

TYPE APPROVAL CERTIFICATE

This is to certify:**That the DC Power Supply**

with type designation(s)
PC-0x24 and Redundancy module PC-06xx

Issued to

Block Transformatoren-Elektronik GmbH
Verden, Germany

is found to comply with
DNV GL rules for classification – Ships

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Location classes:

Temperature B
Humidity B
Vibration A
EMC A / B
Enclosure A

This Certificate is valid until **2022-03-09**.

Issued at **Hamburg** on **2017-03-10**

DNV GL local station: **Bremerhaven**

for **DNV GL**

Approval Engineer: **Klaus-Peter Schröder**

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Joannis Papanuskas
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.

Job Id:
Certificate No: **TAA00000YZ**

Product description

Primary switched mode power supply, biphasic, mounting on standard rail DIN TH35.

Terminals Input/Output/Signaling: Push-In, max. 2.5mm² (suffix -0,-2)

Terminals Input/Output/Signaling: WAGO series 721, max. 2.5mm² (suffix -1, -3)

| | | |
|---|--|--|
| | PC-0224-050-0 PC-0224-050-1 PC-0224-050-2 PC-0224-050-3 | PC-0224-100-0 PC-0224-100-1 PC-0224-100-2 PC-0224-100-3 |
| Nominal input voltage | 200-500V AC | 200-500V AC |
| Nominal input current (nominal load) | 1.25A (200V AC) 0.67A (500V AC) | 1.97A (230V AC) 1.36A (400V AC) |
| Internal fuses | 3.15AT | 6.3AT |
| Nominal output voltage | 24V DC | 24V DC |
| Nominal output current | 5A | 10A |
| Power Boost, types PC-0224-xx0-2 | 7.5A/5s | 15A/5s |
| Output current limitation PC-0224-050-0 PC-0224-050-2 | 5.5A 8.5A | typ. 11A |

Primary switched mode power supply, Power Compact, mounting on standard rail DIN TH35.

Terminals Input/Signaling: Push-In, max. 2.5mm² (suffix -0, -2, -4, -6)

Terminals Input/Signaling: WAGO series 721, max. 2.5mm² (suffix -1, -3, -5, -7)

| | | | |
|---|--|--|--|
| | PC-0324-100-0 PC-0324-100-1 PC-0324-100-2 PC-0324-100-3 PC-0324-100-4 PC-0324-100-5 PC-0324-100-6 PC-0324-100-7 | PC-0324-200-0 PC-0324-200-1 PC-0324-200-2 PC-0324-200-3 PC-0324-200-4 PC-0324-200-5 PC-0324-200-6 PC-0324-200-7 | PC-0324-400-0 PC-0324-400-1 PC-0324-400-2 PC-0324-400-3 PC-0324-400-4 PC-0324-400-5 PC-0324-400-6 PC-0324-400-7 |
| Nominal input voltage | 400-500V AC | 400-500V AC | 400-500V AC |
| Nominal input current (nominal load) | 0.73A (400V AC) 0.66A (500V AC) | 1.21A (400V AC) 1.03A (500V AC) | 2.15A (400V AC) 1.82A (500V AC) |
| Internal fuses, types PC-0324-x00-4 PC-0324-x00-6 | 3x3.15AT | 3x6.3AT | 3x6.3AT |
| Nominal output voltage | 24V DC | 24V DC | 24V DC |
| Nominal output current | 10A | 20A | 40A |
| Power Boost (U _{in} >350V AC), types PC-0324-x00-2 PC-0324-x00-4 | 15A/5s | 30A/5s | 60A/5s |
| Output current limitation (constant) | typ. 11A | typ. 22A | typ. 44A |
| Terminals Output: Push-In (suffix -0, -2, -4, -6) | 2.5mm ² | 6mm ² | 16mm ² |
| Terminals Output WAGO series (suffix -1, -3, -5, -7) | 721, max. 2.5mm ² | 831, max. 10mm ² | 831, max. 10mm ² |

Redundancy module for DC circuits up to 48 V, mounting on standard rail DIN TH35.

Terminals Input/Output: Push-In, max. 16mm², Signaling max. 2.5mm² (suffix -0),

Terminals Input/Output: WAGO series 831, max.10mm², Signaling WAGO series 721,max. 2.5mm²
(suffix -1)

| | | |
|----------------------------|--------------------------------|--------------------------------|
| | PC-0624-400-0 PC-0624-400-1 | PC-0648-400-0 PC-0648-400-1 |
| Nominal input voltage | 24V DC | 48V DC |
| Nominal input current (per | 40A | 20A |

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| | | |
|---------------------------|--------|--------|
| channel) | | |
| Internal fuses | no | no |
| Nominal output voltage | 24V DC | 48V DC |
| Nominal output current | 40A | 40A |
| Output current limitation | no | no |

Application/Limitation

The Type Approval covers hardware listed under Product description.
When the hardware is used in applications to be classed by DNV GL, 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 GL RU SHIP Pt.4 Ch.9 Sec. 1.

Location classes EMC: Power supplies = A
Redundancy modules = B

Type Approval documentation

Tests carried out

Applicable tests according to Class Guideline DNVGL-CG-0339, Edition November 2015.

Marking of product

The products to be marked with:

- device name
- manufacturer name
- order number.

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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE