IS 2373 (1981): Water Meters (Bulk Type) [CED 3: Sanitary Appliances and Water Fittings]

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IS : 2373 - 1981
(Reaffirmed 2003)
Edition 4.3
(1989-12)

Indian Standard

SPECIFICATION FOR WATER METERS (BULK TYPE)

(Third Revision)

UDC 681.121

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Group 6

Indian Standard

SPECIFICATION FOR WATER METERS (BULK TYPE)

(Third Revision)

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(*Continued on page* 21)

AMENDMENT NO. 3 DECEMBER 1989

TO

IS : 2373 - 1981 SPECIFICATION FOR WATER METERS (BULK TYPE)

(Third Revision)

(*Page* 10, *clause* **4.10**, *line* 5) — Insert the following after ' IS : 4131-1967§ ':

'or tensile brass conforming to IS : 320-1980¶.'

(*Page* 10) — Insert the following foot-note after ' § ' mark:

'¶Specification for high tensile brass rods and sections (*third revision*).'

(BDC 3)

AMENDMENT NO. 2 OCTOBER 1985

TO

IS:2373-1981 SPECIFICATION FOR WATER METERS (BULK TYPE)

(Third Revision)

(*Page 7, clause 4.2.1, line 4*) - Substitute 'DCB 2 of IS:1264-1981$' *for* 'CuZn 40 of IS:1264-1965$'.

(*Page 7, clause 4.2.2, line 3*) - Substitute 'DCB 2 of IS:1264-1981$' *for* 'CuZn 40 of IS:1264-1965$'.

(*Page 7, foot-note*) - Substitute '§Specification for brass gravity die castings (*second revision*)' *for* '$Specification for brass ingots for die castings and brass gravity die castings (including naval brass) (*revised*)'.

(HDC 3)

Reprography Unit, ISI, New Delhi, India

AMENDMENT NO. 1 JULY 1983

TO

IS:2373-1981 SPECIFICATION FOR WATER METERS (BULK TYPE)

(Third Revision)

Corrigendum

(*Page 9, clause 4.8.1, first line*) - Substitute 'runner shaft' *for* 'runner'.

(BDC 3)

Reprography Unit, ISI, New Delhi, India

Indian Standard

SPECIFICATION FOR WATER METERS (BULK TYPE)

(Third Revision)

0. FOREWORD

0.1 This Indian Standard (Third Revision) was adopted by the Indian Standards Institution on 27 February 1981, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 This standard was first published in 1963 and the first and second revisions were issued in 1968 and 1973 respectively. A third revision of the standard has been taken up to review the standard and incorporate changes found necessary in the light of comments received from manufacturers and users during the course of implementation of the standard.

0.2.1 In this revision, minimum thickness of the liner for enclosed type water meter has been incorporated to ensure life of the body of water meters.

0.3 This standard contains clauses **4.6.1, 4.6.2, 4.12** and **6.2** which permit the purchaser to use his option for selection to suit his requirements. This standard also contains clause **8.2.2** which requires agreement between the purchaser and the manufacturer.

0.4 This edition 4.3 incorporates Amendment No. 1 (July 1983), Amendment No. 2 (October 1985) and Amendment No. 3 (December 1989). Side bar indicates modification of the text as the result of incorporation of the amendments.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers bulk type water meters of the following types:

a) Vane-wheel (impeller) type water meters from 50 to 300 mm (*see* Fig. 1); and

b) Helical type water meters from 50 to 500 mm (*see* Fig. 2).

*Rules for rounding off numerical values (*revised*).

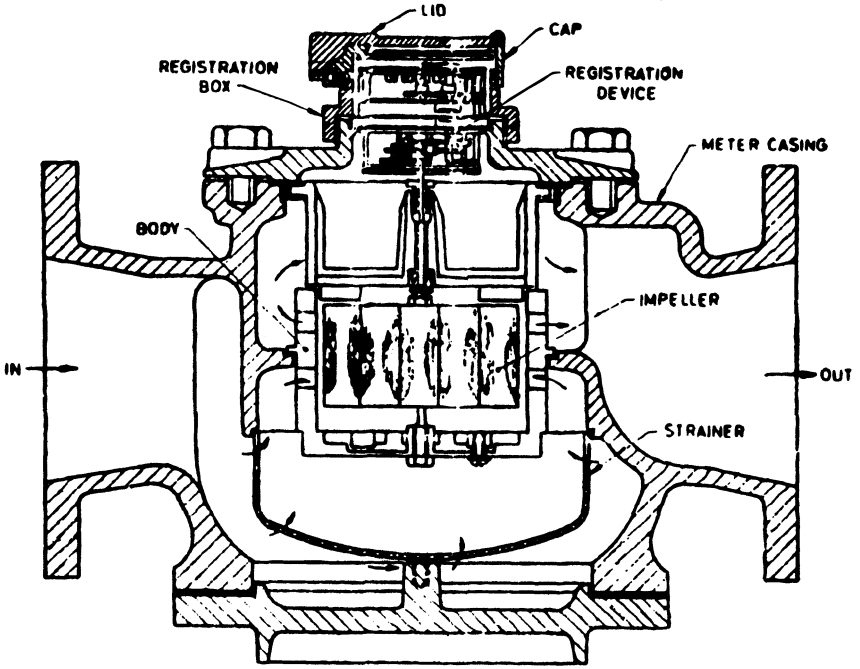
2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions (*see* Fig. 1 and 2) shall apply.

2.1 Meter Casing — The outer casing in which the entire meter mechanism is housed.

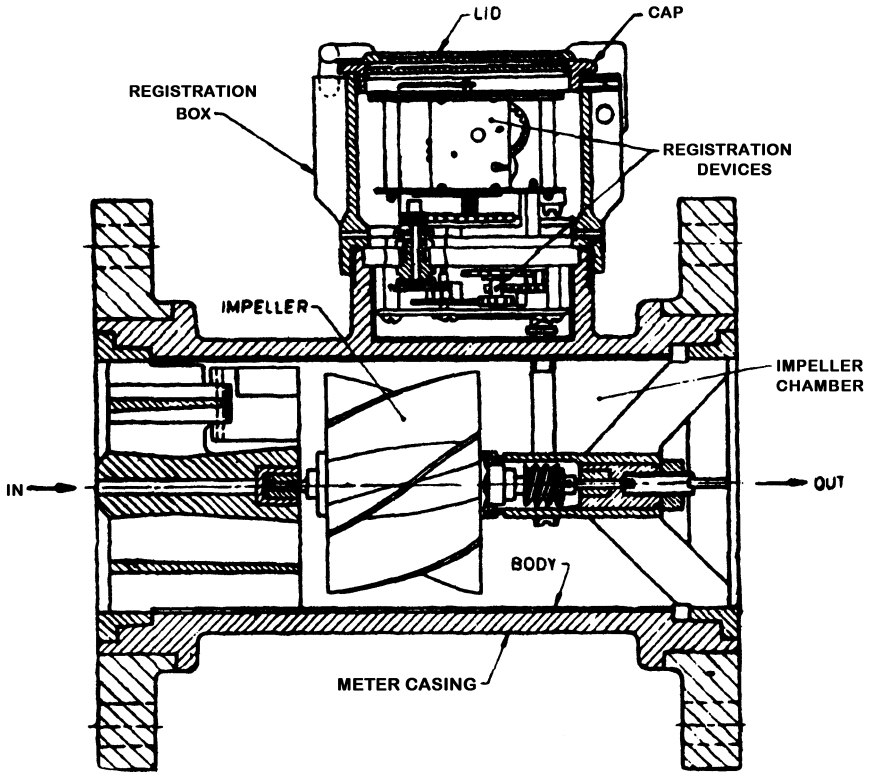
2.2 Body — The part of the meter which houses the runner and the transmission gear train of the water meter. Some parts of the body may be integral with the casing.

2.3 Registration Box — The part of the meter casing which houses the registration device.



NOTE — The illustration is not intended to limit the design but to show the main component parts only.

FIG. 1 TYPICAL ILLUSTRATION OF BULK TYPE WATER METER (VANE-WHEEL TYPE)



NOTE — The illustration is not intended to limit the design but to show the main component parts only.

FIG. 2 TYPICAL ILLUSTRATION OF BULK TYPE WATER METER (HELICAL TYPE)

2.4 Cap — The part of the meter casing body to which is fitted the dial cover and the lid.

2.5 Lid — The top cover which is hinged to the cap with a view to protecting the transparent dial cover.

2.6 Registration Device — The unit which comprises the recording gear train and the indicating device consisting of a cyclometer type

counter or pointer on a dial or a combination of both. It registers in suitable volumetric units the quantity of water which has passed through the meter.

2.7 Vane-Wheel Type Meter — Meter whose runner or impeller is mounted on a vertical spindle, which has several vanes symmetrically spaced round its axis. The water impinges on the runner over a part or the whole of its circumference.

2.8 Helical Type Meter — Axial flowmeter whose runner is provided with a number of vanes forming a multi-threaded helix.

2.9 Water Meter, Dry-Dial Type — Meter in which the counter mechanism is isolated from water flowing through the meter.

2.10 Water Meter, Wet-Dial Type — Meter in which the complete counter unit is in contact with water flowing through the meter.

3. NOMINAL SIZE

3.1 The water meters shall be of the following nominal sizes:

mm	mm
50	250
80	300
100	350
150	400
200	500

3.1.1 The nominal size of water meters shall be denoted by the bore of their inlet.

4. MATERIALS AND MANUFACTURE

4.1 General — Water meters and their parts, especially parts coming in continuous contact with water, shall be made of materials resistant to corrosion and shall be non-toxic and non-tainting; where cast iron is used, it shall be protected suitably against corrosion. Use of dissimilar metals in contact under water shall be avoided, as far as possible, to minimize electrolytic corrosion. Information required to be supplied by the purchaser with the enquiry and order is given in Appendix A.

4.2 Casing and Body

4.2.1 *Casing* — The casing of the meter shall be made from cast iron conforming to Grade FG 200 of IS : 210-1978* or bronze conforming to Grade 2 of IS : 318-1962† or brass conforming to Grade 3 of IS : 292-1961‡ Grade DCB 2 of IS : 1264-1981§.

4.2.2 *Body* — The body of the water meter shall be made of bronze conforming to Grade 2 of IS : 318-1962† or brass conforming to Grade 3 of IS : 292-1961‡ or Grade DCB 2 of IS : 1264-1981§. In the case of enclosed type water meters as per Fig. 2, the liner shall be made of minimum 1.5 mm thick brass sheet conforming to IS : 410-1977||.

4.2.2.1 The body shall be free from all manufacturing and processing defects, such as blow-holes and spongy structures and shall not be repaired by plugging, welding or by the addition of material. The integral shape of the body shall ensure smooth flow of water and easy dismantling.

4.3 Connections — The water meter shall be provided with flanges at both the ends, the internal diameter of which shall be equal to the nominal size of the meter. The flanges shall be machined flat, that is, without a raised joint face. The dimensions and drilling of the flanges shall be in accordance with IS : 1538 (Part IV)-1976¶ and IS : 1538 (Part VI)-1976**. Tolerances on dimensions and drillings shall be in accordance with IS : 1538 (Part I)-1976††. For meters of 50 mm size the dimensions and drilling of flanges and tolerances shall be in accordance with Table 1.

4.4 Screws, Studs, and Nuts — Screws, studs and nuts shall be of mild steel (*see* IS : 280-1978‡‡), brass (*see* IS : 320-1962§§) or some other corrosion resistant material. Where fasteners are likely to be in

*Specification for grey iron castings (*third revision*).

†Specification for leaded tin bronze ingots and castings (*revised*).

‡Specification for brass ingots and castings (*revised*).

§Specification for brass gravity die castings (*second revision*).

||Specification for cold rolled brass sheet, strip and foil (*third revision*).

¶Specification for cast iron fittings for pressure pipes for water, gas and sewage: Part IV Specific requirements for flanges of pipes and fittings (*second revision*).

**Specification for cast iron fittings for pressure pipes for water, gas and sewage: Part VI Specific requirements for standard flange drilling of flanged pipes and fittings (*second revision*).

††Specification for cast iron fittings for pressure pipes for water, gas and sewage: Part I General requirements (*second revision*).

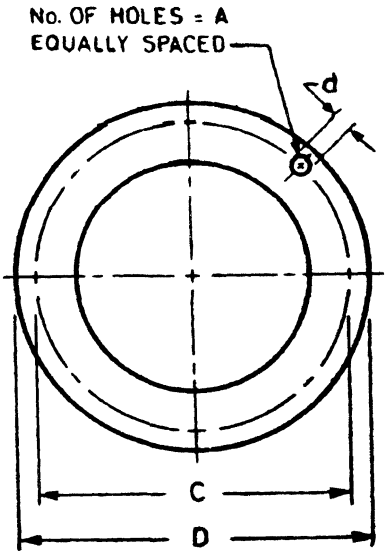
‡‡Specification for mild steel wire for general engineering purposes (*third revision*).

§§Specification for high tensile brass rods and sections (*revised*).

contact with water, they shall be made of brass conforming to IS : 320-1962* or of stainless steel conforming to designation 07 Cr 18 Ni 9 of IS : 1570 (Part V)-1972†.

TABLE 1 DIMENSIONS FOR FLANGE, FLANGE DRILLINGS AND TOLERANCES FOR 50 mm NOMINAL SIZE WATER METER

(*Clause* 4.3)



SL NO.	PARTICULARS	DIMENSIONS
1	Outside diameter, *D*	$165^{+3.0}_{-1.0}$
2	Thickness of flange	19 ± 2
3	Diameter of bolt circle, *C*	125 ± 1.0
4	Number of holes, *A*	4
5	Diameter of bolt holes, *d*	19
6	Diameter of bolts	16

*Specification for high tensile brass rods and sections (*revised*).

†Schedules for wrought steels: Part V Stainless and heat-resisting steels (*first revision*).

4.5 Registration Box — The registration box shall be made of the same material as specified for body in **4.2.2**.

4.6 Cap — The cap shall be made of the same material as specified for body in **4.2.2**. The cap shall be so designed and fixed to the registration box as to avoid entry of water and dirt. The transparent window, which covers the dial, shall be inserted from the inside into the cap. The protective lid shall be secured by a robust hinge or other suitable methods of robust construction.

4.6.1 Where required by the purchaser, provision shall be made to lock the lid to the registration box. The provision shall be such that the lock may be conveniently operated from the top. Where the provision is designed for use in conjunction with padlocks, the hole provided for padlock shall be of diameter not less than 4 mm.

4.6.2 Where so required, for dry type water meter, the transparent window covering the dial shall be provided with a wiper on the inner side for wiping off condensed water.

4.7 Strainer — Strainers shall be made of a material which is not susceptible to electrolytic corrosion. They shall be of plastic or other corrosion resistant materials. They shall be rigid, easy to remove and clean and shall be fitted on the inlet side of the water meter. The strainer shall have total area of holes not less than twice the area of the nominal inlet bore of the pipe to which the meter is connected. Where stainer is installed outside the meter, it shall be at such a distance that it does not affect the accurate functioning of the meter.

4.8 Runners (Impellers)

4.8.1 The runner shaft shall be of tensile brass conforming to IS : 320-1962*, stainless steel conforming to designation 07 Cr 18 Ni 9 of IS : 1570 (Part V)-1972† or nickel alloys conforming to IS : 4131-1967‡.

4.8.2 Runner of the meter shall be of ebonite, vulcanite, or suitable plastic, bronze conforming to Grade 2 of IS : 318-1962§, stainless steel conforming to designation 07 Cr 18 Ni 9 of IS : 1570 (Part V)-1972† or nickel alloy conforming to IS : 4131-1967‡. It shall be accurately

*Specification for high tensile brass rods and sections (*revised*).

†Schedules for wrought steels: Part V Stainless and heat-resisting steels (*first revision*).

‡Specification for nickel-copper alloy castings.

§Specification for leaded tin bronze ingots and castings (*revised*).

balanced. Runner shall be durable and shall work with as low a frictional resistance as possible.

NOTE — If the runner is not placed accurately, it will immediately affect the accuracy at different rates of flow and the minimum flow at which the meter should start registering. No separate tests are, therefore, required for this purpose.

4.9 Runner Chamber — In the case of vane-wheel type meters, the runner chamber shall be of brass conforming to Grade 3 of IS : 292-1961*, bronze conforming to Grade 2 of IS : 318-1962†, stainless steel conforming to designation 07 Cr 18 Ni 9 of IS : 1570 (Part V)-1972‡ or nickel alloy conforming to IS : 4131-1967§. The runner chamber shall be rigid and shall not change its form as a result of internal stresses or with use.

4.10 Gears — Gears shall be so constructed as to fully and smoothly mesh with each other, and shall be firmly fitted on their shaft. Gears coming in contact with water shall be of stainless steel conforming to designation 07 Cr 18 Ni 9 of IS : 1570 (Part V)-1972‡ or nickel alloy conforming to IS : 4131-1967§ or tensile brass conforming to IS : 320-1980¶. In the helical type meters, the worm gears may be fitted on a shaft and the worm wheel shall be enclosed and protected against the incursion of solid particles.

4.11 Bearings — Impeller bearings shall be of agate, sapphire, graphite filled nylon or graphite filled ebonite suitably ground and polished. The shape of the impeller bearing shall be such as to prevent the penetration of particles of sand and to preclude the deposit of anything in solution or suspension in water and to facilitate the washing away of such deposits by water flow. The shafts of the gears shall revolve freely in their bearings. The length of the bearing shall ensure their effective operation.

4.12 Counting Mechanism — The pointer shall be made of sheet brass conforming to 410-1977 || or suitable plastic. The counter shall be of circular multi-pointer pattern with all pointers preferably reading clockwise. The indicating device may also be of the straight reading cyclometer type counter or a combination of pointer and the counter. The rollers of the cyclometer counter shall be made of nickel or nickel plated brass or plastic specially suitable for the purpose and shall be self-lubricating. The external numbering shall be such that it will not fade away under continued use.

4.12.1 The range of registration shall be as given in Table 2.

*Specification for brass ingots and castings (*revised*).

†Specification for leaded tin bronze ingots and castings (*revised*).

‡Schedules for wrought steels: Part V Stainless and heat-resisting steels (*first revision*)

§Specification for nickel-copper alloy castings.

¶Specification for high tensile brass rods and sections (*third revision*).

||Specification for cold rolled brass plate, sheet, strip and foil (*third revision*).

TABLE 2 RANGES OF REGISTRATION OF WATER METERS

(*Clause* 4.12.1)

NOMINAL SIZE	RANGES OF REGISTRATION OF WATER METERS IN LITRES	
	Minimum Registration in Dial Division Not to be More Than	Maximum Registration Not to be Less Than
mm		
50	10	100 000 000
80	10	100 000 000
100	100	100 000 000
150	100	100 000 000
200	100	1 000 000 000
250	100	1 000 000 000
300	100	1 000 000 000
350	100	1 000 000 000
400	1 000	10 000 000 000
500	1 000	10 000 000 000

4.13 Dial — The dial shall be of vitreous enamel, copper or suitable plastic, ensuring indestructible marking and good legibility. The unit of measurement namely, 'litre' or 'kilolitre' shall be marked on the dial as 'LITRES' or 'KILOLITRES' in boldface; the unit, cubic metre (m^3) may also be used in place of kilolitre.

4.14 Sealing — Sealing holes shall be provided and the meter shall be sealed in such a manner as to render it inaccessible to the measuring unit, including registration box and cap without breaking the seal. The sealing wire shall be rust proof such as tinned copper.

4.15 Regulator — Every meter shall be provided with either an external or an internal regulator. The external regulator shall be accessible from outside to be operated by a suitable key without dismantling the meter and protected by a sealed cover. The internal regulating device shall not be accessible from outside.

4.16 Location of Serial Number — The serial number of the meter shall be clearly indicated in any suitable place except the lid.

5 PERFORMANCE REQUIREMENTS

5.1 Temperature — The meter shall be suitable for use with water up to 45°C.

5.1.1 *Temperature Suitability Test* — The water meter shall be immersed in a water-bath maintained at 45 ± 1°C for 10 h. Afterwards it should be checked for flow and accuracy tests.

NOTE — This is a type test.

5.2 Hydrostatic Test — Meters shall satisfactorily withstand a pressure of 1.6 MPa (16 kgf/cm^2).

5.3 Capacity Ratings for Water Meters

5.3.1 *Nominal Capacity or Short Period Rating* — Vane-wheel water meters shall be capable of giving discharges not less than as given in Table 3 without the headloss exceeding 10 m within the meter. The helical meters shall be capable of giving discharges not less than as given in Table 3 without the headloss exceeding 3 m within the meter.

TABLE 3 NOMINAL CAPACITY RATINGS

(*Clauses* 5.3.1 *and* 5.5)

NOMINAL SIZE	CAPACITY RATINGS OF WATER METERS IN LITRES PER HOUR	
	Vane-Wheel Type	Helical Type
mm		
50	30 000	50 000
80	50 000	125 000
100	70 000	200 000
150	150 000	500 000
200	250 000	800 000
250	400 000	1 100 000
300	500 000	1 500 000
350	—	2 000 000
400	—	3 000 000
500	—	5 000 000

5.3.2 *Recommended Capacities for Intermediate Flows* — Vane-wheel water meters shall be capable of giving discharges not less than as given in Table 4 without the headloss exceeding 3 m within the meter; helical meters shall be capable of giving discharges not less than as given in Table 4 without the headloss exceeding 1 m within the meter.

5.3.3 The headloss within meters shall be measured in accordance with the method given in Appendix B.

NOTE — The discharge may also be measured by other suitable devices like suitably designed orificemeter, venturi meter or notches.

5.4 Minimum Starting Flow — The minimum flow at which the meters start registering shall be as given in Table 5.

5.5 Metering Accuracy — The accuracy at lower limit of flow shall be calculated at one-thirtieth of the nominal capacities of water meters given in Table 3; at the lower limit of flow, the metering accuracy shall be ± 2 percent for both types of water meters. The same accuracy shall be complied with at least up to intermediate flows specified in Table 4.

NOTE — This accuracy is attainable when the meter is flowing full under pressure.

6. FROST PROTECTION DEVICES

6.1 Meters liable to be damaged by frost shall be protected with suitable frost protection devices. Several devices are adopted and the following, which have been found to give satisfactory performance, are given as typical examples:

a) Provision of pads of special quality rubber which accommodate the increase in bulk of water when it freezes; and

b) Provision of collapsible metal ring which under frost pressure allows the top plate carrying the mechanism to lift and so safeguard the body, or a metal disc in the body which gives way under pressure. It should be noted that the damaged ring or plate requires immediate replacement to restore water supply to user or to stop waste.

6.2 The purchaser shall specify with his order whether he requires frost protection device.

7. MARKING

7.1 Each water meter shall be marked with the following information:

a) Manufacturer's name or trade-mark,

b) Nominal size of the meter, and

c) Direction of flow of water on both sides of the meter.

TABLE 4 CAPACITY RATINGS FOR INTERMEDIATE FLOWS

(*Clauses* 5.3.2 *and* 5.5)

Nominal Size	Capacity Ratings for Water Meters in Litres Per Hour	
	Vane-Wheel Type	Helical Type
mm		
50	17 000	20 000
80	27 000	62 000
100	40 000	100 000
150	80 000	250 000
200	150 000	400 000
250	220 000	550 000
300	300 000	750 000
350	—	1 000 000
400	—	1 500 000
500	—	2 500 000

TABLE 5 MINIMUM STARTING FLOWS

(*Clause* 5.4)

Nominal Size	Minimum Starting Flows in Litres Per Hour	
	Vane-Wheel Type	Helical Type
mm		
50	250	500
80	500	1 000
100	700	1 500
150	1 000	3 500
200	2 400	5 500
250	3 200	9 000
300	6 400	14 000
350	—	20 000
400	—	25 000
500	—	35 000

7.1.1 Each water meter (with or without strainer) may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

8. TESTS

8.1 Classification of Tests — Tests shall be classified into three groups, namely (a) production routine tests, (b) type tests, and (c) acceptance tests.

8.1.1 *Production Routine Tests* — These tests are carried out on each and every meter to check the requirements which are likely to vary during production (*see* **8.3**).

8.1.2 *Type Tests* — These tests are carried out to prove conformity to the requirements of the relevant specification. These are intended to check the general quality and design of a given type of meter (*see* **8.4**). Once a meter has undergone type tests, any major or essential alterations, which the manufacturer intends to make, shall be reported to the testing authority and further type tests shall be carried out in accordance with the procedure laid down in this standard.

8.1.3 *Acceptance Tests* — Tests carried out on samples selected from a lot for the purposes of acceptance of the lot.

8.2 Samples for Tests

8.2.1 *Type Tests* — Two meters in the case of 50 mm size and one meter in the case of 80 mm size and above shall be sent along with 4 copies of the manufacturer's detailed specification together with figures for the loss of head and accuracy curves to the recognized testing authority for the purpose of type test. The samples shall be picked up at random from stock or routine factory production.

8.2.2 *Acceptance Tests* — The number of samples shall be agreed to between the manufacturer and the purchaser.

8.3 Production Routine Test — Production routine tests shall consist of:

a) hydrostatic test (*see* **5.2**), and

b) tests conducted to determine the following performance requirements:

1) Recommended capacity for intermediate flows (*see* **5.3.2** and NOTE given below),

2) Minimum starting flows (*see* **5.4)**, and

3) Metering accuracy (*see* **5.5**).

NOTE — However, for meters 200 mm and above, flow test may be conducted for a discharge of not less than 275 000 1/h.

8.4 Type Tests — Besides all the production routine tests outlined in **8.3**, the type tests shall comprise those given in **8.4.1** and **8.4.2**.

8.4.1 *Construction* — The meter shall be dismantled completely to its component parts and checked for conformity with regard to dimensions and tolerances with this standard; in the case of meters of 50 mm size, only one meter need be dismantled. A study of the details of assembly shall be made on matters, such as case of assembly, absence of riveted or turned over parts, forced fitting and liability of parts to break during dismantling and assembly.

8.4.2 *Flow Test* — The meter (both the meters in the case of 50 mm size) shall then be subjected to the flow test to measure the following:

a) Loss of head at nominal capacity (*see* **5.3.1**) and recommended capacity at intermediate flows (*see* **5.3.2**),

b) Minimum starting flows (*see* **5.4**), and

c) Metering accuracy (*see* **5.5**).

NOTE 1 — Before the meter is subjected to the flow test it shall be run and brought to normal condition by passing through them water at intermediate flow value for a period of two hours.

NOTE 2 — Type test certificate may be made available in lieu of flow test at manufacturer's premises.

8.4.2.1 Results of the type tests shall be reported in the form given in Appendix C.

APPENDIX A

(*Clause* 4.1)

INFORMATION TO BE SUPPLIED BY THE PURCHASER WITH THE ENQUIRY AND ORDER

A-1. The following information shall be supplied by the purchaser with the enquiry and orders:

a) Nominal size of meter required;

b) Type of meter required, namely, vane-wheel or helical;

c) Provision for locking, whether required or not;

d) Type of counter required, namely:

1) circular multipointer pattern,
2) straight reading cyclometer type, or
3) combination of pointer and counter;

e) Frost protection device required or not;

f) Strainer required or not;

g) Wiper required or not; and

h) Wet or dry dial required.

APPENDIX B

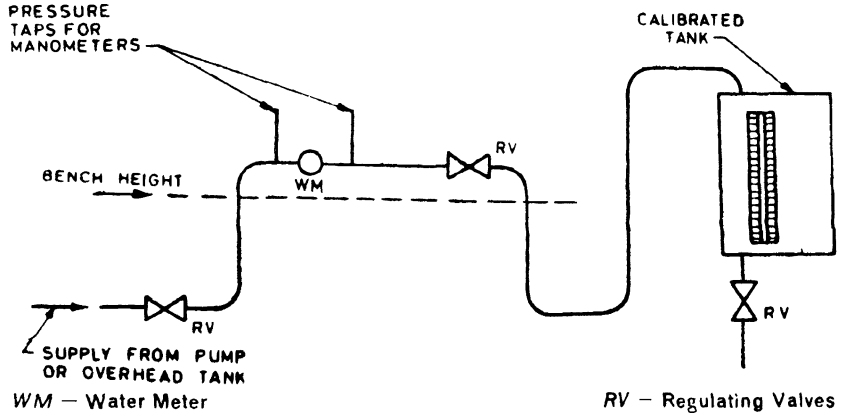
(*Clause* 5.3.3)

METHOD FOR DETERMINATION OF HEADLOSS IN WATER METERS

B-1. DETAILS

B-1.1 Pressure gauges or manometer shall be fixed upstream and downstream of the water meter under test. The inlet and outlet of the water meter shall each be provided with a straight pipe of internal diameter equal to the nominal size of the meter and having a length equal to at least 10 times its diameter on the upstream or inlet side and a straight length of at least 8 times its diameter on the downstream or outlet side free from tees, bends, valves, etc, and the meter in no case shall freely discharge into the atmosphere. When discharging water at

the specified rates (*see* **5.3.1** and **5.3.2**) the pressure drop shall be noted which shall be the headloss at the corresponding flows. A typical arrangement for measurement of headloss is shown in Fig. 3.



Discharge may be measured by some other suitable device, such as suitably designed orfice meters, venturi meters or notches.

FIG. 3 TYPICAL ARRANGEMENT FOR MEASUREMENT OF HEADLOSS OF WATER METERS

B-1.2 The regulating valve shall be situated at a distance not less than 40 times the diameter of the pipe from the inlet end of the water meter. When the feed of the water is through a pump instead of through an overhead tank, the pump shall be so situated and where required suitable damping devices, such as air vessels or automatic pressure switches, shall be so provided that the pulsation in the flow of water through the meter is reduced to the minimum.

APPENDIX C

(*Clause* 8.4.2.1)

TYPE TEST ON WATER METERS

Name of the manufacturer .....

Type designation .....

Nominal size .....

Date of receipt .....

Date on which tests were started

Dimensions and tolerances

Ease of re-assembly, maintenance and inspection

Flow test

Quality of water used in the test

Particulars	Value According to Indian Standard	Meter 1 (Re-Assembled)	Meter 2 (For 50 mm size) (Unopened)
(1)	(2)	(3)	(4)
a) Minimum flows at which measurement commences			
b) Loss of head at:			
1) recommended capacity at intermediate flows			
2) nominal capacity rating			
c) Accuracy at:			
1) lower limit of flow			
2) intermediate flows			
d) Hydrostatic test			
e) Temperature suitability test			

REPORT ON DISMANTLING THE METER FOR TYPE TEST

Remarks

Date

Signature and Designation of
Test Supervisor

Seal of the testing authority

(*Continued from page* 2)

Members	*Representing*
CHIEF ENGINEER	U. P. Jal Nigam, Lucknow
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CHIEF ENGINEER (WATER)	Delhi Municipal Corporation, Delhi
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This Indian Standard has been developed by Technical Committee : BDC 3

Amendments Issued Since Publication

Amend No.	Date of Issue
Amd. No. 1	July 1983
Amd. No. 2	October 1985
Amd. No. 3	December 1989

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