

# ES CERTIFIKÁT TYPU

## EC – Type-examination certificate

Číslo dokumentu:

Document number:

**SK 09-MI001-SMU009****Revision 2**

Revízia 2 nahrádza certifikát zo dňa 15 júna 2010

Revision 2 replaces the certificate issued by June 15, 2010

V súlade:

In accordance with:

nariadením vlády Slovenskej republiky č. 294/2005 Z. z. o meradlách, ktorým sa preberá smernica Európskeho parlamentu a rady 2004/22/ES z 31. marca 2004 o meradlách

Government Ordinance of the Slovak Republic No. 294/2005 Coll., on measuring instruments, which implemented the Directive 2004/22/EC of the European Parliament and Council of March 31, 2004 on measuring instruments

Žiadateľ/Výrobca:

Issued to (Manufacturer):

**Apator Powogaz S.A.****ul. Klemensa Janickiego 23/25, 60 – 542 Poznań, Poľská republika**

Druh meradla:

Type of instrument:

**Vodomer (MI001) / Lopatkový jednvtokový vodomer na studenú a teplú vodu**

Water meter (MI001) / Vane-wheel single-jet water meter for cold and hot water

Označenie typu:

Type designation:

**JS, teplotná trieda T90**

JS, temperature class T90

Základné požiadavky:

Essential requirements:

príloha č. 1 a príloha MI-001 k nariadeniu vlády SR č. 294/2005 Z. z.

Annex No. 1 and Annex MI-001 to Government Ordinance of SR No. 294/2005 Coll.

Platnosť do:

Valid until:

**21. september 2019**

September 21, 2019

Notifikovaná osoba:

Notified body:

**1781**

Dátum vydania:

Date of issue:

**11. apríla 2011**

April 11, 2011

Základné charakteristiky, popis meradla a podmienky schválenia sú uvedené v prílohe, ktorá je súčasťou tohto certifikátu. Certifikát vrátane prílohy má spolu 8 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 8 pages.

  
Dr. Anna Nemečková

osoba oprávnená konať v mene notifikovanej osoby č. 1781

Notified body No. 1781

Poznámka: ES certifikát typu je bez pečiatky a podpisu neplatný. Tento ES certifikát typu môže byť rozmnožovaný len celý a nezmenený. Rozmnožovať jeho časti je možné len s písomným súhlasom Slovenského metrologického ústavu.

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## 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. 294/2005 Coll. (next Government Ordinance), on measuring instruments, which implemented the Directive 2004/22/EC of the European Parliament and Council of the March 31, 2004 on measuring instruments.

Requirements are listed in No. 1 and Annex MI-001 to Government Ordinance of SR No. 294/2005 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+A1	Water meters - Part 1: General requirements
EN 14154-2:2005+A1	Water meters - Part 2: Installation and conditions of use
EN 14154-3:2005+A1	Water meters - Part 3: Test methods and equipment

### 1.3 Other instructions used

OIML R 49-2:2006	Water meters intended for the metering of cold potable water and hot water. Part 2: Test methods
OIML R 49-3:2006	Water meters intended for the metering of cold potable water and hot water. Part 3: Test report format

## 2 Type marking

### Vane-wheel single-jet water meter for cold and hot water - JS

Meter is made in following subgroups:

Type of meter	Temperature class	Class	Nominal Diameter
JS	T90	M1 <sup>1)</sup> B <sup>2)</sup> E1 <sup>1)</sup>	DN15, DN20

## 3 Description of measuring instrument

**Meter name:** Vane-wheel single-jet water meter for cold and hot water

**Type marking:** JS

### Description of operating principle instrument design:

Vane-wheel single-jet water meters JS with permanent flow rates of 1,6 m<sup>3</sup>/h, 2,5 m<sup>3</sup>/h and 4 m<sup>3</sup>/h have been designed to measure actual volume of clean cold and hot potable water flowing in a completely filled up closed pipeline. The water meter for cold and hot water 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.

<sup>1</sup> according to Government Ordinance of the Slovak Republic, Annex No. 1

<sup>2</sup> according to EN 14154-3:2005+A1 and OIML R 49-2:2004





Vane-wheel single-jet water meters JS are composed of two basic assemblies:

1. measuring unit
2. counting mechanism

Water meters may be equipped with units that improve their resistance to external magnetic field. These meters may be additionally marked “SN+”

The counting mechanism has been set so that it can be easily adjusted by rotation to facilitate readout.

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

Water meters have been fitted for mounting on pipelines in horizontal and vertical positions. Accidental occurrence of a reverse flow does not affect metrological characteristics provided for a normal flow.



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

### 3.1 Description of subgroups

Marking: JS

DN: DN15, DN20

Due to the designing solutions adopted and application range assumed for water meters JS with permanent flow rates of 1,6 m<sup>3</sup>/h, 2,5 m<sup>3</sup>/h and 4 m<sup>3</sup>/h there were introduced diverse varieties of meters marked with JS90-X-YY or JS90-X-NKYY or JS90-X-NKPYY,

Where: X is the value of permanent flow rate: 1,6 m<sup>3</sup>/h, 2,5 m<sup>3</sup>/h and 4 m<sup>3</sup>/h and YY is a version of the basic design with or without the pulse transmitter.

For example:

- JS90 2,5 – version with a 5-roller counter,
- JS90 2,5-01 – version with a plastic body,
- JS90 2,5-02 – version with an 8-roller counter,
- JS90 2,5-04 – version with a counter adapted for fitting a radio or remote reading transmission device,
- JS90 2,5-NK – version with a reed contact pulse transmitter,
- JS90 2,5-NKP – version with an output for a reed contact pulse transmitter,
- JS90 2,5-NK-01 – version with a reed contact pulse transmitter and a plastic body,
- JS90 2,5-NKP-01- version adapted to fit a reed contact pulse transmitter and with a plastic body.

### 3.2 Measuring insert

The main elements of the measuring unit are the following:

- a body with a strainer set in the inlet channel and a basic axle pressed into the body bottom without any additional swelling plate in the body bottom or with an swelling plate fixed to the body bottom,
- a vane-wheel,
- a packing plate.

The vane-wheel is borne on a basic axle and in a bearing sleeve mounted on the packing plate. There is a magnet of a magnetic clutch on the vane-wheel. The packing plate is fitted with an adjusting ribs angled to water flow, which allows meter adjustment.

### 3.3 Indicating device

The capacity of the counter is 99 999 m<sup>3</sup> and resolution of the reading is 0,05 dm<sup>3</sup>.

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 axle of the counting mechanism on which the magnet of the magnetic clutch has been fixed there is a small unit disk that performs a function of a vane-wheel rotation indicator. The unit disk is also used in the process of electronic testing of meters.

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 water meter in the version with a reed contact pulse transmitter – NK and NKP varieties – in the counting mechanism, on one of the pointers a magnet is fixed to short-circuit reed relay contacts and the counter casing is equipped with a socket to connect the transmitter assembly. The counter casing with the transmitter is protected with a magnetic shield.

The water meter in the version adapted for fitting of the radio or remote meter reading devices on one of the pointers a magnet has been fixed or reflective pointers to short-circuit reed relay contacts and the counter casing has been suited to fit a radio device for wireless reading or a remote meter reading device.

Connection between the measuring unit and counter gear is provided by both a guarding and a fixing ring or by a fixing ring alone. The guarding ring may be equipped with a cover. On endings of the fixing rings seal holes is provided.

### 3.4 Principle of operation

The water meter operates on the principle of a water speed sensor by impeller wheel. The operating speed of the wheel is proportionated to the speed of overflowing water. The operating speed is proportionated to water delivered quantity. The water meter is dedicated to measure the flow and the delivered cold and hot water quantity.





### 3.5 Technical documentation

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

9562-020000	9007-980000	9561-000000	JS04-MAT
9564-010000	9443-000000	9562-000000	JS-NK-MAT
9007-020000	9444-000000	9563-000000	Mech JS_M
9007-060000	9445-000000	9564-000000	JS_8B
9007-260000	9475-000000	9586-000000	Mech JS_04
9007-320000	9476-000000	9588-000000	Mech JS_NK
9007-380000	9477-000000	9589-000000	JS_8B-04
9007-600000	9478-000000	JS_PODST-MAT	JS_M Plomba WE
9007-880000	9479-000000	JS_PODST-MAT-04	JS_M_NK Plomba WE
9007-920000	9560-000000	JS01-MAT	Mech JS_04
JS-L=110_115_G3/4-G3/4	JS-L=115_G3/4-G7/8	9065-040201	9450-010500
9450-010300	9000-010503	9007-010500	9007-130500
9007-140500	9007-510600	9007-550600	

All drawings, schemes and technical documentation's used during the conformity assessment are saved in document No. NO-061/08 and No. NO-088/09.

## 4 Basic technical characteristics

Type marking		JS	
Nominal diameter DN	mm	15	20
Indicating range	m <sup>3</sup>	10 <sup>5</sup>	
Resolution of the reading	m <sup>3</sup>	0,00005	
Water pressure class	-	MAP16	
Working pressure range	bar	from 0,3 to 16	
Pressure loss class	-	Δp 63	
Temperature class	-	T90	
Flow profile sensitivity classes	-	U0, D0	
Position	-	H, V	
Climatic and mechanical environments	-	closed spaces /from 5°C to 55°C/mech. class M1	
Electromagnetic environments	-	E1	
Impulse number NK, NKP, YY	dm <sup>3</sup> /imp	0,25; 1; 2,5; 10; 25; 100; 250; 1000	

### 4.1 Additional technical characteristics

Weight	from 0,35 kg to 0,55 kg
Meters equipped with units that improve their resistance to external magnetic field	Additional „SN+“ mark



## 5 Basic metrological characteristics

The maximum permissible error (accurate class):

$$\pm 5 \% (Q_1 \leq Q < Q_2)$$

$$\pm 2 \% (Q_2 \leq Q \leq Q_4) \text{ for water temperature (from 0,1 to 30) } ^\circ\text{C}$$

$$\pm 3 \% (Q_2 \leq Q \leq Q_4) \text{ for water temperature greater than 30 } ^\circ\text{C}$$

Temperature class	T		-	90			
Diameter	DN		mm	15	15	20	20
Minimum flow rate	$Q_1$	H	m <sup>3</sup> /h	0,02	0,03125	0,03125	0,05
		V	m <sup>3</sup> /h	0,04	0,0625	0,0625	0,1
Transitional flow rate	$Q_2$	H	m <sup>3</sup> /h	0,032	0,05	0,05	0,08
		V	m <sup>3</sup> /h	0,064	0,10	0,10	0,16
Permanent flow rate	$Q_3$		m <sup>3</sup> /h	1,6	2,5	2,5	4
Overload flow rate	$Q_4$		m <sup>3</sup> /h	2	3,125	3,125	5
Measuring range R	$Q_3/Q_1$	H	-	80			
		V	-	40			
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. 7726/230/142/11- revision 2 dated March 25, 2011 give sufficient evidence that the technical design of the measuring instrument – Vane-wheel single-jet water meter type JS is in compliance with the technical requirements of the Slovak Republic Governmental Ordinance No. 294/2005 Coll. On measuring instruments, Annex No. 1 and MI-001, and the EN 14154-1:2005+A1 and OIML R 49-1:2006 standards.

## 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:

- producer's name or his production mark
- type of the single-jet water meter
- measuring unit m<sup>3</sup>
- numerical value of  $Q_3$  and ratio  $Q_3/Q_1$
- production number and the year of production
- number of ES certificate type and conformity mark
- the highest admissible pressure if it differs from 1 MPa
- flow direction
- the letter V or H, if the meter can only be operated in the vertical or horizontal position
- class of pressure loss if it differs from  $\Delta p_{63}$
- class of climatic and mechanical environment
- flow profile sensitivity classes
- class of electromagnetic environment
- the temperature class where it differs from T30





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

Vane-wheel single-jet water meters for cold and hot water put onto the market in line with the procedure of conformity assessment according to the D or F Annexes 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 49-1:2006. Metrological test is performed by a testing equipment which should be in compliance with the requirements determined in EN 14154-3:2005+A1 and water at temperature  $20\text{ °C} \pm 5\text{ °C}$  and  $50\text{ °C} \pm 5\text{ °C}$  at the following flowrates:

- a) Minimum flow rate  $Q_1 \leq Q \leq 1,1Q_1$
- b) Transitional flow rate  $Q_2 \leq Q \leq 1,1Q_2$
- c) Permanent flow rate  $0,9Q_3 \leq Q \leq Q_3$

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 D or F Annexes 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.

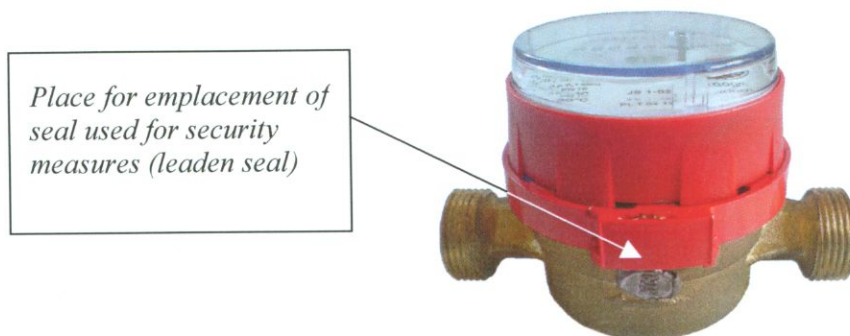
The number given to the EC certificate is put at each piece of the measuring instrument.

Emplacement of the conformity mark is followed by § 7 of the Governmental ordinance.

### 9.2 Sealing of the measuring instrument

Vane-wheel single-jet water meter shall be sealed before the conformity assessment according to the D or F Annexes by following sealing marks:

Connection of counter shelter and water meter body shall be sealed by seal used for security measures (leaden seal) (Picture No. 2)



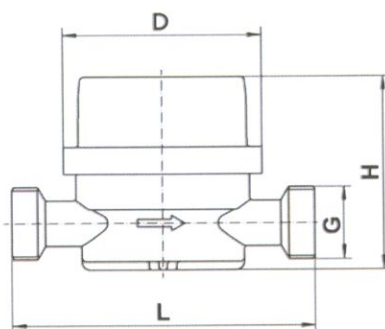
Picture No.2 Emplacement of the seal for security measures



## 10 Requirements for installation, especially conditions of usage

### 10.1 Installation data

Diameter	DN15	DN20
$G$	G3/4, G7/8	G 1
Construction length [mm] - $L$	80/110/115	115/130
Counter diameter [mm] - $D$	72	72
Weight [kg]	0,35-0,45	0,55
Height [mm] - $H$	75	75
Distance axle from edge [mm] - $h$	17	17



Picture No.3 Installation dimensions

### 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.

### 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. Miroslava Benková, Director of the Flow Centre

