

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:
MEDB00001BS

Application of: Council Directive 96/98/EC of 20 December 1996 on Marine Equipment as amended by directive (EU) 2015/559, issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Authority. This Certificate is issued by DNV GL AS under the authority of the Government of the Kingdom of Norway.

This is to certify:

That the Fixed water based local application fire fighting systems components for use in category "A" machinery spaces

with type designation(s)

SEM-SAFE HPWM Local Application

Issued to

**Danfoss Semco A/S
Odense C, Denmark**

is found to comply with the requirements in the following Regulations/Standards:

**Annex A.1, item No. A.1/3.48 and Annex B, Module B in Directive; SOLAS 74 as amended
Regulation II-2/10 & X/3 and 2000 HSC Code 7**

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2019-01-26**.

Issued at **Høvik** on **2016-06-16**

DNV GL local station:

Fredericia

Approval Engineer:

Aleksandr Jegorov

Notified Body

No.: **0575**

for **DNV GL AS**

Vidar Dolonen

Head of Notified Body

Product description

"SEM-SAFE HPWM Local Application"

is a local application water mist system, composed of spray heads, stainless steel piping, manual or automatic section valves, strainers, control systems and electrically driven pumps.

The system is to be designed according to principal requirements for the system, IMO MSC/Circ.1387 and SOLAS Ch.II-2, Reg.10.5.6. Only the spray heads are type approved by this certificate. Pumps, pipes, couplings, valves and other systems components are subject to case by case approval.

The spray heads are manufactured by Danfoss Semco A/S, Odense, Denmark

Application/Limitation

The spray heads are to be installed above the protected objects according to the following specifications:

Alternative 1: high levels – 100 bar	
Maximum horizontal spacing:	4.0 m
Minimum vertical distance from object:	1.9 m
Maximum vertical distance from object:	10.6 m
Minimum operation pressure:	100 bar (at spray heads)
Nozzle ID	S
Spray head type:	7-01-56-5-19.5-00
K-factor, spray head (using $Q = k \times p^{1/2}$):	1.87
Drawing, spray head	DL1: 7-01-56-5-19-00
Spray heads are to cover the area out to the periphery of the protected object. The spray heads are to be installed in a pendant (downward) position. Single spray heads or single rows are accepted when half spacing is used.	
Alternative 2: low levels – 100 bar	
Maximum horizontal spacing:	4.0 m
Minimum vertical distance from object:	1.0 m
Maximum vertical distance from object:	3.0 m
Minimum operation pressure:	100 bar (at spray heads)
Nozzle ID	P
Spray head type:	7-01-56-5-12-00
K-factor, spray head (using $Q = k \times p^{1/2}$):	1.19
Drawing, spray head	DL1: 7-01-56-5-12-00
Spray heads are to cover the area out to the periphery of the protected object. The spray heads are to be installed in a pendant (downward) position. Single spray heads or single rows are accepted when half spacing is used.	
Alternative 3: low levels – 80 bar	
Maximum horizontal spacing:	3.5 m
Minimum vertical distance from object:	1.5 m
Maximum vertical distance from object:	3.0 m
Minimum operation pressure:	80 bar (at spray heads)
Nozzle ID	P
Spray head type:	7-01-56-5-12-00
K-factor, spray head (using $Q = k \times p^{1/2}$):	1.19
Drawing, spray head	DL1: 7-01-56-5-12-00
Spray heads are to cover the area out to the periphery of the protected object. The spray heads are to be installed in a pendant (downward) position. Single spray heads or single rows are accepted when half spacing is used.	
Alternative 4: low levels – 80 bar	
Maximum horizontal spacing:	3.0 m
Minimum vertical distance from object:	1.5 m
Maximum vertical distance from object:	3.0 m
Minimum operation pressure:	80 bar (at spray heads)
Nozzle ID	Q
Spray head type:	7-01-48-4-17-00
K-factor, spray head (using $Q = k \times p^{1/2}$):	1.34
Drawing, spray head	DL1: 7-01-48-4-17-00
Spray heads are to cover the area out to the periphery of the protected object. The spray heads are to be installed in a pendant (downward) position. Single spray heads or single rows are accepted when half spacing is used.	

For all systems

- Spray heads are made of stainless steel (AISI 304) and the maximum operating pressure is 140 bar.

- Only stainless steel piping or equivalent corrosion resistant pipes are to be applied (to avoid clogging of spray heads). System filter shall be provided for each pump unit. Primary water supply shall be a fresh water of potable quality.
- The piping to be regarded as class I.
- Turbo machinery should also be covered by the system but with gentle application of water. Essential electrical equipment and air intakes should preferably not be directly exposed to the water discharge. Electrical equipment as per DNV GL Rules for ships Pt.4 Ch.8 Sec.10, Table B (or equivalent standard as specified by the Flag Administration) shall be applied for new buildings.
- The pump(s) or the pump unit(s) is to be delivered with a product certificate whereas other system components are to be inspected in accordance with the DNV GL Rules for ships (or equivalent standard as specified by the Flag Administration).
- The pump unit and section valves shall be installed in a room having ambient temperature between +4°C and +45°C.

The following documents are to be approved and filed by the Flag Administration:

- System arrangement plans including location of spray heads, section valves, release stations and pump-unit (including water supply specifications).
- Documentation of power supply and control system.
- Specification of pipes, electrical motor, valves, pumps and associated components.
- Pressure drop calculations and water capacity calculations.
- Arrangement of interface to fire detection and alarm system (where applicable).
- Design, installation, operation and maintenance manual.

Other documents:

- Documentation for other components (according to DIN 3.1B and DIN 2.2, or equivalent), including qualification of welders and approval of welding procedures (if applicable) is to be submitted to the Flag Administration/Recognized organization in question.

Installation testing:

- A 30 seconds water mist discharge is to be carried out for at least one section.
- Test of manual and remote release of all section valves and start of pumps.
- Testing of alarms (SOLAS Ch. II-2, Reg.10.5.6.4).
- Cleaning according to Sem-Safe installation procedure.
- Pressure testing of water pipe system to at least 1,5 times maximum working pressure.
- Testing of automatic start of system (in case of unattended machinery spaces).
- Other tests as required by DNV GL Rules (pressure testing of piping, etc.) or a similar standard acceptable to the Flag Administration and according to maker's manual shall be carried out
- Other tests according to maker's manual and any required by the authority having jurisdiction.

Periodical testing:

- Periodical control and inspection to be in accordance with maker's manual.

Type Examination documentation

Danfoss Semco Type Approval Documentation – Local Application Systems (LA Design Manual), November 2000

Fire Performance Test Report:

STF22 F00832, July 2000 SINTEF, Norway
NBL10 F02126, September 2002 SINTEF, Norway

Component testing of water mist nozzles:

DNV Report no. 97-1069, rev. 06, Sept 1998, DNV, Norway
DNV Report no. 2000-1237, rev.1, August 2000, DNV, Norway

Full-scale test with engines running:

Danfoss Semco report, February 2002.

Tests carried out

Tested according to IMO MSC/Circ. 913 (fire tests) and relevant part of IMO Circ. 668/728 (component tests).

Marking of product

The spray head is to be marked with type designation whereas pump / control unit is to be marked with name of manufacturer and type designation.