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ISO 9213:2004

AS 3778.3.8—2007

Australian Standard®

Measurement of water flow in open channels

Part 3.8: Velocity-area methods—Electromagnetic method using a full-channel-width coil

This Australian Standard® was prepared by Committee CE-024, Measurement of Water Flow in Open Channels and Closed Conduits. It was approved on behalf of the Council of Standards Australia on 5 April 2007.
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- Australian Industry Group
- Australian National Committee on Irrigation and Drainage
- Department of Environment and Water Resources
- Institute of Instrumentation, Control and Automation Australia
- Irrigation Association of Australia
- National Measurement Institute
- Plumbing Products Industry Group
- University of New South Wales
- University of South Australia
- Water Services Association of Australia

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Measurement of water flow in open channels

Part 3.8: Velocity-area methods—Electromagnetic method using a full-channel-width coil

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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 3778.3.8—2001,

The objective of this Standard is to specify methods for measuring discharge in large rivers and estuaries by the moving-boat technique.

This Standard is identical to and reproduced from ISO 9213:2004, *Measurement of total discharge in open channels—Electromagnetic method using a full-channel-width coil*.

As this Standard is reproduced from an international standard, the following applies:

(a) Its number appears on the cover and title page while the international standard number appears only on the cover.

(b) In the source text 'ISO 9213' should read 'AS 3778.3.8'.

(c) A full point substitutes for a comma when referring to a decimal marker.

The term 'informative' have been used in this Standard to define the application of the appendix to which they apply. An 'informative' annex is only for information and guidance.

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Australian Standard

Measurement of water flow in open channels Part 3.8: Velocity-area methods—Electromagnetic method using a full-channel-width coil

1 Scope

This International Standard specifies procedures for the establishment and operation of a gauging station, equipped with an electromagnetic flow meter, in an open channel or a closed conduit with a free water surface.

This International Standard is applicable to configurations where an artificial magnetic field is generated through which the entire body of water flows. The induced voltage is sensed in such a way that all elements of the moving water contribute. The equipment described normally requires an electrical mains power supply.

This International Standard is not applicable to devices sampling only part of the flowing body of water (e.g. velocity meters) or to flow meters which operate by using the Earth's magnetic field.

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 (including any amendments) applies.

ISO 748, *Measurement of liquid flow in open channels — Velocity-area methods*

ISO 772, *Hydrometric determinations — Vocabulary and symbols*

ISO 1100-2, *Measurement of liquid flow in open channels — Part 2: Determination of the stage-discharge relation*

ISO 5168:—[1)], *Measurement of fluid flow — Evaluation of uncertainties*

ISO/TR 7066-1, *Assessment of uncertainty in calibration and use of flow measurement devices — Part 1: Linear calibration relationships*

3 Terms and definitions

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

4 Principles of operation and practice

4.1 This is a velocity-area method of discharge determination. The electromagnetic gauge operates on Faraday's principle of electromagnetic induction. If a length of conductor moves through a magnetic field, a voltage is generated between the ends of the conductor. In the electromagnetic gauge, a vertical magnetic field is demonstrated by means of an insulated coil which is located either above or beneath the channel. The conductor is formed by the water which moves through the magnetic field; the ends of the conductor are represented by the channel walls or riverbanks. The voltage generated is sensed by electrodes on the channel extremities and these are connected to the input of a sensitive voltage-measuring device. The faster the velocity of the water, the greater is the voltage which is generated.

1) To be published. (Revision of ISO/TR 5168:1998)