

INTERNATIONAL STANDARD

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Measurement of liquid flow in open channels — Water-level measuring devices

*Mesure de débit des liquides dans les chenaux — Appareils de mesure
du niveau d'eau*



Reference number
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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.

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.

International Standard ISO 4373 was prepared by Technical Committee ISO/TC 113, *Hydrometric determinations*, Subcommittee SC 5, *Instruments, equipment and data management*.

This second edition cancels and replaces the first edition (ISO 4373:1979), which has been technically revised.

Annex A forms an integral part of this International Standard.

Introduction

The collection of water-level records with respect to time generally forms the basis for obtaining a systematic record of stream flow at a gauging station. This water-level record, together with periodic discharge measurements, can be converted by one or more methods (see ISO 1100) into a continuous record of discharge. The accuracy of the record of discharge is governed in large part by the accuracy of the record of water level. It is essential that this be detected and recorded efficiently and with an accuracy sufficient for the purposes for which the stream flow data are required.

Water-level records, besides being used to produce stream flow data, also have an intrinsic value in monitoring the level of any body of water. It must also be recognized that, however accurate the inherent performance of a water-level recording installation, the application of routine operational and maintenance procedures is essential to achieving design performance. Although the design and operation of water-level measuring devices is described in terms of the devices in current use, this International Standard is not intended to inhibit further development. Rather it is intended to encourage the introduction of improved instrumentation exhibiting better performance.

Measurement of liquid flow in open channels — Water-level measuring devices

1 Scope

This International Standard specifies the functional requirements and operational procedures for stage detecting, encoding and recording devices for measuring water levels in open channels. Because of the widespread use of stilling wells in the measurement of water levels, information on stilling wells is given in annex A to this International Standard.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 772:—¹⁾, *Measurement of liquid flow in open channels — Vocabulary and symbols*.

ISO 1100-1:1981, *Liquid flow measurement in open channels — Part 1: Establishment and operation of a gauging station*.

ISO 1100-2:1982, *Liquid flow measurement in open channels — Part 2: Determination of the stage-discharge relation*.

3 Definitions

For the purposes of this International Standard, the

definitions given in ISO 772 and the following definitions apply.

3.1 encoding: Method by which a data signal is changed into a suitable set of bits for data recording.

3.2 parity check: Addition of an extra bit to a data signal so that the total number of bits in a sample are either always even or always odd.

4 Accuracy of stage measurements

For the measurement of stage with respect to a gauge datum, an uncertainty of ± 10 mm may be satisfactory in some installations: in others, uncertainty of ± 3 mm or better may be required. However, in no case should the uncertainty be more than ± 10 mm or 0,1% of the range, whichever is greater. Exceptions can be made if sediment or unstable channel conditions make it impossible to obtain a complete and reliable record with standard equipment, and where special equipment must be used to obtain a complete record but with greater uncertainty (for example, see 8.2).

This clause applies in all cases, unless specifically stated otherwise.

5 Gauge datum

The stage of a stream or lake is the height of the water surface above an established datum plane. The datum of the gauge may be a recognized datum, such as mean sea level, or an arbitrary datum plane selected for the convenience of using gauge readings of relatively low numbers. ISO 1100-1 contains additional requirements regarding gauge datum, gauge zero and benchmarks.

1) To be published. (Revision of ISO 772:1988)