APPLICATION

- ❑ Horizontal and vertical installation
- ❑ For warm water up to 90 °C
- ❑ Fully electronic compact heat meter of multi-jet design for recording energy and volume data
- ❑ Highly accurate recording of all billing data in heating circuits

FEATURES

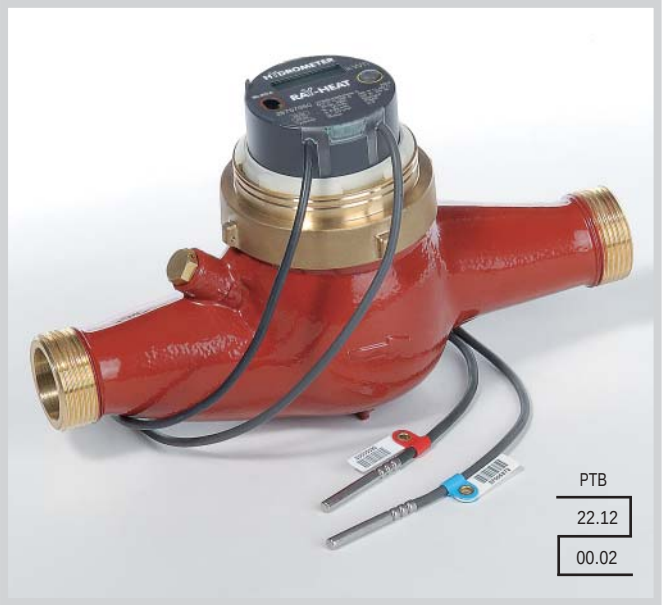
- ❑ Electronically controlled measurements
- ❑ Magnetic coupling and electronic sensor control for recording flow rate
- ❑ Nominal sizes: 3.5/6 and 10 m³/h
- ❑ Multi-jet meter measuring process
- ❑ Measuring accuracy meets the requirements of class B to PTB calibration regulations, Annex 22
- ❑ Lithium battery guarantees longer lifetime than calibration interval
- ❑ Optical interface to ZVEI as standard
  Optional: M-Bus interface
  Optional: Pulse output for energy and volume
- ❑ Adjustable reading date for billing
- ❑ Rotating integrator
- ❑ Service-friendly meter design
- ❑ Temperature sensors permanently connected
- ❑ Hardware and software tools for maximum convenience

COMPONENTS

- ❑ Volume measuring component
- ❑ Integrator – contains hardware and software for measuring flow rate, temperature and energy consumption
- ❑ Temperature sensors

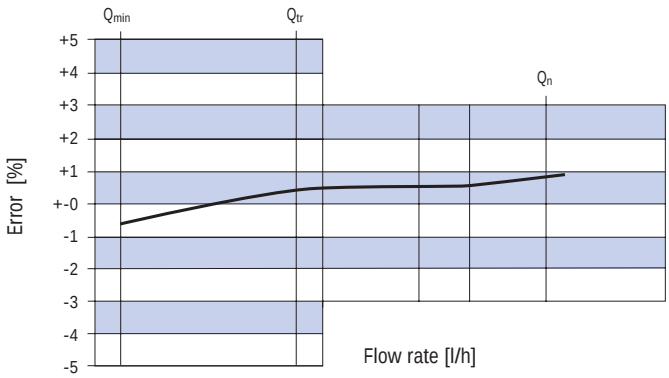
INTEGRATOR

- ❑ Integration of all necessary circuits for recording flow rate and temperature and for calculating, logging and displaying data
- ❑ Compact design for simple installation of unit
- ❑ Single-line, 7-digit display for easy meter reading
- ❑ User-friendly control of various display loops
- ❑ Power supply from built-in lithium battery

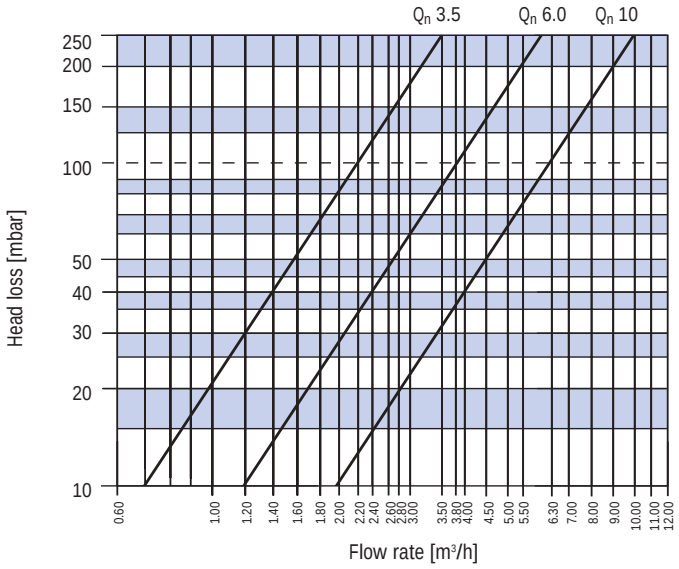


TYPICAL ERROR GRAPH

Measuring accuracy to PTB class B



HEAD LOSS DIAGRAM



VOLUME MEASURING COMPONENT

The volume measuring component is based on the multi-jet meter principle, which achieves very high measuring accuracy. Its size corresponds to the maximum flow rate of the heating circuit system. It can be used in forward or return line. The volume measuring component complies with the requirements of PTB class B.

TEMPERATURE SENSORS

Type Pt 500 temperature sensors to DIN EN 60751 are used as standard. The temperature sensors are permanently connected to the integrator and have a cable length of 1.5 m (meter side) and 6 m (line side).

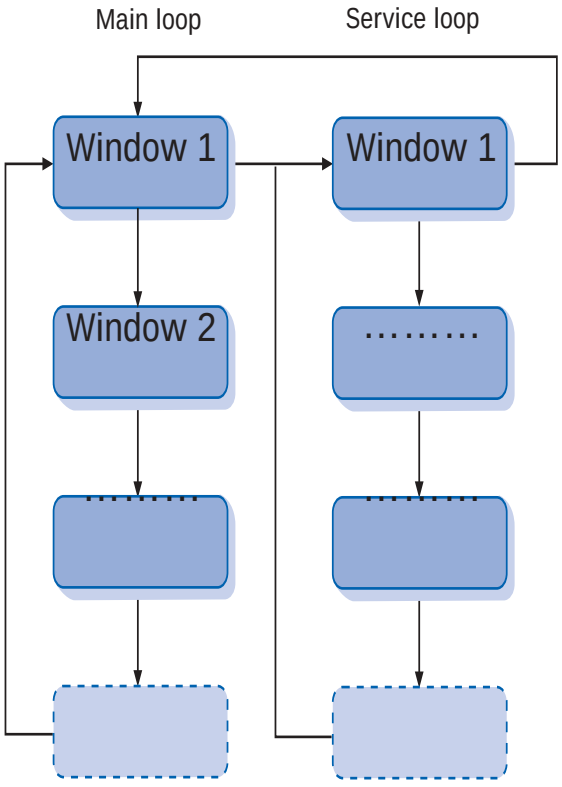
ACCESSORIES/SOFTWARE

❏ Hydro-Set

Software parametrization tool based on the M-Bus and optical interface. It is used for:

- ❏ reading out measured values
- ❏ printing out meter logs
- ❏ meter configuration

OVERVIEW OF LOOPS



LOOP STRUCTURE

The heat meter display has two loops.

Example of main loop:

- ❏ Window 1 (3 s): Total energy consumption
- ❏ Window 2 (1 s): Reading date

Example of service loop:

- ❏ Window 1: Flow rate

The first loop is called the “main loop” and the second loop the “service loop”. The loops have no specific symbol in the display.

The main loop is configured to display the data for current energy and energy on reading date. The service loop displays the current data for flow rate, temperatures, power, volume and next reading date.

OPERATION

A button mounted on the front panel of the meter is used to switch to the next display. The button can be pressed for a short or long time. A short press of the button switches to the next display within a loop and a long press switches to the next loop.

The “Current energy” window in the main loop is the basic display.

NOTE

If the display is switched off, this basic display appears the first time the button is pressed. The display switches off automatically if the button is not pressed for 5 minutes.

LOOP SETTINGS

Loop	Window 1 (3 s)	Window 2 (1 s)
Main loop	Energy since taking into operation	(Basic display)
	Selftest - segments off	Selftest - segments on
	Energy on last reading date	Last reading date
Service loop	Flow rate	-3-
	Forward temperature	-4-
	Return temperature	-5-
	Temperature difference	-6-
	Power	-7-
	Volume	-8-
	Next reading date	-9-

DIMENSIONS OF HEAT METER

	Q_n = 3.5 m³/h	Q_n = 6 m³/h	Q_n = 10 m³/h
DN	25	25	40
AGZ [inches]	G 1 1/4 B	G 1 1/4 B	G 2 B
L [mm]	260	260	300
AGR [inches]	R 1	R 1	R 1 1/2
L1 [mm]	378	378	438
H [mm]	110	110	125
h [mm]	45	45	50

DIMENSIONS OF FLANGE

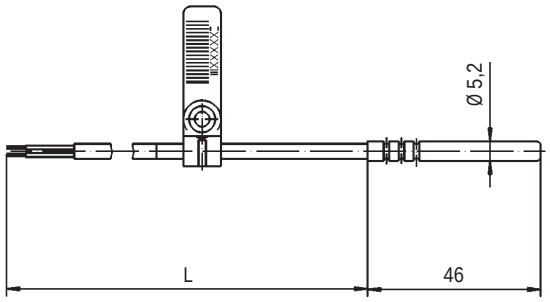
	Q_n = 3.5 m³/h	Q_n = 6 m³/h	Q_n = 10 m³/h
DN	25	25	40
Flange ΔD [mm]	115	115	150
Hole circle ΔK [mm]	85	85	110
L [mm]	260	260	300
H [mm]	110	110	125
h [mm]	45	45	50

DIMENSIONS OF M-TFWZ/M-TSWZ

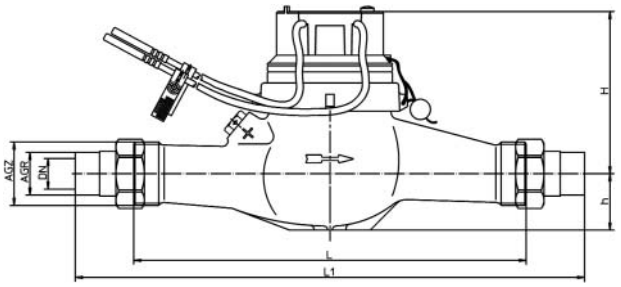
	Q_n = 3.5 m³/h	Q_n = 6 m³/h	Q_n = 10 m³/h
DN	25	25	40
AGZ [inches]	G 1 1/4 B	G 1 1/4 B	G 2 B
L [mm]	135 / 150	135 / 150	150 / 200
AGR [inches]	R 1	R 1	R 1 1/2
L1 [mm]	253 / 268	253 / 268	338
H [mm]	161	161	130
B [mm]	146	146	185

TEMPERATURE SENSORS PT 500

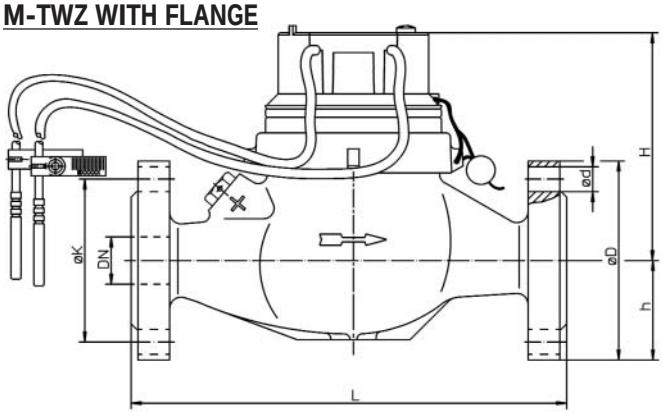
			M-TWZR	M-TWZV
Cable length forward sensor	L	[m]	6	1.5
Cable length return sensor	L	[m]	1.5	6



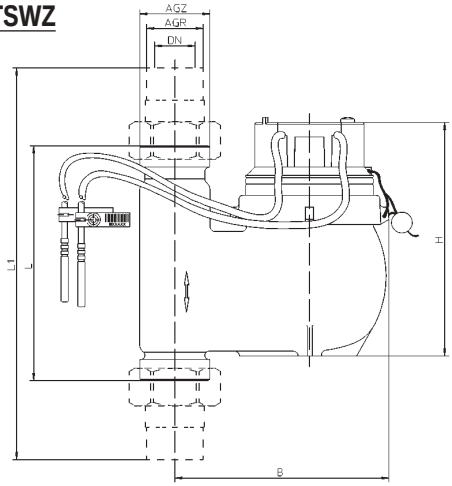
M-TWZ WITH THREAD



M-TWZ WITH FLANGE



M-TFWZ/M-TSWZ



TECHNICAL DATA

M-TWZ				Unit	3.5	6	10
Flow rate ranges	Maximum flow rate		Q_{max}	m³/h	7	12	20
	Nominal flow rate		Q_n	m³/h	3.5	6	10
	Minimum flow rate		q_i	l/h	70	120	200
Head loss	at Q_n		Δp	m/bar	250	250	250
Operating pressure	Maximum		P_N	bar	16	16	16
Connection	Meter thread			inch	G 1 1/4 B	G 1 1/4	G 2 B
	Screw coupling			inch	R 1	R 1	R 1 1/4
	Flange (only horizontal)	Outer ø	D	mm	115	115	150
		Hole circle ø	K	mm	85	85	110
	Nominal diameter		DN	mm	25	25	40
Overall length	Without Screw coupling	Horizontal		mm	260	260	300
		Vertical		mm	150	150	200
	Flange			mm	260	260	300
Medium	Working range			°C	15...90		
Installation	Installation position				Depending on version		
Weight	Without Screw coupling	Horizontal		kg	2.9	2.9	5.1
		Vertical		kg	3.1	3.1	5.5
	Flange			kg	4.9	4.9	8.6

TECHNICAL DATA

Basic features	Ambient class			EN 1434 class C
	Protection class			IP 54
	Type			Compact heat meter to EN 1434
	Metrological class			PTB: class B
	Display			LCD, 7-digit
Display indication	Unit			MWh - kWh - GJ - MJ - kW - m³/h - l/h - m³ - l
	Total values			9 999 999 - 999 999.9 - 99 999.99 - 9 999.999
	Values displayed			Power - energy - flow rate - temperature
Temperature input	Temperature sensors	Type		Pt 500 / 2-wire
	Measuring cycle	T	s	32
	Maximum temperature difference	$\Delta\Theta_{max}$	K	+ 147
	Minimum temperature difference	$\Delta\Theta_{min}$	K	+ 3
	Starting temperature difference	$\Delta\Theta$	K	+ 0.25
	Absolute temperature measurement range	Θ	°C	0...150
Volume/energy pulse (contact or open collector)	Volume pulse values		Pulse	Value of last display
	Energy pulse values		Pulse	Value of last display
	Frequency	f_{max}	Hz	Approx. 4
	Pulse width	t_P	ms	125 ± 16
	Input voltage (contact open)		V	24
	Input voltage (contact closed) at 0.1 mA	max.	mV	250
	Input impedance	min.	kΩ	1.5
Supply voltage	Operating voltage	U_N	VDC	3.0 (lithium battery)
	Nominal power	P_N	µW	30

The M-TWZ range comprises heat meters to PTB standard with nominal sizes Q_n = 3.5 m³/h, 6 m³/h and 10 m³/h.

ORDER REFERENCES

Type Q_n [m³/h]	Type designation	Overall length [mm]	Connection	Nominal diameter [mm]	Cable length of temperature sensors	Display	Variant	Article number
3.5	M-TWZR	260	G 1¼	25	1.5 m / 6 m	kWh	Standard	44100000
6	M-TWZR	260	G 1¼	25	1.5 m / 6 m	kWh	Standard	44100001
10	M-TWZR	300	G 2	40	1.5 m / 6 m	kWh	Standard	44100002
3.5	M-TWZR	260	FL 25	25	1.5 m / 6 m	kWh	Standard	44100003
6	M-TWZR	260	FL 25	25	1.5 m / 6 m	kWh	Standard	44100004
10	M-TWZR	300	FL 40	40	1.5 m / 6 m	kWh	Standard	44100005
3.5	M-TSWZR	135	G 1¼	25	1.5 m / 6 m	kWh	Standard	44100006
6	M-TSWZR	135	G 1¼	25	1.5 m / 6 m	kWh	Standard	44100007
10	M-TSWZR	150	G 2	40	1.5 m / 6 m	kWh	Standard	44100008
3.5	M-TFWZR	135	G 1¼	25	1.5 m / 6 m	kWh	Standard	44100009
6	M-TFWZR	135	G 1¼	25	1.5 m / 6 m	kWh	Standard	44100010
10	M-TFWZR	150	G 2	40	1.5 m / 6 m	kWh	Standard	44100011
3.5	M-TWZR	260	G 1¼	25	1.5 m / 6 m	kWh	M-BUS	44100012
6	M-TWZR	260	G 1¼	25	1.5 m / 6 m	kWh	M-BUS	44100013
10	M-TWZR	300	G 2	40	1.5 m / 6 m	kWh	M-BUS	44100014
3.5	M-TWZR	260	FL 25	25	1.5 m / 6 m	kWh	M-BUS	44100015
6	M-TWZR	260	FL 25	25	1.5 m / 6 m	kWh	M-BUS	44100016
10	M-TWZR	300	FL 40	40	1.5 m / 6 m	kWh	M-BUS	44100017
3.5	M-TSWZR	135	G 1¼	25	1.5 m / 6 m	kWh	M-BUS	44100018
6	M-TSWZR	135	G 1¼	25	1.5 m / 6 m	kWh	M-BUS	44100019
10	M-TSWZR	150	G 2	40	1.5 m / 6 m	kWh	M-BUS	44100020
3.5	M-TFWZR	135	G 1¼	25	1.5 m / 6 m	kWh	M-BUS	44100021
6	M-TFWZR	135	G 1¼	25	1.5 m / 6 m	kWh	M-BUS	44100022
10	M-TFWZR	150	G 2	40	1.5 m / 6 m	kWh	M-BUS	44100023
3.5	M-TWZR	260	G 1¼	25	1.5 m / 6 m	kWh	Pulse output	44100024
6	M-TWZR	260	G 1¼	25	1.5 m / 6 m	kWh	Pulse output	44100025
10	M-TWZR	300	G 2	40	1.5 m / 6 m	kWh	Pulse output	44100026
3.5	M-TWZR	260	FL 25	25	1.5 m / 6 m	kWh	Pulse output	44100027
6	M-TWZR	260	FL 25	25	1.5 m / 6 m	kWh	Pulse output	44100028
10	M-TWZR	300	FL 40	40	1.5 m / 6 m	kWh	Pulse output	44100029
3.5	M-TSWZR	135	G 1¼	25	1.5 m / 6 m	kWh	Pulse output	44100030
6	M-TSWZR	135	G 1¼	25	1.5 m / 6 m	kWh	Pulse output	44100031
10	M-TSWZR	150	G 2	40	1.5 m / 6 m	kWh	Pulse output	44100032
3.5	M-TFWZR	135	G 1¼	25	1.5 m / 6 m	kWh	Pulse output	44100033
6	M-TFWZR	135	G 1¼	25	1.5 m / 6 m	kWh	Pulse output	44100034
10	M-TFWZR	150	G 2	40	1.5 m / 6 m	kWh	Pulse output	44100035

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