
Agricultural irrigation equipment — Volumetric valves — General requirements and test methods

*Matériel agricole d'irrigation — Vannes volumétriques — Exigences
générales et méthodes d'essai*





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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 18, *Irrigation and drainage equipment and systems*.

This fifth edition cancels and replaces the fourth edition (ISO 7714:2008), which has been technically revised.

The main changes are the following:

- addition of a paragraph to 6.1 that metering valves with metrological characteristics shall comply with the relevant standard for meters for irrigation water;
- addition of ISO 16399 to the Normative references.

Agricultural irrigation equipment — Volumetric valves — General requirements and test methods

1 Scope

This document specifies general requirements and test methods for volumetric valves able to automatically deliver preset quantities of water. It is applicable to valves actuated by pipeline pressure and flow alone, and which do not need any other, external, source of energy.

NOTE Volumetric valves are typically required to operate correctly with different qualities of irrigation water at a variety of flow rates and at temperatures between 5 °C and 50 °C.

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 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 9644, *Agricultural irrigation equipment — Pressure losses in irrigation valves — Test method*

ISO 16399:2014, *Meters for irrigation water*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

volumetric valve

valve capable of automatically delivering preset volumes of water within the range of flow rates, as a result of measuring the volume of water flowing through the valve

3.2

serial volumetric valve

volumetric valve (3.1) designed to operate in a sequence of volumetric valves

3.2.1

single outlet serial volumetric valve

serial volumetric valve (3.2) with one inlet and one outlet, intended for connection in parallel in a system of volumetric valves designed to be opened by means of a hydraulic command when preset to the open position and which, on closing after delivering a preset volume of water, transmits a hydraulic command to the next volumetric valve in the system to bring it into operation

3.2.2

single outlet “skip over” serial volumetric valve

serial volumetric valve (3.2) with one inlet and one outlet, intended for connection in parallel in a system of volumetric valves designed to be opened by means of a hydraulic command when preset to the open position and which, on closing after delivering a preset volume of water, skips over the next volumetric valve in the system and transmits a hydraulic command to the second next volumetric valve to bring it into operation

3.2.3

dual outlet serial volumetric valve

serial volumetric valve (3.2) with one inlet and two outlets, normally open when the pressure at the inlet is the atmospheric pressure and designed so that, when a preset volume of water has passed through the first outlet, this outlet closes automatically, the second outlet opens automatically and all the flow is passed through the second outlet to the next volumetric valve in the series

3.3

non-serial volumetric valve

volumetric valve (3.1) designed to operate alone

3.4

permanent flow rate

q_{V3}

highest flow rate within the rated operating conditions at which the meter is designed to operate in a satisfactory manner within the maximum permissible error

3.5

overload flow rate

q_{V4}

highest flow rate at which the water meter is designed to operate for a short period of time within its maximum permissible error, whilst maintaining its metrological performance when it is subsequently operated under normal service conditions

3.6

minimum flow rate

q_{V1}

lowest flow rate at which the *volumetric valve* (3.1) is designed to operate within the maximum permissible error

3.7

range of flow rate

flow rate between the *minimum flow rate* (3.6) and the *overload flow rate* (3.5), inclusive of limits

3.8

range of working flow rate

flow rate between the *minimum flow rate* (3.6) and the *permanent flow rate* (3.4), inclusive of limits

3.9

relative error

ε

difference between measured and actual volume divided by actual volume, expressed as a percentage

3.10

maximum working pressure

highest pressure immediately upstream from a device recommended by the manufacturer to ensure continuous operation and functionality

3.11

minimum working pressure

lowest water pressure at the inlet to a *volumetric valve* (3.1) at which it operates satisfactorily and performs the mechanical and hydraulic functions as specified by the manufacturer