



DC-DC CONVERTERS (MAC & MAGIC SERIES)

Multi purpose DC-DC converters / DC light dimmers

24V DC to 12V DC power converter

Mastervolt is pleased to offer you our new generation of microprocessor controlled DC-DC converters. The converter uses the switch-mode technology, which results in a light weight, safe, reliable and efficient unit. The converter is designed to operate mass produced 12V DC equipment such as navigation equipment, entertainment equipment, professional communication devices, digital motor management, refrigerators and televisions from the 24V DC electrical system on vehicles and onboard vessels. In addition, the DC-DC converter can be used to charge a 12V battery from a 24V system fully automatically (MAC & Magic models). The unit is protected against overload and high ambient temperature environments. The range is CE- marked and E-marked. We offer a choice of two different models.

MAC and MAGIC models

The Mastervolt MAC converter has two main functions: to convert the 24V from the onboard power system to supply 12V consumers such as navigation and communication equipment, or to charge a 12V DC battery with a 3-step charge characteristic. The converter can be paralleled to double/triple the output current up to 60A or more. Our Magic models offer full galvanic isolation between input and output, which filters any noise between battery and appliance. The MAGIC converter can be used to operate a 12V battery from a 24V bank, to charge a 12V battery with a 3-step charge characteristic or as a 24 to 24V isolator/ stabiliser in a 24V DC system.

Halogen light dimming

Both the MAC and MAGIC models can also be used as a dimmer for 12 or 24V halogen lights. The MAC converter/ dimmer is absolutely silent (no buzzing) and is fully interference free.



The dimmer function can be operated by a standard pulse switch.

The advantage of 24V DC

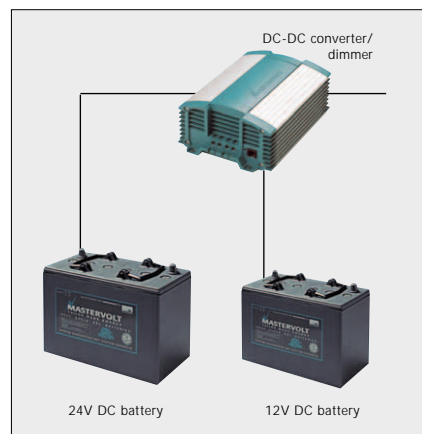
Mastervolt recommends a 24V system on all vessels of 40ft and more. Using 24V means the cables can be thinner (lighter in weight, lower in cost), improves system efficiency and allows for the installation of heavy duty power consumers such as bow thrusters. The 12V consumers are powered through the converter.

The unit generates little heat, which makes it easy to find a convenient location for installation. The converters are built in a rugged aluminum extrusion body.

The converters are completely shock proof.

Fly by Wire remote option

The units are fitted as standard with a modular RJ12 jack for communication by RS232. To alter setpoints and change characteristics, a Mastervolt Windows-based computer program is available.



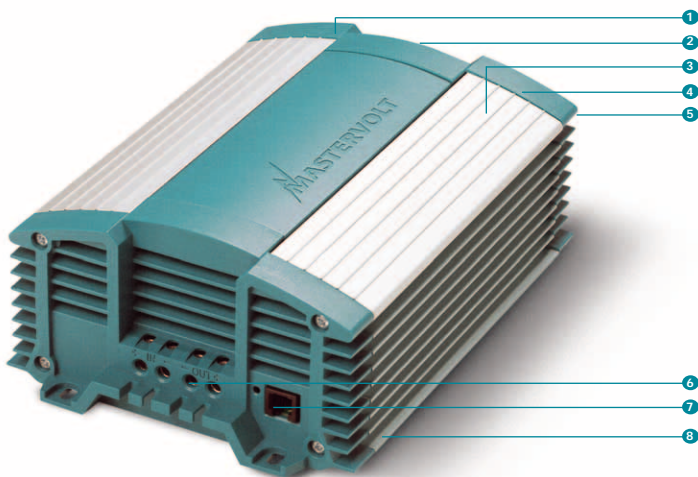
A DC-DC converter as part of a charging system.

4 MAIN FUNCTIONS:

- STEP DOWN FROM 24 TO 12V
- BATTERY CHARGING, FROM 24 TO 12V (3-STEP)
- VOLTAGE STABILIZING 28.5V IN / 24-26V OUT
- 12 OR 24V LIGHT DIMMER

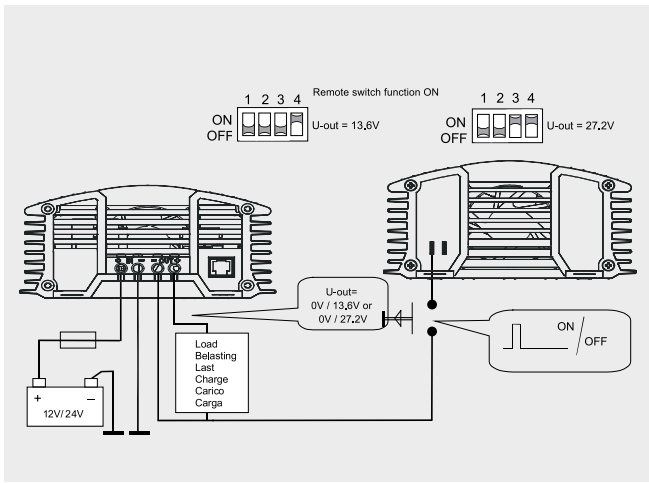
TECHNICAL SPECIFICATIONS

Model	MAC 24/12-20	MAGIC 24/12-20	MAGIC 24/24-20	MAGIC 12/12-20	MAGIC 12/24-10
Article no.	81200100	81300100	81300200	81300400	81300300
Nominal input voltage	24V	24V	24V	12V	12V
Input range, full output specifications	20-32V DC	19-32V DC	19-32V DC	11-16V DC	11-16V DC
Input range, three step charger mode	24-32V DC	24-32V DC	24-32V DC	12-16V DC	12-16V DC
Input range, no defects	0-35V DC	0-35V DC	0-35V DC	0-17.5V DC	0-17.5V DC
Lower input set point, adjustable by software	20.0V DC	20.0V DC	20.0V DC	10.0V DC	10.0V DC
Delay lower input set point, adjustable by software	30 sec.	30 sec.	30 sec.	30 sec.	30 sec.
Output					
Nominal voltage (adjustable by software)	13.6V DC	13.6V DC	27.2V DC	13.6V DC	27.2V DC
Voltage adjustable (manually and by software)	12-15V DC	12-15V DC	24-28.5V DC	12-15V DC	24-28.5V DC
Output voltage dimmer	4.0-13.0V DC	4.0-13.0V DC	8.0-26.0V DC	4.0-13.0V DC	8.0-26.0V DC
Stabilized	2% at extremes of temperature, load and input				
Ripple	max. 1% peak peak				
Maximum power	300W@U-out=12V	300W@U-out=12V	580W@U-out=24V	300W@U-out=12V	300W@U-out=24V
Rated power	270W	270W	540W	270W	270W
Current max. (derating > 40°C, 5%/°C)	20A	20A	20A	20A	10A
Maximum three step charge current (bulk)	16A	16A	16A	16A	8A
General					
Ambient operating temperature	guaranteed operation: 0°C to 60°C (derating above +40°C, 5% per °C); in practice: -20°C to 60°C				
Storage temperature	-25°C to 85°C				
Operating humidity	95% max., non-condensing				
Galvanic insulation	no, common negative	yes	yes	yes	yes
Current limited	yes, I-max	yes, I-max	yes, I-max	yes, I-max	yes, I-max
Three stage battery charge option	yes (DIP switch setting)				
Efficiency	90% (at nominal input voltage, full load) typical; 92% peak				
No load consumption	typical < 30mA	typical < 115mA	typical < 115mA	typical < 115mA	typical < 115mA
Protections					
Over current	limited by current sensing circuit				
Over heat	limited power by temperature sense circuit				
Options					
Dimmer function	yes, by external momentary switch via fast-on connection. To be activated by DIP-switch setting				
Alarm contact	no yes, (faston connector)				
Communication	quasi RS232, modular RJ12 connection, to alter setpoints and to change characteristics (optional interface required)				
Mechanical					
Connections input/output	screw terminals, maximum wire size 16mm ² / AWG 5				
Dimensions (HxWxD)	190x130x61 mm	227x154x81 mm	227x154x81 mm	227x154x81 mm	227x154x81 mm
Mounting holes	diameter 5mm				
Weight	1 kg	1.8 kg	1.8 kg	1.8 kg	1.8 kg
Cabinet	anodized aluminium RAL9006, Strapton ABS blend, blue RAL 5021				
Directives:	<ul style="list-style-type: none"> EMC directive 89/336/EEC, amendments 92/31/EEC, 93/68/EEC Automotive directive 95/54/EC Safety: 73/23/EEC, amendment 93/68/EEC Transient voltage protection: meets ISO 7637-2 Electrostatic voltage protection: meets ISO10605, 8kV contact, 15kV discharge 				



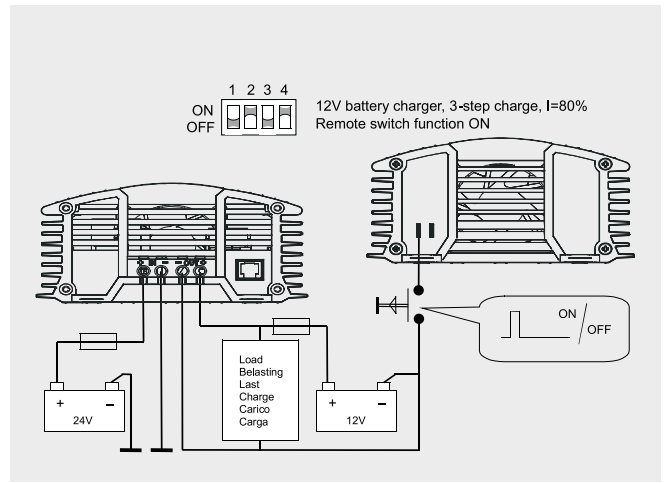
1. Impact proof plastic end parts.
2. Forced ventilation, temperature controlled.
3. Solid aluminium profile.
4. Connection for remote switch.
5. Alarm contact (MAGIC only).
6. DC input/output.
7. Modular RJ12 connector for programming functions.
8. Adjustment settings (inside).

DIP SWITCH SETTINGS					
	1	2	3	4	
#	1	2	3	4	
DEFAULT	OFF	OFF	12V	OFF	
Function	dimmer function	12V three-step charge mode	output voltage 12/24V	remote switch	
Funcție	dimmer funcție	12V 3-traps laadfunctie	uitgangsspanning 12/24V	afstandsbedieningsschakelaar	
Funktion	Lichtdimmer	3-stufiger 12V Batterielader	Ausgangsspannung 12/24V	Fernbedienungs-schalter	
Fonctionnement	fonction variateur	mode de charge 12V à trois étapes	tension de sortie 12/24V	interrupteur télécommande	
Funzione	funzione di regolazione	modalità di carica a 3 passi da 12V	voltaggio in uscita 12/24V	interruttore a distanza	
Función	función de atenuación de luz	modo de carga trifásico 12V	voltaje de salida 12/24V	conmutador a distancia	



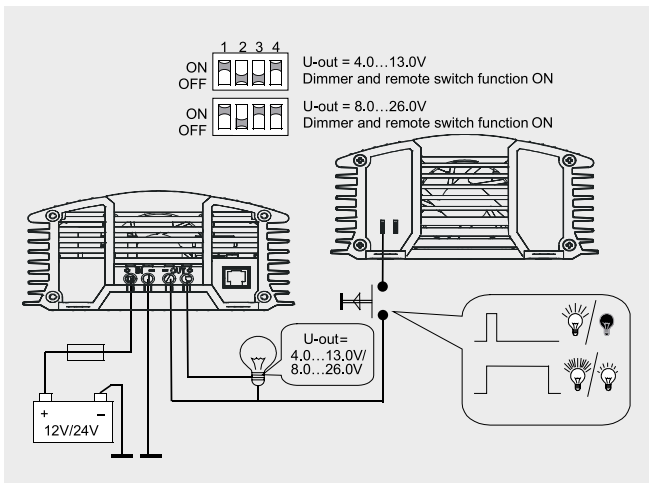
Stabilized 13.6V DC power supply with remote switch function

The MAGIC models offer a full galvanic insulation between input and output. The MAGIC model can be used to operate in step up mode and step down mode.



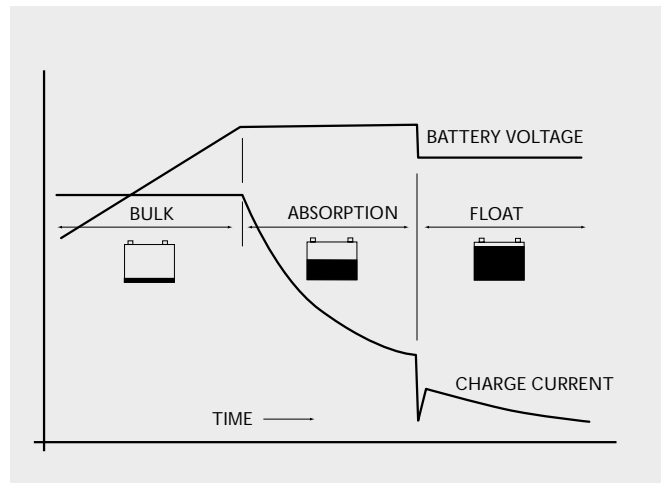
Automatic 3-step 12V battery charger with remote switch function

During charge mode the input window is reduced to prevent DC-drain of the domestic battery. In addition the charger can be controlled by a remote switch.



Dimmer configuration for 12 or 24V halogen lights with remote switch function

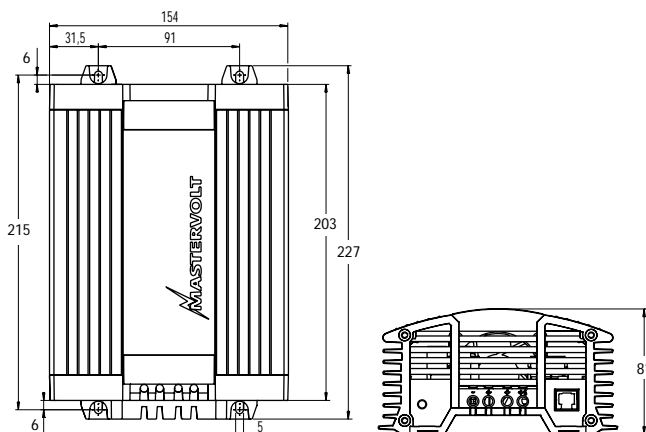
Both the MAC and the MAGIC have a dimmer function which can be set in 12V or 24V output mode. To control the output a remote switch is used to adjust the level of output voltage. The setting is stored into the memory of the unit



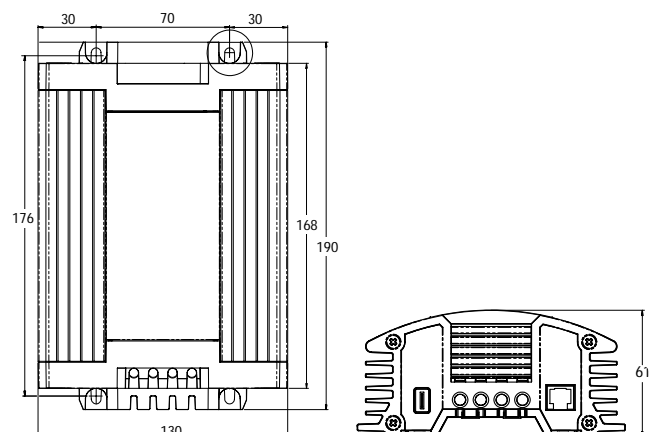
Charge curve of the MAC & MAGIC charge mode

Three-stage charge curve: the only adequate way to charge a battery.

- Stage A: bulk, for quick charging from 0 to 80%.
- Stage B: absorption, the battery is charged from 80 to 100%.
- Stage C: float, battery is maintained in fully charged state.

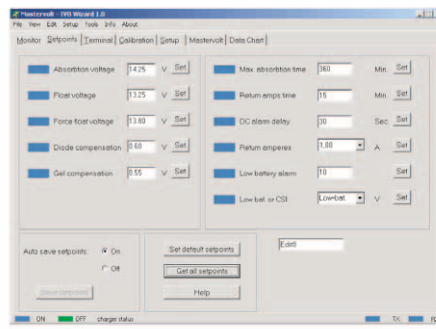
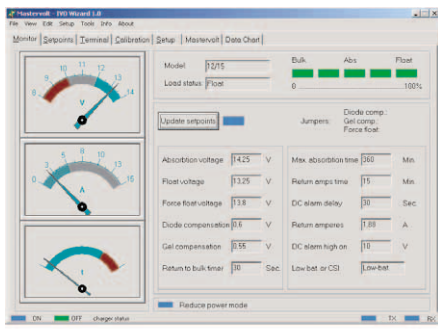


Dimensions of MAGIC models.



Dimensions of the MAC models.

COMMUNICATION

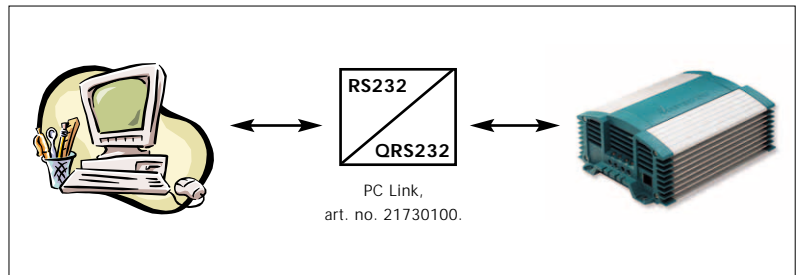


MAC & MAGIC Data Control

The MAC & MAGIC DC-DC converters are delivered with an integrated communication interface as standard. This makes the system interactive with the option of reading the most essential information using your PC or laptop. All that is required to connect the DC-DC converter with your computer is a communication cable and PC Link (interface plug). The free software is downloadable at www.mastervolt.com.

You can download the Wizard software on www.mastervolt.com/download/.

Setpoints	default setting
• Low input voltage switch off level	10.0V / 20.0V
• Low input voltage switch off delay	30 seconds
• Low input voltage switch on level	11.0V / 22.0V
• High input voltage switch off level	16.0V / 32.0V
• High input voltage switch on level	15.0V / 30.0V
• Output voltage	13.6V / 27.2V
• Charging characteristics	
• Settings of trigger point alarm contact	



MAC versus MAGIC	MAC	MAGIC
Galvanic insulated	no, common negative	yes, galvanic insulated
Input and output voltage	24V in, 12V out	wide range can be selected
Battery charging function	yes	yes
Dimmer function	yes	yes
Voltage step up	no, output voltage is always lower than input voltage	yes, output voltage can be higher than input voltage
Stabilized output voltage	yes	yes
Alarm contact	no	yes
Parallel connection possible	yes	yes
Can the input voltage be connected in series with the output voltage to increase the output voltage?	no	yes (without galvanic insulation)
Recommended for	lighting, car audio, CD-player, 12V battery charging from a 24V system	industrial applications, navigation equipment, communication equipment with antenna on negative pole, sensitive equipment, equipment with plus on ground

Need light dimming, battery charger function, galvanic isolation and a voltage stabilizer ?

Keep control on your installation. Use one product line!

With the new DC-DC converter of Mastervolt you can achieve higher installation demands.

Expand your installation features with the MAC and MAGIC series.