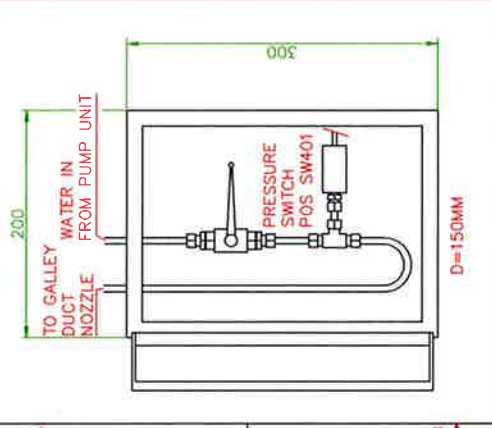


INSTALLATION GUIDELINE
 THIS SYSTEM CAN PROTECT GALLEY DUCT WITH MAX. DIAMETER OR WALL TO WALL DISTANCE OF 760mm. ONE NOZZLE MUST BE INSTALLED IN THE GALLEY HOOD AND ONE AT FIRST BEND. THE GALLEY DUCT SHALL BE PROTECTED WITH SPRINKLER NOZZLE EACH 6M (MAX). MOUNT THE FIRST NOZZLE APPROXIMATE 0.5M FROM THE START POINT OF THE DUCT AND THE OTHER NOZZLES SHALL BE MOUNTED WITH APPROXIMATE 6.5M SPACING. THE SYSTEM IS TO BE CONNECTED TO THE MAIN ULTRAFOG SPRINKLER SYSTEM INSIDE THE GALLEY. ITS RECOMMEND TO 12MM PIPE ALL THE WAY OUT TO THE LAST NOZZLE. THE SLEEVE IS TO BE WELDED TO THE GALLEY DUCT STEEL FRAME. USE THE BULKHEAD PENETRATION FOR FIX THE NOZZLE ON THE SLEEVE.

20080206-901	20080206-901	20080206-901	20080206-901
AK	08/06	UF	FILE
YES	D	YES	YES
ULTRAFOG AB			
20080206-901			
GALLEY DUCT SYSTEM			
ULTRA FOG			
20080206-901	1	1	1/1

ORIGINALFORMAT A2
 SW 401 SHALL CLOSE THE FIRE DAMPERS FOR THE HOOD. STATUS BELOW 1 BAR
 ACTIVATING CABINET PART No. 20080206-201 MATERIAL STAINLESS STEEL





DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. F-19086
This Certificate consists of 4 pages

This is to certify that the
Fire-extinguishing system for protection of galley extract ducts


with type designation(s)
Ultra-fog

Manufactured by
Ultra Fog AB
HISINGS BACKA, Sweden

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Interpretation of SOLAS 1974 Convention as Amended

Application
Approved for use as a fire extinguishing system for galley ducts.

Place and date
Høvik, 2009-09-08
for DET NORSKE VERITAS AS

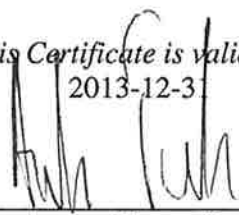


Petter Langnes
Head of Section



Local Office
DNV Gothenburg

This Certificate is valid until
2013-12-31



Anders Tosseviken
Surveyor

Notice: This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Cert. No.: F-19086
File No.: 474.47
Case No.: 262.1-005502

Product description

"Ultra-fog",
is a water mist system, composed of spray heads, stainless steel piping, manual or automatic section valves, filter, control system and water supply pump(s). Operation is manual. The system may be used to protect other ducts, such as laundry extract ducts.

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

The spray heads are manufactured by the following manufacturers:

- MEKO Teknik AB at Halmstad, Sweden
- WIKA Mekaniska AB at Nödinge, Sweden
- Ralex CNC-Teknik & Svets AB at Nässjö, Sweden
- Stacke Metall AB at Gnosjö, Sweden

Application/Limitation

The spray heads are to be installed in the ducts according to the following specifications:

Duct type	Maximum duct protection length
90° bend	0 m (one spray head per 90° bend)
45° bend	4.5 m
Straight duct	6.0 m

Spray heads in ducts	
Maximum horizontal spacing:	According to the above table.
Maximum duct dimensions ¹⁾ :	760 mm by 760 mm (0.58 m ²)
Minimum pressure at spray head:	100 bar
Spray head type:	202-0.61-0
The spray heads are to be installed perpendicular to the duct wall.	
Notes: 1) Larger ducts can be assessed case by case (reduced spacing).	

Spray head information

Spray head	k-factor ($Q = k \times p^{1/2}$)	Rated flow	Drawing no.
202-0.61-0	0.61 lpm/bar ^{1/2}	6.3 lpm at 105 bar	940610-008 B (issued 02/94) 931028-202 A (issued 06/95)
Spray head 202-0.61-0 is marked "0.61".			
Spray heads are to be made of stainless steel. Maximum operating pressure is 200 bar.			





Cert. No.: F-19086
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For all systems:

1. Only stainless steel piping is to be applied and a system filter (UF 960312-102 or equivalent) shall be provided for each pump unit (to avoid clogging of spray heads)
2. The pump(s) or the pump unit is to be delivered with a DNV product certificate. Other system components are to be inspected in accordance with the DNV Rules. The piping shall be regarded as class I.
3. Ambient room temperature for pump unit should be between +4 °C and +45 °C

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

- System arrangement plans including location of spray heads, sections valves, release stations and pump unit (including water supply)
- Documentation of power supply and control system
- Specification of pipes, electrical motor, valves, pumps and associated components
- Pressure drop calculations and water capacity calculations
- Manual with operating, test and maintenance instructions

Installation testing:

- At least one section should be tested with full flow through the spray heads
- Other tests as required by DNV Rules (pressure testing of piping, etc.) and according to maker's manual shall be carried out

Periodical testing:

- Periodical control and inspection to be in accordance with makers test manual

Type Approval documentation

Certification in accordance with Standard for Certification No. 1.2, Type Approval, April 2009.

Fire Performance Test Report:
TESI Report N.173/C, August 2008

Component testing of water mist nozzles:
UL Report, File Ex5204, Project 97NK12814, July 1999

Fire test based on UL300 and IMO MSC/Circ. 1165 (component tests of spray heads)

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.



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Certificate retention survey

Det Norske Veritas' surveyor is to be given permission to perform Certification Retention Surveys at any time during the validity period of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Standard for Certification No. 1.2 item 4.

END OF CERTIFICATE

