



Pre-action alarm valve stations type B (quick dry alarm valve stations)

Requirements and test methods

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VdS Guidelines for water extinguishing systems

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1 Scope

These guidelines define the requirements, test methods and performance characteristics for pre-action alarm valve stations type B (quick dry alarm valve stations, VTAVB) for the use in pre-action sprinkler systems type B according to VdS CEA 4001.

VTAVB are activated by a fire detection and alarm system – either directly via the control and indicating equipment or via an electrical control device. After activation by the fire detection and alarm system the VTAVB release the water flow into the sprinkler piping which is filled with pressurized air or a suitable Inert gas (e.g. Nitrogen). If there is no activation by the fire detection and alarm system, the VTAVB operates as a dry alarm valve station with accelerator.

These guidelines are applicable to VTAVB that base on a dry alarm valve station with accelerator and solely include an additional solenoid valve in the trim.

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	Guidelines for sprinkler systems – Planning and installation
VdS 2100-02	Guidelines for water extinguishing systems – dry alarm valve stations with and without accelerator – Requirements and test methods
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 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

The definitions according to EN 12259-3 apply for the use of these guidelines.

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 nominal working pressure in EN 12259-3.

4 Requirements

4.1 General

The requirements of the VdS 2100-02 for dry alarm valve stations with accelerator do apply and, in addition, the requirements specified in the following sections.

4.2 Activation by a fire detection and alarm system

4.2.1 The solenoid valve actuated by the fire detection and alarm system shall be normally closed.

The manufacturer shall provide the following specifications for the solenoid valve:

- Type, model designation
- Manufacturer
- Nominal voltage
- Nominal power or nominal current
- Minimum and maximum voltage for function
- Current at minimum and maximum voltage
- Specified duty cycle
- Time of actuation (“undelayed”)
- Duration of actuation
- Essential dependencies or limitations (e.g. inhibition of reset)

4.2.2 The manufacturer shall specify at least one fire detection and alarm system control and indication equipment (CIE) or one electrical control device (ECD) for the activation of the VTAVB.

All specified CIE and ECD shall be VdS-approved for this application.

For each CIE and ECD, the manufacturer shall describe the necessary configuration and the connection to the VTAVB.

The electric lines for the activation of the VTAVB shall be designed as monitored lines (primary lines).

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 Performance characteristics test

5.2.1 The test of the performance characteristics of the VTAVB with the exception of the test of the electric activation is conducted in tests according to VdS 2100-02.

5.2.2 The function test with electrical activation is conducted

- with actuation by an adjustable power supply;
- with 80 % of the minimum voltage for function specified by the manufacturer;
- twice each with following supply pressures (tolerance each $\pm 0,1$ bar)
 - 1,4 bar or minimum supply pressure (if a minimum supply pressure $> 1,4$ bar is specified)
 - 3 bar
 - 6 bar
 - 10 bar
 - further pressures in steps of 6 bar until maximum allowable pressure
 - maximum allowable pressure
- with air/Inert gas pressure each according to the specification of the manufacturer.

The VTAVB shall open within 5 s after electrical activation under all conditions.

5.2.3 On basis of the technical documentation it is assessed whether the CIE and/or ECD specified according to 4.2.2 with configuration and connection as specified are suitable for the activation of the VTAVB. Moreover it is assessed whether the electrical activation has to be tested also with test samples of the specified CIE or ECD. If necessary, tests are conducted analogue to 5.2.2.

5.3 Other tests

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