

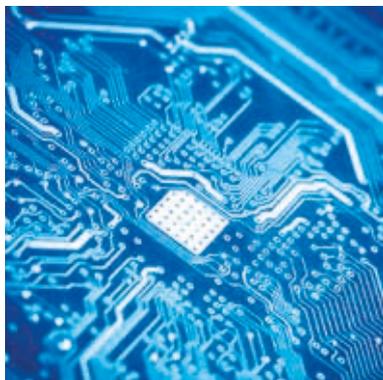


we work  
for giving you  
**energy**  
SINCE 1996



## DESIGN & CONSTRUCTION

AC/DC CONVERTER    DC/DC CONVERTER  
DC/AC CONVERTER    CUSTOM DEVICES





# MTS Elettronica

WE WORK FOR GIVING YOU ENERGY SINCE 1996



We founded our business in 1996 with the company MULTISERVICE snc, owner of the Trademark **MTS Elettronica**.

MULTISERVICE designs and manufactures energy conversion devices, types AC/DC and DC/DC.

These devices are used mainly in the industrial and tertiary sectors. Over the years, the trademark MTS Elettronica established in the domestic and international markets, so the three founders shareholders transformed the company in a limited liability company: **MTS Elettronica Srl**.

The headquarter is in Mantua, near the tollgate junction of Northern Mantua (motorway A22 Modena - Brennero). Here we make the business, administrative, design and manufacturing activities. Our know-how, acquired during the years, allow us to offer technologically cutting edge products, equipped with consolidated technologies, which give the finished product a high level of reliability. The great flexibility of our production structure allows us to manufacture focused devices, satisfying more and more the real needs of the markets and designers.

**MTS Elettronica Srl** develops any activity concerning R&D of its devices, guaranteeing mastery of product, constant service, and an increasing growth of the quality of our devices. One of the main advantages of **MTS Elettronica Srl** is flexibility, allowing fast answers to the user and customized devices according to any need. Thanks to the company organisation and the know-how acquired over the years, we are able to manufacture CUSTOMIZED devices, which are the foundation of our know-how of constant growth.

### APPLICATIONS FIELDS

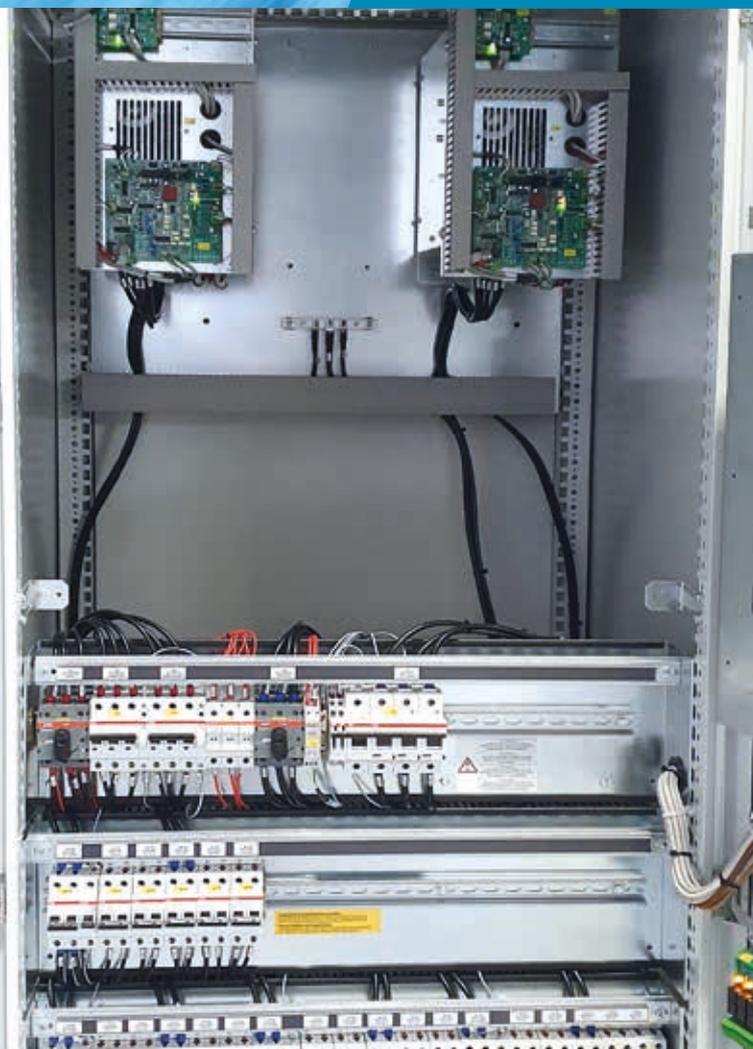
- Oil & Gas
- Electric Plant
- Hydroelectric Plant
- Transports
- Industrial Procedures
- Technological System
- Hospitals



AN ISO 9001:2015 CERTIFIED COMPANY



# PRODUCT LINE DC CURRENT



## IGBT SINGLE BRANCH RECTIFIER TYPE COMPACT ECOLINE RCK5U

AC/DC MODULE



AC/DC MODULE-REAR

### MAIN FEATURES

- Power device conversion: IGBT
- Control type: PWM HF
- Incoming isolation transformer at mains frequency: OK
- Electrostatic shield: OK
- uP of supervision
- LCD with backlit alphanumeric display and LED status
- Charging curve for each battery type
- High efficiency
- High reliability
- **Extractable 5U rack-format AC/DC module for quick and easy assistance thanks to polarized extractable connectors**
- Easy maintenance with access from the front
- Low output ripple
- Extended frequency input range
- Output overload indication
- Acknowledgeable audible alarm
- Accessed from the rear for I/O clamps and relay alarms card

### APPLICATION FIELDS

- Oil & Gas
- Energy
- Process control
- Transport
- Security

TYPE		COMPACT ECOLINE RCK5U		
OUTPUT	NOMINAL VOLTAGE with 1Ph supply	24	48	110
	CURRENT RANGE with 1Ph supply	5 ÷ 60A		
	CURRENT RANGE with 3Ph supply	10 ÷ 60A		
	RIPPLE NOISE (RMS)	≤ 0.5% Vn		
	ADJ. VOUT RANGE	+/- 5%		
	STABILITY	+/- 1%		
	ADJ. FOLLOWING THE CHANGE Vinp.	+/- 1%		
	ADJ. FOLLOWING THE CHANGE ILoad	+/- 1%		
START-UP time	2 sec.			
INPUT	NOMINAL VOLTAGE	230 +/- 10% or 400 +/- 10% (1Ph or 3Ph)		
	FREQ.	50 ÷ 60 +/-7%		
	EFFICIENCY (Typ.)	≥ 90 %		
	ISOLATION I/O	4kV WITH TRANSFORMER		
PROTECTION	OVERLOAD	2In x 5mS Shut down per 250mS - restart aut.		
	CURRENT TYPE	Constant		
	OVP	+ 10% Vn		
	UVP	- 50% Vn		
	OVERTEMP.	Shut down. Restart aut.		
ALARMS SPDT 5Amp/250Vac	INCOMING MAINS FAILURE	LOW VOLTAGE BATTERIES		
	GENERAL FAILURE			
ENVIRONMENT	WORKING TEMP	-10 .....+40°C		
	WORKING HUMIDITY	20 .....90% (NO COND.)		
	STORAGE TEMP.	-20 .....+50°C		
STANDARDS	MARKING	CE		
	PROTECTION DEGREE	IEC 60529		
	EMC	EN 61000-6-2 EN 61000-6-4		
	STATIC CONVERTER	EN 60146-1-2		
	VENTILATION	Iout= 5÷20Amp NATURAL Iout= 21÷60Amp FORCED		
DIMENSIONS (W*H*D) mm with handle and rear clamps		5U rack type 482 x 485 X 221		
DIMENSIONS (W*H*D) mm without handle and rear clamps		5U rack type 482 x 425 X 221		
PROTECTION DEGREE		IP20		
PAINT FRONT PANNEL - INDICATIVE WEIGHT		RAL 7035 - 15Kg		

### LED STATUS

System ok (green)  
System failure (red)

### ELECTRICAL MEASUREMENTS ON DISPLAY

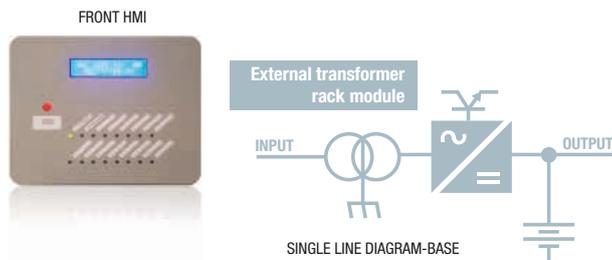
Output voltage  
Output current

### DISPLAY STATE MESSAGES

Rectifier ON  
Boost Charge ON (Optional)  
Manual Charge ON (Optional)  
Overload  
Battery Mode  
Low Volt. Batt.  
End. Batt. Aut.  
Vout. Rect. Max

### MULTIFUNCTION PUSH-BUTTON

Acknowledgeable audible alarm



### OPTIONS

UP card for function AUT/MAN BATTERY TEST	UP card for function DC EARTHED PROBE (with polarity discrimination +/- )
UP card for function BOOST & MANUAL CHARGE	COMMAND FOR EXTERNAL END DISCH. POWER CONTACTOR (LVBD)
UP card for function TEMP. COMPENSATION	
External Temp. probe (3mt. cables max)	

## IGBT SINGLE BRANCH RECTIFIER TYPE COMPACT1-3MCH ECOLINE

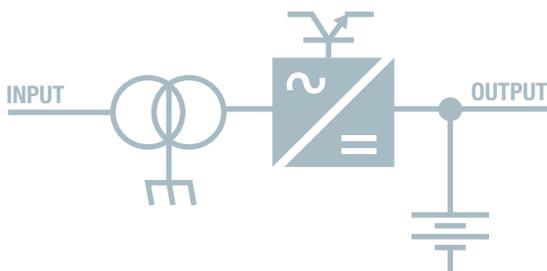


### MAIN FEATURES

- Power device conversion: IGBT
- Control type: PWM HF
- Incoming isolation transformer at mains frequency: OK
- Electrostatic shield: OK
- uP of supervision
- LCD with backlit alphanumeric display and LED status
- Charging curve for each battery type
- High efficiency
- High reliability
- **Extractable 5U rack-format AC/DC module for quick and easy assistance thanks to polarized extractable connectors**
- Easy maintenance with access from the front
- Low output ripple
- Extended frequency input range
- Output overload indication
- Acknowledgeable audible alarm

### APPLICATION FIELDS

- Oil & Gas
- Energy
- Process control
- Transport
- Security



TYPE		COMPACT1-3MCH - ECOLINE		
OUTPUT	NOMINAL VOLTAGE with 1Ph supply	24	48	110
	CURRENT RANGE with 1Ph supply	10 ÷ 60A		
	CURRENT RANGE with 3Ph supply	10 ÷ 60A		
	RIPPLE NOISE (RMS)	≤ 0.5% Vn		
	ADJ. VOUT RANGE	+/- 5%		
	STABILITY	+/- 1%		
	ADJ. FOLLOWING THE CHANGE Vinp.	+/- 1%		
	ADJ. FOLLOWING THE CHANGE ILoad	+/- 1%		
START-UP time	2 sec.			
INPUT	NOMINAL VOLTAGE	230 +/- 10% or 400 +/- 10% (1Ph or 3Ph)		
	FREQ.	50 ÷ 60 +/-7%		
	EFFICIENCY (Typ.)	≥ 90 %		
	ISOLATION I/O	4kV		
PROTECTION	OVERLOAD	2In x 5mS Shut down for 250mS - restart aut.		
	CURRENT TYPE	CONSTANT		
	OVP	+ 10% Vn		
	UVP	- 50% Vn		
	OVERTEMP.	Shut down. Restart aut.		
ALARMS SPDT 5Amp/250Vac	INCOMING MAINS FAILURE	LOW VOLTAGE BATTERIES		
	GENERAL FAILURE			
ENVIRONMENT	WORKING TEMP.	-10 .....+40°C		
	WORKING HUMIDITY	20 .....90% ( NO COND.)		
	STORAGE TEMP.	-20 .....+50°C		
STANDARDS	MARKING	CE		
	PROTECTION DEGREE	IEC 60529		
	EMC	EN 61000-6-2 EN 61000-6-4		
	STATIC CONVERTER	EN 60146-1-2		
PROTECTION DEGREE	IP30			
DIMENSIONS (W x D x H) mm	600 x 650 x 1600			
PAINT	RAL 7035			

### DISPLAY STATE MESSAGES

Rectifier ON
Boost Charge ON (Optional)
Manual Charge ON (Optional)
Overload
Battery Mode
Low Volt. Batt.
End. Batt. Aut.
Vout. Rect. Max

### LED STATUS

System ok (green)
System failure (red)

### ELECTRICAL MEASUREMENTS ON DISPLAY

Output voltage
Output current

### MULTIFUNCTION PUSH-BUTTON

Acknowledgeable audible alarm
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### OPTIONS

MCB: input ÷ output ÷ battery	Coil circuit breaker tripping	Battery reverse control (BRPCU)
UP card for function BOOST & MANUAL CHARGE	Aux circuit breaker contact ( S/H)	E.P.O (Emergency Power Off)
UP card for function TEMP. COMPENSATION	End battery discharge power contactor	
End battery discharge power contactor	uP card for function: AUT./MAN.BATTERY TEST	

COMPACT-PLATINUM 4.0 Industrial1- 3Ph Battery Chargers

# DC UPS

## A SINGLE SYSTEM, THREE DIFFERENT CONFIGURATIONS

We present the DC UPS of the COMPACT PLATINUM 4.0 series. These devices are the result of careful research and development carried out by our company, aimed at obtaining maximum reliability and the best performance in the field of direct current emergency power systems. The improvements made allow us today to offer a single system that can be proposed in three different basic electrical configurations with IGBT (chopper) or THYRISTOR conversion technology depending on the required currents.



SINGLE BRANCH

Product Code

**1R**



DOUBLE BRANCH

Product Code

**2R**



DOUBLE  
PARALLEL  
BRANCH

Product Code

**2RP**



### MAIN FEATURES

- ✓ POWER ELEMENT: IGBT OR THYRISTOR DEPENDING ON POWER
- ✓ ISOLATION TRANSFORMER ON AC INPUT LINE COMPLETE WITH ELECTROSTATIC SHIELD BETWEEN PRIMARY AND SECONDARY
- ✓ SYSTEM CONTROL WITH INDUSTRIAL PLC
- ✓ 7 " TOUCHSCREEN PANEL
- ✓ CHARGING CURVE FOR AGM - PB - NiCd BATTERY
- ✓ 3 CHARGING LEVELS INCLUDING MANUAL CHARGING COMPLETE WITH SAFETY TIMER
- ✓ HIGH MTBF AND LOW MTTR
- ✓ EASY MAINTENANCE WITH ACCESS FROM THE FRONT
- ✓ LOW RESIDUAL RIPPLE IN OUTPUT AND ON BATTERIES (RIPPLE)
- ✓ 4 FULLY USER PROGRAMMABLE ALARM RELAYS
- ✓ TEMPERATURE COMPENSATION WITH PT100 SENSOR AND CORRECTION COEFFICIENT (Vel / ° C) SETTABLE BY THE USER
- ✓ AUTOMATIC BATTERY TEST WITH PROGRAMMABLE FREQUENCY

### INNOVATIVE SYSTEM CONTROL

The SYSTEM CONTROL is now based on an expandable Industrial PLC, characterized therefore by a very high reliability as well as by a considerable flexibility, it allows to satisfy a greater number of technical needs and consequent applications. This section, which constitutes the "intelligent" heart of our system, is now made in a special drawer located on the inside of the main door of the cabinet and FULLY REMOVABLE thanks to the presence of a polarized connector.

This solution introduces a very important advantage, in fact it is possible to replace this assembly while hot, with the machine running, without turning off the system. This is possible as the AC / DC conversion units recognize the loss of communication with the drawer and set themselves up in "AUTOMATIC SAVE MODE", actually working independently and guaranteeing continuity of operation. Once the drawer has been replaced and the connection re-established, the AC / DC units will return to operate under the automatic control of the PLC, resuming normal and complete operation.

### NEW HMI

The HMI (Human Machine Interface) system has also been renewed, which now includes a touch panel, capacitive, 7" with excellent visibility characteristics, mechanical resistance to wear and connectivity with the outside world.

### MORE SPACE FOR REMOTE CONNECTION

Finally, a great deal of space was reserved for REMOTE CONNECTION, in fact now it is possible to control, parameterize and manage these systems in absolute safety through the INTERNET network thanks to the standard presence of the **WEB SERVER function**. This has an undoubted advantage that significantly improves the maintenance and technical assistance aspects in critical installations.

### APPLICATIONS

- Oil & Gas (petrochemical plants, offshore, pipeline).
- Electricity generation (power stations, hydroelectric, transmission, distribution, utilities).
- Transport (Airports, naval, rail).
- Process control (Mining industry, steel mills, paper production, etc.).
- Plants for desalination and water treatment.

# COMPACT-PLATINUM 4.0 Industrial1 - 3Ph Battery Chargers

## GENERAL TECHNICAL DATA

ELECTRICAL DATA							
		IGBT			THY		
Output voltage Vcc		24	48	110	24	48	110 220
Input Voltage	1 Ph	230 Vac ± 10%			NOT AVAILABLE		
	3 Ph	400 Vac ± 10%					
Entry Frequency		50 ÷ 60 Hz ± 5%					
Input Voltage - Icc		≤ 10KA RMS (with standard IEC-nominal main input)					
Current Input Distortion	THD	≤ 27 (with nominal load)					
Input power factor		≥ 0.80 (With nominal voltage 100% load)					
I/O isolation		4kV with transformer					

OUTPUT DATA			
Output current	Input type 1 Ph	10÷60 Amp	
	Input type 3 Ph	10÷100 Amp	100÷500 Amp 10÷250 Amp
Battery charging voltage	Floating (settable from HMI)	2,27 V/cell for VRLA battery type 2,2 ÷ 2,3 V/cell for VLA battery type 1,4 ÷ 1,5 V/cell for Ni-Cd battery type	
	Boost (settable from HMI)	2,4 ÷ 2,45V/cell for VLA battery type 1,5 ÷ 1,65 V/cell for Ni-Cd battery type	
	Manual (settable from HMI)	2,35 V/cell for VRLA battery type 2,7 V/cell for VLA battery type 1,7 V/cell for Ni-Cd battery type	
Current battery charging	(settable from HMI)	1 ÷ In Amp	
Current characteristic		CONSTANT	
Output voltage stability	(ref.INPUT MAIN VAR.)	1%	
Output voltage stability	(ref.LOAD VAR.)	1%	
Output voltage stability		1%	
Output ripple	RMS	1%	
Overload	(without battery)	2 In x 5 mS	<120% per 20 min >150% per 5 sec

ENVIRONMENTAL DATA		
Noise level	Ref. EN50091	< 60 dBA (typical value with forced ventilation in operation)
Emi		EN 61000-6-2 - EN 61000-6-4
Operating temperature	°C	-10.....+40
Storage temperature	°C	-20.....+70
Relative humidity	without condensation	< 95%
Ventilation (on AC/DC conversion module)		Electronic temperature speed control <b>FORCED</b>
Altitude	Mt.sl.m.	< 1000 (derating according EN62040-3)

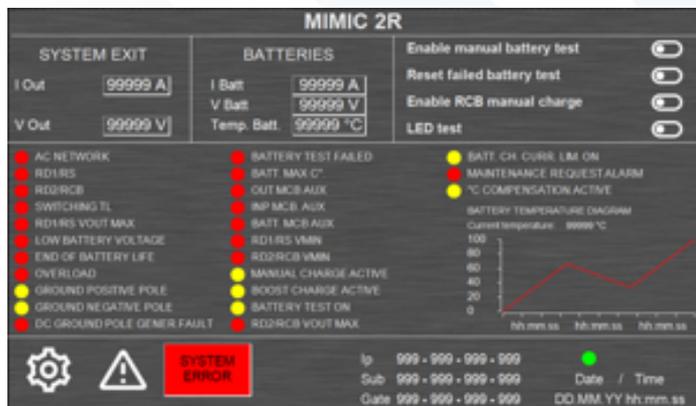
MECHANICAL DATA		
Degree of protection - external	Ref. IEC 60259	IP 31 standard - others on request
Degree of protection - internal	Ref. IEC 60259	IP 20 with open front door and additional protections inserted
Paint		RAL 7035 cabinet RAL 7012 roof and base
Dimensions (WxDxH) mm		To be defined according to the condition lout/Autonomy
IN/OUT cable connections		From the front with cable input from below
Transportation		Base for handling with forklift
Installation		From the floor
Accessibility		Front

PROTECTIONS		
Input		Automatic Circuit Breaker
Output		Manual Isolator
Battery		Fuses
General		Vout > / Vout < / Max.Temp. / Icc / Incorrect cyclic input

# COMPACT-PLATINUM 4.0 Industrial1 - 3Ph Battery Chargers

## HMI - HUMAN MACHINE INTERFACE

All information regarding the system operating status is available on the 7" color touch screen HMI (Human Machine Interface) operator panel with anti-reflective and scratch-resistant glass. The HMI is complete with a MODBUS TCP / IP and RTU interface (slave - server) for connection to external centralized control systems that use the same communication protocol, thanks to which the following functions are made available as standard:



### 1.1 WEB SERVER

Allows remote control of the system through an INTERNET browser

### 1.2 WEB MAIL

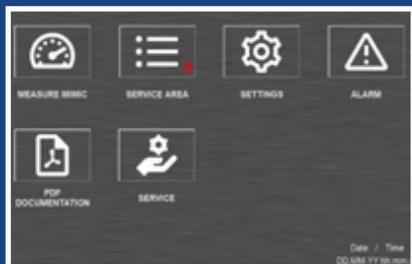
Allows e-mails to be sent to multiple recipients in case of an abnormal system

### 1.3 MANUALS AND TECHNICAL DRAWINGS

Allows viewing of these two types of documents directly from HMI for quick and hands-on on-site consultation.

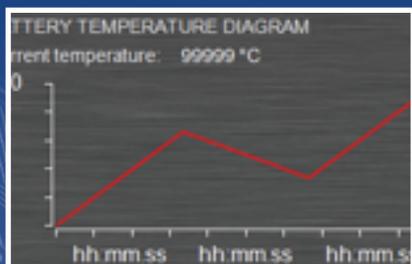
## HOME PAGE

Where you can find **all the information** about how the system works.



## 1 MAIN MENU

From this page you can access the areas of the various sub-menus of the system.



## 2 BATTERY TEMPERATURE GRAPH

Is displayed when the temperature compensation is activated and reports the trend of this parameter.



## 3 ALARMS LOG

From this page you can see the history of alarms. Clear **ALARM HISTORY** is password protected.



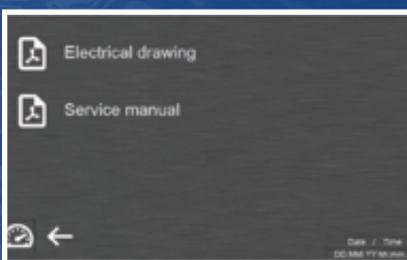
## 4 NETWORK CONFIGURATION

From this section, password-protected access, you can configure the IP parameters of the system's target corporate network.



## 5 MAIL SETTING

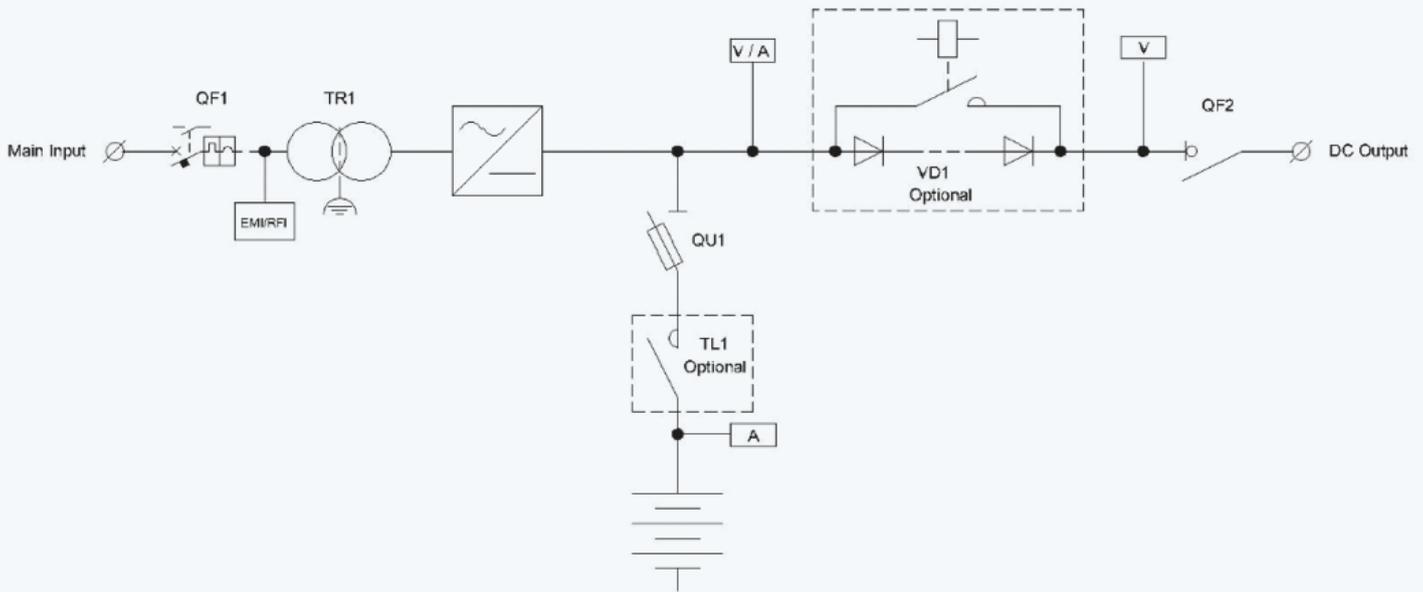
From this section you can configure the **MAIL SERVER** function that allows you to receive emails in case of system abnormalities. Each alarm generates an email when the **ON** state occurs and an on-the-spot alert to the **OFF** state. You can enter up to three mail recipients.



## 6 PDF DOCUMENTATION

From this page you can view on **HMI** the drawings and the technical manual for a quick and always available consultation.

COMPACT-PLATINUM 4.0 Industrial1- 3Ph Battery Chargers



DC UPS - BASIC SINGLE-LINE DIAGRAM - SINGLE BRANCH

STANDARD FUNCTIONS

- AC MCB with cont.aux.
- Floating charge
- Boost charge (f)
- Manual Charge (f)
- Temperature compensation(f)
- BATTERY (f) TEST Function
- DC EATHED sensor (f)
- Relay alarm card (f)
- (f) - See FOCUS on later pages

REPORTS AND MEASURES

HMI REPORTS

- AC main present
- AC/DC active
- Voltage output rectifier High/Low
- Load Floating
- Boost Charge (X)
- Manual Charge (X)
- Active Temperature Compensation(X)
- Battery charging current limitation active
- Positive pole on the ground
- Negative pole on the ground
- Output Overload
- Battery testing in progress
- Battery test failed
- Operating from batteries
- Low battery voltage
- End of battery drain
- High battery temperature(X)
- AC Input MCB OFF
- (X)= HMI-enabled function

MEASUREMENTS ON HMI

- Output voltage
- Output current
- Current battery charge
- Battery temperature

COMMUNICATION (MODBUS SLAVE TCP / IP)

Word individual for electrical parameters:

- Output voltage to loads
- Output current to loads
- Battery recharge current
- Battery temperature

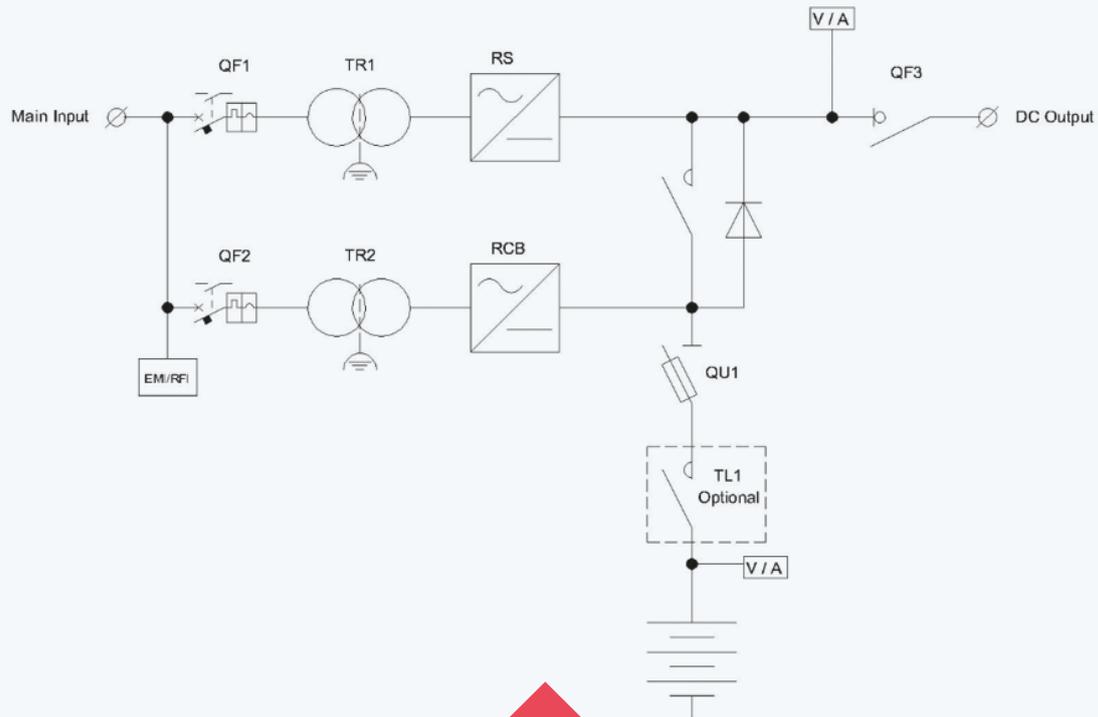
DOUBLEWORD ALARMS

- Showing all the signals present on the HMI



Code  
**1R**

COMPACT-PLATINUM 4.0 Industrial1 - 3Ph Battery Chargers



DC UPS - BASIC SINGLE-LINE DIAGRAM - DOUBLE BRANCH

STANDARD FUNCTIONS

- AC MCB with cont.aux.

SERVICES BRANCH RS

- Normal exercise voltage
- Emergency operating voltage (f)

BATTERY CHARGE BRANCH-RCB

- Floating charge
- Boost charge (f)
- Manual Charge (f)
- Emergency operating voltage (f)
- Temperature compensation (f)
- BATTERY TEST Function (f)

SYSTEM

- POWERBOOST Function (f)
- Relay alarm card (f)
- (f) - See FOCUS on later pages

REPORTS AND MEASURES HMI REPORTS

- AC main present
- AC/DC -RS-active
- AC/DC -RCB-active
- RS-output voltage High / Low
- RCB-output voltage High / Low
- RCB-Floating Charge
- RCB- Boost Charge(X)
- RCB-Manual Charge (X)
- Active Temperature Compensation(X)
- Battery charging current limitation active
- Positive pole on the ground
- Negative pole on the ground
- Output Overload
- Battery testing in progress
- Battery test failed
- Operating from batteries
- Low battery voltage
- End of battery drain
- High battery temperature(X)
- AC Input MCB OFF
- (X)= HMI-enabled function

MEASUREMENTS ON HMI

- Output voltage
- Output current
- Battery voltage
- Current battery charge
- Battery temperature

COMMUNICATION (MODBUS SLAVE TCP / IP)

Word individual for electrical parameters:

- Output voltage to loads
- Output current to loads
- Battery voltage
- Battery recharge current
- Battery temperature

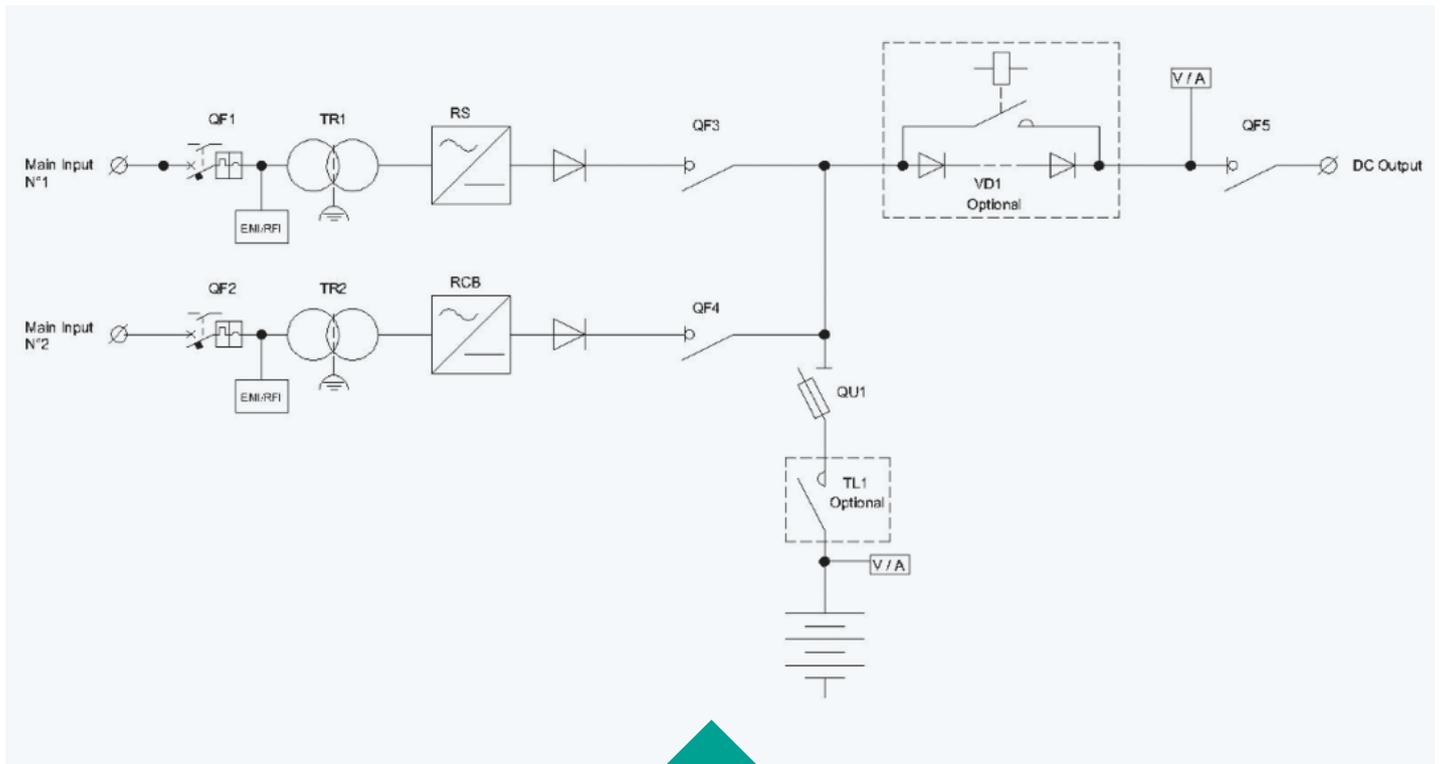
DOUBLEWORD ALARMS

- Showing all the signals present on the HMI

Code  
**2R**



COMPACT-PLATINUM 4.0 Industrial1 - 3Ph Battery Chargers



DC UPS - BASIC SINGLE-LINE DIAGRAM - DOUBLE PARALLEL BRANCH

STANDARD FUNCTIONS

- AC MCB with cont.aux.
- Floating charge
- Boost charge (f)
- Manual Charge (f)
- Temperature compensation (f)
- BATTERY (f) TEST Function
- DC EATHED sensor (f)
- Relay alarm card (f)
- (f) - See FOCUS on later pages

REPORTS AND MEASURES  
HMI REPORTS

- AC main present
- AC/DC -Rect.1-active
- AC/DC -Rect.2-active
- Load-output voltage High / Low
- Battery-output voltage High / Low
- Floating Charge
- Boost Charge (X)
- Manual Charge (X)
- Active Temperature Compensation(X)
- Battery charging current limitation active
- Positive pole on the ground
- Negative pole on the ground
- Output Overload
- Battery testing in progress
- Battery test failed
- Operating from batteries
- Low battery voltage
- End of battery drain
- High battery temperature(X)
- AC Input MCB OFF
- (X) - HMI-enabled function

MEASUREMENTS ON HMI

- Output voltage
- Output current
- Battery voltage
- Current battery charge
- Battery temperature

COMMUNICATION  
(MODBUS SLAVE TCP / IP)

Word individual for electrical parameters:

- Output voltage to loads
- Output current to loads
- Battery voltage
- Battery recharge current
- Battery temperature

DOUBLEWORD ALARMS:

- Showing all the signals present on the HMI



Code  
**2RP**

# COMPACT-PLATINUM 4.0 Industrial1 - 3Ph Battery Chargers

## FOCUS

SINGLE BRANCH Product Code <b>1R</b>	DOUBLE BRANCH Product Code <b>2R</b>	DOUBLE PARALLEL BRANCH Product Code <b>2RP</b>
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### BOOST CHARGE (REF. DIN 41772) - Fig.x1

This type of charging is recommended for tubular plate technology and/or NiCd batteries. The system is fully automatic as the charging current required by the batteries is read and this, by means of possible settings, determines the transition from FLOATING to BOOST and vice versa. This type of charge is protected by software security timers (fixed time of 12 hours) that automatically disables the feature automatically.

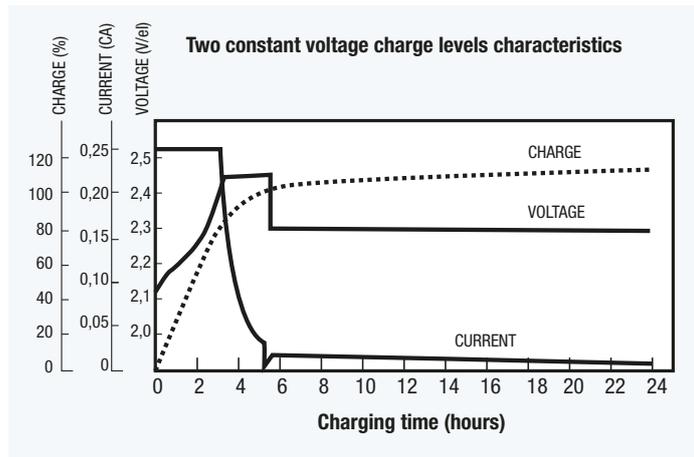


Fig. x1

FROM HMI you can:

- Activate and deactivate the function.
- Set the Boost charge voltage.
- Set the Ah capacity of the batteries required by the algorithm for proper operation.

### MANUAL CHARGE

This type of charging is recommended for tubular plate technology and/or NiCd batteries. The function activates by push button on HMI

This type of charge is protected by software security timers (fixed time of 12 hours) that automatically disables the feature automatically.

FROM HMI you can:

- Activate and deactivate the function
- Set the Manual charge voltage.

### BATTERY TEST

This function gives a further step of reliability to the system. During the Battery Test, the AC / DC section lowers its output voltage to a safety value, thus forcing the accumulators to deliver energy to the load. At the same time, the trend of the battery discharge curve is monitored and, if this exceeds the set setpoint values, the BATT.FAULT TEST alarm is triggered and the AC / DC section will instantly return to the FLOATING CHARGE value.

The presence of this function is very important to prevent anomalies in the BATTERY circuit that would, on the contrary, be found only during scheduled maintenance operations or in the event of a black-out with consequent loss of load. A second very important aspect that the BATTERY TEST this arrangement consists in reducing the phenomenon of SOLPHATION OF THE PLATES in the accumulators; this occurs when the battery remains in buffer charge for a long time without ever being used and leads to an exponential increase in the value of the internal resistance (Ri) of the accumulator. At this point, the more the Ri increases, the less the battery will be able to circulate current, putting the load at risk. Thanks to the periodic intervention of the AUTOMATIC BATTERY TEST, the exchange of ions between the positive and negative plates is triggered in the accumulator; this drastically reduces the SOLPHATION phenomenon by keeping the battery intact.

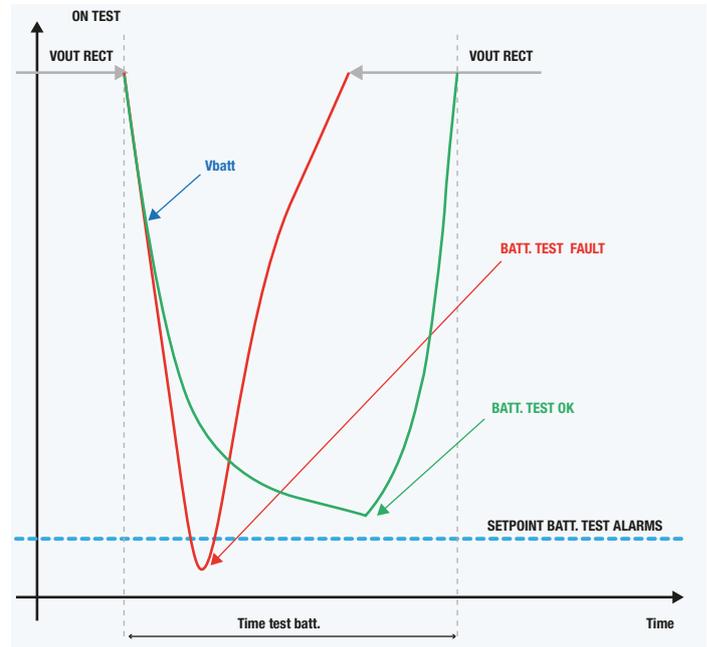


Fig. x2

Fig.x2 shows the trend of the system output voltage, when the BATTERY TEST is running.

The function is standard in two ways:

- **AUTOMATIC**  
The system tests the battery circuit at a user-programmable frequency.
- **MANUAL**  
It is possible at any time to carry out the TEST in MANUAL mode.

FROM HMI you can:

- Activate and deactivate the function
- Set the AUT TEST repeat days, in the range 1 to 45 days.

### TEMPERATURE COMPENSATION

This function allows you to adapt the FLOATING charging voltage according to the ambient temperature in which the batteries operate, whether it is installed inside the rectifier, in a separate cabinet, or in an open shelf located in a technical room. The temperature is measured by means of a PT100 sensor to be positioned near the battery.

The correction of the charging voltage occurs in the temperature range 25 - 35 °C with fixed sampling at 10sec.; the correction acts only if the system is in FLOATING charge. After the temperature of 35 °C, the correction is blocked at the value reached to allow the battery to be recharged anyway and an alarm is generated / stored on the HMI.

FROM HMI you can:

- Activate and deactivate the function
- Set the correction coefficient (V / el x ° C)
- Standard setting = 0.003V / cell
- Set the number of battery elements required by the algorithm for proper operation

# COMPACT-PLATINUM 4.0 Industrial1 - 3Ph Battery Chargers

## FOCUS

SINGLE BRANCH Product Code <b>1R</b>	DOUBLE BRANCH Product Code <b>2R</b>	DOUBLE PARALLEL BRANCH Product Code <b>2RP</b>
--	--	--

### DC POLARITY ON THE GROUND SENSOR

There is a fixed-threshold sensor (about 15mA, referring to the system's output terminals) that detects possible loss of insulation of the output poles and batteries present in the system. This sensor is NOT similar to an ISOLAMENT CONTROL instrument but is provided to give an initial indication of any abnormality. The circuit detects the loss of insulation of the POSITIVE pole or the NEGATIVE pole differentiated.

FROM HMI you can:

- Activate and deactivate the function.

### EMERGENCY VOLTAGE - REVERSIBILITY

Typical function of the 2R configuration. In the event of failure of an AC / DC section of the system, the remainder automatically goes to a higher voltage value (usually the Vfloating value) to also allow the batteries to be recharged simultaneously.

FROM HMI you can:

- Set the EMERGENCY voltage

### FLOATING CHARGE (RIF. DIN 41773) - Fig.x3

This recharge has two different phases:

- **PHASE 1:** the current is constant and the voltage increases
- **PHASE 2:** The current decreases and the voltage is constant

When the recharging current falls below a certain value, the batteries are considered charged and the cycle is over. In this situation the output goes to the floating value which is the minimum value necessary for correct recharging maintenance battery. Figure x3 shows the progress of the function.

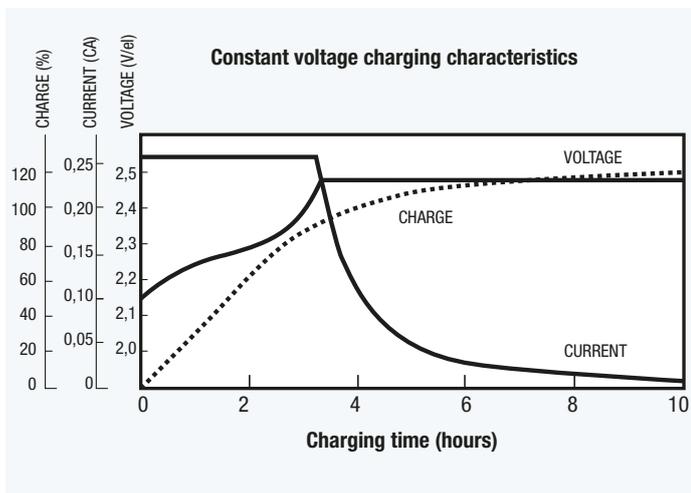


Fig. x3

### ALARMS RELAY CARD

There is a board consisting of 7 alarm relays with SPDT type contact shown on removable and polarized printed circuit terminals. The electrical contacts have a range of 5Amp to 250Vac

There are three fixed alarms respectively:

- **AC MAINS PRESENCE** - wired in positive logic
- **GENERAL FAILURE** - wired in positive logic
- **LOW BATTERY VOLTAGE**

While it is possible to configure the remaining 4 from the HM.

FROM HMI you can:

Configure 4 alarms depending on the menu on HMI.

### POWERBOOST FUNCTION

Typical function of the 2R configuration. In case of overload on RS, the RCB branch automatically intervenes by putting itself in parallel with the load together with the entire battery bank.

The device automatically transforms its configuration from DOUBLE BRANCH to SINGLE BRANCH with TWO UNITS IN PARALLEL only for the time that the overload persists; in this condition, the output voltage of the entire system will go to the FLOATING CHARGE voltage value to also allow the simultaneous recharging of the battery bank.

It is important to emphasize that both branches must have the same power and the same characteristics. With this type of system in all respects, a "REDUNDANCY AND PARALLEL POWER" configuration is created in order to increase the reliability of the system and ensure a high degree of safety towards the load.

### INPUT TRANSFORMER

The power transformer is made with a core of first choice laminations (optional the solution with oriented crystals) and an electrostatic screen between primary and secondary. It produces the reduction of the input voltage to the most appropriate value for the operation of the conversion system and isolation from the network (4kV).

The transformer is made with class F supports and insulators (155 ° C) while the windings are in electrolytic copper class H double insulation (220 ° C). There is an electrostatic shield connected to earth between primary and secondary.

The transformers comply with the Standard CEI EN 61558-2-4-file 4971 classification CEI 96-7.

### WIRING - CABLE TYPE - SECTIONS

- Power cables AC and DC sections = FS17 CPR Cca-s3,d1,a3 ( cable cross-sections according to power )
- Signaling and control cables = FS17 CPR Cca-s3,d1,a3 ( sections 1mmq )
- Signaling and control cables = FRO-HP CPR Cca-s3,d1,a3
- FLAT CABLE = Flame Classification FT1,FT2
- Data transmission cables = Cavo RJ45 - CAT5 FTP

## DC/DC CONVERTER DC1

DC/DC MODULE



DC/DC MODULE - REAR

### MAIN FEATURES

- Static converter
- Configuration: STEP-DOWN
- Control type: PWM HF.
- Isolation I/O: NO
- Negative pole through
- **Extractable 5U rack-format AC/DC module for quick and easy assistance thanks to polarized extractable connectors**

### APPLICATION FIELDS

These converters can be used to power utilities in DC with constant voltage, when it has a variable trend source such as the batteries that require charging curves to voltage values not always acceptable by the loads.



TYPE		DC1-12	DC1-24	DC1-48	DC1-110
OUTPUT	NOMINAL VOLTAGE*	12	24	48	110
	CURRENT RANGE	10÷60A			
	MAX POWER	720W	1440W	2880W	6600W
	RIPPLE NOISE(RMS)	≤ 0.3% Vn			
	RANGE REGOL.Vout	+/- 5%			
	STABILITY	+/- 1%			
	ADJ. FOLLOWING THE CHANGE V <sub>inp</sub> .	+/- 1%			
	ADJ. FOLLOWING THE CHANGE I <sub>Load</sub>	+/- 1%			
	START-UP time	2 sec.			
	CONFIG. PARALL. OF REDUNDANCY	POSSIBLE WITH BLOCK DIODE			
INPUT	VOLTAGE RANGE */**	18 ÷ 75		116 ÷ 170	
	EFFICIENCY (Typ.)	≥ 90 %			
	CURR.CONSUMPTION (NO LOAD)	~ 0.2 Amp			
	INRUSH CURRENT (Typ.)	~ 80Amp			
PROTECTION	OVERLOAD	2In x 5mS Shut down for 250mS - restart aut.			
	CURRENT TYPE	CONSTANT			
	OVP	+ 10% Vn			
	UVP	- 50% Vn			
	OVERTEMP.	Shut down. Restart aut.			
ALARMS	DC/DC OK	SPDT CONTACT (5Amp/230VAC)			
ENVIRONMENT	WORKING TEMP.	-10 .....+40°C			
	WORKING HUMIDITY	20 .....90% (NO COND.)			
	STORAGE TEMP.	-20 .....+50°C			
STANDARDS	MARKING	CE			
	PROTECTION DEGREE	IEC 60529			
	EMC	EN 61000-6-2		EN 61000-6-4	
	STATIC CONVERTER	EN 60146			
VENTILATION	I <sub>out</sub> = 5÷20Amp NATURAL I <sub>out</sub> = 21÷60Amp FORCED				
DIMENSIONS ( W x D x H) mm- with handle and rear clamps	5U rack type 482 x 485 X 221				
DIMENSIONS ( W x D x H) mm- without handle and rear clamps	5U rack type 482 x 425 X 221				
PROTECTION DEGREE	IP20				
PAINT FRONT PANNEL - INDICATIVE WEIGHT	RAL 7035 - 15Kg				

OPTIONS	LCD CARD (Vout & Iout)
	BLOCK DIODE
LEDS ALARMS ON CONTROL CARD	VDC AUX1 OK
	VDC AUX 2 OK
	DRIVING IGBT OK
	UNDER VOLTAGE IN PROGRESS
	OVER VOLTAGE IN PROGRESS
	OVERTEMPERATURE IN PROGRESS
COMMANDS	MANUAL SELECTOR FOR ON/OFF CONVERTER
STATUS LED	GREEN LED FOR CONVERTER IN USE

\*Others on request.

\*\*With converter operating in regulation.



# PRODUCT LINE AC CURRENT





INDUSTRIAL UPS PRODUCTIONS  
WITH OUTPUT FOR DC AND AC LOADS

# SPECIAL PRODUCTS



## EMERGENCY POWER SYSTEM 400-3000VA SMI SERIES



### MAIN FEATURES

- High frequency PWM Inverter
- Single-phase input
- Single-phase sinusoidal output
- Isolation transformer in the inverter output
- Efficiency DC/AC high
- Microprocessor control with 32 bit
- Leds for clear information about the status of the E.P.S.
- Short trasfer time, less than 10 msec (short break)
- Rescue operation (output always present)
- Internal battery - Nominal voltage 24Vdc (S.E.L.V.)
- Suitable for any type of safety utilization
- Specific for led lights, suitable for any other type of load (small pumps, motors power factor corrected lamps or lights, small refrigerators)
- Compact and small dimensions
- Easy wall installation
- **OPTIONS**
- Emergency Power Off (E.P.O.) for Inverter shutdown immediate
- Possibility of increasing autonomy with adequate charger
- Auto Off to load <3% with sensor presence load for start every 30 sec.
- Possibility of emergency operation
- Batteries 10 years expected life (according to EN50171)

TYPE	24 V DC		48 V DC				
	SMI 04	SMI 06	SMI 10	SMI 15	SMI 20	SMI 25	SMI 30
P (VA)	400	600	1000	1500	2000	2500	3000
P (W)	350	550	1000	1500	2000	2500	3000
INPUT	VOLTAGE		230 Vac +10/-20%				
	FREQUENCY		50 Hz +/- 5% (60 Hz - option)				
OUTPUT	VOLTAGE		Line working: line. Battery working: 230Vac +/- 0,5%				
	FREQUENCY		50 Hz +/- 0,005%				
	OVERLOAD		110% per 60 sec. - 130% per 10 sec. - short circuit management				
	WAVEFORM		Pure sinewave				
	VOLTAGE DISTORTION (THD)		< 3% (linear load)				
	EFFICIENCY at full load		With line present > 99%; on battery working > 90%				
BATTERIES	RECHARGE TIME		6 - 10 for full autonomy				
GENERAL NOTES	NOISE (dba at 1 meter)		< 40				
	TEMPERATURE		da 0 a 40 °C				
	RELATIVE HUMIDITY AT 35° C		90% non-condensing				
	UPS DIMENSIONS (L X P X H) mm		315 x 255 x 550				
	WEIGHT (KG) without batteries		In progress				
	COMPLIANCE		Safety EN 62040-1-2, EMC EN 62040-2, CSS EN 50171 (battery on request)				
PROTECTION	ELECTRONIC		Overload - short circuit - battery low				
	ELECTRIC		Input and output fuses and battery fuse (internal)				
	MECHANICAL		IP20				
ALARMS	OPTICAL		Functional E.P.S. - Overload - battery low - general alarm				
	ACOUSTIC		Line fails - battery low - overload - test battery				

### ACCESSORIES

CODE	DESCRIPTION
7050	Communication port RS485
7011E	Emergency Power Off (E.P.O.) for Inverter shutdown immediate
7013E	Dry general alarm
7051E	Emergency operation

EMERGENCY POWER SUPPLY 1-10KVA SMED SERIES



**MAIN FEATURES**

- High frequency PWM Inverter
- Single phase input
- Single phase sinewave output
- Isolation transformer on the inverter output
- High DC/AC efficiency
- Microprocessor management with Auto-Diagnostics
- LCD display for more clear information about the status
- Automatic on/off weekly timer
- Automatic and manual battery test (emergency version)
- Transfer time less than 200 msec
- Rescue or emergency operation (SA/SE) selectable
- Possibility of connection for any user normally destined for security

**OPTIONAL**

- Contact interface
- Communication interface (RS-232) and management software
- USB interface
- Kit Ethernet SNMP adapter and related software
- Remote synoptic LCD remote
- Relay alerts and status communication card
- Manual by-pass
- Emergency Power Off contact (E.P.O.) for immediate stop
- Possible starting even without input power
- Double out possibility SA+SE
- DC output
- Batteries Long Life 10 years expected (according to EN50171)

SMED TYPE		10	15	20	30	40	50	60	80	100
POWER	NOMINAL POWER (KVA)	1	1,5	2	3	4	5	6	8	10
	ACTIVE POWER (KW)	0,9	1,35	1,8	2,7	3,6	4,5	5,4	7,2	9
INPUT	VOLTAGE	230Vac +/-20%								
	FREQUENCY	50Hz +/-5%								
OUTPUT	VOLTAGE	Present mains: mains voltage On batteries: 230 Vac +/- 0,5%								
	FREQUENCY	Present mains: synchronized to mains On batteries: 50Hz +/- 0,005%								
	OVERLOAD	110% for 60 sec. - 130% for 10 sec. - short circuit management								
	WAVEFORM	Sine wave								
	VOLTAGE DISTORTION (THD)	< 3% (linear load)								
	EFFICIENCY at full load	Present mains > 98%; on batteries on> 91%								
BATTERIES	BACK-UP TIME	See the detailed tables								
	RECHARGE TIME	8h								
GENERAL NOTES	NOISE (dba at 1 meter)	< 40								
	TEMPERATURE	from 0 to 40 °C								
	RELATIVE HUMIDITY AT 35° C	To 90% non-condensing								
	UPS DIMENSIONS (L X P X H) mm	320 x 650 x 650 / 420 x 850 x 670 / 420 x 850 x 1050 (See the detailed tables)								
	PACKING DIMENSIONS (L X P X H) mm	420 x 740 x 850 / 530 x 920 x 760 / 530 x 920 x 1140 (See the detailed tables)								
	WEIGHT (KG) without batteries	See the detailed tables								
	COMPLIANCE	Safety EN 62040-1-2, EMC EN 62040-2, CSS EN 50171 (batteries excluded)								
PROTECTION	ELECTRONIC	Overload - short circuit - battery low								
	ELECTRIC	Input and batteries fuses – circuit breaker output								
	MECHANICAL	IP20								
ALARMS	OPTICAL	Functional emergency power system status - overload - low battery								
	SOUNDS ALERT	Mains fail - low batteries - overload - test battery								

## EMERGENCY POWER SUPPLY 1-10KVA SMED SERIES

POWER	TYPE	CODE	AUT. (min.)	OVERALL (LxPxH) (mm)	BATTERIES	WEIGHT (Kg)
1000VA 900W	SMED10-10	4M1000-10	10'	320 x 650 x 650	n.4 12V-9Ah	68
	SMED10-30	4M1000-30	30'	320 x 650 x 650	n.12 12V-7Ah	82
	SMED10-60	4M1000-60	60'	320 x 650 x 650	n.20 12V-7Ah	108
1500VA 1350W	SMED15-10	4M1500-10	10'	320 x 650 x 650	n.8 12V-7Ah	74
	SMED15-30	4M1500-30	30'	320 x 650 x 650	n.20 12V-7Ah	108
	SMED15-60	4M1500-60	60'	320 x 650 x 650	n.24 12V-9Ah	122
2000VA 1800W	SMED20-10	4M2000-10	10'	320 x 650 x 650	n.8 12V-9Ah	91
	SMED20-30	4M2000-30	30'	320 x 650 x 650	n.20 12V-9Ah	128
	SMED20-60	4M2000-60	60'	320 x 650 x 650	n.32 12V-9Ah	157
3000VA 2700W	SMED30-10	4M3000-10	10'	320 x 650 x 650	n.12 12V-9Ah	103
	SMED30-30	4M3000-30	30'	320 x 650 x 650	n.24 12V-9Ah	141
	SMED30-60	4M3000-60	60'	420 x 850 x 1050	n.48 12V-9Ah	224
4000VA 3600W	SMED40-10	4M4000-10	10'	320 x 650 x 650	n.16 12V-9Ah	118
	SMED40-30	4M4000-30	30'	320 x 650 x 650	n.32 12V-9Ah	170
	SMED40-60	4M4000-60	60'	420 x 850 x 1050	n.60 12V-9Ah	268
5000VA 4500W	SMED50-10	4M5000-10	10'	320 x 650 x 650	n.20 12V-9Ah	138
	SMED50-30	4M5000-30	30'	320 x 650 x 650	n.40 12V-9Ah	201
	SMED50-60	4M5000-60	60'	420 x 850 x 1050	n.80 12V-9Ah	318
6000VA 5400W	SMED60-10	4M6000-10	10'	320 x 650 x 650	n.20 12V-9Ah	151
	SMED60-30	4M6000-30	30'	320 x 650 x 650	n.60 12V-9Ah	270
	SMED60-60	4M6000-60	60'	420 x 850 x 1050	n.120 12V-7Ah	403
8000VA 7200W	SMED80-10	4M8000-10	10'	420 x 850 x 670	n.40 12V-7Ah	187
	SMED80-30	4M8000-30	30'	420 x 850 x 1050	n.80 12V-9Ah	328
	SMED80-60	4M8000-60	60'	420 x 850 x 670 + 540 x 715 x 1250	n.40 12V-26Ah	95 + 415
10000VA 9000W	SMED100-10	4M10000-10	10'	420 x 850 x 670	n.40 12V-9Ah	214
	SMED100-30	4M10000-30	30'	420 x 850 x 1050	n.80 12V-9Ah	343
	SMED100-60	4M10000-60	60'	420 x 850 x 670 + 540 x 715 x 1250	n.40 12V-42Ah	105 + 620

### ACCESSORIES

CODE	DESCRIPTION		
7001	Remote synoptic with 15mt cable		
7002-IN	Relay alarm communication card inside the E.P.S. (when ordering)		
7002	External relay alarm communication board (requires the addition of accessory 7012)		
7003	External SNMP Ethernet interface (requires the addition of the 7007R accessory)		
7006-70	Manual bypass for SMED 10-50		
7006-140	Manual bypass for SMED 60-100		
7007R	RS232 communication interface		
7011M	Contact for emergency button (E.P.O.) for immediate inverter stop		
7012	Contacts interface		
7018	USB interface		
GSC026040S	Box with 2x20 batteries 12V-26Ah and safety breaker	Overall 540 x 715 x 1250 mm	415 Kg
GSC042040S	Box with 2x20 batteries 12V-42h and safety breaker	Overall 540 x 715 x 1250 mm	620 Kg
7030	Battery Start button		
70SS-30D	Possibility of double output SA + SE for SMED 10-30		
70SS-100D	Possibility of double output SA + SE for SMED 40-100		



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UNINTERRUPTIBLE POWER SUPPLY – UPS MTS MM/TM 3÷14KVA SERIES



MTS 30/40/55/70 available in rack version

**MAIN FEATURES**

- Technology On-Line double conversion with transformer - VFI-SS-111
- Single or three phase input
- Single phase output
- High AC/DC efficiency
- PFC circuit on the input
- Microprocessor control with Self-Diagnostics
- Automatic by-pass standard
- LCD display for more clear information about UPS status
- Turn on and turn off by weekly timer
- Communication port RS232

**OPTIONS**

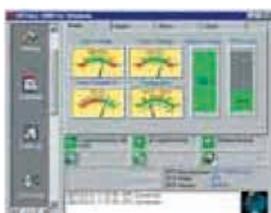
- SNMP adapter and software
- Communication board and relay alarms (AS400)
- Possibility of starting also from batteries
- Available as voltage and/or frequency convert



SNMP Ext.

MTS SERIES		30	40	55	70	100	140	
POWER	POWER (KVA)	3	4	5,5	7	10	14	
	POWER (KW)	2,1	3	4	5	7,5	10	
INPUT	SINGLE PHASE	230 Vac +10/-20%						
	FREQUENCY	50 Hz +/- 5%						
	POWER FACTOR	> 0,98						
OUTPUT	RATED VOLTAGE	230 Vac +/- 0,5%						
	FREQUENCY	<b>Line working:</b> synchronized to line - <b>Battery working:</b> 50Hz +/- 0,005%						
	OVERLOAD	110% for 60 sec. - 130% for 10 sec. – short circuit management						
	WAVEFORM	Pure wave						
	VOLTAGE DISTORSION THD	< 3% (with linear load)						
	EFFICIENCY at full load	91% - on ECO Mode >98%						
BATTERIES	TYPE	12 V - 7 Ah				12 V - 12 Ah		
	NUMBER	10	12	16	20			
	TYPICAL AUTONOMY	10'				13'	10'	
	RECHARGE TIME	8h						
GENERAL NOTES	AUDIBLE NOISE (db at 1 mt.)	40 to 60						
	OPERATING TEMPERATURE	0 to 40° C						
	RELATIVE HUMIDITY AT 35°C	< 90% non-condensing						
	UPS DIMENSIONS (LxPxH) mm	320x650x650				420x850x670		
	UPS RACK DIMENSIONS (LxPxH) mm	630x570x710				-		
	WEIGHT (KG)	90	95	113	132	180	195	
	COMPLIANCE	Safety EN 62040-1-2 / EMC EN 62040-2 / EN 62040-3						
PROTECTION	ELECTRONIC	Overload / short circuit / low battery						
	ELECTRIC	Input and battery fuses - automatic switch on output						
	MECHANICAL	IP20						
ALARMS	OPTICAL	Function UPS status - overload - low battery						
	ACOUSTIC	Line failure - low battery - overload - battery test - inverter off						

## UNINTERRUPTIBLE POWER SUPPLY – UPS M 600÷1.5KVA SERIES



### MAIN FEATURES

- Technology line interactive –VI-Sy-222
- AVR Stabi
- Microprocessor management
- Response time < 4mS
- Self-Diagnostic
- Self-learnig
- LCD display for more clear information about UPS status
- RS232 and/or USB communication port
- Control and management software
- Telephone line and modem protection with RJ11
- Computer network protection with RJ45

M SERIES		M600	M800	M1000	M1500
POWER	NOMINAL POWER (VA)	600	800	1000	1500
	ACTIVE POWER (W)	360	480	600	900
	VOLTAGE	230 Vac ±25%			
	FREQUENCY	50 o 60 Hz ± 10% (autosensing)			
OUTPUT	VOLTAGE	<b>Line working:</b> 230 Vac ± 9% (AVR) - <b>Battery working:</b> 230 Vac ± 10%			
	FREQUENCY	<b>Line working:</b> synchronized to line - <b>Battery working:</b> 50Hz o 60Hz ± 1Hz			
	WAVEFORM	Pure wave			
	N° OF OUTPUT SOCKET	4			6
BATTERIES	TYPE	12V - 7Ah	12V - 9Ah	12V - 7Ah	12V - 9Ah
	NUMBER	1	1	2	2
	TYPICAL AUTONOMY	from 10' - to 20'			
	RECHARGE TIME	6 - 8h			
GENERAL NOTES	AUDIBLE NOISE (db at 1 mt.)	< 30			
	OPERATING TEMPERATURE	from 0 to 40 °C			
	RELATIVE HUMIDITY AT 35° C	90% non-condensing			
	UPS DIMENSIONS (LxPxH) mm	101 x 298 x 142		149 x 338 x 162	158 x 380 x 198
	UPS RACK DIMENSIONS (LxPxH) mm	140 x 350 x 210		195 x 405 x 235	220 x 445 x 285
	WEIGHT (Kg) without batteries	4,25	4,9	7,8	11,1
	COMPLIANCE	Security EN 62040-1-2 / EMC EN 62040-2 / EN 62040-3			
PROTECTION	ELECTRONIC	Overload / short circuit / low battery			
	ELECTRIC	Input and battery fuses			
	MECHANICAL	IP20			
	MODEM PROTECTION	yes			
ALARMS	OPTICAL	Mains ok / battery mode / overload			
	ACOUSTIC	Line failure - low battery - overload			

## UNINTERRUPTIBLE POWER SUPPLY – UPS MKK 1÷10KVA SERIES



### MAIN FEATURES MKK 1000÷3000

- Microprocessor control with Self-Diagnostic
- Automatic by-pass as standard
- LCD display
- Batt. level
- Load level
- RS232 and USB interface
- Control software
- Contact for emergency button (EPO) on the PLUS series

### OPTIONS

- SNMP adapter and related software
- Communication board relay alarm (AS400)

### MAIN FEATURES MKK 6000÷10000

- Technology "on-line" double conversion transformer less VFI-SS-111
- Input and output single phase (pure sinewave)
- High efficiency
- PFC circuit input
- Microprocessor control with Self-Diagnostic
- Automatic and manual by-pass as standard
- LCD display
- Batt. level
- Load level
- RS232 and USB interface
- Control software

### OPTIONS

- SNMP adapter and related software
- Communication board relay alarm (AS400)
- Parallel mode

SAT-KE SERIES		MKK	MKK-PLUS	MKK	MKK-PLUS	MKK	MKK-PLUS	MKK	
POWER	POWER (VA)	1000		2000		3000		6000	10000
	POWER (W)	800	900	1600	1800	2400	2700	4200	7000
INPUT	SINGLE PHASE VOLTAGE	200/295 Vac at full load						220/230Vac +20/-25%	
	FREQUENCY	40-55 a 50Hz / 55-65Hz (autosensing)						50/60Hz +/- 5%	
	POWER FACTOR	> 0,98							
OUTPUT	SINGLE PHASE VOLTAGE	208/220/230/240 (selectable) +/-2%						230 +/- 3%	
	OUTPUT FREQUENCY (HZ) on battery working	50/60 +/-0,2%						50/60Hz (sel. auto) +/- 5%	
	OUTPUT FREQUENCY (HZ) with power on	Synchronized to line							
	OVERLOAD	108%±5% < load ≤ 150%±5% > 30s		loss of the load connected and alarm		110% for 10 min;		130% for 1 min	
		150%±5% < load < 200%±5% > 300ms		loss of the load connected and alarm					
	WAVEFORM	Pure sinewave							
	TOTAL HARMONIC DISTORSION (THD)	< 3% (linear load)							
EFFICIENCY at full load	With power on >90% (PLUS version: >91%) on Eco mode >98%								
N. OF OUTPUT SOCKET	3 IEC 10A	1+2 IEC 10A	4 IEC 10A	4+4 IEC 10A	4 IEC 10A	4+4 IEC 10A +1 IEC 16A	Clamps		
BYPASS	AUTOMATIC	Switching without disconnect (100%) from UPS to BYPASS and return							
BATTERIES	TYPE	12V-9Ah	12V-7Ah	12V-9Ah	12V-7Ah	12V-9Ah	12V-9Ah	12V - 7,2Ah	12V - 9Ah
	NUMBER	2	3	4	6		20		
	AUTONOMY	From 8 to 15 minutes, load-dependent							
	RECHARGE TIME	6 - 8h							
GENERAL NOTES	AUDIBLE NOISE (dba at 1 m.)	< 55dBA						< 45dBA	
	OPERATING TEMPERATURE	0 to 40 °C							
	RELATIVE HUMIDITY AT 35° C	< 90% non-condensing							
	UPS TOWER DIMENSIONS (WxDxH) mm	144x361x215	144x409x215	191x428x337	191x466x337	191x428x337	191x466x337	270x570x720	
	UPS PACKING DIMENSIONS (WxDxH) mm	215x455x300	215x503x300	310x535x445	310x573x445	310x535x445	310x573x445	370x670x940	
	UPS RACK PACKING DIMENSIONS (WxDxH) mm	440x380x86,5 (2U)	-	440x520x131 (3U)	-	440x520x131 (3U)	-	-	
	UPS RACK (WxDxH) mm	610x515x180	-	610x660x215	-	610x660x215	-	-	
	UPS TOWER WEIGHT (Kg)	11	13	21	24	26	-	95	98
	UPS RACK WEIGHT (Kg)	11	-	21	-	26	-	-	
COMPLIANCE	Safety EN 62040-1-2, EMC EN 62040-2, EN 62040-3								

## DC/AC INVERTER MTS - INV SERIES



The new MTS-INV series inverters are the result of careful studies to develop a high efficiency and high performance product, all made in a compact box. These DC / AC conversion systems take energy from direct voltage sources such as rectifiers and buffer batteries, guaranteeing power and continuity even when the AC power sources are no longer available.

Thanks to the numerous versions available as input voltage and power, the uses can be different and therefore ideal for supplying quality power and continuity to the equipment, for example ruter etc. or in some electrical transformer substations for the 110Vdc versions. Optional interfaces allow remote monitoring even if installed in unmanned environments.

### MAIN FEATURES

- Inverter MOSFET with low loss at high frequency with high efficiency
- Wide DC input range
- Output 230Vac, single phase, pure sinewave
- Isolating transformer on the inverter output
- Limit inrush current at power start
- DSP microprocessor for inverter control and management user interfaces
- Display and leds for greater information on the status of the inverter
- Self-diagnosis of faults

### OPTIONS

- Pulse input (TTL)
- E.P.O. (Emergency Power Off)
- Alarms on dry contact
- Internal static bypass switch
- Communication interface RS232 and software for monitoring and management
- SNMP adapter with software

MTS - INV TYPE		1000	1500	2000**	3000**	4000**	5000**	6000**
<b>POWER</b>	POWER (W)	1000	1500	2000	3000	4000	5000	6000
<b>INPUT</b>	DC INPUT VOLTAGE	24 / 48 / 60 / 110 / 220 / 250 Vdc (ask on the order)						
<b>OUTPUT</b>	VOLTAGE	230 Vac +/-3%						
	FREQUENCY	50Hz +/- 0,05%						
	OVERLOAD	110% per 60sec - 130% per 10sec - short circuit management						
	WAVEFORM	sinewave						
	VOLTAGE DISTORTION (THD)	< 2% with full linear load						
	EFFICIENCY AT FULL LOAD	92%						
	CONNECTIONS	clamps						
<b>GENERAL NOTES</b>	NOISE (dba at 1meter)	< 40						
	OPERATING TEMPERATURE	da 0 a 40 °C						
	RELATIVE HUMIDITY AT 35° C	fino al 90% non-condensing						
	DIMENSIONS (W x D x H) mm*	483 x 355 x 95 (2U)			483 x 475 x 133 (3U)		483 x 475 x 222 (5U)	
	PACKING DIMENSIONS (L x P x H) mm	630 x 570 x 220			630 x 570 x 270		650 x 570 x 440 (5U)	
	WEIGHT (Kg)	18	20	24	27	35		37
	COMPLIANCE	Safety EN 62040-1, EMC EN 62040-2, efficiency EN 62040-3						
<b>PROTECTIONS</b>	ELECTRONIC	Overload - short circuit - min/max input voltage - output low voltage						
	ELECTRIC	input fuse						
	MECHANICAL	IP20						
<b>SIGNALLING</b>	OPTICAL	Status of the inverter - overload - alarms						
	ACOUSTIC	Overload - short circuit - min/max input voltage - output low voltage						

\* With options the dimensions can be different. Possibility of others power size, with custom solutions.

\*\* Models with 24 VDC power supply are excluded.

STATIC SWITCH MTS - COM SERIES



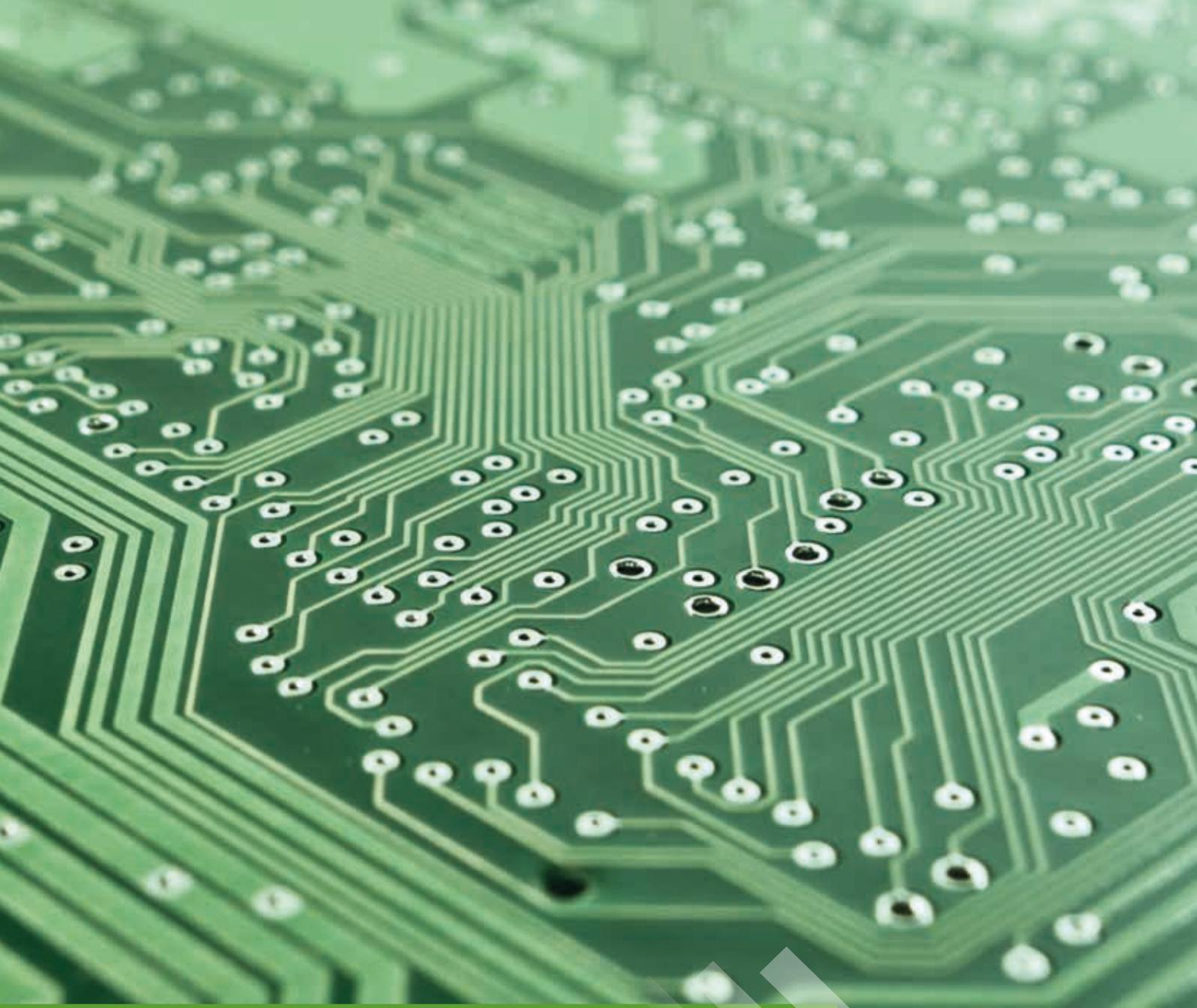
The Static Switch of the MTS-COM series they allow the switching of the users connected to it, from a Priority input line (selectable), to the Reserve input line, in automatic and / or Manual mode.

Switching takes place in time 0 (less than 1 m sec.) with synchronous inputs in frequency, while in the case of asynchronous inputs, switching takes place with a delay of only 7/8 m sec.

**MAIN FEATURES**

- Two input (N in common, fix in and out)
- A first line selectable
- One output
- Microprocessor control
- Easy to use
- Leds to inform on the status
- Neutral cable passing between in and out

TYPE		MTS - COM 5	MTS - COM 10	MTS - COM 20
POWER	NOMINAL POWER	5 5KVA 22A	10 10KVA 44A	20 20KVA 88A
	VOLTAGE	2 x 230 Vac +/- 15% (neutral in common)		
INPUT	FREQUENCY	50Hz		
	VOLTAGE	The same of input		
OUTPUT	FREQUENCY	50Hz		
	OVERLOAD	110% for 60 sec. - 130% for 10 sec.		
	WAVEFORM	Sinewave		
	EFFICIENCY	99%		
	CONNECTIONS	clamps		
	NOISE (dbA at 1 meter)	< 40		
GENERAL NOTES	OPERATING TEMPERATURE	0 to 40° C		
	HUMIDITY	< 90% non-condensing		
	RACK DIMENSIONS (WxDxH) mm	483 x 334 x 90 (2U)		
	PACKING RACK DIMENSIONS (WxDxH) mm	540 x 410 x 165		
	SWITCH BOX DIMENSIONS (WxDxH) mm	325 x 180 x 425		
	SWITCH BOX ACKING RACK DIMENSIONS (WxDxH) mm	340 x 200 x 480		
	WEIGHT (kg)	10		11
	COMPLIANCE	safety EN 62310 - 1, EMC EN 62340-2		
PROTECTIONS	ELECTRIC	Magnetic breakers or fuse		
	MECHANICAL	IP20		
SIGNALLING	OPTICAL	INPUT LINE - OUTPUT LINE		



# PRODUCT LINE ACCESSORIES



## BATTERY MONITORING UNIT



Single module BM1



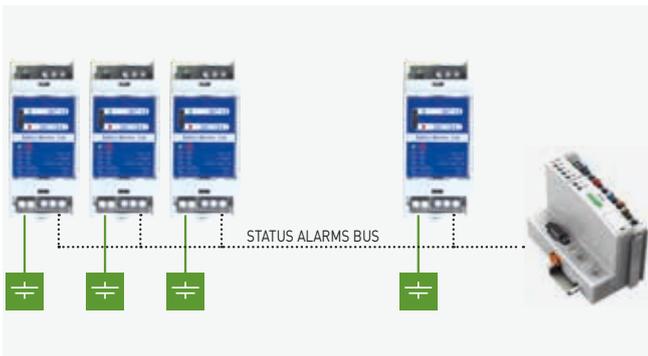
Detail of the front panel



Optional communication device for remotely reporting battery status (no electrical measurements).



### TYPICAL OF CONNECTION WITH POSSIBLE REMOTE ALARM REPORT



Easy to install with extremely small dimensions, it also allows the less experienced person to immediately establish the status of the batteries by identifying the faulty ones.

The growing demand for systems that guarantee ever greater continuity of service, powered by direct current, consequently leads to the development of equipment monitoring systems in order to make the system even more reliable, avoiding unexpected and unexpected failures. The most vulnerable point of the system has been identified in the dc power source, formed by batteries, and therefore a device has been developed capable of controlling the operating status of both the entire bench and each individual battery.

The BM1 device is equipped with LED indicator lights to immediately identify the battery with irregular operation and free voltage contacts prepared for remote alarms. Made in a practical 2-module DIN rail case, it can be easily installed above the accumulator itself or in a common electrical switchboard. The BM1 devices can be connected to optional interface modules to be able to send the operating status of the batteries to which it is connected remotely and / or on a computer network.

In this way it is possible to program maintenance operations well in advance, avoiding a sudden failure and compromising the continuity of the service. The device is suitable for 12 V batteries and having the same electrical characteristics.

### TECHNICAL DATASHEET

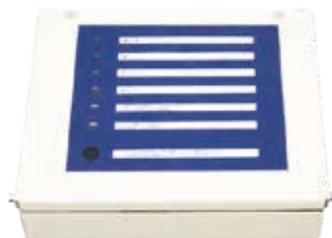
INPUT NOMINAL VOLTAGE	12 VDC
INPUT RANGE VOLTAGE	8 ÷ 16 VDC
CURRENT CONSUMPTION	19 ÷ 50 mA
POWER SUPPLY	From battery
OPERATING TEMPERATURE	0 ÷ 40 °C
RELATIVE HUMIDITY	< 90 % non-condensing
PROTECTION DEGREE	IP20
ELECTRICAL PROTECTIONS	Autoreset fuses
REVERSE POLARITY PROTECTION	Yes
ALARMS SETUP	12 VDC Vmax*: SET = 14.5 RESET = 13.5 VDC Vmin: SET = 9.5 RESET = 12.5 VDC Vric/rech** SET = 11.5 RESET = 13.0 VDC
INTERNAL RELAY DATASHEET	Max. voltage: 125 VAC 30 VDC Max. current: 1 Amp
DIMENSIONS (WxDxH)	TYPE device BM1: 36*58*90mm 2M standard DIN 43880

\* The alarm status is activated after 2 minutes from which the battery is within the indicated range.

\*\* If the battery remains in this condition for 8 hours the alarm is activated.

## REMOTE ALARM DEVICE

TABLE VERSION  
Cod. RA-09



DIN RAIL VERSION  
Cod. RA-09-DIN



DESCRIPTION	RA - 09	RA - 09 - DIN	
SUPPLY VOLTAGE	VAC	230 VAC	12 VAC <sup>1</sup> 230 VAC <sup>2</sup>
	VDC		12 VDC <sup>1</sup> 24 VDC <sup>1</sup> 48 VDC <sup>2</sup> 110 VDC <sup>2</sup>
INPUTS NR.	4		
INPUTS TYPE	N.O and N.C.		
DELAY ON ACTIVATION (Adj)	0 ÷ 300 sec.		
DELAY AT OFF	5 sec. - fix		
SETUP DEVICE	LED test button and buzzer silencing Configuration dip-switch	LED test button e Acknowledgeable audible alarm Configuration dip-switch	
OUTPUT ALARMS	LED + buzzer + cumulative relay		
CUMULATIVE RELAY CONFIGURABLE IN POSIT./NEGAT LOGIC.	Yes		
I/O CONNECTIONS TYPE	Clamps PCB		
BOX DIMENSIONS	168*138*48 (p)mm		
PROTECTION DEGREE	IP30		
BOX TYPE	Metallic		
INTERNAL RELAY DATASHEET	CONTACT N.O-C-NC / 1 Amp - 24VDC / 0.5 Amp - 110VAC		
WEIGHT	450g		
SUPPLIED AUXILIARY FEEDER OF SERIES	Yes		
	NO		

<sup>1</sup> Accepts direct power supply.

<sup>2</sup> Requires external adapter (optional)

This device can manage up to four inputs with signals coming from voltage-free contacts (relays) associated with as many LED indications.

The selection of the type of input contact, (it is possible to manage types of contact both Normally Open and Normally Closed) occurs through internal dip-switches available in single form for each channel, moreover, each input is provided with the excitation delay function adjustable by trimmer, in

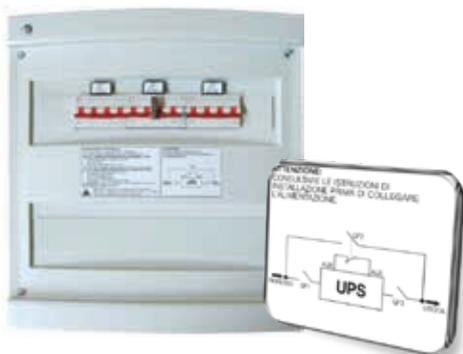
a range between 0 ÷ 300 sec. giving the device a feature of unparalleled flexibility in use. On the front panel there are six LEDs and a button, namely:

- n° 4 red color for input channels status
- n° 1 green color for regular operation status
- n° 1 red color for general failure status
- n° 1 pbutton with acoustic alarm silencing function and LED test

The contacts (COM-NO-NC) of a relay associated

with the general fault function are also made available on the terminal board so as to signal the status also to other external devices. The connections to the four input channels are available through a modular terminal block and / or via an RJ45 connector for a Cat.5 twisted cable (only in the RA-09 version). The RA-09 device requires a 12 VDC power supply guaranteed by an external 230 VAC input power supply unit supplied as standard.

## MANUAL BYPASS



MTS - BYPASS allows to exclude UPS in case of maintenance or malfunction, without causing power loss. Easy to install, it comes in handy wall panel.

TECHNICAL DATA	MM	TM	TT	TTmax
<b>INPUT</b>				
ELECTRICAL SETUP	Ph+N	3Ph+N	3Ph+N	3Ph+N
NOMINAL VOLTAGE	230 VAC	400 VAC	400 VAC	400 VAC
FREQUENCY	50 – 60Hz			
MAXIMUM CURRENT	63 Amp	100 Amp	100 Amp	125 ÷ 400
<b>OUTPUT</b>				
NOMINAL VOLTAGE	230 VAC	230 VAC	400 VAC	400 VAC
<b>SETUP</b>				
OPERATING TEMPERATURE	0°C ÷ 40°C			
RELATIVE HUMIDITY	0 ÷ 90% non-condensing			
DIMENSIONS (WxDxH) mm	395*125*395			**
WEIGHT (kg)	4	4.5	5.5	**
PROTECTION DEGREE	IP20			

\*\*= To be defined based on the current required.

## COMMISSIONING PROCEDURE

The commissioning procedure ensures proper operation of the system. If you have chosen an MTS Elettronica system solution, we will guide you all along the way from the moment you place your order. From design and production, through testing and delivery, to installation and on-time and precise commissioning.

### PREPARING FOR COMMISSIONING

- The equipment must be positioned and the electrical installation completed
- Plan the technical intervention with MTS Elettronica at least 2 weeks in advance on site needs

### WHAT DOES COMMISSIONING INVOLVE?

Our technicians carry out a series of checks to ensure correct installation and operation of the system in accordance with specifications:

- Visual inspection of the installation site
- Visual inspection of equipment and batteries to identify damage
- Check of conformity of the installation conditions
- Equipment inspection
- Battery array wiring inspection
- Check of compliance with current safety regulations
- Inspection of the upstream and downstream protection devices of the systems and battery array
- Check of the VAC supply line
- System start-up with checkup of all main electrical parameters
- Tests with real load applied to the system
- Simulation of power failure and checkup of the battery array
- Tests on systems for interfacing and communicating with the outside world

### CHECK OF INSTALLATION

- Inspection of the entire equipment and control of cabling
- Inspection of battery connections
- Compliance with local security standards and regulations
- Dimensioning of protective equipment
- Check of neutral line and star centre

### INSTRUMENTAL SURVEYS AND CHECKS

- Technical checks carried out with certified instruments
- Operation test of the entire system

#### Why choose commissioning by MTS Elettronica:

- Certainty of correct operation of the equipment
- Technical training of its staff
- Longer service life of the system
- Ad-hoc parameterizations for each type of use
- Specific technical advice
- Possibility of warranty extension

## COMMITMENT TO BATTERIES

Replacing batteries is a matter of security and is a crucial investment to protect a system. The battery is a main component of the system. It can only be replaced by the manufacturer. Thanks to MTS Elettronica's battery replacement programme, you can be sure that only batteries that have been tested and approved for your system will be used.

MTS Elettronica offers durable and reliable batteries at the best price. Building on the experience gained from the numerous systems installed and through collaborations with leading companies in the sector, we ensure your security and that of your investments in technology.

## OUR SERVICES

### BATTERY REPLACEMENT

This includes replacing the batteries on site and putting them back into service. This service ensures compliance with the relevant technical and environmental specifications.

## CONSULTING

Analysis during an inspection, followed by a project that takes into account your requests. This includes a diagnosis and inspection of the batteries. Let our team of technicians advise you. They have extensive experience in the field of batteries and the equipment connected to them.

## QUALITY AT THE FOREFRONT

MTS Elettronica uses specific batteries for each system, with a 12-month warranty. We offer you complete installation and replacement of your old battery system, including professional removal and disposal. This spares you unplanned investments and ensures the highest possible performance from your system.

## AFTER-SALES SERVICE

MTS Elettronica offers various types of service able to satisfy additional requests both in technical and economic terms. Our contracts offer the most effective protection for your installations. In addition, unnecessary costs from unplanned failures and downtime are avoided. MTS Elettronica service contracts include prompt and professional telephone support, a preliminary inspection and response time tailored to your requirements, as well as material costs and working hours in the event of malfunctions depending on your critical applications and investment plan.

## FOCUS

- Service contracts for installed rectifiers and UPSs
- Joint planning of intervention dates
- Contracts even at the end of the warranty period
- Service contracts tailored to individual needs

## SOLUTIONS

	BASE	MIDDLE	PROFESSIONAL
Years	1 year	3 years	5 years
Periodic checks Annual	1	1	1
Corrective actions			●
ELECTRONIC spare parts		●	●
Software updates	●	●	●
Spare parts priority	●	●	●
Priority technical assistance	●	●	●

## ADVANTAGES

- Guaranteed response times
- Optimised working time
- Reduced downtime costs and cost-optimized support
- Efficient on-site support by qualified personnel
- System historical data recording
- Technical service reports
- Guaranteed exclusive use of original spare parts
- Use of certified measuring instruments

# PRODUCT LINE DC CURRENT

SINGLE BRANCH RECTIFIER IGBT TYPE COMPACT ECOLINE RCK5U.....	04
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# NOTES

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# MTS Elettronica

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**SOLUTIONS FOR ENERGY**

