

FAC-QP23

DIGITAL SWITCH MODE POWER SUPPLIES

GENERAL INTRODUCTION TO QP23 SERIES

- The new generation of Digital Switch Mode Power Supplies **FAC series QP23**, has been designed and is manufactured by SALICRU ELECTRONICS to assist and to give solutions to the DC voltage control and power needs raised in very diverse applications.
- The **FAC series QP23** contributes to the ideal solution for the AC to DC voltage transformation needs, by means of a filter, a rectifier and a control process with the end result of an optimal voltage, in accordance to the particular needs of each application.
- The paralleling feature of the series, and its capacity to store energy through the batteries with a high autonomy capability, turns the **FAC series QP23** into a range of products highly adequate for different applications for top technology.

MAIN APPLICATIONS



The SALICRU ELECTRONICS **FAC series QP23** has been designed to meet the highest level of specification, where utmost reliability, safety and efficiency is required. This equipment offers many advantages and benefits in a wide range of applications where AC mains supply needs to be converted to DC voltage.

Suitable applications:

- Telecommunication system (broadcasting and re-emitting system of radio and TV, GSM mobile telephone, communication and transmission networks).
- Emergency lighting supply system (operating rooms, large commercial surfaces, parking, etc.)
- Signalling, control and command centres.
- Central units for telephone distribution.
- Electrically operated valves.
- Starting of generating sets.
- Support and complement on solar energy applications.
- Converter's supply.
- Performance on connecting/releasing switches for medium and high voltage distribution circuits.



ENT CONFIGURATIONS, NTERFACE AND COMMUNICATIONS

ONS:

ack (V), available in versions 5PV, 10PV
y default, all the modules are
ease hot-swapping without interrup-

b-rack (H), available in versions 5PH,
H and 50PH. By default, all the hori-
les can be easily swapped via termi-
ear panel.

e has been designed to be easily
DIN 41494 rack frames.

ufactured and delivered as a comple-
with built-in battery group.

ets to accomodate the batteries, or
tching battery cabinets are available
st.

operation allows the design of redun-
s.

ects undertaken.



USER INTERFACE AND COMMUNICATIONS:

Indicators and control elements are placed on the
front panel, showing:

- LCD display:
Output voltage, output current, battery charge
current, temperatures, alarms and calibrations.
- Visual:
Discharge, float, alarm, ON/OFF.
- Relay interface:
Rectifier's failure, line present, discharge, end
of autonomy alarm, utilisation minimum voltage.
- Optocouplings:
Shutdown.

INTRODUCTION TO PERFORMANCE

The **FAC series QP23** con-
sists of an AC input voltage
transformation - previously
conditioned by means of a
line filter - into a fully trans-
formed, rectified and contro-
lled DC voltage.

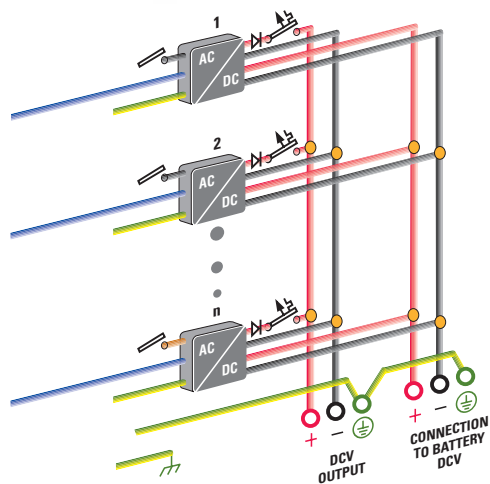
Through the fast action of high
performance transistors, and star-
ting from 385 volts DC, a DC/DC in-
verter generates AC voltage at 40 kHz.

This is then rectified using high speed di-
odes and conditioned by means of an efficient
filter system.

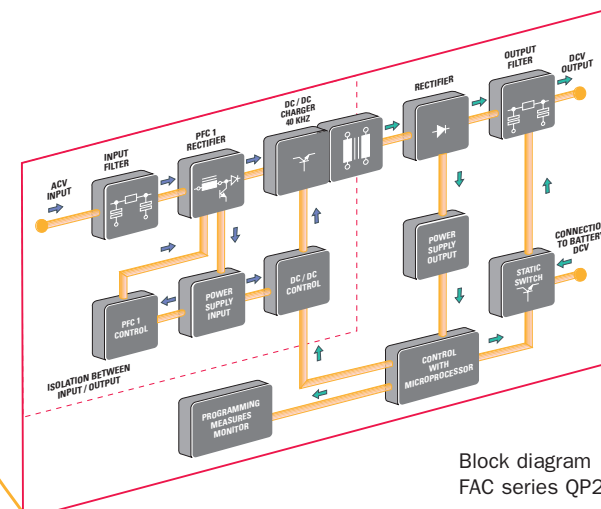
Input and output are separated using a galvani-
cally isolated power transformer, which reduces
the AC voltage to the level required to generate
the final DC voltage.

The output voltage and current are PWM contro-
lled by the transistors placed on the primary
wiring of the transformer.

A static switch located on the output of the **FAC
series QP23** disconnects the battery (where fit-
ted) when it reaches its minimum allowable voltage.
The most critical parameters of the power supply
are controlled via a last generation microprocessor.
The powerful control system manages all adjust-
ments and measurements that are simultane-
ously displayed through the LCD panel.



General schematic of Power
Supply in parallel with internal
static switch on each supply.



Block diagram
FAC series QP23.

SPECIAL FEATURES

TECHNICAL DATA BY MODULE

Power factor	1
Nominal current	Depending on the model.
Efficiency	> 90%.
Frequency	50 / 60 Hz.
Protection	By fuses.
Output :	
Voltage	12,24,48,60,110,125,220 DCV.
Accuracy	+/- 0.1% (with charged batteries).
Ripple level	< 20 mVpp.
Rated power	Depending on the model.
Nominal current	Depending on the model.
Autonomy (if needed)	To be determined.
Structure :	
Single and three phase	SMPS* (PWM) with PFC*.
Protections	Against 5 kV peaks. (8/20 µs pulses).
Batteries :	
Type	Lead-acid, maintenance free. Ni-Cad (optional).
Type of charge	I/U constant.
Charge current	0,1 C. (adjustable).
Time to recharge	Up to 80% in 4 hours.
Protections	Over-under voltages.
General :	
Dielectric strength	3.000 ACV 1 min.
Protection level according to UNE 20 324 78 IR Standard	IP 20.
Insulation	> 10 MΩ
Audible noise at 1m.	< 40 dB.
Ventilation	Natural.
Operating temperature	0 to + 40°C.
Storage temperature	- 20 to + 40°C.
Relative humidity	Up to 95% non condensing.
Max. working altitude	Sea level to 2.400 m.
MTBF	60.000 hours.
MTTR	30 min.
Compliance to standards	EN 61204 (1995). IEC 1204-3 (Future EN 61204-3). EN 41003.
Indicators :	
LCD display	Output voltage, output current, output power, battery charge current, temperatures, alarms and calibrations.
Visual	Discharge, float, alarm, ON/OFF.
Relay interface	Rectifier's failure, line present, discharge, end of autonomy alarm, minimal utilisation voltage.
Optocouplings	Shutdown.
Serial port	RS-485 or RS-232C. *SMPS (switch mode power supply) *PFC (power factor correction)

- High efficiency, resulting in greater economy.
- High accuracy, level of response, very valuable in

The following features make the **FAC series QP23** the ultimate in Digital Switch Mode Power Supplies:

- critical applications.
- Wide power range, thanks to the redundant parallel connection capacity, adjusting the investment down to the actual needs.
- Complying with EMC (Electromagnetic Compatibility) standards.
- Shortcircuit permanent protection, increasing its safety level.
- Excellent dynamic performance.
- High power factor (1), which increases the installation efficiency.
- Low ripple level.
- Low starting current.

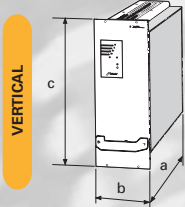
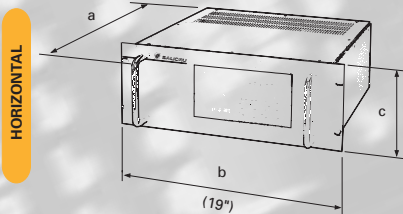
One of the advantages of the SALICRU ELECTRONICS **FAC series QP23** is the total independence of its modules, allowing each one to be “intelligent” by itself.

OUTPUT TECHNICAL FEATURES

Nominal voltage (DCV)	Floating voltage (DCV)	Current (A)			
		5PV/5PH	10PV/10PH	20PV/20PH	50PH
12	13,75	18	25	75	180
24	27,50	18	25	75	180
48	55	12	18	36	91
60	68,75	8	14,50	29	73
110	123,75	6	8	16	40,50
220	247,50	3	4	8	20

(*) For other voltages, powers or specifications, please consult.

DIMENSIONS

Version	Format	Dimensions (*) a x b x c (mm)
	5PV	340x72,50x266,70 (6u)
	10PV	340x110x266,70 (6u)
	20PV	475x145x400 (9u)
	5PH	425x482,60x66,70 (1,50u)
	10PH	425x482,60x88 (3u)
	20PH	525x482,60x132,50 (3u)
	50PH	525x482,60x177 (4u)

(*) Dimensions include handles and terminals.

CENTRALISED AND INTELLIGENT CONTROL SYSTEM

The setting up of a new module in parallel, does not require any additional element.
Should you want to have an exhaustive control of the rectifier's assembly or even of the room where the supply or associated elements are installed, as an option, it is possible to set up a centralised intelligent control module.
The setting up of the MS-101 Centralised intelligent Control System enables controlling of all the connected modules and the communication with a personal computer via serial interface, which, with the proper software, allows to control, to acknowledge alarms, to program and to control the system as a sole and intelligent set.

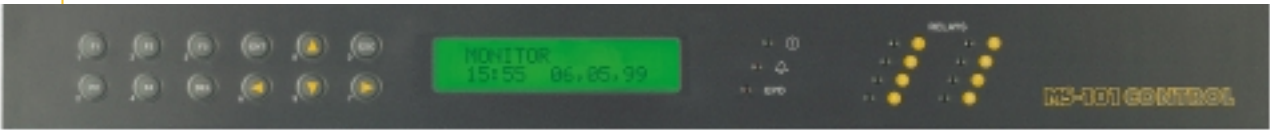
The MS-101 control system permits to carry out the following measurements and alarm controls:

Input measurements

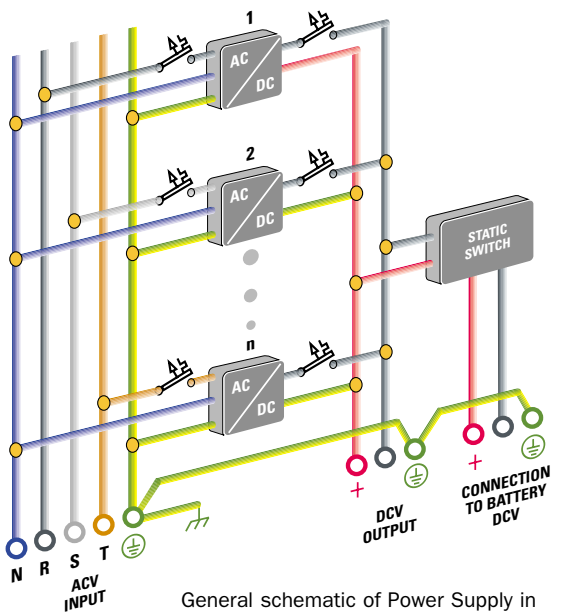
- Input voltage 1: Phase to phase and phase to neutral.
- Input voltage 2: Phase to phase.
- Current.
- Apparent power (VA) : By phase and total.
- Actual power (W): By phase and total.
- Power factor.

- Low output voltage.
- High output current.
- High battery temperature.
- High environment temperature.
- High FAC cabinet temperature

The alarms of the mentioned MS-101 module can be configured by the user according to the needs of



- Frequency.
- ### Battery measurements
- Voltage.
 - Charge current.
 - Discharge current.
- ### DC output measurements
- Voltage.
 - Current.
- ### Temperature measurements
- Battery temperature.
 - Environment temperature.
 - FAC cabinet temperature.
- ### Alarms
- High mains voltage.
 - Low mains voltage.
 - Mains frequency out of range.
 - High battery voltage.
 - Low battery voltage.
 - High battery charge current.
 - High battery discharge current.
 - High output voltage.



General schematic of Power Supply in parallel with external general static switch.

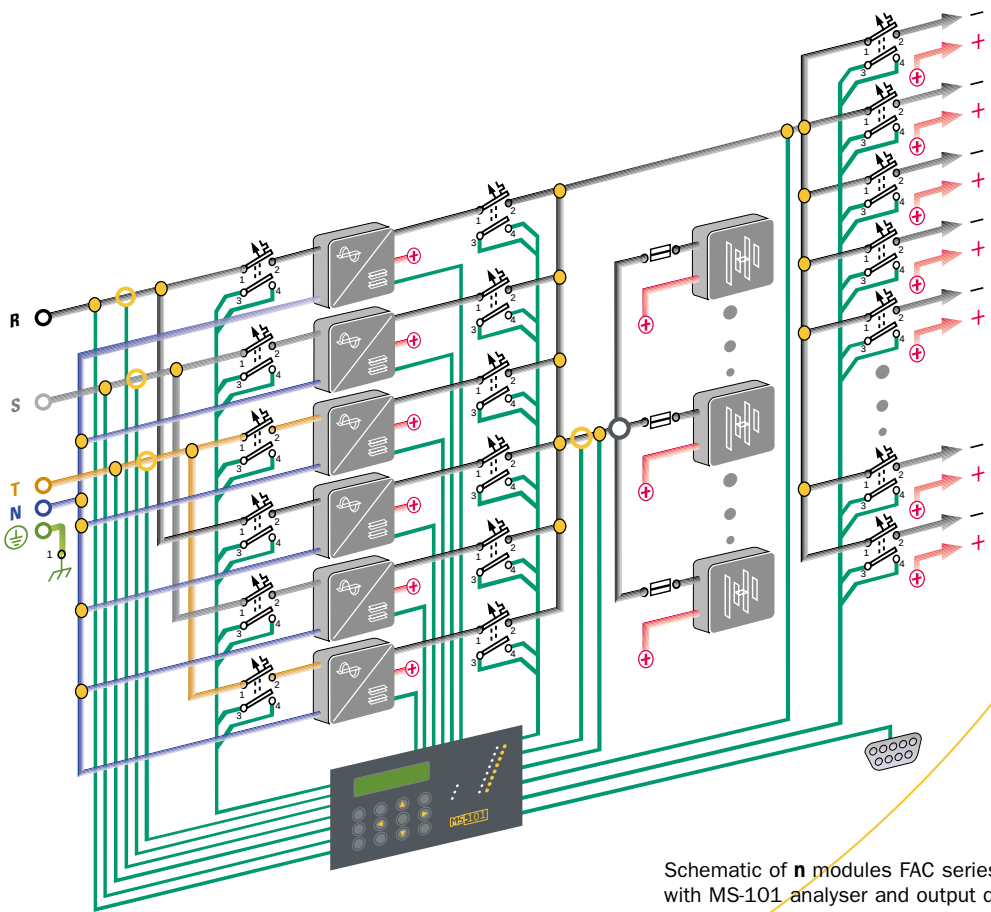
each installation. This flexible tool can be used to inform users of the urgency or the degree of importance when a tripping takes place.

The activation of 8 relays, programmable by means of logic language is responsible for indicating the equipment's status; such activation is achieved from the keyboard, by introducing a logic equation for each relay to be activated, recognising the alarms by numbers and allowing the use of logic operators AND ('&'), OR ('+'), NOT ('/'), Brackets ('(',')') and end of programming operator ('#').
Practical example : $RL2 = 8 + 17 + (18\&/22) \#$
Translating the numbers to the corresponding alarm, the programming equation would be :
 $RL2 = LIV + ALO + (AL1 \&/ AL5)$

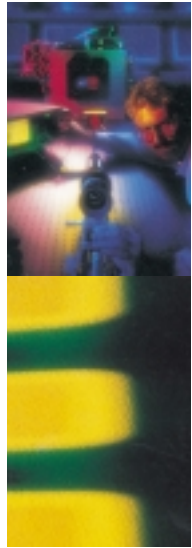
The RL2 will be activated by low input voltage (LIV), or when the alarm N° 0 is activated (ALO) or because the alarm 1 (AL1) trips while the alarm N° 5 (AL5) is not activated.

It is also possible to incorporate these equations and the status of the relays, as well as to validate the equations within a time table, by introducing the 'ON' and 'OFF' time.

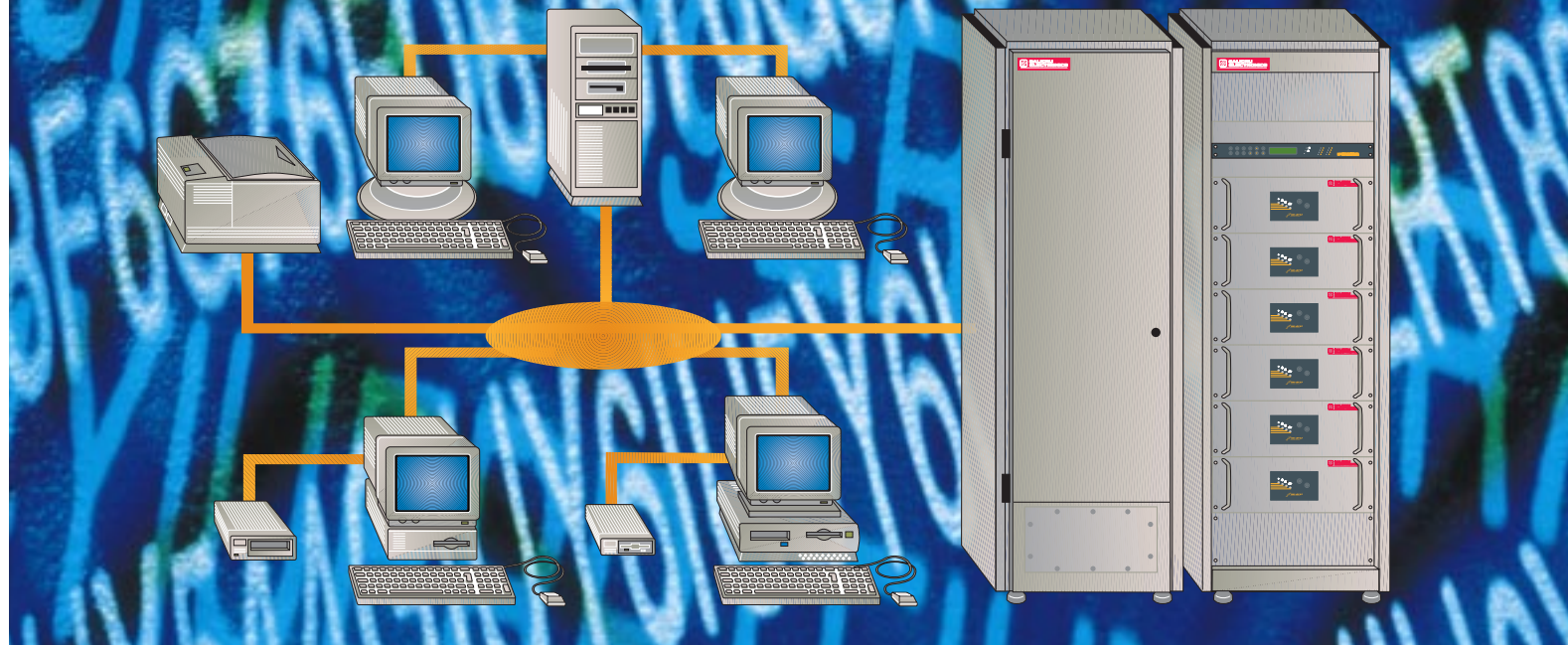
The Digital Switch Mode Power Supplies by SALICRU ELECTRONICS allows for serial communication via the RS-232C or RS-485 depending on the type of



Schematic of n modules FAC series QP23 with MS-101 analyser and output distribution frame.



SERIAL COMMUNICATION

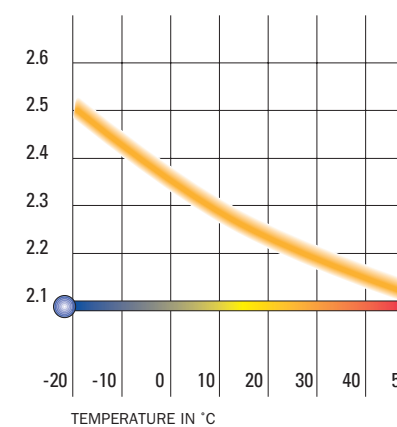


The Digital Switch Mode Power Supplies by SALICRU ELECTRONICS allows for serial communication via the RS-232C or RS-485 depending on the type of application it is devoted to. The RS-232C communication port is more adequate for those occasions where it is intended to establish a dialogue between a **FAC series QP23** and any type of computer system. We call this communication "point to point". To establish a dialogue with several **FAC serial QP23** units, the corresponding communication channels are needed on the mainframe.

When the number of **FAC serial QP23** to be controlled increases, it is more adequate to use the RS-485 channel consisting of a multi-point communication, which travels on a differential "twisted pair" structure, generally operating within a MASTER - SLAVE communication protocol.

The MASTER would be the computer which should incorporate the RS-485 interface, and the SLAVE would be the different **FAC series QP23** units, each of them with a RS-485 interface and a specific address.

CHARGE VOLTAGE BY ELEMENT (V)



BATTERIES



COMPLIANCE TO STANDARDS

ISO 9001 QUALITY ASSURANCE SYSTEM

EN 61204 (1995)
DC low voltage power supplies.
Operating features and safety requirements.

IEC 1204-3 (Future EN61204-3)
DC low voltage power supplies.
EMC product standard.

EN 41003
Particular safety requirements for equipment to be telecommunication n

The Digital Switch Mode Power Supplies **FAC series QP23** by SALICRU ELECTRONICS accepts any type of battery. The floating voltage of the batteries can be adjusted automatically to suit the curve recommended by the manufacturer when environmental temperature and performance varies, thereby increasing the batteries working life.





RANGE OF PRODUCTS

- UNINTERRUPTIBLE POWER SUPPLY - UPS
- STATIC INVERTERS
- FREQUENCY INVERTERS FOR THREE PHASE INDUCTION MOTORS
- STATIC SOFT STARTERS FOR THREE PHASE INDUCTION MOTORS
- VOLTAGE STABILISERS AND POWER LINE CONDITIONERS
- STABILISER - DIMMER FOR LUMINOUS FLUX
- BATTERY CHARGERS
- CCTV POWER SUPPLIES
- VARIABLE TRANSFORMERS



**DIGITAL SWITCH MODE
POWER SUPPLIES
FAC SERIES QP23**