

BUREAU OF INDIAN STANDARDS

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Draft Indian Standard

**PSYCHROMETERS, UNVENTILATED (DRY AND WET BULB HYGROMETERS) -
SPECIFICATION**

(First Revision)

भारतीय मानक मसौदा

साइकोमीटर, बिना हवा के (सूखे और गीले बल्ब हाइग्रोमीटर) - विशिष्टि

(पहला पुनरीक्षण)

ICS 17.060

Glass, Glassware & Laboratoryware Sectional Committee, CHD 10

Last date for Comments: 20 Dec 2022

FOREWORD

(Formal clauses to be added later)

Psychrometers, which are also known as dry and wet bulb hygrometers and curometers, unventilated, are used for measuring atmospheric humidity (relative humidity) for agricultural, commercial and industrial purposes. They consist of two similar liquid-in-glass thermometers exposed side by side, the bulb of one of which is covered with a piece of wet fabric and allowed to cool by natural free evaporation. Relative humidity is computed from the readings of these two thermometers by the use of psychrometric tables.

This standard was originally published in 1970. The first revision of this standard is undertaken in view of the technological advancements taken place in the industry. Several editorial changes such as inclusion of ICS No., Hindi Title, Reference Clause, and statutory changes such as the BIS Certification Marking clause as per the BIS Act 2016 have also been incorporated.

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, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (second revision)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

PSYCHROMETERS, UNVENTILATED (DRY AND WET BULB HYGROMETERS) - SPECIFICATION

(*First Revision*)

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for unventilated psychrometers.

2 REFERENCE

The standards listed below contain provisions which through reference in this text, constitute provisions of and necessary adjuncts to this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated.

<i>IS No.</i>	<i>IS Titles</i>
2627 : 1979	Glossary of terms relating to liquid - In - Glass thermometers (<i>first revision</i>)
2480 (Part 1) : 1983	Specification for general purpose glass thermometers: Part 1 solid - Stem thermometers (<i>second revision</i>)

3 TERMINOLOGY

3.1 For the purpose of this standard,-the definitions given in IS 2627 shall apply.

4 GRADES

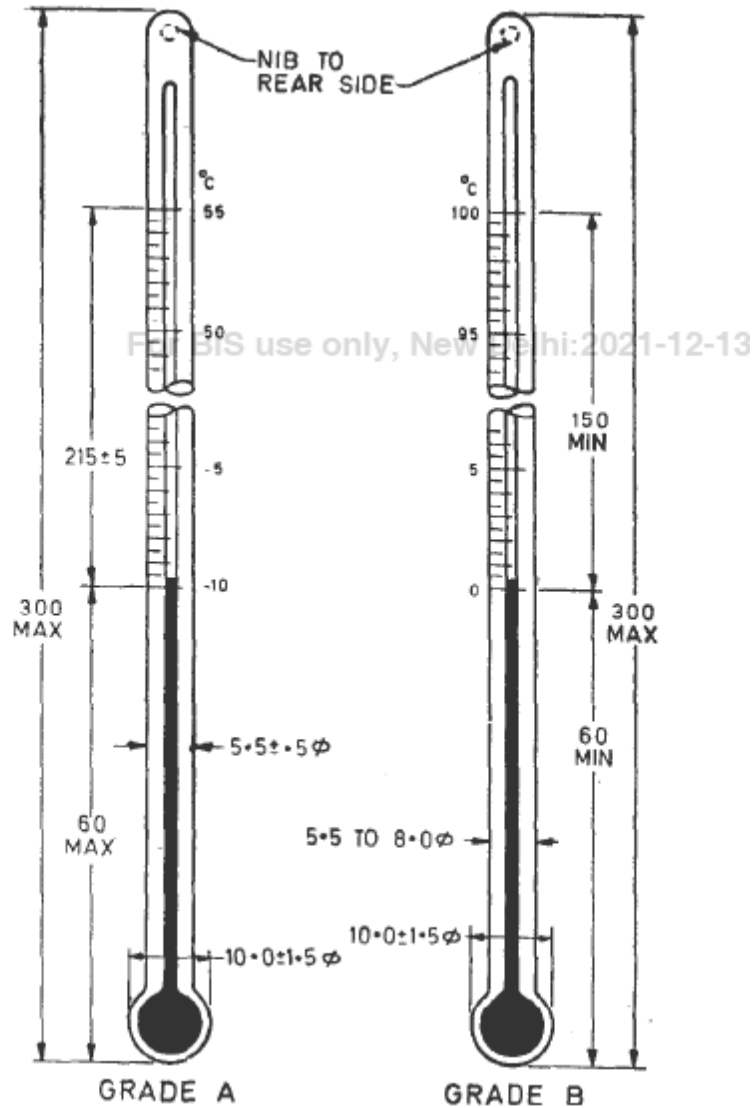
4.1 Psychrometer shall be of two grades, namely:

- a) *Grade A* for normal day-to-day use, and
- b) *Grade B* for industrial use.

5 REQUIREMENTS

5.1 General

Psychrometers shall consist of a pair of dry and wet bulb thermometers mounted in a frame. The wet bulb thermometer shall be provided with a water reservoir, a muslin bag and wick arrangement for wetting the fabric, covering the wet bulb.



All dimensions in millimetres

FIG. 1 THERMOMETERS FOR UNVENTILATED PSYCHROMETERS

5.2 Thermometers

5.2.1 Dry and wet bulb thermometers for Grade A psychrometers shall have a range from -10 to $+55^{\circ}\text{C}$ subdivided into 0.5°C (see Fig. 1). The bulb shall be spherical with an outside diameter 10.0 ± 1.5 mm.

5.2.2 Dry and wet bulb thermometers for Grade B psychrometers shall have a range 0 to 100°C subdivided into 0.5°C (see Fig. 1). The bulb shall be spherical with an outside diameter of 10.0 ± 1.5 mm.

5.2.3 The graduation lines on both the thermometers, when fixed in position, shall match to within half the smallest division of the thermometers at all points on the scale engraved or marked on the mount.

5.3 Muslin and Wick

A piece of thin, clean, water-absorbing muslin, just sufficient to cover the bulb, shall be stretched smooth over the bulb creases being avoided as far as possible. It shall be washed with soap and water and dried before use. Only a single thickness shall be used. The muslin shall be kept in place by attaching the cotton wick (*see* Fig. 2), and the wick shall dip in the small reservoir below.

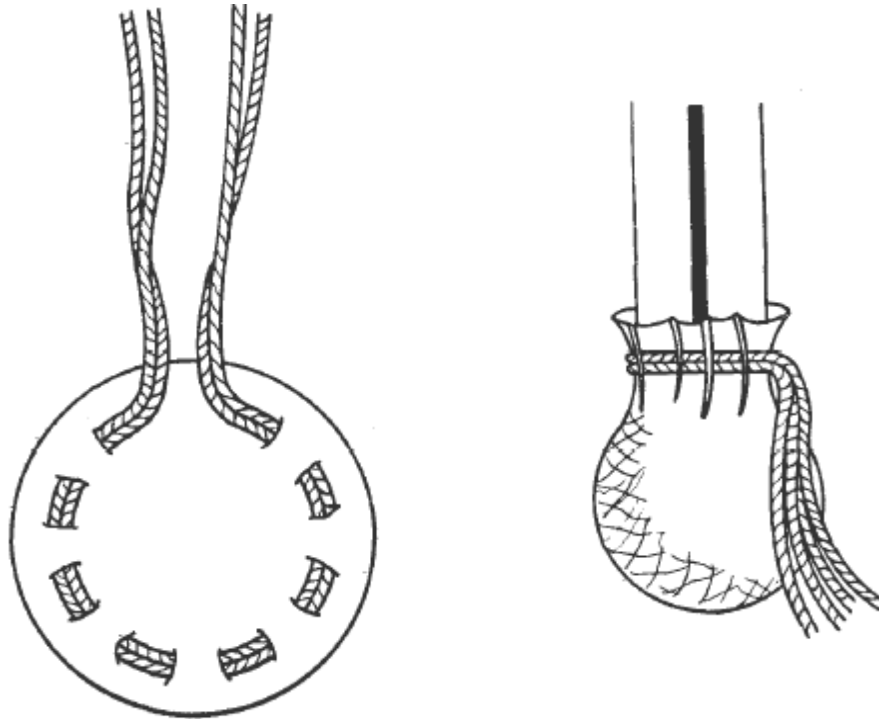


FIG. 2 MUSLIN AND WICK

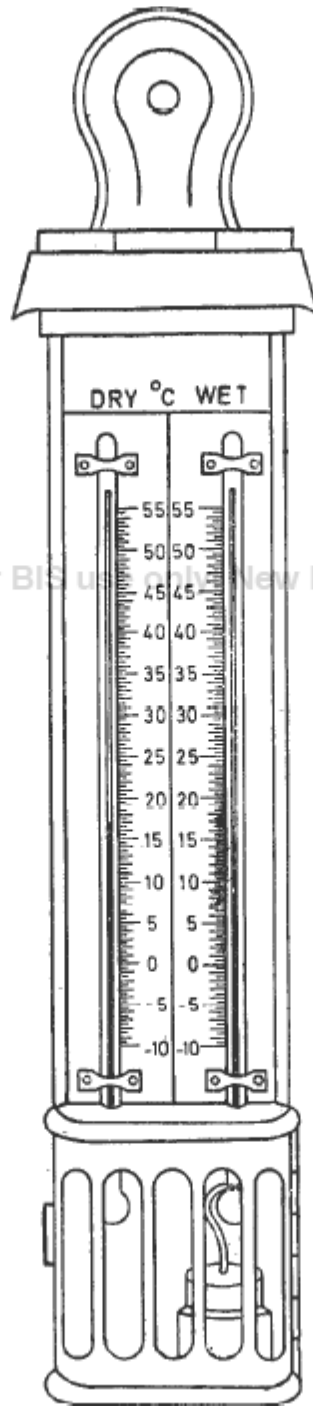


FIG. 3 THERMOMETERS AND WATER RESERVOIR FIXED ON MOUNT

5.4 Water Reservoir

The water reservoir shall be made of glass, plastics, glazed porcelain or any other non-corrodible metal, with a narrow opening not exceeding 10 mm in diameter. The reservoir for Grade A psychrometers shall have a nominal capacity of 50 ml and for Grade B psychrometers, 100 ml.

5.5 Mount

The two thermometers and the water reservoir of an instrument shall be fixed on a mount; the axes of thermometers being at least 3.5 cm apart. A suitable illustration is provided in Fig. 3.

6 MARKING AND PACKING

6.1 Marking

Psychrometers shall be engraved on the mount with the following information:

- a) The letter ' °C ' near the top of each thermometer;
- b) Type of psychrometer; and
- c) Maker's name or recognized trade-mark, if any,

6.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6.3 Packing

Every instrument shall be packed in a suitable cardboard carton or as agreed to between the purchaser and the supplier.

7 SAMPLING AND INSPECTION

7.1 Lot

All psychrometers belonging to the same grade and consignment shall constitute a lot.

7.2 All the glass thermometers shall be tested for all requirements prescribed in IS 2480 (Part 1) : 1983 in addition to those prescribed in this standard.

7.3 Five percent pieces of the lot shall be tested for the requirements of the mount.