

EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Application of: Directive 2014/90/EU of 23 July 2014 on marine equipment (MED), 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 Norway.

This is to certify:

That the Nozzles for fixed pressure waterspraying fire-extinguishing systems for cabin balconies

with type designation(s)
Cabin Balcony System

Issued to

Danfoss Semco A/S
Odense C, Syddanmark, Denmark

is found to comply with the requirements in the following Regulations/Standards:
Regulation **(EU) 2018/773**,
item No. MED/3.60. SOLAS 74 as amended Regulation II-2/10, FSS Code 7, IMO MSC.1/Circ.1313 and IMO MSC.1/Circ.1268

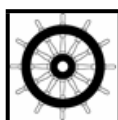
Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2024-04-01**.

Issued at **Høvik** on **2019-04-02**

DNV GL local station:
Fredericia

Approval Engineer:
Tessa Biever



Notified Body
No.: **0575**

for **DNV GL AS**

Roald Vårheim
Head of Notified Body



The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Directive 2014/90/EU.
This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV GL AS of any changes to the approved equipment. This certificate remains valid unless suspended, withdrawn, recalled or cancelled.
Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.



Product description

"Cabin Balcony System",

is an automatic water mist system composed of sprinkler heads, stainless steel piping, section valves and pump unit.

The system is to be designed in accordance with the "Principal Requirements for the System" in IMO MSC.1/Circ.1268.

Only the spray heads are type approved by this certificate. Pipes, couplings, valves and other systems components are subject to case by case approval.

The sprinkler heads are manufactured by Danfoss Semco A/S Fire Protection, Odense, Denmark.

Application/Limitation

Approved for use as an automatic water sprinkler system for cabin balconies.

Installation should be in accordance with the following tables:

Application	Sprinkler type ³⁾	Max. ceiling height [m]	Projection	Spacing [m]	Max. distance to wall of next balcony [m]	Max. distance to wall of cabin [m]
Cabin balcony, max. 3 x 2 m (width x depth) balcony ¹⁾	PB	2.5	pendant	Single	1.5	1.0
Cabin balcony, max. 3 x 2 m (width x depth) balcony ¹⁾	SB	2.5	horizontal	Single	1.5	0.1 ²⁾
Balcony section (max 8 balconies, not to exceed 50 m ²)	PB	2.5	pendant	3.0	1.5	1.0
Balcony section (max 8 balconies, not to exceed 50 m ²)	SB	2.5	horizontal	3.0	1.5	0.1 ²⁾
Notes: 1) Heights above 2.5 m are subject to case by case approval. 2) The nozzle side without sprinkler holes to face the cabin wall. 3) The nozzle to be mounted a maximum distance of 100 mm below the balcony ceiling/deck head.						

Sprinkler head ^{1), 2)}	k-factor ($Q = k \times p^{1/2}$) [lpm/bar ^{1/2}]	Min. working pressure [bar]	Min. flow rate [lpm]	Drawing No.
PB (Pendant Balcony)	4.10	60	31.7 lpm	PB, rev. 00 (27.05.2010)
SB (Sidewall Balcony)	2.33	60	18 lpm	SB, rev. 00 (17.05.2010)
Notes: 1) Minimum working pressure is 60 bar, and maximum system working pressure is 140 bar. 2) All sprinkler heads are made of brass.				

For all applications:

- Maximum system working pressure is 140 bar, while the minimum working pressure at the sprinkler heads is 60 bar.
- All sprinklers heads are fitted with a fast response glass bulb which releases at nominal 57 °C (orange code). Bulbs with higher temperature ratings, but not more than 30 °C over ambient temperature, are subject to approval in each case.
- The pump(s) are to be delivered with a product certificate whereas other system components are to be inspected in accordance with class rules or equivalent standard as specified by the Flag Administration.

- D. The pump unit and section valves shall be installed in a room having ambient temperature between 4°C and 45°C.
- E. Redundant pump arrangement is subject to approval in each case.
- F. Only stainless steel piping or equivalent corrosion resistant pipes are to be applied (to avoid clogging/erosion of sprinklers and sprinkler heads). Primary water supply shall be fresh water of potable quality.
- G. Pipes, couplings and other components are regarded as "Class I" piping.
- H. The system should either be automatic type or capable of manual release from a location remote from the protected area. Operating instructions for the system should be displayed at each operating position.
- I. Nozzle positioning should take into account obstructions to the spray of the fire-fighting system. Any parts of the system which may be subjected to freezing temperatures in service should be suitably protected against freezing.
- J. The system should be available for immediate use and capable of continuously operating for at least 30 minutes.
- K. The system shall be designed for maximum 280 m² nominal coverage, if combined with other than cabin balcony sprinkling.

Installation

Water to be in accordance with manufacturer's specification for water quality. No chemicals shall be added to the water, for the purpose of e.g. cleaning, bacterial control, corrosion inhibition, etc., without the acceptance from the Manufacturer.

The following items are to be submitted for approval for each project:

1. System arrangement plans showing location of sprinkler heads, pipes, sections valves, release controls (as applicable) and pump-unit.
2. Specification of pipes, valves, pump unit and associated components (including water supply specifications).
3. Pressure drop calculations and water capacity calculations.
4. Arrangement of power supply and control system.
5. Manual containing installation, operation and maintenance instructions.

Installation testing:

- System to be cleaned in accordance with routines outlined in maker's manual.
- Not less than 2 sprinkler heads in each section shall be tested. Testing may be limited to 10 sections. i.e. 2 x 10 sprinkler heads if it is successful.
- Automatic start and stop of pumps.
- Automatic change over from main to emergency electric supply
- Pressure testing of all piping to 1.5 times maximum working pressure.
- Other tests according to maker's manual and any required by the authority having jurisdiction

Periodical testing:

- The periodical testing shall comply with instructions from flag administration, statutory interpretations and maker's maintenance manual.

Type Examination documentation

Basis of approval:

Fire tests:

- File PE10055a dated 30 June 2010 from Danish Institute of Fire and Security Technology (DBI), Hvidovre, Denmark.
 - File PE10055b dated 30 June 2010 from Danish Institute of Fire and Security Technology (DBI), Hvidovre, Denmark.
 - Test report NBL 11106 dated 2011-01-21 (watermist nozzle verification - flow constant measurements PB nozzle) from SINTEF, Trondheim, Norway.
 - Test report NBL 11107 dated 2011-01-21 (watermist nozzle verification - flow constant measurements SB nozzle) from SINTEF, Trondheim, Norway.

Component tests (reference testing with similar nozzle types as PB and SB):

- P805649 dated 27 May 2009 from SP, Borås, Sweden. (Nozzle type A4.)
- P805649-01 dated 27 May 2009 from SP, Borås, Sweden. (Nozzle type A4.)
- P805649-02 dated 18 March 2009 from SP, Borås, Sweden. (Nozzle type A4.)
- P805649-03 dated 26 January 2009 from SP, Borås, Sweden. (Nozzle type A4.)
- P805649B dated 27 May 2009 from SP, Borås, Sweden. (Nozzle type A4.)
- P805649C dated 27 May 2009 from SP, Borås, Sweden. (Nozzle type A4.)
- P904544rev dated 28 August 2009 from SP, Borås, Sweden. (Spring as used in both PB and SB).
- 97-1069, rev. 06 dated 1 September 1998 from Det Norske Veritas, Høvik, Norway. (Tower holding glass bulb is same as for PB and SB for RTI-measurements.)
- Test report (inhouse) dated 20 May 2009 from Danfoss Semco, Odense, Denmark. (Same as nozzle type A4.)
- Test report (inhouse) dated March 2010 from Danfoss Semco, Odense, Denmark. (Nozzles with smaller holes than PB and SB.)

Assessment regarding design of Danfoss Semco nozzles, report PX07085 dated 26 November 2010 from SP, Borås, Sweden.

Drawings:

- PB, rev. 00 (27.05.2010) from Danfoss Semco, Odense, Denmark.
- SB, rev. 00 (17.05.2010) from Danfoss Semco, Odense, Denmark.

Other:

- Cabin Balcony System Design Manual, Rev. 1, June 2010 from Danfoss Semco, Odense, Denmark.

Tests carried out

The sprinkler heads are fire tested according to IMO MSC.1/Circ. 1268 with reference component testing for similar type sprinkler heads according to IMO Res. A.800 (19).

Marking of product

Main components in the system are to be marked with name and address of manufacturer, type designation and MED Mark of Conformity (see first page), Notified Body No. and the year of manufacturing.