Slovenský metrologický ústav
Karloveská 63, 842 55 Bratislava 4,
Slovenská republika

SNAS
Reg. No. 101/P-035

CERTIFIKÁT EÚ SKÚŠKY TYPU

EU – type examination certificate

Číslo dokumentu: **SK 21-MI001-SMU071** **Revízia 0**
Document number: *Revision 0*

V súlade s:
In accordance with:
prílohou č. 2, Modul B nariadenia vlády Slovenskej republiky č. 145/2016 Z. z. o sprístupňovaní meradiel na trhu v znení nariadenia vlády SR č. 328/2019 Z. z., ktorým sa preberá smernica Európskeho parlamentu a Rady 2014/32/EU o harmonizácii právnych predpisov členských štátov týkajúcich sa sprístupnenia meradiel na trhu
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 as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll., which implemented the Directive 2014/32/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments

Žiadateľ/Výrobca:
Issued to (Manufacturer):
Apator PoWoGaz S.A.
ul. Klemensa Janickiego 23/25, 60 – 542 Poznań, Poland

Druh meradla:
Type of instrument:
Vodomer (MI-001)
Water meter (MI-001

Označenie typu:
Type designation:
JS, JS130 (Master D+)

Základné požiadavky:
Essential requirements:
príloha č. 1 a príloha č. 3 Vodomery (MI-001) k nariadeniu vlády SR č. 145/2016 Z. z. v znení nariadenia vlády SR č. 328/2019 Z. z.
Annex No. I and Annex No. III Water meters (MI-001) to Government Ordinance of the Slovak Republic No. 145/2016 Coll. as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll.

Platnosť do:
Valid until:
12. máj 2031
May 12, 2031

Notifikovaná osoba:
Notified body:
Slovenský metrologický ústav **1781**
Slovak Institute of Metrology *1781*

Dátum vydania:
Date of issue:
12. máj 2021
May 12, 2021

Základné charakteristiky, popis meradla a podmienky schválenia sú uvedené v prílohe, ktorá je súčasťou tohto certifikátu. Certifikát vrátane prílohy má spolu 16 strán.
Essential characteristics, instrument description and approval conditions are set out in the appendix hereto, which forms the part of the certificate. The certificate including the appendix contains 16 pages.

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Viliam Mazúr
zástupca notifikovanej osoby
representative of notified body

Poznámka: Tento certifikát EÚ skúšky typu môže byť rozmnožovaný len celý a nezmenený. Bez podpisu a odtlačku pečiatky je neplatný.
Note: This EU-type examination certificate shall not be reproduced except in full. Certificates without signature and stamp are not valid.

History of the Certificate

Issue of the Certificate	Date	Modification
SK 20-MI001-SMU071, Revision 0	May 12, 2021	Initial certificate

1 Instructions and standards used within assessment

1.1 Generally binding instructions

Meter type was examined in terms of request for given type provisions Government Ordinance of the Slovak Republic No. 145/2016 Coll. relating to the making available on the market of measuring instruments as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll., which implemented 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 (next Government Ordinance).

Requirements are set out in Annex No. 1 and Annex No. 3 Water Meters (MI-001) to Government Ordinance of SR No. 145/2016 Coll. as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll..

1.2 Harmonised standards and normative documents used:

OIML R 49-1:2006	Water meters intended for the metering of cold potable water and hot water. Part 1: Metrological and technical requirements
OIML R 49-2:2004	Water meters intended for the metering of cold potable water and hot water. Part 2: Test methods
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

1.3 Other instructions used:

OIML R 49-2:2013	Water meters intended for the metering of cold potable water and hot water. Part 2: Test methods
EN ISO 4064-1: 2017	Water meters for cold potable water and hot water. Part 1: Metrological and technical requirements
EN ISO 4064-2: 2017	Water meters for cold potable water and hot water. Part 2: Test methods
EN ISO 4064-3:2014	Water meters for cold potable water and hot water. Part 3: Test report format.
EN ISO 4064-5: 2017	Water meters for cold potable water and hot water. Part 5: Installation requirements

2 Type marking

Water meter: **JS, JS130**

Trade name: **MASTER D+**

Meter is made in following subgroups:

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Type of meter	Temperature class	Class	Nominal Diameter
JS	T30, T50	M1[1)], B[2)] or O[2)]	DN25, DN32, DN40
JS130	T130, T30/130		

3 Description of measuring instrument

Meter name: Vane-wheel single-jet water meter

Type marking: JS, JS130

Trade name: MASTER D+

Description of operating principle instrument design:

Vane-wheel single-jet water meters JS, JS130 with permanent flow rates of 6,3 m^3/h, 10 m^3/h and 16 m^3/h have been designed to measure actual volume of clean cold potable water and hot water flowing in a completely filled up closed pipeline. The water meter is composed of a body, of the measuring mechanism and the counter. Water flowing through a meter, sets the vane-wheel in a rotary motion that is transferred by a magnetic clutch to the counting mechanism.
Vane-wheel single-jet water meters JS, JS130 are composed of two basic assemblies:

1. measuring unit
2. counting mechanism

The body of the water meter is a brass casting, equipped with threaded pipe connectors to enable mounting on a pipeline with the help of fittings and nuts.

The counting mechanism has been set so that it can be easily adjusted by rotation to facilitate readout. Water meters are sealed against fraud with a special plastic covers or mounting rings that will be visibly destroyed if trying to break in. There is an option to add the wire type sealing with round plastic or leaden seal.

Water meters have been equipped with threaded pipe connectors to enable mounting on a pipeline with the help of fittings and nuts.

Water meters are designed for mounting on pipelines in:

1. Horizontal position, with the indicating device at the top and the side
2. Vertical position with flow from bottom to top and from top to bottom.

Accidental occurrence of a reverse flow does not affect metrological characteristics provided for a normal flow.

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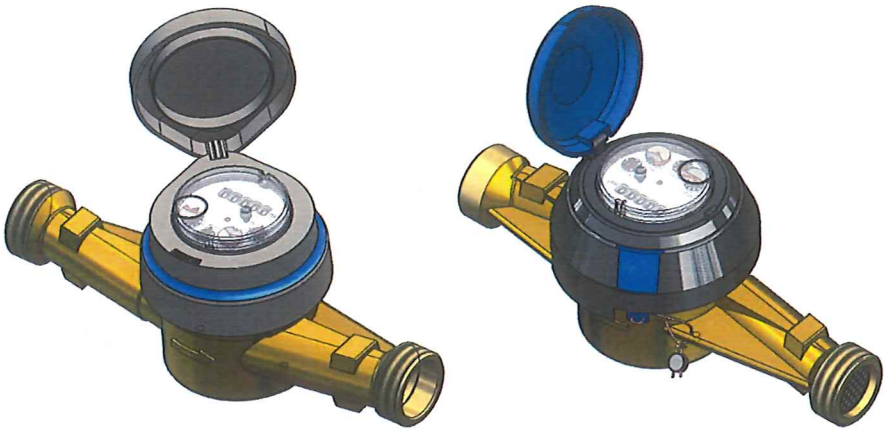
[1] according to Government Ordinance of the Slovak Republic, Annex No. 1

[2] according to EN ISO 4064-1:2017 and OIML R 49-2:2013



Picture No.1 Vane-wheel single-jet water meter JS

3.1 Description of subgroups

Marking: **JS, JS130**

Sub-groups marking: **JSX-YY-ZZ, JS130X-YY-ZZ**

Size: **DN25, DN32, DN40**

Due to the designing solutions adopted and application range assumed for water meters JS, JS130 with permanent flow rates of 6,3 m3/h, 10 m3/h and 16 m3/h there were introduced diverse varieties of meters marked with JSX-YY-ZZ or JS130X-YY-ZZ where X is the value of permanent flow rate: 6,3 m^3/h, 10 m^3/h and 16 m^3/h, YY is a version of a meter and ZZ is a version of pulse transmission type:

YY:

- 01: 5 roller type, ready for inductive and IR reading type communication modules, cover sealed by wire with round seal (leaden or plastic) , with adjusting channel
- 02: 5 roller type, ready for inductive and IR reading type communication modules, self-sealing cover, with adjusting plate
- 03: 5 roller type, ready for inductive and IR reading type communication modules, cover sealed by wire with round seal (leaden or plastic), with adjusting plate
- 04: 5 roller type, ready for pulse transmission purpose (magnetic pointer), cover sealed by wire with round seal (leaden or plastic) with adjusting channel
- 05: 5 roller type ready for pulse transmission purpose (magnetic pointer), cover sealed by wire with round seal (leaden or plastic), with adjusting plate
- 06: 5 roller type ready for pulse transmission purpose (magnetic pointer), self-sealing cover, with adjusting plate
- 07: 5 roller type, IP68 protected mechanism with mineral glass cover and copper bottom plate, ready for inductive reading, self-sealing cover, with adjusting plate
- 08 5 roller type, IP68 protected mechanism with mineral glass cover and copper bottom plate, ready for inductive and IR reading type communication modules, cover sealed by wire with round seal (leaden or plastic) with adjusting channel

ZZ:

- NK: 5 roller type for pulse transmission purpose (magnetic pointer with REED switch), antimagnetic cover.
- NKP: ready for NK switch

3.2 Measuring unit

Measuring unit is an assembly of measuring mechanism and the brass body with sealing parts.

The main elements of the JS measuring mechanism are the following:

- a set of bearings (materials resistant up to 90°C)
- vane-wheel with magnetic clutch on it (materials resistant up to 90°C)
- plastic (material resistant up to 90°C) or brass sealing plate with damming ribs
- damming plate on the bottom
- strainer in the inlet channel.

The main elements of JS130 measuring mechanism elements are made of the materials resistant to hot water, up to 150°C:

- a set of bearings
- vane-wheel with magnetic clutch on it
- plastic or brass sealing plate with damming ribs
- damming plate on the bottom
- strainer in the inlet channel.

In both cases, the vane-wheel is mounted on a bearing pin in the body and the bearing of the sealing plate. There is a magnet of a magnetic clutch on the vane-wheel.

3.3 Indicating device

The capacity of the counter is 99 999 m^3 and resolution of the reading is 0,05 dm^3.

The counting mechanism includes a rear clutch, gears and a register. The register may consist of four pointers and five drum roller or one pointer and eight-drum roller. A transparent casing facilitates readout of meter indications. A special pin in the counter has been provided to prevent undesirable casing deflection thereby indicating unauthorised manipulation. On the central pin of the counting mechanism on which the magnet of the magnetic clutch has been fixed there is a small reflective target that performs a function of a vane-wheel rotation indicator. This reflective target placed on magnetic clutch is predicted for optical read out for testing purpose with higher resolution. The counter design does not allow for resetting of meter indications.

Counter pointers rotate clockwise. Indicated digital values increase as the drums with digits marked on them move upwards. An indication increase by one digit is complete when a digit in a lower decade changes from 9 to 0. In a decade of the lowest values digital indications change continuously. Black digits marked on digital drums indicate cubic meters or their multiples whereas red digits or pointers indicate submultiples of cubic meters.

The pointers move round scales marked with proper multipliers and placed on an indicating dial.

The counter casing with the NK transmitter is protected with an additional magnetic shield.

Connection between the measuring unit and indicating device is provided by a cover with an

optional lid. The cover is a self-sealing type, additionally there are seal holes provided in cover and in the body.

3.4 Principle of operation

Principle of operation of single jet water meters (JS) is the usage of a single flow stream (jet) to move the vane-wheel. The rotation speed of the impeller is converted into a flow rate, which is registered by the counting mechanism. Single jet water meter (JS) is an inferential type water meter. The operating speed of the vane wheel (the impeller) is proportional to the volume of overflowing water.

Water meter adjustment can be performed in two ways:

a) With adjusting channel. The rotation of the impeller speed is changing by the adjustment channel in the water meter body sealed by screw.

b) With adjusting plate. The rotation of the impeller speed is changing by the ribs in the adjusting plate.

3.5 Technical documentation

A number of drawings of technical documentation's are listed in the following list:

Drawing number				
1349-000000	1449-000000	1520-000000	1412-000000	1404-000000
1355-000000	1455-000000	5003-110700	1413-000000	1400-000000 material list
1356-000000	1456-000000	5003-120700	1414-000000	1428-000000
1360-000000	1486-000000	5003-130700	9005-020000	0000-004673
1361-000000	1489-000000	1400-000000	1400-010000	0000-004674
1370-000000	0000-004517	1401-000000	1427-000000	0000-004675
1371-000000	0000-004518	1402-000000	9005-020700	0000-004676
1377-000000	0000-004516	1403-000000	9005-030700	1425-000000
1388-000000	1500-000000	1410-000000	9005-030701	1426-000000
1389-000000	1510-000000	1411-000000	9005-770700	1429-000000
1400-020000	1401-020000	1402-020000	1404-020000	1425-020000
1426-020000	1427-020000	1429-020000		

All drawings, schemes and technical documentations used during the conformity assessment are saved in document No. NO-509/21.

4 Basic technical characteristics

Type marking		**JS, JS130**		
Nominal diameter DN	mm	25	32	40
Indicating range	m^3	99 999		
Resolution of the reading	m^3	0,00005		
Water pressure class	-	MAP10, MAP16		
Working pressure range	bar	from 0,3 to 10 (or 16)		
Pressure loss class	-	Δp 63		
Temperature class	-	JS (T30, T50), JS130 (T130, T30/130)		
Flow profile sensitivity classes	-	U0, D0		
Position	-	Horizontal with indicating device positioned on top, H↑ Horizontal with indicating device positioned on side, H→ Vertical from bottom to top and from top to bottom V		
Climatic and mechanical environments	-	closed spaces /from 5°C to 55°C/mech. class M1		
Accuracy class	-	2		
Impulse number NK, NKP, YY	dm3 /imp	0,25; 0,5; 1; 5; 2,5; 10; 25; 50; 100; 250; 500; 1000		

4.1 Additional technical characteristics

Weight	from 1,2 kg to 3 kg

5 Basic metrological characteristics

The maximum permissible error (accuracy class):

± 5 % ($Q_1 \leq Q < Q_2$)

± 2 % ($Q_2 \leq Q \leq Q_4$) for water temperature (from 0,1 to 30) °C

± 3 % ($Q_2 \leq Q \leq Q_4$) for water temperature greater than 30 °C

Model number			**JS6,3**	**JS10**		**JS16**
Diameter	DN	mm	25	25	32	40
Minimum flow rate	Q_1	m^3/h	According to table of flowrates			
Transitional flow rate	Q_2	m^3/h				
Permanent flow rate	Q_3	m^3/h	6,3	10		16
Overload flow rate	Q_4	m^3/h	7,875	12,5		20
Measuring range R H↑	Q_3/Q_1	-	80; 100; 160; 200			
Measuring range R H→; V↑; V↓	Q_3/Q_1	-	40; 50; 63			
Ratio	Q_2/Q_1	-	1,6			

Model number			**JS130-6,3**	**JS130-10**		**JS130-16**
Diameter	DN	mm	25	25	32	40
Minimum flow rate	Q_1	m^3/h	According to table of flowrates			
Transitional flow rate	Q_2	m^3/h				
Permanent flow rate	Q_3	m^3/h	6,3	10		16
Overload flow rate	Q_4	m^3/h	7,875	12,5		20
Measuring range R H↑	Q_3/Q_1	-	50; 63; 80; 100			
Measuring range R H→; V↑; V↓	Q_3/Q_1	-	40			
Ratio	Q_2/Q_1	-	1,6			

Table of flowrates									
Model number			**JS6,3; JS130-6,3**						
Minimum flow rate	Q_1	m^3/h	0,1575	0,126	0,1	0,079	0,063	0,039	0,032
Transitional flow rate	Q_2	m^3/h	0,252	0,2016	0,16	0,126	0,101	0,063	0,050
Permanent flow rate	Q_3	m^3/h	6,3	6,3	6,3	6,3	6,3	6,3	6,3
Overload flow rate	Q_4	m^3/h	7,875	7,875	7,875	7,875	7,875	7,875	7,875
Measuring range R	Q_3/Q_1	-	40	50	63	80	100	160	200
Ratio	Q_2/Q_1	-	1,6						
Model number			**JS10, JS130-10**						
Minimum flow rate	Q_1	m^3/h	0,25	0,2	0,159	0,125	0,1	0,063	0,050
Transitional flow rate	Q_2	m^3/h	0,4	0,32	0,254	0,2	0,16	0,1	0,080
Permanent flow rate	Q_3	m^3/h	10	10	10	10	10	10	10
Overload flow rate	Q_4	m^3/h	12,5	12,5	12,5	12,5	12,5	12,5	12,5
Measuring range R	Q_3/Q_1	-	40	50	63	80	100	160	200
Ratio	Q_2/Q_1	-	1,6						
Model number			**JS16, JS130-16**						
Minimum flow rate	Q_1	m^3/h	0,4	0,32	0,254	0,200	0,16	0,1	0,08
Transitional flow rate	Q_2	m^3/h	0,64	0,512	0,406	0,320	0,256	0,16	0,128
Permanent flow rate	Q_3	m^3/h	16	16	16	16	16	16	16
Overload flow rate	Q_4	m^3/h	20	20	20	20	20	20	20
Measuring range R	Q_3/Q_1	-	40	50	63	80	100	160	200
Ratio	Q_2/Q_1	-	1,6						

6 Results of conformity assessment

The results of tests, assessments and evaluations given in the evaluation report No. NO-509/21/B/ER dated May 11, 2021 give sufficient evidence that the technical design of the measuring instrument – Vane-wheel single-jet water meter type JS, JS130 is in compliance with the technical requirements of the Slovak Republic Governmental Ordinance No. 145/2016 Coll. relating to the making available on the market of measuring instruments as amended by Government Ordinance of the Slovak Republic No. 328/2019 Coll., Annex No. 1 and Annex No. 3 Water Meters (MI-001) and the EN 14154-1:2005+A2:2011, EN 14154-2:2005+A2:2011, EN 14154-3:2005+A2:2011 and OIML R49-1:2006, OIML R49-2:2004 (harmonised standards and normative documents) and other instructions OIML R49-2:2013, EN ISO 4064-1:2017, EN ISO 4064-2:2017 and EN ISO 4064-3:2014 standards, which are relevant for this type of meter.

7 Data placed on the measuring instrument

On the shroud, the dial of the indicating device or on an identification plate of every water meter or in the product documentation minimum the following data should be marked:

a) Manufacturer's name, registered trade name or registered mark
b) Postal address of manufacturer at which they can be contacted
c) Measuring instrument type
d) Measuring unit (m^3)
e) Numerical value of Q_3 in m^3/h (Q_3 x,x) and ratio Q_3/Q_1 (Rxxx)
f) Year of production
g) Production serial number
h) Number of EU-type examination certificate and conformity mark
i) The highest admissible pressure if it differs from 1 MPa (MAP xx)
j) Flow direction
k) Letter H↑ (Horizontal with indicating device position on the top) H→(Horizontal with indicating device position at the side), V (Vertical from bottom to top and from top to bottom)
l) Class of pressure loss if it differs from Δp63 (Δp XX)
m) Flow profile sensitivity classes (Ux Dx)
n) The temperature class where it differs from T30
o) Environmental classification

The environmental classification may be given on a separate datasheet, unambiguously related to the meter by a unique identification, and not on the meter itself.

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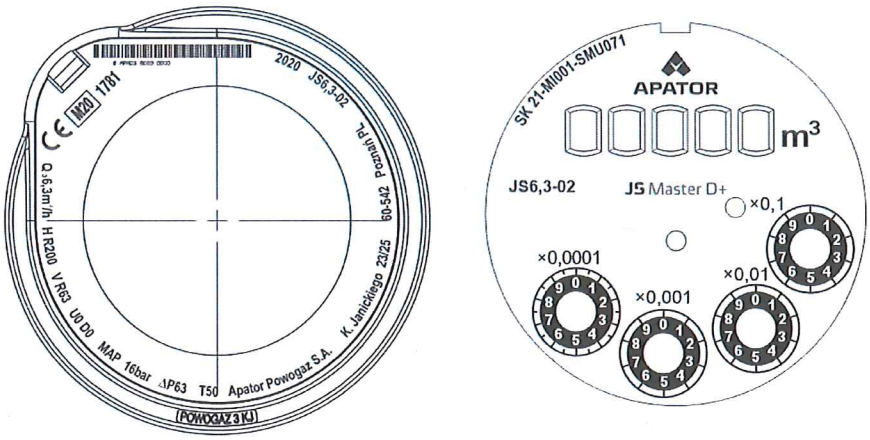
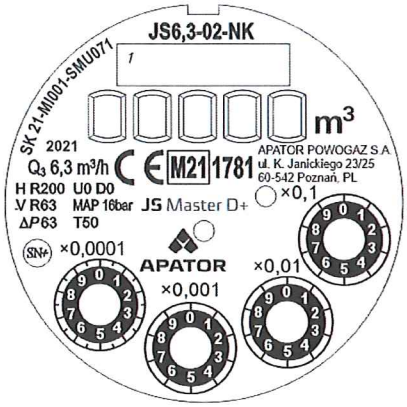
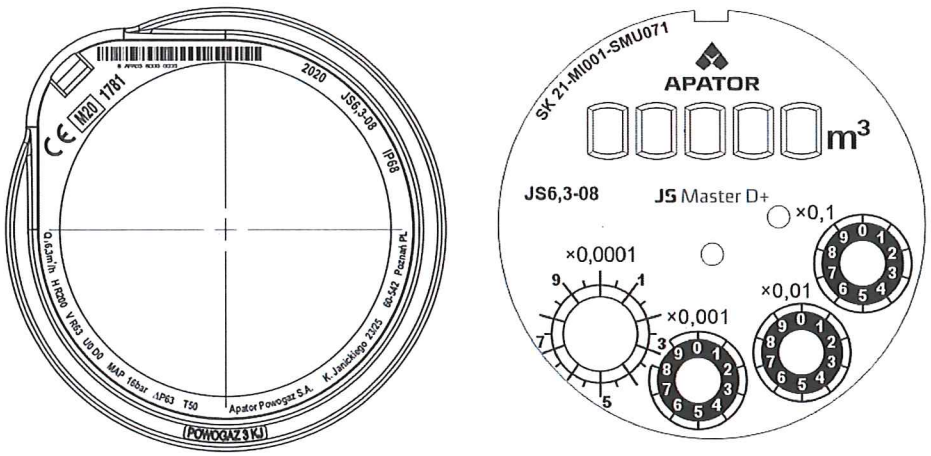


Picture No.2 Examples of the dial marking





Picture No.3 Examples of the dial marking

8 Conditions of conformity assessment of measuring instruments produced with type approval

Vane-wheel single-jet water meters put onto the market in line with the procedure of conformity assessment according to the Annex No.2 (Module D or F) of the Governmental ordinance should be in compliance with the technical description by the item 3 of this report and at test should be in compliance with the requirements determined in OIML R 49-1:2013 and ISO4064-1:2017. Metrological test is performed by testing equipment which should be in compliance with the requirements determined in STN EN 14154-3:2005+A2 and ISO4064-2:2017 and water at temperature 20 °C ± 5 °C (for temperature class T30, T50, T130) and 50 °C ± 5 °C (for temperature class T130, T30/130) at the following flowrates:

a) Minimum flowrate $Q_1 \leq Q \leq 1{,}1Q_1$
b) Transitional flowrate $Q_2 \leq Q \leq 1{,}1Q_2$
c) Permanent flowrate $0{,}9Q_3 \leq Q \leq Q_3$

A metrological test may only be performed by a producer, or a notified body respectively in line with the conformity assessment procedure according to the Annex No.2 (Module D or F) of the Governmental ordinance respectively.

9 Measures asked for providing measuring instrument integrity

9.1 Identification

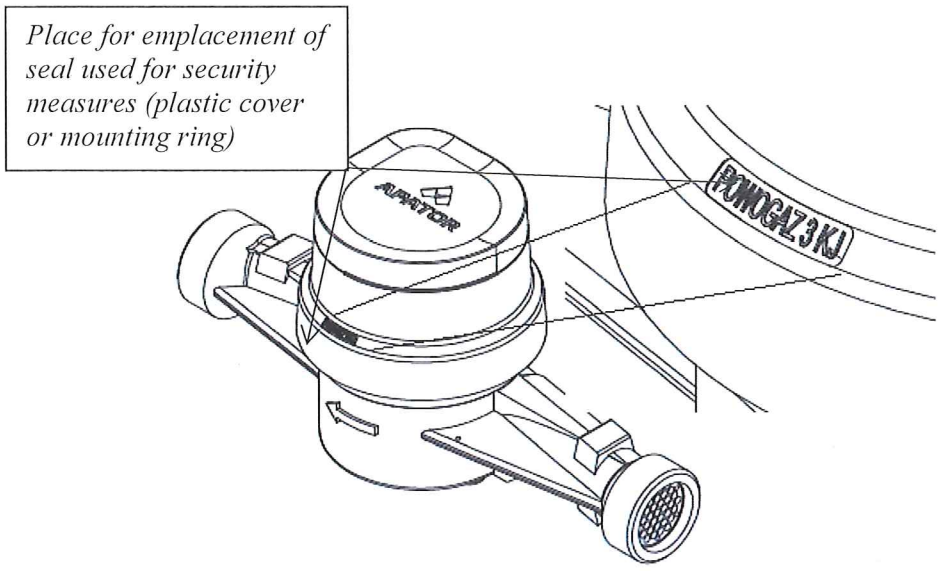
Vane-wheel single-jet water meter should be in compliance with the description provided on item 3 of this Annex and should be in compliance with the marking specified the item 7 of this Annex. The number given to the EU-type examination certificate is put at each piece of the measuring instrument.

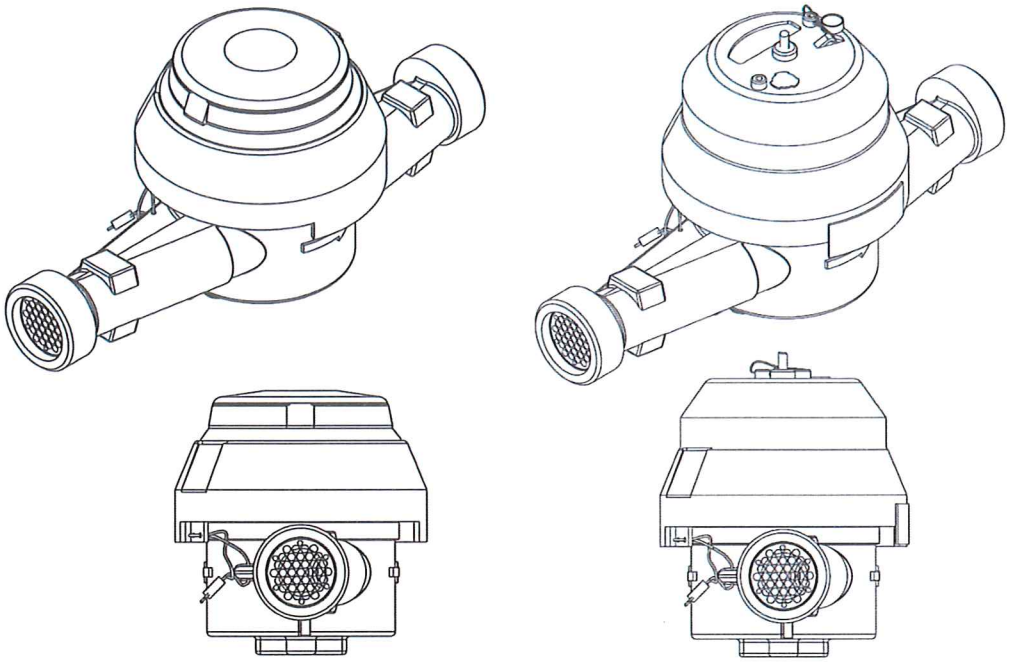
Emplacement of the conformity mark is followed by § 15 of the Governmental ordinance.

9.2 Sealing of the measuring instrument

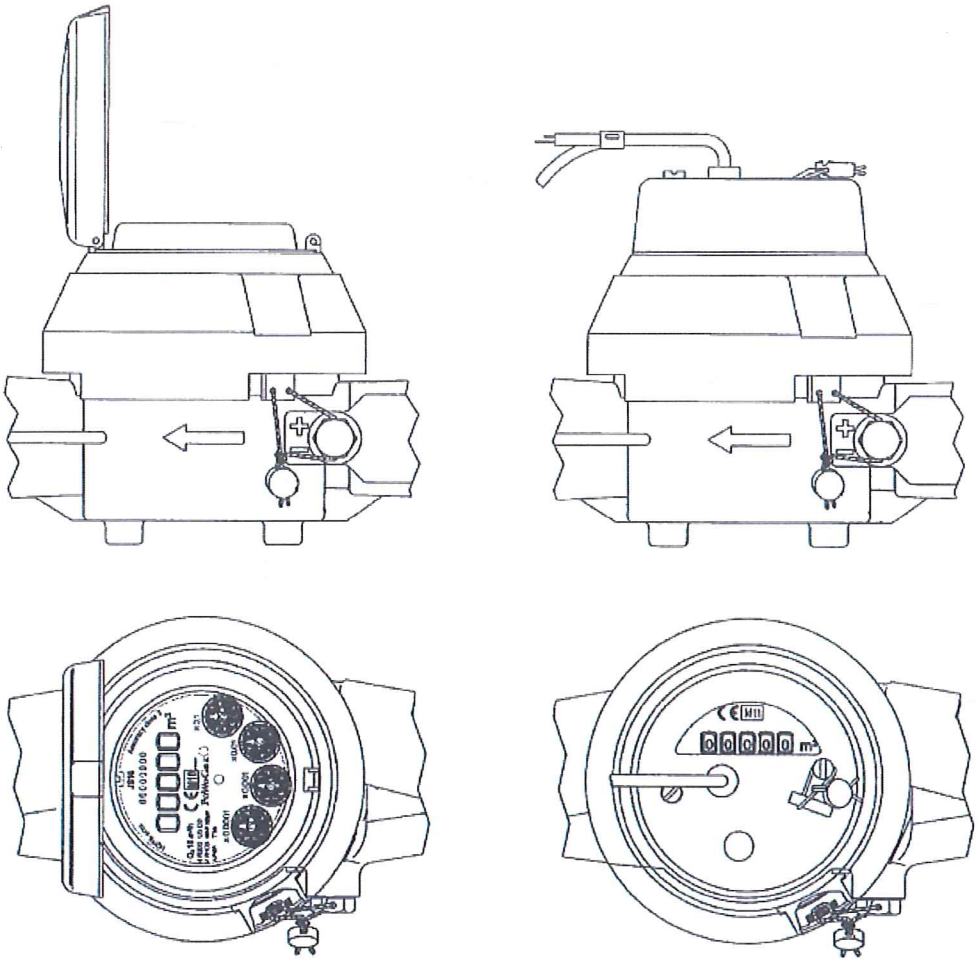
Vane-wheel single-jet water meter shall be before the conformity assessment according to the Annex No.2 (Module D or F) of the Governmental ordinance sealed by following sealing mark:

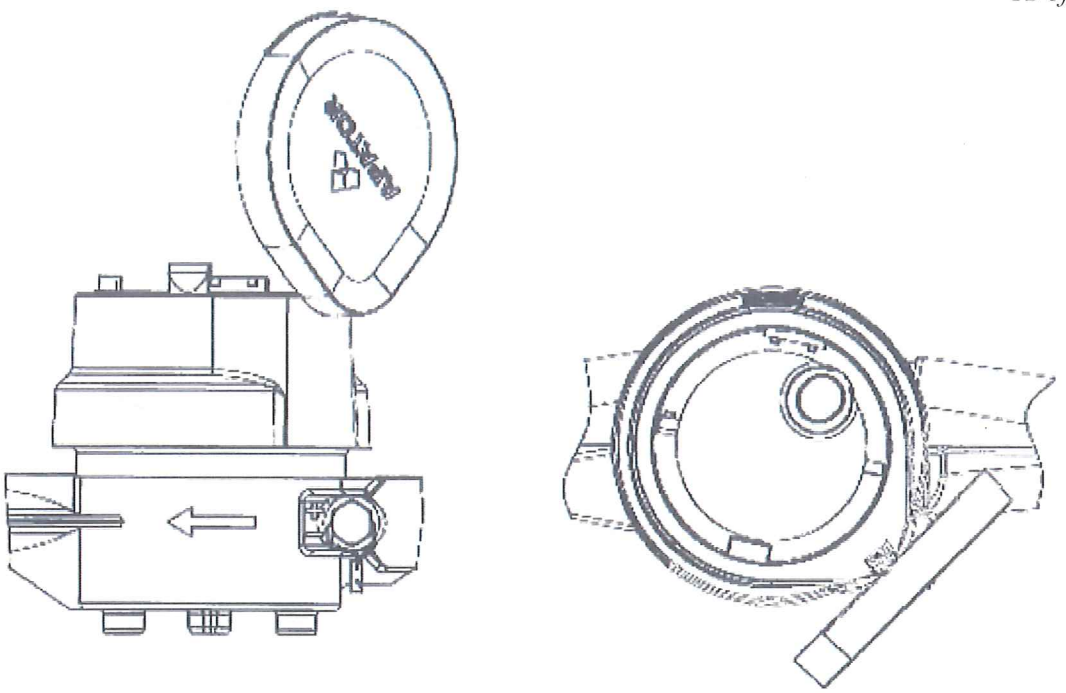
Connection of counter cover and water meter body shall be sealed by seal used for security measures (plastic self-sealing covers, mounting rings, wire type seal)





Picture No.4 Emplacement of the seal used for security measures in versions without adjusting channels with wire and round



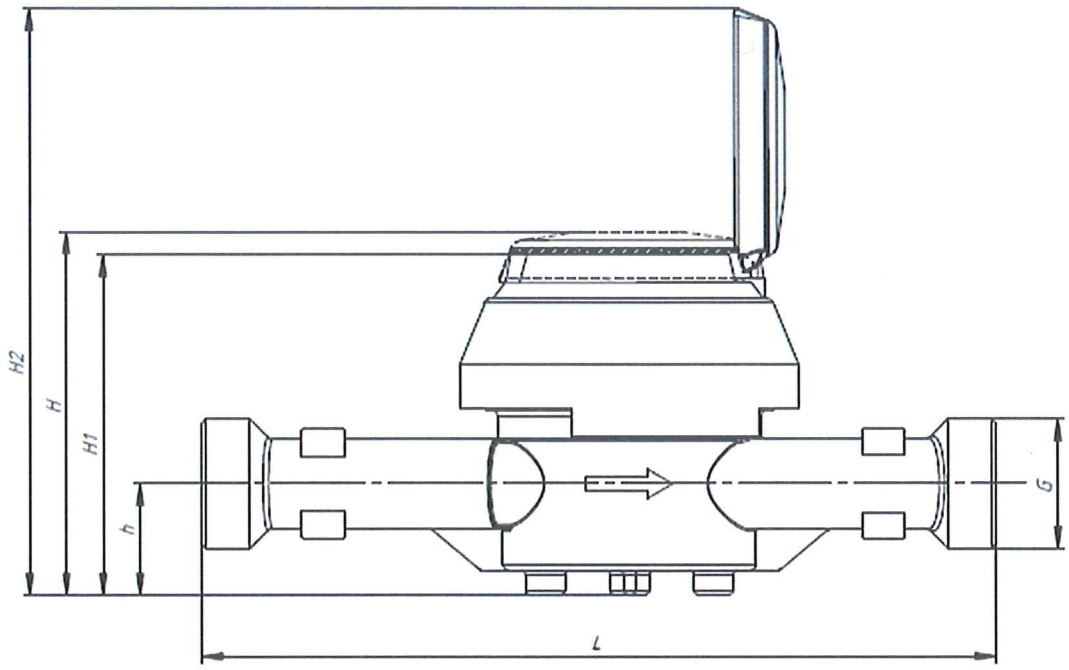


Picture No.5 Emplacement of the seal used for security measures in version with adjusting channel

10 Requirements for installation, especially conditions of using

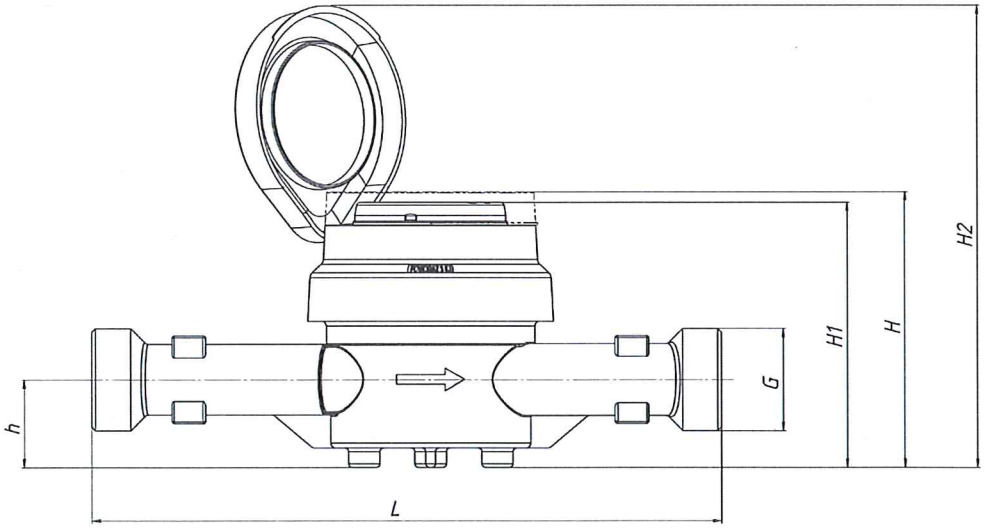
10.1 Installation data

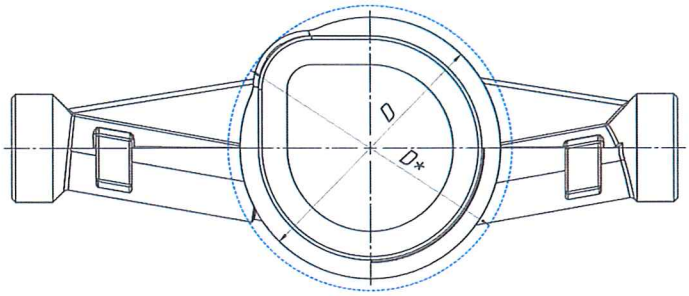
Water meter version	DN	L	G	D	D*	h	H	H1	H2
JS6,3-01/JS130-6,3-01	25	165-260	G 1 1/4	102	110	24,1	117	109	190
JS10-01/JS130-10-01	25	260	G 1 1/4	102	110	24,1	117	109	190
JS10-01/JS130-10-01	32	260	G 1 1/2	102	110	24,1	117	109	190
JS16-01/JS130-16-01	40	300	G 2	102	110	24,1	117	109	190



Picture No.6 Installation dimensions (Standard version JS-01, JS130-01)

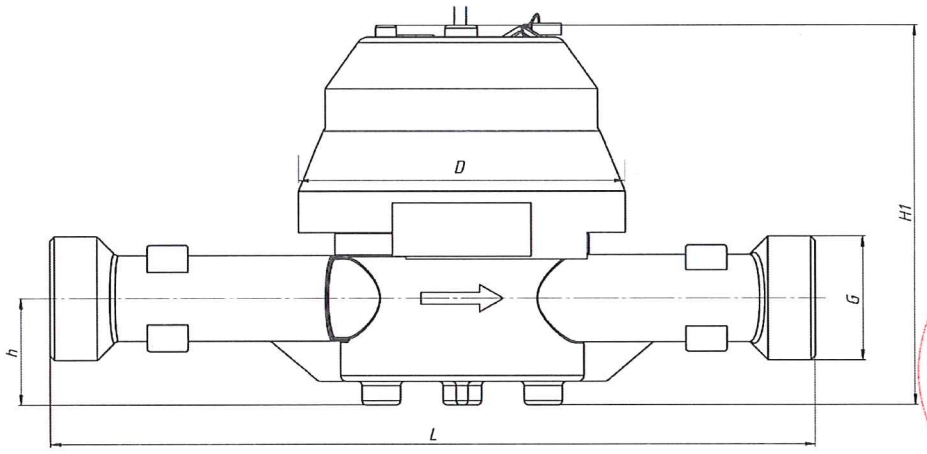
Water meter version	DN	L	G	D	D*	h	H	H1	H2
JS6,3-02/JS130-6,3-02	25	165-260	G 1 1/4	102	110	24,1	114	109	190
JS10-02/JS130-10-02	25	260	G 1 1/4	102	110	24,1	114	109	190
JS10-02/JS130-10-02	32	260	G 1 1/2	102	110	24,1	114	109	190
JS16-02/JS130-16-02	40	300	G 2	102	110	24,1	114	109	190





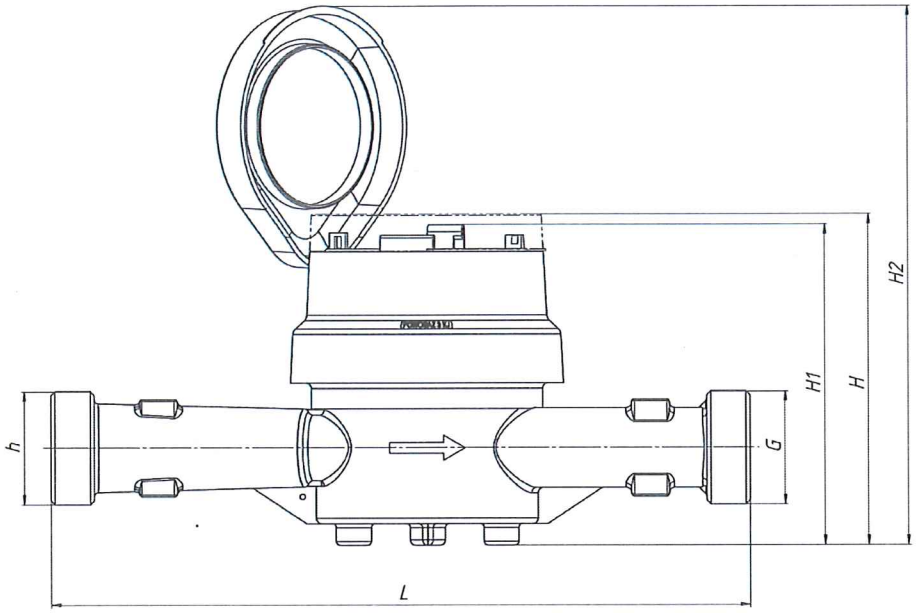
Picture No.7 Installation dimensions (Standard version JS-02, JS130-02)

Water meter version	DN	L	G	D	D*	h	H	H1	H2
JS6,3-NK (NKP)/JS130-6,3- NK	25	165-260	G 1 1/4	111	-	24,1	-	129	-
JS10- NK /JS130-10-NK	25	260	G 1 1/4	111	-	24,1	-	129	-
JS10- NK /JS130-10-NK	32	260	G 1 1/2	111	-	24,1	-	129	-
JS16- NK /JS130-16-NK	40	300	G2	111	-	24,1	-	129	-



Picture No.8 Installation dimensions (Light version JS-01-NK, JS130-01-NK)

Water meter version	DN	L	G	D	D*	h	H	H1	H2
JS6,3-07/JS130-6,3-07 JS6,3-08/JS130-6,3-08	25	165-260	G 1 1/4	111	-	24,1	-	129	-
JS10-07 /JS130-10-07 JS10-08 /JS130-10-08	25	260	G 1 1/4	111	-	24,1	-	129	-
JS10-07 /JS130-10-07 JS10-08 /JS130-10-08	32	260	G 1 1/2	111	-	24,1	-	129	-
JS16-07 /JS130-16-07 JS16-08 /JS130-16-08	40	300	G2	111	-	24,1	-	129	-



Picture No. 9 Installation dimensions (Light version JS-07, JS-08)

10.2 Installation requirements

A vane-wheel single-jet water meter is introduced into the operation by a worker having a certificate for this activity performance. The vane-wheel single-jet meter is possible to be put into use after a construction in line with this report and in line with the producer instruction by "Instruction of installation and conditions of use of water meters". A measuring instrument should be installed in direction of water flow arrow marked on the meter body.

The indicating device can be oriented in the position indicating in the dial

- H↑ Mean flow horizontal and the indicating device position on the top
- H→ Mean flow horizontal and the indicating device position on the side
- V Mean flow vertical from bottom to top or from top to bottom

10.3 Conditions of use

The measuring instrument should be used within the recommendations of a producer or manufacturer: "Instruction of installation and conditions of use of water meters".

Assessment done by: Ing. Viliam Mazúr

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