How to avoid the conflicts when measuring the water consumption at flats

The consumers´ dissatisfaction with the final water-consumption invoice is still a topical problem. This disharmony is usually caused either by a not very precise measuring of water-meters or even by the users themselves who, applying various "modifications", put the water meters out of operation.

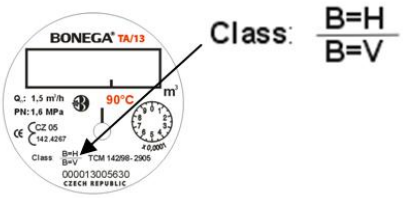
The solution is, however, very easy – to use water-meters of high quality with protecting elements. The new generation of BONEGA® water meters is like this.

How can you find out if a water-meter measures exactly?

Before a water-meter gets to the end-user, it passes some strict tests that verify the parameters affecting its measuring accuracy.

1. Accuracy Class

According to the measurement accuracy, the water-meters are divided into A, B and C class whereby the A class is the least accurate and the C class is the most accurate one. In practice, the B-class water-meters, or the A-class water-meters for the worse category, are used almost exclusively. The C-class water-meters are seldom used because of their high-technology manufacture and therefore high price.



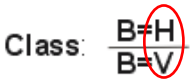
The differences in various values between the classes can be even multiple (see Table). **There are, however, significant differences among the water-meters of the same class.** All the BONEGA® water-meters fall into the B class, but **their parameters come very close to the C class** wherewith they surpass many competitors. **Please find those data in corresponding calibration sheets.** For the BONEGA® water-meters, you can download the data on www.bonega.cz .

Comparison of parameters for the flow-rates DN 15 (1/2“) and DN 20 (3/4“) within the metrological classes A,B,C.

Symbol	Flow-rate	A class for DN 15 (1/2“)	B class for DN 15 (1/2“)	C class for DN 15 (1/2“)	A class for DN 20 (3/4“)	B class for DN 20 (3/4“)	C class for DN 20 (3/4“)
Qmin	Minimal flow-rate (l/h)	60	30	15	100	50	25
Qt	Transition flow-rate (l/h)	150	120	22,5	250	200	37,5
Qn	Nominal flow-rate (m3/h)	1,5	1,5	1,5	2,5	2,5	2,5
Qmax	Maximal flow-rate (m3/h)	3	3	3	5	5	5

Verify always into which accuracy class a water-meter falls and check its calibration sheets.

2. Measurement accuracy in various installation positions



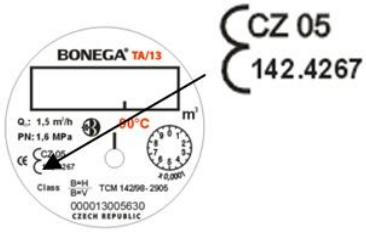
The bulk of flat water-meters have the lower A accuracy class for the vertical installation position than for the horizontal one where they usually reach the B class. That data concerning the measurement accuracy can be found on the dial: H for the horizontal position and V for the vertical position.

The BONEGA® water-meters reach the "B" accuracy class in **both installation positions** thanks to the very precise turbine bedding in two agate bearings.

Do not forget to compare the measurement accuracy in both positions.

3. Metrological verification or "calibration"

Thanks to the high-quality manufacture of individual parts, the technical parameters of some household water-meters can reach even top values theoretically, nevertheless, essential is whether those parameters are really set up and verified. Therefore, the household water-meters subject to the ex-lege obligatory independent metrological verification (calibration) both prior to their first sale and after four years of usage for warm water-meters and six years for cold water-meters.



The above can be affected especially by personal liability, technology and calibration procedure. The calibration can be done either in a traditional way or according to the stricter EHS standard. The most water-meters in the Czech Republic still use the old method.

Observed quantity	Traditional methods	EHS
Flow-rate range	For Qn nominal flow-rate only	up to Qmax maximal flow-rate
Pressure resistance	not measured	test with pressure 1,6 MPa
Approved measurement deviation	+/- 2%	+/- 1% (one-side deviation)
Measurement pursuant to pulse number	no	yea (more accurate by up a thousandth of liter)

Both the calibration facility and the manufacture are to have the EHS Certificate. The BONEGA® water-meters comply with the EHS conditions (certificate and other detailed information please download on ***www.bonega.cz/vodomery***)

Check who and how have calibrated the water-meter (the EHS standard is stricter).

4. Minimal Q_{min} flow-rate and starting flow-rate

Another very important parameter for the water-meter accuracy is at what real minimal flow-rate the water-meters starts to reply (count). As the standard for ½" water-meter design in the B accuracy class says, that value may not exceed 30 liters per hour; in the A accuracy class, the standard permits a reply even with 60 liters per hour.

Simply said: if 29 liters of water drop at the users, (consciously or unconsciously), his water-meter might not register it at all even if it falls into the higher B accuracy class.

Can be found at the box:
Starting flow-rate: < 8 l/hour

An unconscious non-registration of the flow-rate appears at the water-meters of lower quality always during the starting stage of water flow when the water inlet is being closed (which happens many times a day, of course) or if the valves are not tightened (water dropping).

The BONEGA® household water-meters show **fully extraordinary parameters** in this regard. Although the B accuracy class states the minimal flow-rate to be 30 liters per hour, **their real starting flow-rate is under 8 liters per hour** (between 5 and 8), thus **below the C class request (15 l/h at least).**

Find out when the water-meter starts really to reply (so-called starting flow-rate).

How to be sure that nobody puts the water-meters "out of operation".

Unfortunately, it is a sad true that there are still a lot of unfair tenants who try to misuse the technical imperfections of some water-meters, and thus to affect the relating measurement accuracy. In this way, they prey other users and simultaneously, they create disputes with invoicing.

Therefore, the BONEGA® company has placed unique protective elements onto its water-meters, which contribute to a more objective ratio measurement of water consumption in households.

1. Extraordinary high antimagnetic resistance

Thanks to higher reliability, dry-running water-meters are used at the flats. The turbine is not connected with the counter mechanically but magnetically. The most often misuse consists in application of permanent magnet (or other outside source of magnetism) onto the water-meter wherewith the saccade or even the fully stop of the counter occur although the turbine still rotates.

The manufacturers struggle to avoid the aforementioned phenomenon by means of various antimagnetic modifications. They show usually themselves on the higher bottom body. It is an all-European problem that is proven by the interest of European Union that is preparing a new relating standard EN 14 154-3. The BONEGA® water-meters **exceed the requirements of that standard by up to 1300 %,** whereby they are ones of the magnetically most resistant water-meters in Europe. The objective was to withstand the influence of the heaviest permanent magnet available on the Czech market. Even a common BONEGA® water-meter (without antimagnetic modifications) shows a higher antimagnetic resistance than prescribed by the European standard draft.

Observe the rate of antimagnetic resistance when selecting a water-meter.

2. Protection against subtraction to minus

At almost all dry-running water-meters, their upper part can be rotated endlessly to enable a more convenient reading in several installation positions. At the most water-meter types, this rotation can be, unfortunately, misused for *subtraction* to minus.

The BONEGA® water-meters are **the only ones** that avoid the above phenomenon by a gear that enables just limited rotation, namely only by 670 degrees°.

Require the water-meters disabling the subtraction to minus.

3. Input screw joint sealing

Due to an unsuitable sealing, some water-meters can be dismantled or rotated by 180° without later-on recognition of that act. Unfortunately, both the plastic pin and the copper wire can be "de-sealed". Therefore, the return to traditional copper strands is recommended in the last time. The strand is drawn through the hole in the screw joint nut and through the sealing hole on the water-meter body. The ends are secured with a lead sealing with a sign.

Be sure that the water-meter has a hole for sealing by a strand on its body.

Select carefully

If we want to avoid the conflicts when measuring the water consumption, it is necessary to compare a lot of properties during the selection. The water-meter has to indicate as accurately as possible but it has to disable its blocking or stopping.