DATA SHEET

IFX-M4-03

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EU DIRECTIVES - DECLARATION OF CONFORMITY

ISOIL Industria" herewith declares, that this product complies with the relevant requirements of the following directives:

2014/32/EU	Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the member states relating to the making available on the market of measuring instruments
2014/30/EU	Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
2014/35/EU	Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
1999/5/EC	Low Voltage Directive on Radio and Telecommunications Terminal Equipment (R&TTE)

EC-type examination certificate: LT-1621-MI004- 008 rev.2

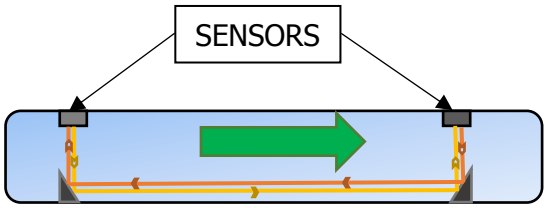
For EU Customers only - WEEE Marking.

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

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.

PRINCIPLE

Ultrasonic flow meters measure the difference of the transit time of ultrasonic pulses propagating in and against flow direction. This time difference is a measure for the average velocity of the fluid along the path of the ultrasonic beam.



HOW TO ORDER

Meter Type										
IFX-M4-03	_	_	_	_	_	_ *	_ *	_ *	15*
Installation site										
Flow pipe	**1**									
Return pipe	**2**									
Destination of the meter										
Meter for heating (for measuring energy only)		**1**								
Meter for heating and cooling (for measuring heating and cooling energy)		**2**								
Ratio of the flow rates (qp/qi)	**Limits of tempearature differences**									
100	(2…150) K		**1**							
250**	(2…150) K		**2**							
100	(3…150) K		**3**							
250**	(3…150) K		**4**							
Flow Sensor										
Permanent flow rate m³/h	**Mounting length mm**	**Connection to the pipe line**								
0.6	110	G ¾" - 1		**10**						
1.0	110	G ¾" - 2		**11**						
1.5	110	G ¾" – 3		**15**						
1.5	130	G 1" – M		**14**						
2.5	130	G 1" – 4		**20**						
3.5	260	G 1 ¼" – 5		**25**						
6.0	260	G 1 ¼" – 6		**32**						
10.0	300	G 2" – 7		**40**						
10.0	300	DN40 – 8		**41**						
15.0	270	DN50 – 9		**50**						
3.5	260	DN25 – A		**26**						
6.0	260	DN25 – B		**33**						
3.5	260	DN32 – N		**34**						
6.0	260	DN32 – R		**35**						
0.6	190	G 1" – C		**06**						
1.0	190	G 1" – D		**08**						
1.5	190	G 1" – E		**17**						
2.5	190	G 1" – F		**22**						

0.6	190	DN20 – G		**09**						
1.0	190	DN20 – H		**12**						
1.5	190	DN20 – K		**16**						
2.5	190	DN20 – L		**21**						
				Communication module						
				None		**0**				
				M-bus		**1**				
				CL		**2**				
				RF module 868Mhz		**4**				
				MODBUS RS485		**5**				
				LON		**6**				
				MiniBus		**7**				
				Supply voltage						
				Internal battery PN16			**1**			
				External power supply 24V Ac/DC PN16			**2**			
				Internal battery PN25			**3**			
				External power supply 24V Ac/DC PN25			**4**			
				Connection cable length between calculator and the flow sensor						
				1.2 m				**1**		
				2.5m				**2**		
				5.0 m				**3**		
				Temperature sensors pair						
						None			**0**	
						DS; PT500			**1**	
						PL; PT500			**2**	

Remark: * - marked numbers are used only for order coding. (It is not used for meter marking).

TECHNICAL DATA

STANDARD FEATURES	
Suitable for	▪ Heating and Cooling application
Range	▪ DN15 to DN50– MI004 see table 1.1
Version	▪ Compact heat meter complete of flow sensor, calculator and probes (w/out pocket or tees)
Power Supply	▪ Internal size AA, 3,6 V, 2,4 Ah, lithium battery (Li-SOCl2); external 12 V…42 V DC or 12 V36 V,50/60 Hz AC,10 mA max+internal backup battery AA; 3,6V; 2,4Ah Li-SOCl2
Service life	▪ Not less than 11 years (w/out data reading via digital interface)
Pressure	▪ PN16 standard (PN25 on request)
Temperature	▪ Electronic Unit: +5°C to +55°C (indoor installation); Sensor: -30°C to 55°C; ▪ Conveying fluid: 5°C....130 °C (for t >90°C separate calculator from flow sensor)
Humidity Range	▪ < 93 %
Environmental class	▪ Class C according to EN1434
Mechanical environment class	▪ M1

Electromagnetic environment class	▪ E2
Accuracy	▪ EN1434 class 2
Energy Units	▪ kWh; MWh; GJ and Gcal
Technology	▪ Transit time method
Protection Rate	▪ IP65 (IP67 on request for wet parts)
Output	▪ Pulse output with different value due to the DN (see table 1.2)
Type of pulse output	▪ Open collector; permissible current loop 20mA; voltage up to 50V
Communication protocol	▪ One between: MBus; CL module (Current Loop); MODBUS RTU module; LON module; Minibus module; RF Module (W-MBus 868MHz)
Mechanical data	
Dimensions of electronic unit, not more than	▪ 117 mm x 44 mm x 89,5 mm
Dimensions of flow sensors	▪ According to Annex B
Weight	▪ According Table 1.3
Material	▪ Housing:PA6 (Polyamide) ▪ Wet Part:Up to DN50 brass; from DN65 painted stainless steel ▪ Sensors: DN15 and DN20 plastic; others Titanium
Warranty and approvals	
Warranty	▪ 12 months
MID approval	▪ MI004
CE certification	▪ YES

Table 1.1

Permanent flow rate qp, m^3/h	Upper flow rate q_s, m^3/h	Lower flow rate qi, m^3/h	Threshold value of flow rate, m^3/h	Overall length L, mm	Pressure losses at q_p, kPa	Joining to the pipeline (Thread – G, flange–DN)
0,6	1,2	0,006	0,003	110	7	G3/4"
0,6	1,2	0,006	0,003	190	0,9	G1" or DN20
1,0	2,0	0,01	0,005	110	11,3	G3/4"
1,0	2,0	0,01	0,005	190	2,5	G1"or DN20
1,5	3,0	0,006	0,003	110	17,1	G3/4"
1,5	3,0	0,006	0,003	190	5,8	G1"or DN20
1,5	3,0	0,015	0,003	110	17,1	G3/4"
1,5	3,0	0,015	0,003	190	5,8	G1"or DN20
1,5	3,0	0,015	0,005	130	7,2	G1"
2,5	5,0	0,01	0,005	130	19,8	G1"
2,5	5,0	0,01	0,005	190	9,4	G1"or DN20
2,5	5,0	0,025	0,005	130	19,8	G1"
2,5	5,0	0,025	0,005	190	9,4	G1"or DN20
3,5	7,0	0,035	0,017	260	4	G1 1/4"or DN25; DN32
6,0	12,0	0,024	0,012	260	10	G1 1/4"or DN25; DN32
6,0	12,0	0,06	0,012	260	10	G1 1/4"or DN25
10,0	20,0	0,04	0,02	300	18	G2"or DN40
10,0	20,0	0,100	0,02	300	18	G2"or DN40
15,0	30,0	0,06	0,03	270	12	DN50
15,0	30,0	0,15	0,03	270	12	DN50

Table 1.2

Energy pulse output values

Energy units	„MWh"	„GJ"	„Gcal"
Pulse value of thermal energy	1 kWh/pulse	0,005 GJ/pulse	0,001 Gcal/pulse

Flow (volume) pulse output values

Permanent flow rate, q_p, m^3/h	0,6 ... 6	10; 15
Pulse value, l/pulse	1	10

Table 1.3

Connection type of flow sensor	Weight of meter, not more than, kg
G3/4" (110 mm)	0,7
G1" (110 mm)	0,7
G1" (130 mm)	0,8
G1" (190 mm)	0,9
DN20 (190 mm)	2,5
G1 ¼"	3,2
DN25	5,6
G2"	3,7
DN40	6,8
DN50	8,5

Straight pipelines lengths

No requirements for straight pipeline length in upstream and/or downstream directions.

Conveying liquid

The meter is built for standard water as conveying liquid but can be used with a conveying liquid (e.g. water+glycol) with a value of mixture up to 50% outside of the MID approval while maintaining conformity to EN1434.

Data Logger

Every hour, day and month values of the measured parameters are stored in memory of the meter
All data from archive can be read only by means of the remote reading.
In addition, data logger records of monthly parameters can be seen on the display.
Following daily, weekly and monthly parameter values are recorded in heat meter memory:

1	Integrated energy
2	Integrated cooling energy
3	Integrated energy of tariff 1
4	Integrated energy of tariff 2
5	Integrated volume of liquid
6	Integrated pulse value in pulse input 1
7	Integrated pulse value in pulse input 2
8	Maximum thermal power value for heating and date
9	Maximum thermal power value for cooling and date
10	Maximum flow rate value and date
11	Maximum value of flow temperature of heat conveying liquid and date
12	Maximum value of return temperature of heat conveying liquid and date

13	Minimum value of flow temperature of heat conveying liquid and date
14	Minimum value of return temperature of heat conveying liquid and date
15	Minimum value of temperature difference and date
16	Average value of flow temperature of heat conveying liquid
17	Average value of return temperature of heat conveying liquid
18	Operating time without an error of thermal energy calculation
19	Total error code
20	Time when the flow rate exceeded 1.2 qs
21	Time when the flow rate was less than qi

Data logger capacity:

- up to 1480 h – for hourly records;
- up to 1130 days - for daily records;
- up to 36 last months - for monthly records.

Archive data storage time not less than 36 months.
Storage time of measured integrated parameters not less than 15 years
(even if device is disconnected from power supply)

Annex A
Electrical wiring diagrams

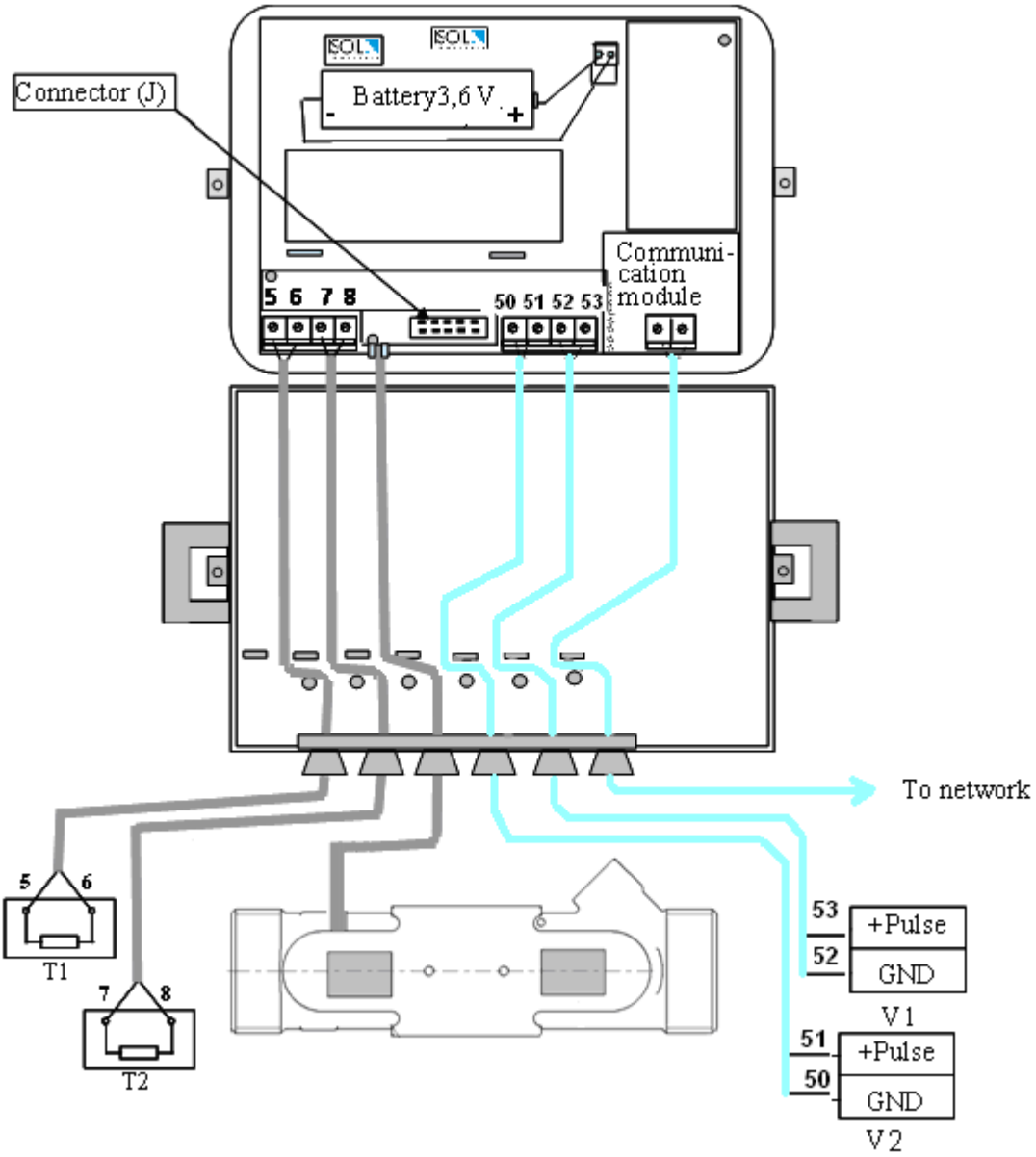
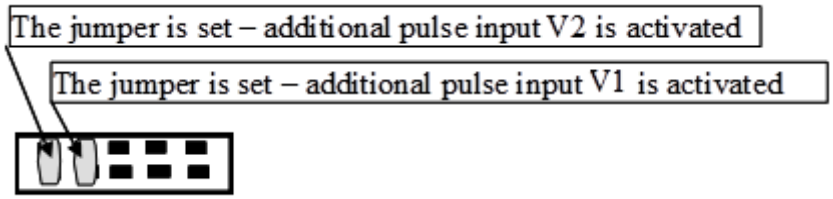


Fig.A1. Electrical wiring diagrams
T1 –flow (inlet) temperature sensor, T2 –return (outlet) temperature sensor,
V1-additional pulse input / output 1, V2 –additional pulse input / output 2



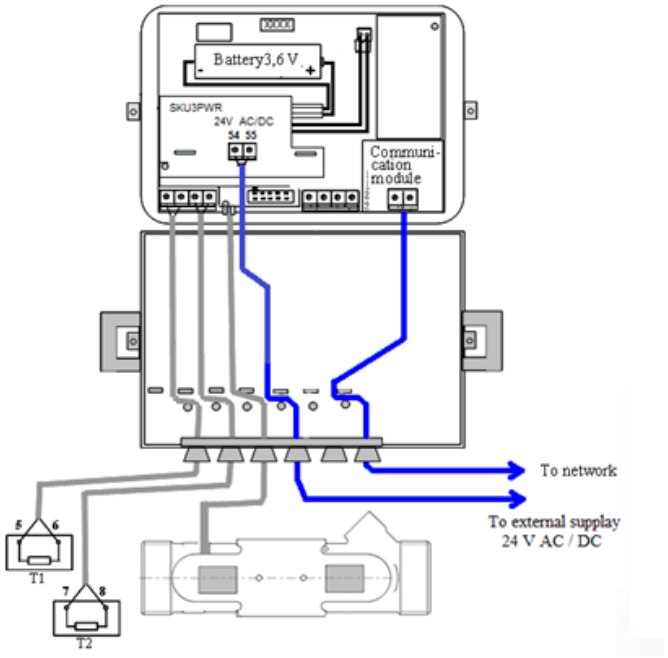


Fig.A2. Wiring diagrams for connecting of the sensor to the external power supply

Table A1. Numbering of terminals

Calculator:

Terminal Nr.	Destination
5	High temperature sensor (T1)
6	High temperature sensor (T1)
7	Low temperature sensor (T2)
8	Low temperature sensor (T2)
50	2nd additional pulse input/output GND
51	2nd additional pulse input/output (In/Out2)
52	1st additional pulse input/output GND
53	1st additional pulse input/output(In/Out1)

Additional plug- in modules:

Numbering of communication module terminals	
Terminal Nr.	Destination
20	CL+ (CL module)
21	CL- (CL module)
24, 25	Mbus (bipolar) (Mbus module)
51	MiniBus + (MiniBus module)
52	MiniBus - (MiniBus module)
60, 61	12-24 V DC power supply voltage for MODBUS and LON (bipolar)
90	MODBUS + (MODBUS module)
91	MODBUS - (MODBUS module)
96	Line A (LON module)
97	Line B (LON module)
Numbering of external power supply module terminals	
Terminal Nr.	Destination
54	24 V AC/DC external power supply voltage (bipolar)
55	24 V AC/DC external power supply voltage (bipolar)

Annex B

Fig. B1. Mechanical dimensions of calculator of heat meter IFX-M4-03

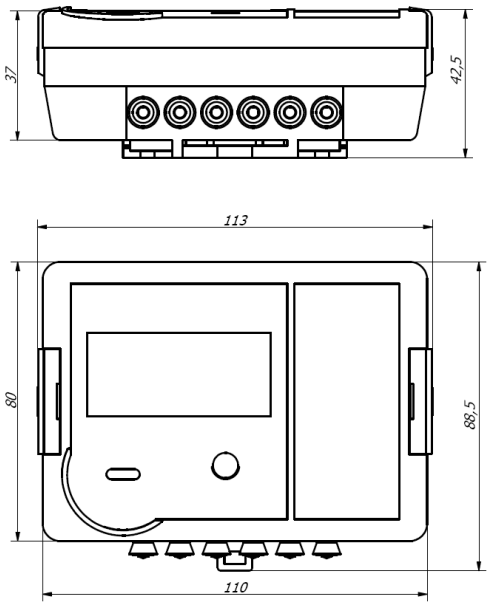


Fig. B2. Sizes and dimensions of heat meter IFX-M4-03

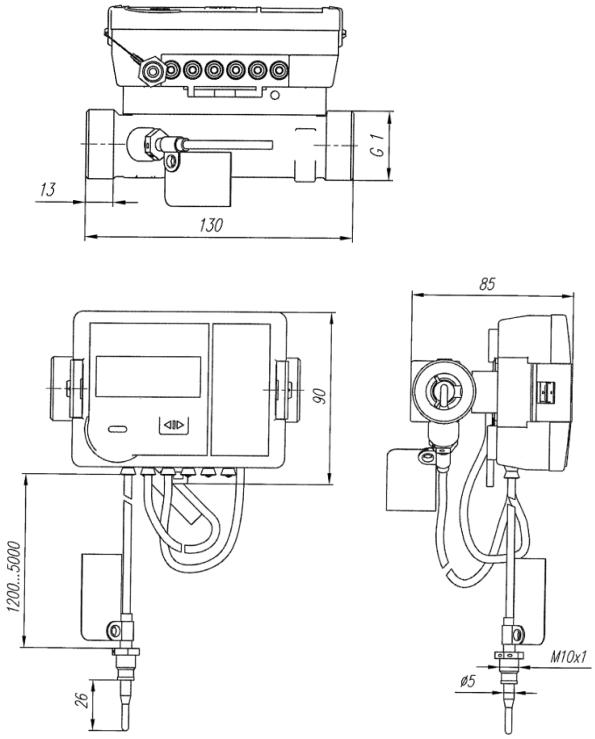


Fig.B2.1. Flow sensor q_p= 0,6/1,0/1,5m^3/h;
Threaded end connections G3/4",
Mounting length L=110 mm

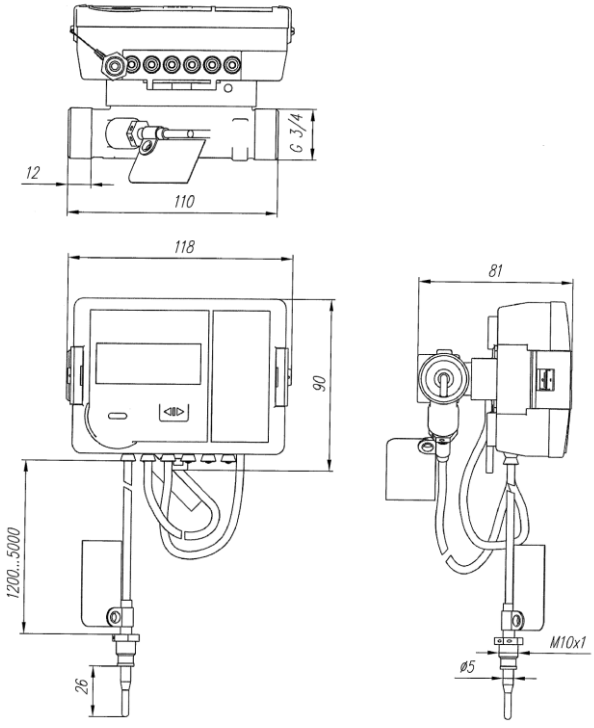
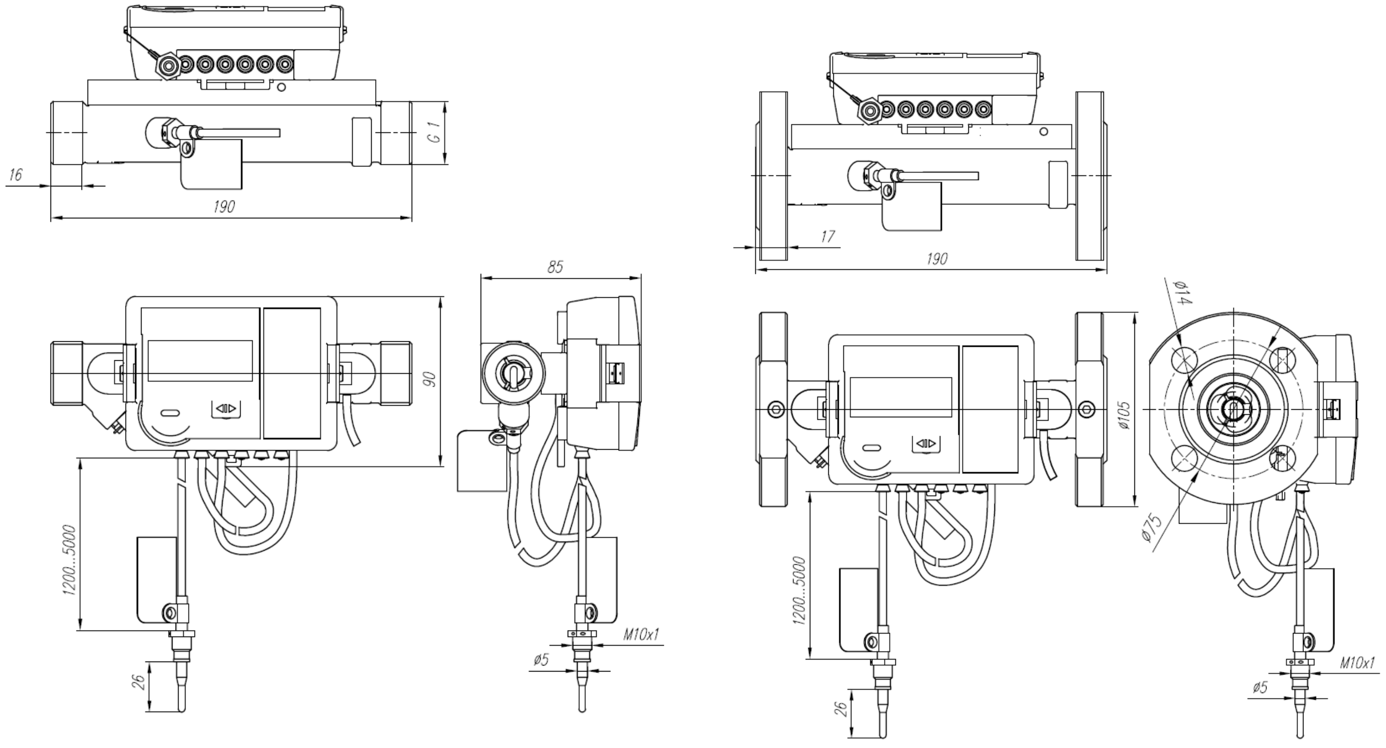
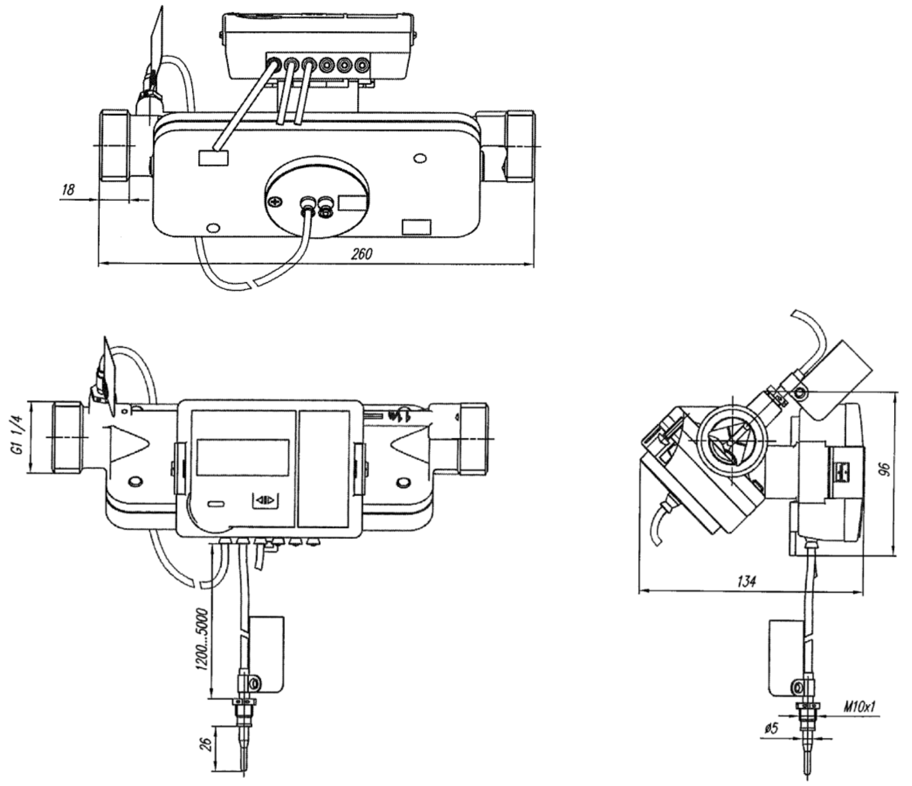


Fig.B2.2. Flow sensor q_p= 2,5/1,5 m^3/h;
Threaded end connections G1",
Mounting length L=130 mm



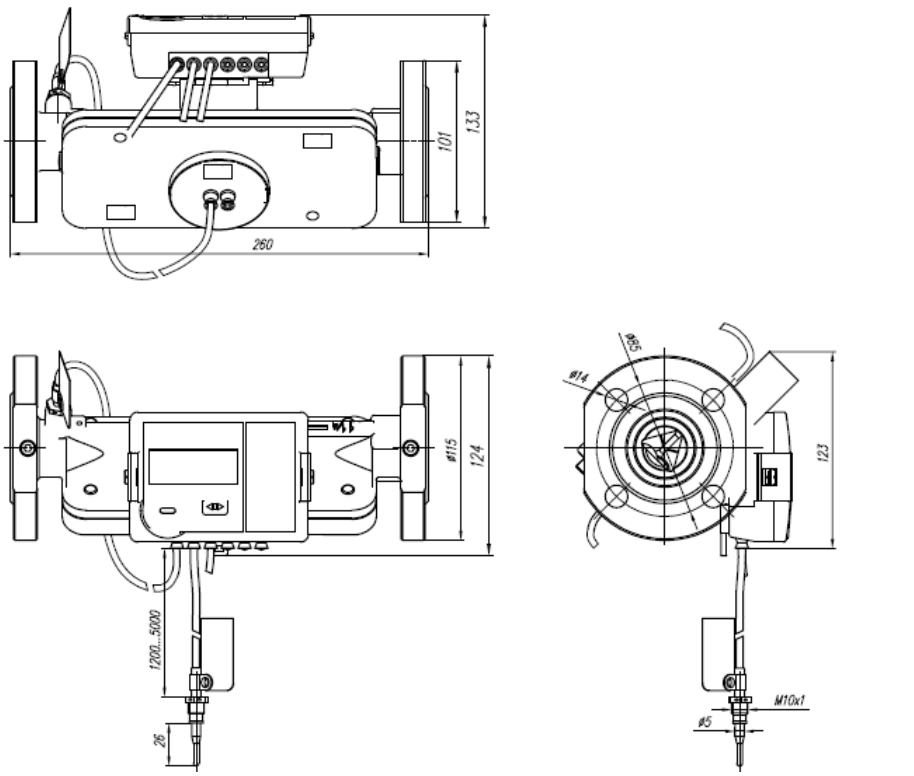
a) Threaded end connection **b)** Flanged end connection

Fig.B2.3. Flow sensor q_p= 0,6/1,0/1,5/2,5 m^3/h;
Threaded end connection G1" (a), flanged end connection DN20 (b),
Mounting length L=190 mm

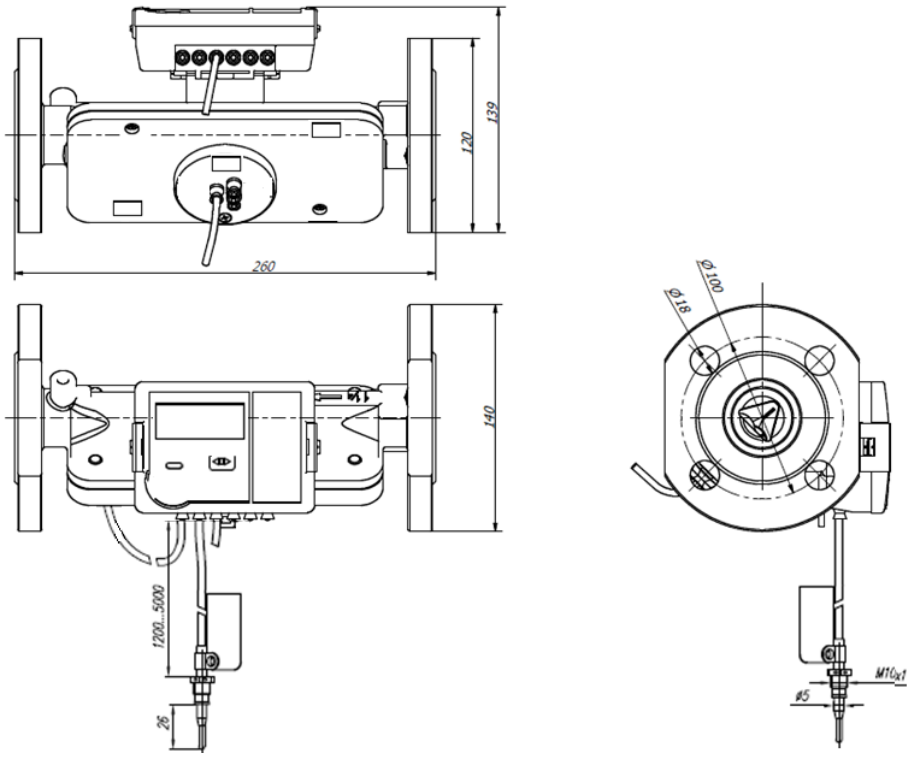


a)

Annex B



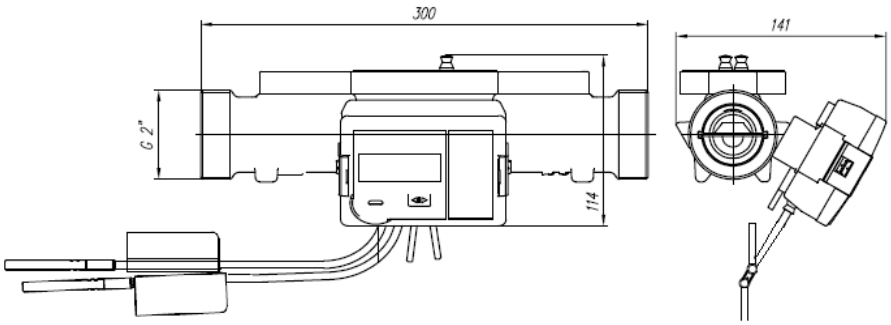
b)



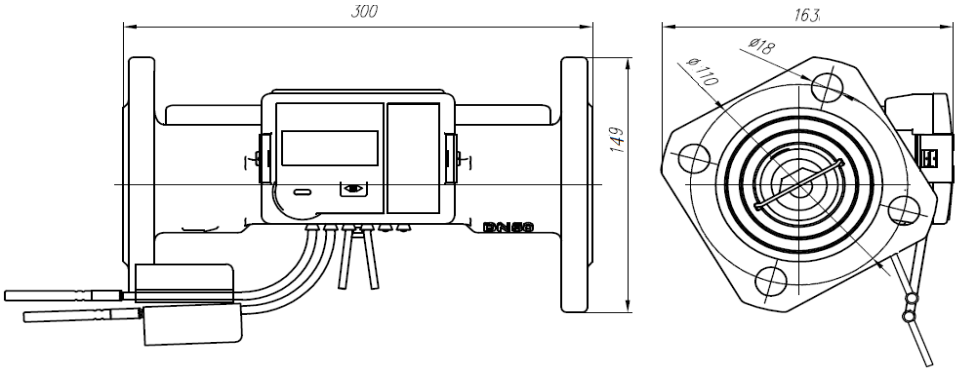
c)

B2.4 pav. Flow sensor q_p= 3,5/6,0 m^3/h;
Threaded end connections G1 1/4"(a) ; flanged end connection DN25 (b)
or flanged end connection DN32 (c)
Mounting length L=260 mm

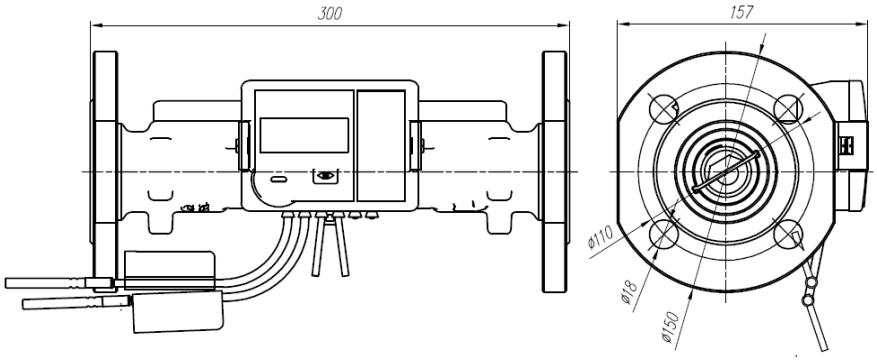
Annex B



a)



b)



c)

Fig.B2.5. Flow sensor q_p= 10,0 m^3/h;
Threaded end connections G2" (a) ; flanged end connection DN40 (b;c) (two design options)
Mounting length L=300 mm

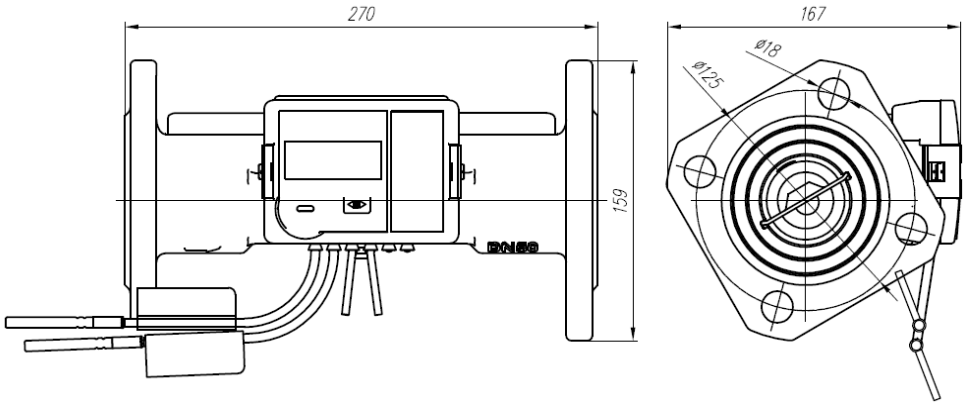


Fig.B2.6. Flow sensor q_p= 15,0 m^3/h;
Flanged end connection DN50,Mounting length L=270 mm

Annex C
Security sealing

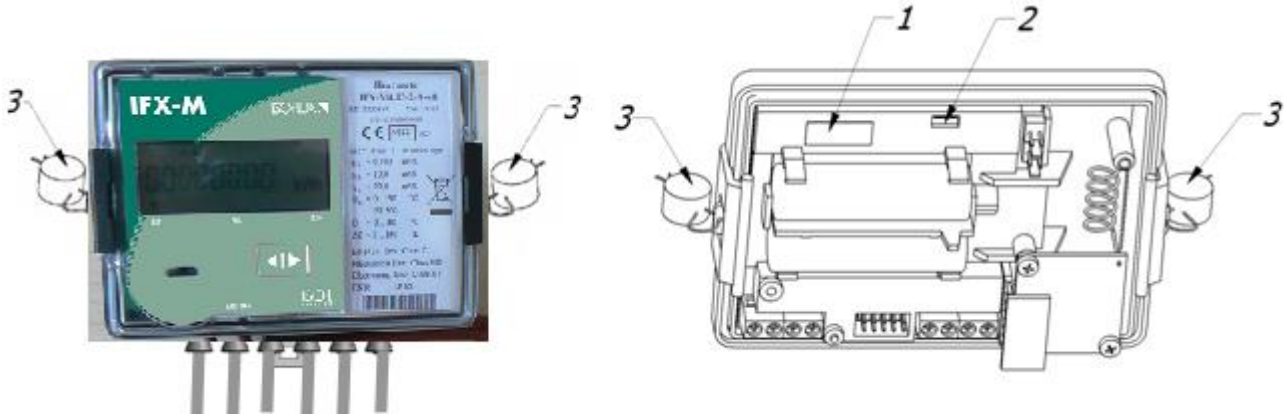
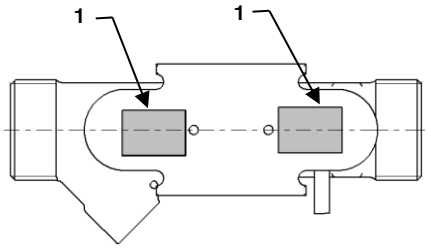
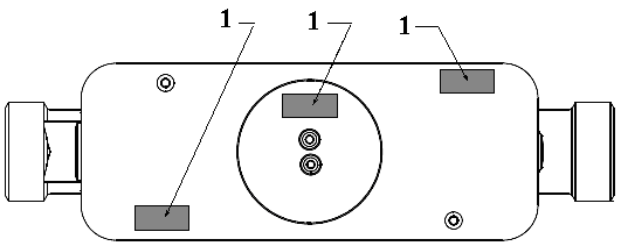


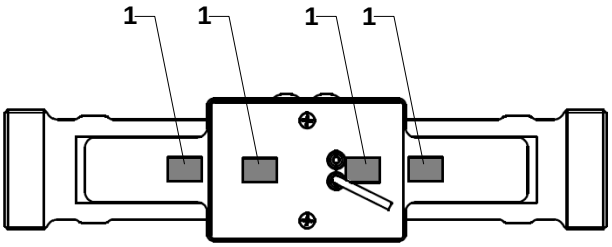
Fig.C1. Calculator sealing
Calculator general view: the cover is closed, and the cover is opened
(1-verification seal- manufacturer adhesive seal-sticker on the bolts of the cover,
2-manufacturer security seal, 3 –mounting seal)

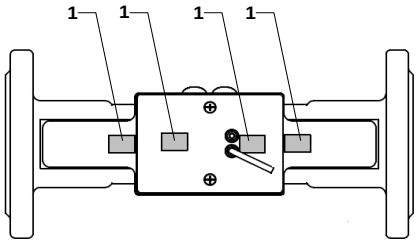


a) Flow sensor qp = 0,6/1,0/1,5/2,5 m^3/h
(threaded or flanged end connection,
L=110 mm/130 mm/190 mm)



b) Flow sensor qp = 3,5/6,0 m^3/h
(threaded or flanged end connection, L=260 mm)

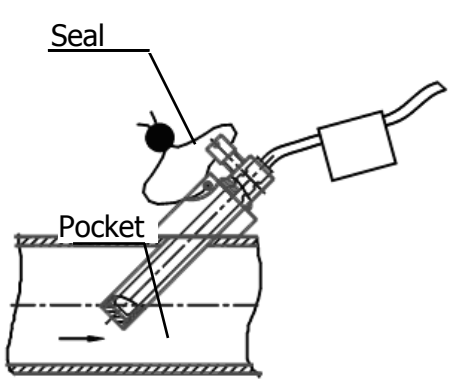


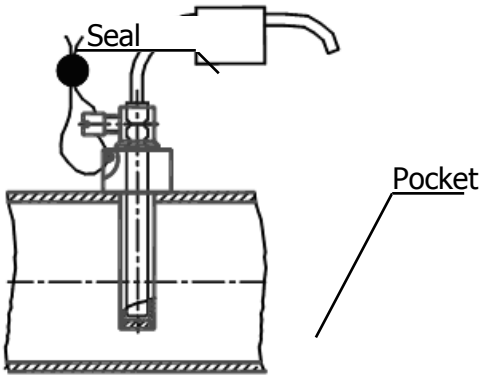


c) Flow sensor qp = 10,0 m^3/h
(threaded or flanged end connection, L=300 mm)

d) Flow sensor qp = 15,0 m^3/h
(flanged end connection DN50, L=270 mm)

Fig.C2. Flow sensors sealing
(1- verification seal-manufacturer adhesive seal-sticker on the bolts of the cover)

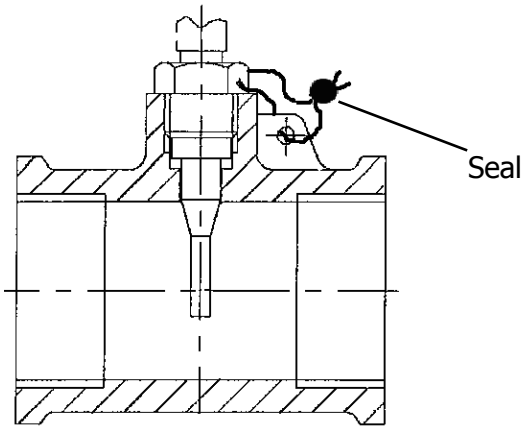




a) angled 45°

b) perpendicular

a) Installation recommendations for temperature sensors type PL with permanently connected signal leads



b) Installation recommendations for temperature sensors type DS

Fig. C3. Temperature sensors installation and sealing

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