

Australian Standard[®]

**Meters for cold and heated drinking and
non-drinking water supplies**

Part 1: Technical requirements



This Australian Standard® was prepared by Committee WS-024, Meters for Cold Potable Water. It was approved on behalf of the Council of Standards Australia on 10 August 2010. This Standard was published on 30 September 2010.

The following are represented on Committee WS-024:

- Australian Industry Group
 - Australian Institute of Refrigeration, Air Conditioning and Heating
 - Brisbane City Council
 - National Measurement Institute
 - Plumbing Products Industry Group
 - Water Industry Alliance
 - Water Services Association of Australia
 - Water Services of Australia
 - Water Industry Alliance
-

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Meters for cold and heated drinking and non-drinking water supplies

Part 1: Technical requirements

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PREFACE

This Standard was prepared by the Standards Australia Committee WS-024, Meters for Cold Potable Water, to supersede Australian Standards AS 3565.1—2004 *Meters for water supply—Cold water meters*, AS 3565.2—2004 *Meters for water supply—Combination meters*, AS 3565.3—2004 *Meters for water supply—Water meters with integral dual check valves* and AS 3565.5—2004 *Meters for water supply—Water meters with two integral single check valves*. This Standard has been harmonized with National Measurement Institute (NMI) R49 series, which specifies the metrological and technical requirements for pattern approval and verification of water meters to comply with the National Measurement Act 1960 (Cth).

The objective of this Standard is to provide technical specifications for water meters to meet the needs of the network utility operators, plumbing regulators, manufacturers and other stakeholders. The objective of this revision is to include essential requirements to maintain progress with technology in the water meter industry.

Requirements for non-metallic bodied meters, heated water meters and non-drinking water meters have been included to complement cold drinking water meters.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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STANDARDS AUSTRALIA

Australian Standard**Meters for cold and heated drinking and non-drinking water supplies****Part 1: Technical requirements**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for water meters used to meter the actual volume of cold and heated drinking and non-drinking water flowing through a fully charged closed conduit, other than applications covered by ATS 4747 series, and additional to those specified in NMI R 49-1.

NOTES:

- 1 Means for demonstrating compliance with this Standard is given in Appendix A.
- 2 Purchasing guidelines are given in Appendix B.

1.2 NORMATIVE REFERENCES

The following are the normative documents referred to in this Standard:

NOTE: Documents referenced for informative purposes are listed in the Bibliography.

AS

- | | |
|--------|---|
| 1722 | Pipe threads of Whitworth form |
| 1722.2 | Part 2: Fastening pipe threads |
| 2345 | Dezincification resistance of copper alloys |
| 2700 | Colour Standards for general purposes |
| 4087 | Metallic flanges for waterworks purposes |

AS/NZS

- | | |
|--------|--|
| 2845 | Water supply—Backflow prevention devices |
| 2845.1 | Part 1: Materials, design and performance requirements |
| 3500 | Plumbing and drainage |
| 3500.0 | Part 0: Glossary of terms |
| 4020 | Testing of products for use in contact with drinking water |

ISO

- | | |
|--------|---|
| 4064 | Measurement of water flow in fully charged closed conduits—Meters for cold portable water and hot water |
| 4064.1 | Part 1: Specifications |

- | | |
|------|--------------------------------------|
| ADWG | Australian Drinking Water Guidelines |
|------|--------------------------------------|

- | | |
|------|---|
| ATS | Australian Technical Specification |
| 4747 | Meters for non-urban water supply (all parts) |

ISO

- | | |
|--------|--|
| 4892 | Plastics—Methods of exposure to laboratory light sources |
| 4892.1 | Part 1: General guidance |
| 4892.3 | Part 3: Fluorescent UV lamps |

ISO/IEC

Guide 98 Guide to expression of uncertainty in measurement (GUM)

NMI National Measurement Institute

R 49-1 Part 1: Metrological and Technical Requirements

R 49-2 Part 2: Test Methods

VIM International Vocabulary of Basic and General Terms in Metrology (VIM). BIPM, IEC, IFCC, ISO, IUPAC, IUPAP and OIML. International Organization for Standardization, Geneva, 1993

VIML International Vocabulary of terms in Legal Metrology

Guide to the expression of uncertainty in measurement. BIPM, IEC, IFCC, ISO, IUPAC, IUPAP and OIML, International Organization for Standardization, Geneva, 1995

1.3 DEFINITIONS

For the purposes of this Standard, the definitions in NMI R 49-1, the International Vocabulary of Basic and General Terms in Metrology (VIM) and the International Vocabulary of Legal Metrology (VIML) and those below apply.

1.3.1 Nominal diameter (DN)

Alphanumeric designation of size for components of a pipework system, which is used for reference purposes.

NOTE: It comprises the letters DN followed by a dimensionless whole number that is indirectly related to the physical size (in millimetres) of the bore, or outside diameter of the end connections.

1.3.2 Drinking water

Water that is intended for human consumption, cooking and for personal bathing.

NOTE: The standards that define potable water are described in the Australian Drinking Water Guidelines (ADWG). ADWG is published by the National Health and Medical Research Council (NHMRC) in collaboration with the Natural Resource Management Ministerial Council (NRMMC).

1.3.3 Non-drinking water

- 1 Water that has not been examined, properly treated, and not approved by appropriate authorities as being safe for consumption. Non-drinking water may still be used for other purposes depending on its quality.
- 2 Non-drinking water has the meaning of treated recycled water used for municipal, domestic, industrial and commercial use, as defined in AS/NZS 3500.0.

SECTION 2 TECHNICAL REQUIREMENTS

2.1 GENERAL

All meters shall comply with the metrological and technical requirements of NMI R 49-1 and shall be of an approved pattern where applicable under the National Measurement Act 1960 (Cth).

2.2 DIMENSIONS OF IN-LINE METERS

The DN and lengths of in-line meters shall be in accordance with Table 2.1. Widths and heights of in-line meters shall be in accordance with ISO 4064-1.

NOTE: Other dimensions excluding DN may be specified by the purchasers.

TABLE 2.1
METER DIMENSION

Nominal diameter, DN	Length cold water meter, mm	Length heated water meter, mm
15	134 + 0 -2	165 + 0 -2
20	154 + 0 -2	190 + 0 -2
25	178 + 0 -2	260 + 0 -2
32	190 + 0 -2	260 + 0 -2
40	232 + 0 -2	300 + 0 -2
50	311 + 0 -3	300 + 0 -3
50	300 + 0 -3	300 + 0 -3
80	413 + 0 -5	—
100	483 + 0 -5	—
150	500 + 0 -5	—
200	520 + 0 -5	—
300	500 + 0 -5	—
350	500 + 0 -5	—
400	600 + 0 -5	—
500	600 + 0 -5	—
600	800 + 0 -5	—
800	1200 + 0 -5	—
>800	1.25 × DN + 0 -5	—

NOTE: Dimensions of meters larger than DN 200 and heated water meters are based on ISO 4064-1.

2.3 PREFERRED END CONNECTIONS

The preferred connections of meters shall be in accordance with Table 2.2.

TABLE 2.2
PREFERRED CONNECTIONS

Nominal diameter DN	Preferred end connection		
	Threaded	Flanged	
		Oval	Round
15	Yes	—	—
20	Yes	—	—
25	Yes	—	—
32	Yes	Yes	—
40	Yes	Yes	Yes
50	—	Yes	Yes
80	—	—	Yes
100	—	—	Yes
150	—	—	Yes
200	—	—	Yes

2.4 THREADED END CONNECTIONS

‘G’ series threads shall comply with AS 1722.2 Class B.

Thread forms for ball joint, nut and tail thread connections shall comply with AS 1722.2 and thread sizes shall comply with Table 2.3.

TABLE 2.3
THREAD SIZES

Connection thread	Pitch diameter, mm			
	Max.	Min.	Max.	Min.
DN 20 Ball joint Diameter 36.60 × 14 TPI	35.44	35.27	—	—
DN 20 Nut and Tail Diameter 32.50 × 14 TPI	31.35	31.18	—	—
DN 25 Ball joint Diameter 43.76 × 14 TPI	—	—	42.60	42.43
DN 25 Nut and Tail Diameter 38.86 × 14 TPI	—	—	37.70	37.53

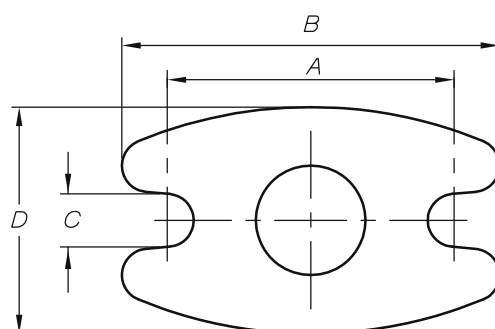
NOTE: Where specific choice of required thread pitch and major diameter is not listed above, the class of thread fit and associated minimum and maximum diameters shall be provided within the meter specification.

2.5 ROUND FLANGE CONNECTIONS

Round flanges shall comply with AS 4087 and shall be rated greater or equal to the meter’s maximum admissible pressure.

2.6 OVAL FLANGE CONNECTIONS

Oval flanges shall conform to the dimensions given in Figure 2.1 and comply in other respects with AS 4087.



Nominal diameter DN	Dimensions, mm			
	A	B	C	D
32	84 ±1.5	110 ±3.0	14 ±1.5	65 ±3.0
40	92 ±1.5	124 ±3.0	14 ±1.5	76 ±3.0
50	108 ±1.5	140 ±3.0	18 ±1.5	86 ±3.0

FIGURE 2.1 OVAL FLANGES

2.7 MATERIALS

All materials used in the manufacture of meters shall comply with the Standards specified in Items (b) and (c) below and shall have the following characteristics:

- (a) Construction materials shall be selected to provide consistent operation for the life of the meter in the operating conditions.
- (b) All copper alloys in contact with water shall comply with AS 2345.
- (c) Materials in contact with drinking water shall comply with AS/NZS 4020.

2.8 MATERIAL DURABILITY TESTS

All meters shall comply with ultraviolet light exposure test as specified in Appendix C.

Where requested by the purchaser, meters shall be tested for material durability as specified in Appendix D.

2.9 STRAINERS

When the accuracy of the water meter is likely to be affected, the water meter shall be provided with a strainer or filter, which shall be fitted at its inlet, internally or in the upstream pipeline such that it does not interfere with the meter's performance.

NOTE: Generally all meters up to and including DN 40 should be installed with strainers or filters.

2.10 TORQUE RESISTANCE OF THREADED END CONNECTIONS

When tested in accordance with Appendix E, the meter with threaded end connections shall have no observed cracking, stripping of threads or other failures.

2.11 WATERTIGHTNESS

Each meter shall be tested at a pressure of 1.6 times the maximum admissible pressure applied for 1 min without leakage, cracking or other failure.

NOTE: See NMI R 49-2 for the test setup and preparation for guidance.