



DATA SHEET

CE



DSPS

Temperature Probes for thermal energy meters

ISOIL 
I N D U S T R I A

For EU Customers only - WEEE Marking

Marking of electrical and electronic equipment in accordance with Article 14 (2) of Directive 2012/19/EU



It is prohibited to dispose a meter marked with this sign into an unsorted municipal waste container together with other waste!

This symbol on the product indicates that it will not be treated as household waste. It must be handed over to the applicable take-back scheme for the recycling of electrical and electronic equipment. For more detailed information about the recycling of this product, please contact your local municipal office

IMPORTANT NOTE: every meter contains at least one AA-size 3.6 V lithium (Li-SOCl₂) battery - model EVE ER14505. These meters may be considered dangerous goods according to IATA regulations – UN3091.

APPLICATION

ISOFLUX ENERGY IFX-E3 is a cost-effective smart ultrasonic heating and cooling meter designed for commercial metering of consumed energy where water is the heat carrier, such as residential buildings, industries, hotels, airports, shopping mall or heat supply facilities.

OPERATING PRINCIPLE

The flowrate is measured based on the ultrasonic transit time measurement principle. The ultrasonic signal is sent along the flow sensor upstream and downstream between the ultrasonic sensors, which alternately perform transmitter and receiver functions. The flow rate is calculated based on the measured propagation time difference (downstream and upstream).

The temperature differential between the supply and return flows is measured by resistive temperature sensors. The electronic unit calculates the amount of consumed heat energy by integrating over time the difference of the enthalpies of supply and return heat carrier and provides the data on the display.

Energy calculation formulas:

- when the flow sensor is in the supply line

$$Q = V \cdot \rho_1 \cdot (h_{T1} - h_{T2})$$

- – when the flow sensor is in the return line

$$Q = V \cdot \rho_2 \cdot (h_{T1} - h_{T2})$$

Where:

Q – heat energy;

V – the volume of water passing through the meter, m³;

ρ_1, ρ_2 – the water density corresponding to the supply and return heat carrier temperatures

Θ_1 and Θ_2 measured by the supply and return water temperature sensors T1 and T2;

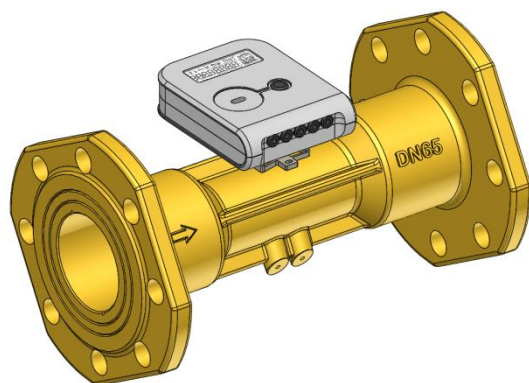
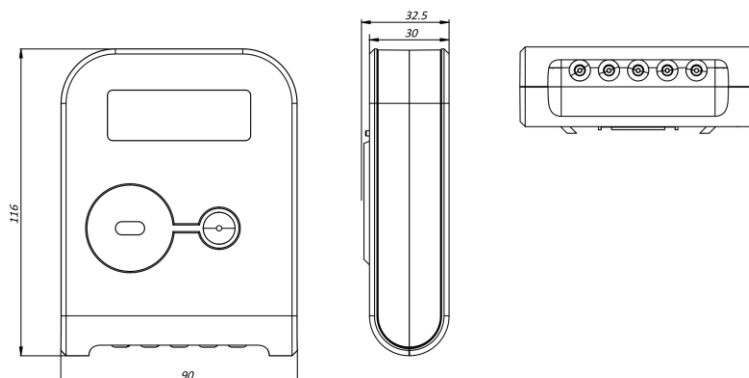
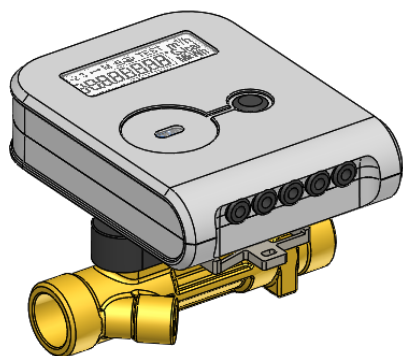
h_{T1}, h_{T2} – the calculated specific enthalpy of the heat carrier for the temperatures $\Theta_1 - \Theta_2$.

TECHNICAL DATA

Flowrate sensor	Qp[m³/h]	0.6 / 1.0 / 1.5 / 2.5 / 3.5 / 6.0 / 10 / 15 / 25 / 40 / 60
	R qp /qi [m³/h]	100 [250 On request]
	Liquid temperature range	0° ... +130°C
	Nominal pressure [bar]	PN25 – 25 bar
	Installation position	All installation positions (vertical, horizontal)
	Flow sensor material	Brass
	Straight pipes	From Qp 0,6m³/h to 2,5m³/h -> U0 D0 From Qp 3,5m³/h to 60m³/h -> U5 D3
Temperature sensor	Type	PT500 - DS type - 2 wires - d 5,2mm [Qp 0,6 ... 2,5 m³/h] PT500 - PL type - 2 wires - d 6,0mm [Qp 3,5 ... 60 m³/h]
	Temperature sensor cable length	1,5 m / 3 m / 5 m
	Temperature measurement range	+0°C ...+180°C
Electronic unit	LCD Display	8-digit
	Power supply	- N.2 AA-size 3.6 V lithium (Li-SOCl₂) batteries 12–42Vdc or 12–36 V 50/60 Hz AC voltage + N.1 AA-size 3.6 V lithium (Li-SOCl₂) battery back-up 230 Vac 50/60 Hz AC voltage + N.1 AA-size 3.6 V lithium (Li-SOCl₂) battery back-up (24Vdc-230Vac transformer as accessory 26TR0001)
	Battery lifetime	15 + 1 years
	Protection class [IP]	IP65 [IP68 On request]
	Ambient temperature	+5° ... +65°C
	Ambient class	Class B / EN 14 154
	Units of measure	kWh; MWh; GJ; Gcal; m³
	Resolution of energy indicators	000000,01 kWh, 00000,001 MWh (Gcal or GJ) 0000000,1 kWh, 000000,01 MWh (Gcal or GJ) 00000001 kWh,
	Flow sensor cable length	1,2 m (2,5 m / 5 m – special order)
	Mounting of calculator	On board / on standard DIN-rail / on the wall
	Communication protocols	M-bus / wireless M-bus / MODbus RTU / BACnet MS-TP / Lo.Ra.WAN.
	Digital I/O	n.2 pulse Input/Output [configurable by ordering code]
Approvals	Metrological	M.I.D. – 2014/32/EU – Annex VI (MI-004) – Class 2
	International standard	EN1434
	International marking	CE

The technical data of the flow sensor are provided in the following table:

Permanent flow rate Qp (m³/h)	Upper Flowrate Qs (m³/h)	Lower Flowrate Qi (m³/h)	Threshold value of flow rate, m³/h	Length of the flow sensor (mm)	Pressure losses at Qp (kPa)	Connections (Thread – G, flange–DN)
0,6	1,2	0,006	0,003	110	7	G3/4"
1	2	0,01	0,005	110	11,3	G3/4"
1,5	3	0,006	0,003	110	17,1	G3/4"
1,5	3	0,015	0,003	110	17,1	G3/4"
1,5	3	0,015	0,005	130	7,2	G1"
2,5	5	0,01	0,005	130	19,8	G1"
2,5	5	0,025	0,005	130	19,8	G1"
3,5	7	0,014	0,007	260	9	G1 1/4"
3,5	7	0,035	0,007	260	9	G1 1/4"
6	12	0,024	0,012	260	10	G1 1/4"
6	12	0,06	0,012	260	10	G1 1/4"
10	20	0,04	0,02	300	18	G2"
10	20	0,1	0,02	300	18	G2"
15	30	0,06	0,03	270	12	DN50
15	30	0,15	0,03	270	12	DN50
25	50	0,1	0,05	300	20	DN65
25	50	0,25	0,05	300	20	DN65
40	80	0,16	0,08	300	18	DN80
40	80	0,4	0,08	300	18	DN80
60	120	0,24	0,12	360	18	DN100
60	120	0,6	0,12	360	18	DN100



WEIGHT OF THE METER

Flow sensor size	Weight of the meter (kg)
G3/4" (110 mm)	0.7
G1" (130 mm)	0.8
G1 1/4"	3.2
G2"	3.7
DN50	8.5
DN65	13
DN80	15
DN100	18

DATA LOGGER

The following parameters of each hour, day, and month are accumulated in the meter:

1	Integral energy
2	Integral cooling energy
3	Integral energy, Tariff 1
4	Integral energy, Tariff 2
5	Integral heat carrier volume
6	Integral value of Pulse Input 1
7	Integral value of Pulse Input 2
8	Value and date of the maximum power
9	Minimum (or maximum cooling) power value and date
10	Value and date of the maximum flowrate
11	Supply heat carrier maximum temperature value and date
12	Return heat carrier maximum temperature value and date
13	Supply heat carrier minimum temperature value and date
14	Return heat carrier minimum temperature value and date
15	Minimum recorded temperature differential and date
16	Supply heat carrier average temperature value
17	Return heat carrier average temperature value
18	No-energy operation calculation error time
19	Summary error code
20	Time when flowrate exceeded 1.2 Qs
21	Time when flowrate was below Qi

Archive capacity, minimum:

- for hours archive records: 1480 h
- for days archive records: 1130 days
- for months and years archive records: 36 months
- Archive data storage time: at least 36 months

Time of storage of all measured integral data, also without power supply to the electronic unit: at least 15 years

FULL CONNECTIVITY





HOW TO ORDER

Model	
IFX	Ultrasonic energy meter
MID	
M4	MID - MI004 - 2014-32-EU
Version	
E3	Flow sensor body in brass
Heating/Cooling Switch and Installation Site	
MR	Automatic switch Heating/Cooling - Return Pipe mounting (T2)
MS	Automatic switch Heating/Cooling - Supply Pipe mounting (T1)
HR	Without automatic switch - Return Pipe mounting (T2)
HS	Without automatic switch - Supply Pipe mounting (T1)
Ratio (Qp/Qi)	
3	R 100
4	R 250
Size	
11	G3/4" Threaded PN25 - Qp: 0,6mc/h - length: 110mm
12	G3/4" Threaded PN25 - Qp: 1mc/h - length: 110mm
15	G3/4" Threaded PN25 - Qp: 1,5mc/h - length: 110mm
20	G1" Threaded PN25 - Qp: 2,5mc/h - length: 130mm
21	G1" Threaded PN25 - Qp: 1,5mc/h - length: 130mm
25	G1"1/4 Threaded PN25 - Qp: 3,5mc/h - length: 260mm
32	G1"1/4 Threaded PN25 - Qp: 6mc/h - length: 260mm
40	G2" Threaded PN25 - Qp: 10mc/h - length: 300mm
50	DN50 Flanged PN25 - Qp: 15mc/h - length: 270mm
65	DN65 Flanged PN25 - Qp: 25mc/h - length: 300mm
80	DN80 Flanged PN25 - Qp: 40mc/h - length: 300mm
100	DN100 Flanged PN25 - Qp: 60mc/h - length: 360mm
Communication Module	
N	None
M	M-Bus
Power Supply	
B	12-42 Vdc or 12-36 V 50/60 Hz AC voltage + N.1 AA-size 3.6 V lithium (Li-SOCl ₂) battery back-up [UN3091]
D	N.2 AA-size 3.6 V lithium (Li-SOCl ₂) batteries [UN3091]
Sensor-Electronic Cable Length	
1	1,2m

2	2,5m
3	5,0m
Extra Communication Interface	
N	None
B	MODBUS - RS485 [it require 12-24V power supply]
LW	LoRaWan [It require M-Bus protocol as main module]
MW	wM-bus - RF868MH [It require M-Bus protocol as main module]
LM	LoRaWan + wM-bus - RF868MH [It require M-Bus protocol as main module]
BC	BACnet MS/TP - RS485 [it require 12-24V power supply]
Electronic Protection Class	
4	IP65 protection
6	IP68 protection
Pulse IN/OUT	
HN	Without Pulse IN/OUT
HY	n.2 Pulse In/OUT
Temperature sensor cable	
1	1,5m [Minimum lenght from size 11 to 21]
3	3m [Minimum lenght from size 25 to 100]
5	5m
10	10m
Configuration Profile	
S	With Transport Mode - ONE function
Energy Unit Measure on display	
1	0,001MWh
2	0,001GJ
3	0,001Gcal
4	1kWh
Fluid	
W	WATER 0° ... +130°C
Temperature Sensor Type	
1	DS probes with plastic nut [Required from size 11 to 21]
2	PL probes [Required from size 25 to 100]
Mounting Set for Temperature	
N	None
Mounting Set for Flow Sensor	
4	n.2 synthetic fibre gasket (non-asbestos)
Special Feature	
0	None

Es. IFX-M4-E3-MR-3-32-N-B-1-B-4-HN-3-S-1-W-2-N-4-0

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