



EW447-EW452 Series

Mechanical Heatmeters

FOR HEATING AND COOLING APPLICATIONS

PRODUCT DATA

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Fig. 1. EW447 (cables removed)



Fig. 2. EW447F (with RF)

GENERAL

Application

Honeywell Home EW447-452 Series mechanical meters are compact heat or chilled water meters with electronic measurement based on the multijet principle, consisting of an electronic energy calculator, a multijet flow sensor and two temperature sensors.

They are used for metering of hydronic heating and/or cooling energy in hydronic systems based on volume, supply and return temperature.

EW447-449 models are suitable for energy metering in heating systems ('heat metering').

EW450-452 models are suitable for energy metering in heating, cooling or combined systems.

Features

- **Approval for meter with dynamic range of 100:1 (qp:qi) in class 2**
- **Lithium battery, battery lifetime 12 years**
- **Optical interface as standard**
- **Rotatable calculator**
- **Optionally with integrated radio, Open Metering Standard, 868MHz**

Design

EW447-452 Series mechanical meters consist of:

- Electronic energy calculator with power supply and fixed to mechanical flow sensor
- Factory fitted supply and return temperature sensors
- Optionally M-Bus or pulse output function
- Flow sensor with external threads according to ISO228 (DN15...DN40) or flanges PN16 (DN32...DN100)
- EW45x versions with potted electronics

Materials

- Front panel of energy calculator made of dark grey plastic with laser markings for approval, flow and other product information
- Housing of energy calculator made of dark grey plastic
- EW447 and 452: housing of flow sensor made of unpainted brass
- EW448, 449, 451 and 452: housing of flow sensor made of brass, painted dark grey

Approvals

Heating

- DN15...20: MID class 2 (DE-07-MI004-PTB030) and EN1434 (22.52 / 00.02)
- DN25...40: MID class 2 (DE-09-MI004-PTB001) and EN1434 (22.52 / 06.02)
- DN50...100: EN1434 (22.52 / 01.02)

TECHNICAL DETAILS

Specifications

Sizes	DN15...DN100 qp0.6...60m³/h
Medium	Water, quality to VDI2035
Medium temperature	5...90°C
Ambient temperature	5...55°C
Storage temperature	-20...55°C
Operating pressure	max. 16bar
Protection class	IP54 (EW44x)
Measuring process	Fully electronic compact heatmeter with direct impeller scanning (EW447, 448, 450 and 451) or impeller scanning via magnetic coupling with sensors (EW449 and 452)
Display	LCD, 7-digit
Display units	MWh, kWh, GJ, MJ, kW, m³/h, l/h, m³ and l
Display values	9 999 999, 999 999.9, 99 999.99, 9 999.999
Values displayed	Power, energy, flow rate, temperature, energy on readout date, readout date
Measuring cycle volume	16s
Measuring cycle temperature	32s
Temperature difference	max. 147K
Starting temperature difference	0.25K
Absolute temperature measuring range	0...150°C
Temperature sensors	Pt500 with 2-wire leads
Operating voltage	3.0V
Ambient class	Class C + M1
Battery lifetime	10 + 2 years
Interfaces	Optical Optional interfaces

Flow data

Table 1. Flow rates EW447-452 Series

	DN	15	15	20	25	25	40	50	65	80	100
Flow rates according to MID											
Minimum (qi)	l/h	6	15	25	70	120	200	300	500	800	1,200
Nominal (qp)	m³/h	0.6	1.5	2.5	3.5	6	10	15	25	40	60
Maximum (qs)	m³/h	1.2	3	5	7	12	20	30	50	80	120
Dynamic range (qp/qi)		1:100	100:1	100:1	50:1	50:1	50:1	50:1	50:1	50:1	50:1
Additional flow data											
Starting flowrate	l/h	1.5-2	3-4	5-6	35	60	100	60	60	90	90
Overload flow rate	m³/h							50	50	110	140
Pressure loss @ qp		243	243	242	170	190	240	62	142	80	100

Sizing

- EW447-452 Series mechanical meters should be selected in such a way that typical system flow rates are between approved minimum (qi) and maximum flow rate (qs)
- Overload flow rate may be reached for not more than 15 minutes per day
- Flow rates below minimum and above maximum should be avoided

Function

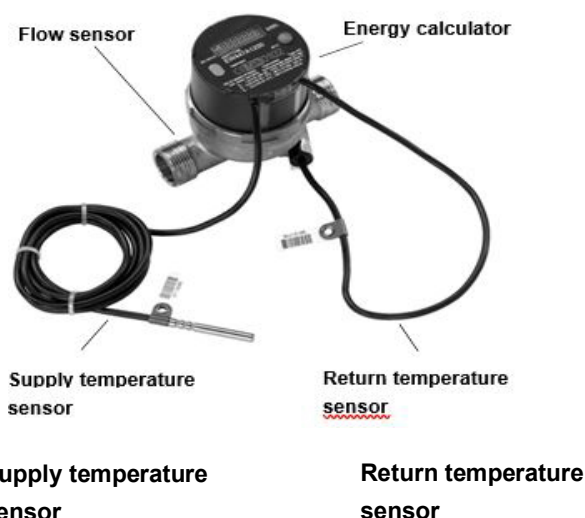


Fig. 3. EW447 components

Energy Calculator

The energy calculator (or simply 'calculator') contains circuits for recording flow rate and temperature and for calculating, logging and displaying data. The meter can be read from a single line seven-digit display with units and symbols. A push button provides control of various display loops. All failures and faults are recorded automatically and displayed on the LCD screen. For protection all relevant data is saved in a non-volatile memory (EEPROM). This memory saves measured values, device parameters and types of error at regular intervals.

Flow Sensor

The multijet technology of the flow sensor permits high measuring accuracy. Standard place of installation is return pipeline. For installation in supply a different version has to be used. Meters cannot be reconfigured from return to supply pipeline usage in the field.

Power Supply

Non replaceable lithium battery 3.0V DC with 10 + 2 year life-time (10 year nominal lifetime, 1 year for storage and 1 year buffer). Nominal lifetime relates to normal usage. Battery life-time is decreased by shorter readout intervals, longer data telegrams, etc.

Temperature sensors

EW447-452 Series mechanical meters are supplied with installed Pt500 temperature sensors with 2-wire leads, Ø5.2mm. The temperature sensors are permanently installed to the meter and cannot be replaced. Sensor cable lengths are as follows:

- | | |
|---------------|--|
| EW447 and 450 | <ul style="list-style-type: none"> Supply: 1.5m Return: 0.4m with sensor installed in housing of flow sensor |
| EW448 and 451 | <ul style="list-style-type: none"> Supply: 3.0m Return: 1.5m with sensor installed in housing of flow sensor |
| EW449 and 452 | <ul style="list-style-type: none"> Supply: 6m Return: 6m |

Interfaces

EW447-452 Series mechanical meters are equipped with a ZVEI optical interface for communication and testing as standard. Further all meters are available with either RF, MBus or pulse output. For more details on interfaces see chapter "Communication and Readout" below.

Installation and Setup

Medium

Heat meters generally are only approved for metering of water and not for water glycol mixtures or fluids other than water. During measurement meter must be completely filled with water.

Flow Sensor

EW447-452 Series mechanical meters must be installed in the return pipeline. When installed in the supply pipeline measurements are either unreliable, inaccurate or nonexistent. Pipeline configuration cannot be changed in the field.

- Avoid installation at highest point of system or system part as air may be trapped in meter
- It is recommended to place a ball valve before and after the heat meter for easy replacement
- Various fittings are available for sizes DN15...DN40
- Ball valves and fittings see Accessories on page 9f
- Further it is recommended to place a strainer before the meter to avoid dirt entering the flow sensor

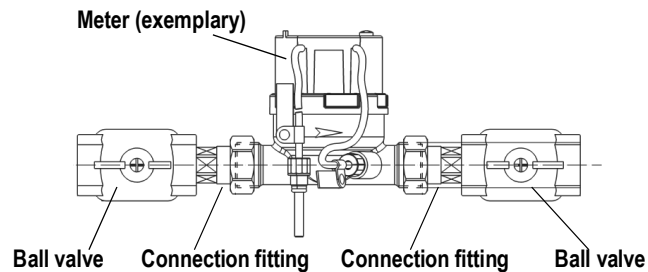


Fig. 4. Flow sensor installation

Calming legs

- EW447, 448, 450 and 451: calming legs before or after meter are not required
- EW449 and 452: a calming leg of 3 x DN before meter is recommended, in case of a T-piece or bend before the meter a length of 5 x DN is recommended

Software

In general it is not necessary to parametrise EW447-452 meters in the field unless standard values should be changed. Such changes can be done with the HydroSet software which you can download free of charge from homecomfort.resideo.com

Installation position

- EW447 and 450 may be installed in any position
- EW448, 449, 451 and 452 may only be installed in horizontal position

Temperature Sensors

- Temperature sensors have to be installed like for like. Example: if one temperature sensor is installed directly in the flow, the second temperature sensor also has to be installed directly in the flow
- Temperature sensors may only be installed directly in the flow or, for sizes DN65 and larger, with MID approved sensor pockets. See Accessories
- Sensor pockets can also be used for smaller sizes, although installation directly in the flow is preferred
- Various fittings and other accessories are available for temperature sensor installation, see Accessories on page 9f

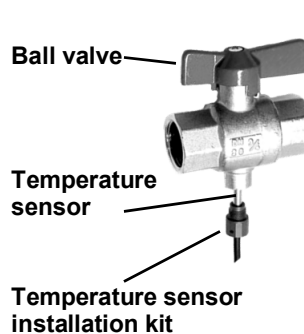


Fig. 5. Temperature sensor installation with ball valve

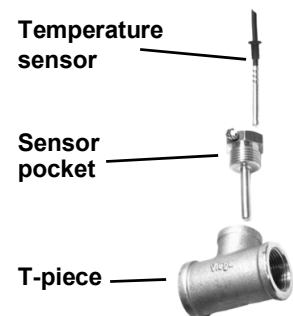


Fig. 6. Temperature sensor installation with sensor pocket

Communication and Readout

Model Overview

EW447-452 Series mechanical meters have an optical interface on the front panel and optionally one additional internal interface.

Model	OS# starting	Sizes available
A type: no interface	EW44xA..., EW45xA...	All sizes
F type: for RF networks	EW447F..., EW450F...	DN15...20
M type: for M-Bus networks	EW44xM..., EW45xM...	All sizes
P type: with pulse output	EW44xP..., EW45xP...	All sizes

Communication Options

Optical interface on front panel

Included as standard in all EW447-452 Series mechanical meters. ZVEI interface, M-Bus protocol, for readout and parametrisation. Required for access to meter:

- Bluetooth optohead (EWA3001799)
- PC with HydroSet software

Onboard RF

Transmission interval 64 seconds, suitable for walk by and fixed RF networks. Open Metering Standard protocol, frequency 868MHz.

Onboard M-Bus interface

According to EN1434-3, data reading and parametrisation via two wires with polarity reversal protection.

Onboard pulse output

Two open collector outputs for energy and volume of heat meters and cooling energy and heat energy for heat and chilled water meters.

Typical Readout Applications

Direct Readout

The meter is visited at its point of installation and desired values are directly read off display and recorded manually.



Recommended model: A model

Alternative

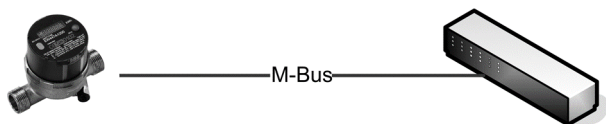
Any EW447-452 Series mechanical meter allows direct readout over the display.

Wired M-Bus Network

The meter is attached to a wired M-Bus network which allows remote configuration and readout over the M-Bus master.

Recommended model: M model

The factory fitted M-Bus interface allows direct wiring to M-Bus networks.



Wireless Networks

Generally there are three kinds of wireless networks:

- Wired M-Bus networks which use RF links for selected parts of the network. Normally an RF capable meter transmits to RF/M-Bus converter EW535M0131 which in turn is wired to an M-Bus master unit
- Mobile RF networks, also called 'walk by'. An RF capable meter is read out by a person walking or driving past the meter and equipped with a suitable receiver
- Fixed RF networks. An RF capable meter is read out by a permanently installed receiver which automatically transmits the data on to an FTP server

All wireless networks mentioned above use the same kind of meter, i.e. all RF capable meters listed below are suitable for use in partially wireless M-Bus networks as well as mobile and fixed RF networks.

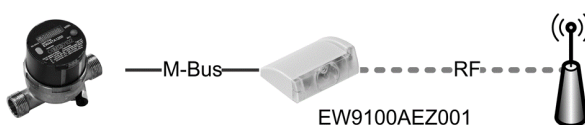
Recommended model: F model

The meter is equipped with an onboard RF interface which enables the meter to be attached to a suitable RF network.



Alternative : M model + EW9100AEZ001

The M-Bus interface allows direct wiring to external RF transmitter EW9100AEZ001.



Pulse Output Signal

The meter is attached to another device which is capable of counting pulses or a converter which converts the pulses into another signal.

Recommended model: P model

The onboard pulse output allows direct wiring to a suitable device. Pulse unit and value cannot be changed.



Setup

On board RF

To activate RF function in the field the red pushbutton on the front side of the meter has to be pushed once. RF can be deactivated with HydroSet software.

On board M-Bus

No field setup required at meter itself. M-Bus parametrisation, for example primary address setting, can be done via M-Bus master unit.

Identification

All EW447 – EW452

- Dark grey calculator housing with OS- Number starting with 'EW4xx...' lasered onto front panel
- 7-digit LCD display
- Models with MID approval: CE mark and MID approval on centre of front panel
- Models with EN1434 approval: CE mark and EN1434 approval mark on front panel
- Serial number and meter specs centre bottom
- Red push button

EW447 and EW450

- Unpainted brass flow sensor housing with external threads on inlet and outlet
- One temperature sensor installed in flow sensor housing

EW448 and EW451

- Dark grey powder coated flow sensor housing with external threads on inlet and outlet

EW449 and EW452

- Dark red powder coated flow sensor housing with flanges on inlet and outlet



Fig. 7. Top view of EW447A1200

Dimensions

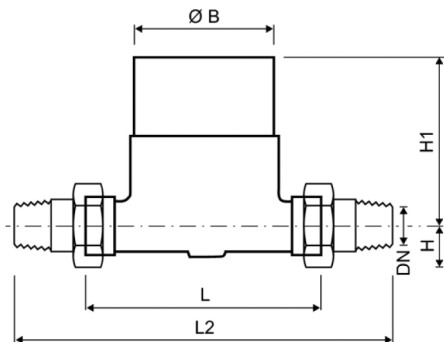


Fig. 8. Dimensions DN15...DN20

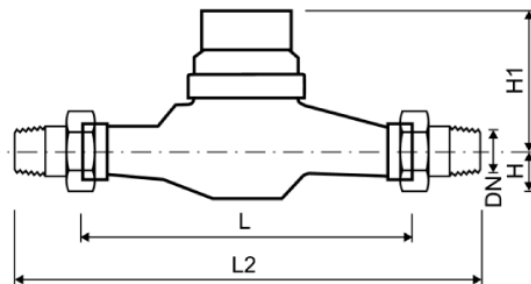


Fig. 9. Dimensions DN25...DN40

Table 2. Dimensions threaded versions

DN	Length L	Length L2	Meter thread	Height H	Height H1	Diameter B	Weight
15	110	190	G3/4" B	20	75	63	0.9 kg
20	130	210	G1" B	20	75	63	1 kg
25	260	378	G1 1/4" B	45	110	63	2.9 kg
40	300	438	G2" B	60	125	63	5.1 kg

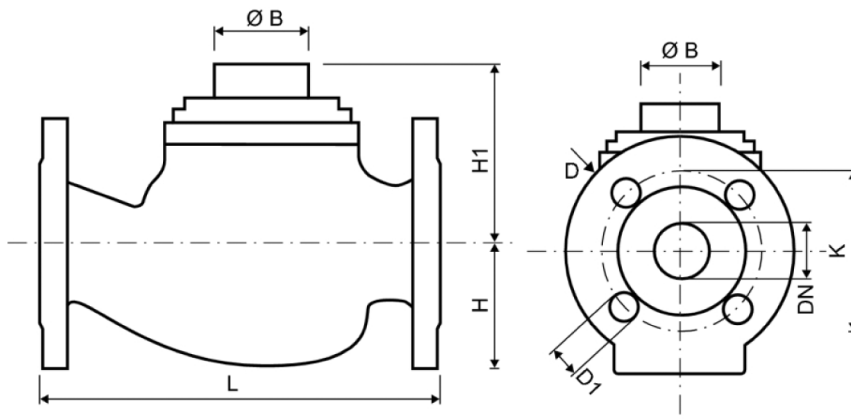


Fig. 10. Dimensions DN50...DN100

Table 3. Dimensions flanged versions

DN	Length L	Height H	Height H1	Flange Ø D	Bolt Ø D1	Bolt circle Ø D1	Weight
50	270	85	125	165	18	125	14 kg
65	300	97	125	185	18	145	18 kg
80	300	102	160	200	18	160	24 kg
100	360	113	170	220	18	180	28 kg

NOTE: All dimensions in mm unless stated otherwise.

Length L2 is approximate and varies depending on type of fitting used

Weight is without fittings or any other accessories

ORDERING DETAILS

Ordering Information

Table 4. Standard Configurations

Item	DN size	Flowrate qp	Length	OS-No.:	
				for heating only	for heating and chilled water
EW447-452 Series without interfaces					
Threaded connections	15	0.6 m³/h	110 mm	EW447A0100	EW450A0100
	15	1.5 m³/h	110 mm	EW447A1200	EW450A1200
	20	2.5 m³/h	130 mm	EW447A2000	EW450A2000
	25	3.5 m³/h	260 mm	EW448A2800	EW451A2800
	25	6.0 m³/h	260 mm	EW448A3600	EW451A3600
	40	10 m³/h	300 mm	EW448A4600	EW451A4600
Flanged connections	50	15 m³/h	270 mm	EW449A5100	EW452A5100
	65	25 m³/h	300 mm	EW449A5900	EW452A5900
	80	40 m³/h	300 mm	EW449A6900	EW452A6900
	100	60 m³/h	360 mm	EW449A7700	EW452A7700
EW447 and 450 Series with RF onboard					
Threaded connections	15	15 m³/h	110 mm	EW447F1200	EW450F1200
EW447-452 Series with M-Bus interface					
Threaded connections	15	0.6 m³/h	110 mm	EW447M0100	EW450M0100
	15	1.5 m³/h	110 mm	EW447M1200	EW450M1200
	20	2.5 m³/h	130 mm	EW447M2000	EW450M2000
	25	3.5 m³/h	260 mm	EW448M2800	EW451M2800
	25	6.0 m³/h	260 mm	EW448M3600	EW451M3600
	40	10 m³/h	300 mm	EW448M4600	EW451M4600
Flanged connections	50	15 m³/h	270 mm	EW449M5100	EW452M5100
	65	25 m³/h	300 mm	EW449M5900	EW452M5900
	80	40 m³/h	300 mm	EW449M6900	EW452M6900
	100	60 m³/h	360 mm	EW449M7700	EW452M7700
EW447-452 Series with pulse output					
Threaded connections	15	0.6 m³/h	110 mm	EW447P0100	EW450P0100
	15	1.5 m³/h	110 mm	EW447P1200	EW450P1200
	20	2.5 m³/h	130 mm	EW447P2000	EW450P2000
	25	3.5 m³/h	260 mm	EW448P2800	EW451P2800
	25	6.0 m³/h	260 mm	EW448P3600	EW451P3600
	40	10 m³/h	300 mm	EW448P4600	EW451P4600
Flanged connections	50	15 m³/h	270 mm	EW449P5100	EW452P5100
	65	25 m³/h	300 mm	EW449P5900	EW452P5900
	80	40 m³/h	300 mm	EW449P6900	EW452P6900
	100	60 m³/h	360 mm	EW449P7700	EW452P7700

Table 5. Special Configurations

Item	DN size	Flowrate qp	Length	OS-Number	
				for heating only	for heating and chilled water
For fallpipe installation, with M-Bus interface					
Threaded connections	25	3.5 m³/h	135 mm		EW6001FM2500
For riser installation, with M-Bus interface					
Threaded connections	25	6.0 m³/h	135 mm		EW6001RM3300
	40	10 m³/h	150 mm		EW6001RM4200

Scope of Delivery

- EW447-452 Series mechanical meter consisting of energy calculator and flow sensor
- Supply and return temperature sensors installed to energy calculator
- One or two installation kits EWA3001305 for pipe installation of temperature sensors:
 - DN15...20: one kit included (one sensor is already installed in meter housing)
 - DN25...50: two kits included
 - DN65 and larger: no kits included as immersion pockets are to be used
- Two paper sealings
- Operating and setup instructions
- M-Bus cable (only types with M-Bus)
- Pulse cable (only types with pulse output)

Accessories

Unless stated otherwise accessories are sold in single packs. Table 6 below shows which connection set and ball valve can be used for which meter size. The meter size is given in the top line and refers to the last four characters of the OS number. Example: Items listed in the column headed '2000' can be used for 'EW447A2000', EW447P2000' or 'EW450M2000' and so on.

Table 6. Cross reference: connection sets and ballvalves / meter

EW4xxX...	0100, 1200	2000	2800, 3600	4600
DN size	DN15	DN20	DN25	DN40
Connection size	G 3/4"	G 1"	G 1 1/4"	G 2"
Connection sets				
Connection set with externally threaded tailpiece	1 x EWA1500035	1 x EWA1500042	1 x EWA1500062	1 x EWA1500072
Connection set with internally threaded tailpiece	2 x VA7405A015	2 x VA7405A020	2 x VA7405A025	n.a.
Connection set with Sanpress crimp fitting	2 x VA7404A015	2 x VA7404A020	2 x VA7404A025	n.a.
Connection set with Mapress crimp fitting	2 x VA7403A015	2 x VA7403A020	2 x VA7403A025	n.a.
Ball valves				
Ball valve with additional port	EWA087HY003	EWA087HY004	EWA087HY005	n.a.

Connection Sets for Flow Sensor

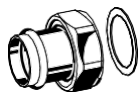
Set of two union nuts, two sealings and two externally threaded brass tailpieces (one pack per meter required) – sealable with locking wire



For DN15, R1/2" x G3/4"	EWA1500035
For DN20, R3/4" x G1"	EWA1500042
For DN25, R1" x G1 1/4"	EWA1500062
For DN40, R1 1/2" x G2"	EWA1500072

NOTE: Union nuts of connection sets EWA15000 are drilled for sealing with locking wire. Union nuts of connection sets VA7403, VA7404 and VA7405 are not sealable with locking wire

Set of union nut, sealing and Sanpress red bronze crimp fitting (two packs per meter required)



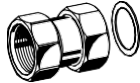
For DN15, for 15mm pipe-Ø	VA7404A015
For DN15, for 18mm pipe-Ø	VA7404A018
For DN20, for 22mm pipe-Ø	VA7404A020
For DN25, for 28mm pipe-Ø	VA7404A025

Set of union nut, sealing and Mapress stainless steel crimp fitting (two packs per meter required)



For DN15, for 15mm pipe-Ø	VA7403A015
For DN15, for 18mm pipe-Ø	VA7403A018
For DN20, for 22mm pipe-Ø	VA7403A020
For DN25, for 28mm pipe-Ø	VA7403A025

Set of union nut, sealing and internally threaded red bronze tailpiece (two packs per meter required)



For DN15, thread Rp1/2"	VA7405A015
For DN20, thread Rp3/4"	VA7405A020
For DN25, thread Rp1"	VA7405A025

Connection Sets for Temperature Sensors

Temperature sensor installation kit (bulk pack of 20pcs)



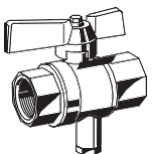
Brass, max. 130°C	EWA3001303
Plastic, max. 90°C	EWA3001305

Tailpiece for direct connection of temperature sensor to T-piece with 1/2" internal thread. Temperature sensor installation kit required



R1/2" external thread, M10x1 sensor thread	EWA087HY003
R1/4" external thread, M10x1 sensor thread	EWA354830

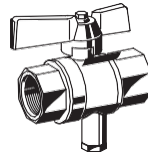
Ballvalve with direct connection for temperature sensor. Temperature sensor installation kit required



DN15, G1/2" internal thread	EWA087HY004
DN20, G 3/4" internal thread	EWA087HY005
DN25, G1" internal thread	EWA087HY006

Brass immersion pockets

35mm, for DN25...32	EWA3002684
52mm, for DN40...65	EWA3002685
85mm, for DN80...100	EWA3004406

Ballvalve with connection for supply temperature sensor

G1/2" internal thread	EWA087HY004
G3/4" internal thread	EWA087HY005
G1" internal thread	EWA087HY006

Tailpiece for connection of supply temperature sensor

R1/2" external thread, M10x1 sensor thread	EWA087HY003
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Brass immersion pocket (for use with MID meters)

35mm, for DN15...32	EWA3002684
52mm, for DN40...65	EWA3002685
85mm, for DN80...125	EWA3004406

Modules**External RF module**

M-Bus, for all EW773 with	EW9100AEZ001
M-Bus module	

Other Accessories**M-Bus cable, length=3m**

For all EW4xxM	EWA812851
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Bluetooth optohead

For all EW447-452	EWA3001799
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Calibration certificates

For up to five meters	EWA3003095A
For six to 20 meters	EWA3003095B
For more than 20 meters	EWA3003095C

DIAGRAMS

Measuring Accuracy

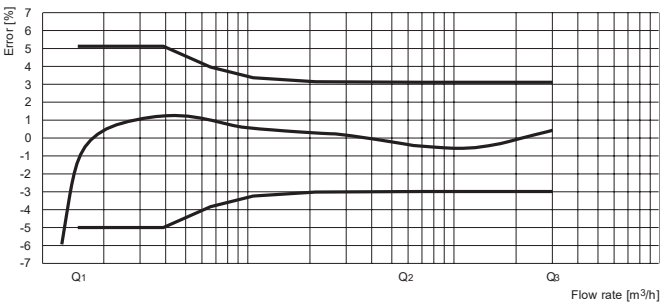


Fig. 11. EW447 and EW450 Series

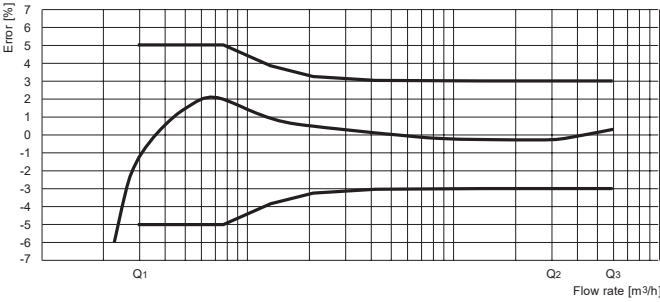


Fig. 12. EW448 and EW451 Series

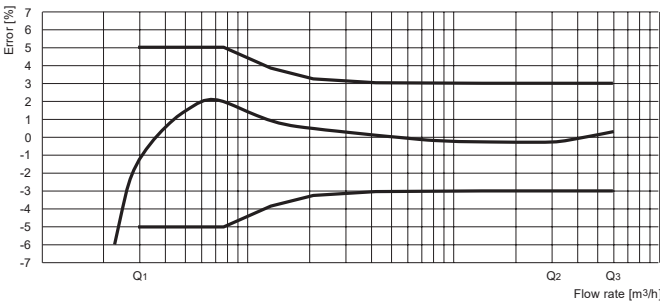


Fig. 13. EW449 and EW452 Series

Flow Diagram

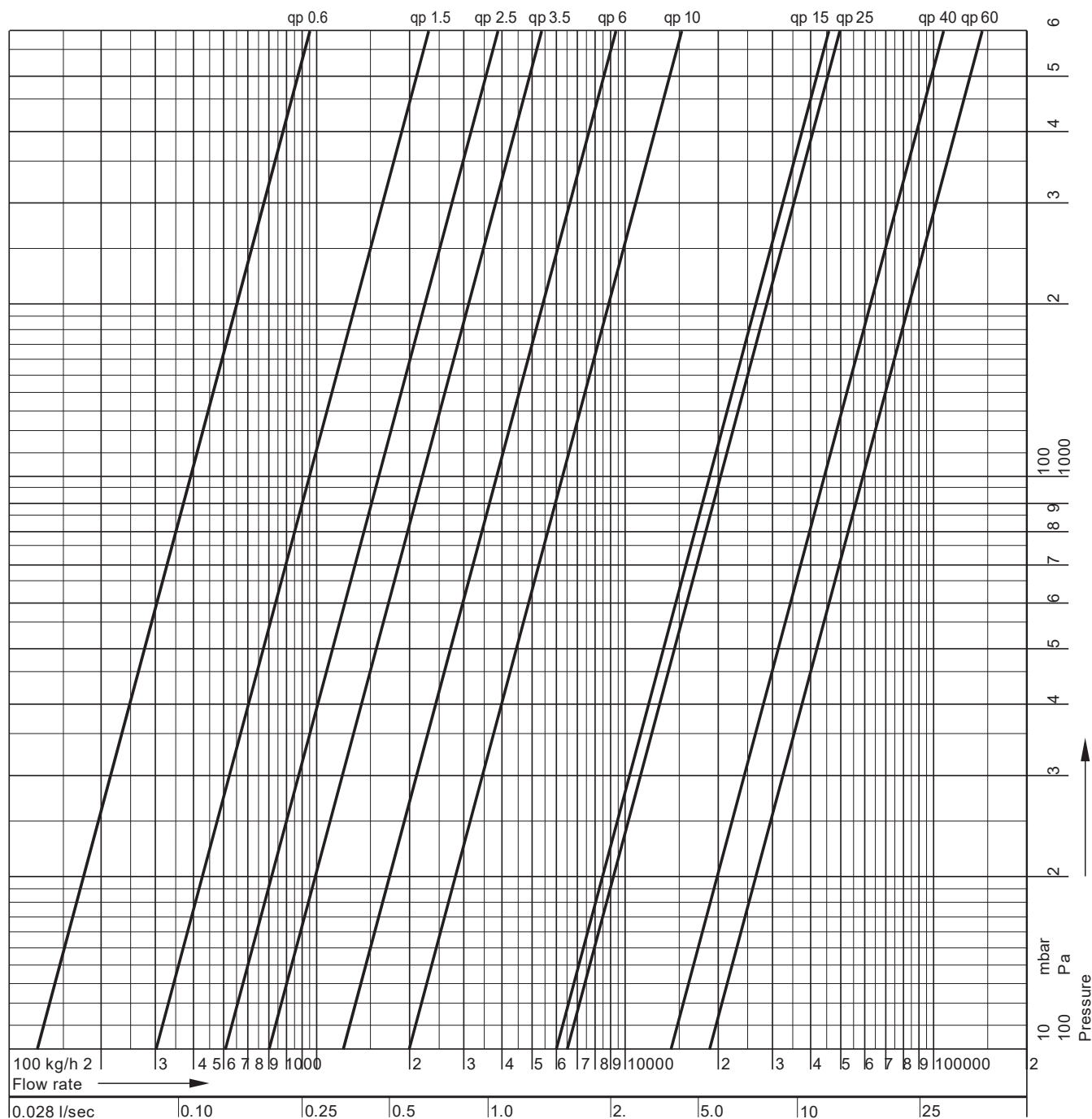


Fig. 14. Pressure drop diagram EW447-EW452 Series



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