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# Measurement of water flow in open channels

**Part 5.3: Guidelines for the application of acoustic velocity meters using the Doppler and echo correlation methods (ISO 15769:2010, IDT)**



AS 3778.5.3:2022

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- Engineers Australia
- Institute of Instrumentation, Control & Automation Australia
- Irrigation Australia
- Joint Accreditation System of Australia & New Zealand
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## Part 5.3: Guidelines for the application of acoustic velocity meters using the Doppler and echo correlation methods (ISO 15769:2010, IDT)

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## Preface

This Standard was prepared by the Standards Australia Committee CE-024, Measurement of water flow in open channels and closed conduits, to supersede AS 3778.5.3—2007, *Measurement of water flow in open channels, Part 5.3: Liquid flow in open channels and partly filled pipes—Guidelines for the application of Doppler-based flow measurements*.

The objective of this document is to provide guidelines on the principles of operation and the selection and use of Doppler-based and echo correlation velocity meters for continuous-flow gauging.

This document is applicable to channel flow determination in open channels and partially filled pipes using one or more meters located at fixed points in the cross-section.

This document is identical with, and has been reproduced from, ISO 15769:2010, *Hydrometry — Guidelines for the application of acoustic velocity meters using the Doppler and echo correlation methods*.

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# Contents

Preface .....	ii
Foreword .....	v
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms, definitions and abbreviated terms</b> .....	<b>1</b>
3.1 Terms and definitions .....	1
3.2 Abbreviated terms .....	3
<b>4 Principles of operation of the techniques</b> .....	<b>3</b>
4.1 Ultrasonic Doppler .....	3
4.2 Operating techniques .....	5
4.2.1 Introduction .....	5
4.2.2 Continuous wave Dopplers .....	5
4.2.3 Pulse incoherent .....	5
4.2.4 Pulse-to-pulse coherent .....	5
4.2.5 Spread spectrum (broad band) .....	6
4.2.6 Range gating .....	6
4.3 Bed-mounted Doppler systems .....	6
4.4 Side-looking/horizontal ADCPs .....	6
4.5 Acoustic (echo) correlation method .....	8
4.6 Velocity-index ratings .....	11
<b>5 Factors affecting operation and accuracy</b> .....	<b>12</b>
5.1 General .....	12
5.2 Characteristics of the instrument .....	12
5.2.1 Introduction .....	12
5.2.2 Ultrasonic beam angle (continuous wave Dopplers) .....	12
5.2.3 Beam “width” .....	14
5.2.4 Ultrasonic frequency .....	14
5.2.5 Method of determining velocity of sound .....	14
5.2.6 Signal processing .....	15
5.2.7 Instrument position and portion of the cross-section sampled .....	15
5.3 Channel and water characteristics .....	16
5.3.1 Channel geometry .....	16
5.3.2 Depth .....	18
5.3.3 Reflector density and efficiency .....	18
5.3.4 Homogeneity .....	18
5.3.5 Velocity of sound .....	19
5.3.6 Bed-mounted devices: siltation, sensor position .....	19
5.3.7 Significance of water level uncertainty .....	21
5.4 Effect of weed .....	21
<b>6 Site selection</b> .....	<b>21</b>
6.1 General .....	21
6.2 General site requirements for Dopplers and echo correlation devices .....	21
6.3 Bed-mounted ultrasonic Doppler and echo correlation devices .....	22
6.4 Side-lookers .....	23
<b>7 Measurements</b> .....	<b>23</b>
7.1 Velocity .....	23
7.1.1 Ultrasonic Dopplers (bed mounted) .....	23
7.1.2 Ultrasonic Dopplers (H-ADCPs/side-lookers) .....	23
7.1.3 Echo correlation .....	23
7.2 Water level .....	24
7.3 Determination of cross-sectional area .....	24

<b>8</b>	<b>Installation, operation and maintenance</b> .....	<b>25</b>
8.1	Installation considerations .....	25
8.1.1	General .....	25
8.1.2	Bed-mounted instruments .....	25
8.1.3	H-ADCPs/side-lookers .....	26
8.2	General maintenance considerations .....	26
<b>9</b>	<b>Calibration, evaluation and verification</b> .....	<b>27</b>
9.1	General .....	27
9.2	Calibration and performance checking .....	28
9.2.1	General .....	28
9.2.2	Indexing method .....	28
9.2.3	Performance checking .....	28
<b>10</b>	<b>Determination of discharge</b> .....	<b>28</b>
10.1	General .....	28
10.2	Velocity-index ratings .....	29
10.2.1	General .....	29
10.2.2	Determination of mean velocity from calibration data .....	30
10.2.3	Distribution of velocity in open channels .....	31
10.2.4	Forms of velocity-index ratings .....	31
<b>11</b>	<b>Uncertainties in discharge determinations</b> .....	<b>33</b>
11.1	General .....	33
11.2	Definition of uncertainty .....	33
11.3	General expectations of performance .....	34
11.4	Methodology of estimating the uncertainty in discharge determination .....	35
11.4.1	Sources of uncertainty .....	35
11.4.2	Determination of the uncertainty in the velocity-index rating .....	36
11.4.3	Uncertainty in the stage .....	36
11.4.4	Overall uncertainty .....	37
11.4.5	Uncertainty — Example of uncertainty estimation .....	37
11.4.5.1	Introduction .....	37
11.4.5.2	Uncertainty in the measured velocity $u_{Vi}$ .....	38
11.4.5.3	Uncertainty in velocity-index rating $u_{Vi}$ .....	38
11.4.5.4	Uncertainty in the stage measurement $u_h$ .....	38
11.4.5.5	Uncertainty in the cross-sectional area $u_{Ar}$ .....	39
11.4.5.6	Uncertainty budget .....	39
11.4.5.7	Overall uncertainty $U_Q$ .....	39
<b>12</b>	<b>Points to consider when selecting equipment</b> .....	<b>39</b>
<b>Annex A</b>	(informative) <b>Selection considerations for ultrasonic Doppler and echo correlation devices</b> .....	<b>41</b>
<b>Annex B</b>	(informative) <b>Practical considerations</b> .....	<b>43</b>
<b>Annex C</b>	(informative) <b>Introduction to measurement uncertainty</b> .....	<b>47</b>
<b>Annex D</b>	(informative) <b>Performance guide for hydrometric equipment for use in technical standards</b> .....	<b>55</b>
<b>Annex E</b>	(informative) <b>Sample questionnaire — Doppler- and echo-correlation-based flowmeters</b> .....	<b>57</b>
<b>Bibliography</b>	.....	<b>62</b>

## 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 2.

The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15769 was prepared by Technical Committee ISO/TC 113, *Hydrometry*, Subcommittee SC 1, *Velocity area methods*.

This first edition of ISO 15769 cancels and replaces ISO/TS 15769:2000, which has been technically revised.

## NOTES

# Australian Standard®

## Measurement of water flow in open channels

### Part 5.3: Guidelines for the application of acoustic velocity meters using the Doppler and echo correlation methods (ISO 15769:2010, IDT)

#### 1 Scope

This International Standard provides guidelines on the principles of operation and the selection and use of Doppler-based and echo correlation velocity meters for continuous-flow gauging.

This International Standard is applicable to channel flow determination in open channels and partially filled pipes using one or more meters located at fixed points in the cross-section.

NOTE A limitation of the techniques is that measurement is made of the velocity of particles, other reflectors or disturbances.

#### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies.

ISO/TS 25377:2007, *Hydrometric uncertainty guidance (HUG)*

ISO 772, *Hydrometry — Vocabulary and symbols*

#### 3 Terms, definitions and abbreviated terms

##### 3.1 Terms and definitions

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

###### 3.1.1

###### **beam angle**

mounting angle of the acoustic transducer relative to the normalized profiling direction

Note 1 to entry: Different beam angles will be suitable for different applications.

###### 3.1.2

###### **beam width**

width of the acoustic signal transmitted, in degrees (°), from the centre of the transducer

Note 1 to entry: This, coupled with the side lobe of the acoustic signal, will affect the suitability of a particular instrument for its application, based on the mounting location and the distance of the water volume measured from the sensor.

###### 3.1.3

###### **bed-mounted device**

upward-looking Doppler or echo correlation device that measures velocities within a beam looking upwards at an angle through the water column