

# PROTECT RCS

## THYRISTOR CONTROLLED INDUSTRIAL RECTIFIER & BATTERY CHARGER

### Input:

220/230/240 VAC 1 phase  
380/400/415 VAC 3 phase

### Output:

24 VDC; 25 – 1000 A  
48 VDC; 25 – 1000 A  
110 VDC; 25 – 1000 A  
125 VDC; 25 – 1000 A  
220 VDC; 25 – 1000 A

AEG Power Solutions rectifiers assure permanent availability of all your global industrial applications including oil, gas & petrochemical, power generation, transportation and other infrastructure.

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 equipment like distribution boards, diode droppers etc. build 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.



### Features & Benefits

- » Standard system configurations
- » Heavy duty design
- » Proven microprocessor-controlled thyristor technology
- » Building block modular design
- » High MTBF and low MTTR
- » Built-in protection
- » Digital processing and setting of all parameters
- » 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
- » Alarm- and event logger, with a date and time-stamped event log memory
- » Ease of installation, start-up & maintenance
- » International service support

## PROTECT RCS – SYSTEM

### INPUT

Nominal input voltage	Single phase (SPRe) 230 V $\pm 10\%$ (+15% – 20% functional) Three phase (TPRe) 400 V $\pm 10\%$ (+15% – 20% functional)
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Frequency	50 Hz or 60 Hz, $\pm 6\%$
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Power factor	Single phase system (SPRe) ~ 0.67 / Three phase system (TPRe) ~ 0.81
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### OUTPUT

Voltage (UDC)	24, 48, 110, 125, 220 VDC
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DC voltage settings range	Floating charge – 75%–125% of UDC nominal at full load and nominal mains voltage ( $\pm 10\%$ ) 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%)
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Static voltage regulation	$\pm 0.5\%$ at float voltage, 0–100% DC load variations, input nominal voltage $\pm 10\%$ , frequency $\pm 6\%$ , temp. range 0°C to +40°C
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Dynamic voltage regulation	10–100%, 100%–10% load step – deviation 5%
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DC ripple voltage	<2% rms of UDC nominal with battery connected (standard battery capacity 5x nominal current) 2.5% rms typically (max 5%) of UDC nominal battery not connected (standard battery capacity 5x nominal current)
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DC current	According to range
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Current settings range	0–100%
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DC current regulation	0 / +2% of current limit
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Long-term stability	0.15% per 1000 hrs
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Temperature coefficient	<0.02% per °C
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Charging characteristic	Constant current/constant voltage (I/U as per IEC 478 1) during float charge
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Insulation resistance	>200 M $\Omega$ / 500 V DC
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Input/output isolation	2,500 V AC between input / output and electrical earth
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### MECHANICAL

Degree of protection	IP21 according to IEC 60529
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Equipment colour	RAL 7035, powder coated, textured paint
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Dimensions & weight	According to range
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Acoustic noise @ 1 m	45–65 dB(A)
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Connections	Bottom
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### ENVIRONMENTAL

Type of cooling	Natural convection up to 75 A / 220 V and top forced air ventilation with optional redundant n+1 fan
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Operating temperature	0°C to +40°C with a de-rating of 1.25% / °C between 40°C and 55°C
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Storage temperature	-25°C to +70°C
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Operating humidity	10% to 95% R H Non-Condensing
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Installation height	0 to 1,000 m – De-rating @ 1% per 100m above 1,000 m up to 3,000 m
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Seismic	BELLCORE GR-63-CORE issue 1 for Zone 1, Zone 2, Zone 3 and Zone 4 (systems max 500 kg)
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### STANDARDS

Safety	IEC/EN 62040-1-2
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EMC	IEC/EN 61000-6-2,-4 , IEC/EN 62040-1-2
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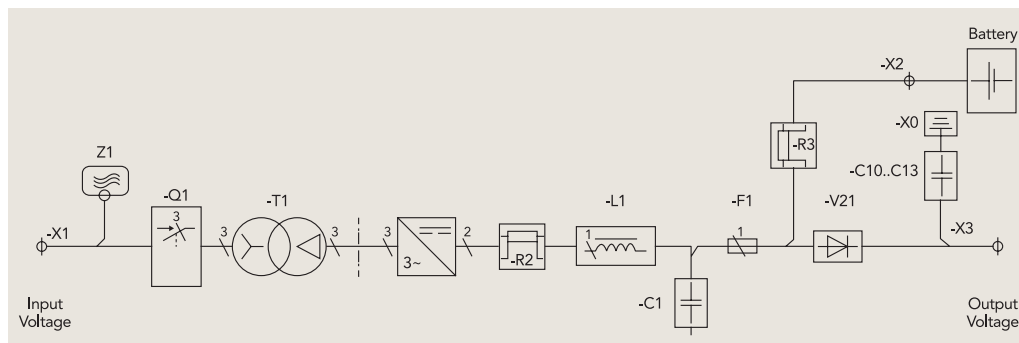
Performance	IEC/EN 62040-1-2, IEC 601146-1-1
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Approvals & certification	CE-Label, NFC 58-311
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## PROTECT RCS – SINGLE PHASE RANGE / THREE PHASE RANGE

BATTERY VOLTAGE (VDC)	SPRe – Single Phase Range			TPRe – Three Phase Range				
	24	48	110	24	48	110	125	220
Output Current (A)	25	25	25	25	25	25	25	25
	50	50	50	50	50	50	50	50
	75	75		75	75	75	75	75
	100	100		100	100	100	100	100
				150	150	150	150	150
				200	200	200	200	200
				300	300	300	300	300
				400	400	400	400	400
				500	500	500	500	500
				600	600	600	600	600
				800	800	800	800	800
				1000	1000	1000	1000	1000

## STANDARD CONFIGURATION AND OPTIONS



### 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 GCAU
- » Output filter L1-C1 ripple voltage <5% RMS without battery
- » Rectifier F1 fuse and rectifier shunt R2
- » Blocking diode V21
- » Multi-functional LCD with 2 LEDs indicate the system status
- » Tropicalized control electronics boards
- » Common fault remote alarm
- » Floor mounted cabinet with external IP21 protection and IP20 with open doors
- » Cabinet colour 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 three key locks
- » Bottom cable entry
- » Input/battery/output terminals X1, X2 and X3
- » Standard labeling/nameplate

### Options

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

#### Alarms/signaling/measurement

- » LED alarm indicators in front panel
- » Relay cards 2x8 free contacts
- » 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

#### Control options

- » Remote rectifier shutdown command
- » Remote forced floating charge command
- » Remote room fan control
- » Remote alarm reset
- » Remote high rate charge command

#### 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 colour
- » Vermin proof protection plates
- » Low smoke wiring (halogen-free)
- » Special markings
- » Top cable entry
- » Air filters at air inlet
- » Ventilation 100% redundant

Additional options are available on request.

# AEG POWER SOLUTIONS



## Batteries

AEG Power Solutions has considerable in-house knowledge in battery technology and is able to offer expert advice on the specifying, selection, operation and testing of batteries. Our total systems solutions include a wide range of products using lead acid and nickel-cadmium batteries in vented and gas recombination technologies. Replacement batteries can be supplied and installed by our global service team.

## Services

With over 60 years of expertise in power systems and solutions, AEG Power Solutions is renowned for its unparalleled services and technical support in critical application environments. As a world class system provider, you can rely on a global network of 20 services centers supported by over 150 field engineers and more than 100 certified service partners around the world. From the power solution selection to your process installation and commissioning, our certified experts go beyond your expectations by offering service excellence that will ensure the lowest operational cost for your mission-critical equipment. The reliability of your installed power solution is supported by a global service team renowned for its short response time and trouble shooting efficiency. Choosing one of the Pro Care™ preventive maintenance options gives you the ultimate peace of mind reassuring complete cost control, security and uninterrupted power supply in utmost critical situations.

You can also benefit from a full range of professional services that will protect and ensure the durability of your investment and will take over when you need it most:

- » Pro Care™ preventive maintenance options
- » Turnkey solutions
- » Installation and commissioning
- » Maintenance services
- » E-Service/remote monitoring
- » 24/7 hotline
- » Onsite training
- » Hot swapping
- » Onsite battery replacement
- » Battery monitoring
- » Facility and equipment management
- » 24/7 global onsite contracts
- » Power quality assessment
- » Load bank and site capacity analysis
- » Trouble shooting and repair

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## AEG Power Solutions

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

[www.aegps.com](http://www.aegps.com)

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