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Hydrometry — Water level measuring devices

Hydrométrie — Appareils de mesure du niveau de l'eau

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Contents

Page

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 113 *Hydrometry*, Subcommittee SC 5, *Instruments, equipment and data management*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 318, *Hydrometry*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 4373:2008), which has been technically revised. The main changes are as follows:

— improvements in water level measuring devices have been incorporated;

— the use of mercury has been removed;

— the old Annex A has been divided into three new separate Annexes A, B and C;

— in the new Annex A, the electronic techniques that are currently more commonly used have been brought to the front in order to give them a greater emphasis.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Measuring the level of water surface is very important in hydrometry for the purpose of, among other things, determining flow rates. Information about water levels is also used in operational water management, including the design of dikes and storm surge warning services. Water level information also provides decision-making guidance to shipping activities.

Hydrometry — Water level measuring devices

1 Scope

This document specifies the functional requirements of instrumentation for measuring the level of water surface (stage), primarily for the purpose of determining flow rates.

This document is supplemented by Annex A, which provides guidance on the types of automatic water level measurement devices currently available and the measurement uncertainty associated with them. The manually operated measuring devices are described in Annex B.

This document is applicable to both contact and non-contact methods of measurement. The non-contact methods are not in direct material contact with the water surface but measure the height of the water level with ultrasonic or electromagnetic waves.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 772, *Hydrometry — Vocabulary and symbols*

IEC 60079-10, *Electrical apparatus for explosive gas atmospheres — Part 10: Classification of hazardous areas*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 772 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Instrument specification

4.1 Performance parameters

The performance parameters of a water level measuring device are uncertainty, measurement range, temperature range and relative humidity range. Thus, the overall performance of the equipment can be summarized by a few characterizing parameters.

4.2 Performance classification

Water level measuring devices shall be classified in accordance with the performance classes given in Table 1 that account for the resolution to be achieved and the limits of uncertainty required over specified measurement ranges. Measurement range is to be understood as the difference between the highest and the lowest water level that can be measured. When measuring short ranges with class 1 and 2 devices, the uncertainty is a few millimetres, and this is difficult to achieve.