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Agricultural irrigation equipment — Check valves

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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.

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.

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Agricultural irrigation equipment — Check valves

1 Scope

This International Standard specifies the construction and performance requirements, and test methods for check valves, intended for operation in agricultural irrigation systems with water at temperatures not exceeding 50 °C, which may contain fertilizers and chemicals of types and concentrations used in agriculture.

This reference to the use of fertilizers and chemicals applies solely to the tolerance of the check valves to these materials from the aspect of their possible corrosivity. It does not imply authorization of the use of check valves in systems where backflow preventers are obligatory for complete stoppage of reverse flow, nor does it apply to valves known as backflow preventers, which completely stop the reverse flow of water, nor to hydraulically activated and controlled check valves.

This International Standard applies to check valves of nominal sizes 15 mm (0,5 in) up to and including 300 mm (12 in).

NOTE 1 A separate International Standard will be prepared for backflow preventers at a later date.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7-1:1982, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 2859-1:1989, *Sampling procedures for inspection by attributes — Part 1: Sampling plans indexed by*

acceptable quality level (AQL) for lot-by-lot inspection.

ISO 7005-1:1992, *Metallic flanges — Part 1: Steel flanges.*

ISO 7005-2:1988, *Metallic flanges — Part 2: Cast iron flanges.*

ISO 9644:1993, *Agricultural irrigation equipment — Pressure losses in irrigation valves — Test method.*

ISO 9911:1993, *Agricultural irrigation equipment — Manually operated small plastics valves.*

3 Definitions

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

3.1 check valve: Valve which permits flow in one direction only and prevents reversal of flow by means of an automatic check mechanism. The valve opens by the flow of fluid and closes by the weight of the check mechanism or by mechanical force (e.g. spring) when the flow ceases.

3.2 check valve complete with stop: Check valve which incorporates an adjustable stop to restrict the lift of the check mechanism.

3.3 horizontal pattern check valve: Check valve for installation in a horizontal position, in which the axes of the inlet and outlet are in line with each other.

3.4 vertical pattern check valve: Check valve for installation in a vertical position, in which the axes of the inlet and outlet are in line with each other.

3.5 angle pattern check valve: Check valve for installation at a junction between vertical and horizontal positions, in which the axes of the inlet and outlet are at right angles to each other.

3.6 push [lift-type] check valve: Check valve in which the check mechanism incorporates a disc, pis-

ton or ball which is pushed off the body seat by flow in the normal direction.

3.7 swing-type check valve: Check valve in which the check mechanism incorporates a swinging disc or two half-discs which swing on a hinge.

3.8 nominal size: Conventional numerical designation used to indicate the size of an irrigation valve. This designation represents the nominal diameter or thread size of the pipe to which the valve can be connected without intermediate fittings.

NOTE 2 A single number designation is adequate if the inlet and outlet ports are the same size.

3.9 nominal pressure: Maximum static water pressure immediately upstream of the valve at which the valve is required to operate.

3.10 adjustable stop: Device used for adjusting the range of movement of the check mechanism up to full opening or full closing of the valve.

3.11 body seat: Machined ring-shaped surface with which the closing component (disc, piston, ball) makes contact for stopping the flow.

3.12 check mechanism: That part or assembly of moving parts which closes the water passage when flow ceases or flow is reversed.

3.13 obturator: Moving member in a valve that operates to close the water passage and, where applicable, contains a washer or similar sealing member.

3.14 full opening: Position reached by the check mechanism when the valve is either fully open or the check mechanism reaches the adjustable stop.

3.15 backflow preventer: Mechanical assembly designed to prevent unintended backflow of water into a non-irrigation section of the water supply system, in order to protect against entry of materials which may constitute a health hazard.

4 Classification

Check valves are classified according to type of check mechanism or of installation.

NOTE 3 Figures 1 to 7 show the basic design concept of the various types of check valves and are given in this International Standard solely to illustrate the structural concepts used in their manufacture. They should not be construed as dictating a design requirement.

4.1 Check mechanism

- a) Swinging disc (see figure 1)

- b) Push or lift disc (see figures 2 and 3)
- c) Push or lift disc - Venturi profile (see figure 4)
- d) Piston (see figure 5)
- e) Ball (see figures 6 and 7)

4.2 Installation

- a) Horizontal position only (see figures 1, 2, 5 and 6)
- b) Vertical position only (see figure 7)
- c) Any position (see figures 3 and 4)

5 Marking

Each check valve shall bear a readily visible, clear and durable marking giving the following information:

- a) manufacturer's name and/or trademark;
- b) nominal size;
- c) nominal pressure;
- d) arrow indicating direction of flow;
- e) a marking "H" for horizontal or "V" for vertical on those check valves where horizontal or vertical orientation is necessary for their proper operation.

6 Technical requirements

6.1 General

The valve parts that are in contact with water shall be of non-toxic materials, and shall be resistant to, or protected against, corrosion in working conditions for which the valve is designed.

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

Plastics parts of the check valve that are exposed to ultraviolet (UV) radiation shall contain additives to strengthen their resistance to deterioration by radiation under the normal working conditions in which the valves operate. Plastics parts that enclose water passages shall be opaque or shall be otherwise protected against penetration of light.