

PROTECT RCS MIP_E NEW GENERATION

Modular switch-mode
industrial applications rectifier



State of the art switch mode technology, N+1 redundant Protect RCS MIP_E rectifier system is designed to be scalable, simple to use and easy to maintain with hot swappable rectifier modules. It allows you to benefit from low electromagnetic pollution and high efficiency, resulting in a cost effective system with reduced operating costs, short delivery time and prepared for possible future power expansion.

Typical applications

- Power generation
- T & D
- Oil & Gas
- Petrochemical and chemical
- Heavy industry
- Mining industry
- Transportation and signaling

FEATURES

- Compact design and light weight
- High power density
- Low input current harmonics and high power factor, high efficiency
- High availability with N+1 redundancy of rectifier modules
- Low MTTR due to modular design
- Low DC voltage ripple for an optimized battery life time
- Power increase possibility on site
- Digital processing and setting of all parameters
- Monitoring of all parameters via the front panel display (touch screen available as option)
- Built-in intelligent battery management
- Temperature-compensated charge voltage regulation
- Manual or automatic high rate charge
- Alarm- and event logger, with a date and time-stamped event log memory
- Large communication facility options
- Inbuilt programable logic control to provide a wide range of interaction possibilities with external systems
- 19" battery charger subrack versions for integration inside cabinet as ready to use solution

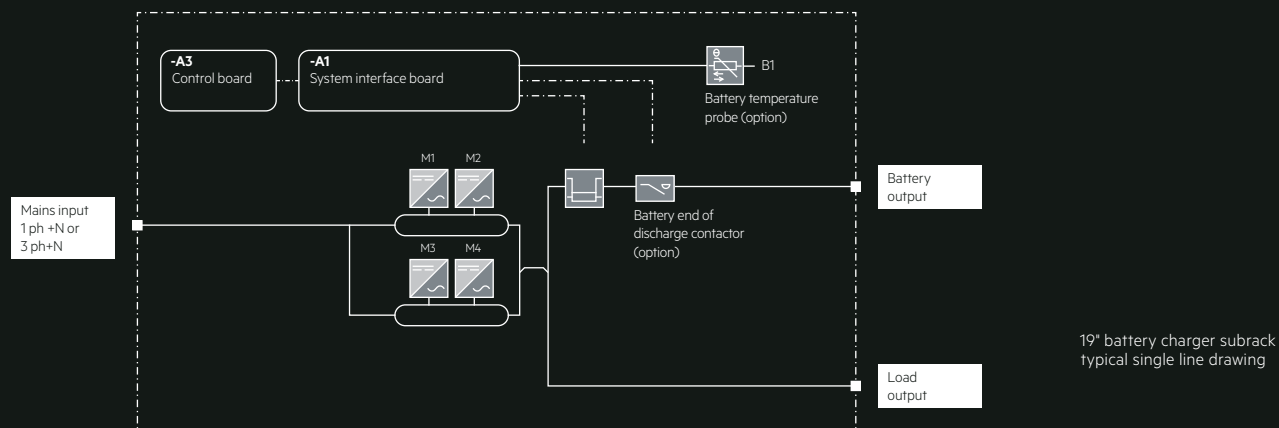
BENEFITS

- Existing pre-defined configurations to permit reduced lead times
- Highly customizable with a fully comprehensive option list and fully flexible design
- Compatible with all industrial battery types including gas recombination, with easy parameter adjustment
- Reduces capital and operational expenses (CAPEX & OPEX)
- Ease of installation, start-up & maintenance, low Mean Time To Repair (MTTR)
- International service support



Configured rectifier system specification

SYSTEM	24 V	48 V	110 /120 V	220 V
INPUT				
Nominal input voltage	230 V single phase $\pm 20\%$ ($+20\%$ -60% functional) or 400 V three phase with neutral $\pm 10\%$ ($+15\%$ -20% functional)			
Frequency	50 Hz or 60 Hz, $\pm 5\%$			
Current consumption	Depends on configuration			
Inrush current	1.5 nominal peak current			
THDI	$< 5\%$			
Power factor	0.99			
OUTPUT				
Output voltage	24 V	48 V	110 /120 V	220 V
Maximum output current	1200 A	1200 A	1200 A	900 A
Voltage range	20 – 29 V	40 – 58 V	91 – 145 V	182 – 260 V
Commissioning voltage	33 V	66 V	166 V	302 V
System earth	Floating/positive or negative output connected to earth			
Static voltage regulation	$< 1\%$			
Dynamic voltage regulation	Load change 10 – 90 %, 90 % – 10 % – deviation 5 %			
Current regulation	0 to $+6\%$			
Ripple voltage	Max. 0.2 % rms of nom. DC voltage, provided battery Ah capacity is 5 times the charger nom. rating (battery connected) Max. 0.2 % rms typical (max. 5 %) on rectifier output, battery not connected			
MANAGEMENT				
Common alarm connection	1 Form C relay contact – Rating 60 VAC @ 2 A, 24 VDC @ 2 A & 60 VDC @ 0.1 A			
Control panel	Multi-functional LCD with 2 LEDs indicate the system status			
PROTECTION				
Input/battery/load	Depending on configuration			
Soft start	Yes			
Protection	The rectifier has built-in protection functions against short circuit, over and under AC input voltage, over and under DC output voltage as well as high temperature			
Decoupling fuse	Yes – within rectifier			
MECHANICAL				
Degree of protection	Standard IP21, optional IP43 (other protection as option)			
Equipment color	RAL 7035, powder coated, textured paint (special colors as option)			
Dimensions (H x W x D) & weight	Output current ≤ 500 A: 2000 x 600 x 800 mm or 2000 x 900 x 800 mm depending on DC voltage and options integrated Output current > 500 A: 2000 x 900 x 800 mm or 2000 x 1200 x 800 mm depending on DC voltage and options integrated (other cabinets as option), weight depends on configuration			
Acoustic noise @ 1 m	≤ 65 dBA – depends on the system output power			
Connections	Bottom (top cable as option)			
ENVIRONMENTAL				
Type of cooling	Rectifier modules are forced air cooling with electronic speed control			
Operating temperature	0 °C to $+40$ °C with a de-rating of 1.25 % / °C between 40 °C and 55 °C			
Storage temperature	-25 °C to $+70$ °C			
Operating humidity	10 % to 95 % R H non-condensing			
Installation height	0 to 1000 m – de-rating @ 1 % per 100 m above 1000 m up to 3000 m			
STANDARDS				
Safety	EN 60950-1			
EMC	EN 55022 Level B, EN 61000.6-1,2,3,4, EN 61000.3-2, EN 61000.3-3, EN21000, IEC 60146-1-1 Class B 2kV			
Environment	ROHS			
Approvals & certification	CE			



19" battery charger subrack

SYSTEM	24 V	48 V	110/120 V	220 V
INPUT				
Nominal input voltage	230 V single phase $\pm 20\%$ ($+20\%$ -60% functional) or 400 V three phase with neutral $\pm 10\%$ ($+15\%$ -20% functional)			
Frequency	50 Hz or 60 Hz, $\pm 5\%$			
Current consumption	8 kW – 4 rectifier subrack 16 kW – 8 rectifier subrack			
Inrush current	1.5 nominal peak current			
THDI	$< 5\%$			
Power factor	0.99			
Mains connections	Integrated mains terminal block compatible for single phase and three phase + neutral mains			
OUTPUT				
Maximum output current	8 kW – 4 rectifier subrack 16 kW – 8 rectifier subrack	200 A 400 A	160 A 320 A	64 A 128 A
Voltage range	20 – 29 V	40 – 58 V	91 – 145 V	182 – 260 V
Commissioning voltage	33 V	66 V	166 V	302 V
System earth	Floating/positive or negative output connected to earth			
Static voltage regulation	$< 1\%$			
Dynamic voltage regulation	Load change 10 – 90 %, 90 % – 10 % – deviation 5 %			
Current regulation	0 to $+6\%$			
Ripple voltage	Max. 0.2 % rms of nom. DC voltage, provided battery Ah capacity is 5 times the charger nom. rating (battery connected) Max. 0.2 % rms typical (max. 5 %) on rectifier output, battery not connected			
Output connections	Power connection to DC load and to battery through battery shunt			
MANAGEMENT				
Common alarm connection	1 Form C relay contact – Rating 60 VAC @ 2 A, 24 VDC @ 2 A & 60 VDC @ 0.1 A			
Control panel	Multi-functional LCD with 2 LEDs indicate the system status (delivered loose with a 2m cable for cabinet front door installation)			
PROTECTION				
Input/battery/load	To be installed separately in the cabinet			
Soft start	Yes			
Protection	The rectifier has built-in protection functions against short circuit, over and under AC input voltage, over and under DC output voltage as well as high temperature			
Decoupling fuse	Yes – within rectifier			
MECHANICAL				
Degree of protection	Standard IP20 from front after integration inside cabinet			
Equipment color	RAL 7035, powder coated, textured paint (special colors as option)			
Dimensions (H x W x D) & weight	19" compatible width – Front face height : 4U (177.8 mm) for 8 kW rack / 5U (222.3 mm) for 16 kW rack			
Acoustic noise @ 1 m	≤ 65 dBA			
Connections	At the back of the rack			
ENVIRONMENTAL				
Type of cooling	Rectifier modules are forced air cooling with electronic speed control			
Operating temperature	0 °C to $+40$ °C with a de-rating of 1.25 %/°C between 40 °C and 55 °C			
Storage temperature	-25 °C to $+70$ °C			
Operating humidity	10 % to 95 % R H non-condensing			
Installation height	0 to 1000 m – de-rating @ 1 % per 100 m above 1000 m up to 3000 m			
STANDARDS				
Safety	EN 60950-1			
EMC	EN 55022 Level B, EN 61000.6-1,2,3,4, EN 61000.3-2, EN 61000.3-3, EN21000, IEC 60146-1-1 Class B 2kV			
Environment	ROHS			
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Protect RCS MIP_E new generation configured system

STANDARD SYSTEM

The Protect RCS MIP_E configured system has been pre-configured with a number of the most commonly requested features built-in as standard. These systems are available "off-the-shelf" with standard drawings and standard user documentation.

- Single system
- Input voltage configuration 1 or 3 phase +N
- Internal rectifier input switch Q1
- 19" sub-rack with up to 100 hot swappable rectifier modules
- Digital control card
- Multi-functional LCD display with 2 LEDs indicate the system status
- Tropicalized control electronics boards
- Common fault remote alarm
- Floor mounted cabinet with protection IP21
- Cabinet color RAL 7035
- Power and control cable marking
- Detailed 3-D layout and component marking presented on rear door
- 180 degrees swing door with three points key lock
- Bottom cable entry
- Input/battery/output terminals
- Standard labeling/nameplate
- Low smoke – halogen free wires and cables

OPTIONS

The standard system can be enhanced by additional options. The system specific drawing packages and user documentation will be automatically generated to reflect the actual option configuration.

To provide exact solutions for each application, we offer a wide range of options:

Protections

- AC Input – switch, fuses, breakers
- Input contactor with external door switch
- DC Load – switch, fuses or breakers, including AC and DC distribution panels/cabinets
- Inverters and converters for alternative AC and DC outputs
- AC and DC surge arrestors

Alarms/Signaling/M Measurement

- Touch screen with system synoptic
- Relay card (8 free contacts each), LED Box
- Alarms on protection devices
- Analog meters for AC and DC measurements
- Remote commands via analog and digital inputs, eg. boost charge, battery room fan, remote shutdown
- High rate interlock (automatic and manual)
- Battery cell fault alarm
- Independant protection system to limit hydrogen emission (NFC15-100)

Communication

- RS232/RS485 interface
- RS232/RS485 Modbus protocol
- TCP/IP interface
- Protocol converters (Profibus DP, J-bus DNP3, IEC 61850)
- Monitoring and management software
- Modem

Battery options

- Battery protection – switch, fuses, breakers
- Low Voltage Disconnect (LVD)
- Battery shunt or hall effect sensor for battery measurement
- Matching battery cabinets
- Battery temperature probe

Mechanical options

- IP43 protection cabinet
- Anti-condensation heater
- Interior light
- Special color
- Special markings

Additional options are available upon request.

AEG Power Solutions

Approach your local AEG Power Solutions representative for further support. Contact details can be found on: www.aegps.com