



DATA SHEET



IFX-M4-03

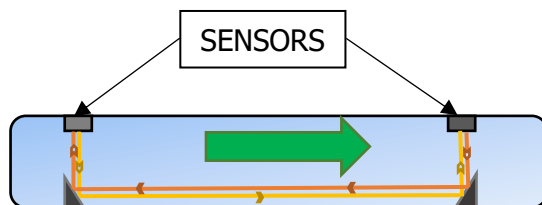


Table of contents

PRINCIPLE.....	3
HOW TO ORDER	3
TECHNICAL DATA.....	4
Table 1.1.....	5
Table 1.2.....	6
Table 1.3.....	6
Straight pipelines lengths.....	6
Conveying liquid	6
Data Logger	6
Data logger capacity:	7
Annex A.....	8
Electrical wiring diagrams	8
Table A1. Numbering of terminals	9
Additional plug- in modules:	9
Annex B.....	10
Annex C.....	15

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		—	—	—	—	—	— *	— *	— *
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 temperature 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"		10					
1.0	110	G ¾"		11					
1.5	110	G ¾"		15					
1.5	130	G 1"		14					
2.5	130	G 1"		20					
3.5	260	G 1 ¼"		25					
6.0	260	G 1 ¼"		32					
10.0	300	G 2"		40					
10.0	300	DN40		41					
15.0	270	DN50		50					
3.5	260	DN25		26					
6.0	260	DN32		35					
0.6	190	G 1"		06					
1.0	190	G 1"		08					
1.5	190	G 1"		17					
2.5	190	G 1"		22					
0.6	190	DN20		09					

1.0	190	DN20		12					
1.5	190	DN20		16					
2.5	190	DN20		21					
25	300	DN65		65					
40	300	DN80		80					
60	360	DN100		100					
Communication module									
None					0				
M-bus					1				
CL					2				
RF module 868Mhz					4				
MODBUS RS485					5				
LON					6				
MiniBus					7				
BACnet					8				
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				
Length of the flow sensor cable / Temperature sensor cable									
1.2 m/1.5 m						1			
2.5 m/2.0 m						2			
5.0 m/5.0 m						3			
Temperature sensors pair (PT500)									
						None		0	
						DS		1	
						PL		2	

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

TECHNICAL DATA

<i>STANDARD FEATURES</i>	
Suitable for	▪ Heating and Cooling application
Range	▪ DN15 to DN100– 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-SOCl ₂); 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-SOCl ₂
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)-BACnet
<i>Mechanical data</i>	
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
<i>Warranty and approvals</i>	
Warranty	▪ 12 months
MID approval	▪ MI004
CE certification	▪ YES

Table 1.1

Permanent flow rate q_p , m ³ /h	Upper flow rate q_s , m ³ /h	Lower flow rate q_i , 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
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

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 ... 60
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 1/4"	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

Storage time of measured integrated parameters
(even if device is disconnected from power supply)

not less than 36 months.

not less than 15 years

Annex A

Electrical wiring diagrams

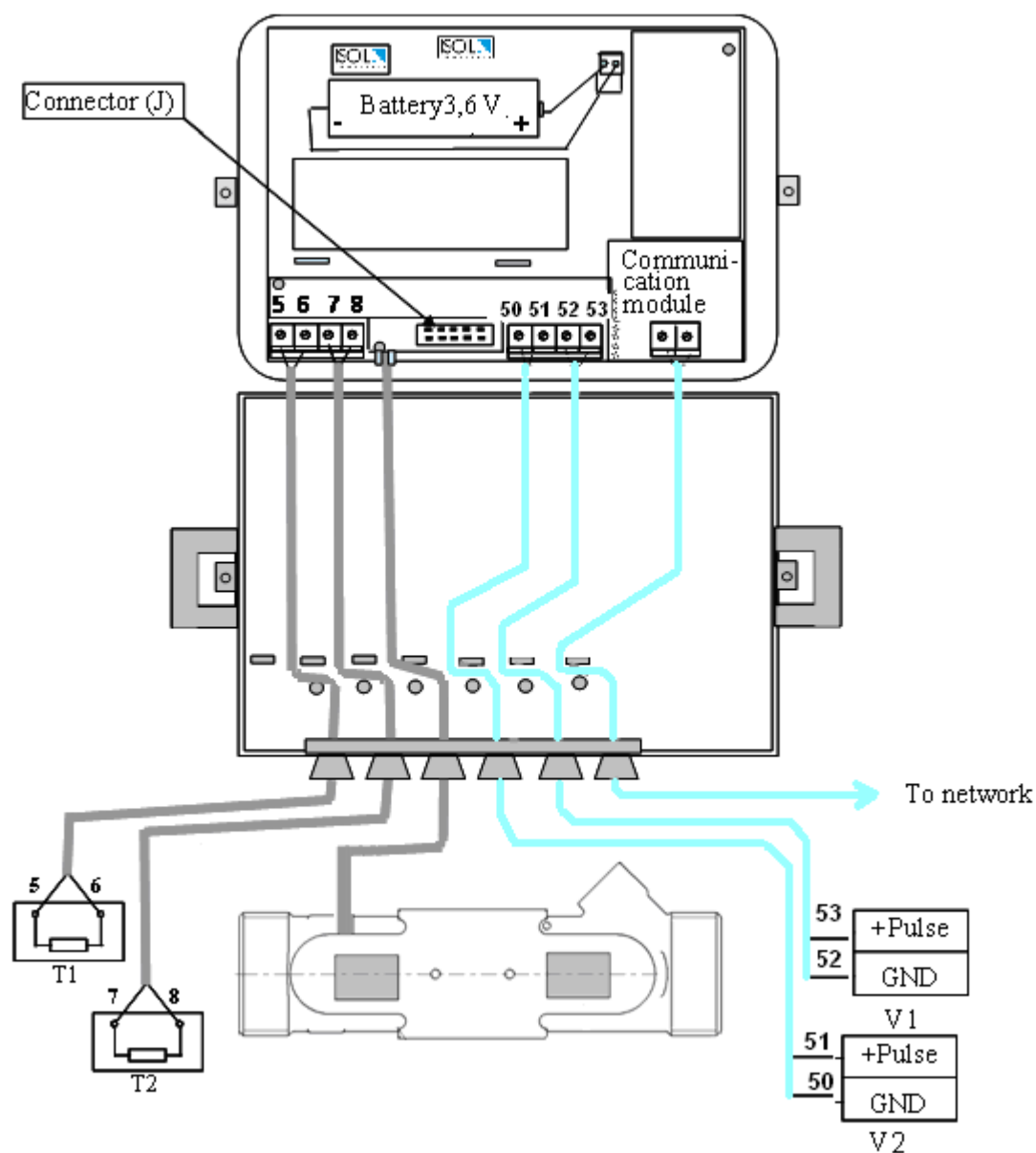
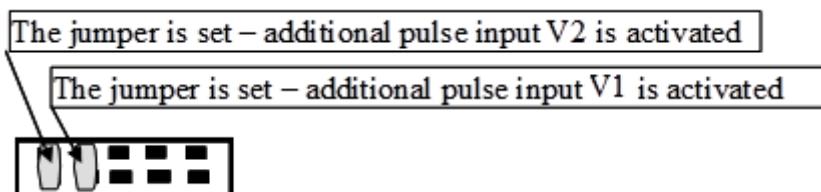


Fig.A1. Electrical wiring diagrams

T1 –flow (inlet) temperature sensor, T2 –return (outlet) temperature sensor,
V1-additional pulse input / output 1, V2 –additional pulse input / output 2



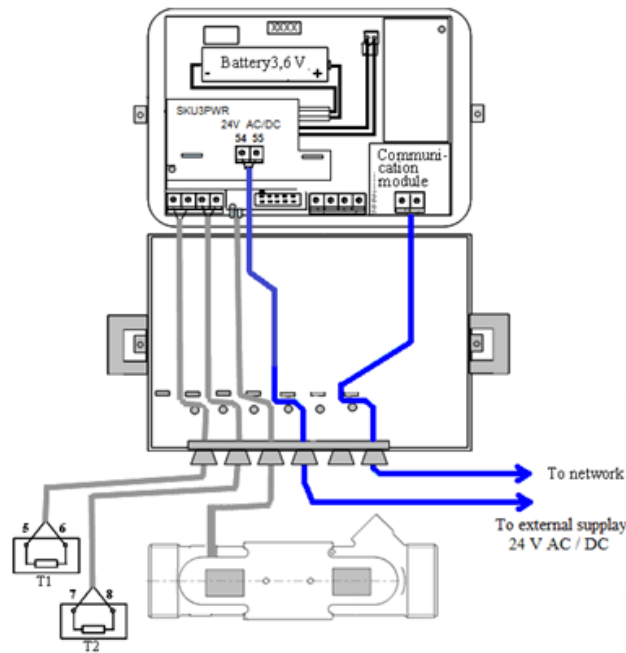


Fig.A2. Wiring diagrams for connecting of the sensor to the external power supply

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	2 nd additional pulse input/output GND
51	2 nd additional pulse input/output (In/Out2)
52	1 st additional pulse input/output GND
53	1 st 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, BACnet and LON (bipolar)
90	MODBUS/BACnet + (MODBUS/BACnet module)
91	MODBUS/BACnet - (MODBUS/BACnet 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)

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

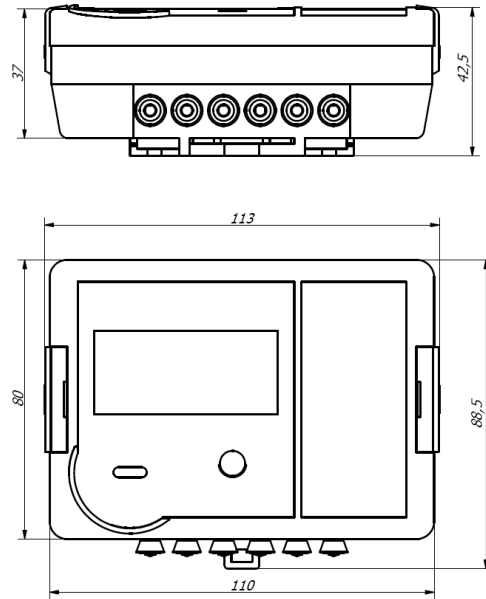


Fig. B2. Sizes and dimensions of heat meter IFX-M4-03

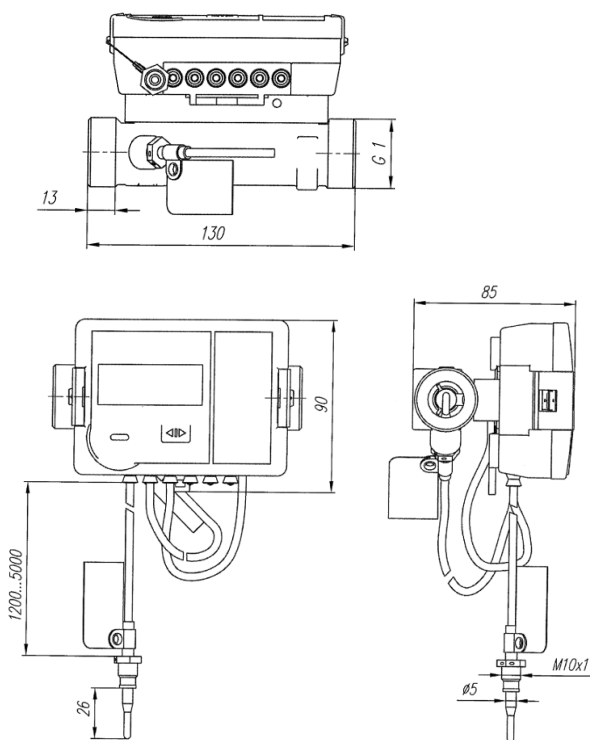


Fig.B2.1. Flow sensor $q_p = 0,6/1,0/1,5 \text{ m}^3/\text{h}$;
Threaded end connections G3/4",
Mounting length $L=110 \text{ mm}$

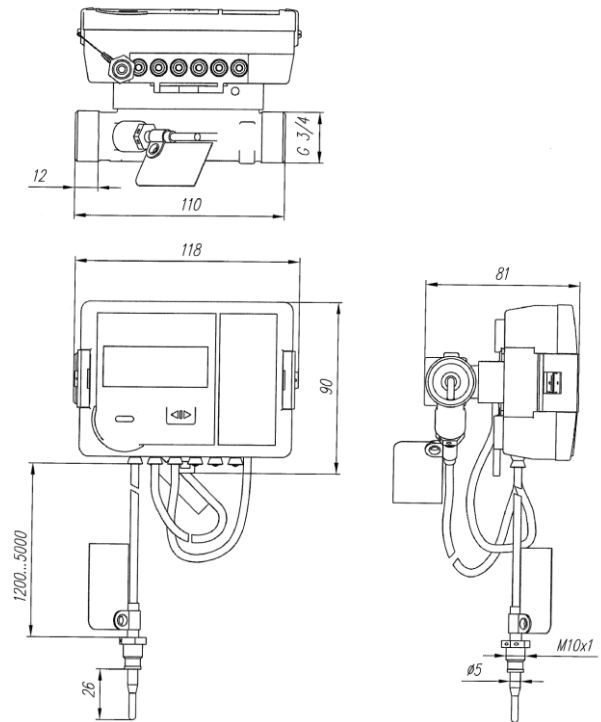


Fig.B2.2. Flow sensor $q_p = 2,5/1,5 \text{ m}^3/\text{h}$;
Threaded end connections G1",
Mounting length $L=130 \text{ mm}$

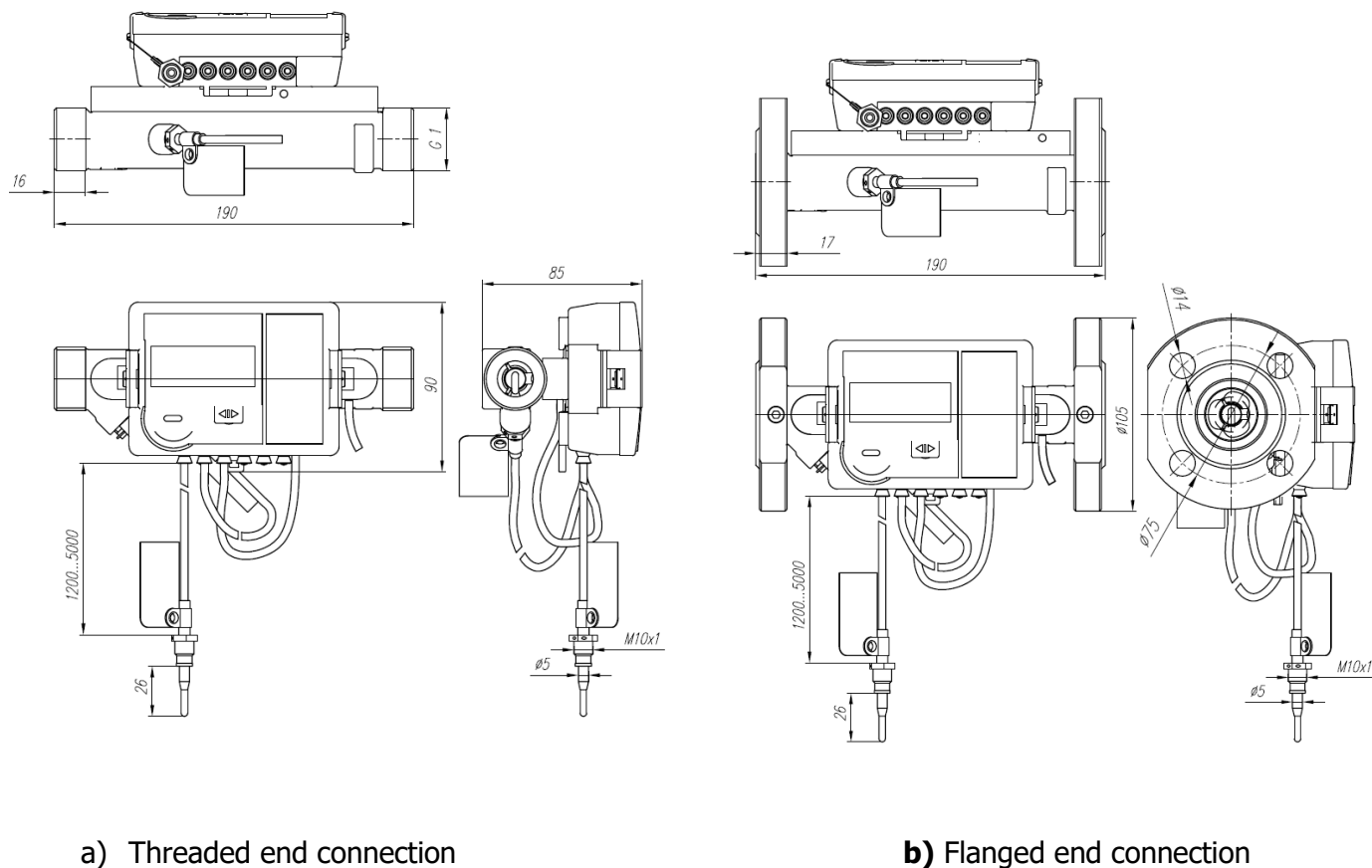
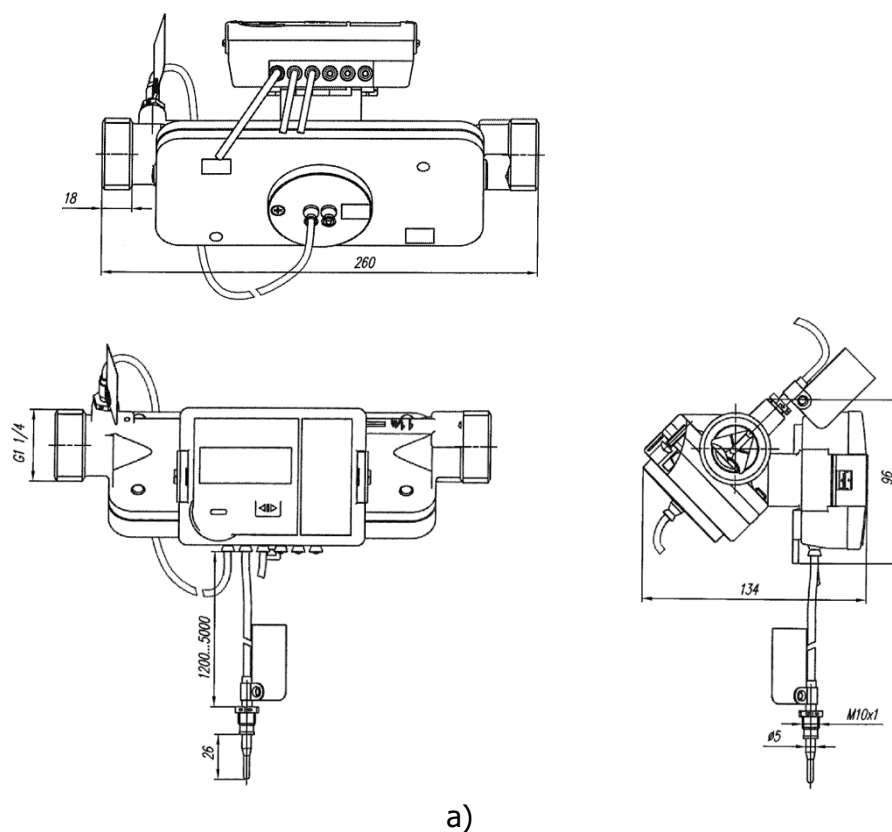
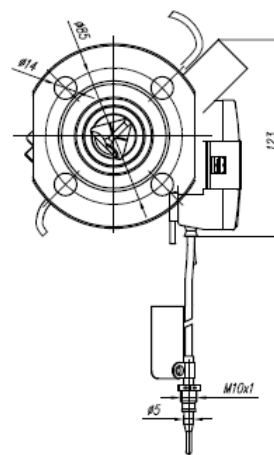
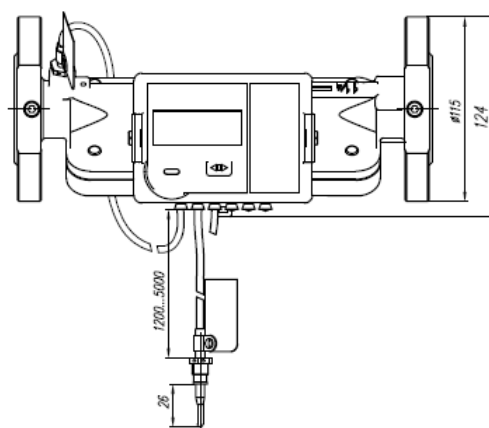
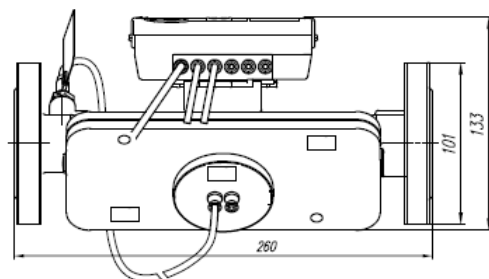


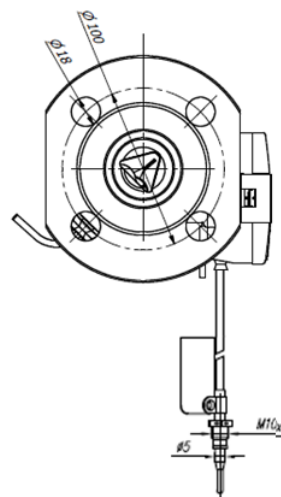
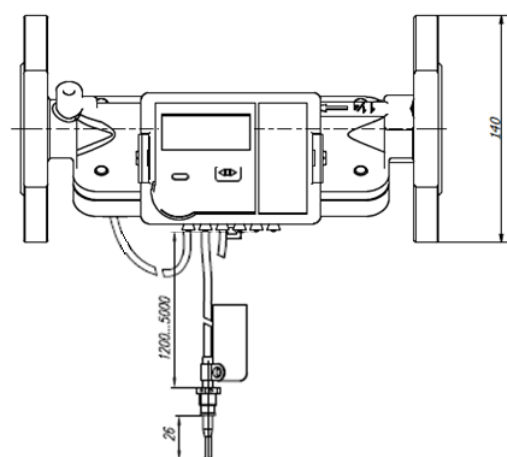
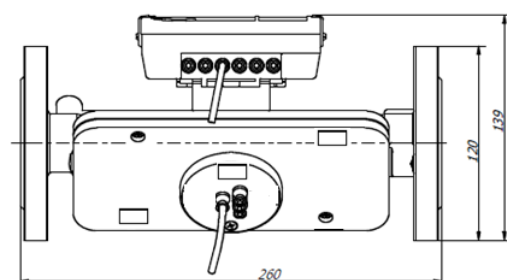
Fig.B2.3. Flow sensor $q_p = 0,6/1,0/1,5/2,5 \text{ m}^3/\text{h}$;
Threaded end connection G1" (a), flanged end connection DN20 (b),
Mounting length $L=190 \text{ mm}$



Annex B



b)



c)

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

Annex B

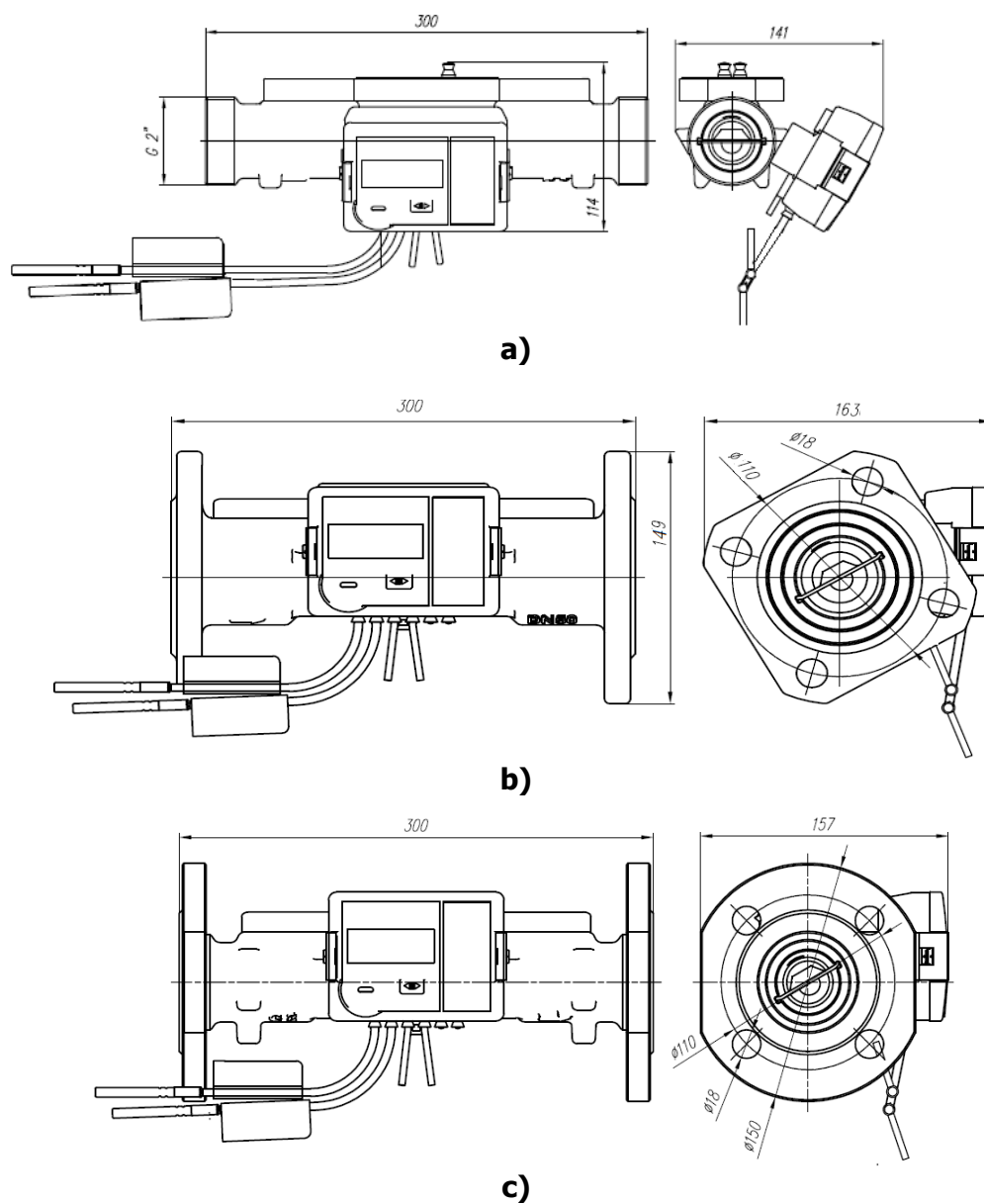


Fig.B2.5. Flow sensor $q_p= 10,0 \text{ m}^3/\text{h}$;
Threaded end connections G2" (a) ; flanged end connection DN40 (b;c) (two design options)
Mounting length $L=300 \text{ mm}$

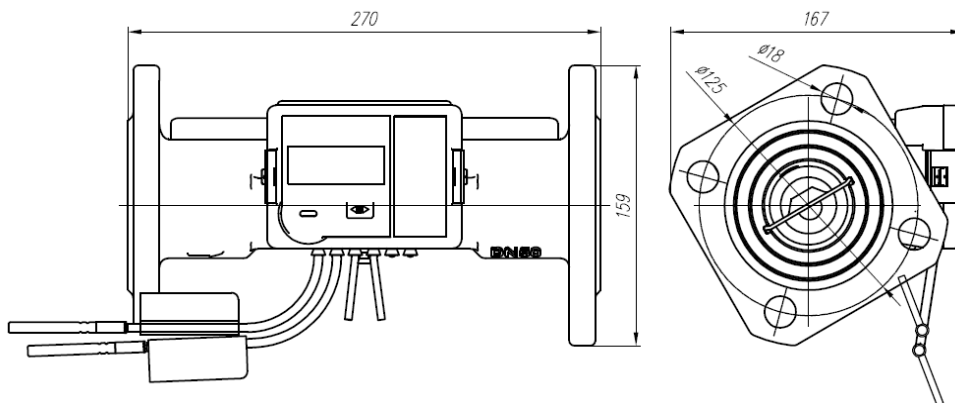


Fig.B2.6. Flow sensor $q_p = 15,0 \text{ m}^3/\text{h}$;
Flanged end connection DN50, Mounting length $L=270 \text{ mm}$

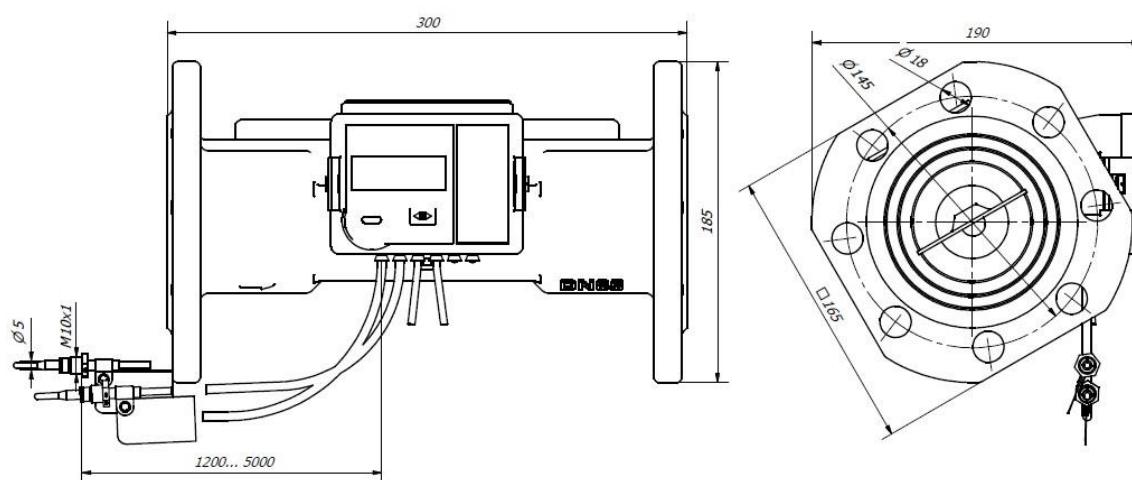


Fig.B2.7.
Flow sensor $q_p = 25,0 \text{ m}^3/\text{h}$;
flanged end connection DN65,
Mounting length $L=300 \text{ mm}$

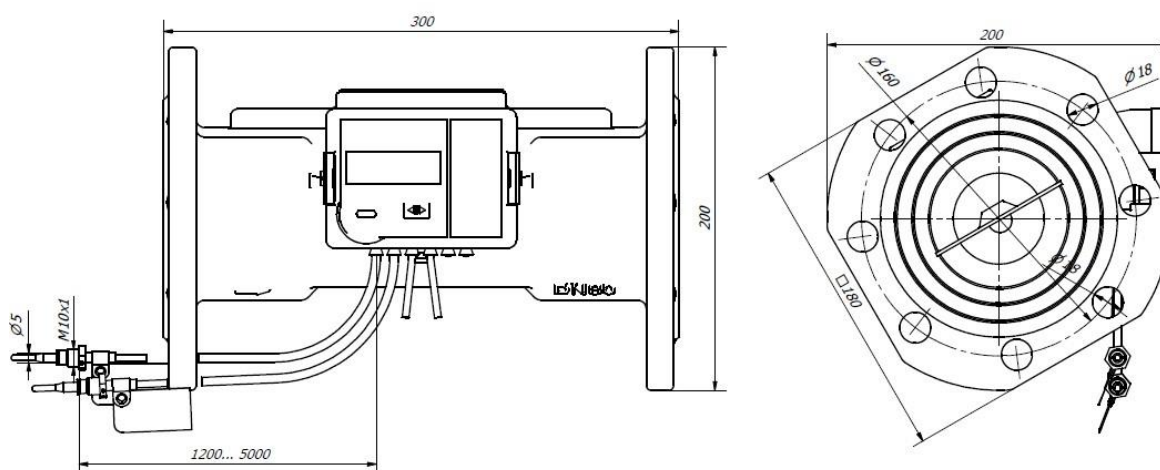


Fig.B2.8.
Flow sensor $q_p = 40,0 \text{ m}^3/\text{h}$;
flanged end connection DN80,
Mounting length $L=300 \text{ mm}$

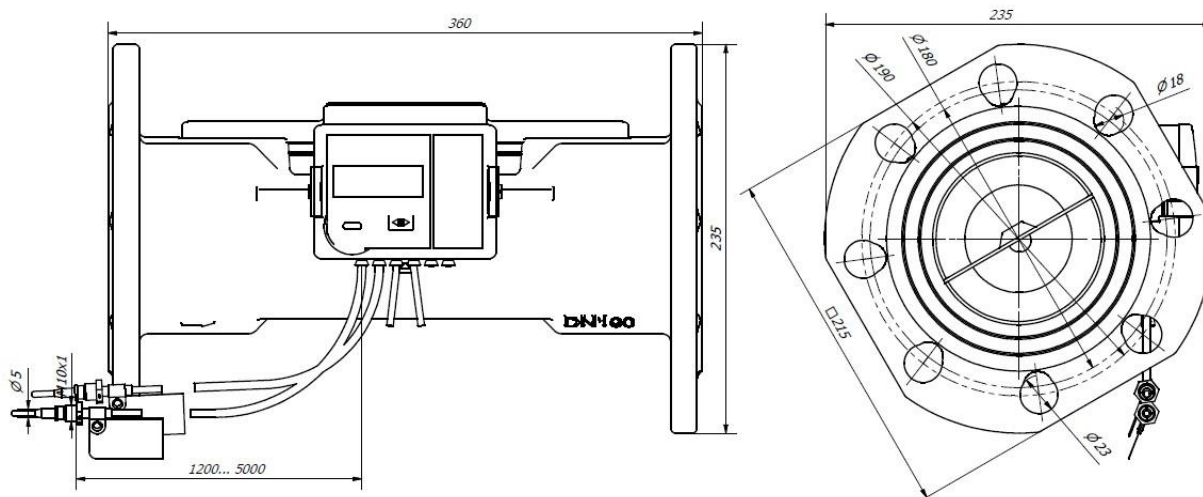


Fig.B2.9.

Flow sensor $q_p = 60,0 \text{ m}^3/\text{h}$; flanged end connection DN100, Mounting length $L=360 \text{ mm}$

Annex C

Security sealing

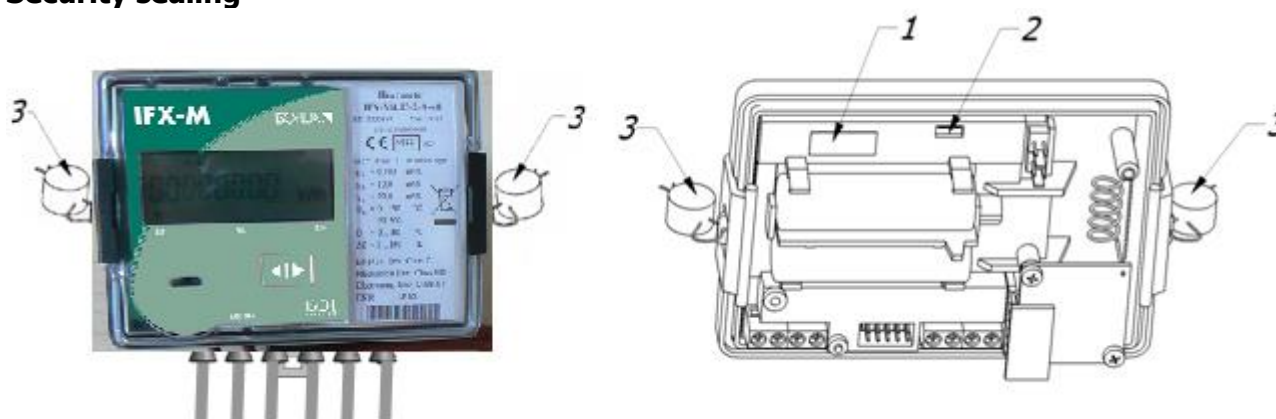
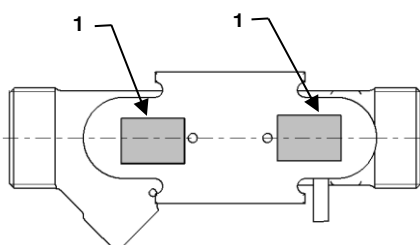
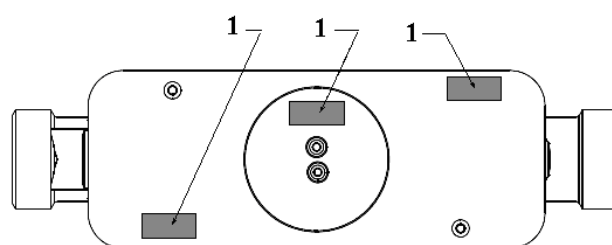


Fig.C1. Calculator sealing

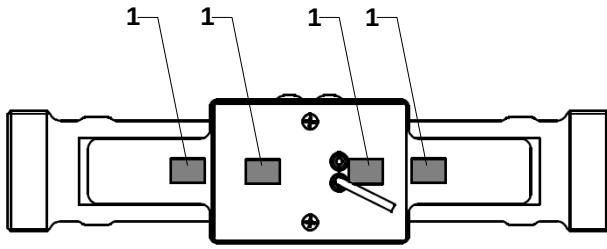
Calculator general view: the cover is closed, and the cover is opened
(1-verification seal- manufacturer adhesive seal-sticker on the bolts of the cover,
2-manufacturer security seal, 3 –mounting seal)



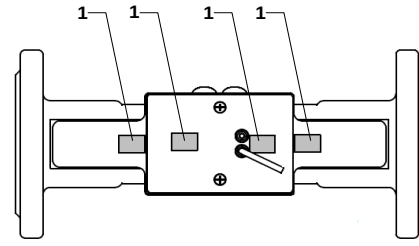
a) Flow sensor $q_p = 0,6/1,0/1,5/2,5 \text{ m}^3/\text{h}$
(threaded or flanged end connection,
 $L=110 \text{ mm}/130 \text{ mm}/190 \text{ mm}$)



b) Flow sensor $q_p = 3,5/6,0 \text{ m}^3/\text{h}$
(threaded or flanged end connection, $L=260 \text{ mm}$)



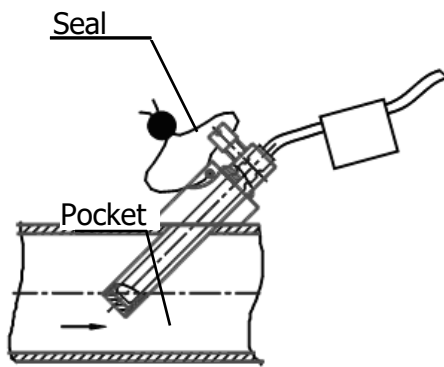
c) Flow sensor $q_p = 10,0 \text{ m}^3/\text{h}$
(threaded or flanged end connection, $L=300 \text{ mm}$)



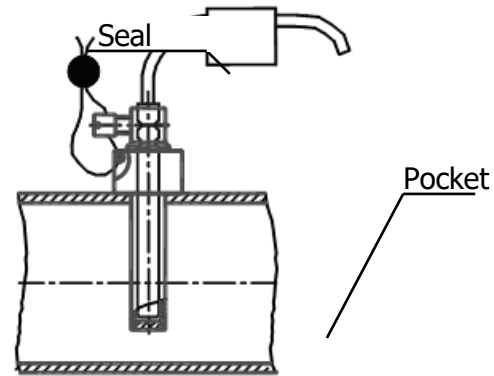
d) Flow sensor $q_p = 15,0 \text{ m}^3/\text{h}$
(flanged end connection DN50, $L=270 \text{ mm}$)

Fig.C2. Flow sensors sealing

(1- verification seal-manufacturer adhesive seal-sticker on the bolts of the cover)

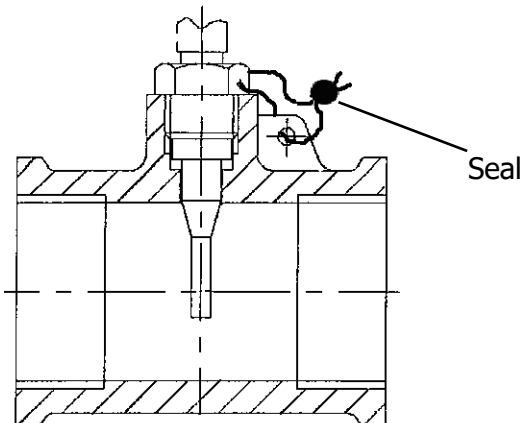


a) angled 45°



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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