

TITLE OF THE INVENTION**A Method of Measuring Water flowrate****FIELD OF THE INVENTION**

The present invention relates to device and method for metering a flow of water and more particularly to device and method for measuring the flowrate of water from an outlet.

BACKGROUND OF THE INVENTION

Because flow measurement is fundamental to fire hydrant, and to maintain accuracy of the water flowrate of flowmeter, it is required that a calibration system is capable of operating in providing a method to calibrate water flow rate to fire hydrant.

Fluid flow rate meters are well known to the prior art. In the most general description, these devices measure fluid flow by sensing and quantifying selected physical parameters of the fluid flowing in a given flow path.

Primary flow calibration systems must allow users to verify by reference to primary standards, of length and time, the accuracy of the system, and thereby to calibrate mass flow meters and flow controllers automatically with the highest degree of accuracy.

A prior art meter of this kind comprises a casing or tank having an inlet hose and an outlet hose and into which is inserted an oscillating piston type volumetric measurement chamber. The measurement chamber has at least one inlet orifice and at least one outlet orifice. This kind of meter is well known to the person skilled in the art.

The float method is used to measure the flow rate for larger streams and rivers. It is found by multiplying a cross sectional area of the stream by the velocity of the water

US Patent No. 6,925,867 discloses fluid meter, in particular a water meter, comprises a tank having a bottom and into which is inserted through an opening opposite the bottom in an insertion direction parallel to its axis of symmetry a measurement chamber having at least one lateral orifice connected in a sealed manner to a pipe of the tank via a seal that is compressed between an external surface of the chamber, called the first surface, and an internal surface of the tank, called the second surface. The first and second surfaces are inclined to the axis of symmetry of the tank and the minimum distance between the first and second surfaces and the axis of symmetry is near the bottom of the tank.

US Patent No. 6,931,946 discloses a large volume water meter having particular application for use with a fire suppression system by which to measure the volume of water consumed by a residence during periods of calm and during a fire emergency when water is supplied from a source at high speed to a sprinkler system in order to combat a residential fire. The water meter has a dual element strainer assembly including an outer strainer to trap sand and other suspended particles and an inner strainer surrounded by the outer strainer and arranged in spaced coaxial alignment therewith. An adjustable flow control turbine assembly having a rotor that is responsive to the water flow is received within the inner strainer. The turbine assembly and the dual element strainer assembly are coupled to one another within the water meter so as to produce an uninterrupted stream of water by way of radial and axial flow paths through the strainer assembly to the turbine assembly.

US Patent No. 5949069 discloses a method includes measuring a fractional volume of water occupying the conduit at a plurality of locations along the conduit. An oxygen activation velocity of the water flowing in the conduit is determined at a plurality of locations along the conduit. A counting rate of a gamma ray detector used to measure oxygen activation is normalized with respect to the measured fractional volume of water. The normalized count rates of the gamma ray detector are characterized with respect to a relative velocity between the water and the detector. The step of characterizing is performed in portions of the conduit which are sloped so that gravity acts on the water along the predetermined direction. A fraction of the characterized counting rate represented by the oxygen activation counting rates measured along the conduit is determined. The fraction represents the fractional volume of water moving in the predetermined direction.

SUMMARY OF THE INVENTION

In accordance with the invention, there is thus provided a method of calibrating water flow rate for water used in fire hydrant comprising the steps of

- (i) weighing a transparent empty tank having 1000 liter volume in a weighing scale and setting the weight of the scale at 0 Kg;
- (ii) adding water into the transparent tank until the weight of the tank indicating 1000kg, which is the volume of the water as the density of water is 1kg/liter;
- (iii) mounting a transparent tubing in communication with the tank and marking as an indication on the tubing the level of water at 1000 l; and
- (iv) marking reading of volume of water in the tank.

It is an object of the present invention to provide a water flowrate tank for calibrating water flow rate comprising (i) a tank having at least one quick release valve on the the top level of the tank 10; (ii) an indicator mounted to the surface of the tank to provide indication on the volume of the water in the tank 10; (iii) a quick discharge valve at mounted at close to the bottom of the tank 10; and (iv) at least one hose for connecting water hydrant to the quick release valve, thereby the volume of water from hydrant to the tank is measured against the time taken.

It is a further object of the invention to provide a water flowrate tank wherein the tank is of a rectangular shape, circular shape and cylindrical shape.

It is a still further object of the invention to provide a water flowrate tank for calibrating water flow rate, wherein the quick release valve allows water to enter via a water hose connected to a hydrant.

It is yet another object of this invention to provide a device to allow standard, inexpensive meter chambers to be installed in a fire service line with little or no modification of the meter chamber, while meeting the standards required for fire protection.

These and other objects of the invention will become readily apparent to one skilled in the art upon study of the detailed description that follows.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view showing water measuring device in accordance with the present invention.

FIG. 2 is a schematic view showing the reading on the scale of the indicator on the measuring device of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 the overall apparatus of a water measuring device 100 is shown. The water measuring device 100 is a water flowrate tank for calibrating water flow rate, and comprises: a tank 10 having at least one quick release valve 22, 20 on one side of the tank 10; an indicator 12 with readings mounted to another side of the tank 10 to provide indication on the volume of the water in the tank 10; a quick discharge valve 14 at mounted on the same side for which the quick release valve 22, 20 are mounted, and close to the bottom of the tank 10; at least one hose 16 for connecting water hydrant 18 to the quick release valve

22, 20, thereby the volume of water from hydrant to the tank is measured against the time taken.

The shape of the tank 10 can be rectangular, cylindrical or square shape. For illustration purpose, in the present invention, a square shape water tank 10 is used. On one side of the water tank 10, the indicator 12 with readings is mounted in such a way that the volume of water in the tank 10 is shown. The indicator 12 shown a reading of which reflects the volume of water in the tank 10. The tank 10 can be enclosed within a frame 20.

The present invention also relates to a method of calibrating water flow rate for water used in fire hydrant. The method comprises the steps of:

- (i) weighing a transparent empty tank 10 having 1000 liter volume in a weighing scale 30, the weighing scale is set to 0 Kg when the tank 10 is empty;
- (ii) adding water into the transparent tank 10 until the weight of the tank indicating 1000kg, which is the volume of the water in the tank 10, as the density of water is 1kg/liter;
- (iii) mounting a transparent tubing 12 in communication with the tank 10 and marking as an indication on the tubing the level of water at 1000 liter; and
- (iv) marking reading of volume of water in the tank 10.

As the density of water is 1 kg/liter, if the scale 30 indicates 10 kg/liter, it means that the volume of the water in the tank 10 is 10 liters.

The indicator 12 mounted on one side of the tank 10 shall indicate the volume of the water corresponding to the weight of the water in the tank 10 that measures. In accordance with another preferred embodiment of the present invention, there is provided a method of measuring water flow rate in fire hydrant comprising the steps of

- (i) closing the inlet valve 22 of the tank 10, open the hydrant valve and purging out any air in the hose 16;
- (ii) weighing the tank 10 on a weighing scale 30 and reset the weight of the tank 10 to zero kilogram;
- (iii) opening water inlet valve 22, 20 and switching on simultaneously a stop watch;
- (iv) closing the inlet valve 22, 20 and switch off the timer when the tank is approaching a full tank;

(v) calculating the flowrate by reading the weighing scale or level indicator and divide by time taken.

As shown in the figure, a square shape tank is used in a preferred embodiment of the present invention. Other shapes such as rectangular, circular or cylindrical shape can also be used. The wall of the tank 10 is provided with water inlet valves 22, 20 to control water flowing into the tank 10 via the hydrant. An indicator with readings 12 is disposed at one side of the tank 10 and the volume of water can be shown by the indicator 12.

FIG. 2 is a schematic view showing the reading on the scale of the indicator 12 on the tank 10 of the present invention. The indicator 12 is marking on a transparent tube which in communication with the water in the tank 10. The reading indicates the total volume of water in the tank 10.

Again referring to FIG. 1, as shown, the quick release valve or inlet valve 22, 20 mounted on the tank 10 allow water to enter via the water hose 16 connected to a hydrant 18 into the tank 10. Below the quick release valve 22, 20, a quick discharge valve 14 is provided for the discharging of water in the tank 10, if required. The quick discharge valve 14 is positioned at an appropriate position on the tank 10 so as to facilitate the discharge of the water from the tank 10.

While the preferred embodiments of the present invention have been illustrated in detail, it should be apparent that modifications and adaptations of those embodiments will occur to those skilled in the art. However, it is to be expressly understood that such modifications and adaptations are within the sphere and scope of the present invention as set forth in the following claims.

CLAIMS:

1. A method of calibrating water flow rate for water used in fire hydrant comprising the steps of
 - (i) weighing a transparent empty tank having 1000 liter volume in a weighing scale and setting the weight of the weighing scale at 0 Kg;
 - (ii) Adding water into the transparent tank until the weight of the tank indicating 1000kg, which is the volume of the water as the density of water is 1kg/liter;
 - (iii) mounting a transparent tubing in communication with the transparent tank and marking as an indication on the tubing the level of water at 1000 l; and
 - (iv) marking reading of volume of water in the tank.
2. A water flowrate tank for calibrating water flow rate comprising
 - a tank having at least one quick release valve on the top level of the tank;
 - an indicator mounted to the surface of the tank to provide indication on the volume of the water in the tank;
 - a quick discharge valve at mounted at close to the bottom of the tank;
 - at least one hose for connecting water hydrant to the quick release valve, thereby the volume of water from hydrant to the tank is measured against the time taken.
3. The water flowrate tank as set forth in Claim 3, wherein the tank is of a rectangular shape, circular shape and cylindrical shape.
4. The water flowrate tank as set forth in Claim 3, wherein the quick release valve allows water to enter via a water hose connected to a hydrant.
5. The water flowrate tank as forth in Claim 3, wherein the quick discharge valve is used to discharge water in the tank.