



EW773 Series

Ultrasonic Heat Meters

DN15 - DN100 for Heating and Cooling Applications

APPLICATION

Honeywell Home EW773 Series ultrasonic meters are static compact heat or chilled water meters with electronic measurement based on the ultrasonic principle, consisting of an electronic energy calculator, an ultrasonic 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.

EW7730 models are suitable for energy metering in heating systems only. EW7731 models are suitable for energy metering in heating, cooling or combined systems.

APPROVALS

- Heating: MID DE-10-MI004-PTB013, class 2
- Cooling: DE-16-M-PTB-0001
- CE

SPECIAL FEATURES

- Ultrasonic measuring principle
- Dynamic range of 250:1 (qp:qi) in class 2
- Detachable calculator unit with connection cable 1.5 m long and wall mounting plate for wall attachment
- High battery efficiency
 - A-cell: battery lifetime up to 11 years
 - D-cell: battery lifetime up to 16 years
- High long term stability, tested and verified by independent AGFW test
- Insensitive to dirt
- No moving parts in the flow
- ZVEI optical interface
- Optionally with integrated radio OMS (Open Metering Standard), 868 MHz
- Remote reading with up to two add on plug and play modules



TECHNICAL DATA

Media	
Medium:	Water (Quality according to VDI2035)
Connections/Sizes	
Connection sizes:	DN15 - 100 qp 1.5 - 60 m ³ /h
Operating temperatures	
Medium temperature:	
EW7730 (brass) DN15 - DN100:	5 - 130 °C
EW7730 (grey cast iron) DN50 - DN100:	5 - 105 °C
EW7731 (brass) DN15 - DN100:	5 - 130 °C
EW7731 (grey cast iron) DN50 - DN100:	5 - 105 °C
Ambient temperature:	5 - 55 °C
Storage temperature:	-25...+60 °C (>35 °C max. 4 weeks)
Pressure values	
Max. operating pressure:	Threaded versions: max. 16 bar Flanged versions: max. 25 bar
Specifications	
Flow sensor:	
Heating:	IP54 (EW7730)
Cooling:	IP68 (EW7731)
Calculator:	IP54
Measuring process:	Fully electronic compact heat meter with ultrasonic volume measurement
Display:	LCD, 8-digit
Display unit:	MWh, kWh, °C, m ³ , m ³ /h
Display values:	99 999 999, 9 999 999.9, 999 999.99, 99 999.999
Values displayed:	Energy, power, volume, flow rate, temperature and more

Specifications	
Measuring cycle volume:	Battery supply: 1 s Mains power supply: 1/8 s
Measuring cycle temperature:	A-cell battery: 16 s D-cell battery: 4 s Mains power supply: 2 s
Temperature difference:	3 - 175 K
Starting temperature difference:	0.125 K
Absolute temperature measuring range:	1 - 180 °C
Temperature sensors:	Pt500 with 2-wire leads
Diameter:	5.2 mm
Operating voltage:	3.6 V
Electromagnetic class:	E2, M2
Mechanical class:	M1, M2
Environmental class:	C
Battery life:	11 years (A-cell, standard)
Interfaces:	a) Optical b) Optional interfaces can be installed in communication slots
Orientation:	Horizontal, vertical
Installation place (standard):	Return pipeline

TRANSPORTATION AND STORAGE

Keep parts in their original packaging and unpack them shortly before use.

The following parameters apply during transportation and storage:

Parameter	Value
Environment:	clean, dry and dust free
Min. ambient temperature:	-20 °C
Max. ambient temperature:	60 °C
Min. ambient relative humidity:	0 % *
Max. ambient relative humidity:	93 % *

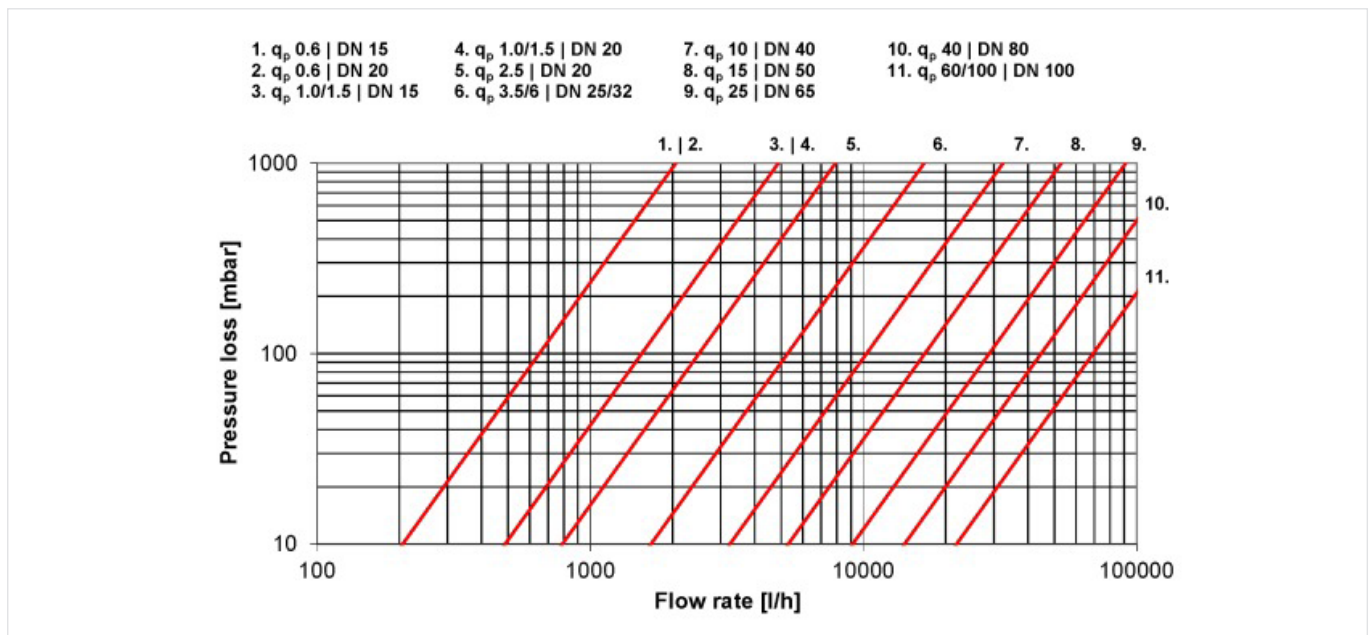
*non condensing

FLOW DATA

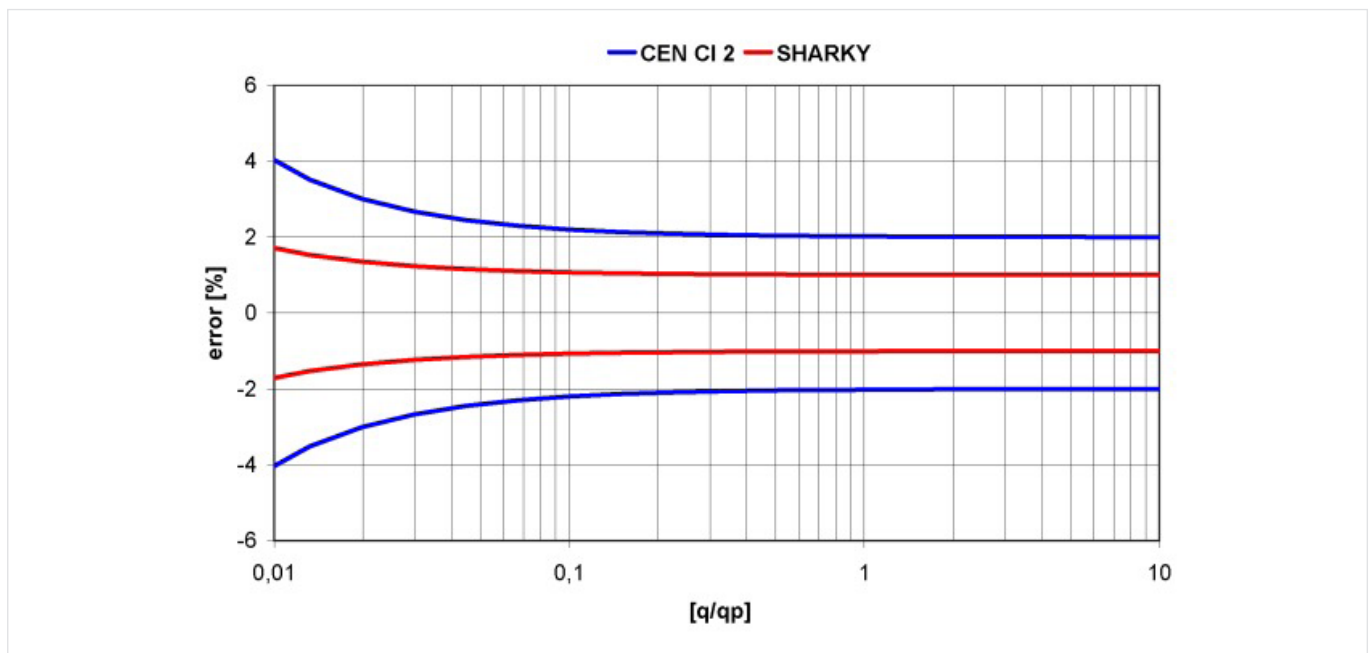
Nominal size diameter:	DN	15	20	25/32	40	50	65	80	100
Flow rates according to MID									
Minimum (qi):	l/h	6 ⁽¹⁾ 15	10 ⁽¹⁾ 25	24 ⁽¹⁾ 60	40 ⁽¹⁾ / 100	60 ⁽¹⁾ / 150	100 ⁽¹⁾ / 250	160 ⁽¹⁾ 400	240 ⁽¹⁾ 600
Nominal (qp):	m³/h	1.5	2.5	6	10	15	25	40	60
Maximum (qs):	m ³ /h	3	5	12	20	30	50	80	120
Dynamic range:	qp/qi	250:1	250:1	250:1	250:1	250:1	250:1	250:1	250:1
Additional flow data									
Starting flow:	l/h	2.5	4	10	20	40	50	80	120
Overload flow rate:	m ³ /h	4.6	6.7	18.4	24	36	60	90	132
Pressure loss at qp:	mbar	120	100	128/190	140	140	75	80	75

⁽¹⁾ When installed in horizontal position

PRESSURE LOSS CURVE



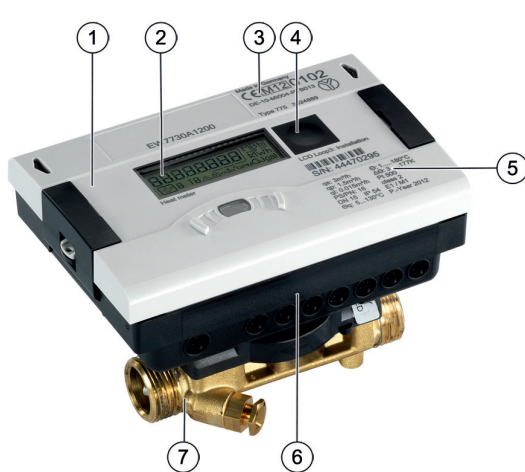
TYPICAL ERROR CURVE



SIZING

- EW773 Series Ultrasonic Hydronic Meters should be selected in such a way that typical system flow rates are between approved minimum (q_i) and maximum flow rate (q_s)
- Overload flow rate may be reached for not more than 15 minutes per day
- Flow rates below minimum and above maximum should be avoided

CONSTRUCTION

Overview	Components	Materials
	1 Top cover	Plastic
	2 Display	LCD
	3 Approval mark	-
	4 Push button	-
	5 Key specifications	-
	6 Base plate	Plastic
	7 Volume sensor housing with threads to ISO 228 or flanges to EN 1092-2 PN25	Brass or cast iron with dark grey coating
Not depicted components:		
	Ultrasonic transducers	-
	Flow tube assembly	Plastic, stainless steel

METHOD OF OPERATION

Energy Calculator

The energy calculator records flow rate and temperature and calculates logs and displays data. The calculator can be mounted directly onto the flow sensor or to the wall.

The meter can be read out from a single line eight-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 nonvolatile memory (EEPROM). This memory saves measured values, device parameters and types of error at regular intervals.

Flow Sensor

The ultrasonic technology of the flow sensor permits very high measuring accuracy and can be used in the supply or return pipeline. Standard place of installation is return pipeline. The configuration for supply can be defined during setup. An additional change after the first use/first contact with water is not possible anymore. Standard cable length between calculator and flow sensor is

- 1.5 m for meters up to qp 6
- 3 m for meters qp 10-60

Note: Other cable lengths are available on request.

Power supply

Standard

- A-cell lithium battery 3.6 VDC with 11 year nominal lifetime

Optional

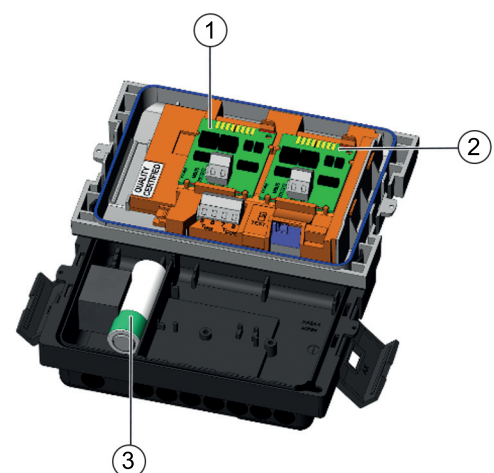
- D-cell lithium battery 3.6 VDC with 16 year nominal lifetime
- 24 VAC mains power supply with integrated, replaceable backup battery
- 230 VAC mains power supply with integrated, replaceable backup battery

Temperature Sensors

EW773 Series ultrasonic meters are supplied with installed Pt500 temperature sensors with 2-wire leads, Ø 5.2 x 2.000 mm. The temperature sensors are installed to the meter with screw terminals and can be replaced by longer versions. Temperature sensors may only be changed in pairs. See chapter "Accessories" further below.

Interfaces/Communication Slots

EW773 Series ultrasonic meters are equipped with a ZVEI optical interface for communication and testing as standard. EW773xF versions additionally have an 868 MHz RF module on board. All meters further have two communication slots which can be occupied with plug and play modules. For more details on interface modules see chapter "Communication and Readout" below. In configuration example below communication slot 1 and slot 2 are occupied.



- 1 Communication slot 1 (occupied)
- 2 Communication slot 2 (occupied)
- 3 Power Supply (A-Cell)

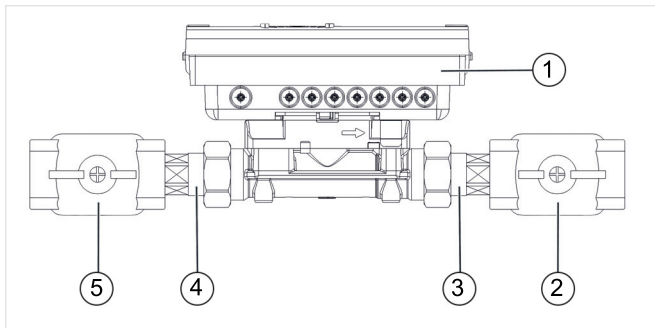
INSTALLATION GUIDELINES

Setup requirements

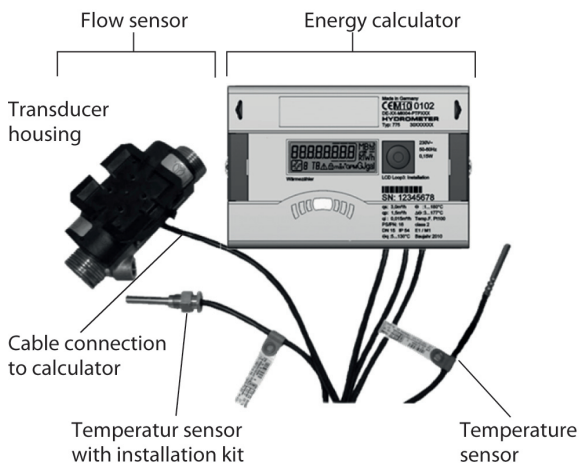
Flow Sensor

EW773 Series ultrasonic meters must be installed in the correct pipeline. When installed in the wrong pipeline measurements are either unreliable, inaccurate or non-existent. Pipeline configuration cannot be changed in the field.

- Calming legs before or after meters are not required but a calming leg of 3DN - 10DN before meters is recommended for flow stabilization
- All sizes may be installed in any position
- Avoid installation at highest point of system or system part as air may be trapped in meter
- It is recommended to place a valve before and after the meter for easy replacement
- For ball valves, connection fittings and a cross reference for which type to use (see Accessories)

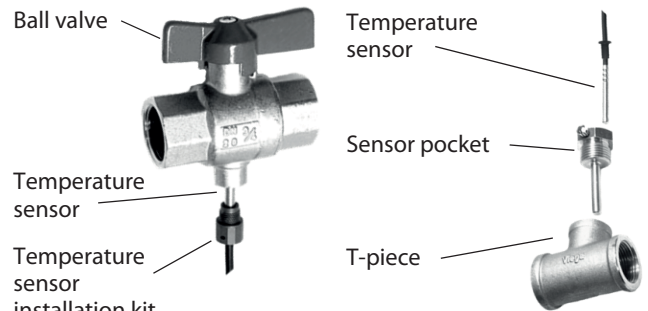


- 1 Meter (exemplary)
- 2 Ball valve
- 3 Connection fitting
- 4 Connection fitting
- 5 Ball valve



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 larger sizes, 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 sensor installation (see Accessories)



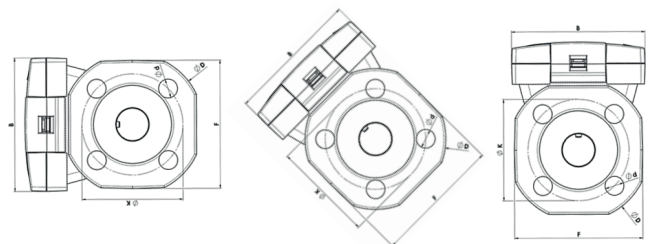
Medium

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

Medium Temperature

Max. medium temperatures for flow sensor are as follows:

- 130 °C when horizontally mounted and transducers (black plastic housing on flow sensor) turned sideways for DN15 and DN20, or
- 105 °C when horizontally mounted and transducers turned sideways for sizes DN25 - DN100



Horizontal installation with counter showing sideways (preferred), 45 °C up (recommended minimum) and upwards (not recommended)

Calculator

Calculator can be installed on or separate from meter, for example with wall mounting plate which is supplied with meter as standard or with other mounting plates available as accessory.

- Flow sensor and calculator of meters up to qp 6 are connected by a permanently fixed cable with a length of 1.5 m which may not be shortened, cut or manipulated in any way
- Cable between flow sensor and calculator of meters qp 10 and larger has to be installed in the field
- In any case calculator must be separated from flow sensor if medium temperature exceeds 90 °C!

Software

In general it is not necessary to parametrize EW773 meters in the field unless standard values should be changed, for example pulse value for a meter with pulse output module. Such changes can be done with the Izar@Mobile 2 software. Izar@Mobile 2 is available in two versions:

- Izar@Mobile 2 Standard allows modification of primary and secondary address as well as some due dates and tariffs
- Izar@Mobile 2 Expert allows further settings, for example display contents and order of appearance and advanced meter configuration

The Izar@Mobile 2 software is available free of charge from Resideo server. To activate Expert functions the software license EWP3066170 is required which is not free of charge and must be purchased separately.

COMMUNICATION AND READOUT

EW773 Series ultrasonic meters have an optical interface on the front panel and two internal communication slots which can be fitted with plug and play modules. Some EW773 models are factory fitted with modules so that one or both slots are occupied. Empty slots can be retrofitted with modules. Possible module combinations are shown in Table below. Not all models are available in all sizes.

It is the responsibility of the purchaser and the installers and users of this unit to ensure that it is wired or installed into a secure network which prevents any unauthorized security intrusion or any other external risk.

Model	Communication slot configuration	OS#starting	Sizes available
A type: freely configurable	Slot 1: empty	EW7730A	DN15 - 100
	Slot 2: empty	EW7731A	DN15 - 100
F type: with RF on board	Slot 1: empty Slot 2: unused	EW7731F	DN15 - 20
M type: with M-Bus on board	Slot 1: M-Bus module	EW7730M	DN15...25
	Slot 2: empty	EW7731M	DN15...100
K-Type (for loop through applications): with M-Bus and PI-Module on board	Slot 1: pulse input module Slot 2: M-Bus module	EW7730K	DN15

COMMUNICATION OPTIONS

Optical interface on front panel

Included as standard in all EW773 Series ultrasonic meters. ZVEI interface, M-Bus protocol, for readout and parametrization. Required for access to meter:

- Bluetooth optohead (EWA3001799)
- PC with Izar@Mobile 2 software

Optional onboard RF module

Transmission interval 12 - 20 seconds (depending on telegram length), suitable for walk by, drive by and fixed RF networks. Open Metering Standard protocol, frequency 868 MHz. RF module is on board and not retrofittable.

M-Bus interface module (EWA3022071)

Configurable telegram, according to EN13757-3, data reading and parametrization via two wires with polarity reversal protection, auto baud detection (300 and 2400 baud), 2 M-Bus connections with 2 primary addresses.

Pulse output module (EWA3022073)

Module with 2 Open Collector pulse outputs (potential free), output 1: 4 Hz (pulse width 125 ms), pulse or static conditions (e.g. errors), output 2: 100 Hz (pulse width \approx 5 ms), ratio: pulse duration / pulse break \sim 1:1, configurable with Izar@Mobile 2 software.

Pulse input module (EWA3022074)

Module with 2 pulse inputs, max. 20 Hz, configurable with Izar@Mobile 2 software, remote data transfer.

Combined pulse in-/output module (EWA3022075)

Module with 2 pulse inputs and 1 pulse output, configurable with Izar@Mobile 2 software, required for leak detection.

Analogue output module (EWA3022106)

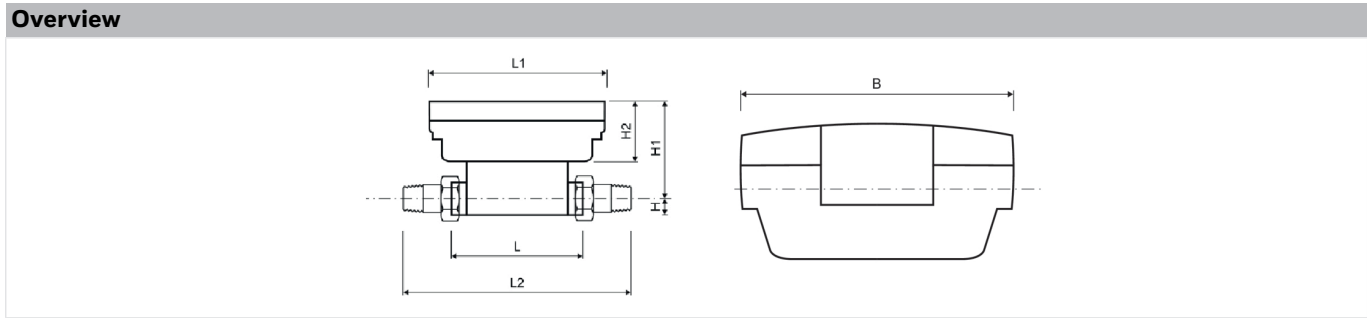
Module for 4 - 20 mA with 2 programmable passive outputs, programmable value in case of error. Field retrofittable only to EW773 meters with two free communication slots as this module occupies both communication slots and can therefore only be combined with RF (which is on board and does not occupy any slot). Not all module combinations are possible. The following table gives an overview of possible combinations:

Slot 1	Slot 2			
	RF	No module	M-Bus	Pulse in
No module	✓	✓		
M-Bus	✓	✓	✓	
Pulse out	✓	✓	✓	✓
Pulse in	✓	✓	✓	
Pulse in/out	✓	✓	✓	
Analogue	✓	✓		

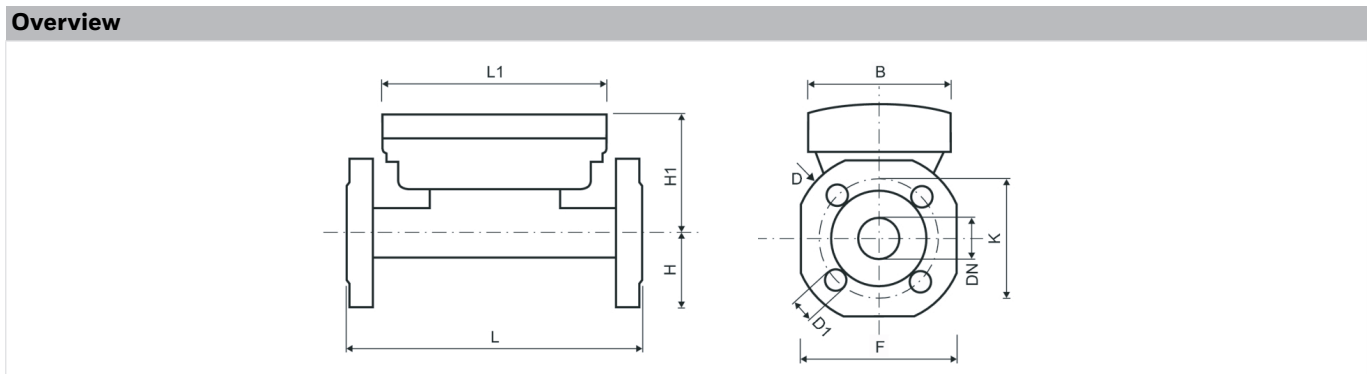
All modules except RF can be retrofitted. RF module is on board and not retrofittable.

Approval of meter is not affected when modules are retrofitted.

DIMENSIONS



Nominal size diameter:	DN	15	20	25	40
Dimensions:	Length L	110	130	260	300
	Length L2	190	230	380	440
	Meter thread	G 3/4" B	G 1" B	G 1 1/4" B	G 2" B
	Height H	14.5	18	23	33
	Height H1	82	84	88.5	94
	Height H2	54	54	54	54
	Length L	150	150	150	150
Weight:	Width B	100	100	100	100
	kg	0.8	0.9	1.5	3.0



Nominal size diameter:	DN	20	25	32	40	50	65	80	100
Dimensions:	Length L	190	260	260	300	270	300	300	360
	Height H	47.5	50	62.5	69	73.5	85	92.5	108
	Height H1	84	88.5	88.5	94	99	106.5	114	119
	Height H2	54	54	54	54	54	54	54	54
	Length L1	150	150	150	150	150	150	150	150
	Width B	100	100	100	100	100	100	100	100
	Flange Ø D	105	114	139	148	163	184	200	235
	Bolt circle Ø K	75	85	100	110	125	145	160	190
Weight:	kg	2.75	3.5	4.8	6.8	7.6	9.6	11	17

Note: All dimensions in mm unless stated otherwise.
 Length L2 is approximate and varies depending on type of fitting used.

ORDERING INFORMATION

EW773 Series with two free communication slots (no modules installed)

Item:	Nominal size diameter:	Flow rate:	Length:	Ordering Number	
				for heating only	for heating and chilled water
Threaded connections	15	1.5 m ³ /h	110 mm	EW7730A1200	EW7731A1200
	20	1.5 m ³ /h	130 mm	EW7730A1400	n.a.
	20	2.5 m ³ /h	130 mm	EW7730A2000	EW7731A2000
	25	6.0 m ³ /h	260 mm	EW7730A3600	EW7731A3600
	40	10 m ³ /h	300 mm	EW7730A4600	EW7731A4600
Flanged connections	32	6.0 m ³ /h	260 mm	EW7730A4000	EW7731A4000
	40	10 m ³ /h	300 mm	EW7730A4800	EW7731A4800
	50	15 m ³ /h	270 mm	EW7730A5200	EW7731A5200
	65	25 m ³ /h	300 mm	EW7730A6000	EW7731A6000
	80	40 m ³ /h	300 mm	EW7730A7000	EW7731A7000
	100	60 m ³ /h	360 mm	EW7730A7800	EW7731A7800

EW773 Series with two free communication slots and installed 230 V mains power supply

Item:	Nominal size diameter:	Flow rate:	Length:	Ordering Number	
				for heating only	for heating and chilled water
Threaded connections	15	1.5 m ³ /h	110 mm		EW7731A1223
	20	2.5 m ³ /h	130 mm		EW7731A2023
	25	6.0 m ³ /h	260 mm		EW7731A3623
	40	10 m ³ /h	300 mm		EW7731A4623
Flanged connections	20	2.5 m ³ /h	190 mm		EW7731A2323
	25	6 m ³ /h	260 mm		EW7731A3823
	40	10 m ³ /h	300 mm		EW7731A4823
	50	15 m ³ /h	270 mm		EW7731A5223
	65	25 m ³ /h	300 mm		EW7731A6023
	80	40 m ³ /h	300 mm		EW7731A7023
	100	60 m ³ /h	360 mm		EW7731A7823

EW773 Series with M-Bus and 230 V on board and one free communication slot

Item:	Nominal size diameter:	Flow rate:	Length:	Ordering Number	
				for heating only	for heating and chilled water
Threaded connections	15	1.5 m ³ /h	110 mm	EW7730M1223	EW7731M1223
	20	2.5 m ³ /h	130 mm	EW7730M2023	EW7731M2023
	25	6.0 m ³ /h	260 mm	EW7730M3623	EW7731M3623
Flanged connections	65	25 m ³ /h	300 mm	EW7730M6023	EW7731M6023
	100	60 m ³ /h	360 mm	EW7730M7823	EW7731M7823

EW773 Series with RF on board and one free communication slot

Item:	Nominal size diameter:	Flow rate:	Length:	Ordering Number	
				for heating only	for heating and chilled water
Threaded connections	15	1.5 m ³ /h	110 mm		EW7731F1200
	20	2.5 m ³ /h	130 mm		EW7731F2000

EW773 Series with RF onboard, one free communication slot and installed 230 V mains power supply

Item:	Nominal size diameter:	Flow rate:	Length:	Ordering Number	
				for heating only	for heating and chilled water
Threaded connections	15	1.5 m ³ /h	110 mm		EW7731F1223
	20	2.5 m ³ /h	130 mm		EW7731F2023

EW773 Series with installed M-Bus module and one free communication slot

Item:	Nominal size diameter:	Flow rate:	Length:	Ordering Number	
				for heating only	for heating and chilled water
Threaded connections	15	1.5 m ³ /h	110 mm	EW7730M1200	EW7731M1200
	20	2.5 m ³ /h	130 mm	EW7730M2000	EW7731M2000
	25	6.0 m ³ /h	260 mm	EW7730M3600	EW7731M3600
Flanged connections	32	6.0 m ³ /h	260 mm		EW7731M4000
	40	10 m ³ /h	300 mm		EW7731M4800
	50	15 m ³ /h	270 mm		EW7731M5200
	65	25 m ³ /h	300 mm		EW7731M6000
	80	40 m ³ /h	300 mm		EW7731M7000
	100	60 m ³ /h	360 mm		EW7731M7800

EW773 Series with installed M-Bus and pulse input modules (both communication slots occupied)

Item:	Nominal size diameter:	Flow rate:	Length:	Ordering Number	
				for heating only	for heating and chilled water
Threaded connections	15	1.5 m ³ /h	110 mm	EW7730K1200	

EW773 Series Kit including EW773 M-Bus Meter plus connection set plus tailpiece for T-supply-sensor

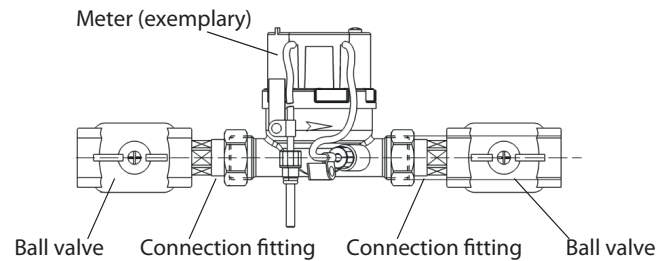
Heat Meter:	Nominal size diameter:	Flow rate:	Length:	Connection set:	Connection for T Sensor:	Ordering Number	
						for heating only	for heating and chilled water
EW7731M1200	15	1.5 m ³ /h	110 mm	EWA1500035	EWA087HY004		EW7731M1200/K1
EW7731M2000	20	2.5 m ³ /h	130 mm	EWA1500042	EWA087HY005		EW7731M2000/K1
EW7731M3600	25	6 m ³ /h	260 mm	EWA1500062	EWA087HY006		EW7731M3600/K1
EW7731M4600	40	10 m ³ /h	300 mm	EWA1500072	EWA3002684		EW7731M4600/K1

Scope of Delivery

- EW773 Series ultrasonic meter consisting of energy calculator and flow sensor
- Cable for connection of energy calculator to flow sensor for sizes DN40 and larger. (Sizes below DN40 have a fixed factory fitted cable)
- Supply and return temperature sensors installed to energy calculator, length = 2 m (except for ...25 versions)
- One or two installation kits EWA3001303 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
- Wall mounting plate EWA3007090
- Two paper sealings
- Operating and setup instructions



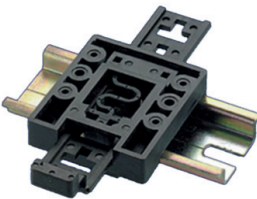

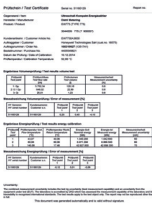
ACCESSORIES

Unless stated otherwise accessories are sold in single packs. Table 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 eighth and ninth characters of the OS number. Example: Items listed in the column headed '12xx' can be used for all OS numbers with '12' as eighth and ninth character, e.g. 'EW7730A1200', 'EW7731M1200' or 'EW7730K1273' and so on.



EW773xX	12xx	14xx, 20xx	36xx	46xx
DN size	DN15	DN20	DN25	DN40
Connection size	G ^{3/4} "	G1"	G1 ^{1/4} "	G2"
Connection fittings				
Connection set with externally threaded tailpiece	1 x EWA1500035	1 x EWA1500042	1 x EWA1500062	1 x EWA1500072
Ball valves				
Ball valve with additional port	EWA087HY004	EWA087HY005	EWA087HY006	n.a.

	Description	Part No.
	Set of two union nuts, two sealings and two externally threaded brass tailpieces (one pack per meter required) – sealable with locking wire	
	For DN15, 1/2" x 3/4"	EWA1500035
	For DN20, 3/4" x 1"	EWA1500042
	For DN25, 1" x 1 1/4"	EWA1500062
	For DN40, 1 1/2" x 2"	EWA1500072
	Pair of Pt500 temperature sensors, Ø5.2 mm (MID approved)	
	Cable length 2 m	EWA3002680
	Cable length 3 m	EWA3002681
	Cable length 5 m	EWA3002682
	Cable length 10 m	EWA3002679
	Temperature sensor installation kit (bulk pack of 20pcs)	
	Brass, max. 130 °C	EWA3001303
	Plastic, max. 90 °C	EWA3001305
	Tailpiece for direct connection of supply temperature sensor	
	Temperature sensor installation kit required	
	R ^{1/2} " external thread, M10x1 sensor thread	EWA087HY003
	Ball valve with internal threads	
	For DN15, G 1/2" internal thread	EWA087HY004
	For DN20, G 3/4" internal thread	EWA087HY005
	For DN25, G1" internal threads	EWA087HY006
	Brass immersion pocket with MID approval	
	Brass pocket, 35 mm MID	EWA3002684
	Brass pocket, 52 mm MID	EWA3002685
	Brass pocket, 85 mm MID	EWA3004406
	Brass pocket, 120 mm MID	EWA3004407
	Retrofittable communication modules	
	M-Bus module, single pack	EWA3022071
	Pulse output module	EWA3022073
	Pulse input module, single pack	EWA3022074
	Combined pulse in-/output module	EWA3022075
	Analogue 4 - 20 mA module	EWA3022106
	Ribbon cable for EW773 modules	EWA3026382

	External M-Bus to RF module	
	For all EW773 with M-Bus module	EW9100AEZ001
	Power supply	
	Replacement A-cell battery	EWA3022102
	D-cell battery	EWA3022103
	Mains supply unit 230 VAC	EWA3022076
	Mains supply unit 24 VAC	EWA3022079
	Calculator mounts	
	Wall mount, single pack	EWA3007090
	Bluetooth optohead	
	For all EW773	EWA3001799
	Izar@Mobile 2 Set Expert	
	License for all EW773	EWP3066170
	Metering software and Certificates	
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