



WATER METERING



## PREPAID WATER METER SYSTEMS

### AquaCode



Thanks to a prepayment system based on 6-digit codes, it is possible for the administrator to achieve almost 100% recoverability of fees for supplied water. The user can purchase further system prepayments by sms premium or through the Internet, without leaving his home. In addition, the system allows him to reduce significantly the costs related to reading water meters, issuing of bills for water and managing fee collection for the supplied water. The system also eliminates the unauthorized intervention in water meter readings, such as by the use of a strong external magnetic field. The system allows the consumer to monitor the water consumption levels, which contributes to achieving substantial savings in both consumption and fees.

#### USE

The prepaid system is recommended for water distribution systems where there are problems related to water consumption charges or where there is often a change of water consumer. This system has proven effective for rented flats, council houses and holiday homes. The main element of the prepaid unit is the type JS water meter, intended for horizontal water supply installations, with a counter facing upwards (H) or in the vertical position (V).



NEW

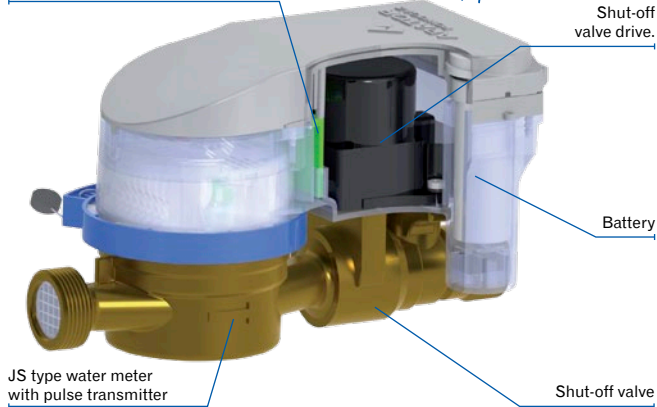
MID R to 160



## PREPAID SYSTEM



An electronic module with a signal receiver control unit to open the valve and a water meter impulse counting system that determines when to close the valve after flowing the purchased volume of water.



PREPAID WATER METER SET



An information display for: valve status and battery life, error and debit modes, device number and code, as well as the remaining volume of water to be used.

WIRELESS CONTROL UNIT



SOFTWARE

## DESCRIPTION OF SYSTEM OPERATION

The prepaid system for water meters is intended to settle water consumption on the basis of advance payments using 6-digit codes that allow consumption of a set amount of water specified by the administrator. The control unit memory contains 700 codes stored in a precise order; these codes are entered by the user using a keyboard in order to supply a specific volume of water. When a valid code is entered, the control unit transmits a wireless signal to the receiver located in the water meter set, which opens the water flow valve. Each code is predefined by the administrator (this value can be any volume of water within the range 0.02 to 650 m<sup>3</sup>). Water consumption is calculated on the basis of readouts of the water meter sent by the impulse transmitter to the electronic module. When the purchased credit is exhausted, further water flow is prevented by closing the valve. The system is supplemented by a debit system, which allows the user to continue water consumption when the basic credit is finished in the absence of any possibilities to purchase the next code (e.g. during holidays). The debit value is predefined by the administrator (it can be any water volume within the range 0.2 to 10 m<sup>3</sup>). To initiate the debit, the customer has to activate the debit function on the control unit, which, at the same time, serves as a reminder that the basic credit is exhausted. The system is supplemented by a free program for issuing codes that can be installed on any PC with Windows XP or later. The following codes may be issued to users in the form of a printout, be transmitted via sms premium, or downloaded from the website.

## SYSTEM ADVANTAGES

### FOR THE ADMINISTRATOR / WATER SUPPLIER:

- Eliminating problems with bills not paid on time for the supplied water;
- Eliminating expenditures on collection services, printouts and sending bills, and monitoring of receivables;
- Eliminating thefts of water by interference in water meter operation. In the case of a strong external magnetic field being used, any attempt to remove the battery or cutting the internal power supply wiring, the valve shuts off the water flow;
- Eliminating possible fraud by inputting, in a precise order, one of the 700 6-digit codes stored in the control unit memory.

### FOR THE USER/WATER CONSUMER:

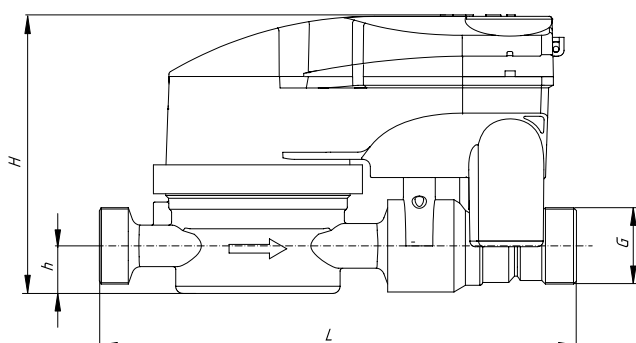
- Full control of expenditures on water with resulting savings in water consumption;
- Easy to service and easy to use;
- Convenience thanks to the ability to purchase codes via a website or mobile phone;
- The guarantee of water price constancy until total use of the purchased credit;
- The ability to purchase any amount of water depending on one's individual needs.

### SPECIAL FEATURES

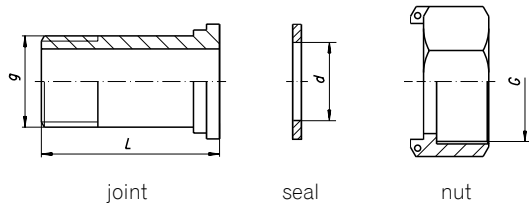
- Prepaid codes are impossible to falsify, which gives an advantage over prepaid systems using RFID or chip cards.
- Minimum battery life is 6 years (length of 1 certification period + 1 year), the battery lasts 700 valve opening/closing operations.
- When credit is exhausted by the user and, for a variety of reasons (e.g. the holiday season) it is impossible to purchase another code, the system allows use of the debit feature for an amount determined by the administrator. In such a case, the next payment automatically deducts any debit amount recorded by the system.
- When the credit is near to exhaustion or there is a low battery condition, the system informs the customer about this.
- Optional equipment includes a check valve in the valve body.

Table 1. TECHNICAL DATA

Parameter				JS	
				JS2,5	JS4,0
Nominal diameter	DN	mm	15	20	
Continuous volumetric flow	$Q_3$	m <sup>3</sup> /h	2,5	4	
Overloaded volumetric flow	$Q_4$	m <sup>3</sup> /h	3,125	5	
Transitional volumetric flow	H R160	$Q_2$	dm <sup>3</sup> /h	25	40
	V R63			63	102
	H R100			40	64
	V R50			80	128
Minimum volumetric flow	H R160	$Q_1$	dm <sup>3</sup> /h	16	25
	V R63			40	63
	H R100			25	40
	V R50			50	80
Starting threshold	R160	-	dm <sup>3</sup> /h	6	12
	R100	-	dm <sup>3</sup> /h	8	15
Ratio $Q_1/Q_2$	-	-	-	1,6	
Temperature class (nominal operating temperature)	-	-	-	T30, T50	
Flow profile resistance classes	-	-	-	U0, D0	
Reading range	-	m <sup>3</sup>	-	99 999,999	
Reading accuracy	-	dm <sup>3</sup>	-	0,00005	
Maximum pressure	$P_{max}$	MPa	-	1,6	
Maximum pressure loss	$\Delta p$	kPa	-	63	
Maximum allowable limiting error in the range of: $Q_2 \leq Q \leq Q_4$	$\epsilon$	%	-	$\pm 2$	
Maximum allowable limiting error in the range of: $Q_1 \leq Q < Q_2$	$\epsilon$	%	-	$\pm 5$	
Casing sealing class	-	-	-	IP 65 (optionally IP 68)	
Inlet and outlet port thread	G	cal	G $\frac{3}{4}$	G1	
Height	h	mm	17		
	H	mm	91		
Length	L	mm	165	190	
Pulse value	-	dm <sup>3</sup> / imp.	1		
Battery life	-	-	min. 6 years		
Ambient temperature range	-	°C	+5 ... 55		



## CONNECTING PIECES



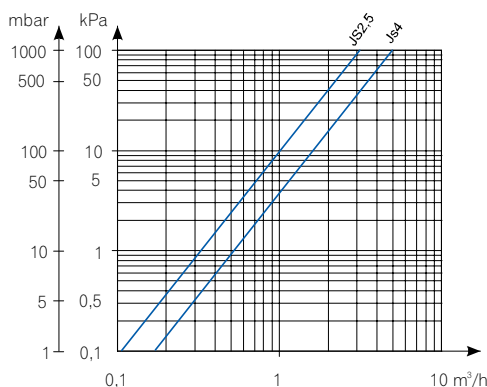
DN	G	g	d	L
15	3/4"	1/2"	17	37,5
20	1"	3/4"	23	45,5

## COMPLIANCE WITH STANDARDS AND RULES

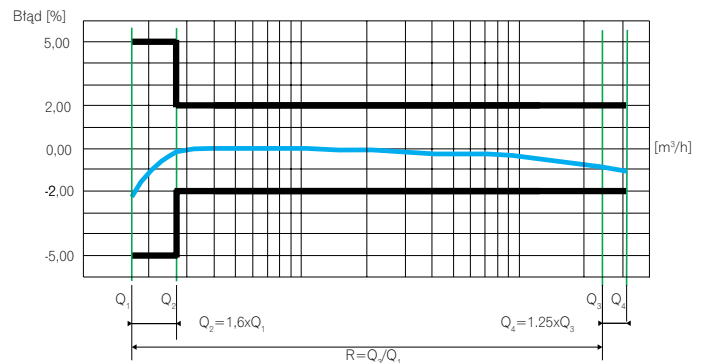
- Directive 2004/22/EC of the European Parliament and of the Council of 31 March 2004 on measuring instruments.
- PN-EN -14154:2005. Water meters. Part 1 - 3 (classification of environmental, climatic and mechanical conditions - class B).
- OIML R49:2004 and 2006 - Water meters intended for metering cold potable water and hot water.
- EC type-examination certificate - cold water no. SK09-MI001-SMU007 and TCM 142/11 - 4832.
- Classification of environmental, climatic and mechanical conditions - class B acc. to PN-EN-14154-3:2005:A1.
- Classification of environmental mechanical conditions - class MI - by RMG of 18.12.2006.
- Classification of environmental electromagnetic conditions - class E1 - by RMG of 18.12.2006.

All materials used to the manufacture the prepayment system that are in contact with potable water have the appropriate hygienic approvals.

## PRESSURE LOSS CHART



## TYPICAL ERROR GRAPH



## EXAMPLE ORDER

Standard unit:

- Prepayment water meter set for cold water, JS4.0 (DN20, L=190 mm, R100)

Options:

- Water meter connection fittings, without a non-return valve,
- Connection fittings for water meters, with check valve (prevents backflow through the water meter of water forced in the reverse direction).
- Single use clips with snap seals made of a plastic material, with individual, unique numbering (to protect against mechanical manipulation of water meter connections).
- Water meter consoles.