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Hydrometry — Measurement of liquid flow in open channels — Velocity area methods using point velocity measurements

Hydrométrie — Mesurage du débit des écoulements à surface libre — Méthodes d'exploration du champ des vitesses utilisant le mesurage de la vitesse par point

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Contents

Page

Foreword ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Principle of the methods of measurements ... **1**
5 Site selection ... **2**
5.1 Selection of site ... 2
5.2 Demarcation of site ... 3
6 Measurement of cross-sectional area ... **3**
6.1 General ... 3
6.2 Measurement of width ... 3
6.3 Measurement of depth ... 3
7 Measurement of mean velocity ... **4**
7.1 Determination of mean velocity using point velocity measurements ... 4
7.1.1 General ... 4
7.1.2 Measurement procedure ... 4
7.1.3 Oblique flow ... 5
7.1.4 Determination of the mean velocity in a vertical ... 5
7.1.5 Integration method ... 8
7.1.6 Errors and limitations ... 8
7.2 Determination of mean velocity from surface velocity ... 8
7.2.1 General ... 8
7.2.2 Non-contact systems ... 9
7.2.3 Surface one-point method by current meter ... 9
7.2.4 Measurement of velocity using floats ... 9
7.2.5 Exceptions ... 9
7.2.6 Main sources of error ... 9
8 Computation of discharge ... **10**
8.1 Arithmetic methods ... 10
8.1.1 General ... 10
8.1.2 Mean-section method ... 10
8.1.3 Mid-section method ... 10
8.1.4 Bathymetric verticals ... 11
8.2 Independent vertical method ... 11
8.3 Mean-section method — Horizontal planes ... 13
9 Uncertainties in flow measurement ... **13**
9.1 General ... 13
9.2 Method of calculating the uncertainty in discharge by measurement of velocity by current meter ... 14
9.2.1 General ... 14
9.2.2 Contributory uncertainties ... 14
9.3 Method of calculating the uncertainty in discharge by measurement of velocity using floats ... 16
9.3.1 General ... 16
9.3.2 Contributory uncertainties ... 16
9.3.3 Combined uncertainty in discharge ... 17
9.4 Limitations ... 18
9.5 Interpolated variance estimator (IVE) ... 19
9.6 Q+ ... 19
9.7 Flaure ... 19
Annex A (informative) **Use of point velocity current meters** ... **20**

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Annex B (informative) **Surface velocity measurement using floats** **23**
Annex C (informative) **Example surface velocity systems** **27**
Annex D (informative) **Uncertainties in the velocity-area measurement** **29**
Annex E (informative) **Velocity measurement under ice conditions** **32**
Annex F (informative) **Corrections for wetted length of wire when measuring depths with wire not normal to surface** **38**
Bibliography **41**

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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.

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).

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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 1, *Velocity area methods,* 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 fifth edition cancels and replaces the fourth edition (ISO 748:2007), which has been technically revised. The main changes compared with the previous edition are as follows:

— the document has been updated to take account of technological developments;

— Clause 7 has been revised to reduce uncertainties in measurements;

— ISO 9196 regarding measurement under ice conditions has been incorporated.

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.

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Hydrometry — Measurement of liquid flow in open channels — Velocity area methods using point velocity measurements

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1 Scope

This document specifies methods for determining the velocity and cross-sectional area of water flowing in open channels and for calculating the discharge employing point velocity measurement devices.

It is applicable to methods using rotating-element current meters, acoustic doppler velocimeters (ADVs), acoustic doppler current profiler (ADCP) stationary method, surface velocity measurement including floats and other surface velocity systems.

Although some general procedures are discussed, this document does not describe in detail how to use or deploy these systems.

NOTE For detailed procedures, refer to guidelines from instrument manufacturers and the appropriate public agencies.

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*

ISO 25377:2020, *Hydrometric uncertainty guidance (HUG)*

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 Principle of the methods of measurements

The principle depends upon determining velocity and cross-sectional area.

This is characterized as shown by Formula (1):

$$Q = \bar{V}\mathrm{A} \tag{1}$$

where

Q is the flow (m^3/s);

$\bar{V}$ is the mean velocity (m/s) (averaged over the cross-section);

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