



Dry alarm valve stations with and without accelerator

Requirements and test methods

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VdS Guidelines for water extinguishing systems

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Requirements and test methods

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1 Scope

These guidelines specify requirements, test methods and performance characteristics for dry alarm valve stations with and without accelerator for the use in sprinkler systems according to VdS CEA 4001.

*Note: A **dry alarm valve** is installed in the vertical water supply riser of a sprinkler system. When one or more sprinkler open, water flows through the dry alarm valve into the sprinkler piping network which is filled with compressed air or a suitable inert gas (e.g. Nitrogen). Alarm equipment is operated simultaneously by a branch stream.*

*Note: A **dry alarm valve station** is based on a dry alarm valve. A water drain valve, pressure gauges for the water supply pressure and the air or inert gas pressure, an alarm test valve, an alarm pressure switch, a connection for air or inert gas supply and, if applicable, an accelerator complete the dry alarm valve to a dry alarm valve station, together with the necessary connection piping.*

Note: Dry alarm valves are not a complete functional unit. With regard to the functional reliability and the durability of sprinkler systems, the VdS guidelines for sprinkler systems – design and installation – require the use of dry alarm valve stations that have been tested and approved as a complete unit. Thus, a VdS Approval is issued only for a complete dry alarm valve station as an unit.

Note: Accelerators are accessories of dry alarm valve stations. They reduce the time between the opening of the first sprinkler and the release of water flow into the dry sprinkler piping network. If the rate of the air or inert gas pressure decrease exceeds a certain value, the accelerator will cause the operation of the dry alarm valve.

2 Normative references

These Guidelines incorporate, by dated or undated references, provisions from other publications (e.g. European Standards EN or International Standards IEC), which are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to these Guidelines only when incorporated in them by amendment or revision. For undated references the latest edition of the publication referred to applies.

VdS CEA 4001	VdS Guidelines for sprinkler systems – Planning and installation
EN 12259-3	Fixed firefighting systems – Components for sprinkler and water spray systems – Part 3: Dry alarm valve assemblies
ISO 7-1	Pipe threads where pressure-tight joints are made on the threads – Part 1: Dimensions, tolerances and designation
EN ISO 228	Pipe threads where pressure-tight joints are not made on the threads
EN 1092-2 und -3	Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated
EN 764-1	Pressure equipment – Part 1: Terminology – Pressure, temperature, volume, nominal size

3 Definitions

For the purpose of these guidelines the definitions of EN 12259-3 apply.

Maximum allowable pressure: maximum pressure for which the device is designed according to the manufacturer specifications (EN 764-1).

Note: The maximum allowable pressure corresponds to the pressure specified as rated working pressure in EN 12259-3.

4 Requirements

4.1 General

4.1.1 The requirements of the standard EN 12259-3 do apply and, in addition, the requirements determined in the following sections.

4.1.2 The dry alarm valve and its moving parts shall not show any deformation, cracks, delamination, detachments, displacements or other failures during the flow test according to 5.2.2.

Note: The flow test according to 5.2.2 completely covers the test according to EN 12259-3, Annex I.

4.2 Marking

Dry alarm valve stations shall be marked with following details:

- Name of manufacturer or supplier or his trademark
- Type designation
- Year of manufacture
- Nominal size of valve
- Maximum allowable pressure of the alarm valve station
- Flow direction of valve

The marking shall be non-detachable, non-flammable and permanent. It shall be well legible.

4.3 Connections

The piping within the station shall consist of galvanized steel pipe or equivalent material and shall have a minimum nominal size of DN 15. With superior material, e.g. copper pipe, DN 10 is sufficient.

Dry alarm valve stations shall be equipped with following connection points:

- Pressure gauge connections Rp 1/2 (ISO 7-1) or G 1/2 (ISO 228) for the pressure indication at the supply side and at the outlet side.
- Connection for alarm devices DN 20.
- Connection for alarm test valve DN 15.
- Connection at least DN 15 for the compressed air or inert gas feed.
- Connections at least DN 15 for an accelerator, if applicable.

- Connection for the drainage of the alarm valve at least DN 20 (see EN 12259-3).

The connection for the drainage of the alarm valve may be specified for the drainage of the piping network as well if it is designed with DN 50.

4.4 Function

Dry alarm valves open in response to a drop in the air or inert gas pressure in the sprinkler piping network.

The alarm shall sound as soon as the water is allowed to flow into the sprinkler piping network.

The operation of the dry alarm valve station shall be guaranteed within a pressure range from 1.4 bar or the specified minimum supply pressure – whichever is higher – to the maximum allowable pressure.

It shall not be possible for the valve to close again once it has opened.

4.5 Pressure resistance

The maximum allowable pressure of the dry alarm valve station shall be at least 12 bar. The body shall be made of metal with a melting point > 800°C. For pressures > 12,5 bar, the body shall be made of ductile material as e.g. ductile cast iron or at least equivalent.

4.6 Equipment

The dry alarm valve station shall consist of following components which shall meet the requirements specified:

- Drain valve

The drain valve shall be capable of removing all water from the alarm valve station. The dimension of the drain valve derives from section 4.3.

- Pressure gauge

For the indication of pressure at the supply side and at the outlet side pressure gauges shall be provided with R 1/2 or G 1/2 connection, housing diameter of at least 100 mm, accuracy class 1.6, scale intervals of at least 0.5 bar and an adequate display range (starting at 0 bar). Shut-off valves with pressure relief feature shall be provided.

- Alarm test device

On operation of a control, the alarm test device shall initiate a test alarm without affecting otherwise the operational readiness of the dry alarm valve station.

- Alarm pressure switch

Alarm pressure switches shall be VdS approved.

- Drain valve for the alarm line

see EN 12259-3

- Alarm shut-off valve

The alarm shut-off valve is used to interrupt the alarm sound during operation.

In addition, the dry alarm valve station may be equipped with a main shut-off valve. This main shut-off valve shall be VdS approved.

Alarm valve stations shall be either completely assembled in the factory or delivered as kit of not more than five pre-assembled subunits (gauges, pressure switch, monitoring switches etc are exempted) that can be easily assembled on site.

4.7 Labelling and operating instructions

The alarm test valve and the alarm shut-off valve shall be marked appropriately as well as their operating positions.

An operation manual shall be issued for each dry alarm valve station. It shall be durable and permanent and shall contain the following details:

- a graphic representation of the dry alarm valve station which makes it possible to identify the functional components of the station and their operational condition.
- a key identifying the functional components in the station.
- a description of the functional sequence.
- an instruction for the operating sequence until operational readiness with specification of pressures for air/inert gas and water (including minimum supply pressure, if higher than 1.4 bar).
- an instruction for restoring the operational readiness after a fire.
- an instruction for conducting trial alarms and functional tests.
- an instruction for periodic maintenance.

Note: The instruction for periodic maintenance may also be a separate document.

5 Test methods

5.1 Compliance test

A visual and dimensional check is made to determine whether the test samples correspond to the description in the technical documentation (drawings, parts list, functional descriptions, instructions for operation, maintenance and installation) and comply with the verifiable requirements of these guidelines.

5.2 Test of the performance characteristics

5.2.1 The test of the performance characteristics of dry alarm valve stations is carried out in tests according to EN 12259-3.

The additional requirements of these guidelines are included in these tests.

5.2.2 A flow test is conducted according to EN 12259-3, Annex I, however with a higher flow velocity of 7.5 m/s – in relation to the nominal cross section – and a longer flow time of 90 min.

5.2.3 An additional pressure loss test is conducted according to EN 12259-3, Annex C.3, however with a flow velocity of 5 m/s – in relation to the nominal cross section.

5.3 Other tests

Where special designs or new manufacturing methods make it necessary, additional tests will be conducted in agreement with the manufacturer.