

# VOLTAGE RECTIFIER / BATTERY CHARGER

## 450 W, output voltage regulated by temperature , heavy duty

### Type: KMB xx – yy

#### Technical description

Rectifier – battery charger is used for power supply of users with nominal value 30 VDC, as well as for charging, i.e. maintenance of dry lead acid batteries made in VRLA technology or Ni – Cd battery.

The rectifier is manufactured in high frequency switching technology and it is designed for operation under very hard conditions from the electrical point of view. The rectifier consists of the following functional segments: Input circuit, diode rectifier, power factor corection, power modulator – inverter, high frequency transformer, quick rectifier, output L-C circuit, output circuit, auxiliary power supplier, control electronics - PWM, electronic protection devices, excitation devices – drivers and peripheral segments.

- Input circuit consists of radio frequency disturbance filters, over voltage protection, over current protection, supressor voltage and under voltage protection of the input and a soft start device (gradual charging of input electrolytic capacitor).
- Diode rectifier rectifies input AC voltage into DC voltage that is more suitable for further processing; it also rectifies all irregular voltage peaks into middle voltage. It consists of a Graetz, electrolytic and foil capacitors and necessary protections.
- Power factor corection. Transform input impulse cutent into sinus form, PF 0,99 and step up voltage to 410V,DC.
- Power modulator modulates instable DC voltage (410 V) into high frequency AC voltage of a rectangular form and frequency of 100 kHz that has controllable changeable impulse band. It consists of a full bridge connection made by MOSFET, necessary RCD cells and other protection elements.
- High frequency transformer transforms input voltage of one voltage level into the voltage level necessary for usage; it also performs galvanic separation from the DC voltage network. The transformer core is made of ferrite material. The transformer is impregnated.
- Quick rectifier rectifies transformed AC voltage into DC (in the permeable direction); i.e. it is used as a null diode with the purpose of regulation (while FETs do not perform conduction).
- Output L-C circuit is used for regulation and straightening of output voltage. A current limiting reactor made of a ferrite material and an electrolytic capacitor are used.
- Output circuit is used for measurements of output current and output voltage – with the purpose of regulation and protection as well as to show values on the instruments; it enables parallel connection of more than one rectifiers, detects rectifier failures and incorporates radio frequency disturbance filter.
- Auxiliary power feeder is used for power supply of internal devices of rectifiers with certain voltages (electronics, drivers, instruments).
- Control electronics work on the principle PWM modulation and it is used for regulation and electronic protections.
- Drivers activate the MOSFETs in accordance with the command of the control electronics.
- Electronic protection devices measure input and output parameters, and direct the control electronics.
- Outside segments of rectifiers are mechanical structure, light and remote signalisation, switch, input-output connectors and other elements necessary for the control of the device.
- Digital ammeter and voltmeter. The instruments remain in function even when the rectifier stops working.
- The protection of deep battery discharge: At the low battery voltage (meaning at 1,8 V / lead acid cell or 1V / Ni-Cd cell), is being communicated to no voltage contact thru warning alarm. When the battery is empty (1,73 V / lead acid or 0,92 V / Ni-Cd battery cell) the load is being disconnected from the battery and the battery disconnection status is being communicated. The protection reset is in automatic.
- There are two outputs. The connection for load power supply and the connection for the battery.

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<b>MARETON</b> Power electronic <b>ZAGREB-CROATIA</b>	<b>VOLTAGE RECTIFIER -                  BATTERY CHARGER</b>  <b>Type: KBM xx - yy</b>	Revision 1	Date: 10.09.2014.		
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### Technical data

Type:	KMB 24-15	KMB 30-10	KMB 48-8	KMB 60-7.3
Application:	Supply load and charging load acid or Ni-Cd battery			
Input voltage:	220 V / 230 / 240 V, 50 Hz			
Input voltage deviations:	+15%, - 15%			
Input current form:	Sinus, PF = 0,99			
Output DC voltage, nominal:	24 V	30 V	48 V	60 V
Output DC voltage, real (charging):	27,2 V	34,1 V	54,4 V	68,1 V
Output voltage stability (ch. of in. vol.):	better than 0,5 %			
Output voltage stability (ch. of out. cur.):	better than 1 %			
Ripple:	<0,1%			
Possibility of output voltage adjustment:	20 – 30 V	26 – 36 V	40 – 60 V	52 – 78 V
Output current:	15 A	10 A	8 A	7,3 A
Current limit:	15 A	10 A	8 A	7,3 A
Battery charging characteristics:	IU (floating – one level)			
Possible charging battery:	20 Ah to 200 Ah			
Technology:	PFC + Two transistor forward / PWM			
Input protections:	under voltage, surge voltage over voltage, over current			
Output protections:	over voltage, over current			
Operating frequency:	100 kHz			
Galvanic separation in – out - housing:	2,5 kV, 50 Hz, 1 min			
Indication:	Digital voltmeter, digital ammeter			
Remote control (voltage free contact):	Failure, low voltage battery, disconnected battery			
Light siglisation (LED):	Uin ok, Uin <, Uout ok, Iout limit			
Ambient temperature during operation:	-25°C to +55°C			
Terminals:	Connectors or by request			
Cooling:	Natural			
Case:	box of powder-coated sheet steel			
Protection:	IP 20			
Dimensions, Wall case (WxHxD):	380mm x 180mm x 100mm			



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