

PROJECT TITLE : Supply of Labor and Materials for the Rehabilitation of Water line

LOCATION : National Road, Brgys. Bucal -Pansol-Bagong Kalsada

SUBJECT: Material Specifications

Flow Meters

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.

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

Parameter	Unit	40 mm (1½")	50 mm (2")	75 mm (3")	100 mm (4")	150 mm (6")	200 mm (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	0.10-0.30	0.22-0.40	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 qt ±2%	m ³ /h	0.8	1-5	1.4-8.0	2-12	3.5-30	8.5-50
Minimum Flow qmin ±5%	m ³ /h	0.20-0.35	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

Meter Size	Unit	250 mm (10")	300 mm (12")	350 mm (14")	400 mm (16")	450 mm (18")	500 mm (20")	600 mm (24")	700 mm (28")
Maximum Registration	m ³	≥100,000,000	≥100,000,000	≥100,000,000	≥100,000,000	≥100,000,000	≥100,000,000	≥100,000,000	≥100,000,000
Maximum Water Temperature	°C	50	50	50	50	50	50	50	50
Maximum Working Pressure	bar	16	16	16	16	16	16	16	16
Starting Flow	m ³ /h	1.5–3.0	2.0–4.0	2.5–5.0	3.0–6.0	4.0–8.0	5.0–10.0	7.0–14.0	9.0–18.0
Maximum Flow Rate	m ³ /h	1,200	1,500	1,750	2,500	3,000	4,000	5,000	≥5,500
Transitional Flow qt ±2%	m ³ /h	32	48	60	80	100	120	160	200
Minimum Flow qmin ±5%	m ³ /h	12	18	24	30	38	45	60	75
Overall Length	mm	450	500	500–600	600	600–700	800	800–1,000	Manufacturer's standard
Weight	kg	80	98	145	199	270	320	520	Manufacturer's standard

- 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 tempered glass of 5mm minimum thickness (or of suitable synthetic polymer which shall 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 resist 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")	to 700mm (28")
Type of Pipe	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.

Note: The offered product shall comply with all mandatory requirements herein. Equivalent products from any manufacturer shall be acceptable provided that they meet or exceed the specified technical and performance requirements.

Reference - LWUA TECHNICAL STANDARDS and CWD EXISTING STANDARDS.