
**Agricultural irrigation equipment —
Irrigation valves —**

**Part 4:
Air valves**

*Matériel agricole d'irrigation — Vannes d'irrigation —
Partie 4: Vannes de purge d'air*

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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 (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 (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*.

This second edition cancels and replaces the first edition (ISO 9635-4:2006) which has been technically revised.

ISO 9635 consists of the following parts, under the general title *Agricultural irrigation equipment — Irrigation valves*:

- *Part 1: General requirements*
- *Part 2: Isolating valves*
- *Part 3: Check valves*
- *Part 4: Air valves*
- *Part 5: Control valves*

Agricultural irrigation equipment — Irrigation valves —

Part 4: Air valves

1 Scope

This part of ISO 9635 specifies construction and performance requirements and test methods for air valves, intended for operation in irrigation systems with water at temperatures not exceeding 60 °C, which can contain fertilizers and other chemicals of the types and concentrations used in agriculture.

It is applicable to hydraulically operated air irrigation valves of DN 15 diameter or greater, designed to be directly operated, i.e. the force is applied to the obturator by the float, either directly or via a mechanical linkage. The valves can be operated by a force applied through an adjustable pilot valve.

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*

ISO 9635-2:2014, *Agricultural irrigation equipment — Irrigation valves — Part 2: Isolating valves*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9635-1:2014 and the following apply.

3.1

air valve

float-type purger

self-operating float-type valve for the evacuation of air from, or the ingress of air into water pipelines

Note 1 to entry: Such valves can be single-float or double-float and can fulfill one or more of the following functions: air release, air intake.

3.2

air release function

discharge of air from a water pipeline or appliance

3.3

air intake function

vacuum relief function

admittance of air to a water pipeline or appliance

3.4

air venting function

continuous acting air vent function

purging of entrapped air from a water pipeline in service under pressure

4 Design requirements

Air valves shall be designed in accordance with ISO 9635-1:2014, Clause 4. In addition, these valves may be fitted with an integrated isolating device which shall be in accordance with ISO 9635-2:2014.

5 Performance requirements

5.1 General

Perform all tests on the valve as delivered to the test facility.

5.2 Mechanical strength

5.2.1 Resistance of shell and all pressure-containing components to internal pressure

Carry out testing in accordance with ISO 9635-1:2014, 5.2.1. For double-float valves, the obturators may be tested simultaneously or separately.

Test results shall comply with the requirements of ISO 9635-1:2014, 5.2.1.

5.2.2 Resistance of obturator to differential pressure

Tested within [5.2.1](#).

5.2.3 Resistance of valves to bending

Not applicable. However, testing of bending resistance may be an optional requirement for air valves, if bending resistance is specified by the customer.

5.2.4 Resistance of valves to operating loads

Not applicable, except for any integrated isolating device, which shall be in accordance with ISO 9635-2:2014, 5.2.4.

5.3 Watertightness

5.3.1 Watertightness of shell and all pressure-containing components

5.3.1.1 Internal pressure

The requirement of watertightness to internal pressure is fulfilled by compliance with [5.2.1](#).

5.3.1.2 External pressure

Not applicable, except for any integrated isolating device, which shall be in accordance with ISO 9635-2:2014, 5.3.1.2.

5.3.2 Seat tightness

5.3.2.1 Seat tightness at high pressure

Carry out testing in accordance with ISO 9635-1:2014, 5.3.2.1, using water as the test fluid. The leakage rate shall be rate A. For a type test, continue the test for at least 10 min. For double-float valves, the obturators may be tested simultaneously or separately.

Test results shall comply with the requirements of ISO 9635-1:2014, 5.3.2.1.

5.3.2.2 Seat tightness at low pressure

Carry out testing in accordance with ISO 9635-1:2014, 5.3.2.2, using water as the test fluid. The leakage rate shall be rate A. For a type test, continue the test for at least 10 min. For double-float valves, the obturators may be tested simultaneously or separately.

Test results shall comply with the requirements of ISO 9635-1:2014, 5.3.2.2.

5.3.3 Maximum operating torque (MOT) for operation and tightness

Not applicable, except for air valves with an integrated isolating device which shall be in accordance with ISO 9635-2:2014, 5.3.3.

5.4 Airflow characteristics

Test results shall comply with the requirements of ISO 9635-1:2014, 5.4.

The characteristics given by the manufacturer in the form of a graph or table shall be the airflow as a function of inlet pressure. When this is measured according to the conditions defined hereafter in the relevant subclauses of this part of ISO 9635, the flow shall be not less than 90 % of the value indicated by the manufacturer at a minimum of three points on the curve, these points being indicative of the range and functions of the valve.

Show the performance data at standard conditions of temperature and barometric pressure.

5.4.1 Air release function

Conduct the type test as set out in [Annex A](#). Compare the results with the values given in the manufacturer's catalogue and the difference shall be no greater than ± 10 %.

5.4.2 Air intake function

Conduct the type test as set out in [Annex B](#). Compare the results with the values given in the manufacturer's catalogue and the difference shall be no greater than ± 10 %.

5.4.3 Air venting function

Verify the air venting function by measuring the section of the small orifice of the valve, calculating the flow through it at sonic conditions and comparing the result with the value given in the manufacturer's catalogue. The difference shall be no greater than ± 10 %.

To calculate the flow, use the M51 AWWA formula, changing the units from US units to SI units.