

Standards and documents applied:

LST EN ISO 4064-1:2017;
LST EN ISO 4064-2:2017;
LST EN ISO 4064-4:2014;
LST EN ISO 4064-5:2017;
OIML R 49-1:2013;
OIML R 49-2:2013;
WELMEC 7.2:2015.

The measuring instrument must correspond with the following specifications:

1 Design of the instrument

1.1 Construction

Ultrasonic complete water meter QALCOSONIC W1 consists of a measurement transducer with a primary flow sensor, an electronic calculator and indicating device. Plastic measuring sections with two ultrasonic transducers are installed in the plastic meter body (for meters with threaded end connection G 2 and flanges DN50 – with four ultrasonic transducers). A filter strainer can be installed in the meter inlet. A non-return valve can be installed in the meter outlet (except for meters with threaded end connection G $\frac{3}{4}$ length 80 mm, G 1 length 105 mm and 110 mm, G $1\frac{1}{2}$ and flanges DN50). The meter has an electronic calculator and a LCD indicating device mounted in the same body.

The meter, depending on the modification, is designed to measure forward flow or forward and reverse flow. The volume passed during reverse flow is registered in a separate register and additionally can be subtracted from the volume of the forward flow.

The meter is powered by a non-replaceable 3,6 V DC lithium battery (one or two).



Fig.1. Water meter QALCOSONIC W1, $Q_3 = 1,6/2,5/4,0$ m³/h, with threaded end connection G $\frac{3}{4}$ or G 1 (meter design initial version)



Fig.2. Water meter QALCOSONIC W1, $Q_3 = 1,6/2,5/4,0$ m³/h, with threaded end connection G $\frac{3}{4}$ or G 1 (meter design version „n“)



Fig. 3. Water meter QALCASONIC W1,
 $Q_3 = 6,3/10 \text{ m}^3$, with threaded end connection
G 1¼ or G 1½



Fig. 4. Water meter QALCASONIC W1,
 $Q_3 = 10/16/25 \text{ m}^3$, with threaded
end connection G2



Fig. 5. Water meter QALCASONIC W1,
 $Q_3 = 16/25/40 \text{ m}^3$, with flanges DN50

1.2 Sensor

Ultrasonic flow sensor.

1.3 Measurement value processing

The flow measurement principle is based on the measurement of ultrasonic signal propagation time on the downstream and upstream of water flow. The difference between the measuring times is proportional to the water flow through the meter, which is calculated by the meter calculator.

1.4 Indication of the measurement results

Measured volume of water is indicated on the two-line LCD indicating device.

Upper line: 9 columns, intended for volume of water, passing through the meter.

Indications in operating mode: m^3 , three digits after decimal point.

Indications in TEST mode : m^3 , six digits after decimal point.

Lower line: 5 columns for displaying current flow in m^3/h and information symbols.

1.5 Optional equipment and functions subject to MID requirements

None.

1.6 Technical documentation

Ultrasonic water meter QALCOSONIC W1. Technical description, installation manual and user guide: PE_QW1_V14_EN, 01-2023.

Assembly drawing N10.0001.00.00-01, 07-12-2021.

Assembly drawing N10.0013.00.00-01, 24-08-2018.

Assembly drawing N14.0010.00.00-00, 01-10-2020.

Assembly drawing N10.0033.00.00-00, 01-10-2020.

Assembly drawing N14.013.00.00 W1 DN40 L300, 11-12-2020.

Assembly drawing N10.0052.100.00-00, 15-10-2021.

Assembly drawing N10.0052.100.00-00, 15-10-2021.

Assembly drawing N10.0043.00.00-00, 10-12-2020.

Other reference documents on which basis this certificate is issued, are stored in a file No. LEI-12-MP-001.23.

1.7 Integrated equipment and functions not subject to MID

NFC (near-field communication) interface is integrated in the meter, intended for data reading. The optical interface according to requirements of EN 62056-21 is integrated in the meter, intended for data reading via M-Bus protocol, for meter parameters setting and for optical pulses output.

The meter is equipped with one of the following wireless communication interfaces:

- RF 868 MHz;
- RF 433 MHz;
- RF 915 MHz;
- RF 920,5 MHz;
- NB-IoT, frequency bands B1, B3, B5, B8, B20, B28.

Data via RF communication interfaces may be transmitted using the following protocols:

- W-M-Bus-T1;
- W-M-Bus-T2;
- W-M-Bus-S1;
- W-M-Bus-C1;
- SIGFOX;
- LORA WAN;
- CoAP.

The meter can be equipped (optional, only for meters with threaded end connection G2 and flanges DN50) with one or both of the following additional wired communication interfaces (cable length 1,5 m):

- M-Bus;
- wired pulse output.

2 Technical data

2.1 Rated operating conditions

2.1.1 Measurand

The volume of water passing through the meter, indicated on the LCD indicator.

2.1.2 Measurement range

The measurement range of the water meter QALCOSONIC W1 and other technical characteristics are presented in table 1:

Table 1

Flowrate, m ³ /h				The ratio $R, Q_3/Q_1$	End connections	Overall length L, mm	Pressure loss class: without filter/ with filter strainer
Q_3	Q_4	Q_1	Q_2				
1,6	2,0	0,020	0,032	80	G ¾	80 ¹ ; 105; 110; 115 ¹ ; 165;170	For forward and reverse flow: $\Delta p 16/ \Delta p 16$
1,6	2,0	0,010	0,016	160	G ¾		
1,6	2,0	0,0064	0,010	250	G ¾		
1,6	2,0	0,005	0,008	315	G ¾		
1,6	2,0	0,004	0,0064	400	G ¾		
2,5	3,125	0,031	0,050	80	G ¾	80 ¹ ; 105; 110; 115 ¹ ; 165;170	For forward flow: $\Delta p 25/ \Delta p 25$ For reverse flow: $\Delta p 25/ \Delta p 40$
2,5	3,125	0,0156	0,025	160	G ¾		
2,5	3,125	0,010	0,016	250	G ¾		
2,5	3,125	0,0062	0,010	400	G ¾		
2,5	3,125	0,005	0,008	500	G ¾		
2,5	3,125	0,0031	0,005	800	G ¾	105; 110; 130;165; 190	For forward and reverse flow: $\Delta p 16/ \Delta p 16$
2,5	3,125	0,031	0,050	80	G 1		
2,5	3,125	0,0156	0,025	160	G 1		
2,5	3,125	0,010	0,016	250	G 1		
2,5	3,125	0,0062	0,010	400	G 1		
4,0	5,0	0,050	0,080	80	G 1	105; 110; 130; 165; 190	For forward flow: $\Delta p 25/ \Delta p 40^2$ For reverse flow: $\Delta p 25/ \Delta p 40$
4,0	5,0	0,025	0,040	160	G 1		
4,0	5,0	0,016	0,026	250	G 1		
4,0	5,0	0,010	0,016	400	G 1		
4,0	5,0	0,008	0,0128	500	G 1		
4,0	5,0	0,005	0,008	800	G 1	260	For forward and reverse flow: $\Delta p 25/ \Delta p 40$
6,3	7,875	0,079	0,126	80	G 1¼		
6,3	7,875	0,040	0,063	160	G 1¼		
6,3	7,875	0,0252	0,040	250	G 1¼		
6,3	7,875	0,016	0,0252	400	G 1¼		
6,3	7,875	0,0126	0,0202	500	G 1¼	260	For forward and reverse flow: $\Delta p 16/ \Delta p 16$
6,3	7,875	0,008	0,013	800 ³	G 1¼		
6,3	7,875	0,079	0,126	80	G 1½		
6,3	7,875	0,040	0,063	160	G 1½		
6,3	7,875	0,0252	0,040	250	G 1½		
6,3	7,875	0,016	0,0252	400	G 1½	260	For forward flow: $\Delta p 63/ \Delta p 63$ For reverse flow: $\Delta p 63/ -^4$
10,0	12,5	0,125	0,200	80	G 1¼		
10,0	12,5	0,0625	0,100	160	G 1¼		
10,0	12,5	0,040	0,064	250	G 1¼		
10,0	12,5	0,025	0,040	400	G 1¼		
10,0	12,5	0,020	0,032	500	G 1¼	260	For forward and reverse flow: $\Delta p 25/ \Delta p 25$
10,0	12,5	0,0125	0,020	800 ³	G 1¼		
10,0	12,5	0,010	0,016	1000 ³	G 1¼		
10,0	12,5	0,125	0,200	80	G 1½		
10,0	12,5	0,0625	0,100	160	G 1½		
10,0	12,5	0,025	0,040	400	G 1½	260	For forward and reverse flow: $\Delta p 25/ \Delta p 25$
10,0	12,5	0,020	0,032	500	G 1½		
10,0	12,5	0,0125	0,020	800 ³	G 1½		



Flowrate, m ³ /h				The ratio $R, Q_3/Q_1$	End connections	Overall length L, mm	Pressure loss class: without filter/ with filter strainer
Q_3	Q_4	Q_1	Q_2				
10,0	12,5	0,125	0,200	80	G 2	300	For forward and reverse flow: $\Delta p 16/ \Delta p 16$
10,0	12,5	0,0625	0,100	160	G 2		
10,0	12,5	0,040	0,064	250	G 2		
16,0	20,0	0,200	0,320	80	G 2	300	For forward and reverse flow: $\Delta p 16/ \Delta p 16$
16,0	20,0	0,100	0,160	160	G 2		
16,0	20,0	0,064	0,102	250	G 2		
16,0	20,0	0,040	0,064	400	G 2		
16,0	20,0	0,032	0,0512	500	G 2		
16,0	20,0	0,020	0,032	800 ³	G2		
25,0	31,25	0,3125	0,500	80	G 2	300	For forward and reverse flow: $\Delta p 16/ \Delta p 16$
25,0	31,25	0,156	0,250	160	G 2		
25,0	31,25	0,100	0,160	250	G 2		
25,0	31,25	0,0625	0,100	400	G 2		
25,0	31,25	0,050	0,080	500	G 2		
25,0	31,25	0,0312	0,050	800 ³	G 2		
16,0	20,0	0,200	0,320	80	DN50	200	For forward and reverse flow: $\Delta p 16/ \Delta p 16$
16,0	20,0	0,100	0,160	160	DN50		
16,0	20,0	0,064	0,102	250	DN50		
16,0	20,0	0,040	0,064	400 ³	DN50		
25,0	31,25	0,3125	0,500	80	DN50	200	For forward flow: $\Delta p 16/ \Delta p 16$ For reverse flow: $\Delta p 16/ -^4$
25,0	31,25	0,156	0,250	160	DN50		
25,0	31,25	0,100	0,160	250	DN50		
25,0	31,25	0,0625	0,100	400	DN50		
25,0	31,25	0,050	0,080	500	DN50		
25,0	31,25	0,0312	0,050	800 ³	DN50		
40,0	50,0	0,500	0,800	80	DN50	200	For forward flow: $\Delta p 16/ \Delta p 16$ For reverse flow: $\Delta p 16/ -^4$
40,0	50,0	0,250	0,400	160	DN50		
40,0	50,0	0,160	0,256	250	DN50		
40,0	50,0	0,100	0,160	400	DN50		
40,0	50,0	0,080	0,128	500	DN50		
40,0	50,0	0,050	0,080	800 ³	DN50		

Notes:

¹ – meters with a length $l = 80 \text{ mm}$ and $l = 115 \text{ mm}$ are produced only in the initial design version.

² – for meters $Q_3 = 4 \text{ m}^3/\text{h}$, threaded end connection G 1, $l = 190 \text{ mm}$, when installed the filter strainer, the pressure loss class $\Delta p 40$ is valid. For all other lengths of meters $Q_3 = 4 \text{ m}^3/\text{h}$ with filter, the pressure loss class $\Delta p 25$ applies.

³ – this ratio is only valid for meters with temperature class T30.

⁴ – meters with reverse flow measurement function are installed only without filter strainer.

2.1.3 Meter temperature classes and maximum permissible errors

Meter temperature classes and maximum permissible errors are presented in table 2:

Table 2

Meter temperature class	Water temperature ranges	Maximum permissible errors
T30	between 0,1 °C and 30 °C	$\pm 5 \%$ in flow range $Q_1 \leq Q < Q_2$ $\pm 2 \%$ in flow range $Q_2 \leq Q \leq Q_4$

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Meter temperature class	Water temperature ranges	Maximum permissible errors
T50	between 0,1 °C and 50 °C	$\pm 5 \%$ in flow range $Q_1 \leq Q < Q_2$ $\pm 2 \%$ in flow range $Q_2 \leq Q \leq Q_4$ (for water temperature between 0,1 °C and 30 °C) $\pm 3 \%$ in flow range $Q_2 \leq Q \leq Q_4$ (for water temperature between 30 °C and 50 °C)
T30/90	between 30 °C and 90 °C	$\pm 5 \%$ in flow range $Q_1 \leq Q < Q_2$ $\pm 3 \%$ in flow range $Q_2 \leq Q \leq Q_4$
T90	between 0,1 °C and 90 °C	$\pm 5 \%$ in flow range $Q_1 \leq Q < Q_2$ $\pm 2 \%$ in flow range $Q_2 \leq Q \leq Q_4$ (for water temperature between 0,1 °C and 30 °C) $\pm 3 \%$ in flow range $Q_2 \leq Q \leq Q_4$ (for water temperature between 30 °C and 90 °C)

2.1.4 Environmental conditions / Influence quantities

Ambient working temperature	:	-15 °C to 70 °C;
Humidity level	:	condensing;
Installations	:	indoor or outdoor;
Electromagnetic environment	:	class E2;
Degree of protection	:	IP68.

2.2 Other operating conditions

2.2.1 Maximum admissible working pressure

The maximum admissible working pressure of water meter is 1,6 MPa (MAP 16).

2.2.2 Mounting position of the water meter

Water meter can be mounted either horizontally, vertically or inclined.

3 Interfaces and compatibility conditions

The communication interfaces of the meter are described in section 1.7 of this appendix.

4 Requirements on production, putting into use and utilization

4.1 Requirements for production

At the end of the manufacturing and adjustment process the water meters shall be tested according to the requirements of the EN ISO 4064-2, section 10.1. Errors of water meters shall not exceed the maximum permissible errors, described in Annex III (MI-001) of the Directive 2014/32/EU.

The meters shall be tested within each of the following flowrates:

between Q_1 and $1,1Q_1$;

between Q_2 and $1,1Q_2$;

between $0,9Q_3$ and Q_3 .

For meters class T30 and T50: water temperature of tests $20 \text{ °C} \pm 10 \text{ °C}$.

For meters class T30/90: water temperature of tests is $50 \text{ °C} \pm 10 \text{ °C}$.

For meters class T90: water temperature of tests $20 \text{ °C} \pm 10 \text{ °C}$ and $50 \text{ °C} \pm 10 \text{ °C}$.

4.2 Requirements for putting into use

The water meter QALCOSONIC W1 must be installed in accordance with the requirements of technical description specified in section 1.6.

The straight pipelines in upstream and downstream the meter is not necessary (flow profile sensitivity class U0 D0).

4.3 Requirements for consistent utilization

No special requirements identified.

5 Checking of instruments which are in operation

5.1 Documented procedure

None.

5.2 Special equipment or software

- optical reading head according to standard LST EN 62056-21, with special holder;
- service software **W1 TOOL**.

5.3 Identification of hardware and software

Identification of hardware:

- see Fig.1– Fig. 5 of this appendix.

Identification of software. The software version number is:

- **1.03** for meters with threaded end connection G $\frac{3}{4}$, G 1, G 1 $\frac{1}{4}$, G 1 $\frac{1}{2}$ (when the Renesas RF10WMGAFB microprocessor is used);
- **3.01** for meters with threaded end connection G $\frac{3}{4}$, G 1, G 1 $\frac{1}{4}$, G 1 $\frac{1}{2}$ (when the Nuvoton M258KE3AE microprocessor is used);
- **2.02** for meters with threaded end connection G 2 and flanges DN50 (in all cases, the Renesas RF10WMGAFB microprocessor is used).

The version number is marked on the label of the device (SW:1.03, SW:3.01 or SW:2.02).

5.4 Calibration/adjustment procedure

Using an optical head and computer with **W1 TOOL** software the meter verification mode (TEST) is activated. Optical head should be connected to the computer USB interface.

After placing the optical head on the meter with the special holder and opening the program startup window, computer port number (to which optical head is connected) is entered in the field „**Com Port**“.

Click „**Wake Up Meter**“ button, then click the „**Enter Test Mode**“ button. When the meter TEST mode is activated, meter readings are displayed with a resolution of 1 ml.

The meter's measurement errors shall be evaluated at the reference flow rates indicated in section 4.1 of this appendix. Optical pulse output of the meter is used or volume indications can be read directly from meter's LCD.

The volume pulse value in TEST mode is presented in table 3.

Table 3

Permanent flowrate Q_3 of the meter, m ³ /h	Volume pulse value in verification mode (TEST), litre/pulse
1,6	0,001
2,5	0,002

Permanent flowrate Q_3 of the meter, m ³ /h	Volume pulse value in verification mode (TEST), litre/pulse
4	0,004
6,3	0,005
10	0,010
16	0,015
25	0,020
40	0,025

Using an optical head and computer with **W1 TOOL** software the meter is returned to the operating mode. After opening the program startup window, click the „**Wake Up Meter**“ button, then click the „**Enter User Mode**“ button, the meter returns to the operating mode.

The meter returns to its operating mode itself, 24 hours after activation of the TEST mode.

6 Security measures

6.1 Sealing

The meter casing is imperceptibly closed. Any unauthorized opening of the housing is impossible without damaging. When the upper cover is opened, the safety button that is installed in the meter body is activated and the error code appears on the meter display, with the first digit „4“.

Holes in the meter body are provided for sealing the meter with threaded end connection after installation (Fig. 6 a and b).

For meter with flanges DN50, the mounting screws are sealed after installation (Fig. 6 c).

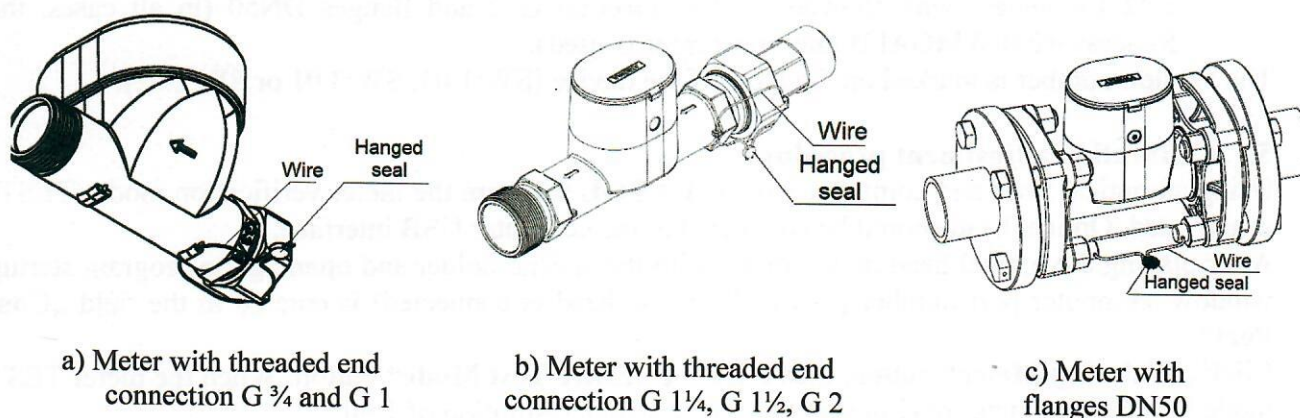


Fig. 6. Sealing of the water meter QALCASONIC W1 after installation

7 Marking and inscriptions

7.1 Information to be borne by and to accompany the measuring instrument

The water meter housing cover contains the following information:

- EU-type examination certificate number;
- trade mark of the manufacturer;
- distributor's logo (if applicable);
- type designation of the meter;
- year of manufacture and serial number;

- unit of measurement: m³ (on LCD display);
- permanent flowrate Q_3 ;
- the ratio Q_3/Q_1 , preceded by „R“;
- the temperature class, where it differs from T30;
- the maximum admissible working pressure (MAP);
- pressure loss class;
- the installation sensitivity class of the meter;
- the latest date by which the meter shall be replaced;
- software version number;
- IP code;
- QR code or barcode;
- communication interface NB-IoT (if installed on the meter).

Arrow to indicate the direction of the flow shall appear on flow sensor body.

7.2 Conformity marking

In addition, the label of water meter should contain the following marking:

- „CE” marking;
- supplementary metrology marking, consisting of the capital letter „M” and the last two digits of the year of its affixing, surrounded by a rectangle;
- the number of the notified body that carried out the conformity assessment.

8 List of the drawings attached to the certificate

Assembly drawing N10.0001.00.00-01, 07-12-2021.
 Assembly drawing N10.0013.00.00-01, 24-08-2018.
 Assembly drawing N14.0010.00.00-00, 01-10-2020.
 Assembly drawing N10.0033.00.00-00, 01-10-2020.
 Assembly drawing N14.013.00.00 W1 DN40 L300, 11-12-2020.
 Assembly drawing N10.0052.100.00-00, 15-10-2021.
 Assembly drawing N10.0055.100.00-00, 15-10-2021.
 Assembly drawing N10.0043.00.00-00, 11-12-2020.

9 Certificate history

Issue	Date and reference No.	Description
1	2	3
LT-1621-MI001-034	31-08-2018, No. LEI-12-MP-076.18	Type examination certificate first issued.
LT-1621-MI001-034 Revision 1	30-07-2019, No. LEI-12-MP-088.19	1. The meter has been supplemented with water temperature class T50. 2. The design of the meter marking label has been changed (Fig. 1) 3. The document PL_QW1_V02, issued 29-08-2018, has been replaced by the document PL_QW1_V04, issued 24-07-2019.

1	2	3																																																				
LT-1621-MI001-034 Revision 2	09-12-2019, No. LEI-12-MP-092.19	1. The meter has been supplemented by new modifications with extended flow measurement limits: <table><tr><th colspan="4">Flowrate, m³/h</th><th rowspan="2">R, Q₃/Q₁</th><th rowspan="2">End connections</th><th rowspan="2">Overall length L, mm</th><th rowspan="2">Pressure loss class</th></tr><tr><th>Q₃</th><th>Q₄</th><th>Q₁</th><th>Q₂</th></tr><tr><td rowspan="5">1,6</td><td rowspan="5">2,0</td><td rowspan="5">0,004</td><td rowspan="5">0,0064</td><td rowspan="5">400</td><td>G ¾</td><td>80</td><td>ΔP 25</td></tr><tr><td>G ¾</td><td>105</td><td>ΔP 25</td></tr><tr><td>G ¾</td><td>110</td><td>ΔP 25</td></tr><tr><td>G ¾</td><td>165</td><td>ΔP 25</td></tr><tr><td>G ¾</td><td>170</td><td>ΔP 25</td></tr><tr><td rowspan="5">2,5</td><td rowspan="5">3,125</td><td rowspan="5">0,0031</td><td rowspan="5">0,005</td><td rowspan="5">800</td><td>G ¾</td><td>80</td><td>ΔP 40</td></tr><tr><td>G ¾</td><td>105</td><td>ΔP 40</td></tr><tr><td>G ¾</td><td>110</td><td>ΔP 40</td></tr><tr><td>G ¾</td><td>165</td><td>ΔP 40</td></tr><tr><td>G ¾</td><td>170</td><td>ΔP 40</td></tr></table> 2. New meter labeling drawings with distributor's NeoVac logo. 3. The document PL_QW1_V04, issued 24-07-2019, has been replaced by the document PL_QW1_V05, issued 21-08-2019.	Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Overall length L, mm	Pressure loss class	Q ₃	Q ₄	Q ₁	Q ₂	1,6	2,0	0,004	0,0064	400	G ¾	80	ΔP 25	G ¾	105	ΔP 25	G ¾	110	ΔP 25	G ¾	165	ΔP 25	G ¾	170	ΔP 25	2,5	3,125	0,0031	0,005	800	G ¾	80	ΔP 40	G ¾	105	ΔP 40	G ¾	110	ΔP 40	G ¾	165	ΔP 40	G ¾	170	ΔP 40
Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Overall length L, mm					Pressure loss class																																											
Q ₃	Q ₄	Q ₁	Q ₂																																																			
1,6	2,0	0,004	0,0064	400	G ¾	80	ΔP 25																																															
					G ¾	105	ΔP 25																																															
					G ¾	110	ΔP 25																																															
					G ¾	165	ΔP 25																																															
					G ¾	170	ΔP 25																																															
2,5	3,125	0,0031	0,005	800	G ¾	80	ΔP 40																																															
					G ¾	105	ΔP 40																																															
					G ¾	110	ΔP 40																																															
					G ¾	165	ΔP 40																																															
					G ¾	170	ΔP 40																																															
LT-1621-MI001-034 Revision 3	31-01-2020, No. LEI-12-MP-098.20	1. The meter may additionally equipped with the following wireless communication interfaces: - RF 920,5 MHz; - NB-IoT, frequency bands B1, B3, B5, B8, B20, B28. 2. The document PL_QW1_V05, issued 21-08-2019, has been replaced by the document PL_QW1_V06, issued 09-01-2020.																																																				
LT-1621-MI001-034 Revision 4	25-08-2020, No. LEI-12-MP-106.20	1. The meter has been supplemented by modifications with additional values of the ratio $R(Q_3/Q_1) = 80$ and $R(Q_3/Q_1) = 160$. 2. For meters with end connections G ¾ and permanent flowrate $Q_3 = 1,6$ m³/h, pressure-loss class has been changed from Δp 25 to Δp 16. 3. For meters with end connections G ¾ and permanent flowrate $Q_3 = 2,5$ m³/h, pressure-loss class has been changed from Δp 40 to Δp 25. 4. Meter marking labels with the logos of new distrubutors (Fig.1p). 5. The document PL_QW1_V06, issued 09-01-2020, has been replaced by the document PL_QW1_V08, issued 22-07-2020.																																																				
LT-1621-MI001-034 Revision 5	25-08-2020, No. LEI-12-MP-106.20	1. The meter has been supplemented with the following new modifications: <table><tr><th colspan="4">Flowrate, m³/h</th><th rowspan="2">R, Q₃/Q₁</th><th rowspan="2">End connections</th><th rowspan="2">Overall length L, mm</th><th rowspan="2">Pressure loss class</th></tr><tr><th>Q₃</th><th>Q₄</th><th>Q₁</th><th>Q₂</th></tr><tr><td>6,3</td><td>7,875</td><td>0,079</td><td>0,126</td><td>80</td><td>G 1¼</td><td>260</td><td>Δp 25</td></tr><tr><td>6,3</td><td>7,875</td><td>0,040</td><td>0,063</td><td>160</td><td>G 1¼</td><td>260</td><td>Δp 25</td></tr><tr><td>6,3</td><td>7,875</td><td>0,0252</td><td>0,040</td><td>250</td><td>G 1¼</td><td>260</td><td>Δp 25</td></tr><tr><td>6,3</td><td>7,875</td><td>0,016</td><td>0,0252</td><td>400</td><td>G 1¼</td><td>260</td><td>Δp 25</td></tr></table>	Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Overall length L, mm	Pressure loss class	Q ₃	Q ₄	Q ₁	Q ₂	6,3	7,875	0,079	0,126	80	G 1¼	260	Δp 25	6,3	7,875	0,040	0,063	160	G 1¼	260	Δp 25	6,3	7,875	0,0252	0,040	250	G 1¼	260	Δp 25	6,3	7,875	0,016	0,0252	400	G 1¼	260	Δp 25								
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LT-1621-MI001-034 Revision 6	21-01-2021, No. LEI-12-MP-111.21	1. The meter has been supplemented with the following new modifications with threaded end connection G2: <table><tr><th colspan="4">Flowrate, m³/h</th><th rowspan="2">R, Q₃/Q₁</th><th rowspan="2">End connections</th><th rowspan="2">Overall length L, mm</th><th rowspan="2">Pressure loss class</th></tr><tr><th>Q₃</th><th>Q₄</th><th>Q₁</th><th>Q₂</th></tr><tr><td>10,0</td><td>12,5</td><td>0,125</td><td>0,200</td><td>80</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>10,0</td><td>12,5</td><td>0,0625</td><td>0,100</td><td>160</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>10,0</td><td>12,5</td><td>0,040</td><td>0,064</td><td>250</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>16,0</td><td>20,0</td><td>0,200</td><td>0,320</td><td>80</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>16,0</td><td>20,0</td><td>0,100</td><td>0,160</td><td>160</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>16,0</td><td>20,0</td><td>0,064</td><td>0,102</td><td>250</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>16,0</td><td>20,0</td><td>0,040</td><td>0,064</td><td>400</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>25,0</td><td>31,25</td><td>0,3125</td><td>0,500</td><td>80</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>25,0</td><td>31,25</td><td>0,156</td><td>0,250</td><td>160</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>25,0</td><td>31,25</td><td>0,100</td><td>0,160</td><td>250</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>25,0</td><td>31,25</td><td>0,0625</td><td>0,100</td><td>400</td><td>G 2</td><td>300</td><td>Δp 16</td></tr><tr><td>25,0</td><td>31,25</td><td>0,0312</td><td>0,050</td><td>800*</td><td>G 2</td><td>300</td><td>Δp 16</td></tr></table> Note: * – this ratio is only valid for meters with temperature class T30.	Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Overall length L, mm	Pressure loss class	Q ₃	Q ₄	Q ₁	Q ₂	10,0	12,5	0,125	0,200	80	G 2	300	Δp 16	10,0	12,5	0,0625	0,100	160	G 2	300	Δp 16	10,0	12,5	0,040	0,064	250	G 2	300	Δp 16	16,0	20,0	0,200	0,320	80	G 2	300	Δp 16	16,0	20,0	0,100	0,160	160	G 2	300	Δp 16	16,0	20,0	0,064	0,102	250	G 2	300	Δp 16	16,0	20,0	0,040	0,064	400	G 2	300	Δp 16	25,0	31,25	0,3125	0,500	80	G 2	300	Δp 16	25,0	31,25	0,156	0,250	160	G 2	300	Δp 16	25,0	31,25	0,100	0,160	250	G 2	300	Δp 16	25,0	31,25	0,0625	0,100	400	G 2	300	Δp 16	25,0	31,25	0,0312	0,050	800*	G 2	300	Δp 16																								
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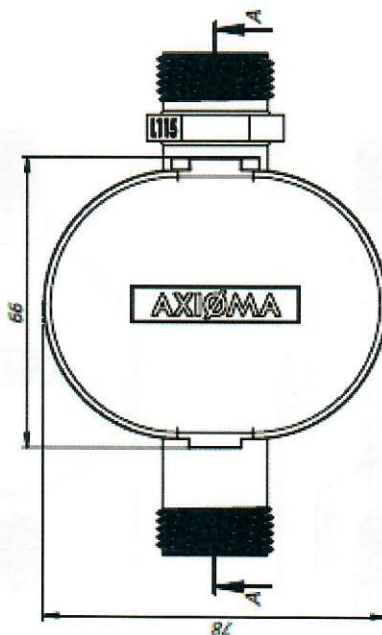
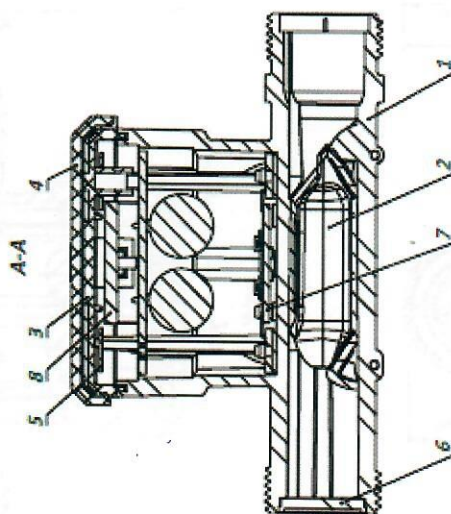
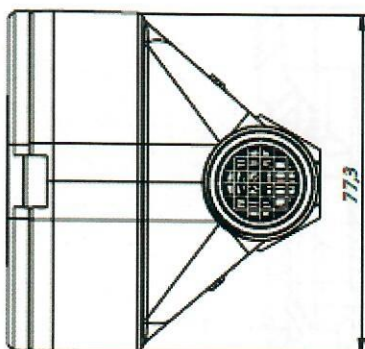
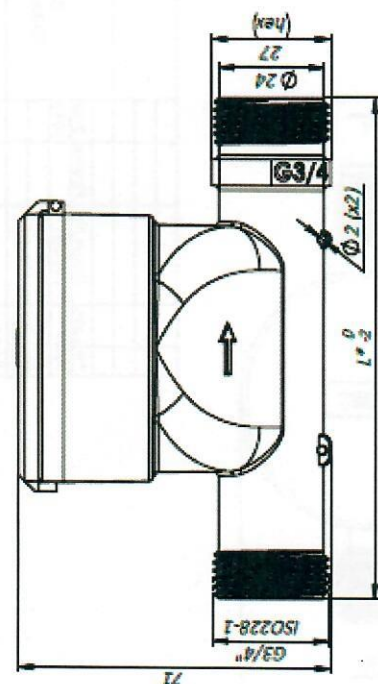
1	2	3																				
		2. Additional data transmission protocol CoAP for meter communication interfaces. 3. Additional software version for meters with threaded end connection G2. The version number is 1.02. 4. Additional technical description for meters with threaded end connection G2: PL_QW1DN40_V01, issued 20-01-2021.																				
LT-1621-MI001-034 Revision 7	25-05-2021, No. LEI-12-MP-114.21	1. Meter marking labels with the logos of new distributors (Fig. 1p). 2. New technical description for meters of all sizes: TM_QW1_V01_LT, issued 05-05-2021.																				
LT-1621-MI001-034 Revision 8	14-06-2021, No. LEI-12-MP-115.21	1. Additional data transmission protocol W-M-Bus-T2 for meter RF communication interfaces. 2. New software version for meters with threaded end connection G $\frac{3}{4}$, G 1, G $1\frac{1}{4}$, G $1\frac{1}{2}$. The version number is 1.03. 3. The document TM_QW1_V01_LT, issued 05-05-2021, has been replaced by the document TM_QW1_V02_LT, issued 07-06-2021.																				
LT-1621-MI001-034 Revision 9	28-10-2021, No. LEI-12-MP-119.21	1. Additional design version for meters with threaded end connection G $\frac{3}{4}$ and G 1 (design version „n“). 2. Possibility of filter strainer installation in the meter inlet. Information on pressure loss classes for meters with filter. 3. Possibility of non-return valve instalation in the meter outlet. 4. Additional wired communication interfaces: M-Bus and/or wired pulse output (optional). 5. Meter marking labels with the logos of new distributors (Fig. 1p). 6. The document TM_QW1_V02_LT, issued 07-06-2021, has been replaced by the document TM_QW1_V03_LT, issued 18-10-2021.																				
LT-1621-MI001-034 Revision 10	10-12-2021, No. LEI-12-MP-116.21	1. The meter has been supplemented with the following new modifications with flanges end connection DN50: <table><tr><th colspan="4">Flowrate, m³/h</th><th rowspan="2">R, Q₃/Q₁</th><th rowspan="2">End connections</th><th rowspan="2">Length L, mm</th><th rowspan="2">Pressure loss class: without filter/ with filter strainer</th></tr><tr><th>Q₃</th><th>Q₄</th><th>Q₁</th><th>Q₂</th></tr><tr><td>16</td><td>20,0</td><td>0,200</td><td>0,320</td><td>80</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 16</td></tr></table>	Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Length L, mm	Pressure loss class: without filter/ with filter strainer	Q ₃	Q ₄	Q ₁	Q ₂	16	20,0	0,200	0,320	80	DN50	200	Δp 16/ Δp 16
Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Length L, mm					Pressure loss class: without filter/ with filter strainer											
Q ₃	Q ₄	Q ₁	Q ₂																			
16	20,0	0,200	0,320	80	DN50	200	Δp 16/ Δp 16															

1	2	3																																																																																																																																								
		<table><tr><th colspan="4">Flowrate, m³/h</th><th rowspan="2">R, Q₃/Q₁</th><th rowspan="2">End connections</th><th rowspan="2">Length L, mm</th><th rowspan="2">Pressure loss class: without filter/ with filter strainer</th></tr><tr><th>Q₃</th><th>Q₄</th><th>Q₁</th><th>Q₂</th></tr><tr><td>16</td><td>20,0</td><td>0,100</td><td>0,160</td><td>160</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 16</td></tr><tr><td>16</td><td>20,0</td><td>0,064</td><td>0,102</td><td>250</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 16</td></tr><tr><td>16</td><td>20,0</td><td>0,040</td><td>0,064</td><td>400*</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 16</td></tr><tr><td>25</td><td>31,25</td><td>0,3125</td><td>0,500</td><td>80</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 16</td></tr><tr><td>25</td><td>31,25</td><td>0,156</td><td>0,250</td><td>160</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 16</td></tr><tr><td>25</td><td>31,25</td><td>0,100</td><td>0,160</td><td>250</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 16</td></tr><tr><td>25</td><td>31,25</td><td>0,0625</td><td>0,100</td><td>400</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 16</td></tr><tr><td>25</td><td>31,25</td><td>0,0312</td><td>0,050</td><td>800*</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 16</td></tr><tr><td>40</td><td>50,0</td><td>0,500</td><td>0,800</td><td>80</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 40</td></tr><tr><td>40</td><td>50,0</td><td>0,250</td><td>0,400</td><td>160</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 40</td></tr><tr><td>40</td><td>50,0</td><td>0,160</td><td>0,256</td><td>250</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 40</td></tr><tr><td>40</td><td>50,0</td><td>0,100</td><td>0,160</td><td>400</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 40</td></tr><tr><td>40</td><td>50,0</td><td>0,050</td><td>0,080</td><td>800*</td><td>DN50</td><td>200</td><td>Δp 16/ Δp 40</td></tr></table> 2. The meter has been supplemented with the following new modification with threaded end connection G2: <table><tr><th colspan="4">Flowrate, m³/h</th><th rowspan="2">R, Q₃/Q₁</th><th rowspan="2">End connections</th><th rowspan="2">Length L, mm</th><th rowspan="2">Pressure loss class: without filter/ with filter strainer</th></tr><tr><th>Q₃</th><th>Q₄</th><th>Q₁</th><th>Q₂</th></tr><tr><td>16</td><td>20,0</td><td>0,020</td><td>0,032</td><td>800*</td><td>G 2</td><td>300</td><td>Δp 16/ Δp 16</td></tr></table> Note: * – this ratio is only valid for meters with temperature class T30. 3. New software version 2.02 for meters with threaded end connection G 2. 4. The document TM_QW1_V03_LT, issued 18-10-2021, has been replaced by the document TM_QW1_V04_LT, issued 07-12-2021.	Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Length L, mm	Pressure loss class: without filter/ with filter strainer	Q ₃	Q ₄	Q ₁	Q ₂	16	20,0	0,100	0,160	160	DN50	200	Δp 16/ Δp 16	16	20,0	0,064	0,102	250	DN50	200	Δp 16/ Δp 16	16	20,0	0,040	0,064	400*	DN50	200	Δp 16/ Δp 16	25	31,25	0,3125	0,500	80	DN50	200	Δp 16/ Δp 16	25	31,25	0,156	0,250	160	DN50	200	Δp 16/ Δp 16	25	31,25	0,100	0,160	250	DN50	200	Δp 16/ Δp 16	25	31,25	0,0625	0,100	400	DN50	200	Δp 16/ Δp 16	25	31,25	0,0312	0,050	800*	DN50	200	Δp 16/ Δp 16	40	50,0	0,500	0,800	80	DN50	200	Δp 16/ Δp 40	40	50,0	0,250	0,400	160	DN50	200	Δp 16/ Δp 40	40	50,0	0,160	0,256	250	DN50	200	Δp 16/ Δp 40	40	50,0	0,100	0,160	400	DN50	200	Δp 16/ Δp 40	40	50,0	0,050	0,080	800*	DN50	200	Δp 16/ Δp 40	Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Length L, mm	Pressure loss class: without filter/ with filter strainer	Q ₃	Q ₄	Q ₁	Q ₂	16	20,0	0,020	0,032	800*	G 2	300	Δp 16/ Δp 16
Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Length L, mm					Pressure loss class: without filter/ with filter strainer																																																																																																																															
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LT-1621- MI001-034 Revision 11	10-03-2022, No. LEI-12- MP-123.22	1. The meter has been supplemented with this new modification of length l = 115 mm: <table><tr><th colspan="4">Flowrate, m³/h</th><th rowspan="2">R, Q₃/Q₁</th><th rowspan="2">End connections</th><th rowspan="2">Length L, mm</th><th rowspan="2">Pressure loss class: without filter/ with filter strainer</th></tr><tr><th>Q₃</th><th>Q₄</th><th>Q₁</th><th>Q₂</th></tr><tr><td>1,6</td><td>2,0</td><td>0,020</td><td>0,032</td><td>80</td><td rowspan="7">G ¾</td><td rowspan="7">115*</td><td>Δp 16/ Δp 16</td></tr><tr><td>1,6</td><td>2,0</td><td>0,010</td><td>0,016</td><td>160</td><td>Δp 16/ Δp 16</td></tr><tr><td>1,6</td><td>2,0</td><td>0,0064</td><td>0,010</td><td>250</td><td>Δp 16/ Δp 16</td></tr><tr><td>1,6</td><td>2,0</td><td>0,005</td><td>0,008</td><td>315</td><td>Δp 16/ Δp 16</td></tr><tr><td>1,6</td><td>2,0</td><td>0,004</td><td>0,0064</td><td>400</td><td>Δp 16/ Δp 16</td></tr><tr><td>2,5</td><td>3,125</td><td>0,031</td><td>0,050</td><td>80</td><td>Δp 25/ Δp 25</td></tr><tr><td>2,5</td><td>3,125</td><td>0,0156</td><td>0,025</td><td>160</td><td>Δp 25/ Δp 25</td></tr></table>	Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Length L, mm	Pressure loss class: without filter/ with filter strainer	Q ₃	Q ₄	Q ₁	Q ₂	1,6	2,0	0,020	0,032	80	G ¾	115*	Δp 16/ Δp 16	1,6	2,0	0,010	0,016	160	Δp 16/ Δp 16	1,6	2,0	0,0064	0,010	250	Δp 16/ Δp 16	1,6	2,0	0,005	0,008	315	Δp 16/ Δp 16	1,6	2,0	0,004	0,0064	400	Δp 16/ Δp 16	2,5	3,125	0,031	0,050	80	Δp 25/ Δp 25	2,5	3,125	0,0156	0,025	160	Δp 25/ Δp 25																																																																																
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Flowrate, m³/h				R, Q ₃ /Q ₁	End connections	Length L, mm					Pressure loss class: without filter/ with filter strainer																							
Q ₃	Q ₄	Q ₁	Q ₂																															
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2,5	3,125	0,0031	0,005	800			Δp 25/ Δp 25																											
LT-1621-MI001-034 Revision 12	20-09-2022, No. LEI-12-MP-128.22	1. The following types of microprocessors can be used in the meter: - 16-bit microprocessor Renesas R5F10WMGAFB (in the meters of all modifications); - 32-bit microprocessor Nuvoton M258KE3AE (in meters with threaded end connection G ¾, G 1, G 1¼, G 1½). 2. New software version 3.01 for meters equipped with a Nuvoton M258KE3AE microprocessor. 3. Meter marking labels with the logos of new distributors (Fig.1p – distributor TENNACOLA).																																
LT-1621-MI001-034 Revision 13	28-12-2022, No. LEI-12-MP-131.22	1. The meter has been supplemented with a reverse flow measurement function. 2. Meter marking labels with the logos of new distributors (Fig.1p – distributors Watercare, PAVIA ACQUE and GSA). 3. Technical description TM_QW1_V05_LT, issued 11-01-2022, has been replaced by technical description PE_QW1_V13_EN, issued 12-2022.																																
LT-1621-MI001-034 Revision 14	25-01-2023, No. LEI-12-MP-132.23	1. Meters with a permanent flow rate from Q₃ = 2,5 m³/h to Q₃ = 40 m³/h has been supplemented with a modification with a ratio Q₃/Q₁ (R) = 500. 3. Technical description TM_QW1_V13_EN, issued 12-2022, has been replaced by technical description PE_QW1_V13_EN, issued 01-2023.																																
LT-1621-MI001-034 Revision 15	28-04-2023, No. LEI-12-MP-001.23	Meter marking labels with the logos of new distributors (Fig.1p – distributors ABC, Heitland Leipzig, Heitland OOWV and AUSINO).																																

Pos.	Description	Qty.
1	Housing DN15	1
2	Insert assembly (DN15)	1
3	Top cover	1
4	Top cover lid	1
5	Antenna	1
6	Strainer D20	1
7	SMP bottom assembly	1
8	SMP top assembly	1

Configuration	L (length,mm)
DN15 L80	80
DN15 L105	105
DN15 L110	110
DN15 L115	115
DN15 L165	165
DN15 L170	170

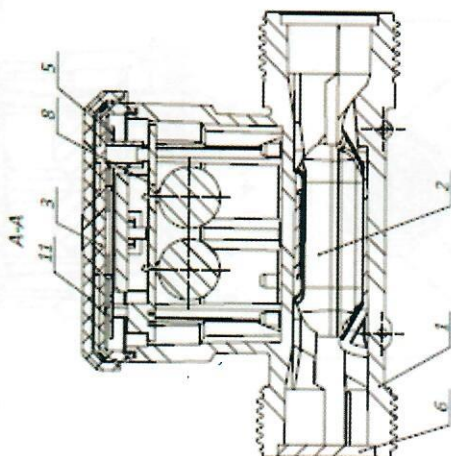
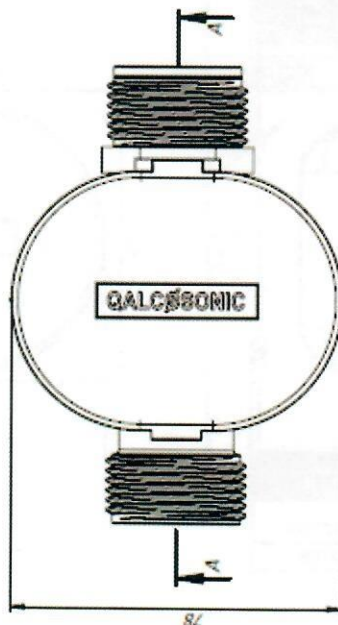
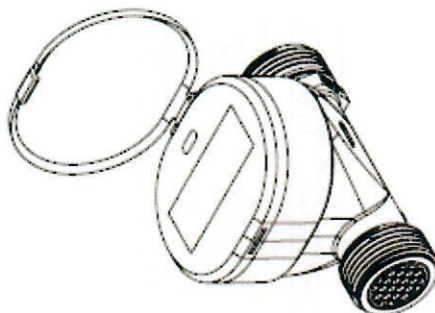
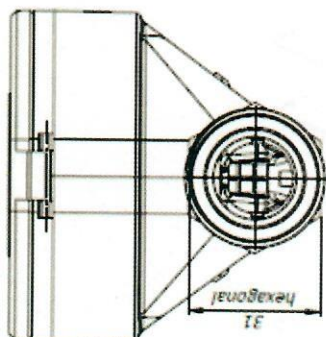
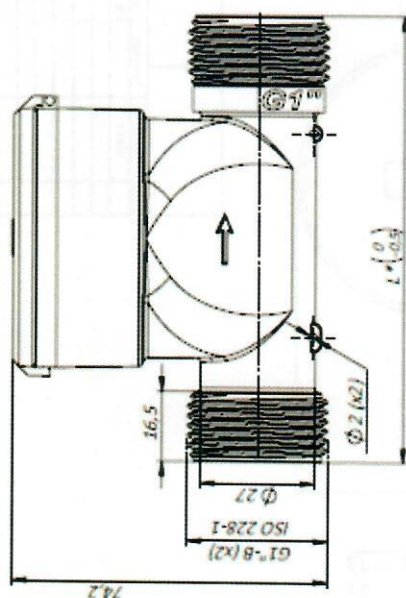


f - configurations of different lengths - see table No. 1

[illegible]

Pos	Description	Qty
1	Housing DA20	1
2	Insert DA20	1
3	Top cover	1
5	Antenna	1
6	Spring D25	1
8	SW Top Assy	1
11	Top cover Rd	1

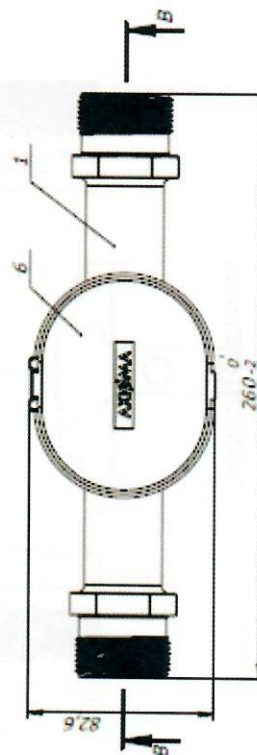
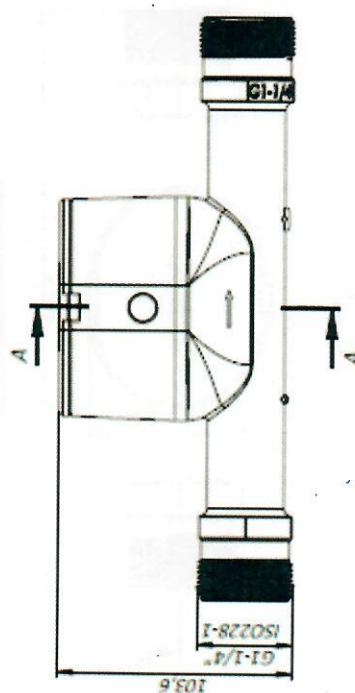
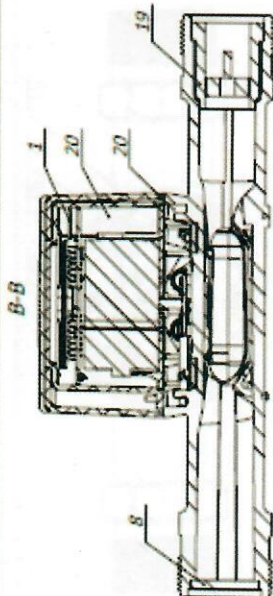
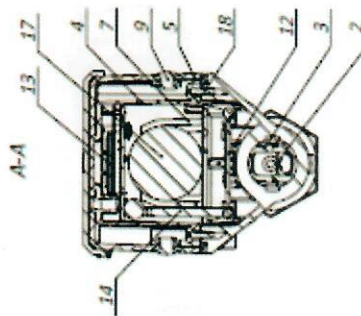
Table No. 1	CONFIGURATION	l (length), mm
	DN-70-1105	105
	DN-70-1110	110
	DN-70-1130	130
	DN-70-1165	165
	DN-70-1190	190

[illegible]

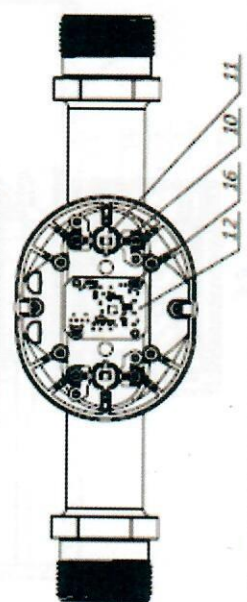
1. *. for configurations of different lengths see table No. 1



Pos.	Part No.	Description	Qty.
1	N14.001.00.01-03	Housing DN25 L260	1
2	N14.001.101.01-03	Insert DN25 bottom	1
3	N14.001.102.01-03	Insert DN25 top	1
4	N10.033.02.01-03	Inner shell	1
5	N10.033.02.02-02	Outer shell	1
6	N10.033.02.03-00	Cover lid	1
7	N10.033.02.02-00	Battery holder	1
8	N14.001.00.05-00	Strainer DN25	1
9	N14.001.00.03-05	Plastic rivet	2
10	N10.033.00.03-02	Steel metalising	2
11	N10.033.00.04-00	PCB plate 10mm	2
12	N10.001.05.00-02	SWP bottomassy.	1
13	N10.001.05.00-02	Top PCB	1
14	-	Cable	1
15	N10.033.02.07-00	Antenna	1
16	3P-39A-03000-30	Screw 3.0x7	8
17	-	D-Cell battery	1
18	3P-39A-03000-000	Screw 3.5x10 inox	2
19	W1025-W1490/25x00	Checkvalve "Watfit"	1
20	-	Poling compound	1

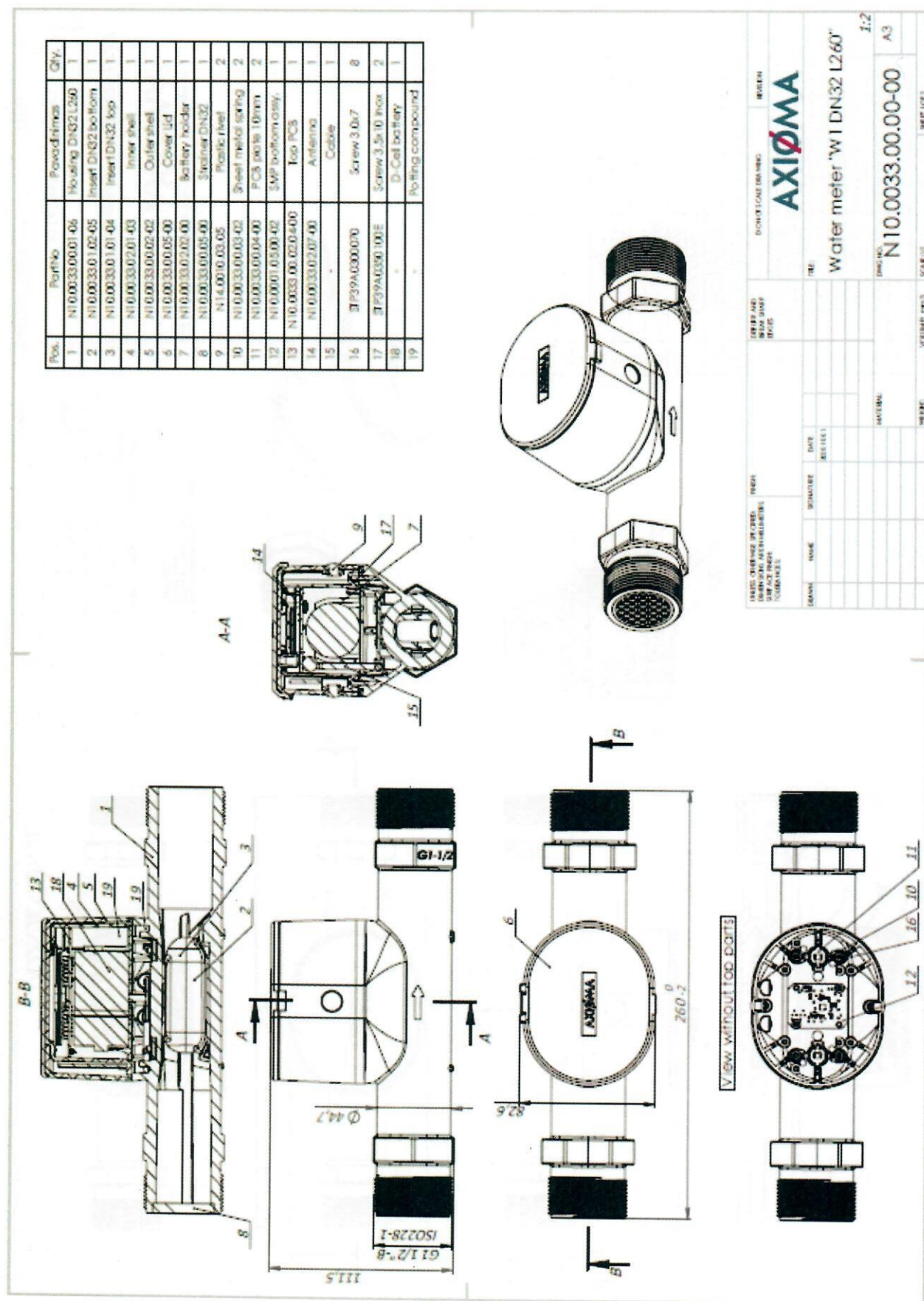


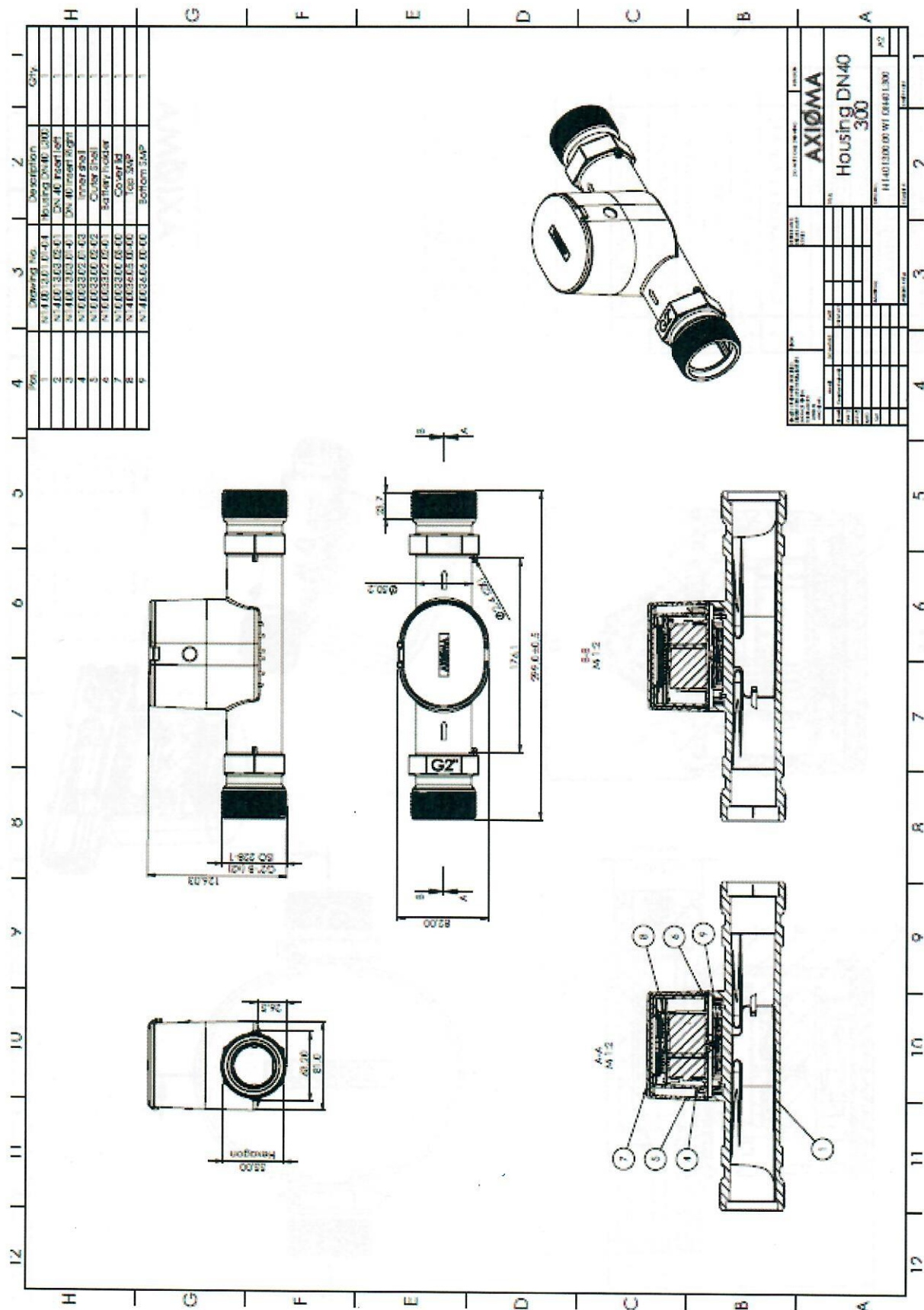
VIEW WITHOUT TOP PORTS



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DRAWN BY: []	DATE: []	SCALE: 1:2	
CHECKED BY: []	DATE: []	SCALE: 1:2	
DATE: []	SCALE: 1:2		
AXIOMA			
Water meter "W1 DN25 L260"			
N14.001.00.00-00			
A3			

[Signature]

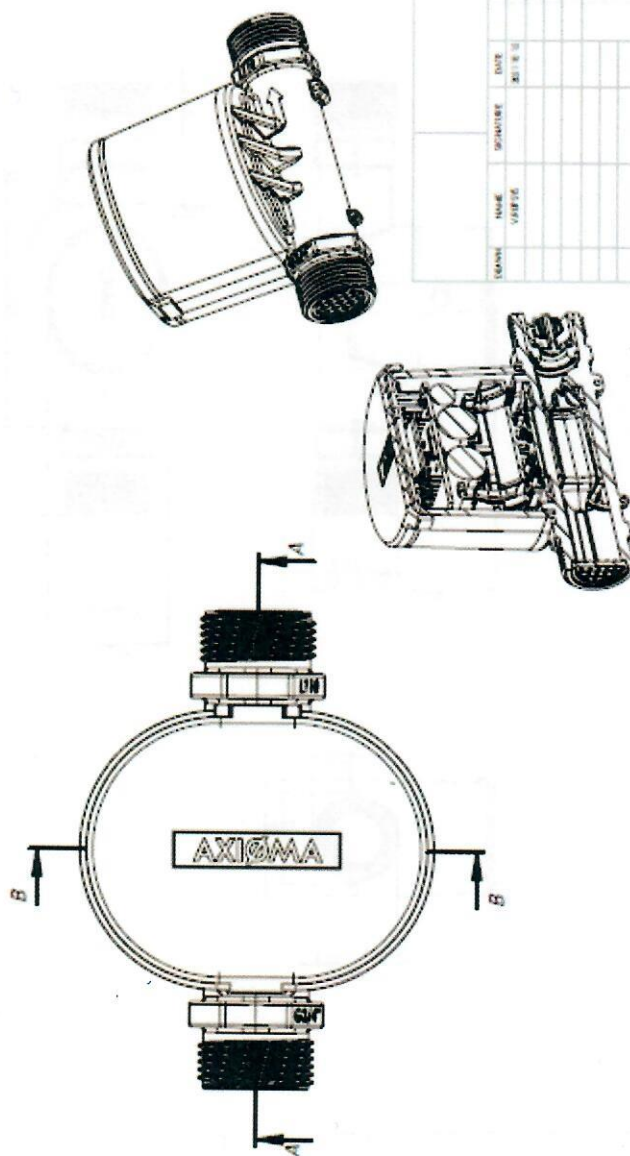
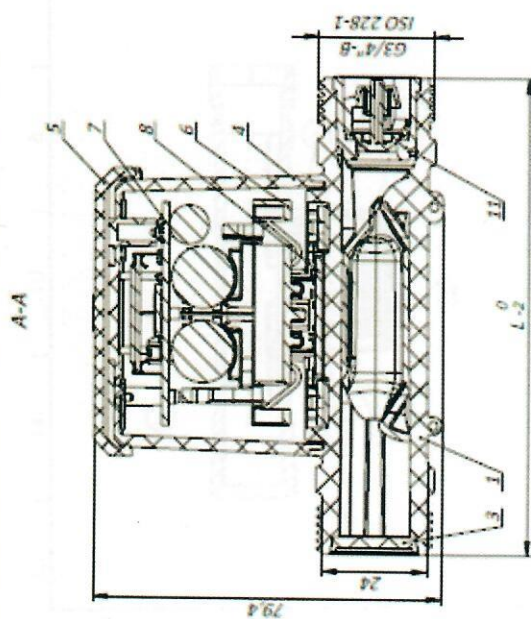
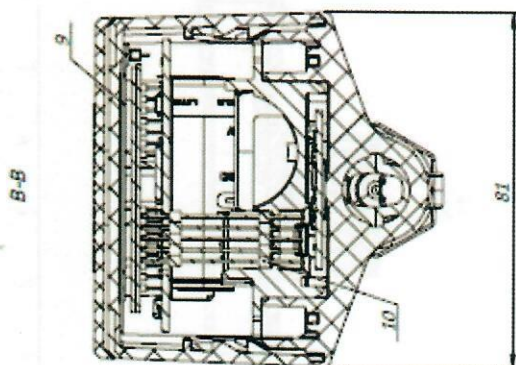


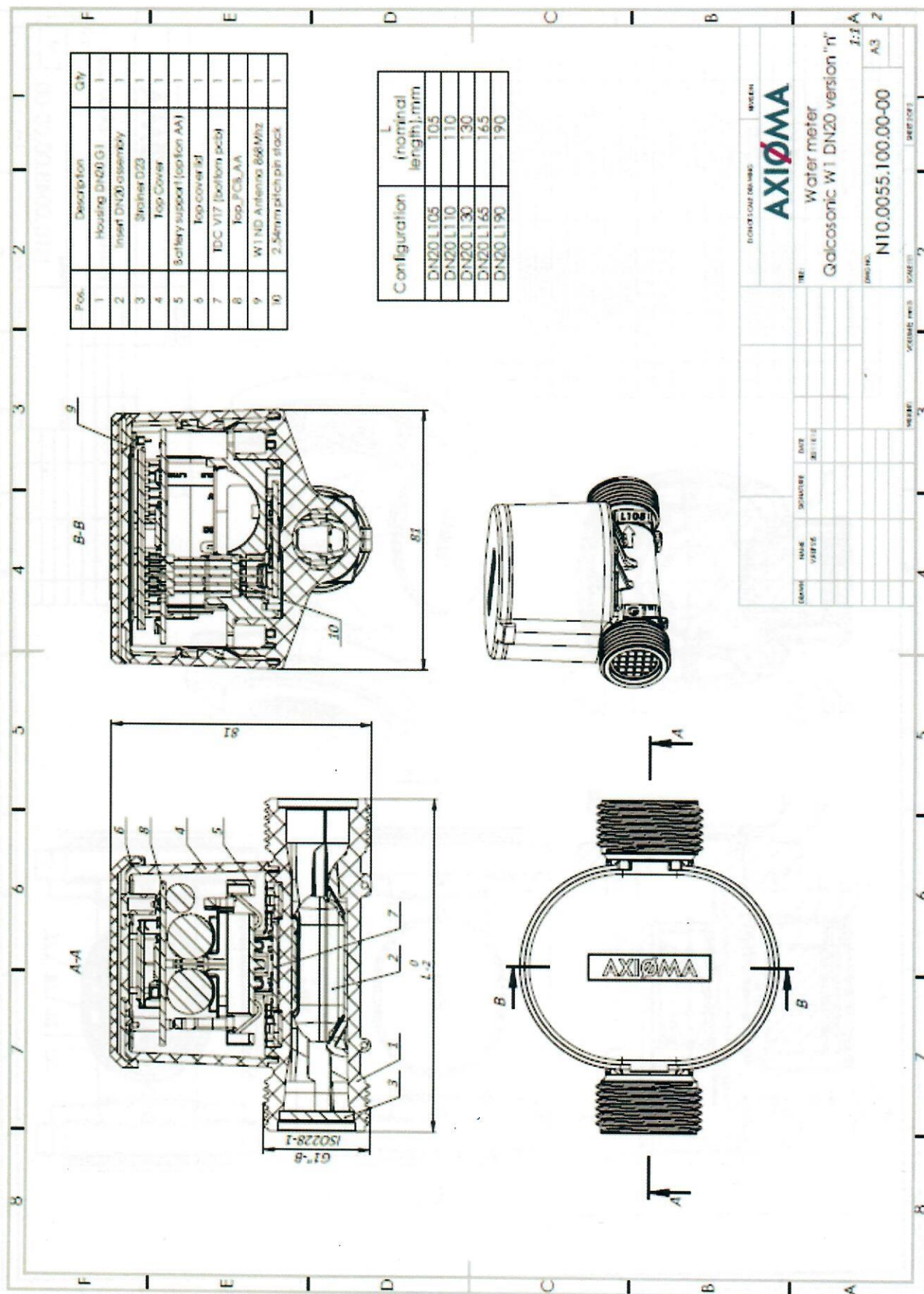


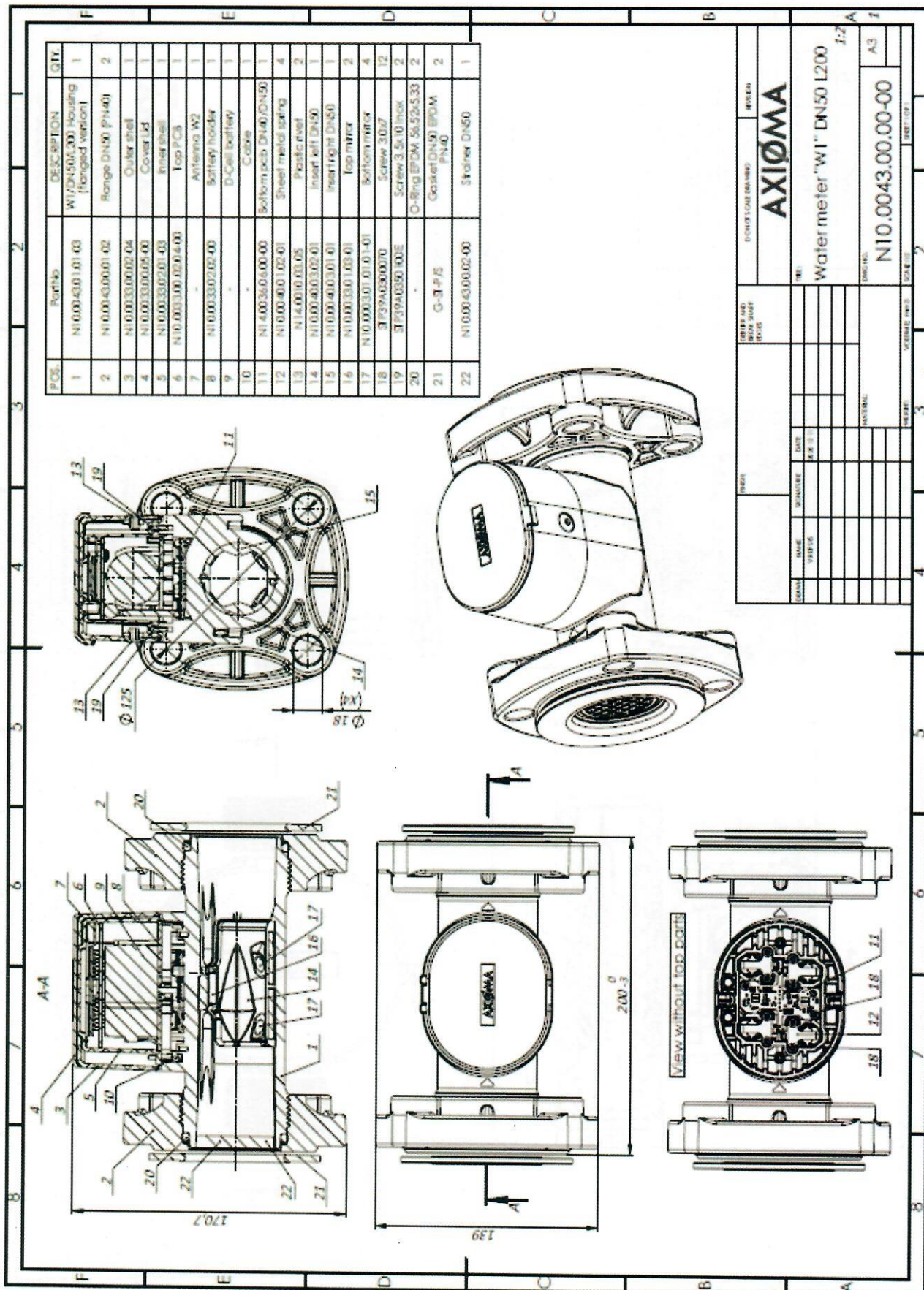
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Pos.	Description	Qty.
1	Housing DNI15 G3/4	1
2	Inlet DNI15 assembly	1
3	Strainer D20	1
4	Top Cover	1
5	Top cover lid	1
6	Battery support (option AA)	1
7	Top_PCB_AA	1
8	TDC V17 (bottom pcb)	1
9	W1 ND Antenna 565MHz	1
10	2.54mm pitch pin stack	1
11	Non return valve (WATTS_WW015-W1 4501 5600)	1

Configuration	L (nominal length), mm
DN15 L105	105
DN15 L110	110
DN15 L165	165
DN15 L170	170

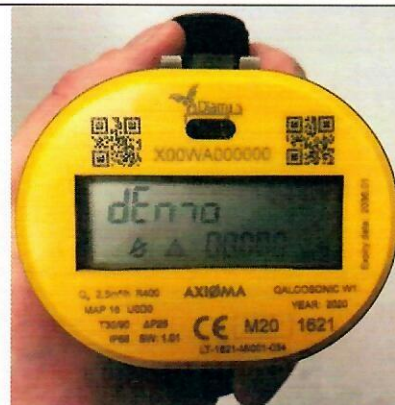
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1) Distributor Neovac label



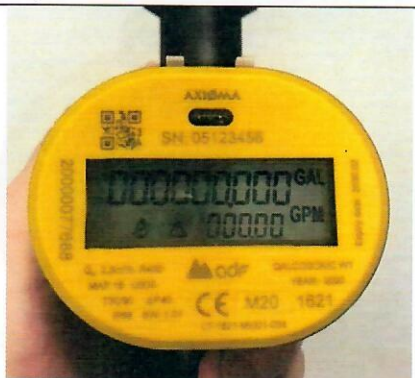
2) Distributor DIAM label



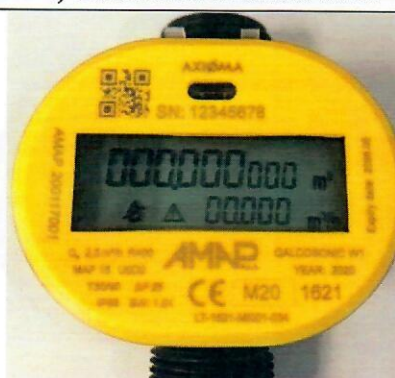
3) Distributor HT GROUP label



4) Distributor Heitland label



5) Distributor ADF label



6) Distributor AMAP label



7) Distributor OSE label



8) Distributor GSP label

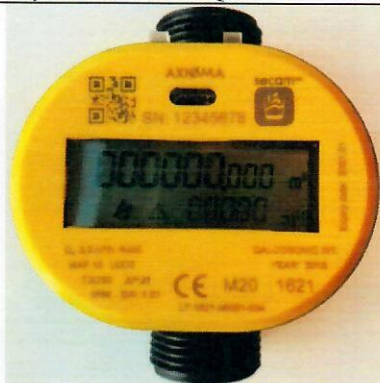
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9) Distributor EQUYSIS label



10) Distributor AQP label



11) Distributor SECAM label



12) Distributor RKG label



13) Distributor Hydro Control label



14) Distributor NSVA label

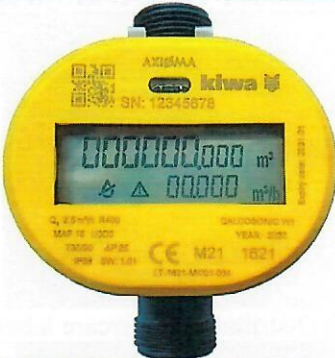
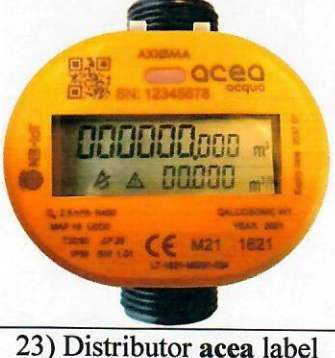
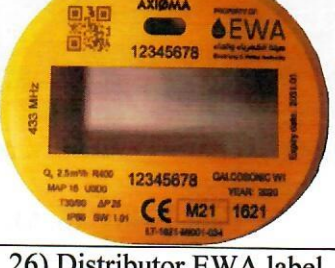


15) Distributor VASYD label



16) Distributor ASIS label

Handwritten signature

	
17) Distributor VERTO label	18) Distributor ETRA label
	
19) Distributor KIWA label	20) Distributor PUBLIACQUA label
	
21) Distributor ASA label	22) Distributor Evides label
	
23) Distributor acea label	24) Distributor APS label
	
25) Distributor AQUAS NUEVAS label	26) Distributor EWA label

Handwritten signature

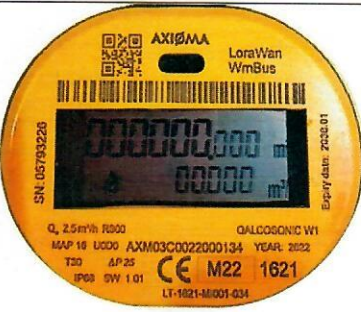
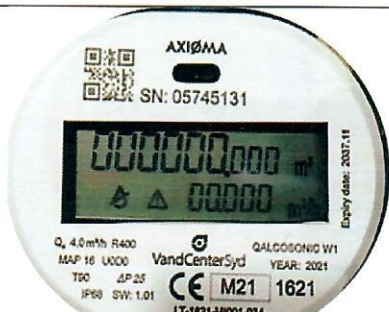
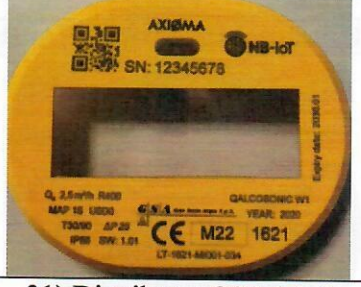
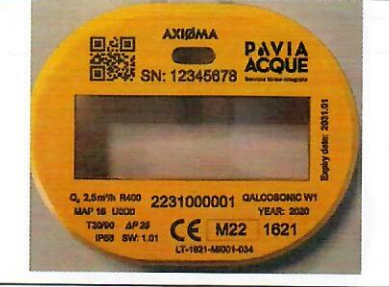
	
27) Distributor IREN label	28) Distributor VandCenterSyd label
	
29) Distributor TENNACOLA label	30) Distributor Watercare label
	
31) Distributor GSA label	32) Distributor PAVIA ACQUE label
	
33) Distributor ABC label	34) Distributor Heitland Leipzig label
	
35) Distributor Heitland OOWV label	36) Distributor AUSINO label

Fig.1p. Meter labels with distributor's logos