DATA SHEET

IFX-M4-04

Table of contents

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
2014/53/EU	Directive 2014/53/EU of the European Parliament and of the Council of 16 april 2014 on the harmonisation of the laws of the member states relating to the making available on the market of radio equipment and repealing directive 1999/5/EC

EC-type examination certificate: LT-1621-MI004- 010 rev.2

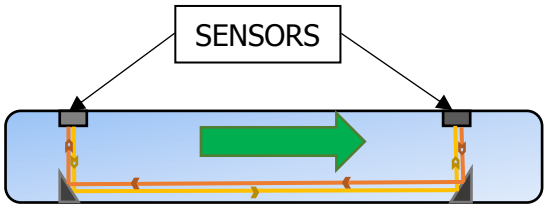
For EU Customers only - WEEE Marking.

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-M4-04	_	_	_	_ *	_ *	_ *	_ *
Flow sensor installation							
In Flow pipe (T1)	**1**						
In return pipe (T2)	**2**						
Destination of the heat meter							
For measuring heating enrgy		**A**					
For measuring heating and cooling energy		**B**					
Flow sensor:							
Connection ; length mm ; qp m³/h							
G ¾; 110 - 0,6 - ## 1 ##			**1**				
G1; 190 - 0,6 - ## 31 ##			**31**				
DN20; 190 - 0,6 - ## 35 ##			**35**				
G ¾; 110 - 1 - ## 2 ##			**2**				
G1; 190 - 1 - ## 32 ##			**39**				
DN20; 190 - 1 - ## 36 ##			**36**				
G ¾; 110 - 1,5 - ## 3 ##			**3**				
G ¾; 165 - 1,5 - ## 11 ##			**11**				
G1; 130 - 1,5 - ## 21 ##			**21**				
G1; 190 - 1,5 - ## 33 ##			**33**				
DN20; 190 - 1,5 - ## 37 ##			**37**				
G1; 130 - 2,5 - ## 22 ##			**22**				
G1; 190 - 2,5 - ## 34 ##			**34**				
DN20; 190 - 2,5 - ## 38 ##			**38**				
G1 ¼; 260 - 3,5 - ## 41 ##			**25**				
DN25; 260 - 3,5 - ## 43 ##			**43**				
DN32; 260 - 3,5 - ## 45 ##			**45**				
G1 ¼; 260 - 6 - ## 42 ##			**32**				
DN25; 260 - 6 - ## 44 ##			**44**				
DN32; 260 - 6 - ## 46 ##			**46**				
G2; 300 - 10 - ## 51 ##			**40**				
DN40; 300 - 10 - ## 52 ##			**52**				
DN50; 270 - 15 - ## 61 ##			**50**				
DN65; 300 - 25 - ## 71 ##			**65**				
DN80; 350 - 40 - ## 81 ##			**80**				
DN100; 350 - 60 - ## 91 ##			**100**				
Supply voltage:							

Internal battery – PN16	**1**			
External power supply 230Vac – PN16	**2**			
Internal battery – PN25	**3**			
External power supply 230Vac – PN25	**4**			
Communication module				
None		**0**		
M-bus module		**1**		
RS232 module		**2**		
RS485		**3**		
Universal module (RS232/M-bus/CL ant Current outputs)		**4**		
Universal module (RS232/M-bus/CL ant Pulse outputs)		**5**		
MODBUS		**6**		
MiniBus		**7**		
Wireless Radio readout module RF 868 MHz		**8**		
Length of sensors connection cable, m :				
3 m			**3**	
5 m			**5**	
10 m			**10**	
15 m			**15**	
20 m			**20**	
40 m			**40**	
60 m			**60**	
80 m			**80**	
100 m			**100**	
Communication package:				
None				0
Optical interface adapter OG-1				OG1
Software READER				SW
Optical adapter OG-3 for hanheld terminal DK-3				OG3
Hanheld terminal for data acquisition DK-3				DK3

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 DN100– MI004 see table 1.1
Version	▪ Heat meter complete of flow sensor, calculator and probes (with pocket or tees); ▪ 2 different circuits controlled by the same meter; ▪ Possible to use as leak detection (2 sensors, on flow pipe and on return pipe) ▪ See Annex A
Power Supply	▪ Internal: 3,6 V, D-cell lithium battery); ▪ External: AC (50±2) Hz, 230 V $^{+10}_{-15}$ %; < 3VA(only for meter, consumption of energy per year 26,3kWh); <15VA(for meter and extra sensors; consumption of energy per year 131.5kWh)
Service life (battery)	▪ Not less than 11 years (10 years for scheme U1F, U2F)
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
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	▪ Universal output(one between M-bus, CL, and RS-232) with two pulse output; Universal output(one between M-bus, CL, and RS-232) with two current output; MBus; RS232; MODBUS; MiniBus; RF (W-MBus frequency 868MHz)
Mechanical data	
Dimensions of electronic unit, not more than	▪ 159 mm x 52 mm x 142 mm
Weight of calculator	▪ 0,5 kg
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

Flow-rate, m³/h			Threshold value, m³/h	Overall length, L, mm	Pressure loss Δp, at q_p, kPa, not more than	Connections end (Thread – G, Flange –DN)
Permanent q_p	Maximum q_s	Minimum q_i *				
0,6	1,2	0,006(0,024)	0,003	110	7	G3/4"
0,6	1,2	0,006(0,024)	0,003	190	0,9	G1", DN20
1,0	2,0	0,01 (0,04)	0,005	110	11,3	G3/4"
1,0	2,0	0,01 (0,04)	0,005	190	2,5	G1", DN20
1,5	3,0	0,006 (0,06)	0,003	110; 165	17,1	G3/4"
1,5	3,0	0,006 (0,06)	0,003	190	5,8	G1", DN20
1,5	3,0	0,015 (0,06)	0,006	110; 165	17,1	G3/4"
1,5	3,0	0,015 (0,06)	0,006	190	5,8	G1", DN20
1,5	3,0	0,015 (0,06)	0,006	130	7,2	G1"
2,5	5,0	0,01 (0,1)	0,005	130	19,8	G1"
2,5	5,0	0,01 (0,1)	0,005	190	9,4	G1", DN20

2,5	5,0	0,025 (0,1)	0,01	130	19,8	G1"
2,5	5,0	0,025 (0,1)	0,01	190	9,4	G1", DN20
3,5	7,0	0,035 (0,14)	0,017	260	4	G1 1/4" DN25, DN32
6,0	12,0	0,024 (0,24)	0,012	260	10	G1 1/4" DN25, DN32
6,0	12,0	0,06 (0,24)	0,024	260	10	G1 1/4" DN25, DN32
10,0	20,0	0,04 (0,4)	0,02	300	18	G2", DN40
10,0	20,0	0,10 (0,4)	0,04	300	18	G2", DN40
15,0	30,0	0,06 (0,6)	0,03	270	12	DN50
15,0	30,0	0,15 (0,6)	0,06	270	12	DN50
25	50	0,1 (1)	0,05	300	20	DN65
25	50	0,25 (1)	0,1	300	20	DN65
40	80	0,16 (1,6)	0,08	350	18	DN80
40	80	0,4 (1,6)	0,16	350	18	DN80
60	120	0,24 (2,4)	0,12	350	18	DN100
60	120	0,6 (2,4)	0,24	350	18	DN100

Table 1.2

Maximum flow rate, m^3/h	Displayed fluid volume (mass) lowest digit value (flow pulse output value), m^3	Displayed energy lowest digit value (energy pulse output value)
$q_s < 5$	0,001	0,1 kWh or 0,0001 Gcal (or GJ)
$5 \leq q_s < 50$	0,01	0,001 MWh (Gcal or GJ)
$50 \leq q_s$	0,1	0,01 MWh (Gcal or GJ)

Table 1.3

Connection type and overall length of flow sensor	Mass*, not more than, kg
G3/4" , 110 mm	0,7
G3/4" , 165 mm	0,8
G1" , 130 mm	0,8
G1" , 190 mm	0,9
DN20 , 190 mm	2,5
G1 ¼" , 260 mm	3,2
DN25, 260 mm	5,6
DN32, 260 mm	6,1
G2", 300 mm	3,7
DN40, 300 mm	6,8
DN50, 270 mm	8,5
DN65, 300 mm	13,0
DN80, 350 mm	15,0
DN100, 350 mm	18,0
NOTE: The mass of flow sensor is presented without mass of connecting cables. Maximum mass of cables is 8 kg (2x100 m)	

Straight pipelines lengths

For flow sensors of the heat meter with nominal diameter DN65….DN100 necessary straight pipelines lengths are: upstream ≥ 5 × DN, downstream ≥ 3 × DN. For flow sensors of other sizes the straight pipelines installation in upstream and downstream the sensor are not necessary.

Data recording and storage

Following daily, weekly and monthly parameter values are recorded in heat meter memory:
- Absolute integral instantaneous parameter values (listed in Table 1.4)
- Hourly, weekly and monthly alterations of integral parameters
- Hourly, weekly and monthly average values for all measured temperature and pressure values
- error (fault) and information codes that occurred during the last hour, day and month

Data logger capacity:

up to 110 days (3,5 months)	- for hourly records.
up to 1096 days (36 last months)	- for daily and monthly records,
Archive data retention time	not more than 36 months

Retention time of measured integrated parameters even if device is disconnected from power supply not more than 12 years

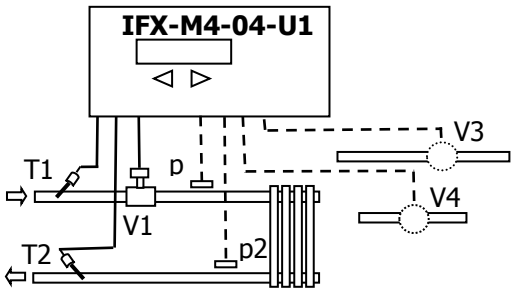
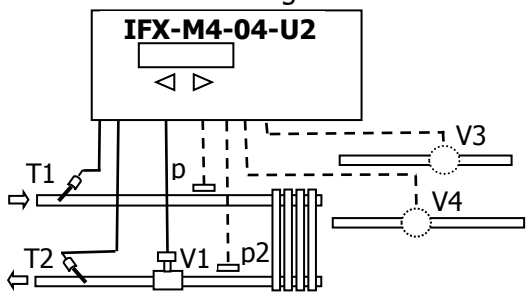
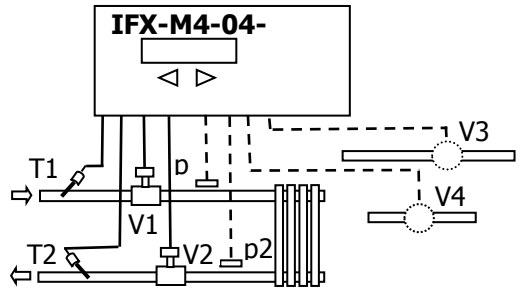
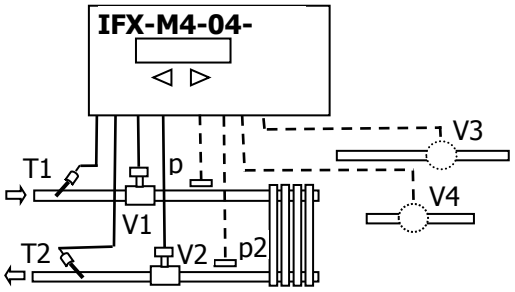
Table 1.4

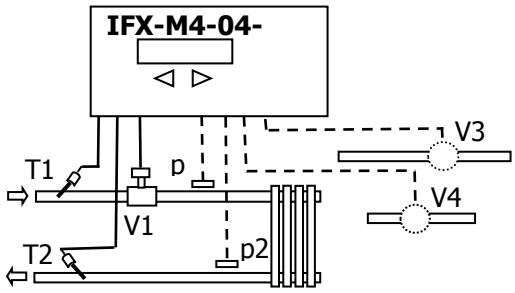
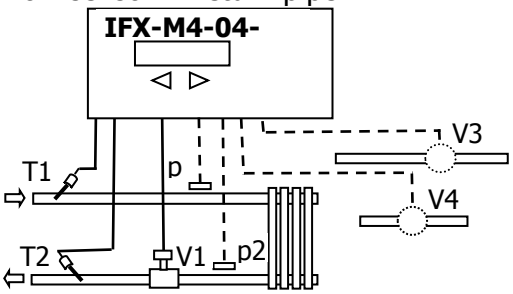
Arbitrary symbol	Parameter	Display capacity, measurement units, measurement ranges	Recorded in archive
Integral parameters			
∑E	Total consumed energy (in accordance with Annex A)	8 digits, MWh, Gcal, GJ*	Absolute values every hour, alterations every hour, day and month
E1	1st component of energy (in accordance with Annex A)		
E2	2nd component of energy (in accordance with Annex A)		
V1(M1)	Fluid volume (mass) of 1-st measurement channel	8 digits, m^3 (t)	
V2 (M2)	Fluid volume (mass) of 2-nd measurement channel		Absolute values every hour, alterations every hour, day and month
M1-M2 (V1-V2)	Fluid volume (mass) difference between 1-st and 2-nd measurement channels	8 digits, m^3 (t)	
V3 (M3)	Fluid volume (mass) of 3-rd measurement channel	8 digits, m^3	
V4	Fluid volume of 4-th measurement channel		
	Total operation time	8 digits, 0,01 h	
A	Operation time in normal mode		
Er_1	Codes of significant faults (errors)	6 digits	Amount in hour, day, month
Er_2	Codes of transitory faults (errors)	6 digits	
Instantaneous parameters			
P	Total instantaneous thermal power	5 digits, kW	-------
q1	Flow rate on 1-st channel	5 digits, m^3 /h or t /h	-------
q2	Flow rate on 2-nd channel		
q3	Flow rate on 3-rd channel		
q4	Flow rate on 4-th channel	5 digits, m^3 /h	
p1	1-st channel fluid pressure	0 ... 2500,0 kPa	Average hourly, daily and monthly data
p2	2-nd channel fluid pressure		
Θ1	1-st channel fluid temperature	0...180 °C	
Θ2	2-nd channel fluid temperature		
Θ1-Θ2	1-st and 2-nd channel temperature difference	± (2...150) °C	
Θ3	3-rd channel fluid temperature	- 40...+180 °C	

Annex A

Application type

Application type	Energy calculation formula
For closed heating systems	

U1 - Meter for heating. Flow sensor in flow pipe 	**$E=V1\cdot\rho_1\cdot(h_{T1}-h_{T2})$** **$M1=V1\cdot\rho_1$**
U2 - Meter for heating. Flow sensor in return pipe 	**$E=V1\cdot\rho_2\cdot(h_{T1}-h_{T2})$** **$M1=V1\cdot\rho_2$**
U1F - Meter for heating with leakage detection option The flow sensor in flow pipe 	**$E=V1\cdot\rho_1\cdot(h_{T1}-h_{T2})$** **$M1=V1\cdot\rho_1$** **$M2=V2\cdot\rho_2$**
U2F- Meter for heating with liquid leakage detection option. The flow sensor in return pipe 	**$E=V2\cdot\rho_2\cdot(h_{T1}-h_{T2})$** **$M1=V1\cdot\rho_1$** **$M2=V2\cdot\rho_2$**
Application type	**Energy calculation formula**

For closed heating/cooling systems	
U1L – Meter for heating and cooling. The flow sensor in flow pipe 	**$\Sigma E = E1 + E2$** **then $\Theta 1 > \Theta 2$:** **$E1=V1\cdot\rho_1\cdot(h_{T1}-h_{T2})$, $E2=0$** **then $\Theta 1 < \Theta 2$:** **$E2=V1\cdot\rho_1\cdot(h_{T2}-h_{T1})$, $E1=0$** **$M1 = V1\cdot\rho_1$**
U2L - Meter for heating and cooling. The flow sensor in return pipe 	**$\Sigma E = E1 + E2$** **then $\Theta 1 > \Theta 2$:** **$E1=V1\cdot\rho_2\cdot(h_{T1}-h_{T2})$, $E2=0$** **then $\Theta 1 < \Theta 2$:** **$E2=V1\cdot\rho_2\cdot(h_{T2}-h_{T1})$, $E1=0$** **$M1 = V1\cdot\rho_2$**

Annex B
Electrical wiring diagrams

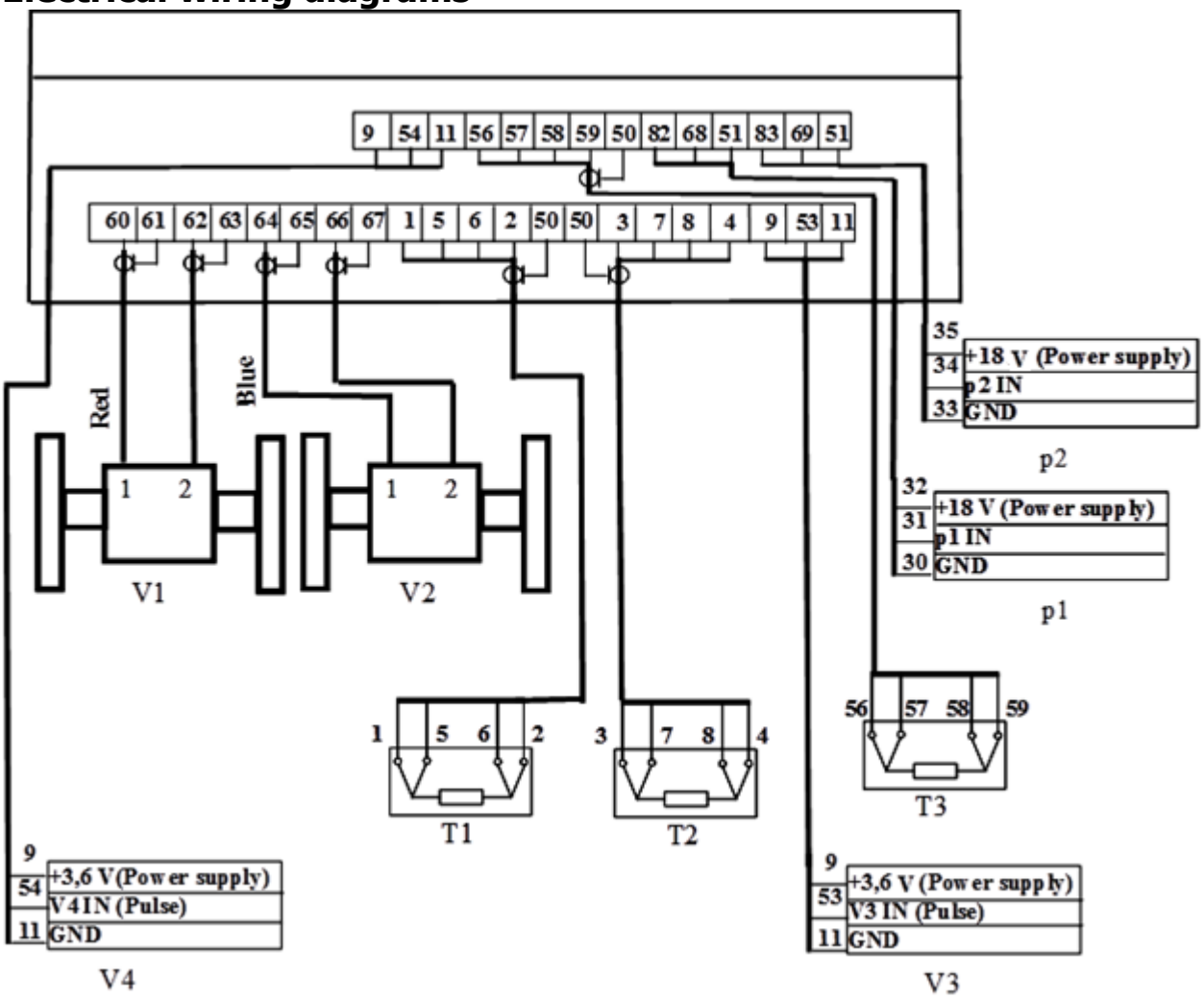


Fig. B1. Electrical wiring diagram
Temperature sensors with 4-wire (K) connection, flow sensors DN25…DN100

T1 … T3 - temperature sensors
V1 … V2 - ultrasonic flow sensors (DN25…DN100)
V3... V4 – water meters with pulse output
p1 ... p2 -pressure sensors

Remark: *1. Only required for selected measurement scheme sensors should be connected (see Annex A)*

Electrical wiring diagrams

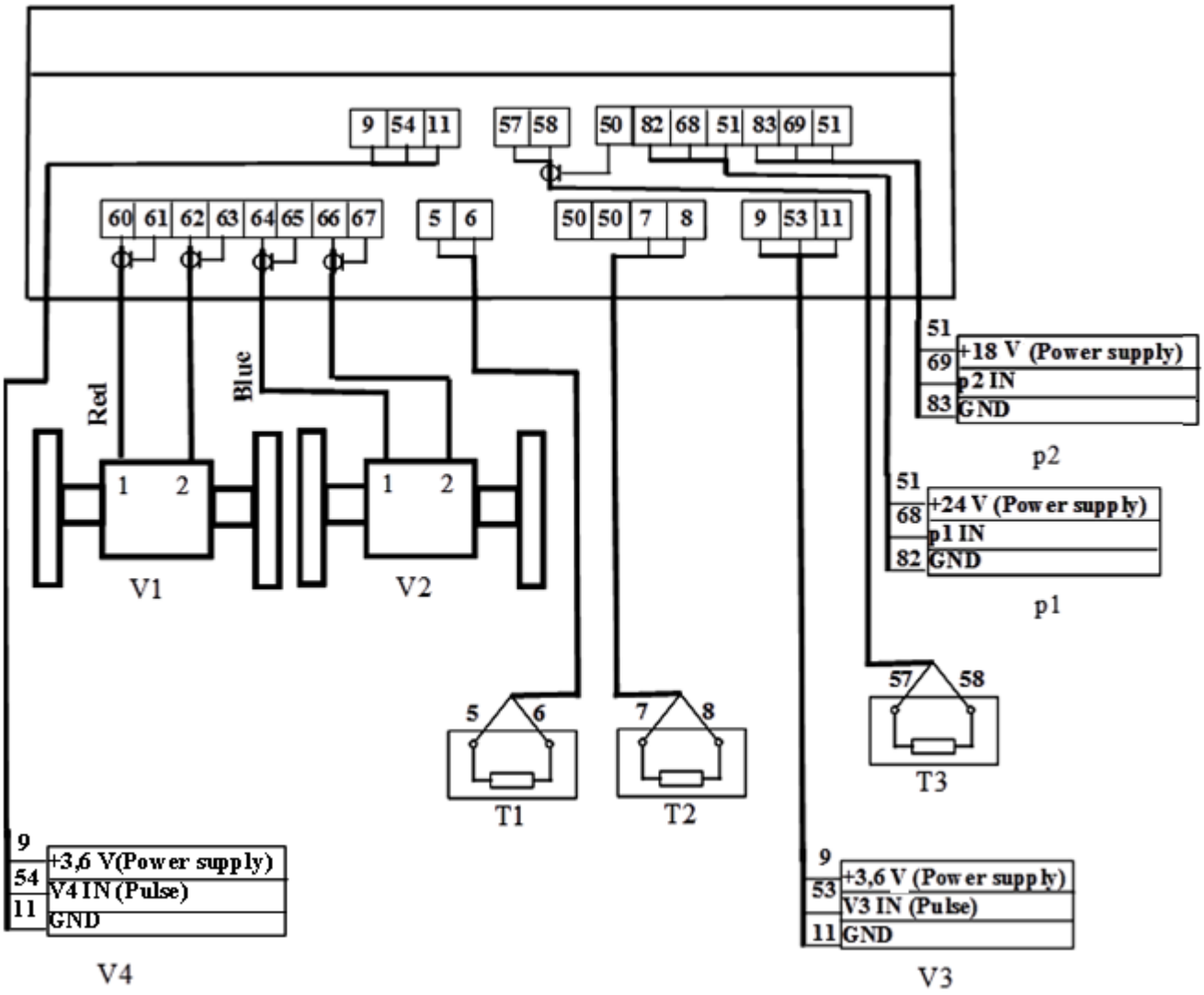


Fig. B2a. Electrical wiring diagram
Temperature sensors with 2-wire (D) connection, flow sensors DN25…DN100

T1 … T3 - temperature sensors
V1 … V2 - ultrasonic flow sensors (DN25…DN100)
V3... V4 – water meters with pulse output
p1 ... p2 -pressure sensors

Remark: *1. Only required for selected measurement scheme sensors should be connected (see Annex A)*

Electrical wiring diagrams

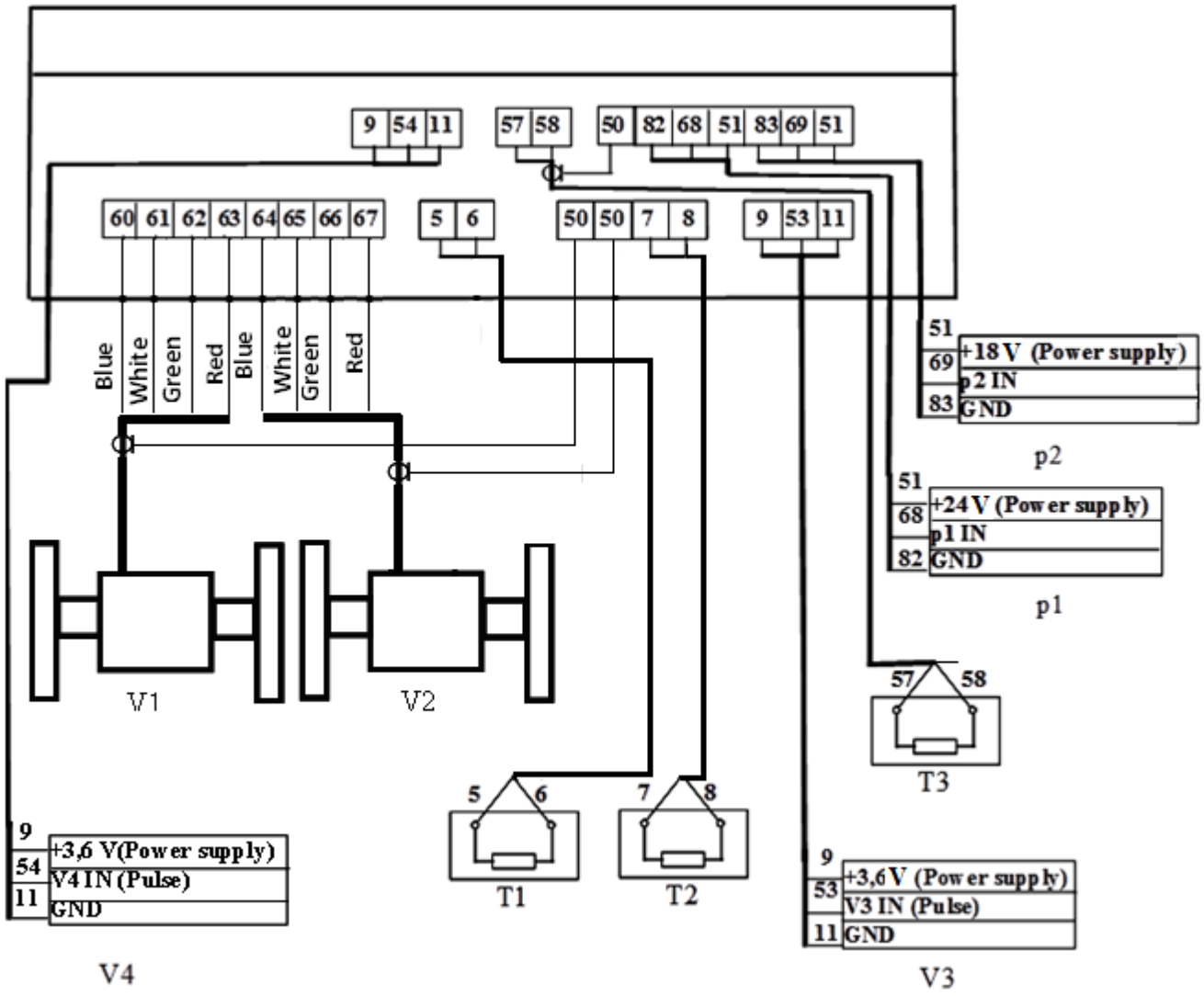


Fig. B2b. Electrical wiring diagram

Temperature sensors with 2-wire (D) connection, flow sensors DN15…DN20

T1 … T3 - temperature sensors
V1 … V2 - ultrasonic flow sensors (DN15…DN20)
V3... V4 – water meters with pulse output
p1 ... p2 -pressure sensors

Remark: *1. Only required for selected measurement scheme sensors should be connected (see Annex A)*

Electrical wiring diagrams

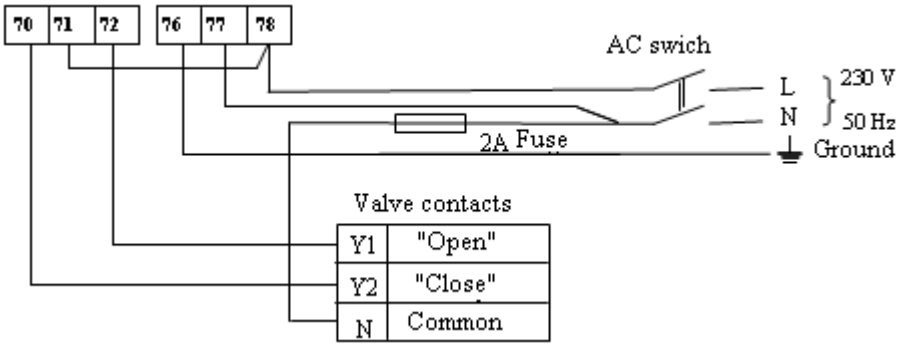


Fig. B3. Wiring diagrams for connecting of the meter to the line voltage 230 V and for connecting of the regulating valve.
Valve power supply and meter supply is 230 V

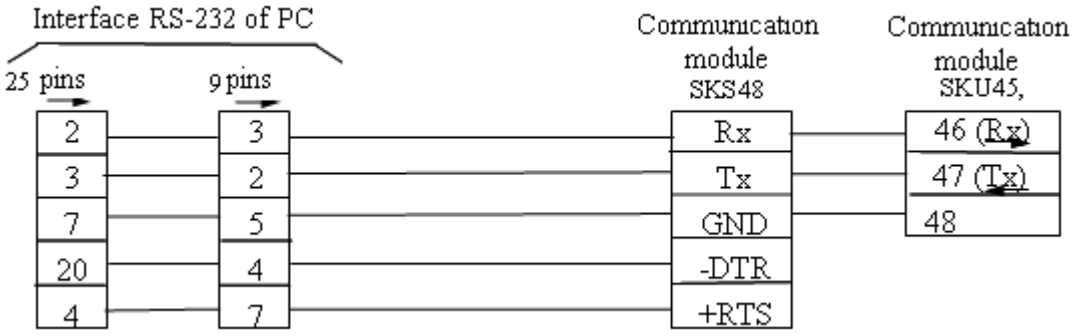


Fig. B4. Direct connection of the meter to the computer interface RS-232

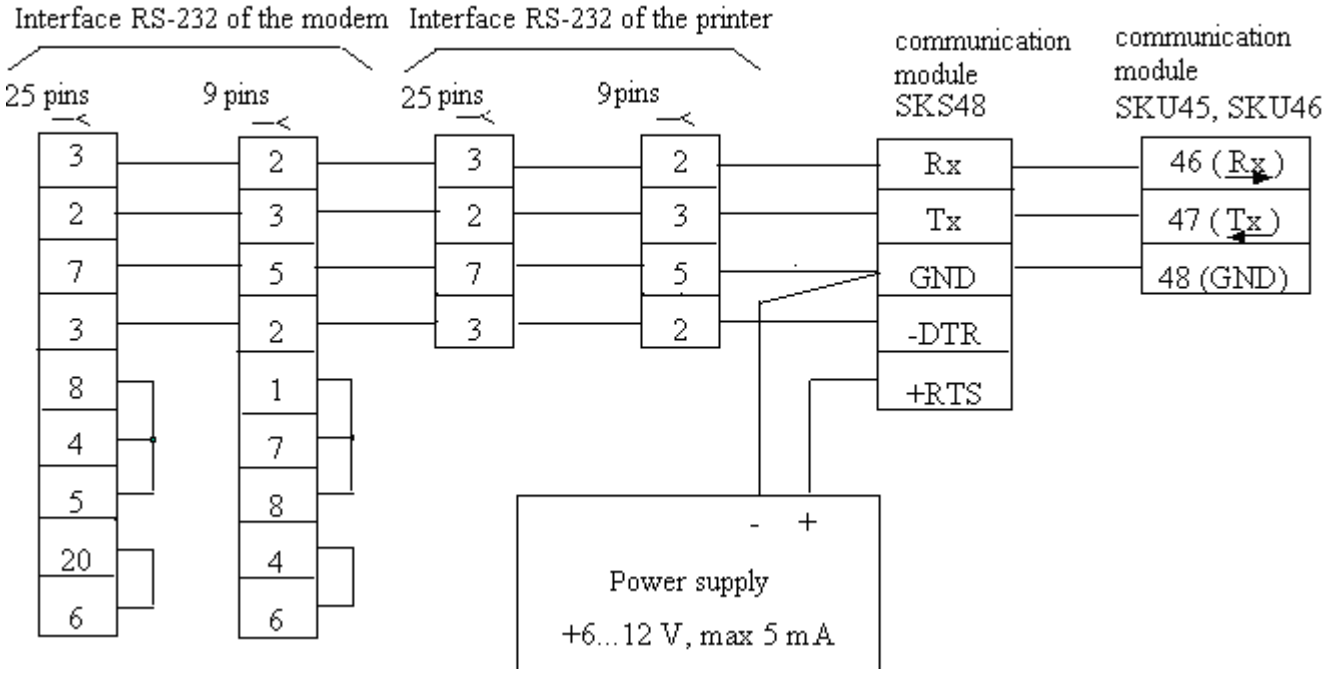


Fig. B5 Direct connection of the meter to the modem or printer via interface RS-232

Electrical wiring diagrams

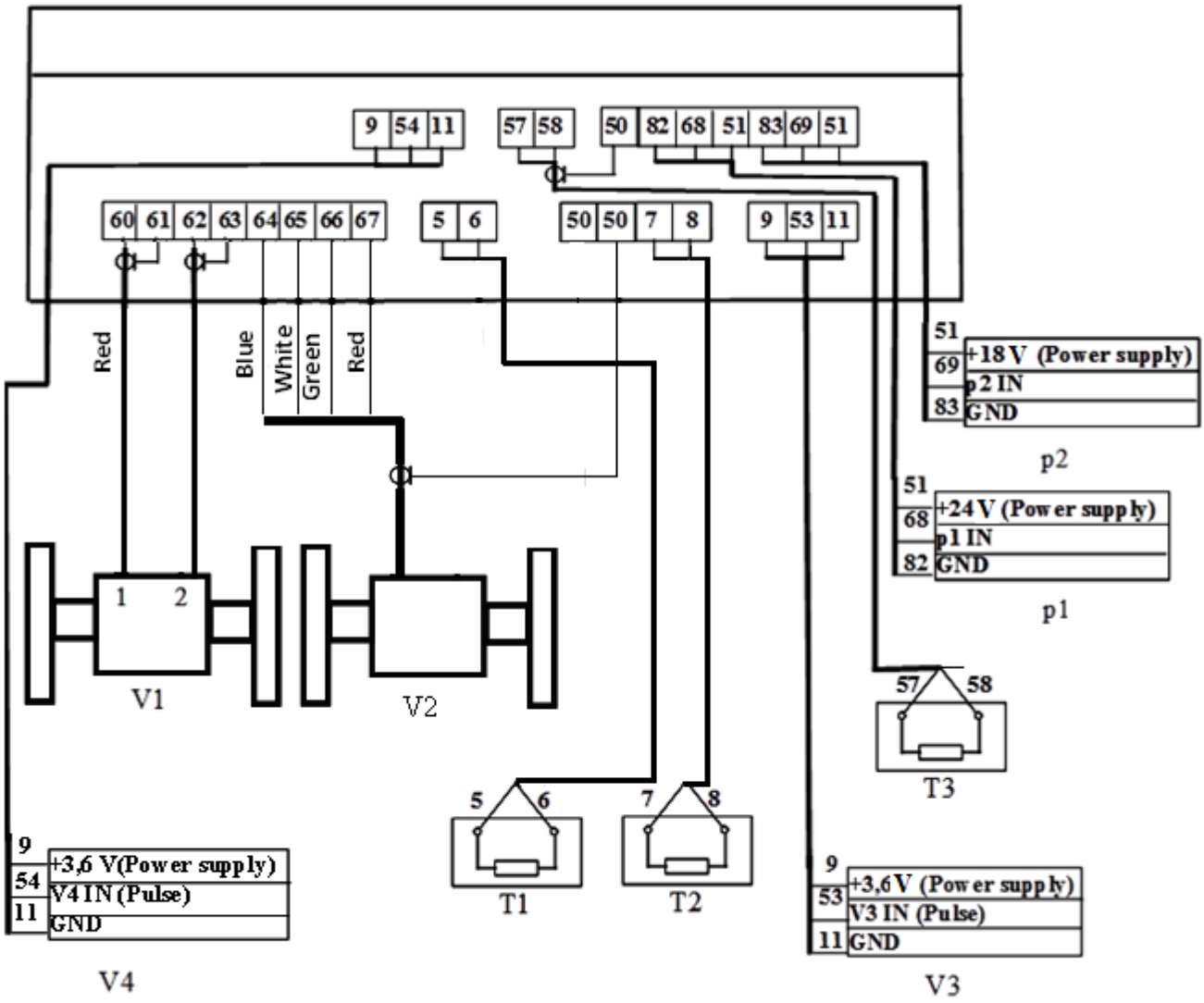


Fig. B6. Electrical wiring diagram

Temperature sensors with 2-wire (D) connection, flow sensors: V1-DN25…DN100; V2 – DN15…DN20

T1 … T3 - temperature sensors
V1 (DN25-DN100) … V2 (DN15-DN20) - ultrasonic flow sensors
V3... V4 – water meters with pulse output
p1 ... p2 -pressure sensors

Remark: *1. Only required for selected measurement scheme sensors should be connected (see Annex A)*

Electrical wiring diagrams

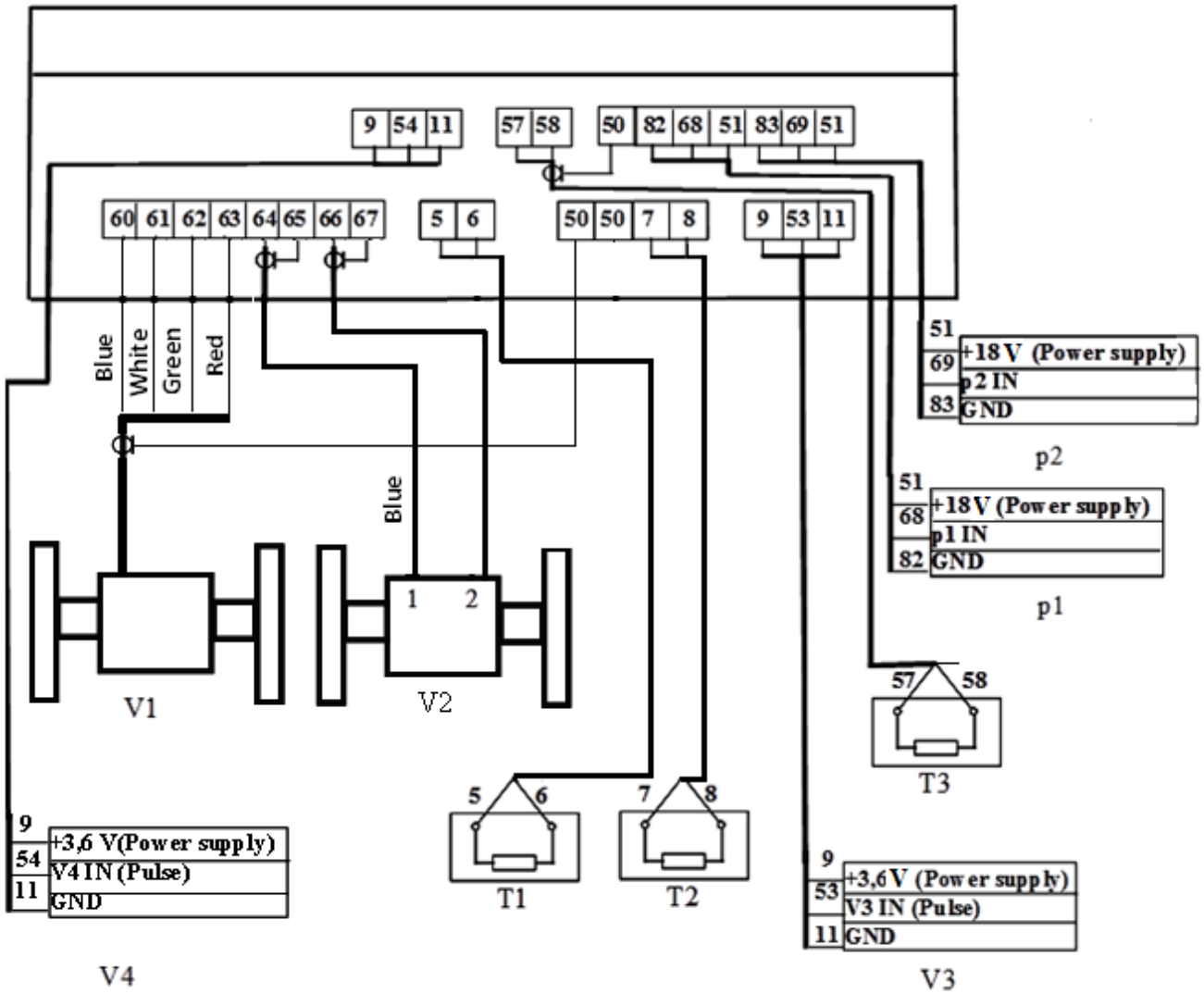


Fig. B7. Electrical wiring diagram

Temperature sensors with 2-wire (D) connection, flow sensors: V1-DN15…DN20; V2 – DN25…DN100

T1 … T3 - temperature sensors
V1(DN15-DN20) … V2 (DN25-DN100) - ultrasonic flow sensors
V3... V4 - water meters with pulse output
p1 ... p2 - pressure sensors

Remark: *1. Only required for selected measurement scheme sensors should be connected (see Annex A)*

Annex C

Table C1. Numbering of terminals

Terminal number	Marking	Signal description
60	V1-1 (+)	Output signal (OUT) from 1st flow sensor V1 (ultrasonic sensor 1)
61	V1-1(-)	GND for output (OUT) of 1st flow sensor V1 (ultrasonic sensor 1)
62	V1-2 (+)	Input signal (IN) from1st flow sensor V1 (ultrasonic sensor 2)
63	V1-2 (-)	GND for input (IN) of 1st flow sensor V1 (ultrasonic sensor 2)
64	V2-1 (+)	Output signal (OUT) from 2nd flow sensor V2 (ultrasonic sensor 1)
65	V2-1 (-)	GND for output (OUT) of 2nd flow sensor V2 (ultrasonic sensor 1)
66	V2-2 (+)	Input signal (IN) from 2nd flow sensor V2 (ultrasonic sensor 2)
67	V2-2 (-)	GND for input (IN) of 2nd flow sensor V2 (ultrasonic sensor 2)
1*	T1	Current terminal for 1-st temperature sensor "+I"
5	T1	Voltage terminal for 1-st temperature sensor "+U"
6	T1	Voltage terminal for 1-st temperature sensor "-U"
2*	T1	Current terminal for 1-st temperature sensor "-I"
50*	⏚	GND for temperature and flow sensors
3*	T2	Current terminal for 2-nd temperature sensor "+I"
7	T2	Voltage terminal for 2-nd temperature sensor "+U"
8	T2	Voltage terminal for 2-nd temperature sensor "-U"
4*	T2	Current terminal for 2-nd temperature sensor "-I"
9	+	+3,6V power supply voltage for flow sensor V3 , V4
53	V3	Pulse input signal from 3-rd flow sensor (IN)
11	⏚	GND for 3-rd and 4-th flow sensors
54	V4	Pulse input signal from 4-th flow sensor (IN)
56*	T3	Current terminal for 3-rd temperature sensor "+I"
57	T3	Voltage terminal for 3-rd temperature sensor "+U"
58	T3	Voltage terminal for 3-rd temperature sensor "-U"
59*	T3	Current terminal for 3-rd temperature sensor "-I"
82	⏚	GND for pressure sensor p1
68	P1	Input signal from 1-st pressure sensor (IN)
51	+	+18 V power supply voltage for pressure sensors p1, p2
83	⏚	GND for pressure sensor p2
69	P2	Input signal from 2-nd pressure sensor (IN)
REMARK: * - only for 4-wire connection method of temperature sensors (K)		

Table C2. Numbering of additional module terminals

Terminal number	Marking	Signal description
Numbering of power supply module terminals		
70	ˇ	Relay output "decrease"
71	R	GND for relay output
72	ˆ	Relay output "increase"
26	⏚	Main ground
27	230V	Mains power supply (230V AC)
28	230V	Mains power supply (230V AC)
Numbering of communication module terminals		
76	⊥	GND for currency outputs (module SKS-45)
77	Iout1	1st currency outputs (+) (module SKU45)
78	Iout2	2nd currency outputs (+) (module SKU45)
79	⊥	GND for pulse outputs (module SKS-46)
80	Puls 1	1st pulse outputs (+) (module SKU46)
81	Puls 2	2nd pulse outputs (+) (module SKU46)
24 (73)	BUS	M-bus line L1(CL – CL1 or RS-232 – Rx (input))
25 (74)	BUS	M-bus line L2(CL – CL2 or RS-232 – Tx (output))
75	BUS	GND for communication interface RS-232
51	+	MiniBus module line (+)
52	-	MiniBus module line (-)
60	60	MODBUS module 12-24 V DC power terminal (bipolar)
61	61	MODBUS module 12-24 V DC power terminal (bipolar)
90	90	MODBUS module line (+)
91	91	MODBUS module line (-)

Annex D

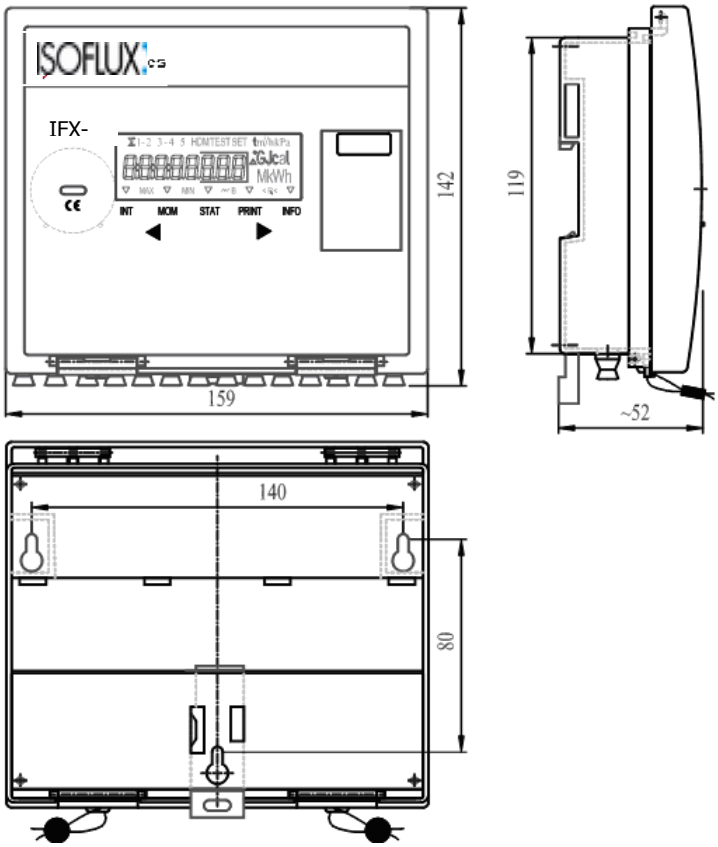
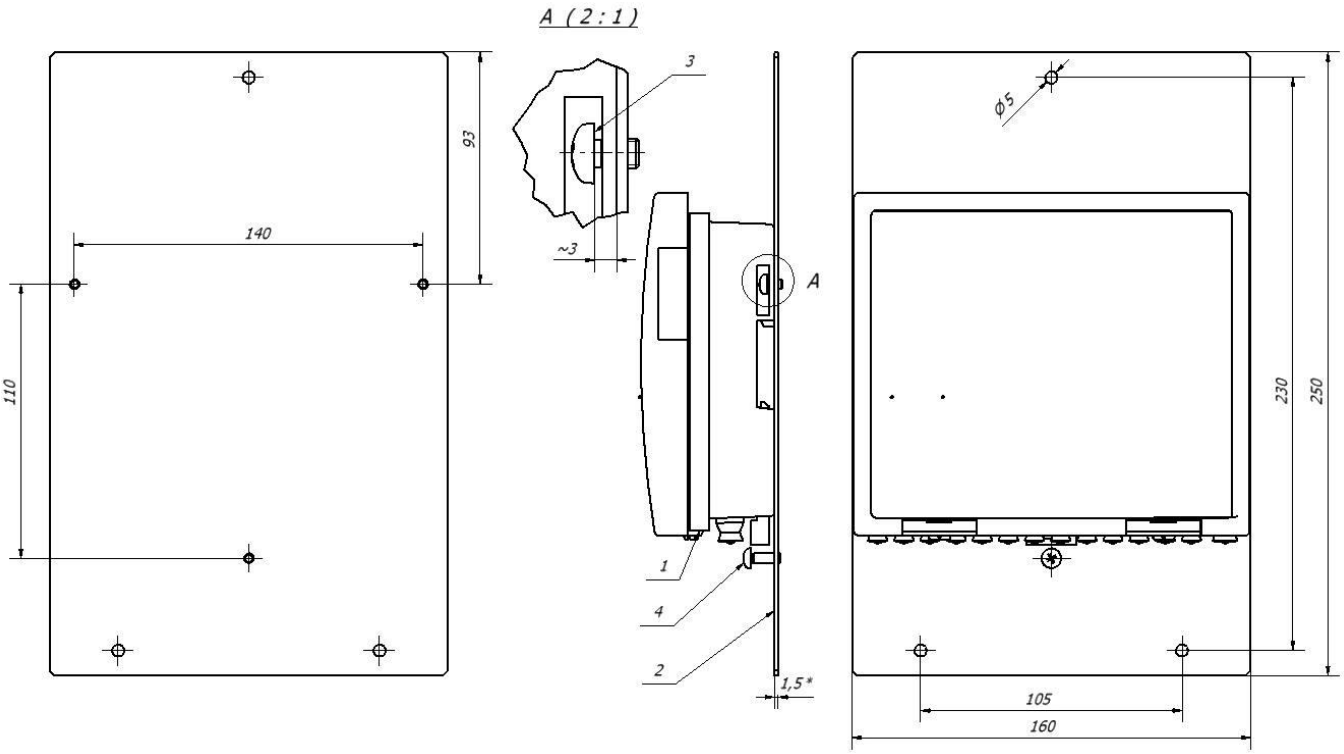


Fig.D1. Mounting dimensions of calculator



D1.1. Adapter plate according to figure 8 of EN1434-2:2007 for wall mounting of calculator

It can be used for wall mounting, if the aperture in the wall is too large for the calculator

1 – calculator IFX-M4-04

2 – adapter plate
3 – screw M4x6
4 - screw M4x12

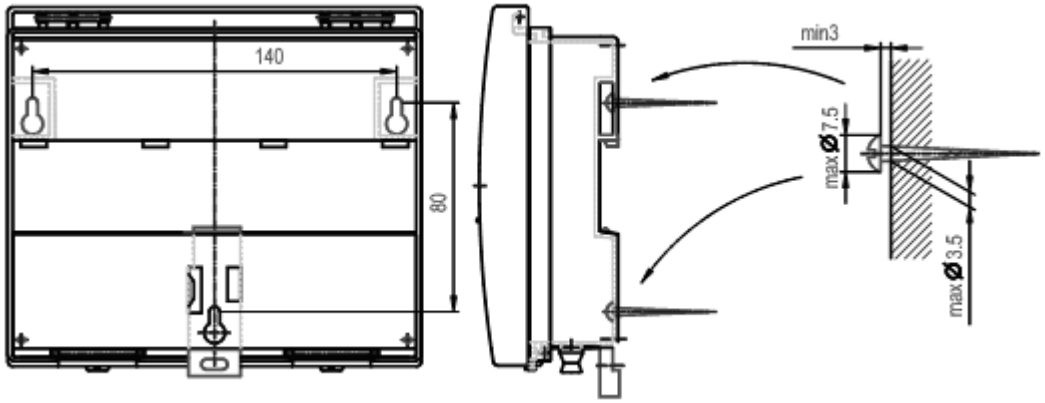


Fig. D2. Wall mounting, without possibility sealing of mounting

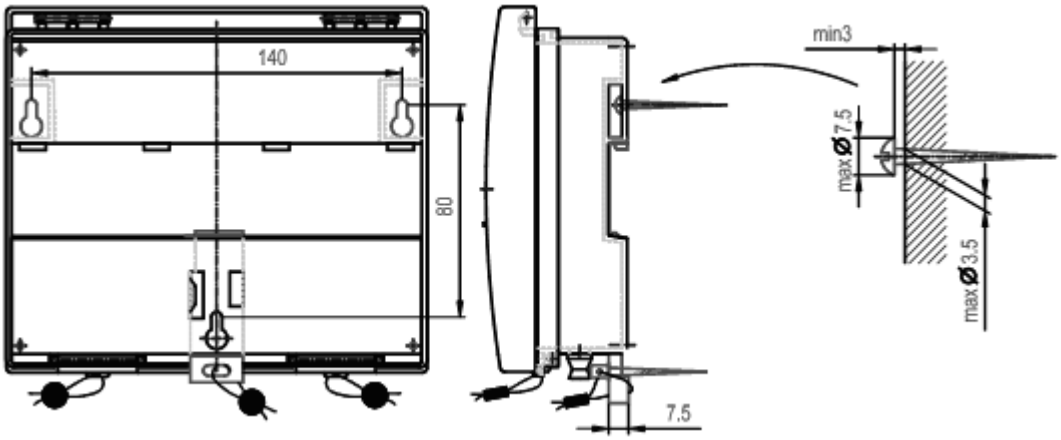
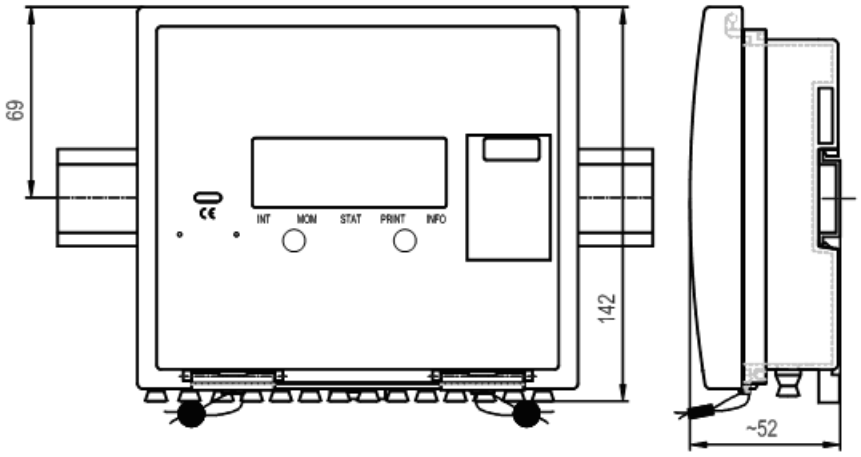


Fig. D3. Wall mounting, with possibility sealing of mounting



D4. Mounting on standard DIN-rail

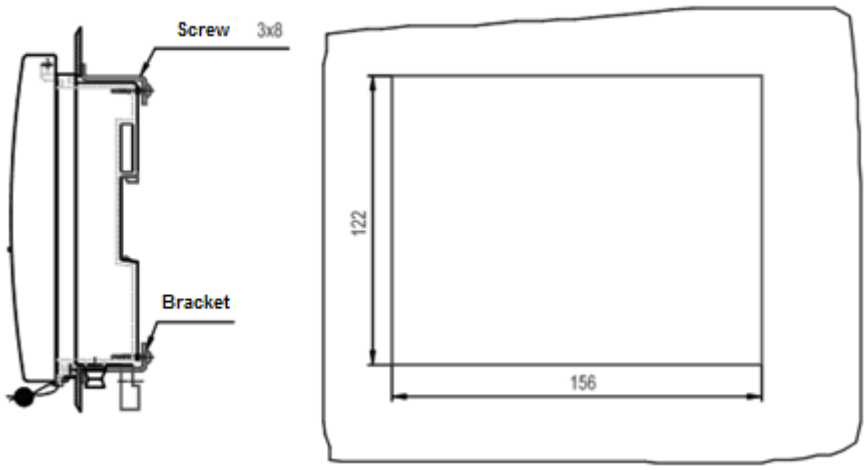


Fig.D5. Panel mounting

a) G 1 ¼ (qp = 3,5 m3/h; qp = 6,0 m3/h)

b) G 2 (qp = 10,0 m3/h)

c) DN 50 (qp = 15,0 m3/h); DN 65 (qp = 25,0 m3/h);
DN 80 (qp = 40,0 m3/h); DN 100 (qp = 60,0 m3/h);
(on flow sensors with brass housing only)

Fig. D6. Mounting on ultrasonic flow sensor
Flow temperature max. 90 °C

Annex E
Sizes and dimensions of ultrasonic flow sensors

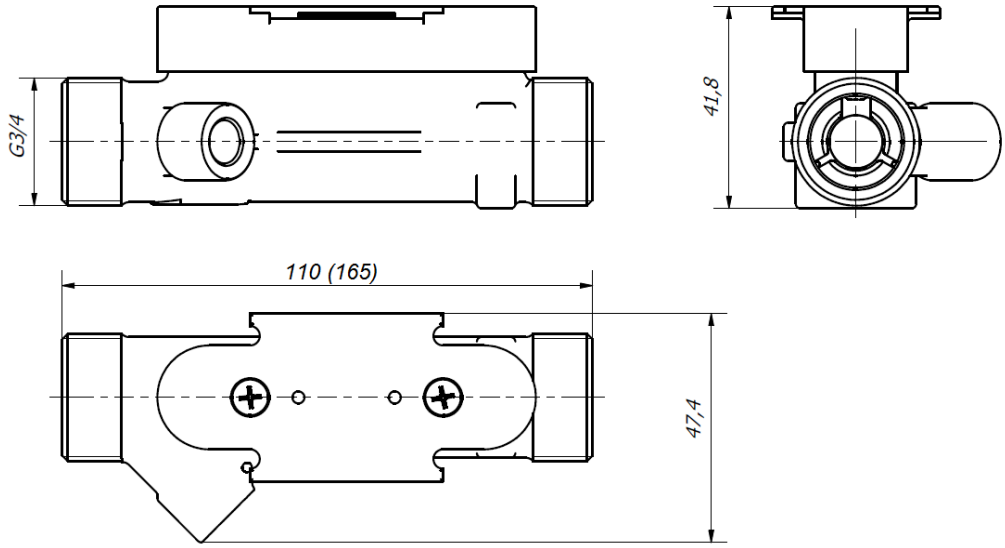


Fig. E1. Dimensions of flow sensors G3/4", L=110 mm or 165 mm

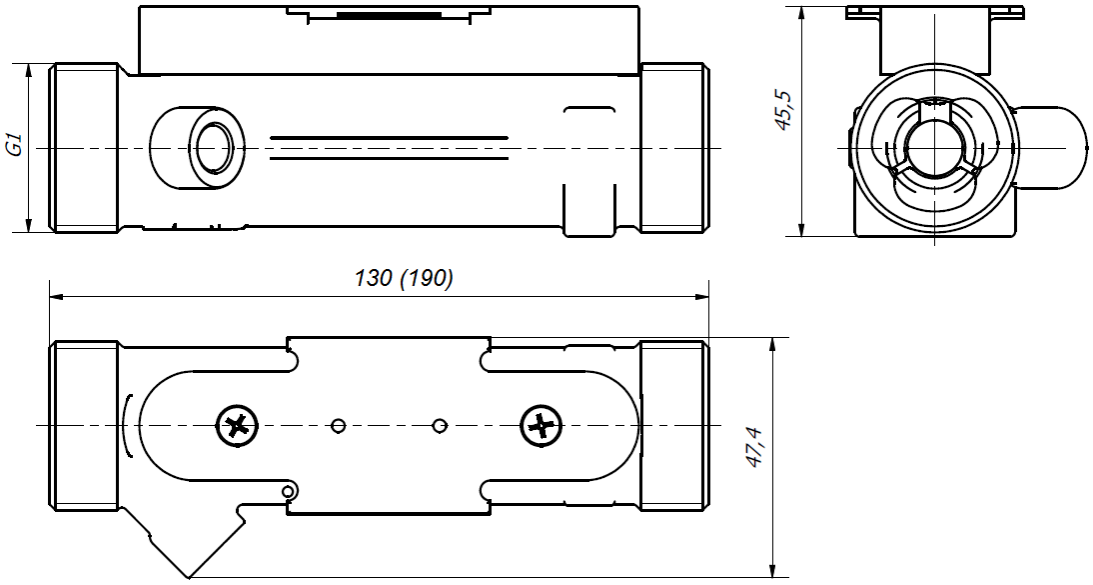


Fig. E2. Dimensions of flow sensors G1", L=130 mm or 190 mm

Sizes and dimensions of ultrasonic flow sensors

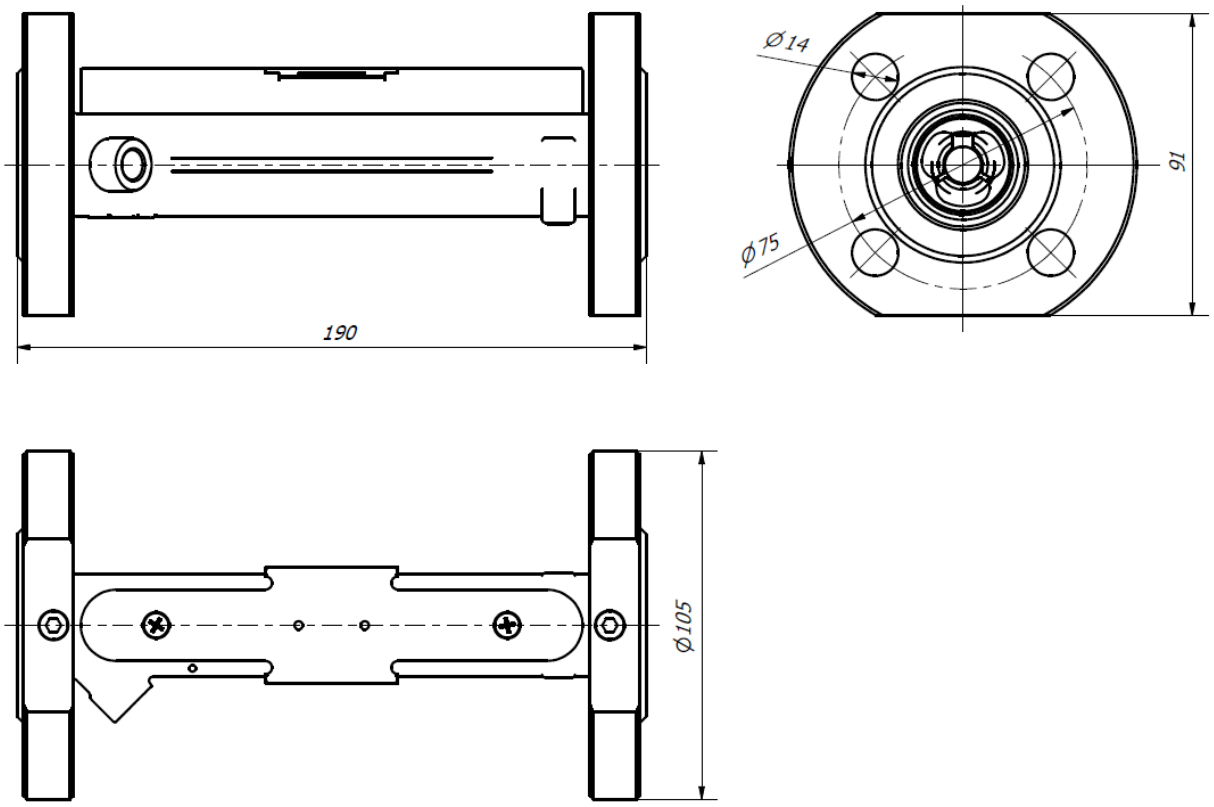


Fig. E3. Dimensions of flow sensors DN20, L=190 mm

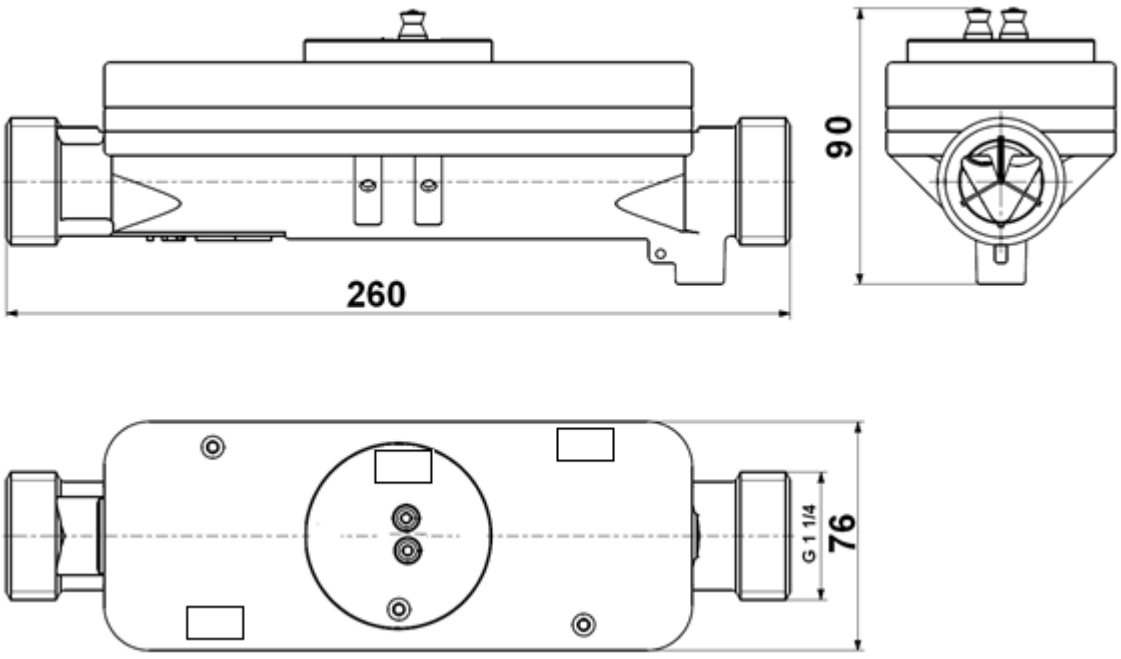
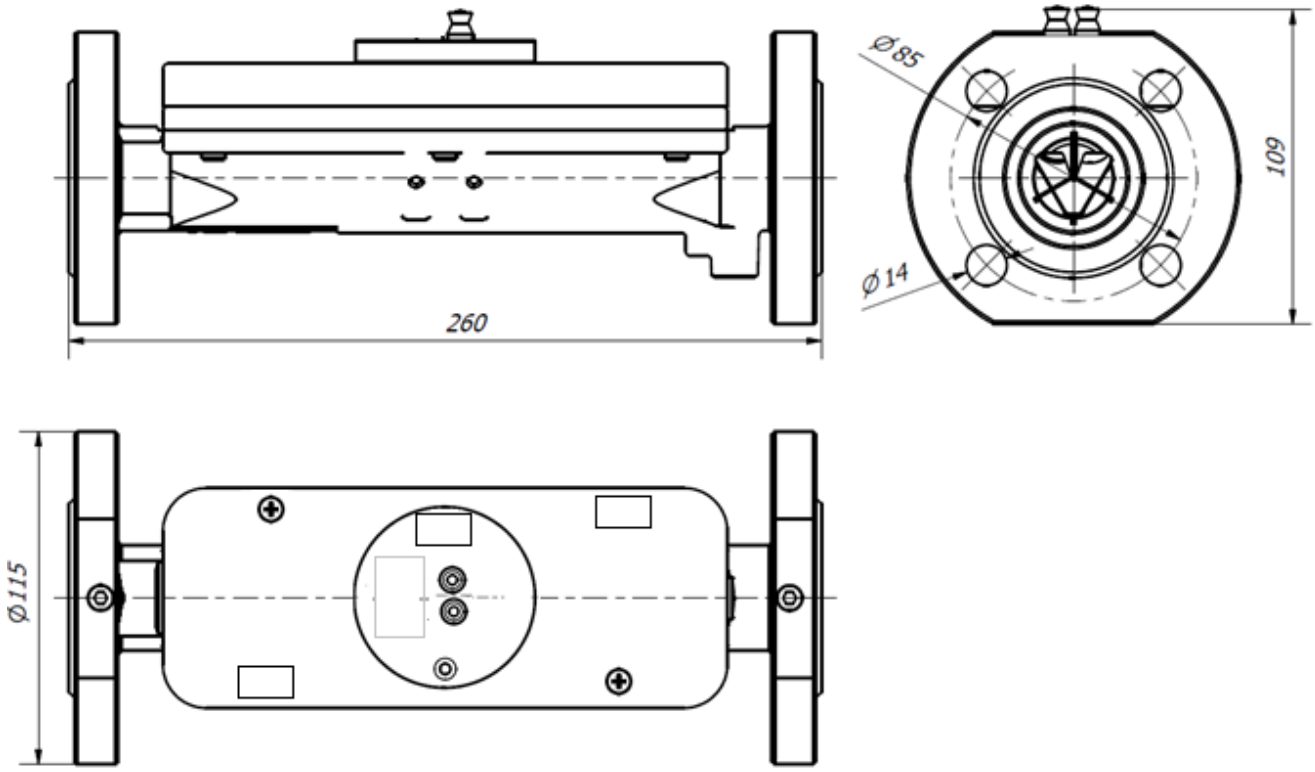
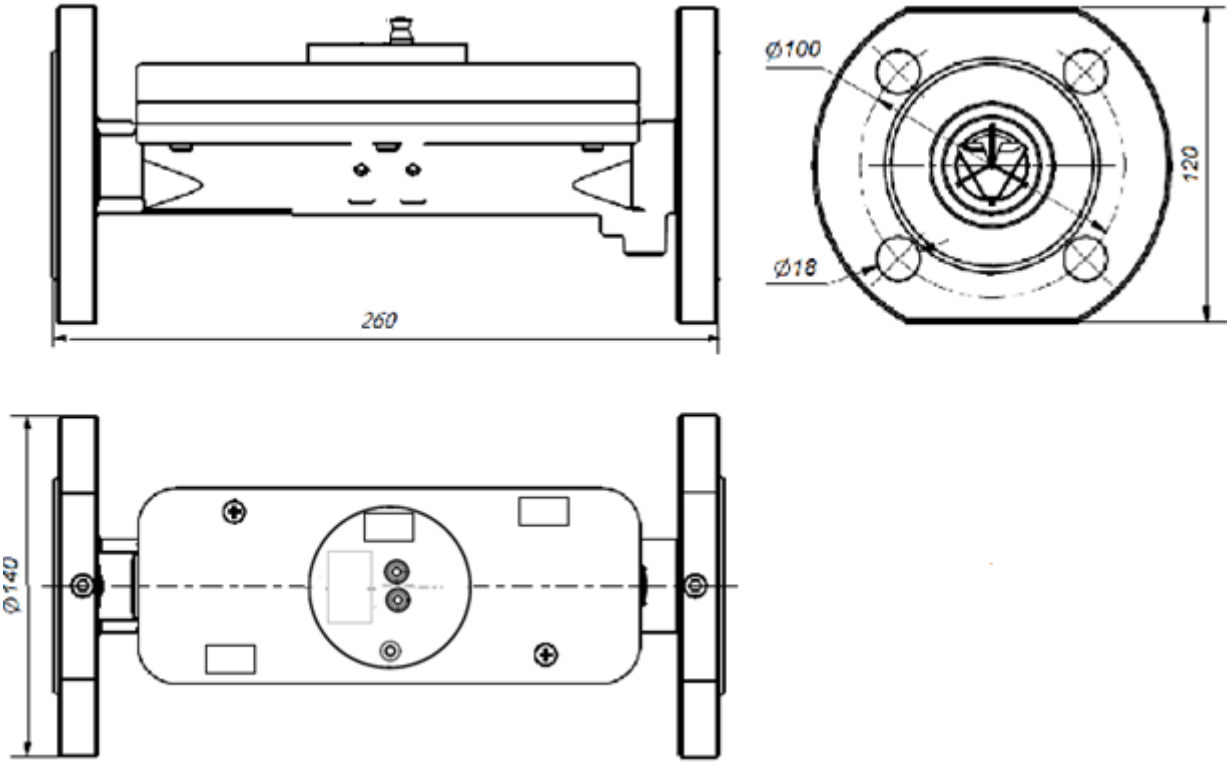


Fig. E4. Dimensions of flow sensors G1 1/4", L=260 mm

Sizes and dimensions of ultrasonic flow sensors



a) Dimensions of flow sensors DN25



b) Dimensions of flow sensors DN32

Fig. E5. Dimensions of flow sensors (a- DN25; b- DN32), L=260 mm

Sizes and dimensions of ultrasonic flow sensors

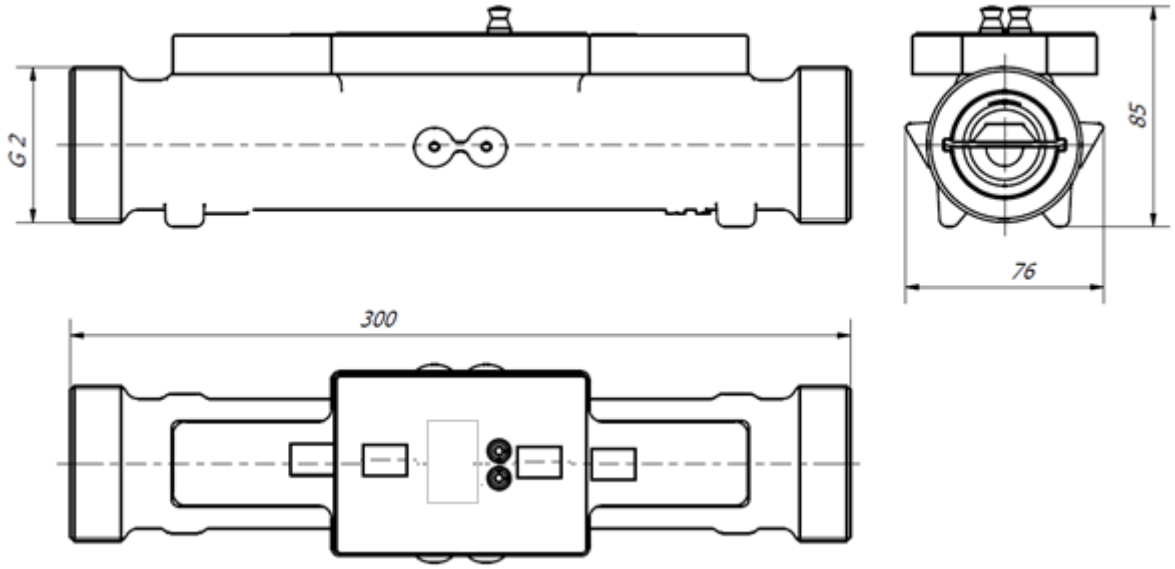
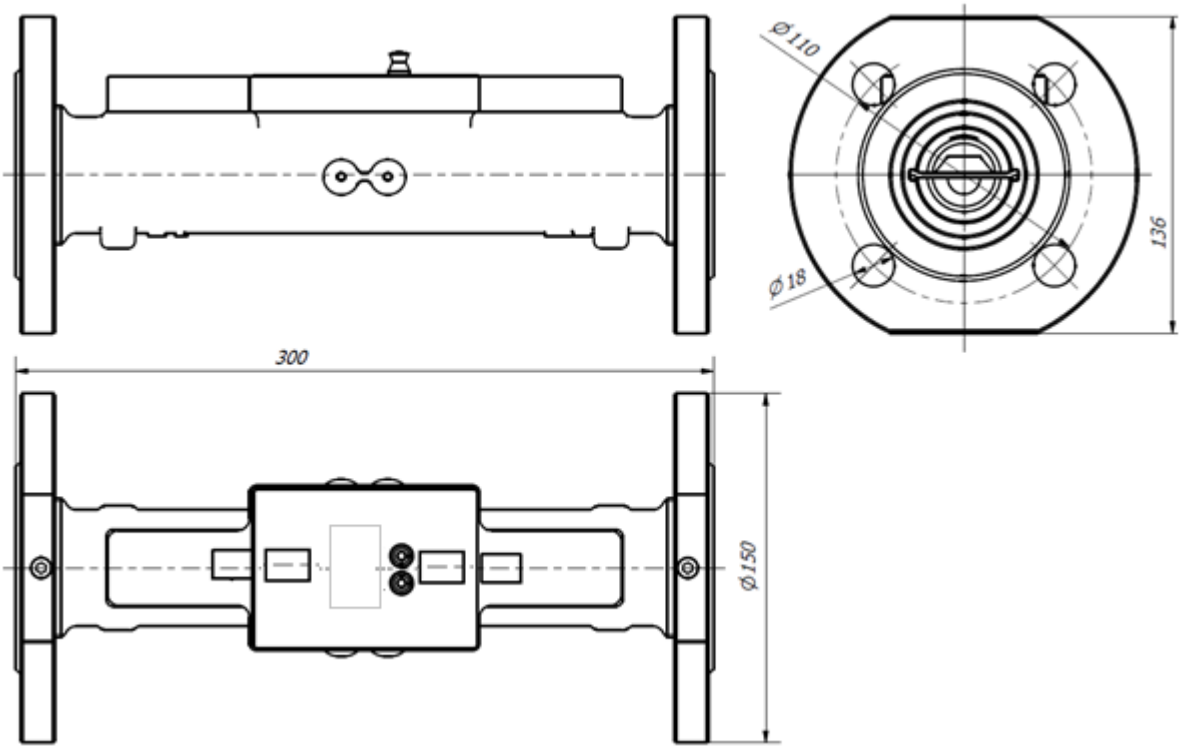


Fig. E6. Dimensions of flow sensors G2", L=300 mm



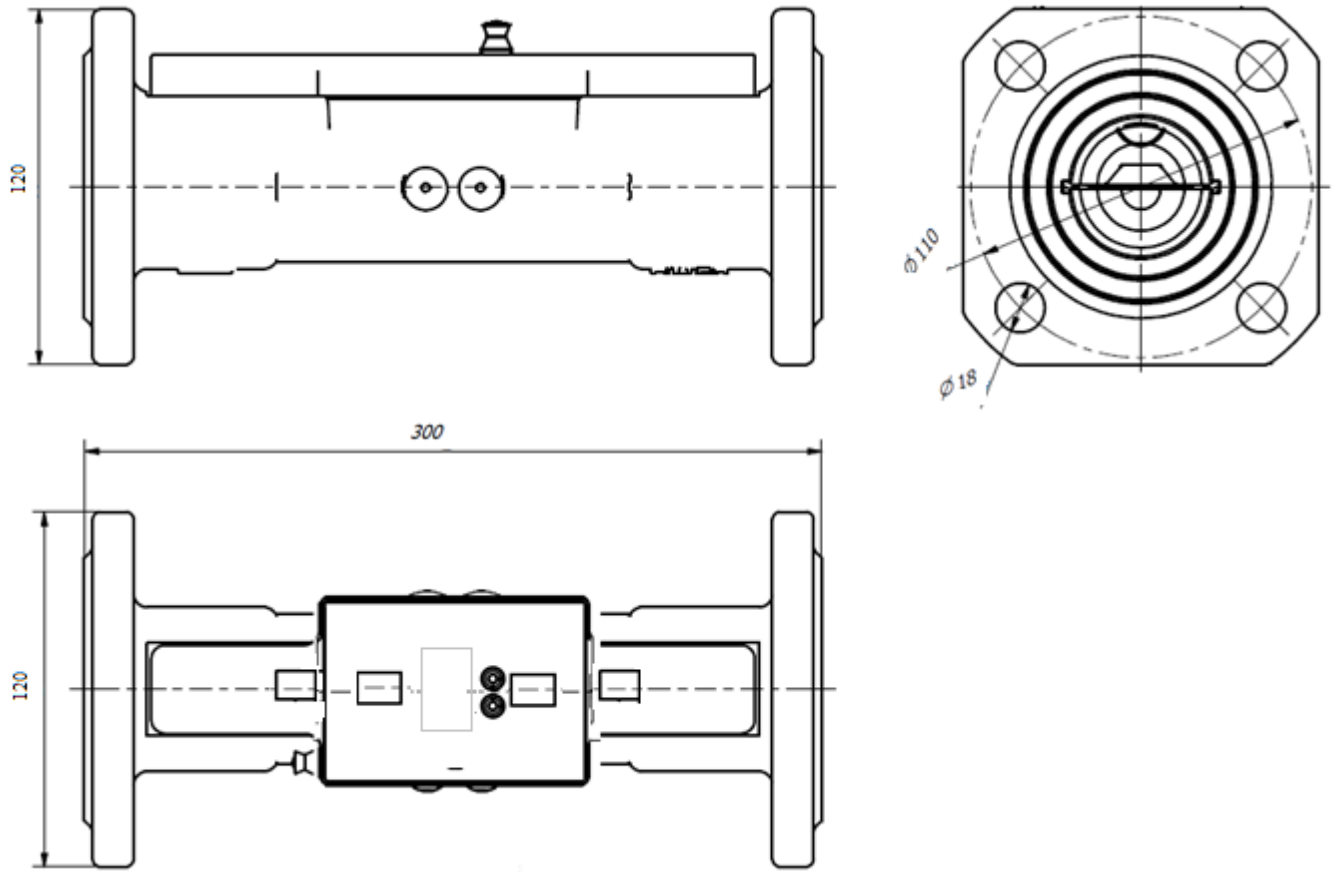
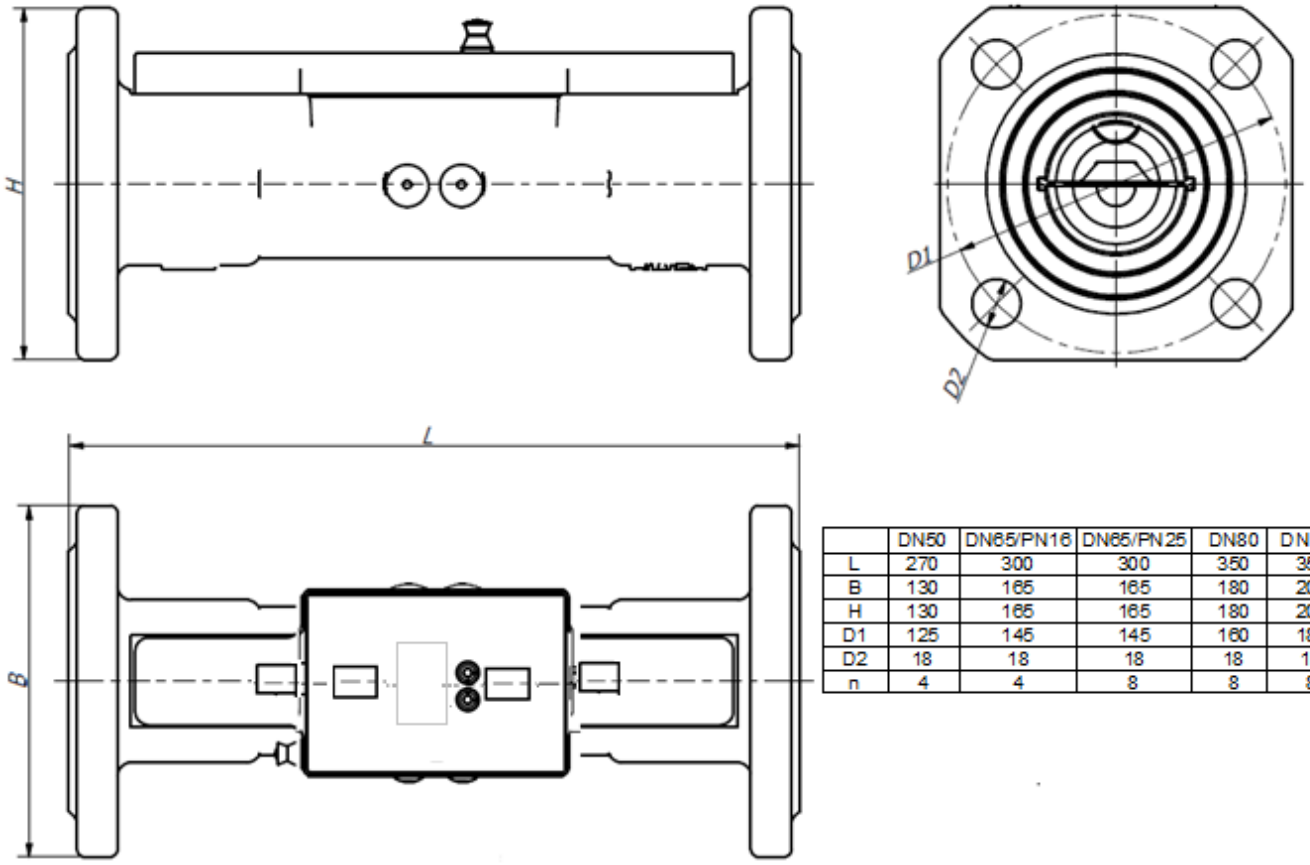


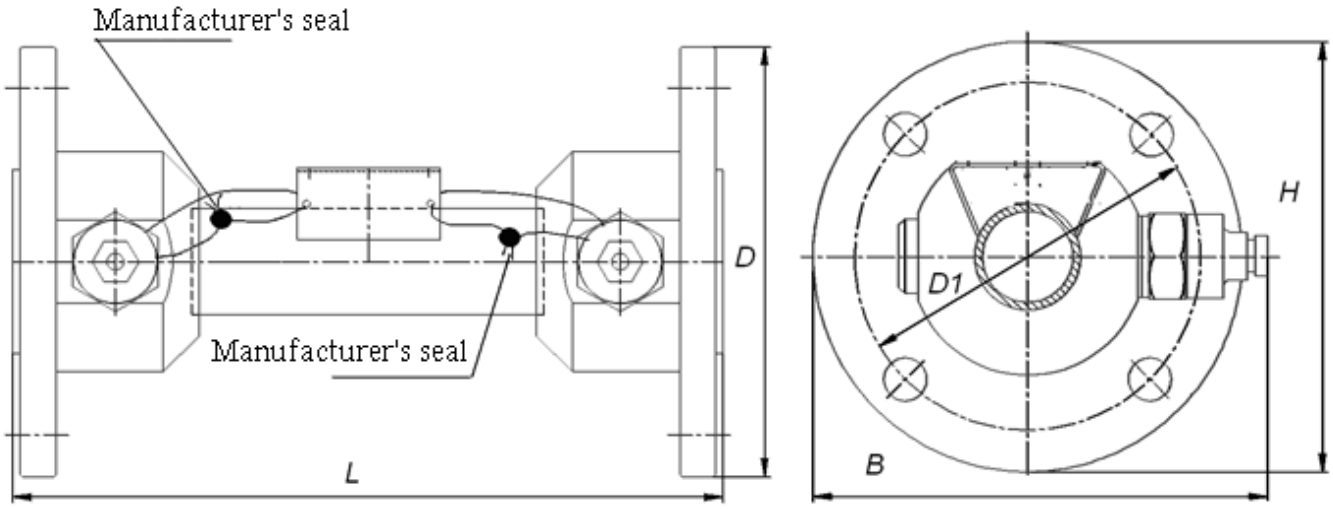
Fig. E7. Dimensions of flow sensors DN40, L=300 mm (two design options)



	DN50	DN65/PN16	DN65/PN25	DN80	DN100
L	270	300	300	350	350
B	130	165	165	180	200
H	130	165	165	180	200
D1	125	145	145	160	180
D2	18	18	18	18	18
n	4	4	8	8	8

Fig. E8. Dimensions of flow sensors DN50, DN65, DN80, DN100 (Brass housing)

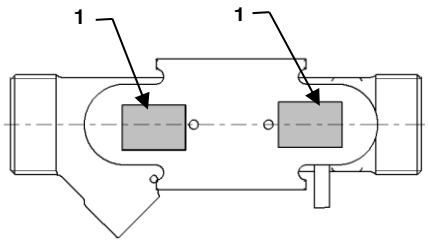
Sizes and dimensions of ultrasonic flow sensors



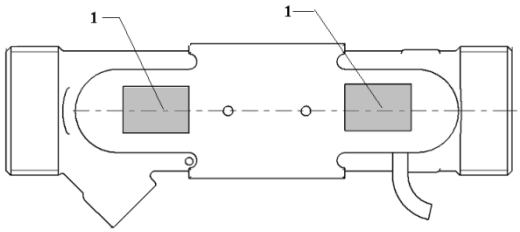
	DN65/PN16	DN65/PN25	DN80	DN100
L	300	300	350	350
D	185	185	200	220
H	185	185	200	220
D1	145	145	160	180
B	200	200	215	235
D2	18	18	18	18
n	4	8	8	8

Fig. E9. Dimensions of flow sensors DN65, DN80, DN100 (Steel housing)

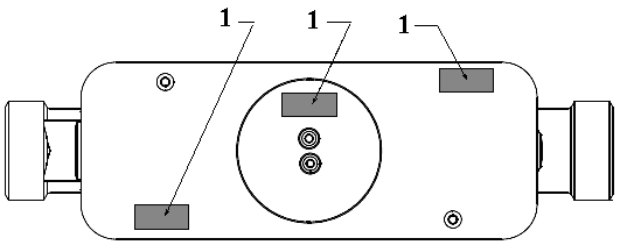
Security sealing



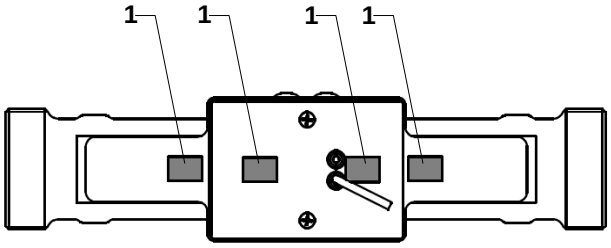
a) Flow sensor G 3/4"



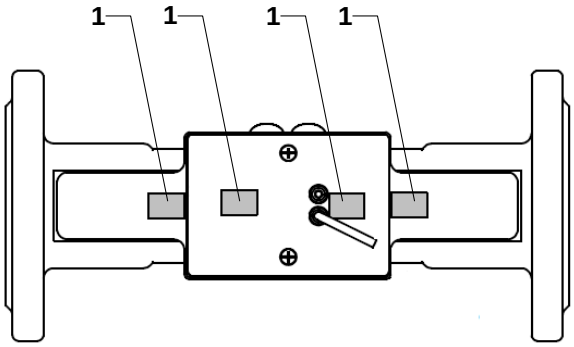
b) Flow sensor G 1"or DN20



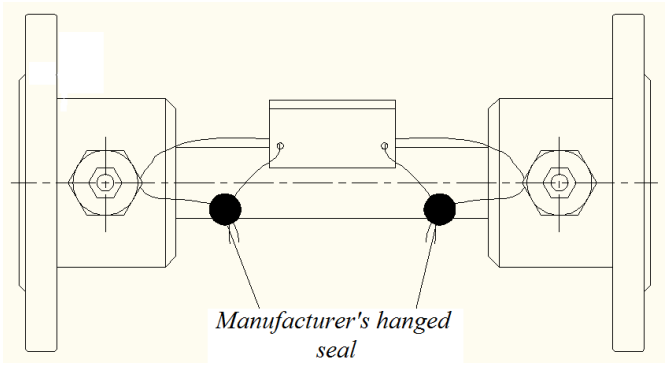
c) Flow sensor G 1 ¾"**;** DN25 or DN32



d) Flow sensor G 2"or DN40



e) Flow sensor DN50, DN65, DN80, DN100 (Brass housing)

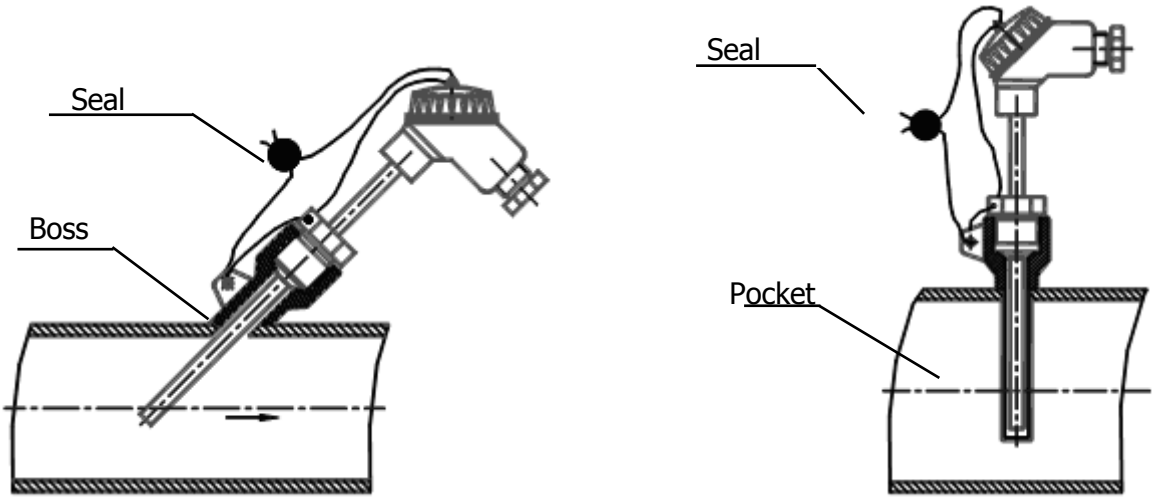


f) Flow sensor DN65, DN80, DN100 (Steel housing)

Fig.E10. Flow sensors sealing
(a;b;c;d;e - 1- manufacturer adhesive seal-sticker on the bolts of the cover;
f – manufacturer hanged seal)

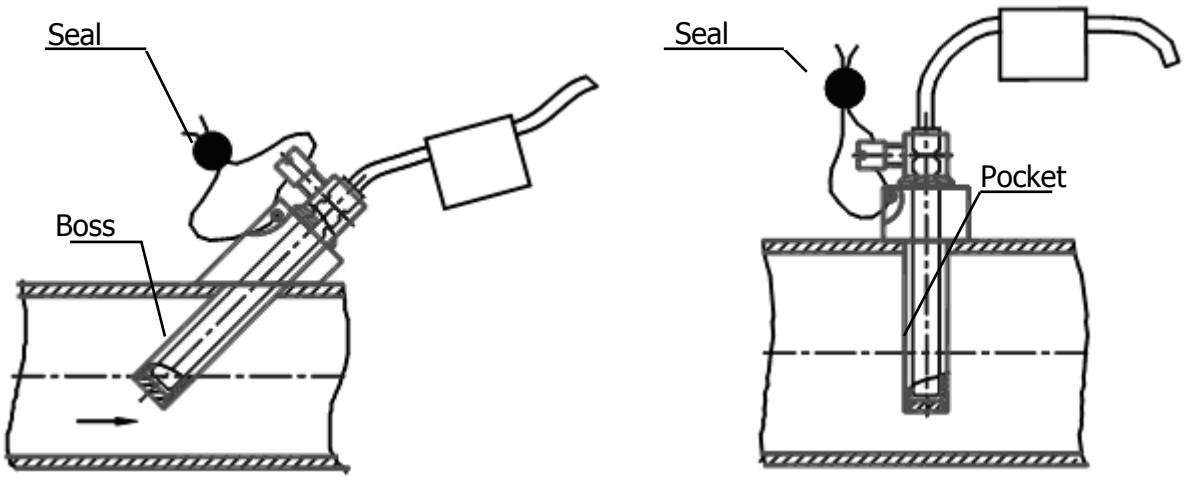
Annex F

Temperature sensors



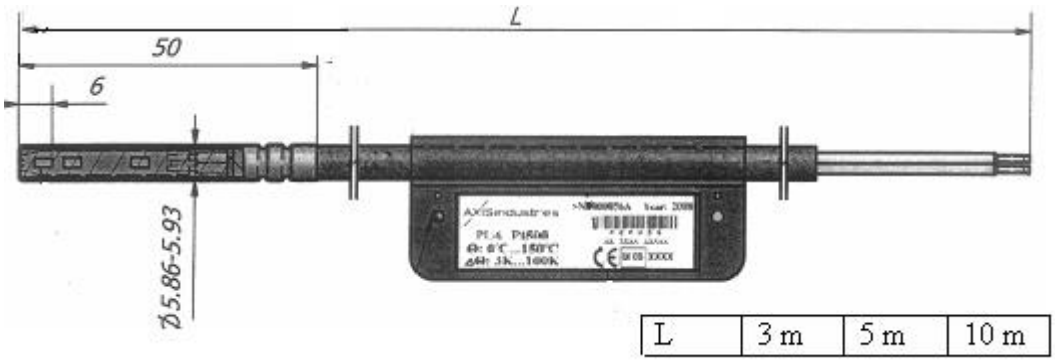
a) Without pocket b) With pocket

Fig.F1. Installation recommendations for temperature sensors with mounting head

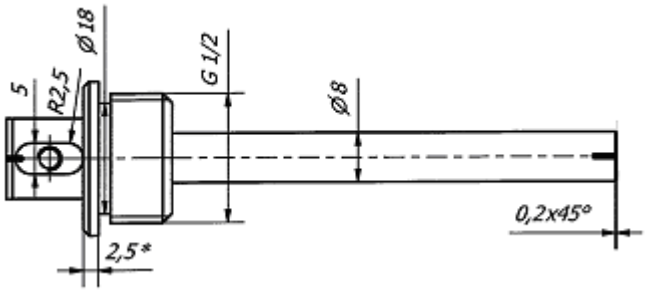


a) Angled 45° b) perpendicular

Fig.F2. Installation recommendations for temperature sensors with permanently connected signal leads



Temperature sensors with permanently connected signal leads
L- signal leads length

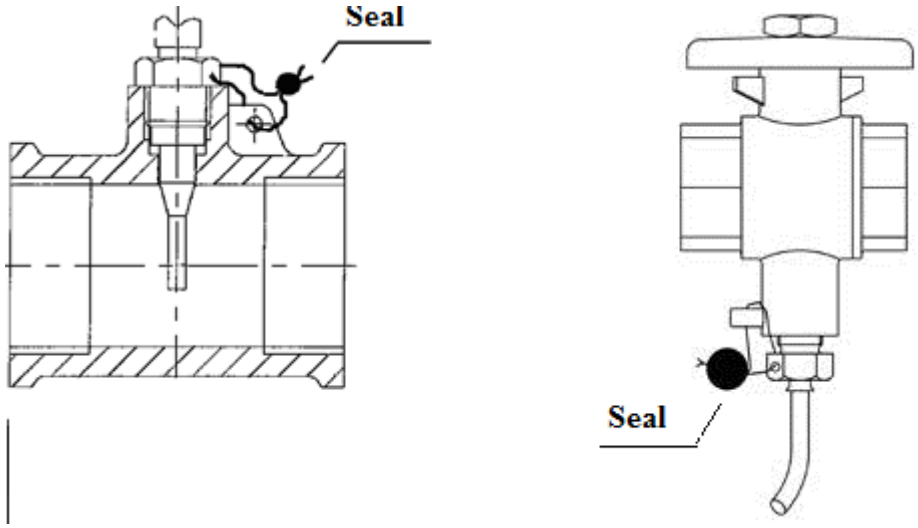


b)

Nominal diameter of pipe, mm	DN20...DN100	DN125...DN150
Total length of pocket, mm	100	135

Temperature sensors pocket

Fig.F3. Dimensions of temperature sensors type PL-6 and theirs pockets



a) via a tee

b) using a valve-tee

Fig.F4. Installation recommendations for temperature sensors type DS

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