

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Network and Communication Components

with type designation(s)
RedFox 5728 SA Series Industrial Ethernet Switches

Issued to
Westermo Network Technologies AB
STORA SUNDBY, Sweden

is found to comply with
DNV 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.

Location classes:

Temperature	D
Humidity	B
Vibration	A
EMC	See product table on page 2
Enclosure	A / IP40

Issued at **Høvik** on **2023-06-15**

for **DNV**

This Certificate is valid until **2028-06-14**.

DNV local unit: **Sweden CMC**

Approval Engineer: **Ståle Sneen**

Frederik Tore Elter
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Westermo RedFox 7528 SA (Substation Automation) Industrial Ethernet Switches, comprising the following units:

Art. No.	Type Designation	Rated Voltage	Description Ports
3641-4350	RedFox-5728-F4G-T24G-LV ¹	24-48 VDC	4 SFP Fiber, 24 Copper RJ45 Single LV power port
3641-4355	RedFox-5728-F4G-T24G-LVLV ¹	24-48 VDC 24-48 VDC	4 SFP Fiber, 24 Copper RJ45 Dual redundant LV power ports
3641-4550	RedFox-5728-F4G-T24G-HV	110-240 V (AC or DC)	4 SFP Fiber, 24 Copper RJ45 Single HV port
3641-4555	RedFox-5728-F4G-T24G-HVHV	110-240 V (AC or DC) 110-240 V (AC or DC)	4 SFP Fiber, 24 Copper RJ45 Dual redundant HV ports
3641-4360	RedFox-5728-F16G-T12G-LV ¹	24-48 VDC	16 SFP Fiber, 12 Copper RJ45 Single LV power port
3641-4365	RedFox-5728-F16G-T12G-LVLV ¹	24-48 VDC 24-48 VDC	16 SFP Fiber, 12 Copper RJ45 Dual redundant LV power ports
3641-4560	RedFox-5728-F16G-T12G-HV	110-240 V (AC or DC)	16 SFP Fiber, 12 Copper RJ45 Single HV port
3641-4565	RedFox-5728-F16G-T12G-HVHV	110-240 V (AC or DC) 110-240 V (AC or DC)	16 SFP Fiber, 12 Copper RJ45 Dual redundant HV ports
3641-4250	RedFox-5728-E-F4G-T24G-LV ¹	24-48 VDC	4 SFP Fiber, 24 Copper RJ45 Single LV power port
3641-4255	RedFox-5728-E-F4G-T24G-LVLV ¹	24-48 VDC 24-48 VDC	4 SFP Fiber, 24 Copper RJ45 Dual redundant LV power ports
3641-4450	RedFox-5728-E-F4G-T24G-HV	110-240 V (AC or DC)	4 SFP Fiber, 24 Copper RJ45 Single HV port
3641-4455	RedFox-5728-E-F4G-T24G-HVHV	110-240 V (AC or DC) 110-240 V (AC or DC)	4 SFP Fiber, 24 Copper RJ45 Dual redundant HV ports
3641-4260	RedFox-5728-E-F16G-T12G-LV ¹	24-48 VDC	16 SFP Fiber, 12 Copper RJ45 Single LV power port
3641-4265	RedFox-5728-E-F16G-T12G-LVLV ¹	24-48 VDC 24-48 VDC	16 SFP Fiber, 12 Copper RJ45 Dual redundant LV power ports
3641-4460	RedFox-5728-E-F16G-T12G-HV	110-240 V (AC or DC)	16 SFP Fiber, 12 Copper RJ45 Single HV port
3641-4465	RedFox-5728-E-F16G-T12G-HVHV	110-240 V (AC or DC) 110-240 V (AC or DC)	16 SFP Fiber, 12 Copper RJ45 Dual redundant HV ports

¹ LV / LVLV models satisfy DNV EMC class B requirements. Other models satisfy DNV EMC class A requirements.

RedFox-5728-E series (with option -E) supports OSI layer 3 (network layer)

RedFox-5728 series (without option -E) series supports OSI layer 2 (data link layer)

LV / LVLV models are approved for nominal voltage: 24-48 VDC
 HV / HVHV models are approved for nominal voltage: 110-240 VAC 50/60 Hz and 110-240 VDC
 Dielectric strength – Ethernet to other isolated ports: 1.5 kVAC
 Dielectric strength – power to other isolated ports: 2.0 kVAC

Westermo SFP transceivers are covered by type approval certificate TAA000006B.

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Application/Limitation

Shielded CAT6 Ethernet cable is required to fulfil class requirements for EMC.
Compass safe distance: Standard: 55 cm, Steering: 30 cm.

Type Approval documentation

User guide: RedFox 5728 Series: 6641-25001 Rev. E, dated 2022-10
Data sheet: RedFox-5728 Series Rev. E, dated 2022-10
Test reports: DELTA REC-E703698 Rev. A, dated 2016-01-28,
DELTA 621-20321-30_R0, dated 2022-03-04,
DELTA 621-20255-R0, dated 2023-04-25,
KEMA 1028-21 R0, dated 2021-09-29,
KEMA 1364-21 R0, dated 2021-09-30,
KEMA 1677-22 R1, dated 2022-10-19.

Tests carried out

Applicable tests according to class guideline DNV-CG-0339, August 2021.
15 g, 11 ms shock test according to IEC 60068-2-27:2008.
'Compass safe distance' was measured according to section 11.2 of IEC 60945:2002.

Marking of product

Westermo
Art. No. and Type as listed under Product description
Unique serial number
Power supply voltage and current rating

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the 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