

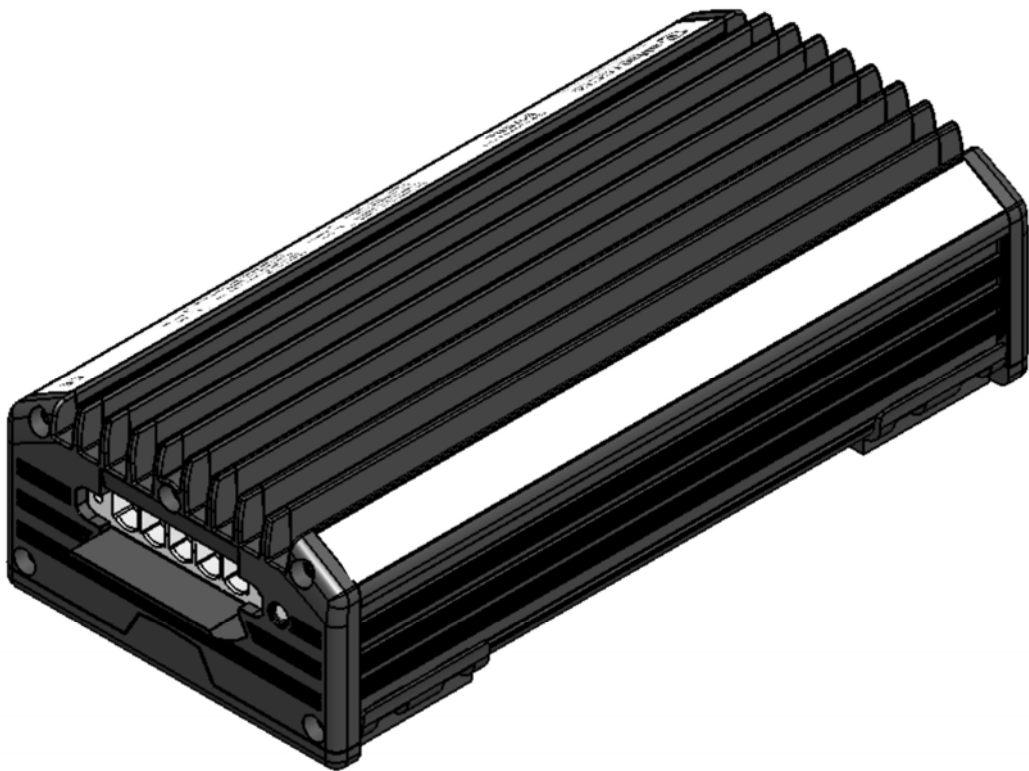
MASTERVOLT

USERS MANUAL

DC Master

24/12 50-60A

DC-DC converter



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TABLE OF CONTENTS:

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1	GENERAL INFORMATION.....	3
1.1	Use of this manual.....	3
1.2	Product description and application.....	3
1.3	Use of pictograms	3
1.4	Identification label.....	3
1.5	Liability	3
2	IMPORTANT SAFETY INSTRUCTIONS	4
2.1	General	4
2.2	Explosive gases	4
2.3	Warning regarding life support applications.....	4
2.4	Guarantee specifications	4
3	INSTALLATION	5
3.1	Before you start	5
3.2	Choosing a location to install.....	5
3.3	Contents of the delivery:.....	5
3.4	Installation step-by-step	5
4	OPERATION	6
4.1	Switching on and off	6
4.2	Remote switch function	6
4.3	Status LED	6
4.4	Maintenance.....	6
5	TROUBLE SHOOTING	6
6	TECHNICAL DATA.....	7
6.1	Specifications	7
6.2	Dimensions.....	7
7	EC DECLARATION OF CONFORMITY	8

1 GENERAL INFORMATION

1.1 USE OF THIS MANUAL

Copyright © 2015 Mastervolt. All rights reserved.
 Reproduction, transfer, distribution or storage of part or all of the contents in this document in any form without the prior written permission of Mastervolt is prohibited.
 All of the specifications, provisions and instructions contained in this manual apply solely to standard versions of the DC Master 24/12 50 delivered by Mastervolt.

This manual is only valid for the following model:

Part number	Description
81400352	DC Master 24/12 50

Keep this manual at a secure place!

1.2 PRODUCT DESCRIPTION AND APPLICATION

This Mastervolt DC Master converts a 24V DC voltage to a 12 V DC voltage. Typical application is a 24V battery bank that powers 12V equipment.

1.3 USE OF PICTOGRAMS

Safety instructions and warnings are marked in this manual by the following pictograms:



WARNING

A WARNING refers to possible injury to the user or significant material damage to the converter if the user does not (carefully) follow the procedures.



CAUTION!

Special data, restrictions and rules with regard to preventing damage.



A procedure, circumstance, etc which deserves extra attention.

1.4 IDENTIFICATION LABEL

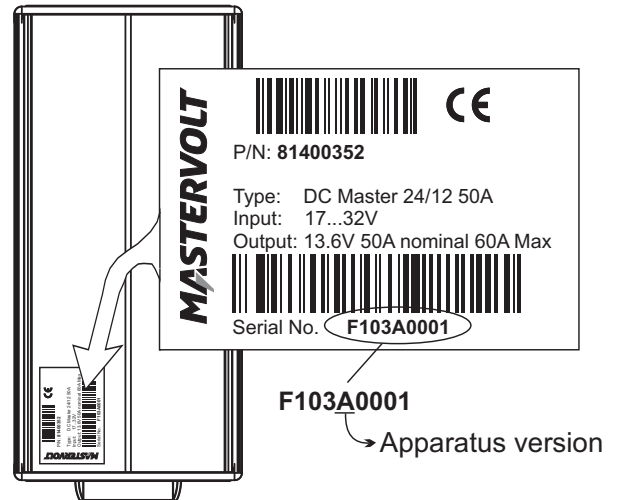


Figure 1: Position of the identification label

The identification label is located at the rear side of the DC Master (see Figure 1) Important technical information required for service, maintenance & secondary delivery of parts can be derived from the identification label.



CAUTION!

Never remove the identification label.

1.5 LIABILITY

Mastervolt can accept no liability for:

- consequential damage due to use of the DC Master;
- possible errors in the manuals and the results thereof.

2 IMPORTANT SAFETY INSTRUCTIONS

READ AND SAVE THESE INSTRUCTIONS



WARNING

This chapter describes important safety and operating instructions for use of a DC Master in residential, recreational vehicle (RV) and marine applications.

2.1 GENERAL

- 1 Before using the DC Master, read all instructions and cautionary markings on the DC Master, the batteries, and all appropriate sections of the manual.
- 2 To reduce the risk of electric shock – Do not expose DC Master to rain, snow, spray, moisture, excessive pollution and condensing circumstances. To reduce risk of fire hazard, do not cover or obstruct the ventilation openings. Do not install the DC Master in a non-ventilated room, overheating may result.
- 3 Use of an attachment or spare part not recommended or sold by Mastervolt may result in a risk of fire, electric shock, or injury to persons.
- 4 Do not operate DC Master if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.
- 5 To reduce risk of electric shock, disconnect the DC Master from both input and output before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
- 6 Short circuiting or reversing polarity will lead to serious damage to batteries, DC Master, wiring as well as accessories. Fuses can not prevent damage caused by reversed polarity and the warranty will be void.
- 7 In case of fire, you must use the fire extinguisher which is appropriate for electrical equipment.
- 8 If applied in a marine application in the United States, external connections to the DC Master shall comply with the United States Coast Guard Electrical Regulations (33CFR183, Sub part I).

2.2 EXPLOSIVE GASES

- 1 **WARNING – RISK OF EXPLOSIVE GASES. WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF**

UTMOST IMPORTANCE THAT EACH TIME BEFORE USING THE DC MASTER, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.

- 2 To reduce risk of battery explosion, follow these instructions and those published by battery manufacturer and manufacturer of any equipment you intend to use in vicinity of the battery. Review cautionary marking on these products.
- 3 **DANGER:** To reduce the risk of explosion – Never use the DC Master in situations where there is danger of gas or dust explosion or area in which ignition-protected equipment is required.

2.3 WARNING REGARDING LIFE SUPPORT APPLICATIONS

The DC Master is not sold for applications in any medical equipment intended for use as a component of any life support system unless a specific written agreement pertaining to such intended use is executed between the manufacturer and Mastervolt. Such agreement will require the equipment manufacturer either to contract additional reliability testing of the DC Master and/or to commit to undertake such testing as a part of the manufacturing process. In addition the manufacturer must agree to indemnify and not hold Mastervolt responsible for any claims arising from the use of the DC Master in the life support equipment.

2.4 GUARANTEE SPECIFICATIONS

Mastervolt guarantees that this unit has been built according to the legally applicable standards and specifications. Should work take place, which is not in accordance with the guidelines, instructions and specifications contained in this user's manual, then damage may occur and/or the unit may not fulfil its specifications. All of these matters may mean that the guarantee becomes invalid.

The guarantee is limited to the costs of repair and/or replacement of the product. Costs for installation labor or shipping of the defective parts are not covered by this guarantee. Refer to your terms of delivery for the guarantee period.

3 INSTALLATION

3.1 BEFORE YOU START



WARNING

During installation and commissioning of the DC Master, the Important Safety Instructions are applicable at all times. See chapter 2 of this manual.

- Make sure that the battery voltage is the same as the input voltage of the DC Master (24V battery for a 24V input voltage).
- Fuses must be integrated in the positive wires. These fuse(s) shall be placed last of all. Recommended fuses:

	Recommended Fuse
Input fuse	50A
Output fuse	60A
Remote switch fuse	2A - T

- Keep the cable connections as short as possible, Recommended maximum length of the DC cables: 3 m / 10ft. If available, use coloured battery cables: Red for positive, black for negative. Recommended wire gauges:

	AWG	Metric
Input wires (24V)	8 AWG	10 mm ²
Output wires (12V)	6 AWG	16 mm ²
Remote switch (24V)	16 AWG	1.5 mm ²

3.2 CHOOSING A LOCATION TO INSTALL

- For an optimal optimum heat discharge, the DC Master must be installed in a well-ventilated room protected against rain, vapour, moisture and dust. We advise to mount the unit in a vertical position with the connecting cables downward.
- Never use the DC Master at a location where there is danger of gas or dust explosions.
- Allow at least 10 cm / 4 inch space around the apparatus.
- Do not mount the DC Master straight above the batteries because of possible corrosive fumes.

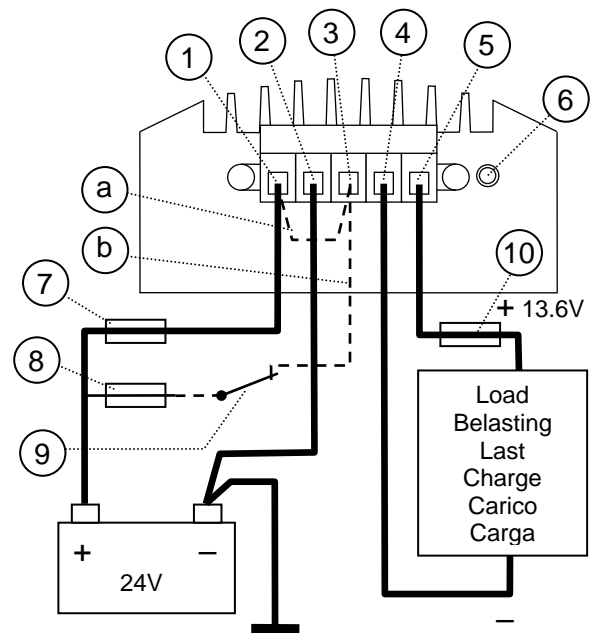
3.3 CONTENTS OF THE DELIVERY:

- DC Master 24/12 50-60A
- Mounting bracket
- 4x screws, 4x screw covers, 4x mounting spacers
- A 5-way terminal block + wire bridge
- This user's manual;

If one of these items is missing, please contact your supplier.

3.4 INSTALLATION STEP-BY-STEP

- 1 Carefully remove the mounting bracket from the DC Master using a flat-blade screwdriver. Use the provided screws and dowels to mount the bracket to a solid and flat surface. Insert the DC Master in the mounting bracket and press it down until it clicks into place.
- 2 See figure 2. Connect the wires as indicated, but do not place the DC fuse(s) yet. Connect the input wires first, and then connect the output wires.
 - a. Without remote switch function: place the supplied wire bridge between Enable contact (3) and Positive input (1);
 - b. With remote switch function: remove the supplied wire bridge and install Remote switch fuse (8) and Remote switch (9) as indicated.
- 3 Check all wiring. If OK, place the DC fuse(s). When the fuse is placed, internal capacitors may cause a spark. This is normal.



- | | |
|-----------------------------|------------------------|
| 1 = Positive input (27.2V) | 6 = Status LED |
| 2 = Negative input (0V) | 7 = Input fuse |
| 3 = Enable (Active high) | 8 = Remote switch fuse |
| 4 = Negative output (0V) | 9 = Remote switch |
| 5 = Positive output (13.6V) | 10 = Output fuse |

Figure 2: Wiring diagram

4 OPERATION

4.1 SWITCHING ON AND OFF

The DC Master does not have a main switch; it is enabled by inserting the fuse, refer to chapter 3.

Despite its low no-load consumption, the converter should be disconnected from the supplying battery when it is not in use to protect the battery from discharging.

4.2 REMOTE SWITCH FUNCTION

The DC Master can be operated remotely by means of an optional remote switch. See figure 2, reference 9. If the ENABLE input is powered by the input voltage, the DC Master is switched on.

4.3 STATUS LED

See Figure 2. The Status-LED (ref. 7) shows the operation mode of the DC Master.

LED indication	Meaning
Continuous green	DC Master is working OK
Other	Fault condition, refer to chapter 5.

4.4 MAINTENANCE

No specific maintenance is required. If necessary, use a soft clean cloth to clean the DC Master. Do not use any liquids or corrosive substances, such as solvents, alcohol, petrol or abrasive components.

Check the wiring on a regular base. Defects such as loose connections, burnt wiring etcetera must be corrected immediately.

5 TROUBLE SHOOTING

If you cannot solve a problem with the aid of this chapter, contact your local Mastervolt Service Centre. See www.mastervolt.com/dealer-locator. Make sure you have

the article and serial number (See section 1.4) present if you have to contact your local Mastervolt Service Center to solve a problem:

Problem	Possible cause	What to do?
Output voltage is OK, Status LED yellow	High load	Reduce connected load
Output voltage is OK, Status LED yellow blinking @ 1Hz	Too high load	Reduce connected load, output power is limited by the DC Master
Output voltage is OK, Status LED yellow blinking @ 2Hz	Too high temperature	Reduce load and let the converter cool down. Output power is limited by the DC Master
Converter switches on and off.	Too high load	Reduce connected load
	Too high temperature	Reduce load and let the converter cool down.
	Voltage drop over DC cables	Check cable length and wire gauge
	Loose connections	Check connections and replace if necessary
No output voltage, Status LED is OFF	Input fuse blown	Check the cause of the blown input fuse(s). Then replace the fuse(s).
	Enable contact is open	Connect Enable contact to the positive input (see section 3.4 and 4.2)
	No input voltage or input voltage too low.	Check wiring, fuses and battery.
No output voltage, Status LED flashing green	Input voltage too low	Check battery voltage, cable length, wire gauge
	Input voltage too high	Check battery voltage
No output voltage, Status LED is continuous red.	Converter is shut down due to a fault condition (too high load, short circuit, too high temperature)	Reduce load and let the converter cool down. Converter will automatically restart after 1 minute
No output voltage, Status LED is blinking red.	Converter was shut down several times due to a fault condition	Reduce load and let the converter cool down. Converter must be restarted manually by switching off and on the DC input voltage

6 TECHNICAL DATA

6.1 SPECIFICATIONS

Model	24/12 50A
Article no.	81400352
Function	Non isolated 24V to 12V DC DC converter
Nominal input voltage:	27.2 V (18.0-32.0 V)
Max. input current	30A
Nominal output voltage:	13,6 V +/- 5%
Output current	50 A continuous, 60 A peak during 2 minutes @ 30°C [86 °F]
Ripple	2% of output voltage
Parallel fitting	Yes, up to 4 DC Masters of the same model
Efficiency at full load	>90%
No load consumption (on/off)	15 / 5 mA
Temperature range	-25 to +80 °C [-13 to 176 °F]. Load must be reduced at temperatures between 35 and 80°C [86 and 176 °F].
Cooling	Natural convection
Connections	5-way terminal block for wires 1.5mm up to 16mm ² [16 up to 6 AWG]. Stripping length: 14mm [0.55 inch]. Tightening torque: 1.7 – 1.8 Nm [15-16 InLbs]
Dimensions in mm (inch):	283 x 125 x 74 mm [11.14 x 4.92 x 2.91 inch] – see also section 6.2
Weight in kg :	1.8 kg [4.0 lbs]
Protection degree	IP 53

Specifications are subject to change without prior notice.

6.2 DIMENSIONS

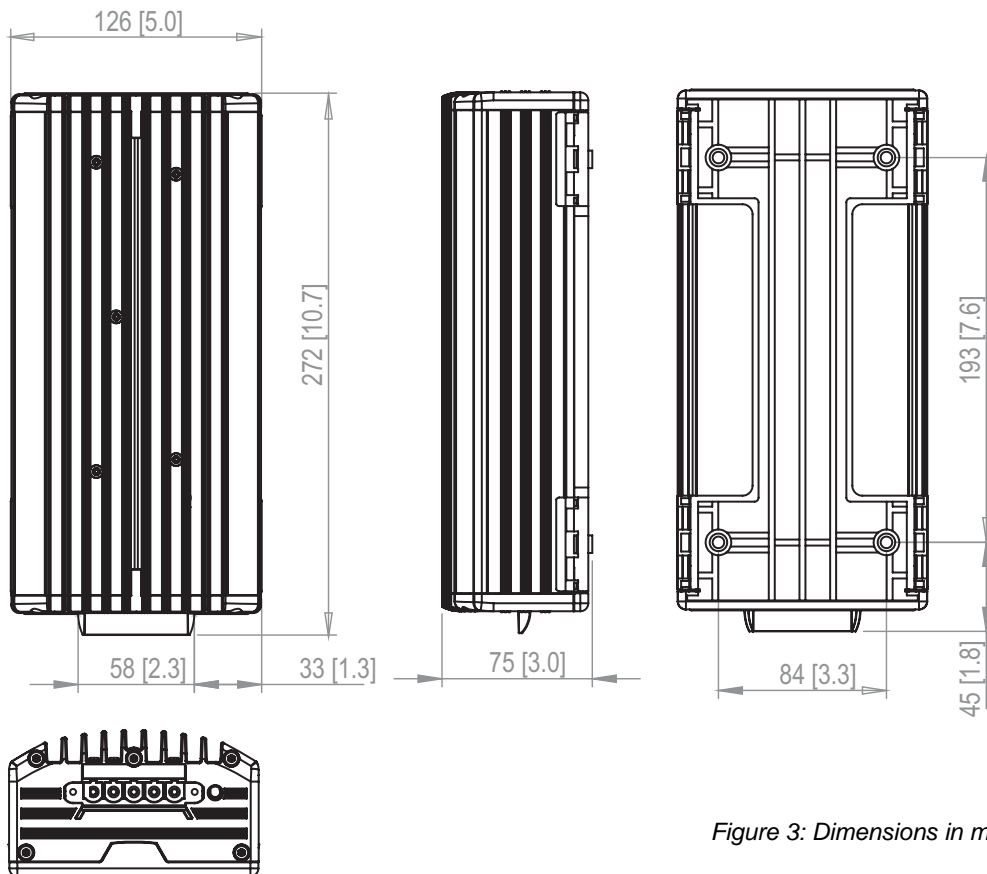


Figure 3: Dimensions in mm [inch]

7 EC DECLARATION OF CONFORMITY



We,
Manufacturer Mastervolt
Address Snijdersbergweg 93
 1105 AN Amsterdam
 The Netherlands

Declare under our sole responsibility that

Product: DC-DC-converter
Model: 81400352 DC Master 24/12 50-60A

Is in conformity with the provisions of the following EC directives:

2004/108/EC (EMC directive); the following harmonized standard has been applied:

- EN 60945: 2002 Maritime navigation and radio communication equipment and systems

2011/65/EU (RoHS directive)

Amsterdam, 11 February 2015

H.A. Poppelier
Global R&D Leader

MASTERVOLT
THE POWER TO BE INDEPENDENT

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