

The logo for 'K-factor' is displayed in a bold, italicized, 3D-style font. The letters are white with a metallic, brushed metal texture and are set against a solid black rectangular background.

Static voltage regulator
Frequency converter 50/60Hz
GMM/VMM

Instruction manual

Warning: this handbook refers to the model for network voltage of 230V. For other countries, under the same characteristic, the products are supplied with rated voltage 220V or 240V or others. Check that the rated voltage on the plate of the apparatus is conforming to the country network one and to the installation of the product.

**Regulator / Frequency converter
Type GMM / VMM**



1. Initialization

At the first start the system does an internal check-up: the start-up sequence takes about 1 minute. In this stage it is not possible to control the device; this is possible only at the end of the start-up sequence. Mains absence results in a stop of the regulator; when mains comes-back the regulator begins the start-up sequence again.

2. Front panel

On the front panel two digital displays give the values of output voltage and current; the buttons allow the control of all functions of the unit. some LEDs indicate a state or the execution of the main features.



Measures

Volt: It shows the output voltage with 2% accuracy ± 4 digit

Amp: It shows the current used by the load connected to the output of the regulator with 2% accuracy ± 4 digit

LED signals

50HZ: Green LED ON: the regulator is ready to supply a 50 Hz voltage
60HZ: Yellow LED ON: the regulator is ready to supply a 60 Hz voltage.

ON:	Green LED ON: the regulator is properly working; this LED is ON only after the end of the initialization sequence, then it executes the commands of the user (in local or remote mode).
OFF:	Red LED ON: the regulator is OFF. The LED is ON during the initialization sequence
LOCAL:	Green LED ON: it shows it is possible to control the regulator using the buttons placed on the front of the regulator; in this case the output remote signals are available, but the equipment do not accept the remote control.
REMOTE:	Yellow LED ON: it shows it is possible to control the regulator through the interface placed on the back side. In this case the controls placed on the front are disabled.
READY:	Green LED ON: it shows the regulator is ready to accept the controls. During the initialization sequence this LED is OFF and the regulator do not accept any control.
OVERTEMPERATURE:	Red LED ON when the inverter temperature is higher than 70°C: the lighting of this LED causes the immediate stop of the regulator. It is possible to reset the equipment by turning-off and then turning-on the regulator. If the problem goes-on please verify the position of the regulator and the proper working of the cooling fan.
FAULT:	Red LED ON when there is a heavy stop of the regulator: it can be caused by a strong perturbation on the mains or by a fault of the regulator. The immediate lighting of the LED after a reset shows a fault of the regulator.

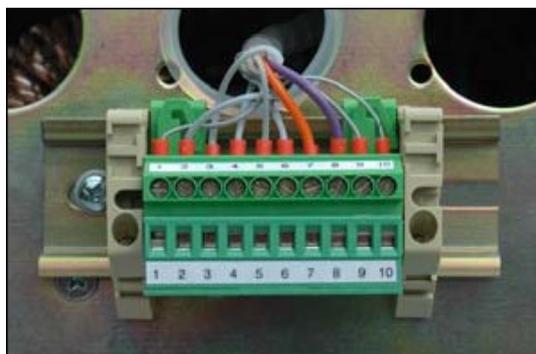
Control buttons

ON/OFF:	By pushing the button it is possible the switching-on or switching-off of the regulator. The system enables the button only after the end of the initialization sequence. The button can work only in local mode.
50/60HZ:	To select the desired output frequency (50 or 60 Hz). The button can work only in local mode.
REMOTE/LOCAL:	Keeping the button pushed for at least 3 seconds it is possible to select the local or remote mode: in the local mode the control is possible using the buttons placed on the front panel; in the remote mode it is possible to control the equipment only by the interface placed on the back side.
UP/DOWN:	Pushing "UP" or "DOWN" the button it is possible to select the desired output voltage. Pushing for a short time allows a fine regulation of the voltage. Keep the button pushed to obtain a voltage regulation that increases his speed covering all the range in about 5 seconds.

3. Terminal boxes

On the back side, under the protection shells, two terminal boxes are available for signals and connections.

"Signals" connector



- Pin 1: Input (+) 0 – 10 Vdc
- Pin 2: Input common 0 – 10 Vdc
- Pin 3 / 4: If you close the contact between the two pins by a free contact the regulator starts.
- Pin 5 / 6: contact closed - output frequency is 50 Hz; contact open - output frequency is 60 Hz.
- Pin.7: Emitter optocoupler to repeat signal "regulator ON"
- Pin 8: Collector optocoupler to repeat signal "regulator ON"
- Pin 9: Emitter optocoupler to repeat signal "FAULT"
- Pin 10: Collector optocoupler to repeat signal "FAULT"

Terminal box for power connections

- Terminal (L1): Regulator input phase
- Terminal (N): Regulator input neutral
- Terminal (U1): Output feed phase to load
- Terminal (N1): Output Neutral feed to load
- Yellow/Green T. (PE): Earthing connection: this connection is required to ensure the safety of users and the safety of the connected equipments.

3. Protections

The equipment is protected from over-temperature and overload.

The regulator stops itself when the temperature of the heat sink is $> 70^{\circ}\text{C}$ or when the equipment is overloaded with a current higher than the rated value for more than 6 seconds.

4. How to remove the over-temperature or overload block

To reset the equipment it is necessary to use the command ON and then OFF.

If the block is due to over-temperature it is possible to reset the regulator only when the temperature of the heat sink has gone down under 60°C .

If the block is due to overload or short-circuit it is necessary to reduce the load before trying the reset.

K-FACTOR srl

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GARANZIA

L'apparecchio come ogni suo componente è stato sottoposto ad accurati collaudi ed è garantito per un periodo di 12 mesi dalla data di acquisto o non oltre 13 mesi dalla data di spedizione. Per data di acquisto si intende quella indicata sulla fattura o ricevuta fiscale rilasciata dal venditore. Per garanzia si intende la sostituzione o riparazione gratuita dei componenti riconosciuti dalla ditta produttrice inefficienti o difettosi di fabbricazione. Per l'intervento in garanzia, l'apparecchio deve essere consegnato o inviato franco di porto al servizio di assistenza più vicino, allegando lettera con dati apparecchiatura descritti nel paragrafo precedente. Il trasporto avverrà a rischio e pericolo dell'acquirente. L'apparecchio riparato in garanzia verrà restituito all'acquirente appena possibile e a sue spese e rischio. Sono escluse dalla garanzia le rotture accidentali, distruzioni o folgorazioni da eventi naturali, i danni provocati da incuria, uso ed installazione errati, impropri o non conformi alle avvertenze riportate. La garanzia decade qualora l'apparecchio sia stato manomesso o riparato da personale non autorizzato o abbia subito interventi per vizi o verifiche di comodo. E' esclusa la sostituzione dell'apparecchio o il prolungamento della garanzia in caso di intervento. E' escluso altresì il risarcimento di danni diretti o indiretti di qualsiasi natura a persone, cose o animali per l'uso e la sospensione d'uso dell'apparecchio.

GUARANTEE

This guarantee is offered as an extra benefit and does not affect your legal rights.

All the voltage stabilisers and line conditioners are guaranteed by the Company for one year against faulty material or workmanship. If any part is found to be defective in this way within the first twelve months from the purchase date, we or our authorised service agents, we will replace or at our option repair that part without any charge for materials or labour, provided that the appliance has been used only in accordance with the instruction provided with each stabiliser and that it has not been connected to an unsuitable electricity supply, or subjected to misuse, neglect or damage or modified or repaired by any person not authorised by us.

The correct electricity supply voltage and frequency is shown on the rating plate on the appliance. This guarantee is normally available only to the original purchaser of the appliance, but the company will consider written applications for transfer.

Should any defect arise in any voltage stabilisers or line conditioners a claim under guarantee become necessary, the appliance should be carefully packed and returned to your local service agent. This copy of the guarantee should be attached to the appliance. Guarantee is applied only if the equipment is returned F.O.T. our factory. No technical intervention may be claimed for any reason at the place of installation under guarantee.

Cut and send to our address for the validity of the guarantee Tagliare e inviare in busta chiusa per la validità della garanzia

Model/type	Modello	
Work no.	No. Matricola	
Manuf. Year	Anno fabbricazione	
Tested by	Firma collaudo	

Data di acquisto/*Purchase date*: _____

Nome e indirizzo dell'acquirente/*Name and address of the owner*: _____

(Inviare entro 15 gg. dalla data di acquisto/*to be sent within 15 days from the purchase date*)

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