DNV·GL

Certificate No:
TAE00002Y5

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, Switzerland

is 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 **2018-06-18**
This Certificate is valid until **2023-06-17**.
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.

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Job Id: **262.1-026560-1**
Certificate No: **TAE00002Y5**

Product description

Type: RADOX MARINE DATABUS 120 OHM

Rated Voltage: 300 V a.c.
Temperature range: -40 to 90°C (fixed)

Conductor: Flexible tin-plated copper
Insulation: RADOX foam, cross-linked foam skin polyethylene
Filler: PE
Wrapping: PP-tape
Braid / Screen: Tin-plated copper
Outer sheath: RADOX Elastomer S FH (SHF2 or SHF MUD)

Number of cores: Cross-sectional area:
1 x 2 0,75 mm²

Cable Parameter

Characteristic Impedance f = 1 MHz	120 +-10 Ω
Mutual capacitance wire/wire	38 +- 3 pF/m
Velocity factor f = 1 MHz	77 +-3 %
Attenuation f = 1 MHz	≤ 10 dB/km
Transferimpedance f ≤ 30 MHz	≤ 30 mΩ/m

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.

Min. bending radius: fixed 3 x cable dia.
flexing 5 x cable dia.

Type Approval documentation

Specification: HUBER+SUHNER 85 063 638 J (e), dated 2018-05-24

Tests carried out

Standard	Release	General description	Limitation
EN 50288-7	2005-09	Multi-element metallic cables used in analogue and digital communication and control -- Part 7: Sectional specification for instrumentation and control cables	
IEC 61156-1	2009-10	Multicore and symmetrical pair/quad cables for digital communications - Part 1: Generic specification	
EN 50290-2-23	2013-11	Communication cables - Part 2-23: Common design rules and construction – Polyethylene insulation for multi-pair cables used in access telecommunication networks: Outdoor cables	
EN 50290-2-29	2016-09	Communication cables - Part 2-29: Common design rules and construction - Crosslinked polyethylene insulation compounds: instrumentation, control and field bus cables	

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 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.	
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	Bunch test Category A
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 - Part 2: Determination of acidity (by pH measurement) 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	HF max 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%
NEK TS 606	2016	Cables for offshore installations. -halogen-free low smoke flame-retardant / fire-resistant (HFFR-LS) Technical specification	Mud resistance test for cable types with SHF2 MUD sheath: IRM902+IRM903 100°C 7d. Calcium Bromide 70°C 56d. EDC 95-11 70°C 56d.

Marking of product

HUBER+SUHNER RADOX MARINE DATABUS 120 OHM 2X0.75MM2 SHF2 SHF MUD 90C
IEC 60332-1-2 IEC 60332-3-22 85063638-[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