

# INTERNATIONAL STANDARD

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## Measurement of water flow in closed conduits — Combination meters for cold potable water —

### Part 2: Installation requirements

*Mesurage de débit d'eau dans les conduites fermées — Compteurs combinés d'eau potable froide —*

*Partie 2: Conditions d'installation*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 7858 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 7858-2 was prepared by Technical Committee ISO/TC 30, *Measurement of fluid flow in closed conduits*, Subcommittee SC 7, *Volume methods including water meters*.

This second edition cancels and replaces the first edition (ISO 7858-2:1987), which has been technically revised.

ISO 7858 consists of the following parts, under the general title *Measurement of water flow in closed conduits — Combination meters for cold potable water*:

- *Part 1: Specifications*
- *Part 2: Installation requirements*
- *Part 3: Test methods*



# Measurement of water flow in closed conduits — Combination meters for cold potable water —

## Part 2: Installation requirements

### 1 Scope

This part of ISO 7858 specifies the criteria for the selection of combination meters for cold water and their associated fittings, for the installation and first operation of new or repaired meters, for the purpose of ensuring accurate and constant measurement as well as reliable reading of the meters.

The field of application is as defined in ISO 7858-1. This part of ISO 7858 deals only with combination meter installations.

Particular requirements dealing with single meter installations are specified in ISO 4064-1, ISO 4064-2 and ISO 4064-3.

When legal requirements exist, they shall in all cases take precedence over or supplement the specifications given in this part of ISO 7858.

### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 7858. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 7858 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 4064-1, *Measurement of water flow in closed conduits — Meters for cold potable water — Part 1: Specifications*.

ISO 4064-2, *Measurement of water flow in closed conduits — Meters for cold potable water — Part 2: Installation requirements*.

ISO 4064-3, *Measurement of water flow in closed conduits — Meters for cold potable water — Part 3: Test methods and equipment*.

ISO 7858-1, *Measurement of water flow in closed conduits — Combination meters for cold potable water — Part 1: Specifications*.

### 3 Terms and definitions

For the purposes of this part of ISO 7858, the terms and definitions given in ISO 7858-1 apply.

## 4 Criteria for the selection of combination meters

The types, metrological characteristics, sizes and flow range of combination meters are selected with respect to the operating conditions of the installation, taking into account, in particular, the following criteria:

- a) the expected flowrates: the flowrates  $q_{\min}$  to  $q_s$  of the combination meter (as defined in ISO 7858-1) shall be compatible with the expected flowrate conditions of the installations; a combination meter shall be chosen so that its change-over zone does not coincide with flowrates in the installation which occur frequently or for long periods of time;
- b) the available supply pressure;
- c) the physical and chemical characteristics of the water;
- d) the acceptable pressure loss across the combination meter;
- e) the suitability of the combination meter type for the installation conditions outlined in clause 6.

## 5 Required associated fittings of the combination meter installation

### 5.1 Upstream side

5.1.1 **Full bore valve**, preferably with the direction of operation indicated.

5.1.2 **Flow-straightening device** or **straight length of pipe**, fitted between the upstream valve and the combination meter, if stipulated by legal requirements or recommended by the manufacturer.

5.1.3 **Strainer**, if required, fitted between the stop valve and the combination meter. If a straight length of pipe or flow-straightening device is required, the strainer shall be located upstream of the straight length or flow-straightening device.

5.1.4 **Means of sealing the combination meter to the inlet line**, if required, in order to detect any unauthorized removal of the combination meter.

### 5.2 Downstream side

5.2.1 **Adjustable length device**, if required, so that the combination meter can be installed and removed easily.

5.2.2 **A device including a drain valve** which may be used for pressure monitoring, disinfecting, water sampling, and possible tests of the combination meter *in situ*, if required.

5.2.3 **Full bore valve**, if required, preferably with the direction of operation indicated.

5.2.4 **Check valve**, if required.

## 6 Installation

### 6.1 General requirements

6.1.1 The combination meter shall be set in position in accordance with the national authority's or the manufacturer's instructions. In particular, should it be necessary that the combination meter be set in a truly horizontal or vertical position in order to operate correctly, then a levelling device as specified in ISO 7858-1 shall be used for such positioning.

**6.1.2** The combination meter shall be installed in a position ensuring complete filling of the meter with water in the normal operating conditions.

**6.1.3** The combination meter shall be easily accessible for reading (for instance without the use of a mirror or ladder), for fitting *in situ*, for maintenance, for removal and for *in situ* dismantling of the mechanism, if allowed by national legislation. In particular, if the combination meter is placed along a wall, the small meter shall not be placed between the axis of the pipe and the wall.

**6.1.4** The combination meter shall be securely supported both horizontally and vertically to avoid transmission of vibration to, or the imposition of its mass on, adjoining pipes and fittings.

**6.1.5** For combination meters having a mass greater than 25 kg, clear access to the installation site to allow the combination meter to be brought to or removed from its working position and adequate space around the working position for the fitting of lifting gear shall be provided.

The following points shall be taken into account:

- there shall be adequate lighting of the installation site;
- the flooring shall be clear of obstacles and shall be even, rigid and not slippery.

**6.1.6** All fittings specified in clause 5 shall also be readily accessible and the requirements relating to large meters (see 6.1.5) shall be complied with for the fittings.

**6.1.7** In all cases, contamination of the inside of the combination meter, fittings and pipework shall be avoided. If the combination meter is installed in a pit, the combination meter and its fittings shall be mounted at a sufficient height above the floor to prevent them from being flooded.

If necessary, the pit shall be provided with a sump or drain to remove water.

## 6.2 Protection of the installed combination meter

**6.2.1** The combination meter shall be protected from the risk of damage by shock or vibration induced by the surroundings at the place of installation.

**6.2.2** The combination meter shall not be subjected to unbalanced or undue stresses caused by misalignment of pipes and fittings or by lack of adequate support or setting on deformed supports.

NOTE The water pipelines up and downstream should be adequately supported and anchored to ensure that no part of the installation can be displaced under water thrust when the combination meter is dismantled or disconnected on one side.

**6.2.3** The combination meter shall be protected from the risk of damage from extreme water and ambient temperatures.

**6.2.4** The combination meter shall be protected from flooding or from rain water leaking in.

**6.2.5** The combination meter shall be protected from the risk of damage due to external electrolytic or environmental corrosion.

**6.2.6** Precautions shall be taken to prevent damage to the combination meter due to unfavourable hydraulic conditions (abrupt variation in the flow section close to the meter, cavitation, surging and water hammer).

**6.2.7** National legislation and local regulations in force concerning the protection of operational staff from electric shock shall always be followed (for example, rules concerning the use of water pipes for electrical earthing of an electrical installation).

## **7 Special requirements governing the installation of combination meters containing helix-type meters, also known as Woltman meters**

For installation of such combination meters, see ISO 4064-2.

## **8 First operation of new or repaired combination meters**

Before installation of the meter, a pipe length shall be inserted in the water main which is then flushed to remove debris, and the strainer, if fitted, shall be cleaned.

After installation, any locking mechanism fitted, possibly by the manufacturer to protect the change-over device whilst in transit, shall be removed. Then water shall be let slowly into the main and through the combination meter, with air bleeds opened so that entrained air does not cause the meter to overspeed, thereby causing damage.

When the installation is fully charged, the downstream valve shall be operated to control the meter at the range of flows at which the change-over device operates to ensure that it functions correctly at increasing and decreasing flows. The downstream and upstream valves shall then be fully opened.

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