

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Data transmission cables and systems**with type designation(s)
RADOX MARINE DATABUS 120 Ohm

Issued to

Huber+Suhner AG
Pfäffikon ZH, Switzerlandis found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Hamburg** on **2018-01-22**This Certificate is valid until **2023-01-21**.DNV GL local station: **Augsburg**for **DNV GL**Approval Engineer: **Carsten Hunsalz**

Arne Schaarmann
Head of Section

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.



Product description

Halogen-free, low smoke emission, no-corrosive gases and flame retardant databus cable

Type: RADOX MARINE DATABUS 120 Ohm

Rated voltage: 300 V a.c.
Max. operating conductor temperature: 90° C
Ambient temperature: -25° C to +90° C
Conductor: Tinned copper stranded (class 5)
Insulation: RADOX foam, (modified type C) for pairs and quads
RADOX 125, (type EI 5) for single insulated conductors
Braid / screen: Tinned copper wire braid
Outer sheath: RADOX ELASTOMER S FH, (type SHF 2)

Further technical data according data sheet

Number of cores: Cross-sectional area:

1 x 2	0,5 mm ²
1 x 2 +1	0,5 mm ²
2 x 2	0,5 mm ²
2 x 2 +2	0,5 mm ²
1 x 4	0,5 mm ²
1 x 4 + 2	0,5 mm ²

Application/Limitation

The requirements of SOLAS Amendments Chapter II-1, Part D, Reg. 45, 5.2 (provision to be taken to limit Fire Propagation along Bunches of Cables or Wires) are fulfilled without any additional measures.

Databus cable
Flame retardant in bunch Cat. A. Halogen free. Low smoke.

Type Approval documentation

Test report : Huber + Suhner PL060815A and PL060816A (2007-02-14)
ES05545E and ES05545F (2005-12-14)
ISSEP 703-1/2005; 703-2/2005; 703-3/2005 (2005-04-15)
Huber + Suhner PL170680, 2017-10-25
Documentation: Technical Data Sheet 584 403 I (e), 2017-12-15

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-360	2014-04	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	
IEC 61375-3-1	2012-06	Electronic railway equipment - Train communication network (TCN) - Part 3-1: Multifunction Vehicle Bus (MVB) 4.5.3 Cable section	

Job Id: **262.1-026073-1**
Certificate No: **TAE00002HJ**

Standard	Release	General description	Limitation
EN 50363-5	2011-03	Insulating, sheathing and covering materials for low voltage energy cables Part 5: Halogen-free, cross-linked insulating compounds	
IEC 60332-1-2	2015-07	Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable –Procedure for 1 kW pre-mixed flame	
IEC 60332-3-22	2009-02	Tests on electric and optical fibre cables under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
IEC 60754-1	2011-11	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content	Low Halogen: <0,5% Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables – Determination of the degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 60684-2	2011-08	Flexible insulating sleeving - Part 2: Methods of test. Clause 45.2 Methods of determination of low levels of fluorine	Fluorine content <0,1%
IEC 61034-1/2	2013-06	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance >60%

Marking of product

HUBER+SUHNER RADOX MARINE 120OHM nx2x0.5+nx0.5MM2 SHF2 90C IEC 60332- 1- 2
IEC 60332- 3- 22 [item no]- [batch no] [date of manufacture] [prod- place]

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine Tests (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE