INTERNATIONAL STANDARD

ISO 13693-2

First edition
2015-02-15

Irrigation equipment — Safety devices for chemigation —

Part 2: Chemigation valve assemblies from DN 75 (3”) to DN 350 (14”)

Matériel d'irrigation — Dispositifs de sécurité pour l'application de produits chimiques par irrigation —

Partie 2: Installations de vannes pour application de produits chimiques par irrigation de DN 75 (3”) à DN 350 (14”)



Reference number
ISO 13693-2:2015(E)

© ISO 2015



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Design considerations **2**
4.1 General requirements 2
4.2 Specific requirements 3
5 Performance requirements **4**
5.1 General 4
5.2 Permissible deviations of measuring devices 4
5.3 Mechanical strength of valve body assembly and components 4
5.3.1 Resistance to internal pressure 4
5.3.2 Test methods 5
5.4 Low pressure drain valve 5
5.5 Hydraulic characteristics 5
5.6 Vacuum relief valve 6
5.7 Elevated temperature tests 6
5.8 Endurance 6
5.8.1 Requirements 6
5.8.2 Tests 6
5.9 Acoustic test 6
6 Conformity assessment **6**
6.1 General 6
6.2 Type tests 7
6.3 Control of production process and quality system 7
7 Marking, technical documents, and packaging **7**
7.1 Marking 7
7.2 Technical documents 7
7.3 Packaging 7
Bibliography **8**

© ISO 2015 – All rights reserved

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 18, *Irrigation and drainage equipment and systems*.

ISO 13693 consists of the following parts, under the general title *Irrigation equipment —Safety devices for chemigation*:

— *Part 1: Small plastics valves for chemington*

— *Part 2: Chemigation valve assemblies from DN 75 (3") to DN 350 (14")*

© ISO 2015 – All rights reserved

Introduction

Chemigation is the practice of injecting chemicals into irrigation water for the purpose of distributing the chemicals onto crops. During the course of this activity, under certain hydraulic conditions, the chemicals being injected can migrate upstream into a well or other pressurized water supply and pollute that water source. A chemigation valve assembly has been developed to meet this need. The chemigation valve assembly is designed to meet the specific need and performance requirements as required to prohibit the migration of injected chemicals into irrigation wells, thereby polluting ground water supplies.

This part of ISO 13693 applies to a mainline check valve assembly in sizes from DN 75 (3") to DN 350 (14"), with related components, that is designed to permit full flow in the operational mode and stop backflow (back siphonage or back pressure) when the pipeline shuts down. The potential for backflow from back siphonage occurs as water tumbles back down the column pipe when the pump shuts down. The potential for backflow occurs when a positive pressure exists on the downstream end of the valve. The valve obturator is forced to the closed position by a pre-tensioned spring. A resilient cover on the obturator helps to seal the valve against very low pressures.

This chemigation valve assembly is included in a technical report (to be written) that specifies a complete chemigation safety system. This system features a chemical tank (fertilizers and chemicals), a chemical pump (positive displacement or Venturi), check valves, and interlocking safety shutdown controls. The system is designed to keep irrigation water from flooding the chemical tank and to shut the chemical system down when the irrigation pump shuts down or the irrigation system pressure has been reduced to a level where the injected chemical is not being uniformly distributed to the field. The functional requirements of the chemigation valve could possibly be provided by valves of a different design. The valve is not designed for use in potable water systems.

© ISO 2015 – All rights reserved

Irrigation equipment — Safety devices for chemigation —

Part 2: Chemigation valve assemblies from DN 75 (3”) to DN 350 (14”)

1 Scope

This part of ISO 13693 specifies the construction and performance requirement and test methods for metal-bodied chemigation valves with water at temperatures not exceeding 50 °C, which might contain fertilizers and chemicals of the types and concentration used in agriculture.

The valve is designed to prohibit backflow caused by either back pressure or back siphonage. It is not designed for use in potable water systems. It is not to be confused with other forms of backflow prevention devices including pressure vacuum breakers, double check valves, reduced pressure zone valves, or goose neck loops. This part of ISO 13693 specifies the minimum design, construction, and performance testing requirements for the chemigation valve assembly. The assembly consists of the following components:

— a valve body into which a spring-loaded check valve is mounted with a resilient disk cover on the sealing surface;

— a combination air release/vacuum relief valve located upstream of the check valve;

— a low pressure drain valve located upstream of the check valve;

— an inspection port located so as to permit visual and manual inspection of the valve working components.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9635-1:2014, *Agricultural irrigation equipment — Irrigation valves — Part 1: General requirements*

EN 1267:1999, *Industrial valves — Test of flow resistance using water as a test fluid*

3 Terms and definitions

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

3.1
chemigation valve
valve featuring a chemical injection port and designed to prevent injected chemicals from moving upstream

3.2
check valve
valve which permits flow of water in one direction only

© ISO 2015 – All rights reserved