DOCUMENTATION

RISEFR 040-0201

With reference to Requirement Specification RISEFR P-001 – Water mist protection of OH4 auditorium – of 17th April 2018 and on Test protocol RISEFR method 05-01, Fixed firefighting systems – Water mist systems – Test protocol for auditorium protection with automatic nozzle systems of 11th April 2018, RISE Fire Research AS document, based on test reports, evaluations and installation instructions, that this product meets the requirements of prEN 14972-1:2017 Appendix A.

Equipment: **SEM-SAFE® High Pressure Water Mist Fire Fighting System**

Product responsible: **Danfoss Fire Safety A/S**
Middelfartvej 9, DK-5000, Odense C, DENMARK

The documentation is conditional that the product is in accordance with the specifications given in the appendix and that the product is applied and used in accordance with regulations and all important details in this process follow precisely what is described in a Design Installation Operation and Maintenance (DIOM) manual. Both the DIOM manual and the RISE Documentation shall follow the product or be available for the purchaser, user, inspector and the local authority.

The product shall be labeled with **RISEFR 040-0201**, trade name, product responsible and/or the manufacturers traceability label. Alternatively, this documentation and the DIOM manual shall be attached. The labelling shall have good visibility.

Detailed product design and principle design of installation details are described in "Standard construction details for SEM-SAFE® High Pressure Water Mist Fire Fighting System (SEM-SAFE®), belonging to Documentation RISEFR 040-0201". The version of the construction details filed at RISE Fire Research at any time is a formal part of the approval.

The product must have at least one annual, external inspection related to the internal system for control of quality. The inspection is adjusted to the type of product and other existing inspection arrangements. Details are specified in a written agreement with RISE Fire Research.

This documentation was first issued **2018-05-08.** A renewal may be issued based on a written application. Termination by the applicant shall be asked for in writing and with 6 months notice. RISE Fire Research may withdraw this documentation when irregularities or misuse happens, and written instructions are not respected.

Issued: 2023-05-31

Valid until: 2028-07-01

Asbjørn Østnor
Discipline Manager Documentation

Per Arne Hansen
Project Manager Documentation

Appendix 1 to Documentation RISEFR 040-0201 of 2023-05-31

1. Owner of the Documentation

Danfoss Fire Safety A/S
Middelfartvej 9,
DK-5000, Odense C,
DENMARK
www.semsafe.danfoss.com

2. Manufacturer

Danfoss Fire Safety A/S.

3. Product Description

SEM-SAFE® is a high pressure water mist fire fighting system that uses micro droplets released through nozzles into protected areas. It comprises a high pressure modular pump unit, section valves, piping and water mist nozzles.

4. Fields of Application

For water mist protection of OH4 auditorium which is considered as part of a theatre, concert hall or public spaces in which the audience sits.

5. Properties

SEM-SAFE® has the following specifications:

- *System type and identification:* Nozzle I.D.: CP and CQ.
- *Occupancies with any restrictions:* Auditorium and similar fire risks.
- *Description of hazards and storage:* OH4 auditorium.
- *Ventilation and ambient conditions:* Shutdown of forced ventilation on detection of fire is required for all applications. Controlled ventilation; doors and fire dampers to the protected compartment are to be closed on fire detection.
- *Area and room limitations:* The system limited to indoor applications should not be used for direct application to materials which react with water to produce violent reactions or hazardous products. It should not be specified where uncontrolled ventilation conditions exist. Shutdown of forced ventilation on detection of fire is required for all applications. Water based fire extinguishing systems are susceptible to freezing, therefore, pump units and wet piping shall be in a frost-free area, i.e. an area with a guaranteed temperature above 4°C can always be maintained or by other means that prevent the water in the pipework from freezing.
- *Requirements on separation:* Individual fire sections.

Figure 1: SEM-SAFE® High Pressure Water Mist Fire Fighting System with Nozzle I.D.: CP and CQ.

- *All design parameters:*
  - *Nozzle type and unique identification:* CP and CQ.
  - *Number of operating nozzles or area of operation:* 360 m^2.
  - *Design pressure (if a pumped system is used):* CP: 60 bar; CQ: 100 bar.
  - *Specific value for the automatic start of the first pump set when the pressure in the water mist system falls:* At 12 bar and down to 6 bar.
  - *Minimum nozzle flow rate:* CP: 31.0 l/min, CQ: 31.0 l/min.
  - *Maximum ceiling height:* 12 m[1)].
  - *Minimum and maximum volume or area:* Unlimited.
  - *Maximum nozzle spacing:* 4 m[1)].
  - *Maximum distance to wall:* 2 m[1)].
  - *Requirements concerning obstructions:* See DIOM Manual Section 9.4 Nozzle obstructions.
- *Minimum requirement for water and/or atomizing:* Water can be normal potable

[1] Tolerance of +10 % is acceptable

water which complies with most current version of the European Directive 80/778/EEC (1980) and filtered before entering the system, see further in data sheet 901-90-00006 ″Water Quality Requirements″.

6. Special Conditions for Use and Installation

SEM-SAFE® shall be installed according to installation details shown in ″Standard Construction Details for the product belonging to RISE documentation RISEFR 040 0201″.

There should be a DIOM manual according to PrEN 14972-1:2017 Chapter 4.2. The manufacturer shall prepare a relevant detailed manual to provide a specification of the system as listed in Item 5 if applicable. This manual shall in addition include at least the following:

- Any system constraints crucial to the operation.
- Full functional system description.
- Full installation and commissioning instructions.
- Full operation instructions.
- The maintenance information shall include at least a full maintenance schedule and instructions.

Labeling:
For traceability, the product shall be labeled with ″CP″ or ″CQ″ as well as the documentation RISEFR 040-0201, and the DIOM Manual shall follow the product.

7. Basis for the Documentation

This documentation is based on the properties that are documented in the following reports and drawings:

- DIOM manual PrEN 14972-1:2017 Chapter 4.2.
- RISE Fire Research AS: Test reports according to RISEFR 05-10: Water mist protection of OH4 Auditorium:
  - RISE Report F17 20343:1 of 2017-12-18.
  - RISE Report F17 20343:2 of 2017-12-19.
- RISE Fire Research AS: Evaluation of tolerances of physical dimensions in fire tests of OH4 Auditorium, RISE Fire Research AS Memo (Project No / File Code 20428) of 2019-02-21.
- Danfoss Fire Safety A/S Fire Protection: Drawing no. of 2017-11-23:
  - Nozzle CP 60 bar NO-032400-CP-P-4.00-12-057-000000.
  - Nozzle CQ 100 bar NO-032500-CQ-P-3.10-12-057-000000.

8. Validity

The validity of this appendix is uniquely linked to the first page of the document with the requirements, conditions and expiration date expressed.

9. Technical Management

Project Manager for this approval is Per Arne Hansen and Discipline Manager Documentation is Asbjørn Østnor, RISE Fire Research AS, Trondheim.

Verification

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Document

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Signing parties

Per Arne Hansen (PAH)
per.arne.hansen@risefr.no

Signed 2023-05-31 11:32:54 CEST (+0200)

Asbjørn Østnor (AØ)
asbjorn.ostnor@risefr.no

Signed 2023-06-02 08:23:21 CEST (+0200)

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