

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Constant Voltage Charger**with type designation(s)
MASS- 24/50MB, 24/75C & 24/100C

Issued to

**Mastervolt International
AMSTERDAM, Netherlands**

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Voltage output	24 V DC
Power	up to 3500 VA
Temperature class	A
Vibration class	A
Humidity class	B
Enclosure class	A

This Certificate is valid until **2017-12-31**.Issued at **Høvik** on **2016-05-13**DNV GL local station: **Rotterdam**Approval Engineer: **Nicolay Horn**for **DNV GL**

**Marit Laumann
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

Battery charger. Charging of 24 V open and closed lead acid (gel or wet) batteries and power simultaneously loads. Equipped with temperature compensated charging.

Type	Input Voltage	Input Current	Output (at 40 °C)	Enclosure
MASS-24/50-2	1 ph 180 - 260 V AC, 50/60 Hz, $\pm 5\%$	7,0 A at 230 V AC	24 V DC / 50 A	IP 23
MASS-24/75C	1 ph 180 - 260 V AC, 50/60 Hz, $\pm 5\%$	11,2 A at 230 V AC	24 V DC / 75 A	IP 23
MASS-24/100C	1 ph 180 - 260 V AC, 50/60 Hz, $\pm 5\%$	14,4 A at 230 V AC	24 V DC / 100 A	IP 23

Application/Limitation

The output current will be decreased if operating at 45 °C for longer period or with restricted ventilation. Derating with 2.5 % / °C > 40 °C.

Applicable for bridge installation in accordance with Class requirements.

Type Approval documentation

Datasheet:

Mastervolt User Manual version 2.3 issued February 2014
Technical details – charger mass 24/100, dated 2003-03-05.

Drawings:

MASTERVOLT Appendix A, B & C.

Test reports:

DARE Measurements EMC Test Report ref. no. 15C01712RPT01.

KEMA Environmental Test report for Battery charger, model MASS 3-24/100 no. 2076565-QUA/EMC 04-4743 dated 2004-10-19 and EMC Test report for Battery charger, model MASS 3-24/100 no. 2076565-QUA/EMC 04-4883 dated 2004-11-05.

See also approval letter 262.1-008458-J-13

Tests carried out

Low temperature, Dry heat & Vibration in accordance to SfC No. 2.4 Class A, Humidity/ Damp heat and EMC in accordance with SfC No. 2.4 Class B.

Marking of product

Mastervolt – charger model no. 24/xxx – charger input – charger output.

Periodical assessment

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

The main elements of the periodical 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 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 to be performed at least every second year.

END OF CERTIFICATE