EU - TYPE EXAMINATION CERTIFICATE

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This revision replaces all previous versions of this Certificate in full wording

Issued by	**Slovenská legálna metrológia, n. o.** Notified Body number **1432** **Hviezdoslavova 31** **974 01 Banská Bystrica** **Slovak Republic**
In accordance with	Annex II, Module B to Government Ordinance of the Slovak Republic No 145/2016 Coll. relating to the making available on the market of measuring instruments, which implements, in Slovakia, the Directive 2014/32/EU 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 as later amended (MID).
Applicable essential requirements	Annex I and Annex III to MID
Manufacturer	**Madey Vered Ltd.** **Ha´ashlagan St. 8, P.O.B 8628, Kiryat Gat 8202195** **Israel**
Applicant	**Manufacturer**
Measuring instrument	**Water meter**
Type	**RY-xx**
Trade mark	see Descriptive Annex
Environment classes	
- climatic	(-10 to +55) °C
- mechanical	M1
- electromagnetic	E1
Description and documentation	The principal technical and metrological data, characteristics, instrument description and approval conditions are set out in the Descriptive annex to this EU - type examination certificate (57 pages), which is part of this EU - type examination certificate. The test reports, designs, schematic diagrams and documentation used during certification process are recorded under reference folder Madey Vered_RY_00 až 01.
Valid until	**28 May 2020**
Date of issue	20 February 2018

SLOVAK LEGAL METROLOGY • SLM 1432 •

Ing. Štefan Král, PhD.
Representative of Notified Body

Where the instrument is subject to other Directives covering other aspects, this EU - type examination certificate is valid, assuming that the instrument conforms to the provisions of those Directives. Without written premission of the notified body this certificate may by reproduced only as a whole.

1. Designation

The mechanical multi-jet dry dial water meters series ***RY-xx*** (*RY-A1, RY-A2, RY-B, RY-B2, RY-C1, RY-C2, RY-D, RY-D2, RY-E1, RY-G1, RY-H, RY-L, RY-M, RY-U, RY-W, RY-X, RY-Y, RY-Z, RY-AA, RY-AB)* are designed to measure, memorise and display the volume at metering conditions of water passing through the measurement transducer. They are intended for the measurement of volumes (consumption) of clean water in household and commercial use.
The mechanical water meters series *RY-xx* are multi-jet rotary vane wheel water meters with the mechanical indication device.
The mechanical water meters series *RY-xx* consist of a brass body. The water meters types *RY-A2, RY-B2, RY-C2, RY-D2* consist of a plastic body only.
The water meters series *RY-xx* shall be installed to operate into pipe lines horizontal positions with the indication device positioned at the top and *RY-AA* is installed into pipe lines in vertical installation position only.

2. Description

Essential parts of water meter:

- measuring mechanism - consisting of vane wheel with an axle perpendicular to the flow direction, lower and upper tightening plates with bearing hubs;
- dry type mechanical register - digital drum with gearing mechanism for all figures:
  - 4 digits indication, 4 pointers of analogue device (*RY-L, RY-M);*
  - 5 digits indication, 4 pointers of analogue device (*RY-A1, RY-A2, RY-B, RY-B2, RY-C1, RY-C2, RY-D, RY-D2, RY-E1, RY-G1, RY-L, RY-M, RY-U, RY-W, RY-X, RY-Y, RY-Z and RY-AA);*
  - 7 digits indication, 1 pointers of analogue device (*RY-M, RY-AB*);
  - 8 digits indication, 1 pointers of analogue device (*RY-H, RY-M*);
- housing of meter;
- adjustment device – adjustment is carried out by flow regulation;
- magnetic coupling.

Non-essential parts of water meter:

- strainer - optional;
- non-return valve - optional;
- stainless steel cup (SS cup) for register of water meters– for water meters types *RY-B, RY-C1, RY-E1* and *RY-G1* (300 mm) - optional

2.1 Metrological functions

- measuring, memorizing and displaying the volume of water passing through the water meter

2.2 Software

- not applicable

2.3 Optional equipment and functions subject to MID requirements

- not applicable

2.4 Integrated equipment and functions not subject to MID

- pulse output (optional);
- optical reading (optional);
- data output (optionally) through RF module, MBUS, SMART card, GPRS or pulse output (for type *RY-AB* only).

Via the above mentioned parts no legally relevant data shall be altered. The above mentioned parts are outside the scope of Annex III of MID. Data displayed or transferred via these parts are not considered as a metrological relevant data in sense of MID.

3. Technical and metrological data

3.1 Parameters of water meters of types *RY-A1, RY-A2, RY-B, RY-B2, RY-C1*

Type	-	***RY-A1***	***RY-A2***	***RY-B***	***RY-B2***	***RY-C1***
Nominal diameter DN	mm	20				25
Permanent flowrate Q_3	m^3/h	2,5		4		6,3
Minimum flowrate Q_1	m^3/h	0,015625		0,025		0,039375
Transitional flowrate Q_2	m^3/h	0,025		0,04		0,063
Overload flowrate Q_4	m^3/h	3,125		5		7,875
Ratio Q_3/Q_1	-	160				
Ratio Q_2/Q_1	-	1,6				
Connection thread	-	G 1 B				G 1 ¼ B
Construction length L	mm	190				260
Installation orientation	-	H				
Water temperature range	°C	0,1 to 50				
Maximum working pressure	bar	16				
Maximum pressure loss	bar	0,63				
Maximum permissible error in upper flowrates range $Q_2 \leq Q \leq Q_4$	%	± 2 (at $\Theta \leq 30°C$) ± 3 (at $\Theta > 30°C$)				
Maximum permissible error in lower flowrates range $Q_1 \leq Q < Q_2$	%	± 5				
Scale interval	m^3	0,000 05				

Capacity of calculator	m^3	99999
Mechanical class	-	M1
Climatic class	°C	- 10 to + 55
Electromagnetic class	-	E1

3.2 Parameters of water meters of types *RY-C2*

Type	-	***RY-C2***		
Nominal diameter DN	mm	25		
Permanent flowrate Q_3	m^3/h	6,3		
Minimum flowrate Q_1	m^3/h	0,07875	0,063	0,039375
Transitional flowrate Q_2	m^3/h	0,126	0,1008	0,063
Overload flowrate Q_4	m^3/h	7,785		
Ratio Q_3/Q_1	-	80	100	160
Ratio Q_2/Q_1	-	1,6		
Connection thread	-	G 1 ¼		
Construction length L	mm	260		
Installation orientation	-	H		
Water temperature range	°C	0,1 to 50		
Maximum working pressure	bar	16		
Maximum pressure loss	bar	0,63		
Maximum permissible error in upper flowrates range $Q_2 \leq Q \leq Q_4$	%	± 2 (at $\Theta \leq 30°C$) ± 3 (at $\Theta > 30°C$)		
Maximum permissible error in lower flowrates range $Q_1 \leq Q < Q_2$	%	± 5		
Scale interval	m^3	0,000 05		
Capacity of calculator	m^3	99999		
Mechanical class	-	M1		
Climatic class	°C	- 10 to + 55		
Electromagnetic class	-	E1		

3.3 Parameters of water meters of types *RY-D, RY-D2, RY-E1, RY-G1*

Type	-	***RY-D***	***RY-D2***	***RY-E1***	***RY-G1***
Nominal diameter DN	mm	15		40	50
Permanent flowrate Q_3	m^3/h	2,5		16	25
Minimum flowrate Q_1	m^3/h	0,015625		0,1	0,15625
Transitional flowrate Q_2	m^3/h	0,025		0,160	0,250
Overload flowrate Q_4	m^3/h	3,125		20	31,25
Ratio Q_3/Q_1	-	160			
Ratio Q_2/Q_1	-	1,6			
Connection thread	-	G ¾ B	G 2 B	G2 ½ B	flange
Construction length L	mm	165	300	300	350
Installation orientation	-	H			
Water temperature range	°C	0,1 to 50			
Maximum working pressure	bar	16			
Maximum pressure loss	bar	0,63			
Maximum permissible error in upper flowrates range $Q_2 \leq Q \leq Q_4$	%	± 2 (at $\Theta \leq 30°C$) ± 3 (at $\Theta > 30°C$)			
Maximum permissible error in lower flowrates range $Q_1 \leq Q < Q_2$	%	± 5			
Scale interval	m^3	0,000 05			
Capacity of calculator	m^3	99999			
Mechanical class	-	M1			
Climatic class	°C	- 10 to + 55			
Electromagnetic class	-	E1			

3.4 Parameters of water meters of types *RY-L*

Type	-	***RY-L***			
Nominal diameter DN	mm	20		15	
Permanent flowrate Q_3	m^3/h	2,5			
Minimum flowrate Q_1	m^3/h	0,03125	0,025	0,025	0,015625
Transitional flowrate Q_2	m^3/h	0,050	0,040	0,040	0,025
Overload flowrate Q_4	m^3/h	3,125			
Ratio Q_3/Q_1	-	80	100	100	160
Ratio Q_2/Q_1	-	1,6			
Connection thread	-	G 1 B		G ¾ B	
Construction length L	mm	165 / 190			
Installation orientation	-	H			
Water temperature range	°C	0,1 to 50			
Maximum working pressure	bar	16			
Maximum pressure loss	bar	0,63			
Maximum permissible error in upper flowrates range $Q_2 \leq Q \leq Q_4$	%	± 2 (at $\Theta \leq 30°C$) ± 3 (at $\Theta > 30°C$)			
Maximum permissible error in lower flowrates range $Q_1 \leq Q < Q_2$	%	± 5			
Scale interval	m^3	0,00005			
Capacity of calculator	m^3	9999 99999			
Mechanical class	-	M1			
Climatic class	°C	- 10 to + 55			
Electromagnetic class	-	E1			

3.5 Parameters of water meters of types *RY-H, RY-M*

Type	-	***RY-H***	***RY-M***			
Nominal diameter DN	mm	20	15		20	
Permanent flowrate Q_3	m^3/h	2,5				
Minimum flowrate Q_1	m^3/h	0,025	0,0156	0,025	0,015625	0,025
Transitional flowrate Q_2	m^3/h	0,040	0,025	0,040	0,025	0,040
Overload flowrate Q_4	m^3/h	3,125				
Ratio Q_3/Q_1	-	100	160	100	160	100
Ratio Q_2/Q_1	-	1,6				
Connection thread	-	G 1 B	G ¾ B		G 1 B	
Construction length L	mm	190	110			
Installation orientation	-	H				
Water temperature range	°C	0,1 to 50				
Maximum working pressure	bar	16				
Maximum pressure loss	bar	0,63				
Maximum permissible error in upper flowrates range $Q_2 \leq Q \leq Q_4$	%	± 2 (at $\Theta \leq 30°C$) ± 3 (at $\Theta > 30°C$)				
Maximum permissible error in lower flowrates range $Q_1 \leq Q < Q_2$	%	± 5				
Scale interval	m^3	0,000 05				
Capacity of calculator	m^3	99999,999	9999 99999 9999,999 99999,999			
Mechanical class	-	M1				
Climatic class	°C	- 10 to + 55				
Electromagnetic class	-	E1				

3.6 Parameters of water meters of types *RY-U, RY-W, RY-X, RY-Y*

Type	-	***RY-U***	***RY-W***	***RY-X***	***RY-Y***	
Nominal diameter DN	mm	20	15	15	15	20
Permanent flowrate Q_3	m³/h	2,5				
Minimum flowrate Q_1	m³/h	0,015625			0,03125	0,025
Transitional flowrate Q_2	m³/h	0,025			0,050	0,040
Overload flowrate Q_4	m³/h	3,125				
Ratio Q_3/Q_1	-	160			80	100
Ratio Q_2/Q_1	-	1,6				
Connection thread	-	G 1 B	G ¾ B	G ¾ B	G 1 B	G ¾ B
Construction length L	mm	190	165	145	190	
Installation orientation	-	H				
Water temperature range Θ	°C	0,1 to 50				
Maximum working pressure	bar	16				
Maximum pressure loss	bar	0,63				
Maximum permissible error in upper flowrates range $Q_2 \leq Q \leq Q_4$	%	± 2 (at $\Theta \leq 30$°C) ± 3 (at $\Theta > 30$°C)				
Maximum permissible error in lower flowrates range $Q_1 \leq Q < Q_2$	%	± 5				
Scale interval	m³	0,000 05				
Capacity of calculator	m³	99999				
Mechanical class	-	M1				
Climatic class	°C	- 10 to + 55				
Electromagnetic class	-	E1				

3.7 Parameters of water meters of types *RY-Z, RY-AA, RY-AB*

Type	-	***RY-Z***		***RY-AA***	***RY-AB***		
Nominal diameter DN	mm	25	32	20			
Permanent flowrate Q_3	m³/h	10		2,5			
Minimum flowrate Q_1	m³/h	0,0625		0,020	0,025		
Transitional flowrate Q_2	m³/h	0,1		0,032	0,040		
Overload flowrate Q_4	m³/h	12,5		3,125	3,125		
Ratio Q_3/Q_1	-	160		125	100		
Ratio Q_2/Q_1	-	1,6					
Connection thread	-	G 1 ½ B		G 1 B			
Construction length L	mm	260		105	110	130	190
Installation orientation	-	H		V	H		
Water temperature range Θ	°C	0,1 to 50					
Maximum working pressure	bar	16					
Maximum pressure loss	bar	0,63					
Maximum permissible error in upper flowrates range $Q_2 \leq Q \leq Q_4$	%	± 2 (at $\Theta \leq 30$°C) ± 3 (at $\Theta > 30$°C)					
Maximum permissible error in lower flowrates range $Q_1 \leq Q < Q_2$	%	± 5					
Scale interval	m³	0,000 05					
Capacity of calculator	m³	99999			9999,999		
Mechanical class	-	M1					
Climatic class	°C	- 10 to + 55					
Electromagnetic class	-	E1					

4. Interfaces and compatibility conditions

- not applicable

5. Marking and inscriptions

The following data shall be marked on the water meter:

a) manufacturer's name or mark;
b) manufacturer´s postal address (article 8, point 6 of Directive 2014/32/EU), (Fig. 9);
c) type of water meter;
d) measuring unit m³;

e) year of production and serial number;
f) flowrate Q_3 and ratio Q_3/Q_1; *(R);*
g) installation position of the water meter *H, V (V* has type *RY-AA* only*);*
h) maximum working pressure;
i) temperature class *(T50);*
j) EU - type examination certificate number;
k) CE marking and supplementary metrology marking according to Article 21 and Article 22 of Directive 2014/32/EU (CE marking and supplementary metrology marking following with number of a notified body).

The flow direction shall be marked on a water meter's body in form of an arrow. All inscriptions on the water meter shall be in the EC official language; the international abbreviations are admitted.

5.1 Designation of trademark on the water meters

The manufacturer uses following trademark on its water meters:

Madey Vered

6. Security measures

The water meter shall be protected against unauthorised manipulation by:
- one seal securing the water meter head with the screw cap of adjustment device (for the meters with the adjustment screw);
  or
- one seal securing water meter head with the water meter body (for the meters without the adjustment screw).

7. Requirements on production, putting into use and utilization

7.1 Requirements on production

- no special requirements identified

7.2 Requirements on putting into use

- water meters must be installed in accordance with the requirements listed in the installation and user manual issued by the manufacturer;
- no requirements for straight pipeline length in upstream and downstream;
- initial verification tests of the water meters can be carried out in line with EN 14154-1 +A2: 2011 (point 9.2) or EN ISO 4064-2: 2014 (point 10.1).

7.3 Requirements for utilization

- in accordance with the requirements of the manufacturer`s documentation.

8. Documentation used for assessment purposes

- Evaluation report No 011/1432/18 MI-001, of 20.02.2018, issued by SLM NB 1432;
- Manufacturer`s technical documentation stored in folder *Madey Vered_RY_00 and 01.*

9. Standards and regulations used for assessment purposes

9.1 Regulations, harmonized standards and normative documents

- Government Ordinance of the Slovak Republic No. 145/2016 Coll. relating to the making available on the market of measuring instruments, which implements, in Slovakia, the Directive 2014/32/EU 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 as later amended (MID);
- EN 14154-1: 2005 + A2: 2011 Water meters - Part 1: General requirements
- EN 14154-2: 2005 + A2: 2011 Water meters - Part 2: Installation and conditions of use
- EN 14154-3: 2005 + A2: 2011 Water meters - Part 3: Test methods and equipment.

9.2 Further applied standards and documents

- OIML R 49-1, edition 2013 (E): Water meters for cold potable water and hot water. Part 1: Metrological and technical requirements
- EN ISO 4064-1: 2014 Water meters for cold potable water and hot water. Part 1: Metrological and technical requirements
- EN ISO 4064-5: 2014 Water meters for cold potable water and hot water. Part 5: Installation requirements
- WELMEC Guide 11.1 Measuring Instruments Directive 2004/22/EC Common application for utility meters (Issue 5: 2014)
- WELMEC Guide 11.3 Guide for sealing of Utility meters (Issue 1: 2012)

10. Final provisions on water meter

Construction, technical and metrological parameters of the water meters type series *RY-xx* must comply with the documentation presented within the process of type certification. All the characteristics of the measuring instrument (including those not mentioned) shall meet the respective requirements of Government Ordinance of the Slovak Republic No. 145/2016 Coll. relating to the making available on the market of measuring instruments, which implements, in Slovakia, the Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of measuring instruments as later amended (MID).

11. Figures

RY-A1

RY-A2

RY-B

RY-B2

Fig. 1a: Views on water meters series *RY-A1, RY-A2, RY-B, RY-B2* (*illustrative*)

RY-C1

RY-C2

RY-D

RY-D2

Fig. 1b: Views on water meters series *RY-C1, RY-C2, RY-D, RY-D2* (*illustrative*)

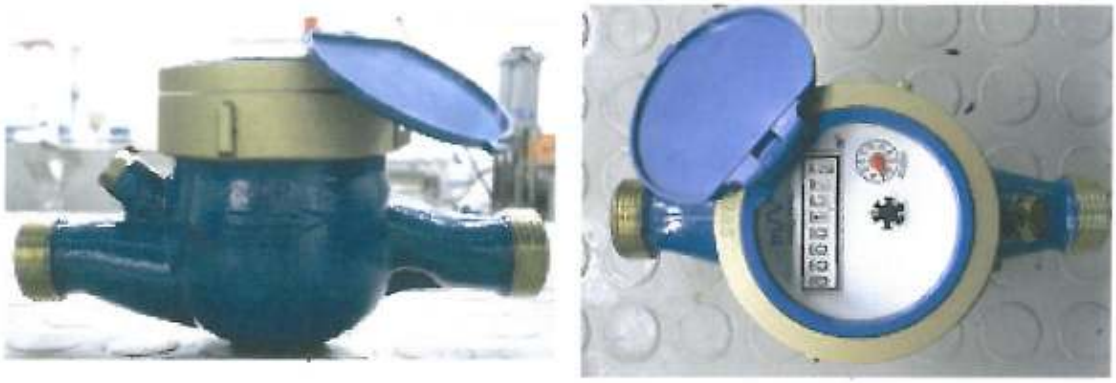
RY-E1

RY-G1
(300 mm)

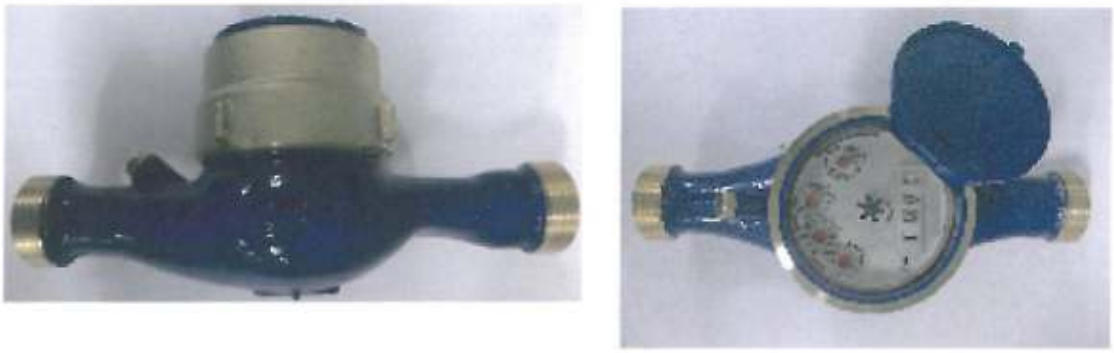
RY-G1
(350 mm)

Fig. 1c: Views on water meters series *RY-E1* and *RY-G1 (*300 mm and 350 mm*)*
(*illustrative*)

RY-H



RY-L
(190 mm)



RY-L
(165 mm)

Fig. 1d: View on water meter type *RY-H* and *RY-L*
(*illustrative*)

RY-M (alternative 1)

RY-M (alternative 2)

RY-M (alternative 3)

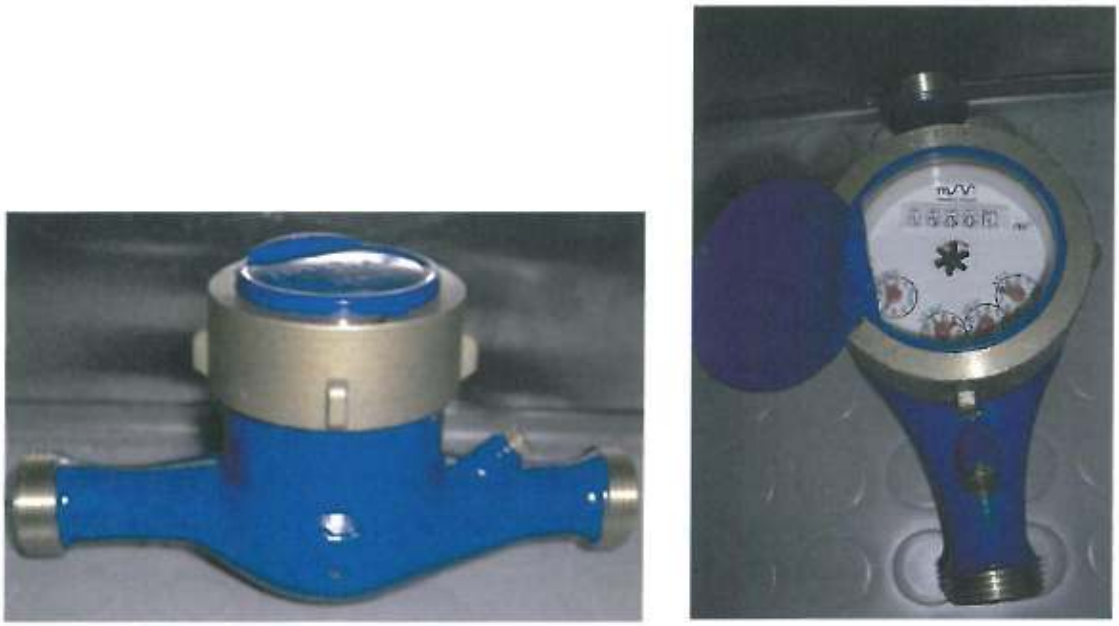
RY-M (alternative 4)

DN15

DN20

Fig. 1e: Illustrative view on water meter type *RY-M*

RY-U



RY-W

Fig. 1f: Illustrative view on water meter type *RY-U* and *RY-W*

RY-X

RY-Y

Fig. 1g: Views on water meters *RY-X, RY-Y (illustrative)*

RY-Z

RY-AA

Fig. 1h: Views on water meters *RY-Z, RY-AA (illustrative)*

RY-AB

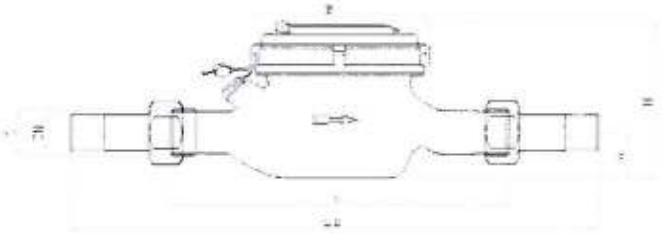
RY-AB (*with module output*)

Fig. 1i: Views on water meters *RY-AB* and *RY-AB (with module output)*

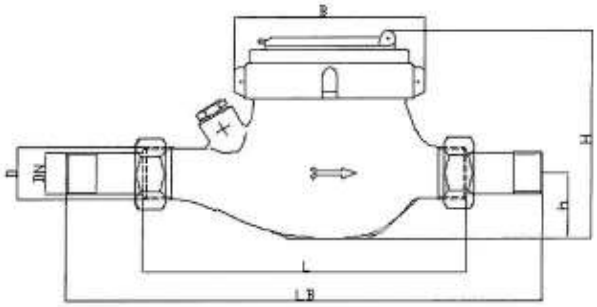
(illustrative)

RY-A1

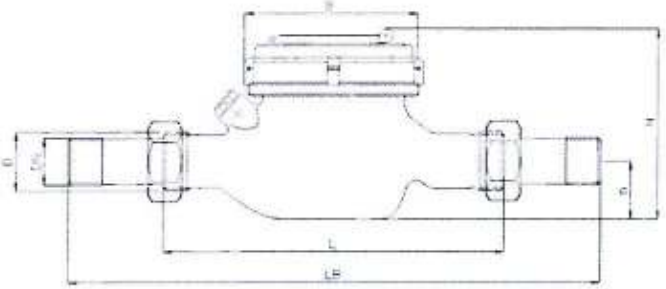
RY-A2



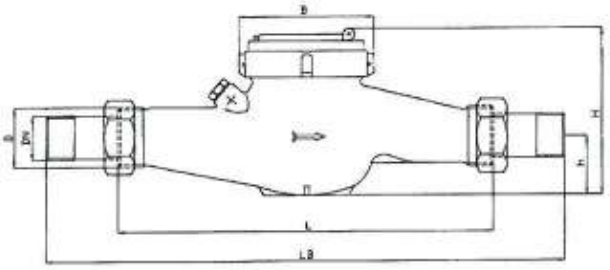
RY-B



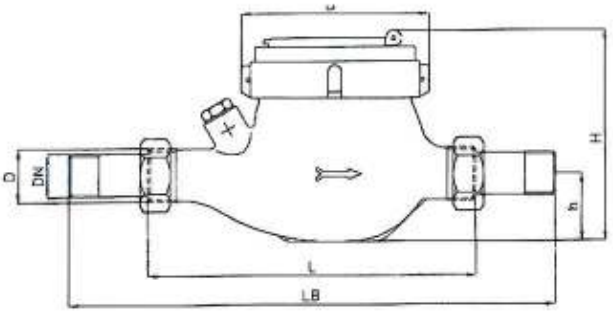
RY-B2



RY-C1, RY-C2



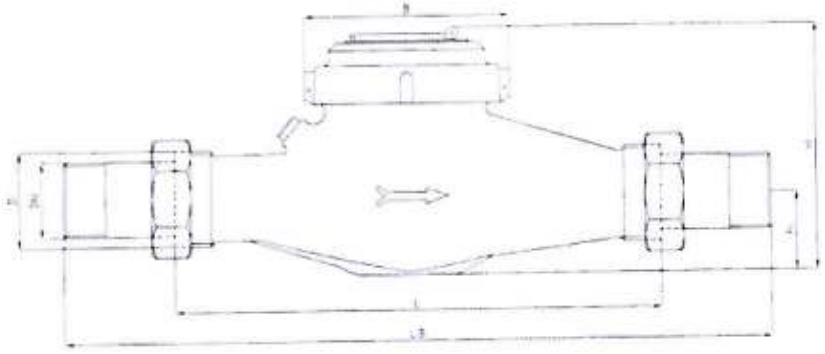
RY-D, RY-D2



Type	DN	D	LB	H	h	B	L
RY-A1	20	G 1 B	285	109	31,5	97	190
RY-A2			285	114	34	97	
RY-B, RY-B2			285	114	34	96	
RY-C1	25	G 1¼ B	375	120	40,5	97	260
RY-C2				125	45	100	
RY-D, RY-D2	15	G ¾ B	253	114	33,5	100	165

Fig. 2a: Main dimensions in mm

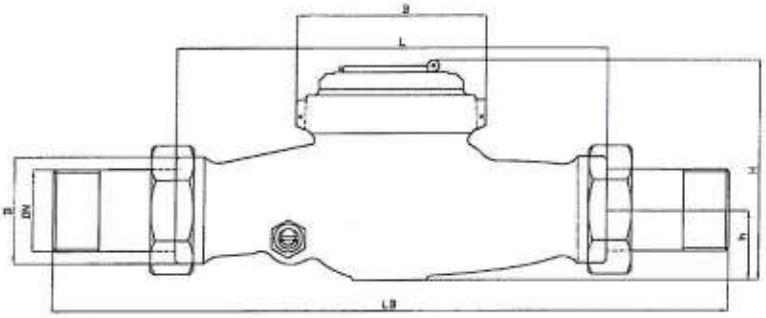
RY-E1



Dimensions in mm

Type	DN	D	LB	H	h	B	L
RY-E1	40	G 2 B	430	152	47,5	131	300

RY-G1 300 mm



Type	DN	D	LB	H	h	B	L
RY-G1 (300 mm)	50	G 1/2 B	429	154	50	142	300

RY-G1 350 mm

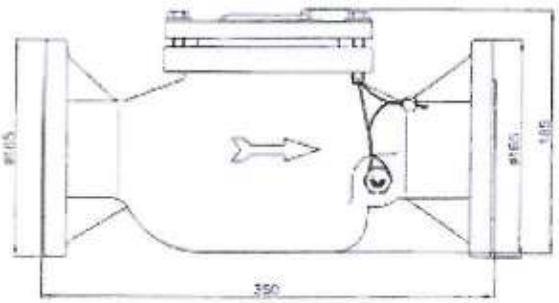
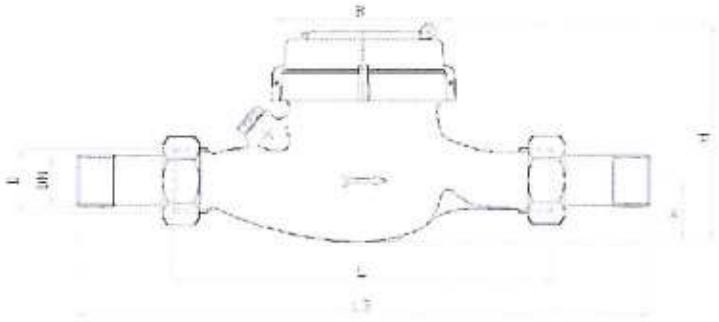
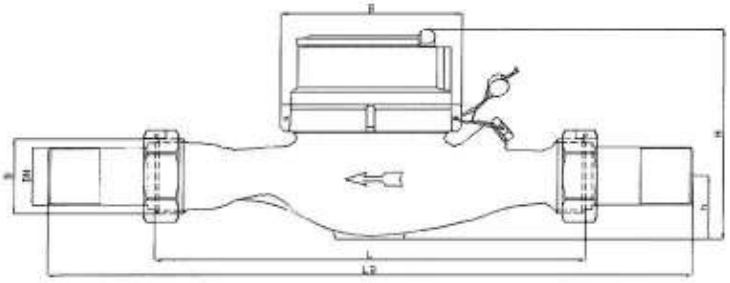


Fig. 2b: Main dimensions –of water meters *RY-E1, RY-G1*

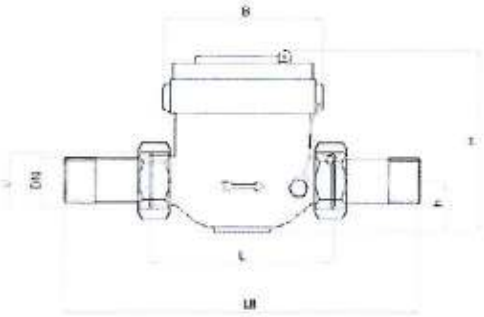
RY-H



RY-L



RY-M

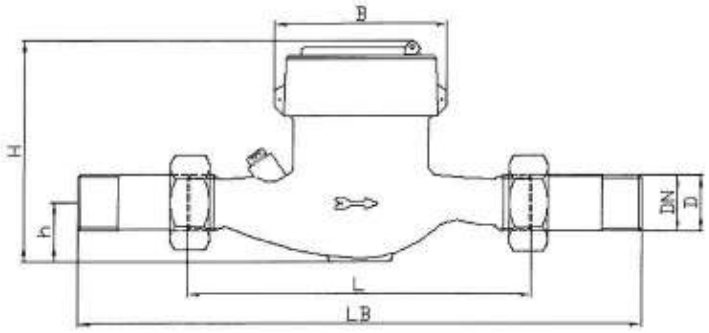


Dimensions in mm

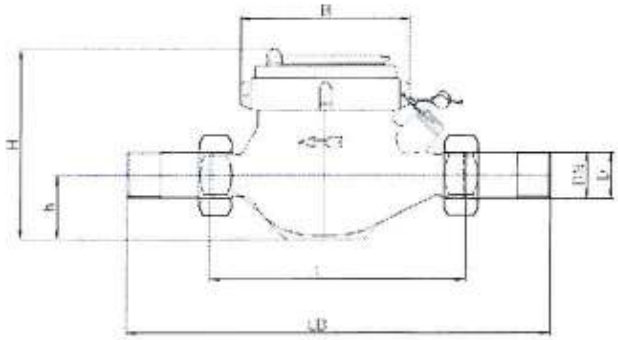
type	DN	D	LB	H	h	B	L
RY-H	20	G 1 B	285	111	35	97	190
RY-L	15	G ¾ B	266	93,5	28	80	165
	20	G 1B	285				190
RY-M	15	G ¾ B	199	108	33	94,5	110
	20	G 1 B	200				

Fig. 2c: Main dimensions of water meters *RY-H, RY-L, RY-M*

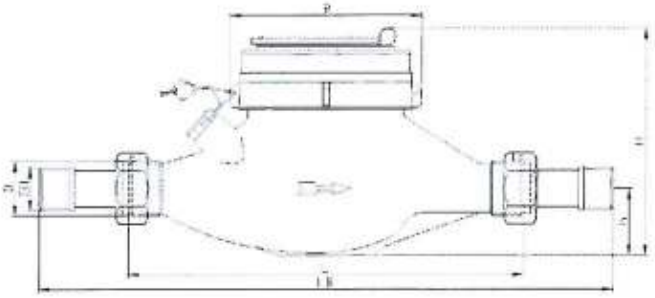
RY-U, RY-W



RY-X



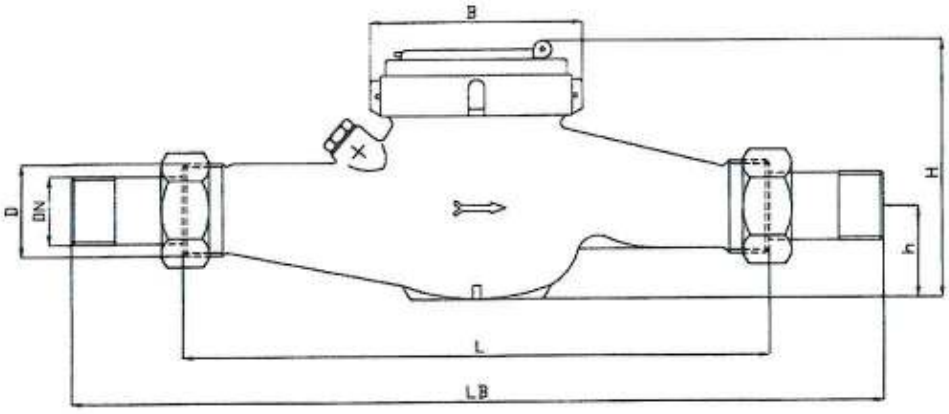
RY-Y



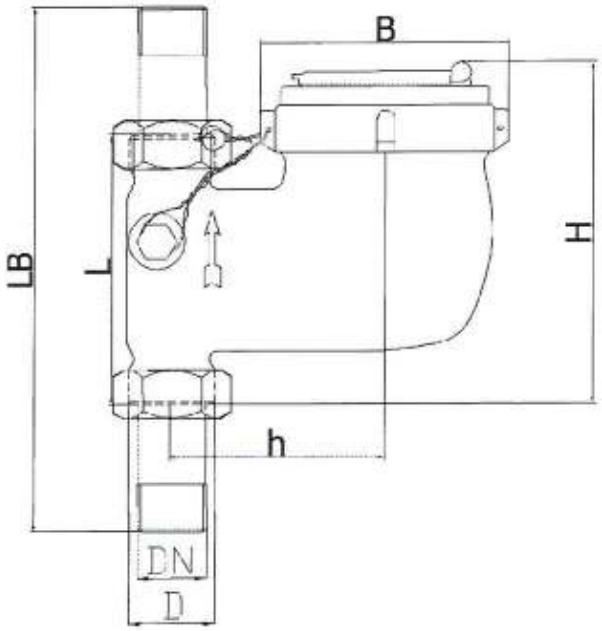
Type	DN	D	LB	H	h	B	L
RY-U	20	G 1 B	285	107	30	95	190
RY-W	15	G ¾ B	243	107	30	95	165
RY-X	15	G ¾ B	236	115	33,5	97	145
RY-Y	15	G ¾ B	270	109	31,5	93	190
	20	G 1 B					

Fig. 2d: Main dimensions water meters *RY-U, RY-W, RY-X, RY-Y*

RY-Z



RY-AA



Dimensions in mm

Type	DN	D	LB	H	h	B	L
RY-Z	32	G 1½ B	380	130	40,5	97	260
	25	G 1 ¼ B	375	120			
RY-AA	20	G 1 B	195	133	95	95	105

Fig. 2e: Main dimensions of water meters *RY-Z, RY-AA*