

Large Water Meter - Test in the place

Written by ?evad Kold♦o

Monday, 17 September 2012 23:00



According to the laws in most countries (including Bosnia and Herzegovina) Water Supply Companies shall perform calibration of water meters up to 40 mm diameter in a maximum of five years, and watermeters larger than 40 mm in a maximum of three years.

Utility have interest that calibration is done as soon as possible because water meters as well as any device that uses some kind of bearings during the time caused an increase in resistance and decrease in the number of revolutions, so the meter shows less consumption of real, and what is the loss for water supply company.

Waterworks which have not performed calibration or replacement of water meters for a long time, at the time when they do usually have frequent protests of citizens, who are convinced that their new watermeter was not correct, "because the old one showed much lower consumption."

Water meters "are" cashbox for waterworks, and according to that, particular attention should be paid to the big meters (with diameter bigger than 40 mm), because them size is proportionally match the size losses .In the world there are two recognized methods for Water meters calibration :

- Calibration in the calibration station or
- Test in the Place calibration

Fulfillment of conditions for testing of large water meters in the Place

Test in the place calibrating method for large water meter (diameter greater than 40 mm) is regulated in most countries in the world. Unfortunately, when it comes to the south-eastern European countries law does not approve this method, and all the water meters regardless of size must be calibrated in calibration station.

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Large size water meters are installed on pipe using a flange and bolts, and their removal is not easy. Besides that the water meter's weight is between 10 and 120 kg depending on the manufacturer and the diameter of the water meter, which is an additional problem for booting from the chamber and transport to calibration station.

The law stipulates that a large water meters must be calibrated within a maximum of three years. If the waterworks in this term did not calibrate, it is considered that the meter was not correct and according to that, waterworks can not billing for consumption measured with that meter

A well-informed consumers generally don't have objections if the waterworks didn't performe calibration of water meters during proscribed time from the simple reason that the readings which will be perform far less than the real consumption that the consumer achieved.

The practice of waterworks in United States is that the calibration of large water meters shall provide continuously regardless what the legal regulations also stipulate that the deadline for the calibration of large water meters is 3 years. The theory that I have heard from Mr. Haris Saidela, (General manager in one waterworks in Iowa state -USA) is that water meters are cashbox for the waterworks , and a according that large water meter register, big money. Based on that theory water utilities in the U.S. have a team who are constantly on the field and performe control or calibration action on the big water meters, and the time between two calibration amounts less than one year.

In countries where, according to the current legislation, calibration of water meters on the site still can not be performed, however can be tested (control accuracy of water meters), and only those meters for which this method finds that are no accurate can be removed and sent to calibration station.

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For Test in the place deploy is necessary to create a simple "device" which consists of large-diameter water meters and small meter. The device has an connection for a fire hose with the input side, and it is very useful on the output side, so that the water which passes through the meter can be taken to drain. At the output side of each water meter placed two manometer (0 to 20 bar), and two ball valves with which the device can be put into function. Used Water meters must be calibrated every 6 months into the calibration station.

Large water meter need not be the same size like tested water meter and could be a smaller for one diameter size. Acceptable combination of large and small water meters shown in the following table:

COMBINATION

LARGE WATER METER DIAMETER

SMALL WATER METER DIAMETER

1
50 mm
13 mm (1/2")

2
80 mm
20 mm (3/4")

3
100 mm
25 mm (1") ili 30 mm (5/4")

Except devices for testing water meters in the place, considering the usual appearance of the connector and the installation of water meters in South East European Countries (in Middle East countries too), it is Necessary to Make Certain corrections in the chamber where the water meter will be tested.

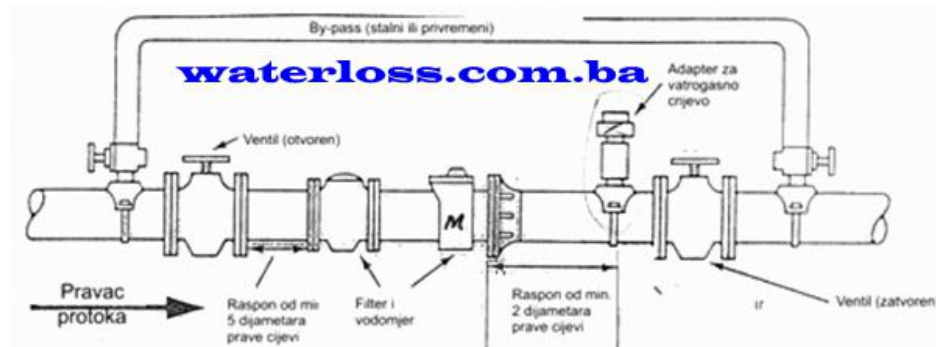
Under correction is thought to be install the "T" piece behind the water meter to the

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consumer, with connection for a fire hose, and valve behind it. During testing this valve will be closed.



In most western countries connector has exactly look like connector presented on the right picture. By-Pass is usually temporary, and sometimes permanent, only serves to the consumer not left without water supply during the testing time . Also be seen that the filter is in front of the consumer meter integral part of the connector's structure .

Large water meter testing in place is much simpler, cheaper and much more accurate than their bringing to the workshop for testing.

1. Check the installation and verify the identification number of the water meter, its size etc.
2. Easily open the by-pass (if there is one);
3. Isolate customer water meter by closing both valves;
4. Clean the filter/strainer;
5. Ensure that the outlet/downstream valve is tightly closed in order to avoid leaking during testing;
6. Connect the pipe to the test fitting;
7. Open the front valve;
8. Let a small stream of water into the pipe in order to remove all the remainings;
9. Connect the pipe to the portable test water meter;
10. Connect the outlet hose to the adequate location forBefore initiating the testing, ensure that both water meters are full of water and under positive pressure;
11. Initiate testing at lowestThe flow is controlled by manipulating the ball valve at

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the outlet side of the test water meter;

12. **Do an additional test with increasedMaximum flow should not exceed $\pm 20\text{?}30\%$ of the total capacity or the customer water meter rating;**
13. **Record pressure. The pressure downstream of the customer water meter should not drop below 1,5 atm;**
14. **Record flow and time for each test;**
15. **Precise flow (l/s) does not matter; the goal of testing is to compare the volume (liters) of water;**
16. **Calculate the accuracy of customer water meter after each test;**
17. **Depending on the type of water meter, if need be, setting and repairs could be done on site;**
18. **After the adjustment of settings and repairs, retest the water meter in order to determine whether its accuracy is now acceptable;**
19. **Disconnect the mobile water meter and return everything back to normal;**
20. **Close and secure the by-pass.**

Remarks:

Test water meter does not have to be an expensive type of water meter. A good water meter, regularly calibrated shall serve the purpose.

Test water meter does not have to be of the same size as the customer one. For instance, a 50 mm test water meter would be adequate for determining the accuracy of a 100 mm or even 150 mm customer water meter.




If the customer water meter indicates any type of deviation, it is being demounted and sent to the calibration workshop, and a new accurate water meter is installed in its place.

For easier processing of test results is useful to prepare a table in MS Excel or a similar software. One such tool can be download [here](#)

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TEST IN THE PLACE FORM																	
MANUCIP.			ID		MANUFACTURE AND DATE PRODUCT.												
DATE			DIAMETER		RESPONSIBLE PERSON												
TIP FORM BY DJEVAD KOLDZO e-mail: dzevad.koldzo@waterloss.com.ba																	
1	TIME			PRESSURE	TEST WATER METER			KONTROLNI UREĐAJ						REZULTAT			
	START	FINISH	DURATION		First Reading	Second Teading	Cumul.	VELIKI VODOMJER			MALI VODOMJER			DIFFERENCE m³	ERROR %		
								First Reading	Second Teading	Cumul.	First Reading	Second Teading	Cumul.			Cumulative big + small	
1			0:00:00							0					0	0,00%	
2			0:00:00							0					0	0,00%	
3			0:00:00							0					0	0,00%	