AEG

POWER SOLUTIONS

PROTECT RCS SPRE/TPRE

Thyristor controlled industrial rectifier & battery charger

The Protect RCS DC system has been developed and designed to provide high reliability power supply and battery charging capability. The Protect RCS DC system is a thyristor-controlled rectifier suitable for charging nickel-cadmium or lead-acid batteries while supplying DC loads. It can also be used without batteries as a direct power supply.

The rectifier is built from independent building blocks and can be equipped with optional items such as distribution boards, diode droppers etc. built inside or in a separate cubicle.

The cabinets are floor mounted and can be designed to meet specific environmental requirements. The batteries are mounted in free-standing racks or in cabinets together with or separated from the rectifier.

Typical applications

- Power generation
- Transmission & Distribution
- Oil & Gas
- Petrochemical and chemical
- Heavy industry
- Mining industry
- Transportation and signalling

FEATURES

- Input isolation transformer, isolated DC output with built-in earth fault detection
- Standard system configurations
- Heavy industrial duty design
- Building block modular design
- Built-in protection
- Digital processing and setting of all parameterssww
- Monitoring of all parameters via the front panel display
- Built-in intelligent battery management
- Temperature-compensated charge voltage regulation
- Manual or automatic high rate charge
- Parallel operation for redundancy and power increase
- 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

BENEFITS

- Existing pre-defined configurations to permit reduced lead times
- Highly customizable with a fully comprehensive list of options and fully flexible design
- Compatible with all industrial battery types including gas recombination, with easy parameter adjustment
- Field proven high reliability with microprocessor-controlled thyristor technology
- Ease of installation, start-up & maintenance, low Mean Time To Repair (MTTR)
- International service support

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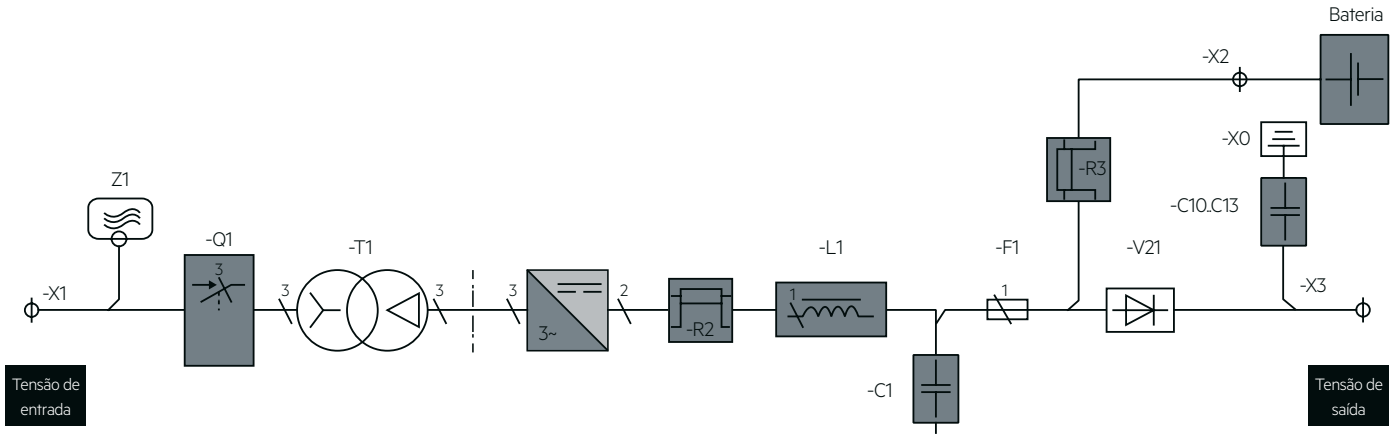
STANDARD SYSTEM

The Protect RCS range of systems has been preconfigured 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.

Standard configuration

- Single system with building block modular design
- Internal rectifier input switch Q1
- 6-pulse rectifier bridge with input isolation transformer
- Digital control card
- DC ripple voltage <5 % RMS without battery
- Internal protection fuse and rectifier shunt R2
- Blocking diode V21
- Multi-functional LCD with 2 LEDs indicates the system status
- Natural cooling for rating up to 50 A
- Tropicalized control electronic boards
- Low smoke – halogen free wires and cables
- Common fault remote alarm
- Floor mounted cabinet with external IP21 protection and IP20 with open doors
- Cabinet color RAL 7035
- Power and control cable marking
- Detailed 3-D layout and component marking presented on rear door
- Door able to open to 180° with 3-points key lock
- Bottom cable entry
- Input/battery/output terminals X1, X2 and X3
- Standard labeling/nameplate



OPTIONS

The standard system can be enhanced by many additional options. System specific drawing packages and user documentation will be automatically generated to reflect the actual options as configured.

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

System
- Parallel redundant configuration with load sharing
- Special mains input voltages (180 – 690 V) and frequency 60 Hz
- DC ripple filter 1 % & 0.1 %
- 12 pulse rectifier with isolation transformer
- Rectifier input MCB or fuse
- Battery MCB, fuse or switch in rectifier
- Battery MCB or fuse box
- Load MCB, fuse or switch
- Diode dropper
- DC distribution
- Battery installed inside the rectifier cabinet, running together
- Automatic transfer switch and changeover systems

Alarms/signaling/measurement
- LED alarm indicators in front panel
- Relay cards (8 free contacts each)
- Additional analog meters
- Low electrolyte level alarm
- Audible alarm
- Temperature charging compensation sensors & cables
- Temperature alarm
- High DC ripple voltage alarm
- Cable drop compensation
- Battery circuit failure alarm
- Ground fault alarm
- High rate interlock (automatic and manual)
- Battery cell fault alarm
- Independant protection system to limit hydrogen emission (NFC15-100)
- Battery capacity and connection tests

Control options
- Remote rectifier shutdown command
- Remote forced floating charge command
- Remote room fan control
- Remote alarm reset
- Remote high rate charge command
- Other control features available depending upon customer requirements

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

Mechanical
- Interior cabinet light, AC single phase socket & cabinet heater
- Protection up to IP54
- Special color
- Vermin proof protection plates
- Special markings
- Top cable entry
- Air filters at air inlet
- Ventilation 100 % redundant or natural
- cooling

Additional options are available upon request.

Specifications

INPUT	
Nominal input voltage	Single phase (SPRE) 220 V/230 V/240 V ±10 % (+15 % – 20 % functional) Three phase (TPRE) 380 V/400 V/415 V ±10 % (+15 % – 20 % functional)
Frequency	50 Hz or 60 Hz, ±6 %
Power factor	Single phase system (SPRE) ~ 0.67/Three phase system (TPRE) ~ 0.81
Overvoltage category	OVC III acc. to IEC62477-1
Ground scheme	IT, TN, TT
THDI	Typical single phase <45% - three phase 6 pulse <25% - three phase 12 pulse <10%
OUTPUT	
Voltage (UDC)	24, 48, 60, 110, 125, 220 VDC
DC voltage settings range	Floating charge – 75 % – 125 % of UDC nominal at full load and nominal mains voltage (±10 %) High-rate charge – 75 % – 135 % of UDC nominal at full load and nominal mains voltage (0/+10 %) Commissioning charge – 75 % – 140 % of UDC nominal at half load and nominal mains voltage (0/+10 %)
Static voltage regulation	±0.5 % at float voltage, 0 – 100 % DC load variations, input nominal voltage ±10 %, frequency ±6 %, temp. range 0 °C to +40 °C
Dynamic voltage regulation	10 – 100 %, 100 % – 10 % load step – deviation 15 % - recovery 100ms typical
DC ripple voltage	<2 % rms of UDC nominal with battery connected (standard battery capacity 5 x nominal current) 2.5 % rms typically (max 5 %) of UDC nominal battery not connected
DC current	According to range
Current settings range	0 – 100 %
DC current regulation	0 /+2 % of current limit
Long-term stability	0.15 % per 1000 hrs
Temperature coefficient	<0.02 % per °C
Charging characteristic	Constant current/constant voltage (I/U as per IEC 478-1) during float charge
Insulation resistance	>200 MΩ / 500 VDC
Input/output isolation	2,500 V AC between input/output and electrical earth
MECHANICAL	
Degree of protection	IP21 according to IEC 60529
Equipment color	RAL 7035, powder coated, textured paint
Dimensions & weight	According to range
Acoustic noise @ 1 m	45 – 65 dB(A)
Connections	Bottom
ENVIRONMENTAL	
Type of cooling	Natural convection or fan forced cooling depending on output power and IP protection
Operating temperature	-10 °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 1,000 m – de-rating @ 1 % per 100 m above 1,000 m up to 4,000 m
Seismic	BELLCORE GR-63-CORE issue 1 for Zone 1, Zone 2, Zone 3 and Zone 4
Pollution degree	Grade 2 acc. to IEC60664-1
STANDARDS	
Safety	IEC/EN 60529, IEC 60146-1-1
EMC	IEC/EN 61000-6-2, IEC/EN 61000-6-4
Performance	IEC/EN 60146-1-1, IEC/EN 62040-5-3
Approvals & certification	CE marking, NFC58-311 (gas recombination battery)

PROTECT RCS	**SPRE – SINGLE PHASE RANGE**			**TPRE – THREE PHASE RANGE**			
BATTERY VOLTAGE (VDC)	**24**	**48/60**	**110/125**	**24**	**48/60**	**110/125**	**220**
Output current (A)	25	25	25	25	25	25	25
	50	50	50	50	50	50	50
	75	75		75	75	75	75
	100	100		100	100	100	100
				150	150	150	150
				200	200	200	200
				300	300	300	300
				400	400	400	400
				500	500	500	500
				600	600	600	600
				700	700	700	700
				800	800	800	800
				1000	1000	1000	
				1200	1200	1200	

AEG Power Solutions

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

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