SV RTK

Instruction manual

Volumetric Water Meters DN15 to DN40 SV-RTK

APATOR POWOGAZ

Contents

Congratulations on choosing our product. Below we present the operating instruction of the volumetric water meters with threaded connectors DN15 to DN40, manufactured by Apator Powogaz S.A., according to the procedures of its quality system. Please, read the instruction thoroughly before installing the meter in order to ensure usage according to its intended use.

1. The subject of the instruction

This instruction defines the criteria of correct choice, the conditions of correct installation, operation and maintenance as well as the rules regarding safety, environment protection and disposal of threaded volumetric water meters designed for measurement of volume of potable water used for domestic, business and small industrial purposes which flows in closed circuits (pipelines).

Table 1. Types of Water Meters and Their Intended Uses

Water Meter Type	Use
SV-RTK standard version	Cold water min 0.1°C - max 30°C Operating pressure max 1.6 MPa (16 bar) IP65 counter Counter adapted to a reed switch transmitter

Table 2. Types of Water Meters and Their Intended Uses

Water Meter Type	Installation Orientation			Counter Location
	Horizontal	Vertical	Diagonal	
SV-RTK standard version	OK	OK	OK	

Table 3. Continuous Flow Rate

Water Meter Type	SV-RTK standard version
Size / Nominal Diameter (mm)	**Continuous flow rate Q3 (m^3/h)**
15	2,5
20	4,0
25	6,3
32	10
40	16

2. Technical data – standards and regulations

Technical data is included in the specification sheets for each type of water meter. Water meters comply with the following standards and regulations:

- Directive 2004/22/EC of the European Parliament and the European Council of 31 March 2004 (Measuring Instruments Directive – MID)
- EN 14154 standards harmonised with directive 2004/22/EC of the European Parliament and the European Council of 31 March 2004
- ISO 4064 – Measurement of water flow in conduits. Water meters for cold potable water
- OIML R49 – Water meters intended for the metering of cold potable water and hot water

The basic requirements regarding the installation of water meters can be found in standards:

- EN 14154-2: Installation and operating conditions

3. Description of proper water meter operation

The volumetric water meters type SV-RTK are designed to measure, memorise and display the volume at metering conditions of water passing through the measurement transducer in the sense of the Directive 2004/22/EC of the European parliament and the European Council of 31 March 2004, as amended.

The water meters type SV-RTK are positive displacement meters with rotary piston.

The water meters type SV-RTK consist of a brass casted body with connecting threads and inlet strainer, a wet measuring unit, a pressure plate, an o-ring, a gasket, a screwed plate a dry mechanical indicating device (standard counter) and clamp on plastic cover.

The measuring unit consists of an internal strainer, a piston chamber with plastic shaft with stainless steel holder, a bush, a plate, a piston with stainless steel shaft, a piston chamber cover, an o-ring, a transmission shaft with magnetic holder.

The mechanical indicating device, dry (standard counter), are formed by numbered rollers with eight drums and one rotary pointer. There is star wheel with six arms which can be used for rapid testing in mechanical indicating device.

4. Choosing the right water meter size

The main criterion for choosing the right water meter size (nominal diameter) should always be the water meter working conditions, that is the average and maximum value of a passing water working flow.

When a water meter is too large, it does not only increase the investment cost, but also has lower accuracy in cases of small water flow.

A too small water meter can cause its overload, and simultaneously quicken the wear of its active parts.

In order to ensure that the water meter works within its measurement range and the acceptable accuracy error ranges, you have to specify the scope of its work during the day, or define this scope based on the monthly water consumption, taking into account the minimum and maximum values of flow rate.

It is recommended to choose the size of the water meter so that the size of the largest expected flow rate in the system is between 0.5 and 0.7 of the water meter constant flow rate Q3.

Values of constant flow rate Q3 for a given type of water meter were provided in table 3. Using the correct type of water meter depends also on the temperature, water pressure, water meter conditions of installation

to the pipeline, as well as the need to transmit indications and the flow rate measurements. When choosing a water meter the pressure loss caused by the installation is important as well.

5. Testing at the receipt

The water meter supplied by the manufacturer should be checked for possible external damage which occurred during transport, especially the body and its threads and the counter cover, as well as the transmitter cable (in the case of supply with pulse transmitter). Also check the labelling of the water meter.

The following markings are located on the counter disc, plaque or body of the water meter:

- name and marking of a manufacturer
- mark of test type according to MID
- manufacturer's mark of type
- water meter number
- metrologic marking consists of an upper-case M and two last digits of the water meter year of production when the marking was placed on the measurement instrument
- flow direction, as an arrow
- flow rate value Q3 per m^3/h
- marking of measurement unit in m^3 (on the counter dial)
- value of the maximum pressure loss ΔP
- value of the upper pressure limit: MAP16

6. Conditions of correct installation of a water meter

Place of installation for water meters should be easily accessible for installation, deinstallation and operation, reading indications, separated from utility and industrial rooms. Protected from negative atmospheric conditions and protected from the influence of electrical and gas installations. In case there is no such place, the water meter may be installed in the water meter well, and additionally the water meter and its equipment should be installed far enough from the well bottom. The well should be fitted with a settling pond or a water outlet.

In the location of installation, the water meter cannot be at risk of being hit or be subjected to vibrations caused by other devices in the vicinity, or subjected to high ambient air temperature, contamination, flooding and corrosive action of the surroundings. Temperature in the installation location should not be lower than 4°C. The water meter should be protected from influence of such hydraulic phenomena such as cavitation or hydrodynamic water hammering.

Before, and after the water meter, provide the valves in order to cut off the water supply if there is need for deinstallation or repair. Use valves which can entirely reveal the cross-section of a water pipe.

In case of expected water contamination during the time of operation install a filter or a settling tank between a valve and a straight pipe section and before the water meter.

For an installation of a water meter which does not cause strain in the body it is recommended to use compensative connectors installed at the output, which enable for the length reduction by extending the telescopic connector sleeve.

The pipe in the installation location should be shaped so that there is no possibility for an air pocket to be created in the water meter. Water meter has to be entirely filled with water.

Water meter should not be under risk of excessive strain caused by pipelines and equipment. If necessary, install it on a pedestal or in a grip. What is more, the pipes connecting on the inlet and outlet side should be adequately fastened, so that no part of the system is dislocated by the water when the water meter is deinstalled or disconnected from one side.

During installing a meter in the water network, observe the correct water meter orientation according to the design: for horizontal, vertical and diagonal operation (Table 2).

Volumetric water meters according to table 3, with or without non-return valve, work without the need to take into account straight sections before (U0) and after the water meter (D0).

Pipe sections before and after the water meter should be coaxial. Gaskets should be placed concentrical in relation to the pipe. Eccentric installation of a water meter in a pipe is not permitted, in particular the dislocation of gaskets between the water meter and the pipe so that they cover a part of the free pipe cross-section at the water meter and interrupt the flow.

Water flow through the water meter should correspond to the direction of arrows placed on both sides of the body.

Water meters are appropriate for threaded installation. Threads are made according to the standard ISO 228-1.

7. Filling with water and start-up of a water meter

Before installing the water meter, the pipeline should be flushed in order to remove contamination, and the filter (if it is used) should be cleaned. During flushing, use a spigot to replace the water meter.

Before installation, check the operation of a water meter by starting a rotating motion of a rotor while observing the rotation or the rotation of the counter indicators. Check the lead seal condition.

Before installing the water meter, water should be supplied freely to the pipeline, with the vents open so that the air that leaves the system does not cause excessive water meter rotations, which causes the device damage.

During operation, the valves before and after the water meter should be entirely open.

After performing all the actions related to the start-up, check the water meter operation by observing the increase of the counter indication.

During operation, check whether the actual operating conditions correspond to the water meter intended use, in particular in terms of permitted pressure, temperature and flow.

8. Maintenance, inspection and repairs

Water meter is an instrument which measurement capacity changes over time. Moreover, the deterioration of this capacity is generally a result of aggressive water influence, that is why, after some time it should be deinstalled from the network, inspected or repaired.

Expiry dates of the compliance assessments are specified in the metrologic regulations. After deinstallation of the water meter from the mains, it is recommended to thoroughly check its indication accuracy for the purpose of comparison, and only after this is done, start the disassembly and cleaning. Do not use cleaning chemicals which have harmful influence on the materials from which the water meter elements are made of. It is unacceptable to use for cleaning any chemical reagents which cause corrosion of materials or which are solutions, particularly for plastics, or which cause accelerated ageing of gaskets.

Repairs should be performed in specially prepared water meter repair stations, or in service plants.

When the repair necessitates replacement of parts, use only original spare parts supplied by Apator Powogaz S.A. After the repair, the water meters are checked according to the current regulations.

9. Storage and transport

Water meters received from deliveries or deinstalled from the mains should be stored with counter face up or on the side, in a closed room free from caustic, stinking vapours etc. which have a destructive effect on the water meter condition. The room temperature should be between 5°C and 50°C, and air relative humidity no more than 90%. Both during transport and storage, the water meter should be protected from vibrations and in particular from shock which may cause damage of body or internal elements. The transport should take place with covered means of transport in manufacturer's packaging or a substitutive package which entirely protects the product from damage.

10. Malfunctions and removing them

If the counter does not indicate anything as the water flows, check whether the inlet sieve is not jammed by dirt. If the water meter does not work after cleaning and in any other case it is not working, give it to be repaired. Remember to share your observations. If the pulse transmitter is not working, notify the supplier. If after the consultation with the supplier the fault cannot be removed, the water meter should be left at a service.

11. Safety requirements and environmental aspects

The water meter is a measurement device which is safe to use if installation and operation requirements adequate for the intended use are observed.

During installation, handling and operation there may be risks relating to the water meter itself:

- Mechanical threats:
  - If carried improperly, it may fall
  - Water leaks and flooding due to installation of the product which does not agree with installation requirements or excessive water pressure
- Thermal threats:
  - Scalding due to contact with the used water meter

In order to install and use the water meter, choose an easily accessible place.

Water meter components do not contain substances harmful for health and the environment. All water meters are hygienically approved for potable water contact.

Counter seals (IP65) and other design solutions protect the water meter from negative influence of steam condensation on correct reading of indication or transmitter operation.

Classification of environmental requirements according to EN 14154-3+A1:

- Classification of mechanical environmental requirements - class M1
- Classification of climatic and mechanical environmental requirements - class B
- Classification of environmental electromagnetic requirements - class E1

12. Value of water meter pulse

The value of water meter pulse for a pulse transmitter is defined in Table 4.

In order to extend the standard transmitter cable, use a cable with a single conductor diameter of at least 0.75 mm^2, taking into account the recommendation, that the total impedance of the extended section should not be higher than 500 Ohm. See to it that the extended cable does not cross with the existing layout of power supply or automatic control cables. Warning: use the shortest possible extension.

Table 4. Value of Water Meter Pulse

Water Meter Type	**SV-RTK standard version**
Size (mm)	**Pulse value (L)**
15	1
20	1
25	1
32	1
40	10

13. What to do with used product packages

The package is made of recyclable corrugated board. You can dispose of it in every waste paper purchase point. Additional information regarding the re-cycling of particular materials water meters are built of as well as proper disposal methods can be obtained in relevant company departments.

14. User's evaluation

The operating instructions are constantly updated. You can help us optimize the operating instruction to better suit the users' needs by sending us your suggestions. Please, send all the remarks regarding the operating instruction as well as the use of flow transducers to the manufacturer's address.

Warning!

Within the range of the technological progress, the manufacturer reserves the right to introduce changes to the manufactured products without marking them in the operating instruction as long as the main features of the product are preserved. We send a spare parts catalogue upon the client's request.

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