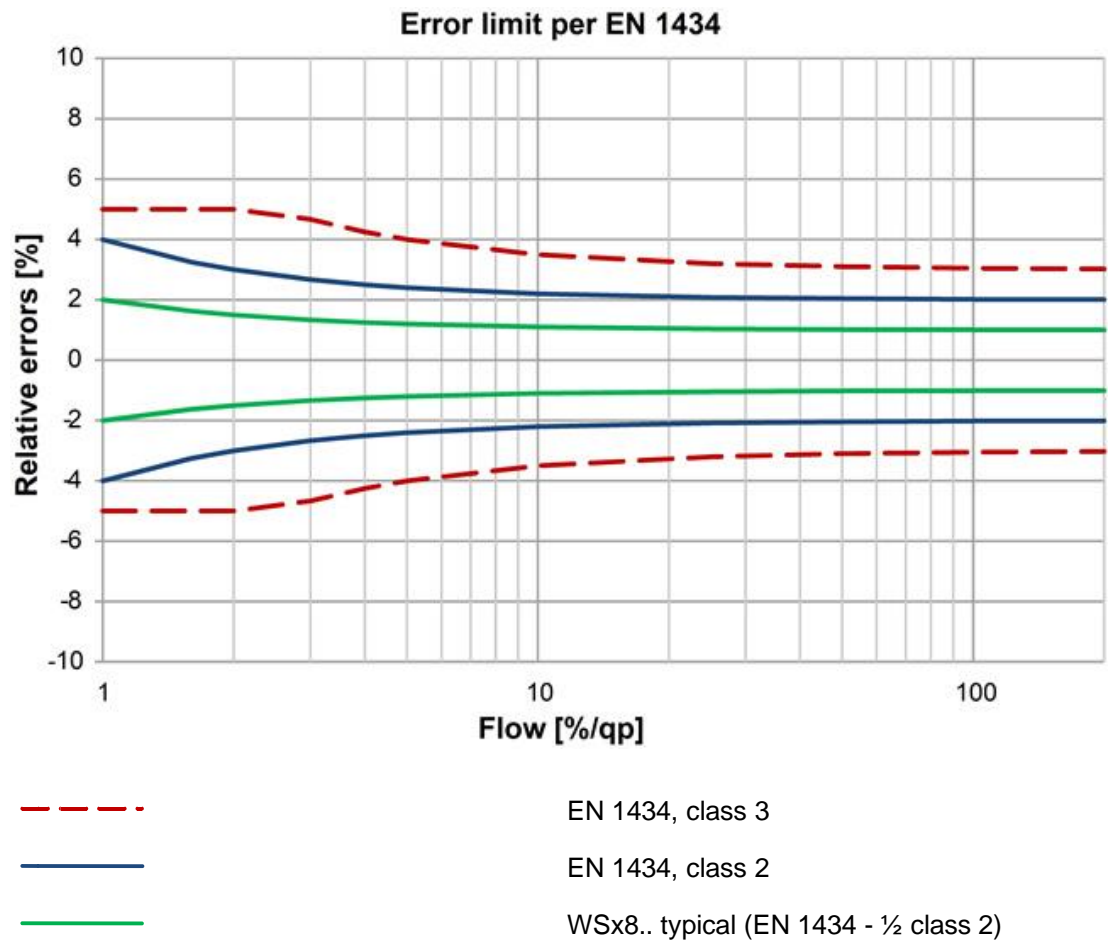
q Current flow that determines the precision as a percentage of the continuous flow q_p

q_i Lower flow limit (value 1 on the x axis = 1 % of q_p):
The smallest flow above which the heat meter must operate without exceeding the fault limits.

q_p Continuous flow of meter = Value 100 on the x axis.

The pressure loss in a flow sensor is indicated as continuous flow q_p.

Actual pressure loss at the indicated flow can be calculated using the Kv value, which indicates flow at 1 bar differential pressure:

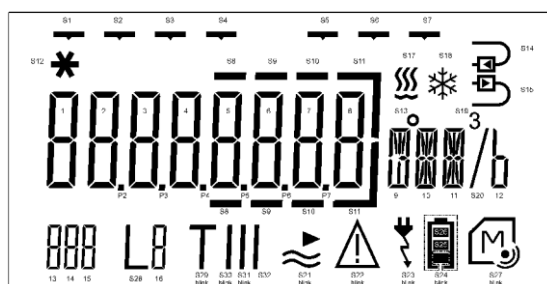The value can also be read graphically using the diagram as an alternative.

Pressure loss WSx8..
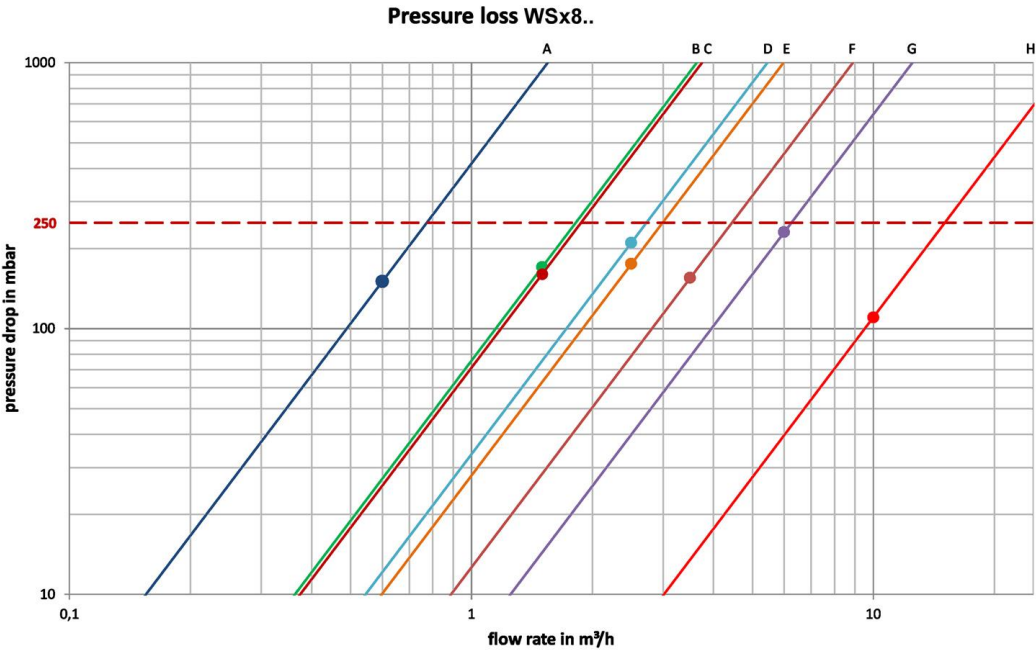
Continuous flow q_P	0.6	0.6	1.5	1.5	1.5	2.5	2.5	3.5	6	10	[m³/h]
Mounting length	110	190	110	130	190	130	190	260	260	300	[mm]
Connecting thread	G ¾	G1	G ¾	G 1	G 1	G 1	G 1	G1¼	G1¼	G2	-
Maximal flow qs	1.2	1.2	3	3	3	5	5	7.0	12.0	20	[m³/h]
Minimum flow q_i	6	6	15	15	15	25	25	35	60	100	[l/h]
Response threshold (variable)	2.4	2.4	6	6	6	10	10	14	24	40	[l/h]
Pressure loss at q_p	150	150	170	160	160	175	210	155	230	110	[mbar]
Kv value at Δp = 1 bar	1.5	1.5	3.6	3.8	3.8	6.0	5.3	9.0	12.8	32.0	[m³/h]
Curve in the diagram	A	A	B	C	C	E	D	F	G	H	-
Weight	1.0	1.5	0.8	0.8	1.1	0.8	1.1	2.0	2.0	2.5	[kg]
Packaging dimensions	226 186 117	226 186 117	226 186 117	226 186 117	226 186 117	226 186 117	226 186 117	288 188 162	288 188 162	399 239 258	[mm] [mm] [mm]

The pressure loss in a flow sensor is indicated as continuous flow q_p.

Actual pressure loss at the indicated flow can be calculated using the Kv value, which indicates flow at 1 bar differential pressure:

$$\Delta p = 1 \text{ bar} \times \left(\frac{Q}{K_v}\right)^2$$

Δp Pressure loss in bar

Q = Flow in m^3/h

$K_v = K_v$ – Value at Δp = 1 bar

LCD

The WSx8 has a large, easy-to-read LCD with 8 digits to display different values (e.g. energy or flow). The dynamic display enables users to identify positive flow at a glance. Icons for previous year values and previous month values support the easy-to-understand display concept.

ID number	Symbol	Description
S1	H	Hour value
S2	D	Day value
S3	M	Month value
S4	Y	Year value
S5	m	Maximum value
S6	M	Minimum value
S7	Ø	Average value
S8-S11	-	Decimal places
S12	✱	Calibrated value
S14		Mounting location return
S15		Mounting location flow
S17	≋	Meter type: Heat energy meters or combined heat/cooling meters
S18	❄	Meter type: Cooling meters
S21	≈	Current flow rate

S22	⚠	Error message
S23		Energy supply: Mains
S24-S26		Energy supply: Battery operating with capacity display
S27		Module detection
S28	L0	Displays the current loop
S29-S32	T III	Tariff display
13 - 15	000	Key figure of the current display (LCD-ID)

Display resolution

ⓘ The number of decimal places of a value depends on the selected measuring path and the selected dimension.

The number of decimal places of a value can be modified under consideration of standardized requirements.

The following standardized display resolutions are used for energy:

Continuous flow [m³/h]	Energy [kWh]	Energy [MWh]	Energy [MJ]	Energy [GJ]	Energy [MBtu]	Energy [Gcal]
0.6	00000001	00000.001	00000001	00000.001	00000001	00000.001
1.5	00000001	00000.001	00000001	00000.001	00000001	00000.001
2.5	00000001	00000.001	00000001	00000.001	00000001	00000.001
3.5	00000001	00000.001	00000001	00000.001	00000001	00000.001
6	00000001	00000.001	00000001	00000.001	00000001	00000.001
10	00000001	00000.001	00000001	00000.001	00000001	00000.001

The following standardized display resolutions are used for volume:

Continuous flow [m³/h]	Volume [m³]	Volume [gal]
0.6	000000.01	00000001
1.5	000000.01	00000001
2.5	000000.01	00000001
3.5	000000.01	00000001
6	000000.01	00000001
10	000000.01	00000001

The meter's display is subdivided into multiple loops.

A short press on button 1 enables selection of the required loop. The user loop reappears after the last loop. Press button 2 to read the value on the respective loop. The first value reappears after the last loop.

The marking under the applicable symbol indicates that type of display value (e.g. previous year or previous month value).

The decimal places of displayed values are outlined to avoid errors.

The calibrated value is recognizable by an additional asterisk (S12).

The range of display and the displayed data may deviate from this description and certain button functions may be disabled, depending on the parameter settings on the meter. Moreover, certain push button functions can be locked.

Operating elements
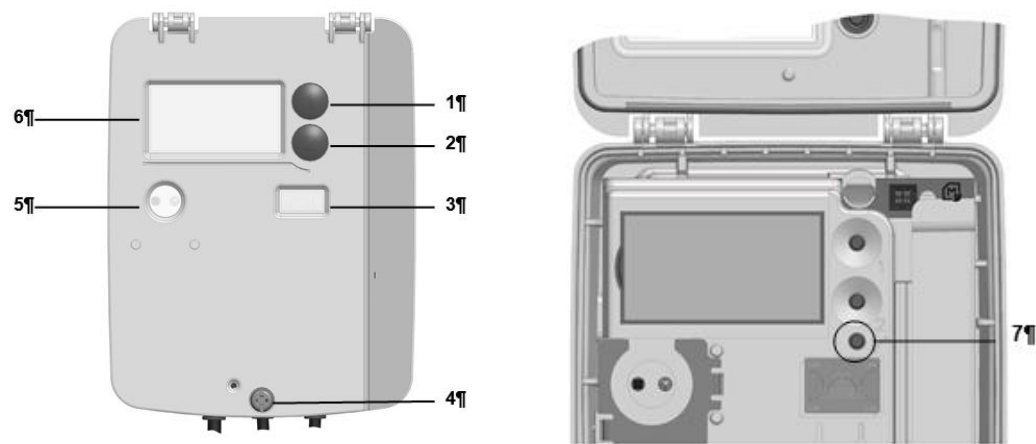
No.	Designation	Description	Note
1	Button 1	Switches within a loop to the next line.	-
2	Button 2	Switches to the next loop.	-
3	Security seal	-	-
4	Screw	-	-
5	Optical interface	Permits data traffic via a computer using the associated service software.	-
6	LCD	-	-
7	Service pin	To query the meters configuration function.	Must detach the cover to access

Loop 'Loop 0'

LCD display the following value (in order):

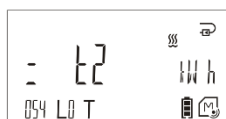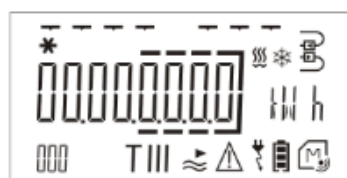| Display	Description
LOOP 0 148 L0	Loop head
F - - - - 115 L0	Error message (here currently no error)
* 01234567 kW h 051 L0 T	Current energy (here: kWh; heating energy meter; mounting location: Return, tariff to)
0123456.7 m³ 052 L0 T	Current volume
01234567 kW h 053 L0 T _ t1 kW h 053 L0 T	Current value tariff register 1 (only if tariff was selected)
01234567 kW h 054 L0 T _ t2 kW h 054 L0 T	Current value tariff register 2 (only if tariff was selected)
01234567 kW h 055 L0 T _ t3 kW h 055 L0 T	Current value tariff register 3 (only if tariff was selected)
* 00.00.00.00 kW h 000 T III	Segment test
20.01 FW 122 L0	Firmware version
46856594 MA c 131 L0	CRC / CMAC
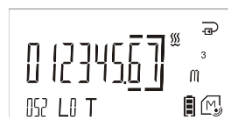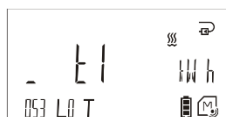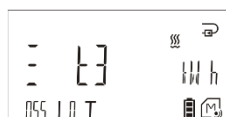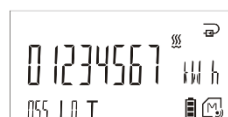
Month values (Loop 2)

The computer stores the following values on the monthly set day for up to 24 months:

- Prev. month minimum temperature hot side
- Prev. month minimum temperature cold side
- Previous month maximum flow rate
- Prev. month maximum power
- Prev. month maximum temperature hot side
- Prev. month maximum temperature cold side
- Prev. month maximum temperature difference
- Prev. month value energy
- Prev. month value volume
- Prev. month value tariff register 1
- Prev. month value tariff register 2
- Prev. month value tariff register 3
- Prev. month value volume pulse input 1
- Prev. month value volume pulse input 2
- Prev. month value error time
- Prev. month value flow time
- Prev. month value energy (incorrect installation)
- Prev. month value volume (incorrect installation)
- Monthly set date

Middle of the month values (Loop 3)

The computer stores the following values on the middle of the month set day for up to 24 months:

- Middle of the monthly value for energy amount
- Mid-month value volume
- Mid-month value tariff register 1
- Mid-month value tariff register 2
- Mid-month value tariff register 3
- Mid-month value volume pulse input 1
- Mid-month value volume pulse input 2
- Mid-month set date

Previous year values (Loop 4)

The computer stores the following values on the set day for 16 years:

- Prev. year minimum temperature hot side
- Prev. year minimum temperature cold side
- Prev. year maximum flow rate
- Prev. year maximum power
- Prev. year maximum temperature hot side
- Prev. year maximum temperature cold side
- Prev. year maximum temperature difference
- Prev. year value energy
- Prev. year value volume
- Prev. year value tariff register 1
- Prev. year value tariff register 2
- Prev. year value tariff register 3
- Prev. year value volume pulse input 1
- Prev. year value volume pulse input 2

- Prev. year value error time
- Prev. year value flow time
- Prev. year value energy (incorrect installation)
- Prev. year value volume (incorrect mounting)
- Yearly set date

i	Central European Time (CET) is the default time. Storage is performed at the appropriate times if daylight saving time is activated.
	Previous year values and monthly and middle of the month values can also be read out via the optical interface.

Default parameters (M-bus wire)

It is programmed at the factory as follows:

- Power
  - Present power
- Volume
  - Current flow rate
  - Current total volume
  - Volume previous year
  - Volume previous month
- Energy
  - Current total energy
  - Energy previous year
  - Energy previous month
- Temperatures
  - Current temperature cold side
  - Current temperature hot side
  - Current temperature difference
- Times
  - Date & Time
  - Update time
  - Error time
  - Operating time
  - Prev. year storage day
  - Prev. month storage day
- Tariff register
  - Tariff register 1
  - Tariff register 1 prev. month
  - Tariff register 1 prev. month
  - Tariff register 2
  - Tariff register 2 prev. month
  - Tariff register 2 prev. month
  - Tariff register 3
  - Tariff register 3 prev. month
  - Tariff register 3 prev. month

- Pulse inputs
  - Meter number pulse input 1
  - Current volume pulse input 1
  - Meter number pulse input 2
  - Current volume pulse input 2
- Various
  - Customer number
  - Fabrication number
  - Error flags

| i | A data logger can only read out the data also sent by the data telegram by the meter. The service software can adapt the default telegram. |

Error messages for incorrect mounting:

The meter continuously performs self-diagnostics to detect and display various error messages.

FL nE6 M3	Error 'Wrong direction of flow (negative)' Check whether the direction of flow arrow on the flow measuring section matches the system direction of flow of the system. Rotate the flow measuring section by 180° if the directions do not match.
d iFFnE6 M5	Error 'negative temperature difference' Check whether the temperature sensor is correctly installed. Change the mounting location if the temperature sensor is not correctly installed.

| i | These messages can also display even if not incorrectly mounted if the plant is idle. |

Error codes

Eventually together with other error codes:

Error code	Error	Notes on service
F 0⁻⁻⁻	Flow cannot be measured	Air in the measuring section/pipe; vent the pipe (as supplied)
F 1⁻⁻⁻	Interruption in temperature sensor heat side	Check temperature sensor on the heat side, replace as needed
F 2⁻⁻⁻	Interruption in temperature sensor cold side	Check temperature sensor on the cooling side, replace as needed
F 3⁻⁻⁻	Electronics for temperature assessment defective	Replace meter
F 4⁻⁻⁻	Battery exhausted; Problem with power supply	Replace battery; Check connection
F 5⁻⁻⁻	Short circuit in temperature sensor heat side	Check temperature sensor on the heat side, replace as needed
F 6⁻⁻⁻	Short circuit in temperature sensor cold side	Check temperature sensor on the cooling side, replace as needed
F 7⁻⁻⁻ or F 7F⁻⁻	Fault in the internal memory	Replace meter
F 8⁻⁻	Errors F1, F2, F3, F5, or F6 pending for more than 8 hours, detection of tampering attempts (here: F1 longer than 8 hours).	Measures depend on the error message. Service must reset error message F8
F 9⁻⁻⁻	Error in the electronics	Replace meter

	NOTICE
!	Manually reset message F8 in configuration mode or using the service software 'UltraAssist'. All other error messages are deleted automatically as soon as the error is eliminated.

Two types of power are available:
● AA battery
● Power supply via M-bus

Power supply via M-bus

NOTICE
❗ 1 AA cell must be installed as a backup battery, even if the meter is powered over M-bus.

Battery operated

NOTICE
❗ Battery life depends on the type of battery and requirements (z.B. short timebase, communications module) and the number of installed baterries. ● Install only batteries approved by the manufacturer.

	6 years	11 years	16 years	20 years
Standard meter	1x AA	2x AA	3x AA	4x AA
RF module 868 MHz (mobile, 30 sec. transmission interval)	2x AA	3x AA	4x AA	-

Battery life for a standard meter was calculated using the following assumptions:
- Limits to ambient conditions are maintained
- Computer temperature is 35 °C on annual average
- Heating period ½ year
- Flow measuring every 2 s
- Temperature measurement 4-32 s adaptive
- LCD economy mode
- 2 pulse inputs at 50 % duty cycle max. 2 Hz
- 1 read out via the optical interface per month
- RF transmission interval 15 min., T1, telegram F000, encrypted (Mode 7)

Dynamic battery life calculation

NOTICE	
!	**Change battery**
	Erroneous calculation of battery life
	• The number of batteries must be configured using the service software when replacing batteries. This ensures that the meters can correctly calculate battery life.
	• The date (month, year) the batteries are replaced can also be read out remotely via the M-bus wire or M-bus RF.

Dynamic battery life calculates the probable remaining battery life.

The calculation is based on meter consumption and configuration. Any change to the configuration is automatically applied to battery life. If the meter determines energy use is higher or lower than expected, it lowers or increases its battery life.

Important:
Replace ALL batteries at the same time for an accurate calculation.

Communication

Meters are equipped with an optical interface and two water meter pulse inputs as standard.

You can use one of the following communication modules to remotely read out data:
- Pulse output module
- M-bus module
- RF module

The modules do not impact the acquisition of consumption data. You can upgrade the modules at any time without violating the security seal.

Communication module

The communication modules are connected to a reaction-free plug that can be installed or updated at any time.

Compliance with ESD regulations must be ensured.
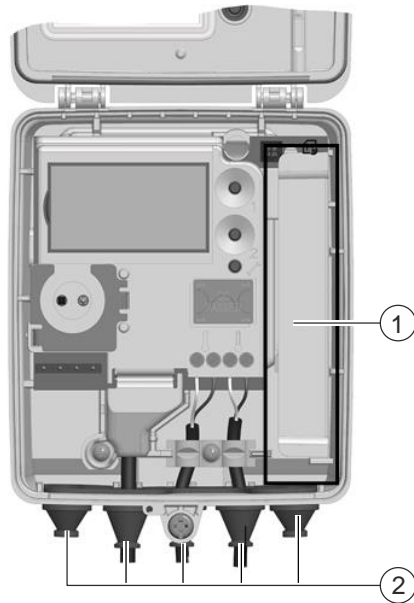
1   Communication module   2   Grommets

Connection terminals

2-pin or 4-pin terminals are used to connect external cables to the modules.

● Stripping length: 6 mm
● Choice of connections:
  – Fixed or flexible, 0.14…1.5 mm²
  – Flexible with ferrules with plastic sleeve, 0.25…1.5 mm²
  – Flexible with ferrules without plastic sleeve, 0.25…1.0 mm²
  – Wire sizes 26…14 AWG
● Recommended screwdriver: 0.6 × 3.5 mm
● Torque: 0.35…0.4 Nm

The exterior diameter must be between 4 and 6 mm. All wiring must be able to be guided to the meter through the existing bushings.

Do not connect shielded cables on the meter side (connect to one end only).

Pulse output module T45-PULSE

Function description

The pulse output module T45-PULSE enables the meter to communicate with a pulse collector to transmit measured values. It supplies pulses that can be derived from the energy, volume, tariff register 1 or tariff register 2. Two channels are available; their function can be adapted using the service software 'UltraAssist'.

The outputs are in the form of standard pulses or "high-resolution pulses".

The pulse output module T45-PULSE enables the output of pulses to 2 configurable channels.

On channel 1 (terminal 16, 17), proportional pulses can be provided:

- Energy (CE)
- Volume (CV) or
- Tariff register 1 (C1)

On channel 2 (terminal 18, 19), proportional pulses can be provided:

- Volume (CV)
- Tariff register 1 (C1) or
- Tariff register 2 (C2)

NOTICE	
!	The output mode as well as standard/high-resolution pulses can be configured with the service software.

Connection of outputs

M-bus module T45-MBUS

Function description

The M-bus module T45-MBUS enables the meter to communicate with an M-bus central communication unit to transmit the measured values.

The data in the M-bus module is up-to-date on each read out. The maximum read-out frequency is once a minute at 9600 baud / 2400 baud or once an hour at 300 baud.

NOTICE
! The M-bus module is equipped with a double terminal. This permits a daisy chain. So that multiple meters can be easily connected; an external split box is no longer required.

RF module 868 MHz T45-RADIO, 868 MHz T45-RADIO-EXT

Function description

RF module T45-RADIO enables wireless communication by the meter with a mobile or stationary receiver at 868 MHz. The maximum range in a free field of view is 400 meters.

RF module T45-RADIOD has an internal antenna on the PCB.

RF module T45-RADIO-EXT has an external antenna connection.

NOTICE
! An external antenna is required for RF module T45-RADIO-EXT with an SMA connection, e.g. WZU-ANT-MAG or WZU-ANT-WALL.

The RF intelligence resides in the meter, the module is only responsible for communications. The RF meters are set by default to 'stationary'.

Data output conforming to OMS

The following data is available:

Stationary read out (F000)

Transmission interval 15 min

- Current energy
- Current volume
- Present power
- Current flow rate
- Current temperatures heat and cold side
- Error (manufacturer-specific)
- Current time stamp (type I)

Mobile read out (F001)

Transmission interval 30 s

- Current energy amount
- Current volume
- Prev. month value energy
- Prev. month value volume
- Save time last previous month
- Prev. year value energy
- Save day last previous year
- Error flags
- Meter time

Other data telegrams on request.

The applicable read out type must be indicated when ordering the RF module (stationary, mobile).

Pulse inputs

Pulse input set T45-PULSE

Function description

The meter has two pulse inputs to count external volume pulses, e.g. as generated from a chilled water meter and/or hot water meter.

Pulse inputs can be supplied via various communication modules and optical interfaces.

Meter readings of the pulse inputs can also be displayed on the LCD.

ⓘ	The pulse inputs must be activated by the service software.

Antennas

|	
Antenna with magnetic base WZU-ANT-MAG 868 MHz, EU-Band 8 / 20 antenna with magnetic base, 2,5 m cable, SMA/M connection, for LoRa®, NB-IoT, GPRS, wM-Bus communication	Wall mounted antenna WZU-ANT-WALL Wall mounted antenna 868 MHz, EU-Band 8 / 20, IP65, 1.5 m cable, SMA/M connection, for LoRa®, wM-Bus, NB-IoT, GPRS communication

Tariff overview

The following options are available for tariff control:

- Threshold value tariff (Tariffs T1 - T5, T9 – T13)
- Threshold values S1, S2, and S3 can be derived from:
  - Flow (Tariff T1, T9),
  - Power (Tariff T2, T10),
  - Temperature cold side (Tariff T3, T11),
  - Temperature hot side (Tariff T4, T12) or
  - Temperature difference (Tariff T5, T13)

For tariffs T1 - T5, the energy is added up in the tariff register; for tariffs T9 - T13 the volume.

Threshold tariffs
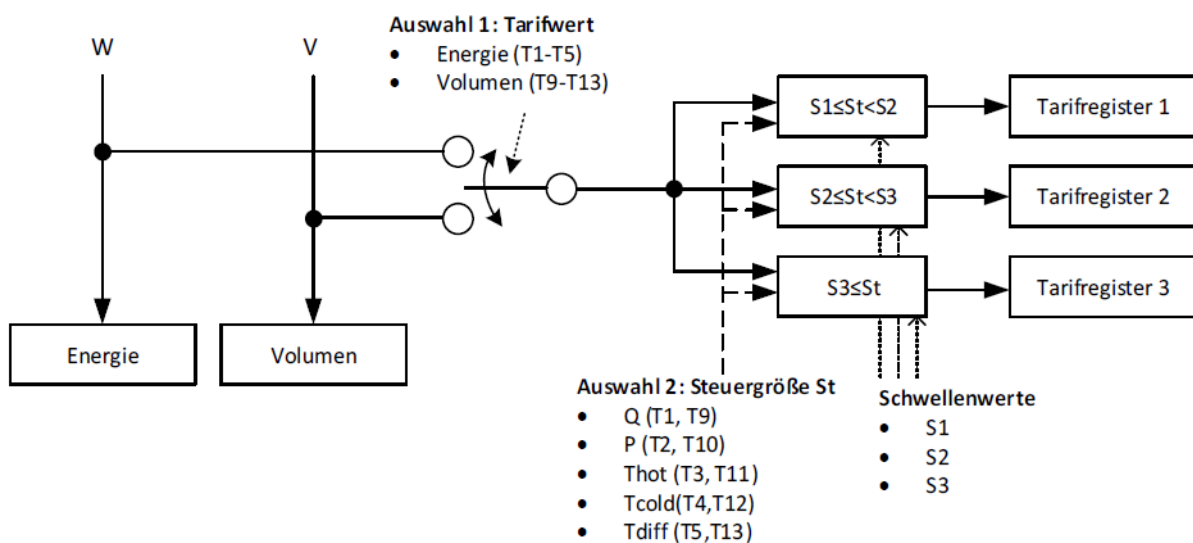
The total is only added up in the applicable tariff register if the threshold in question was exceeded.

- Threshold 1 exceeded: Added up in tariff register 1
- Thresholds 1 and 2 exceeded: Added up in tariff register 2
- Thresholds 1, 2, and 3 exceeded: Added up in tariff register 3

Supplied energy (tariff T6)

The energy is totaled in tariff register 1 as calculated from the temperature, heating side, and the reference temperature.

Returned energy (tariff T6)

The energy is totaled in tariff register 1 as calculated from the temperature cold side, and the reference temperature.

Heat/cooling energy meter (tariff T7)

In tariff register 1, the measured cooling energy is totaled; in tariff register 2, the measured heat energy. In both cases, a threshold can be defined via the temperature heat side (cold threshold, heat threshold).

- Temperature above heat threshold and temperature difference >+0.2 K → thermal energy is acquired
- Temperature below threshold and temperature difference >-0.2 K → Cooling energy is acquired

Surcharge quantity tariff by means of return temperature (tariff T8)

The energy is totaled based on the temperature cold side in tariff registers 1 or 2.

The totaled energy is calculated from the temperature difference cold side and a defined return temperature threshold (and not from the temperature difference).

- Return threshold exceeded: T1 is totaled.
- Return threshold breached: T2 is totaled.

Volume-weighted temperature (Tariff T14)

The result from multiplying the volume with the temperature on the heating side, is totaled in tariff register 1. The result from multiplying the volume with the temperature on the cooling side, is totaled in tariff register 2.

i	Only 'UltraAssist' can perform the tariff configuration.
	The total of energy and volume in the standard registers is performed independently of the tariff situation.

Log functions

In the internal logbook, measurement relevant events (errors, states, actions) are stored in chronological order with the time of occurrence. The acquired events are predefined. Logbook data cannot be deleted.

Each event is stored in a separate 4-level shift register; the overflows are transferred to a 30-level circulating buffer. So that at least the last 4 times can be traced for each event.

In a monthly register, the error states are stored for the current month and the past 18 months (without time stamp).

i	Read out is via M-bus or the optical interface per 'UltraAssist'

Description
F0 = Flow measurement not possible
F1 = Interruption hot side temperature sensor
F2 = Interruption cold side temperature sensor
F3 = Electronics for temperature evaluation defective
F4 = Battery status critical (battery must be replaced)
F5 = Short circuit hot side temperature sensor
F6 = Short circuit cold side temperature sensor
F7 = Data storage defective
F8 = Temperature sensor error > 8 hours
F9 = Internal communication error
F10 = CRC incoherent
F11 = Flow sensor mounted incorrectly
F12 = Temperature sensors mounted incorrectly
W0 = Soiling prewarning
W1 = Storage prewarning (F7V)
W2 = Voltage drop during COM
W3 = Battery must be replaced
W4 = Pipe burst detected
W5 = Leakage detected
E0 = Mains operation
E1 = Temperature in the flow sensor above 130°C
E2 = Temperature in the flow sensor below 5°C
E3 = Maximum flow rated (qs) exceeded
E4 = Temperature in the calculator above 55°C
E5 = Temperature in the calculator below 5°C
E6 = Reset (Start / warm start)
E7 = Negative flow
E8 = Negative temperature difference
E9 = Bubbles detected in the flow
E10 = Commissioning
P0 = Calibration seal set

Description
P1 = Reset of max / min / average values
P2 = Reset of time counters
P3 = Reset of tariff registers
P4 = Reset of datalogger
P5 = Calibration values parameterized
P6 = Meter time / date set
P7 = Set day parameterization
P8 = Master reset
P9 = LCD parameterization
P10 = Tariff parameterization
P11 = Leakage detection parameterized
P12 = Datalogger parameterization

Type summary

Heat energy meters WS8.. and combined heat/cooling energy meters WSN8..

The types of meters listed below are equipped as follows:	
Mounting location	In return
Rated pressure	PN 16
Protection (per EN 60529) ● Heat meter ● Combined heating/cooling energy meter	Flow measuring section: IP54 / Processor: IP54 Flow measuring section: IP65 / Processor: IP54
Length of control cable	1.5 m
Sensor mounting	Return sensor, integrated in the flow measuring section
Temperature sensor cable length	1.5 m
Approval	EN 1434, class 2 MID 2004/22/EG
Display	kWh

The following accessories are included with the sensor types:

Sensing type	Supplied accessories
M10x1 mm, sensor length 27.5 mm	2 flat seals ¾" or 1" 1 sealing set
Ø5.2 mm, sensor length 45 mm	2 flat seals ¾" or 1" 1 sealing set 1 Adapter kit, consisting of: ● 1 sensor adapter ● 1 O-ring ● 1 mounting aid
M10x1 mm, sensor length 38 mm	2 flat seals 1 ¼" 1 sealing set

$\mathbf{i}$ Various other meters including $Q_P = 10$ m^3/h available upon request.

Heat energy meter with sensor M10x 1 mm, sensor length 27.5 mm

Options	Order number	Type
Continuous flow 0.6 m^3/h, mounting length 110 mm, connecting thread G ¾", battery life 6 years, M-bus wired communication, 2 pulse inputs	S55561-F269	WSM805-FBBAE3A
Continuous flow 1.5 m^3/h, mounting length 110 mm, connecting thread G ¾", battery life 6 years, M-bus wired communication, 2 pulse inputs	S55561-F270	WSM821-FBBAE3A
Continuous flow 2.5 m^3/h, mounting length 130 mm, connecting thread G 1", battery life 6 years, M-bus wired communication, 2 pulse inputs	S55561-F271	WSM836-FBBAE3A

Heat energy meter with sensor M10x 1 mm, sensor length 38 mm

Options	Order number	Type
Continuous flow 3.5 m^3/h, mounting length 260 mm, connecting thread G 1¼", battery life 6 years, M-bus wired communication, 2 pulse inputs	S55561-F284	WSM843-FDBAE3A
Continuous flow 6 m^3/h, mounting length 260 mm, connecting thread G 1¼", battery life 6 years, M-bus wired communication, 2 pulse inputs	S55561-F285	WSM853-FDBAE3A

Heating energy meters with sensor Ø5.2 mm, sensor length 45 mm

Options	Order number	Type
Continuous flow 0.6 m^3/h, mounting length 110 mm, connecting thread G ¾", battery life 6 years, M-bus wired communication, 2 pulse inputs	S55561-F272	WSM805-FHBAE3A
Continuous flow 1.5 m^3/h, mounting length 110 mm, connecting thread G ¾", battery life 6 years, M-bus wired communication, 2 pulse inputs	S55561-F273	WSM821-FHBAE3A
Continuous flow 2.5 m^3/h, mounting length 130 mm, connecting thread G 1", battery life 6 years, M-bus wired communication, 2 pulse inputs	S55561-F274	WSM836-FHBAE3A

Combined heat/cooling energy meters with sensor M10x1 mm, sensor length 27.5 mm

Options	Order number	Type
Continuous flow 0.6 m^3/h, mounting length 110 mm, connecting thread G ¾", battery life 11 years, M-bus wired communication, 2 pulse inputs	S55561-F275	WSN805-FBBBF3
Continuous flow 1.5 m^3/h, mounting length 110 mm, connecting thread G ¾", battery life 11 years, M-bus wired communication, 2 pulse inputs	S55561-F276	WSN821-FBBBF3A
Continuous flow 2.5 m^3/h, mounting length 130 mm, connecting thread G 1", battery life 11 years, M-bus wired communication, 2 pulse inputs	S55561-F277	WSN836-FBBBF3A

Combined heating/cooling energy meters with sensor M10x 1 mm, sensor length 38 mm

Options	Order number	Type
Continuous flow 3.5 m^3/h, mounting length 260 mm, connecting thread G 1¼", battery life 11 years, M-bus wired communication, 2 pulse inputs	S55561-F286	WSN843-FDBBF3A
Continuous flow 6 m^3/h, mounting length 260 mm, connecting thread G 1¼", battery life 11 years, M-bus wired communication, 2 pulse inputs	S55561-F287	WSM853-FDBBF3A

Power supply modules

Component	Order number	Type
1 standard battery (AA)	LYU:T45-BA-1	T45-BA-1
Set of 2 Standard batteries (AA)	LYU:T45-BA-2	T45-BA-2
Set of 3 Standard batteries (AA)	LYU:T45-BA-3	T45-BA-3
Set of 4 Standard batteries (AA)	LYU:T45-BA-4	T45-BA-4

Communication input/output modules

Component	Order number	Type
M-Bus wired module	LYU:T45-MBUS	T45-MBUS
Pulse module	LYU:T45-PULSE	T45-PULSE
RF module, 868 MHz, for stationary and mobile read out	LYU:T45-RADIO	T45-RADIO
Pulse input set for water meters	LYU:T45-PULSE-IN	T45-PULSE-IN
RF module, 868 MHz, for stationary and mobile readout with connection for external antenna	LYU:T45-RADIO-EXT	T45-RADIO-EXT
Antenna with magnetic base	LYU:WZU-ANT-MAG	WZU-ANT-MAG
Wall-mounted antenna	LYU:WZU-ANT-WALL	WZU-ANT-WALL

	NOTICE
!	When ordering wireless meters, please indicate in the order whether the meters are used for stationary or mobile meter reading, since the logic is programmed in the meter and not in the module itself. The RF module is the same for both applications. The 'UltraAssist' service software can adapt the meter configuration (stationary or mobile meter reading). A change to readout type can impact battery life.

Mounting accessory

Component	Order number	Type
Mounting kit G ¾", consisting of: 2x threaded connection G ¾" x R ½" 2x cap nuts G ¾" 2x gaskets G ¾"	S55563-F124	WZM-E34
Mounting kit 1", consisting of: 2x threaded connection G 1" x R ¾" 2x cap nuts G 1" 2x gaskets G 1"	S55563-F123	WZM-E1
Mounting kit 1¼", consisting of: 2x threaded connection G 1¼" x R 1" 2x cap nuts G 1 ¼" 2x gaskets G 1 ¼"	S55561-F125	WZM-E54

Component	Order number	Type
Mounting kit 2", consisting of: 2x threaded connection G 2" x R 1½" 2x cap nuts G 2" 2x gaskets G 2"	LYU:WZT-E2.1	WZT-E2.1
Mounting set 110 mm, consisting of: 2x ball valve Rp ¾" with union nut G ¾" (WZT-K34-34) 1x ball valve Rp ¾" with connection for the direct installation of temperature sensors M10x1 mm (WZT-K34) 1x spacer 110 mm (WZM-G110) 2x flat seals	LYU:WZT-MS110	WZT-MS110
Mounting set 130 mm, consisting of: 2x ball valve Rp 1" with union nut G 1" (WZT-K1-1) 1x ball valve Rp 1" with connection for the direct installation of temperature sensors M10x1 mm (WZT-K1) 1x spacer 130 mm (WZM-G130) 2x flat seals	LYU:WZT-MS130	WZT-MS130
Adapter piece 110 mm G ¾" to 130 mm G ¾": 1x extension G ¾ B" to G ¾ B" 1x gaskets G ¾"	LYU:WZM-V130	WZM-V130
Adapter piece 110 mm G ¾" to 130 mm G 1": 2x extension G ¾ B" to G 1 B" 2x gaskets G ¾" 2x gaskets G 1"	LYU:WZM-V130.G1	WZM-V130.G1
Adapter piece 110 mm G ¾" to 165 mm G ¾": 1x extension G ¾ B" to G ¾ B" 1x gaskets G ¾"	LYU:WZM-VE165	WZM-VE165
Adapter piece 110 mm G ¾" to 190 mm G 1": 2x extension G ¾ B" to G 1 B" 2x gaskets G ¾" 2x gaskets G 1"	LYU:WZM-V190	WZM-V190
Sealing disk for thread G ¾", threaded connection R ½"	LYU:9060944002	9060944002
Sealing disk for thread G 1", threaded connection R ¾"	LYU:9060944003	9060944003
Sealing disk for thread G 1¼", threaded connection R 1"	LYU:9060944004	9060944004
Sealing disk for thread G 2", threaded connection R 1 ½"	LYU: 9060944006	9060944006
Mounting set for sensor Ø 5.2x45 mm, consisting of: - 1 sensor fitting DS M10x1 mm, brass - 1x O-ring - 1 grooved pin	LYU:WZT-FA	WZT-FA
Sealing disk for temperature sensor M10x1 mm, Ø 8.6/5,3x1 mm, hard fiber	LYU:9060944001	9060944001
Sealing disk for temperature sensor M10x1 mm, Ø 8.6/5,3x1.5 mm, copper	LYU:9060950	9060950
Sealing disk, copper, for protection pocket G ½" or adapter WZT-A12, Ø 27.9/ 21.2 mm x 1.5 mm	LYU:9060948	9060948
Ball valve R½" with union nut G ¾"	LYU:WZT-K12-34	WZT-K12-34
Ball valve R¾ " with union nut G ¾"	LYU:WZT-K34-34	WZT-K34-34
Ball valve R¾ " with union nut G 1"	LYU:WZT-K34-1	WZT-K34-1

Component	Order number	Type
Ball valve R1" with union nut G 1"	LYU:WZT-K1-1	WZT-K1-1
Ball valve R 1 ¼" with union nut G 1 ¼"	LYU:WZT-K54-54	WZT-K54-54
Ball valve R 2" with union nut G 2"	LYU:WZT-K2-2	WZT-K2-2
Ball valve R ½" to install a DS sensor M10 x 1 mm, length = 28 mm, max. 130°C, PN 25	S55563-F104	WZT-K12
Ball valve R ¾" to install a DS sensor M10 x 1 mm, length = 28 mm, max. 130°C, PN 25	S55563-F120	WZT-K34
Ball valve R 1" to install a DS sensor M10 x 1 mm, length = 28 mm, max. 130°C, PN 25	S55563-F119	WZT-K1
Ball valve R 1 ¼" to install a DS sensor M10 x 1 mm, length = 38 mm, max. 130°C, PN 25	LYU:WZT-K54	WZT-K54
Ball valve R 1 ½ " to install a DS sensor M10 x 1 mm, length = 38 mm, max. 130°C, PN 25	LYU:WZT-K112	WZT-K112
Ball valve R 2" to install a DS sensor M10 x 1 mm, length = 38 mm, max. 130°C, PN 25	LYU:WZT-K2	WZT-K2
Adapter for ball valve for sensor DS 38 mm, including flat seal	LYU:WZT-KA	WZT-KA
Adapter G ⅜ B with threaded hole for sensor M10x1 mm, including gasket G ⅜" made of copper	LYU:WZT-A38	WZT-A38
Adapter G ½ B with threaded hole M10x1 mm for sensor, including gasket G ½" made of copper	S55563-F116	WZT-A12
Adapter G ¾ B with threaded hole M10x1 mm for sensor, including gasket G ¾" made of copper	LYU:WZT-A34	WZT-A34
Protection pocket G ½ B made of brass, mounting length 35 mm, for temperature sensor Ø 5.2x45 mm, including gasket G ½", copper	S55563-F103	WZT-M35
Protection pocket G ½ B made of brass, mounting length 50 mm, for temperature sensor Ø 5.2x45 mm, including gasket G ½", copper	LYU:WZT-M50	WZT-M50
Protection pocket G ½ B made of Stainless steel, mounting length 50 mm, for temperature sensor Ø 5.2x45 mm, including gasket G ½", copper	LYU: WZT-S43V	WZT-S43V
Protection pocket G ½ B x G ¼, stainless steel, mounting length 100 mm, for temperature sensor Ø 6.0x100 mm and universal sensor Ø 6.0, including copper gasket G½"	LYU:WZT-S100	WZT-S100
Protection pocket G ½ B x G ¼, stainless steel, mounting length 150 mm, for temperature sensor Ø 6.0x150 mm and universal sensor Ø 6.0, including copper gasket G½"	LYU:WZT-S150	WZT-S150
Protection pocket G ½ B made of stainless steel, with threaded hole G ¼", mounting length 210 mm, incl. copper gasket G ½"	LYU:WZT-S210	WZT-S210
Adapter kit, consisting of: - 1x plastic sensor adapter Ø 5.2x45 mm - 1 mounting aid for sensor Ø 5.2x45 mm - 2 O-rings	LYU:9956230	9956230
Adapter set for universal sensor Ø 6.0, M12x1.5 mm, adapter fittings, made of brass	LYU:WZT-FAM12	WZT-FAM12
Adapter set for universal sensor Ø 6.0, 2x1/4", adapter fittings, made of Plastic	LYU:WZT-FAG14	WZT-FAG14

Spacer G ¾", length 110 mm, incl. 2 gaskets	LYU:WZM-G110	WZM-G110
Spacer G 1", length 130 mm, incl. 2 gaskets	LYU:WZM-G130	WZM-G130
Spacer G 1¼", length 260 mm, incl. 2 gaskets	LYU:WZM-G260	WZM-G260
Spacer G 2", length 300 mm, including 2 gaskets	LYU:WZM-G300.1	WZM-G300.1
Welding sleeve with threaded hole for temperature sensor DS M10x1 mm	S55563-F121	WZT-G10
Self-lock seal with sealing wire	LYU:9956186001	9956186001
Adapter plate for tophat rail assembly	LYU:WZU-MH	WZU-MH
Mounting plate for wall mounting, large, including 3 screws and dowel	LYU:WZU-WA	WZU-WA

Temperature sensors

Component	Order number	Type
Temperature sensor pair Pt500, DS M10x1 mm, sensor length 27.5 mm, cable length 1.5 m	LYU:WZU5-2815	WZU5-2815
Temperature sensor pair Pt500, DS M10x1 mm, sensor length 27.5 mm, cable length 2.5 m	LYU:WZU5-2825	WZU5-2825
Temperature sensor pair Pt500, DS M10x1 mm, sensor length 38 mm, cable length 1.5 m	LYU:WZU5-3815	WZU5-3815
Temperature sensor pair Pt500, DS M10x1 mm, sensor length 38 mm, cable length 2.5 m	LYU:WZU5-3825	WZU5-3825
Temperature sensor pair Pt500, PS Ø 5.2x45 mm, cable length 1.5 m	LYU:WZU5-4515	WZU5-4515
Temperature sensor pair Pt500, PS Ø 5.2x45 mm, cable length 5 m	LYU:WZU5-4550	WZU5-4550

Pt500, universal temperature sensor pair Ø 6 mm, cable length 3 m	LYU:WZU5-U630	WZU5-U630
Pt500, universal temperature sensor pair Ø 6 mm, cable length 5 m	LYU:WZU5-U650	WZU5-U650
Pt500, universal temperature sensor pair Ø 6 mm, cable length 10 m	LYU:WZU5-U6100	WZU5-U6100

Programming accessories

Component	Order number	Type
Optical read head with USB plug for PC interface	LYU: WZR-OP-USB	WZR-OP-USB
Readout and configuration software: - UltraAssist	Download	-

Ordering
Please specify the quantity, order number, and type when ordering.

Delivery
The ultrasound meters include mounting and operating instructions in various languages, a pulse input set, a sensor adapter set (by sensor version), two flat seals, and a security seal.

Languages
The Installation Instructions are supplied in the following languages:

Bulgarian, Chinese, Czech, Dutch, English, French, German, Greek, Hungarian, Italian, Norwegian, Polish, Russian, Serbo-Croatian, Slovakian, Slovenian, Spanish and Turkish.

Product documentation

Type of document	Title	Document ID
User's guide	Ultrasonic heat and cooling energy meters WSx8..	A6V11906002
Mounting instructions	Ultrasonic heat and cooling energy meters WSx8..	A6V11905994

Related documents such as environmental declarations, CE declarations, etc., can be downloaded at the following Internet address:

http://siemens.com/bt/download

Flow measuring section

Compare the mounting location with the symbol on the LCD (⊡ or ⊡) to determine the mounting location. Adapt the mounting location to local conditions as needed. On heat energy meters ⧘ or combined heat/cooling energy meters, the mounting location of the cooling side corresponds to the return ⊡ and the mounting location of the heating side to the flow ⊡.

On cooling energy meters ❄, the mounting location of the heating side corresponds to the return ⊡ and the mounting location of the cooling side to the flow ⊡.

NOTICE
!	The mounting location can be changed in the field. The function locks after 5 changes and can no longer be used. Entries can be checked in the LCD loop 'LE'. As an alternative, the mounting location can also be changed with the service software 'UltraAssist'.

Settling paths are not required, neither upstream of nor downstream from the meter. If the meter is installed in the common return of 2 heating circuits, the mounting location must be at an adequate distance from the T-piece (min. 10 x DN) to allow the different water temperatures to properly mix.

Thoroughly flush the plant prior to installing the meter.

Mount the flow measuring section between 2 shutoff valves with the arrow pointing in the direction of flow. The sensors must be mounted in the same water circuit as the flow measuring section (observe mixing). Do not separate, shorten, or extend the lines. The sensors can be fitted in T-pieces or ball valves, or can be immersed, either directly or in pockets (observe all national regulations). In any case, the end of the sensors' probe must extend to at least the pipe center. Temperature sensors and fittings must be sealed to prevent tampering.
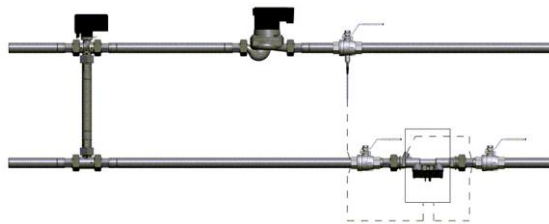
| *NOTICE* |
|---|
| **!** | Comply with all local mounting regulations for meters when mounting the meter. |
| | Protect the meter against damage from shocks and vibrations at the mounting location. |
| | Ensure that no water can enter the processor unit at the mounting location. |

Ball valve
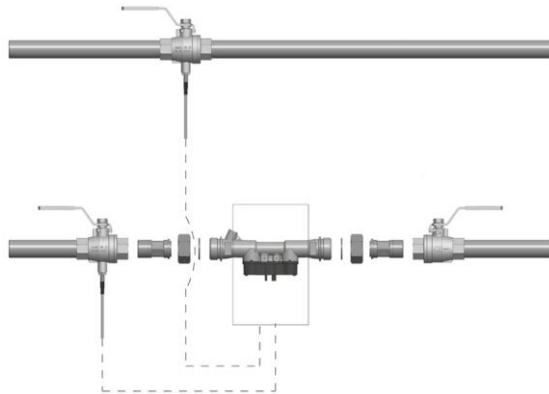
Fig. 1: Integrating with ball valves (recommended up to and including DN25)

Fig. 2: Integration for circuits with mixing; placement of the temperature sensor
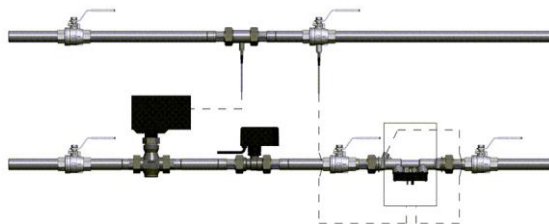
Fig. 3: Integration for circuit with e.g. throttling circuit (flow sensor in the direction of flow prior to control valve / differential pressure controller)

Note the following torques for tightening screws and bolts on the meter:
● Screws on lock to the device cover (Fig. 1, No. 4): At least 1 Nm
● All other screws: Hand tighten, ca. 0.5 Nm

Required position for the cooling energy meter

To avoid the formation of condensation on cooling energy or combined heat/cooling energy meters, make sure the cover on the measuring tube points to the side or downward. Install the protection pockets so that the temperature sensor is horizontal or vertical, pointing down. Forms a loop down using the connected wires. Mount the processor unit away from the flow measuring section (e.g. on the wall). Make sure that condensation cannot run along the connected lines, entering the processor unit (forming a loop downward).

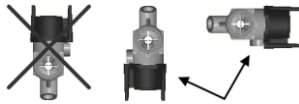Permissible mounting position when metering cooling energy:

Fig. 4: Transducer cover: Recommended mounting position for cooling energy meters and combined heat/cooling energy meters

Processor unit

The ambient temperature of the processor unit cannot exceed 55 °C. Avoid direct sunlight.

Ensure that no water can enter the processor unit at the mounting location.

For water temperatures between 10 °C and 90 °C, the processor can be secured to the flow measuring section.

For water temperatures above 90 °C and/or below 10 °C, mount the processor unit on the wall (split mounting).

The adapter plate on the wall or the flow measuring section can be aligned as needed to ensure ease of reading. Gently push the housing up to remove the processor.

To fit the processor unit to the wall, remove it from the flow measuring section and screw the adapter plate to the wall and slide the processor unit to the adapter base, snapping into place.
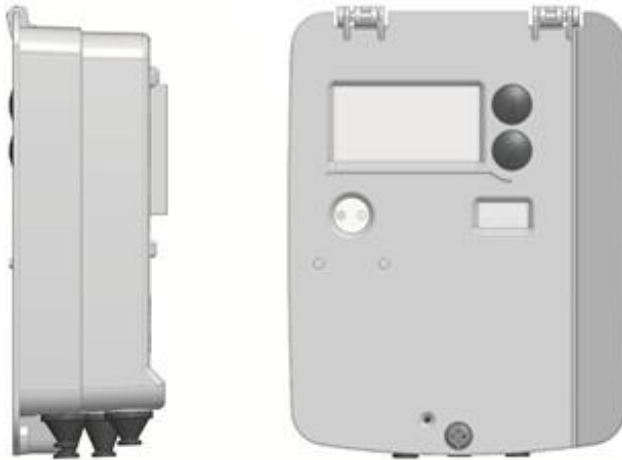
Wall mounting
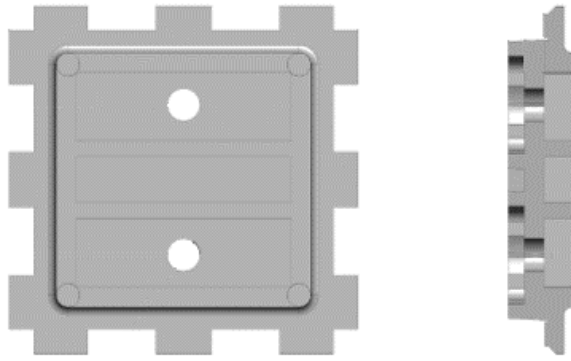
Wall adapter   Wall adapter
(view from above)   (print preview)

Maintenance

The meters are maintenance-free.

Observe all national calibration regulations.

Disposal

	The device is considered an electronic device for disposal in accordance with European Directive and may not be disposed of as domestic waste.
	● Use only designated channels for disposing the devices.
	● Comply with all local and currently applicable laws and regulations.
	● Dispose of empty batteries at designated collection points.

Warranty service

The application-specific technical data is guaranteed only in combination with the Siemens products listed in the 'Device combinations' section. If third-party products are used, any guarantee provided by Siemens will be invalidated.

Processor unit

Power supply	
Battery type	Lithium battery (can be replaced)
Battery voltage	3.6 V
Lithium content of the AA cell	0.65 g per battery
Battery life	6, 11, 16 or 20 years
Number of batteries per meter	1 to 4, depending on configuration

Processor unit	
Temperature measuring range	0…180 °C
Range of temperature difference ΔT	3...120 K
Temperature response threshold	<0.2 K
Thermal coefficient	Shifting compensated
Temperature-measuring error without sensor	$(0.5 + \Delta\Theta min./ \Delta\Theta)$ %, Max. 1.5% at $\Delta\Theta = 3$ K
Measuring accuracy	Class II or class III (EN 1434)

Temperature sensors	
Type	Pt500 or Pt100 (EN 60751)
Temperature range	0…150 °C (up to 45 mm mounting length) 0…180 °C (up to 100 mm mounting length)

Flow measuring section

Operating data							
Temperature range (national approvals may differ) Recommended for: • Heating applications • Cooling applications		5…130 °C 10…130 °C 5…50 °C					
Maximum temperature t_{max}	°C	130					
Rated pressure	MPa	1.6 (PN 16); 2.5 (PN 25)					
Continuous flow q_p	m³/h	0.6	1.5	2.5	3.5	6	10
Meterological class	-	1:100	1:100	1:100	1:100	1:100	1:100
Maximum flow q_s	m³/h	1.2	3	5	7	12	20
Minimum flow q_i	l/h	6	15	25	35	60	100
Response threshold (variable)	l/h	2.4	6	10	14	24	40
Max. overload (2.8 x q_p)	m³/h	1.7	4.2	7	10	17	28

Operating data							
Pressure loss at q_p ● Mounting length 110 mm ● Mounting length 130 mm ● Mounting length 190 mm ● Mounting length 260 mm ● Mounting length 300 mm	mbar	150 - 150 - -	170 160 160 - -	- 175 210 - -	- - - 155 -	- - - 230 -	- - - - 110
Kv value at Δp = 1 bar ● Mounting length 110 mm ● Mounting length 130 mm ● Mounting length 190 mm ● Mounting length 260 mm ● Mounting length 300 mm	m^3/h	1.5 - 1.5 - -	3.6 3.8 3.8 - -	- 6.0 5.3 - -	- - - 9.0 -	- - - 12.8 -	- - - - 32.0
Mounting position	-	Any					
Mounting location	-	Configurable: Cold/heat side					

Communication	
Optical interface ● Basic design ● Protocol	 Similar to EN 62056-21 Per EN 13757-2 / -3

Pulse output module	
Output type	Open drain
Classification	OB/OC per EN 1434-2
Voltage	Max. 30 V
Dielectric strength	500 V_{eff} against ground
Voltage drop	0.9 V at 30 mA (OB) 0.1 V at 0.1 mA (OC)
Current	Max. 30 mA
In the building	e.g. horizontal 30 m

M-bus wired interface	
Voltage V_{max}.	50 V
Power consumption	Max. 1 M-bus load (1.5 mA)
Disconnect/connect	Galvanically isolated
Addressing	**-**
● Meters	Primary and/or secondary
● Pulse inputs	Primary and/or secondary
Baud rate	300 / 2400 / 9600 baud with automatic baud rate detection
Max. permissible reading frequency	1x per minute at 2400 / 9600 baud 1x per hour at 300 baud
Protocol	Per EN 13757-2
Conformity	OMS
M-bus RF interface	
Send mode	T1 and C1
Transmission frequency at T1 / C1	868.95 MHz (868.928 … 868.972 MHz)
Transmitter power (ERP)	Min. 3.16 mW (5 dBm) to max. 25 mW (13.9 dBm)
Send interval	6 s – 24 h, adjustable
Protocol	Open Metering System Specification Vol. 2 4.1.2:2016 EN 13757—3:2018; EN 13757-4:2019
Encryption	Without, security profile A (Encryption Mode 5) or security profile B (Encryption Mode 7)
Max. battery life with 4 AA cells: ● RF mobile (30 s) ● RF stationary (15 min.) Meter in standard configuration, data telegram F000 or F001, T1, frame format A, encryption mode 7, 4x AA cells.	 16 years 20 years
Range: ● In the building ● Outdoors	 Up to 30 m Up to 400 m

Pulse input	
External connection	Open Drain Pulse input 1: Signal to terminal 65, ground to terminal 66 Pulse input 2: Signal to terminal 67, ground to terminal 68
Max. current	Max. 3 µA
Max. pulse frequency	2 Hz
Minimum pulse length	10 ms
Polarity	Active low
Max. cable length	10 m
Standard	Class IB/IC per EN 1434-2

Housing type	
Protection class	III
Protection (o EN 60529) ● Processor unit ● Flow measuring section	 IP54, IP68 IP54, IP65, IP68

Ambient conditions			
	Operation EN1434-1	**Transportation** EN1434-1	**Storage** EN1434-1
Climatic conditions	Class A	Class A	Class A
Temperature	+5...+55 °C	-20...+60 °C	-20...+60 °C
Humidity	<93 % r.h. at 25 °C (non-condensing)		
Mechanical conditions	Class M2		
Electromechanical class	Class E1		
Max. altitude	Min. 700 hPa, corresponding to max. 2000 m above sea level		

Standards and guidelines	
Product standards	DIN EN 1434-x (heat meters)
EU conformity (CE)	See EU declaration of conformance *)

Environmental compatibility
The product environmental declaration A5W00080753A *) contains data on environmentally compatible product design and assessments (RoHS compliance, material composition, packaging, environmental benefit, and disposal).

Dimensions (W x H x D)	
Processor unit	105 x 138 x 44 mm
Flow measuring section	See "Dimensions"

Housing material	
Cover	PC 10 % GF
Bottom section	PC 10 % GF
Battery compartment	PC 10 % GF

Housing colors	
Cover	RAL 9002 (gray white) with stripes on the side, RAL 5014 (dove-blue)
Bottom section	RAL 9002 (Gray white)

Weight	
Device packed complete with inserts	
● $QN = 0.6\ m^3/h$, L = 110 mm	Ca. 1200 g
● $QN = 1.5\ m^3/h$, L = 110 mm	Ca. 1150 g
● $QN = 2.5\ m^3/h$, L = 130 mm	Ca. 1250 g
● $QN = 3.5\ m^3/h$, L = 260 mm	Ca. 2000 g
● $QN = 6\ m^3/h$, L = 260 mm	Ca. 2000 g
● $QN = 10\ m^3/h$, L = 300 mm	Ca. 2500 g

*) Documents can be downloaded at http://siemens.com/bt/download.
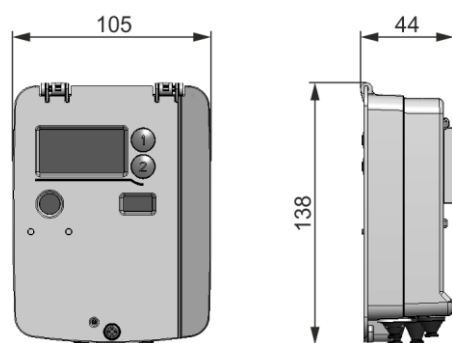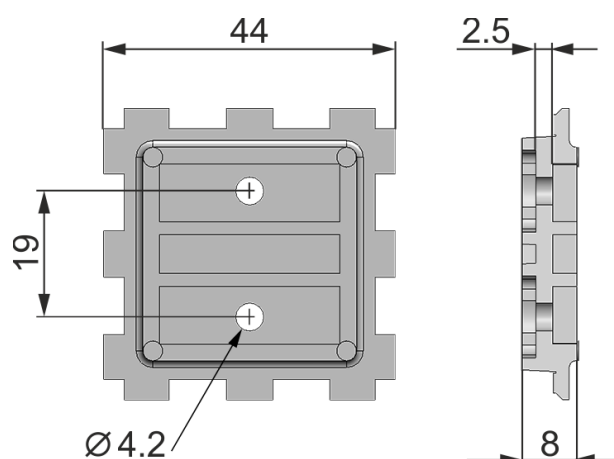
Fig. 5: Dimensions Processor

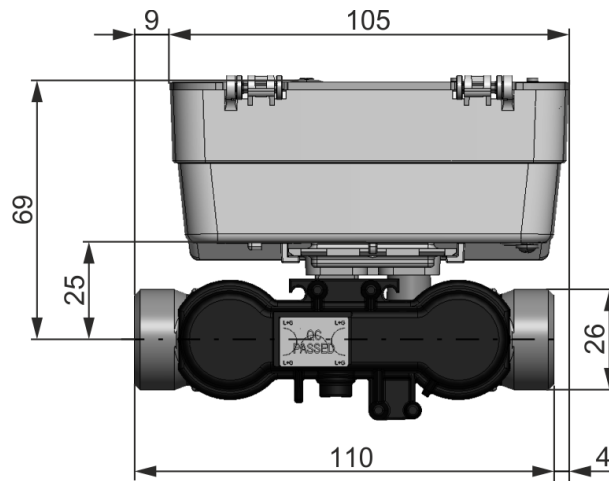*Fig. 6: Top view and cross section of the adapter plate*

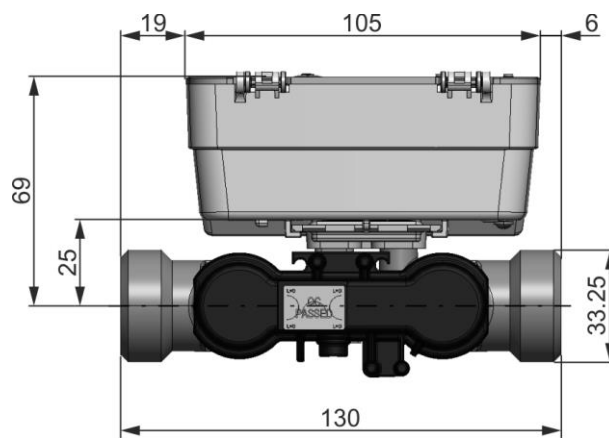*Fig. 7: Overview of dimensions mounting length 110 mm*

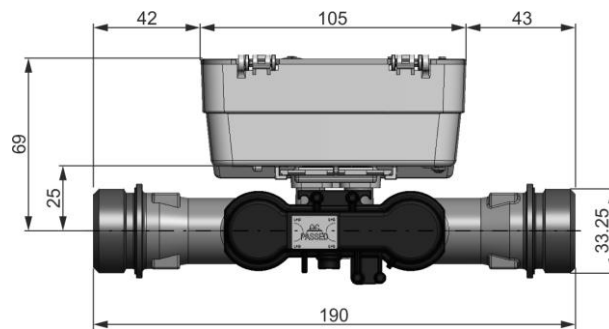*Fig. 8: Overview of dimensions mounting length 130 mm (threaded)*

Fig. 9: Overview of dimensions mounting length 190 mm (threaded)
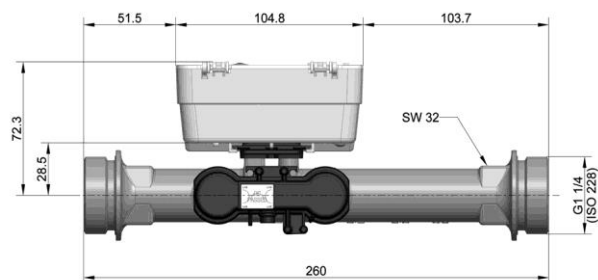
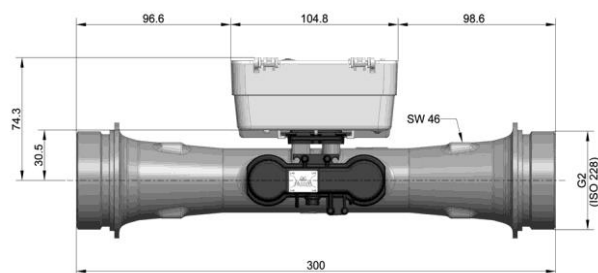*Fig. 10: Overview of dimensions mounting length 260 mm (threaded)*

Fig. 11: Overview of dimensions mounting length 300 mm (threaded)

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