TC 23

International Standard ISO 7714

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Irrigation equipment — Volumetric valves — General requirements and test methods

Matériel 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7714 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*.

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Irrigation equipment — Volumetric valves — General requirements and test methods

1 Scope and field of application

This International Standard specifies general requirements and test methods for volumetric valves capable of delivering automatically preset quantities of water for irrigation purposes, at various rates of flow, by measuring volumetrically the quantities of water flowing through the valves.

This International Standard applies to volumetric valves which are actuated by pipeline pressure alone, and do not require any external source of energy.

2 References

ISO 7/1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 228/1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 2084, *Pipeline flanges for general use — Metric series — Mating dimensions.*

ISO 4064/1, *Measurement of water flow in closed conduits — Meters for cold potable water — Part 1: Specification.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 maximum flow rate, q_{max}: The highest flow rate at which the valve is required to operate for a limited period of time without deteriorating.

3.2 nominal flow rate, q_{nom}: The highest flow rate at which the valve is required to operate over a long period of time, under normal service conditions. This flow rate is used to designate the valve.

3.3 minimum flow rate, q_{min}: The lowest flow rate at which the valve is required to operate within the maximum error tolerance, under normal service conditions.

3.4 range of flow rate: The range limited by the maximum and minimum flow rates (q_{max} and q_{min}).

3.5 nominal working pressure: The maximum static water pressure immediately upstream of the valve, at which the valve is required to operate.

3.6 minimum working pressure: The minimum static water pressure immediately upstream of the valve, at which the valve is required to operate.

3.7 range of working pressures: The range of water pressures between the minimum and nominal working pressures.

4 Classification

Volumetric valves are classified as follows:

4.1 Class 1

Volumetric valves containing a control mechanism with cumulative counter, and having an accuracy as required by water meters complying with ISO 4064/1.

4.2 Class 2

Volumetric valves containing a control mechanism with cumulative counter, but having an accuracy less than that required by water meters complying with ISO 4064/1.

4.3 Class 3

Volumetric valves containing a control mechanism, but no cumulative counter.

5 Marking

Each volumetric valve shall bear a clear and permanent marking including the following particulars:

a) name of manufacturer or registered trademark;

b) nominal flow rate, q_{nom};

c) serial number;

d) arrow indicating the direction of flow;

e) arrow indicating the direction of setting the control device, if necessary;

f) range of working pressures.

6 Technical characteristics

6.1 General

All parts belonging to volumetric valves of the same size, type and model and produced by the same manufacturer shall be interchangeable.

Upon request, the manufacturer shall supply information on the resistance of the valve to chemicals used in agriculture and on the operation of the valve with water that does not comply with the properties specified in 7.1.

Plastics parts of the volumetric valve that enclose waterways and are exposed to UV radiation shall be opaque and shall include additives to resist UV radiation.

The flow control mechanism of the volumetric valve shall enable a manual override, so that the flow can be stopped at any given moment by means such as returning the setting device to zero.

6.2 Flow rates and dimensions

The nominal flow rate of the valve and the dimensions of end connections shall be as specified in table 1.

Table 1 — Flow rates and dimensions

Nominal flow rate m^3/h	Designation of thread	Nominal diameter of flanges and connections* mm
1,5	G 3/4 B	—
5	G 1 B	—
12	G 1,5 B	—
25	G 2 B	50
40	G 3 B	80
60	G 4 B	100
150	—	150
250	—	200
400	—	250
600	—	300

* According to ISO 2084.

6.3 Threaded and flanged connections

In volumetric valves with threaded ends intended for direct connection to the pipeline, the threads shall comply with ISO 7/1. In valves with threaded ends intended for connection to the pipeline with compression pipe connectors, the connector threads shall comply with ISO 228/1.

Volumetric valves with threaded ends shall be provided with spanner flats on the body, or other means of preventing rotation of the valve during connection or disconnection. If special tools are required, the manufacturer shall supply them.

7 Mechanical, functional and accuracy tests

7.1 General

The water used shall be at a working temperature not exceeding 50 °C or at a temperature specified by the manufacturer, and shall contain no solids larger than can pass through a 200 µm screen, and no dissolved salts in excess of 2 g/l.

This specified water temperature limit of 50 °C differs from the water temperature limit of 30 °C specified in ISO 4064/1 and from the test temperature. All tests shall be performed with water at a temperature of 25 ± 5 °C and at a static water pressure between minimum and nominal working pressures of the valve.

The instruments used for measuring flow rates and pressures shall permit measurements within an accuracy of ± 1 %.

7.2 Sampling and acceptance requirements

From a lot of 50 or less volumetric valves, a sample of test specimens is selected at random by the testing laboratory representative. The number of test specimens required for each test shall be as specified in table 2.

If the number of defectives found in the test specimens is equal to or less than the acceptance number shown in table 2, the lot shall be considered acceptable. If the number of defectives found in the test is greater than the acceptance number, the lot shall be rejected.

7.3 Test of resistance of volumetric valve to hydrostatic pressure

This test is performed once with the valve in open position and its outlet closed, and once with the valve in closed position and its outlet open.

7.3.1 Metal valves

Apply a hydraulic pressure internally and increase it gradually to 1,6 times the nominal working pressure declared by the manufacturer. Maintain this pressure for 1 min.

No signs of leakage shall appear through the body of the valve or its outlet.