



# काठमाण्डौ उपत्यका खानेपानी लिमिटेड

## ललितपुर शाखा कार्यालय



प.सं./चलानी नं. १२४/०८०/०८९

मिति: २०८०/६/८

काठमाण्डौ उपत्यका खानेपानी लिमिटेडको  
मौजूदा सूचीमा रहेका आपूर्तिकर्ताहरु,

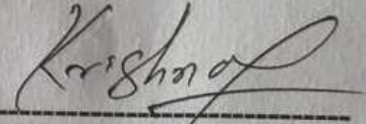
**बिषय:- दरभाउपत्र उपलब्ध गरिदिने बारे ।**

उपरोक्त बिषयमा काठमाण्डौ उपत्यका खानेपानी लिमिटेडको यस शाखा कार्यालयलाई यसै संग संलग्न Specification बमोजिमको १/२" खानेपानी मिटर खरिद गर्नुपर्ने भएकोले के कति दर रेटमा उपलब्ध गराउन सकिन्छ? सो को ईकाइको दरभाउ ३ (तीन) दिन भित्र उपलब्ध गराई दिनु हुन अनुरोध छ ।

**बोधार्थ:** श्री जिल्ला प्रशासन कार्यालय,  
मानभवन, ललितपुर ।

श्रीमान् प्रमुख कार्यकारी अधिकृत ज्यू,  
श्री सूचना प्रबिधि शाखा: Website मा upload गरिदिनु हुन ।  
काठमाण्डौ उपत्यका खानेपानी लिमिटेड  
मुख्य कार्यालय, त्रिपुरेश्वर, काठमाण्डौ ।

श्री प्रशासन फांट: सूचनापाटीमा टाँस गर्ने ।



(ई.कृष्ण कुमार साह)  
कार्यालय प्रमुख

कार्यालय प्रमुख

०१८

## (Technical Specifications)

### ½" Water Revenue Meter General

All water meters shall be AMR compatible, Volumetric Rotary Piston direct transmission, liquid filled register, designed to be equipped at any time with an external module for remote reading with the essential features of household water meters described in the following sections are sought for supply and installation.

Manufacturer must be registered to ISO9001-2008 and ISO 14001:2004 international quality certificates.

### Materials

Only the best quality and type of materials shall be used, which shall be suitable for the purpose intended. Unless otherwise specified, materials shall be selected by the supplier. The materials shall be appropriate both mechanically and chemically to the operating conditions. In connecting units they shall be mechanically, chemically and electrochemically compatible with one another and with the environment.

Materials shall be selected to the adequate resistance against abrasion and corrosion and where necessary, protective coating and lining shall be applied.

All materials in contact with the potable water shall be non-toxic and shall not affect the quality of the potable water at any given time.

### Design and Construction

Design and construction shall be conforming to ISO 4064: 2005 requirements, for cold water meters. The meters shall be suitable for cold water up to 50°C (working range 0°C to 50°C) and pressure-rating of minimum PN16. Pressure loss shall be on a minimum and as per ISO 4064.

All water meters shall be provided with an efficacious replaceable strainer in the inlet fitting. The strainer screen shall be rigid, fit snugly, be easy removable and have an effective straining area at least double that of the inlet.

The register is a semi-dry liquid filled register (condensation-free totalizer), made of engineering plastic for all gears and drums.

The register has 8 rollers with 4 digits for m<sup>3</sup> (black) and 4 for submultiples (red).

Maximum reading must be 9999 m<sup>3</sup>; minimum reading must be 0, 02 liters.

Easy to read thanks to large digits with minimum height of 4.4 mm.

A plastic lid has to protect the register rollers from dirt.

Registration shall be in cubic meters.

All meters shall be provided with wire and lead seals, both to upper and lower body.

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## Warranty

Warranty starts from the day of delivery and written acceptance by the client and shall be minimum 1 year after installation. This includes.

- Meter performance
- Materials, and
- Function.

## Essential Features

All water meter shall be volumetric water meters, Rotary Piston, liquid filled register with direct transmission. The two ends shall be threaded connection and the inlet and outlet shall have a common axis. They shall have water tight dismantling coupling on each side to allow easy removal of the instrument from the pipe works. Installation of the water meter can be done in horizontal and vertical position without hampering meters' performance.

The water meter shall be suitable for out- and indoor connection for tough conditions and shall afford reasonable safeguards against destruction. Special regards shall be given to the strength of glass & the cover-lid.

The dial shall be easy-read in cubic meters. The body as well as all parts in water contact shall be in corrosion free materials and approved for drinking water and to be a short construction the connection shall be in thread connection according to ISO. Adequate connecting nipples for the inlet as well as for the outlet together with all necessary seals shall be provided.

The meter body must be manufactured from brass metal (containing a minimum of 50 to 60% of copper).

The meters shall have the following minimum performance characteristics:

ND, mm	15
Flow rate Q3 m <sup>3</sup> /h	2.5
Maximum flow rate Q4 m <sup>3</sup> /h	3.125
Minimum flow rate Q1 liter/h	15.625
Measuring range R=Q3/Q1	160



The meter should not have any internal or external calibration device. The accuracy curve and the position inside the tolerance channel must be assured by design.  
 The piston of the measuring chamber has a special profile to absorb without damage particles present in water in case of network maintenance  
 All parts shall have smooth surface, special the parts in contact with water to prevent encrustation.  
 The water meter shall be suitable for out- and indoor connection for tough conditions.

Each delivered part shall be new and not used before and supplied according to technical specifications descript.  
 The water meter shall be designed for a lifetime of 10 years of normal operating conditions. Markings

The following markings on the closure cap shall be provided on the meters:

- One arrow caste on the body indicating the flow direction.
- Nominal size of the water meter
- Identification of the model, ISO standard or approval by international body (CE), serial number and year of manufacturing Manufacturers name suitably marked.

#### Meter Performance

Required Performance and accuracy shall be as per ISO 4064: 2005 as indicated below. The range of measured flow rates is sub divided into 3 reaches. The limits being defined by the following flow rates:

Identification	Description Value	Remarks
Q1	Minimum flow rate for reliable registration	Error permission +/- 5%
Q2	Limiting flow rate for increased accuracy of registration	Error permission +/- 2%
Q3	Nominal flow rate for continuous or limiting function.	Error permission +/- 2%
Q4	Maximum flow rate at which the meter shall function for a limited time without exceeding a metering error	Error permission +/- 2%
H in bar	Pressure loss in Q3	Not Exceeding 0.63 bar
P	Maximal permissible pressure	Min. requirement 16

## Testing

### Pattern Test Certificates:

Towards approval of meter manufacturer, contractor shall submit all pattern test results as per ISO 4064-1/3 which is tested/certified by an international / national accredited test laboratory accredited to ISO: 17025.

### Factory Pre Shipment Inspection:

Upon vendor approval, Contractor shall submit manufacturer's quality assurance plan for testing water meters for performance testing / dimensional checking/ marking requirements etc to be witnessed by the Employer/ Employers Representative. Sampling/ acceptance criteria during testing shall be as per ISO/National Standards like BS/IS/Nepalese Standards.

It is required that quality and compliance with these specifications shall be demonstrated for all materials and equipment by appropriate tests performed during the various phases of the work of production.

The minimum test pressure shall be the specified nominal pressure plus 50%. This pressure shall be applied increasing from 0 to maximum event over 15 minutes.

The test pressure shall be held without pressure drop for at least half an hour without any sign of leakage.

Shop testing shall be run with water of not more than 40-degree C and not less than 10-degree C temperature. Shop testing shall sufficiently cover the entire range of the capacity to demonstrate that the characteristics are stable.

The arithmetic mean of all readings for one performance point shall be within the specified limits.

## Reference to standards

In general, the relevant ISO or EN standards shall be applied. Reference to any other national standard or publication in these Specifications is intended to indicate general configuration, type and quality only.

Water meters must refer to ISO 4064. Certificates from the relevant authority shall be submitted along with the offer to the above effect.

Goods meeting other internationally accepted standards may be furnished, provided that overall quality will be at least equal to that required by the standards specified.

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### Shop testing and inspection

If required by the Engineer, the inspection of water meters will take place on the manufacturer's premises according to ISO 4064/3. The Contractor shall provide the testing equipment, the needed material, the checking devices and necessary trained personnel.

Inspection of external appearance, shape, dimensions and weight shall be carried out on sample water meters, appurtenances and accessories. This includes inspection of external appearance, shape and dimensions for each type of water meter according to ISO 4064. All water meters, appurtenances and accessories shall be sound and free from surface defects.

Accuracy tests shall be performed on test water meters selected at random out of batches, grouped in different types of water meters, as follows:

- 5% of the total quantity of each diameter and type

Each successfully tested batch will be identified by a mark. Results of all such tests shall be submitted to the Engineer on a previously approved certificate or form certified by the manufacturer or by a recognized agency.

Pieces of which the deviations from standard dimensions or accuracy exceed the tolerances shall be rejected.

### Submittals for Vendor Approval

The Contractor shall furnish to the Engineer the following:

Pattern Test Results of water meters as per ISO 4064-1/3 which is tested/certified by an international / national accredited test laboratory accredited to ISO: 17025.

### Handling and storing

Care shall be taken during loading, transporting, and unloading to prevent damage to the materials or coatings. Water meters that were examined and found to be defective shall not be accepted. Any damage to the water meter shall be repaired as directed by the Engineer.

Special handling of water meters shall be in accordance with the manufacturer's instructions.



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Particular care shall be taken during loading, unloading, handling and transportation to avoid distortion, flattening, denting, scoring or any other damages to the water meters.

Any goods which, in the opinion of the Purchasers' representative are delivered damaged or are damaged by the Contractor in the process of stockpiling at the delivery site shall be promptly removed from the site. The Contractor shall receive no compensation for the damaged material or its removal until it is either repaired to the satisfaction of the Engineer or completely replaced.

### General Design and Construction

Meters shall be designed for use in climate ranging from  $-5^{\circ}\text{C}$  to  $45^{\circ}\text{C}$ .

Meters shall have a modular design, consisting of an outlet case and separate measuring chamber. The measuring chamber shall be removable and rapidly exchangeable without removing the body.

Registration shall be by direct straight reading in cubic meters with single pointers to show the smallest measurements. The pointers shall move in clockwise direction.

Dials cover for dry type water meters shall provide an air-tight seal.

All revenue water meters shall be provided with a lid, which shall be recessed and shall overlap the registration box to protect the lens.

All meters shall be provided with lead seals.

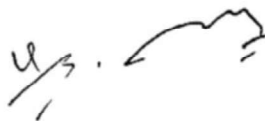
All parts in contact with the water shall have smooth surfaces, protected where necessary to prevent incrustation.

Water meters shall be designed for a lifetime of 10 years under normal operating conditions.

### Markings

Each meter shall be marked on the casing or display with the following information:

- At least one arrow cast onto the body indicating direction of flow
- Nominal size
- Nominal flow rate ( $Q_n$ ) preferably on counter housing
- Model identification
- Year of manufacture
- Serial number
- Manufacturer's name



### Characteristic flows

General performance and accuracy shall be as indicated below. The range of measured flow rates is subdivided into three reaches, the limits being defined by the following flow rates:

- Qmin = minimum flow rate for reliable registration  $\pm 5\%$
- Q1 = limiting flow rate for increased accuracy of registration
- Qn = nominal flow rate for continuous or intermittent function of the water meter  $\pm 2\%$
- Qmax = maximum flow rate at which the meter may function for limited time without damage

### Accuracies

Accuracy shall be as indicated below

- From Qmin to Qt: the error shall not exceed  $\pm 5\%$
- From Qt to Qmax: the error shall not exceed  $\pm 2\%$
- At Qn : the error shall not exceed  $\pm 2\%$

The Supplier shall include with his Tender the information in a format set out in the Technical Data Sheets regarding the above performance.

### Packing

Each meter shall be mounted on a pallet secured against movement, with protection against damages; especially the housing of the counter shall be covered. In case there is sufficient space, more than one piece can be mounted.

### Factory Warranty

Warranty starts from the day of delivery and written acceptance by the client and shall be minimum 1 year after installation. This includes:

- Meter performance,
- Materials, and
- Function.



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