CALAMBA WATER DISTRICT

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24/7 Public Service

PAB ACCREDITED QMS CERTIFICATION BODY

PHP QMS 21 93 0047

WATER METER WITH TAIL PIECE

Scope

The water meter shall conform to requirements of ISO 4064 part 1: Measurement of Water Flow in Closed Conduits-Meters for Cold Potable Water.

Meter

1. Only Multi-jet water meter will be accepted.

2. Meter shall be manufactured by a company with a minimum of 40 years of experience in the manufacturing of water meters. It shall be preferably assembled/made in Europe, Israel or India

Meter capacity and dimensions shall be:

			SPECS	
Nominal Size		mm	15	25
Maximum Flowrate	Q_4	m^3/h	2-5	5-12
Nominal Flowrate	Q_3	m^3/h	1.5	3.5
Measuring Range	R	m^3	9,999	999,999
Accuracy				
		Qmin	±5%	±5%
		Qt	±2%	±2%
		Qn	±2%	±2%
		Qmax	±2%	±2%
Maximum Operating Pressure		bar	10	10
Maximum Temperature			30	30
DIMENSIONS				
Length with tail piece		mm	315	370-420
Width		mm	90 (± 5% tolerance)	95-105
Height		mm	100 (± 5% tolerance)	100-130
Weight		kg	1.5 (± 5% tolerance)	2.7-3.5
Length of tail piece		mm	60 mm	
Length with one tail piece @ outlet side with one coupling only		mm	252.5 w/tolerance ± 0.1mm	

3. Meter body or casing shall be brand new manufactured brass and brass finish with anti-corrosion treatment. Meter bodies shall be smoothly finished free from defects. Bodies which have been repaired are not acceptable. All coating shall be free from defects of any kind. Meter Bodies shall have a common inlet-outlet axis and shall be suitable for

horizontal installation. With CWD Logo and meter number will be printed inside the *insert at no cost with the procuring entity.*

All external fasteners and seal shall be designed for easily disassembly, after a lengthy in- service use, without the need for special tools or equipment.

Metallurgical test result is subject for verification and retesting by the Procuring Entity and Manufacturer Mill Certificate shall be provided in every delivery.

4. Meters furnished under the specification shall be guaranteed to operate under a working water pressure of 100-150 psi without damage or leakage to any part.

5. Meters shall be factory tested and shall register in accordance with ISO 4064 standards. Any meter not meeting these standards will be rejected.

6. Meters durability or performance shall withstand at 10 years of service without repair.

Measuring Chamber Assembly

The measuring chamber of the meter shall be a self-contained unit manufactured and can withstand all normal conditions of operation without changes in form or dimensions. It shall be firmly seated and easily removed, and be secured so that the meter's accuracy will not be adversely affected by any distortion of the meter body. Metallurgical test result is subject for verification and retesting by the Procuring Entity.

Register

Register compartments shall be self-contained and hermetically sealed. Register compartments that rely upon a compressed gasket for the hermetical sealing and which can be opened to repair the gear train, shall include an approved desiccant capsule. Lock and side gears shall be secured fastened to the number of wheel disc and hubs. Tumbler pinions shall mesh accurately with the lock and side gears of the adjacent wheels at the turn over points. Frames, shafts, gears and pinions are made of suitable non-corroding materials.

The register reading shall be of the straight reading, cubic meter.

Dial Lens

The lens covering the register dial shall be securely fastened to achieve hermetical sealing and shall be of clear tampered glass of 5 mm minimum thickness (or of suitable synthetic polymer which shall of be of high impact, ultra violet stabilized polycarbonate resin film of clear transparency). Dial lens shall be resistant to impact and abrasion. Impact resistance shall be taken as the capacity to resists the impact of a 12 mm diameter steel ball dropped from a height of one (1) meter without sustaining any evident damage. Abrasion resistance shall be taken as the capacity to resist permanent scratch marks using a material not harder than Philippine one-peso coin. Meter dial lenses shall be held in place by a hinged lid or similar holding device of suitable synthetic polymer.

Register Box Ring (Bonnet) and Lid

Register box ring and lid shall be of the same materials composition as the meter body or suitable synthetic polymer.

Sealing

Each meter shall be supplied with 2.5mm diameter copper wire and other suitable type of seal system to discourage unauthorized opening or removal of the meter and also to indicate if such unauthorized act has been made. All elements of the sealing system, including length of wire, location of wire holes, etc, shall be suitable for covering all possible means of tempering, in particular, disturbance of the coupling nuts; of the accuracy adjustment device, if there is any; and of the register assembly. The seal shall be blank and suitable for sealing by a compression tool. The sealing elements shall be provided in such of way that after sealing, both before and after the water meter has correctly installed, there is no possibility of altering or dismantling the meter without damaging the sealing elements.

Test Method and Equipment

The methods and means to be employed in determining the compliance of water meter shall be in accordance with ISO 4064/3. (Test methods and equipment).The following test shall be conducted on meters in the automated calibration machine of Manila Water.

1. Accuracy
   a.) ½"Ø Water Meters –
      a1. Random testing of 5% of the total quantity picked by an authorized representative of the Procuring Entity.
2. Physical/Dimensional, Lens Impact and Abrasion Test.
3. All sealed meters should passed pressure loss testing
4. Accelerated endurance test – submit certification from LWUA or Manila Water.
   Endurance Test A (100,000 liters)
   Endurance Test B

Warranty

For the procurement of water meter, in order to assure that manufacturing defects shall be corrected by the supplier, a warranty period of two (2) years shall be imposed upon acceptance by the Procuring Entity of the full delivery. Provided however, that the supplies delivered are free from patent and latent defects and all the conditions imposed under the contract have been fully met.

Drawing

3.00MM
Black color, Lens cover attached to brass body (refer to specification)
Brass
3.50MM

Technical Specification: Water Meter

1. Meter description

The water meter shall conform to requirements of ISO 4064 part 1: Measurement of Water Flow in Closed Conduits-Meters for Cold Potable Water, subject to the following additional requirements.

a. Meter shall be manufactured by a company with a minimum of 40 years experience in the manufacturing of water meters.
b. Meter capacity and dimensions shall be:

Meter Size		40mm(1.5″)	50mm(2″)	75mm (3″)	100mm (4″)	150mm (6″)	200mm (8″)
Maximum Registration	m^3	100,000	1,000,000	1,000,000	10,000,000	10,000,000	100,000,000
Maximum Water Temperature	°C	50	50	50	50	50	50
Maximum Working Pressure	bar	10-16	16	16	16	16	16
Starting Flow	m^3/h		0.10-0.3	0.22-0.40	0.25-0.60	0.90-1.00	1.20-2.00
Maximum Flow rate	m^3/h	20-30	45-100	80-170	120-300	250-410	300-325
Transitional Flow q_t ±2%	m^3/h	0.8	1-5	1.4-8.0	2-12	3.5-30	8.5-50
Minimum Flow q_{min} ±5%	m^3/h	0.2-0.35	0.35-0.75	0.8-1.2	1.5-1.8	2.5-4.5	7-7.5
Overall Length	mm	300-365	200-245	200-300	250-360	300-500	350-520
Weight	kg	3.3-9.8	10.0-13.2	14.1-15.5	17.0-19.4	30.0-37.5	47.0-47.5

c. The meter body (or casing) shall be brand new manufactured from cast iron, coated with polyester. Meter bodies shall be smoothly finished free from defects. Bodies which have been repaired are not acceptable. All coating shall be free from defects of any kind. Meter bodies shall have a common inlet-outlet axis and shall be suitable for horizontal installation.

All external fasteners and seal shall be designed for easily disassembly, after a lengthy in-service use, without the need for special tools or equipment.

d. Meter shall be factory tested and shall register in accordance with ISO 4064 standards. Any meter not meeting these standards will be subject to rejections.

2. Register

Register compartments shall be self-contained and hermetically sealed. Register compartments that rely upon a compressed gasket for the hermetical sealing and which can be opened to repair the gear train, shall include an approved desiccant capsule. Register reading shall be of straight reading in cubic meter.

3. Electrical Output

Register shall include electrical outputs with a range of electric output options. Pulser can be easily fitted on site without disturbing the calibration seal or interrupting the water supply. The pulser /electrical output shall be bi–directional designed to interface with almost all or any products, providing a pulse resolution in accord with the fitted position on the register. Capable of volume and flow rate measuring control, remote reading system or computerized data acquisition system, including connectors and/or cable, shall be bi-directional designed to interface with the existing CWD multi-log data logger or products and any other measuring gadgets.

Electrical Output/Pulse	Flow rate, 1 m^3/hr
Maximum Contact Voltage	24-28 V dc
Maximum Contact Current	50mA
Maximum Power	0.25

4. Dial Lens

The lens covering the register dial shall be securely fastened to achieve hermetical sealing and shall be of clear tampered glass of 5mm minimum thickness (or of suitable synthetic polymer which shall of be of high impact, ultra violet stabilized polycarbonate resin film of clear transparency.). Dial lens shall be resistant to impact and abrasion. Impact resistance shall be taken as the capability to resists the impact of a 12mm diameter steel ball dropped from a height of one (1) meter without sustaining any evident damage. Abrasion resistance shall be taken as the capability to resist permanent scratch marks using a material not harder than Philippine one-peso coin. Meter dial lenses shall be held in place by a hinged lid or similar holding device of suitable synthetic polymer.

5. Register Box Ring (Bonnet) and Lid

Register box ring and lid shall be of the same material composition as the meter body or of suitable synthetic polymer.

6. Sealing

Each meter shall be supplied with 2.5mm diameter copper wire and other suitable type of seal system to discourage unauthorized opening or removal of the meter and also to indicate if such unauthorized act has been made. All elements of the sealing system, including length of wire,

location of wire holes, etc., shall be suitable for covering all possible means of tampering, in particular, disturbance of the coupling nuts; of the accuracy adjustment device, if there is any; and of the register assembly. The seal shall be blank and suitable for sealing by a compression tool. The sealing elements shall be provided in such a way that after sealing, both before and after the water meter has correctly installed, there is no possibility of altering or dismantling the meter without damaging the sealing elements.

7. Connection Flange,Steel-flange

The flange shall be cast iron and shall be furnished with bolts, nuts and gaskets. The flange bolt circle and bolt holes shall match with two (2) ends water meters. The flange can be installed for the following pipe:

Pipe Size	40mm(1.5″) 50mm(2″) 75mm (3″)	100mm (4″)	150mm (6″)	200mm (8″)
Type of Pipe	GI	GI	GI	GI

8. Cable and/or Electrical Output Connector

The cable /connector shall be adaptable to the CWD multi-log data logger and other products.

9. Test Method and Equipment

The methods and means to be employed in determining the compliance of water meter shall be in accordance with ISO 4064/3. (Test methods and equipment).The following test shall be conducted on all new sealed meters in the presence of the Procuring Entity representative in automated calibration machine of Manila Water for accuracy testing. Testing of meters will be conducted prior to delivery.

1. Accuracy test.
   Random testing of 5% of the total quantity picked by an authorized representative of the Procuring Entity.
2. Physical/ Dimensional, Lens Impact and Abrasion test.
3. All sealed meters should passed pressure loss testing
4. Accelerated endurance test – submit certification from LWUA or Manila Water

Endurance Test A (100,000 liters)

Endurance Test B

10. Warranty

The manufacturer also guarantees that replacements, (whole meter), replacement parts and service shall be made available within thirty (30) calendar days from notice during a period of at least five (5) years from date of acceptance.

11. Certification

The manufacturer shall furnish a sworn statement that the inspection and all of the specified tests have been results thereof comply with the requirements of the applicable Standard(s) herein specified. A copy of the Certification shall be submitted to Calamba Water District including laboratory test of accuracy from a reliable local laboratory such as in Manila Water and Manufacturer Mill Certificate shall be provided in every delivery.

ULTRASONIC FIXED TYPE FLOWMETER

Technical Specification:

Design	Field device with 1 measuring channel
Transducers	Set of ultrasonic flow transducers for measurement of liquids Inner pipe diameter (recommended); 100-400mm Inner pipe diameter (extended); 50-400mm Pipe surface temperature; -40 - +100°C
Measurement	
Measurement Principle	Transit time difference correlation principle
Flow Velocity	0.01-25 m/s
Repeatability	0.25% of reading ±0.01 m/s
Fluid	Liquid phase
Accuracy-Volumetric flow rate	±2% of reading ±0.01 m/s
Flow Transmitter	
Power supply	100-240 V AC / 50-60 Hz
Power consumption	<10 W
Number of meas. Channel	1
Damping	0-100 S, adjustable
Measuring cycle (1 channel)	10 Hz
Response time	1 S
Housing material	Aluminum, powder coated
Degree of protection according to IEC/EN 60529	IP 66
Fixation	Wall mounting
Ambient temperature	-10-+60 °C
Display	2 x 16-character, dot matrix, backlight
Menu language	English
Measuring functions	
Physical quantities	Volumetric flow rate, mass flow rate, flow velocity
Totalizer	Volume, mass
Current Output	
Number	1
Range	4-20
Accuracy	0.1% of reading ±15 µA
Active output	Rext < 500 Ω
Binary Output	
Number	2
Optorelay	28V / 100mA
Binary output as alarm output-functions	Limit, change of flow direction or error
Binary output as pulse output	Mainly for totalizing
- Pulse value	0.01-1000 units
- Pulse width	80-1000 ms
Flexibility	Mobile: (Can be transfer to another size or location)

Cable length: 10m (32.8ft)	- Calibration certificate and sensor prom - Coupling foils (-10-+200°C (+14-+392°F), 2 pcs) - Coupling compound -30-+130°C (-22-+266°F), 100ml (3.5 oz) tube
(VL) VARIOFIX L transducer mounting	Measuring mode; reflection or diagonal arrangement inclusive: - 2x VARIOFIX L, SS316 - 4x universal tension strap, 2.06m (6.7ft), SS316 - 4x ratchet claps, SS316 - 4x tension band springs, SS316

Prepared by:	Checked by:	Approved by:
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