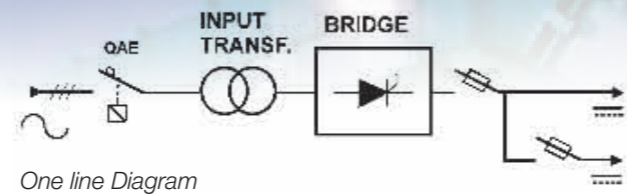


# RDC ■ Digital High-Performance Rectifier

■ 6 or 12-Phase models up to 1000A, from 24 to 220 Vdc



## KEY FEATURES:

- Clean and stable DC output with <math><1\%</math> peak-to-peak ripple voltage
- Redundant fan system with temperature and air flux control.
- 5 Automatic charging modes.
- Manual charge mode.
- 4 Adjustable voltage levels (rectifier can function as a rectifier at the nominal voltage, as a float charger, as a boost charger and can perform battery commissioning at the desired voltage level).
- Adjustable alarm threshold and delays.
- Programmable temperature compensation on charge voltage to improve battery life.
- Microprocessor Digital Control (DSP + PLD).
- Complete optical isolation on all logic and interface boards.
- Low input harmonic distortion with the 12-phase bridge and the optional input filter.
- Certified to withstand the worst environmental condition.
- More than 90% efficiency (low frequency transformer included).
- Optional 150% overload capability for two hours.
- Short circuit proof architecture.
- Modbus communication interface via RS232 or RS485 port.
- Ethernet connectivity.
- Optional FALCON battery monitoring system.
- Top insulation "class H" transformer with low temperature rise for best durability.

## HEAVY DUTY POWER SYSTEMS FOR THE HARSH INDUSTRIAL ENVIRONMENT:

The RDC, LEVER Digital Rectifier and Battery Charger is an industrial grade power converter designed to guarantee a constant power supply associated to battery, to critical dc load during blackouts or black-start and to recharge any battery type, at a wide range of voltages according to particular requirements, depending by the kind of the plant they are operating in.

Using the more different way of connection, operating principle and the experiences acquired in the last 4 decades, LEVER SRL is able to satisfy every required application still keeping high the reliability of the system.

The industrial Rectifier Battery Charger Series is based on 6 pulses or 12 pulses thyristors total-controlled bridge. A wide selection of systems is available with voltage output ranging from 24 V DC to 220 V DC with current output up to 1000 A. The equipments are installed inside free standings self supporting cabinets.

The enclosure and the structure are made of steel. The mechanical protection degree will be IP 30 (up to IP43 on request) for the enclosure and IP 20 with the cabinet doors open the access to the equipment is from the front.

The equipments are designed, manufactured and tested in compliance with the applicable IEC standards.



From the graphical display, it is possible to choose between 5 different charging modes:

- Rectifier only
- Floating charge with temperature compensation only
- Activation of the boost charge with a time delay
- Activation of the boost charge if the voltage drops under a certain value
- Activation of the boost charge if the current overcomes a certain threshold

The voltage curves will follow the DIN 41773 standard for an optimal recharge to improve battery life.

## PARALLEL SOLUTION FOR IMPROVED RELIABILITY AND PERFORMANCE:

Lever SRL designed a wide range of parallel solution to increase the overall MTBF of the system making it virtually infinite. In fact, thanks to a CAN BUS communication board, the various rectifiers which compose the system share the current dividing the load in equal parts and manage a complex function exchange system.

### Redundant single branch rectifier with DC-DC redundant converters

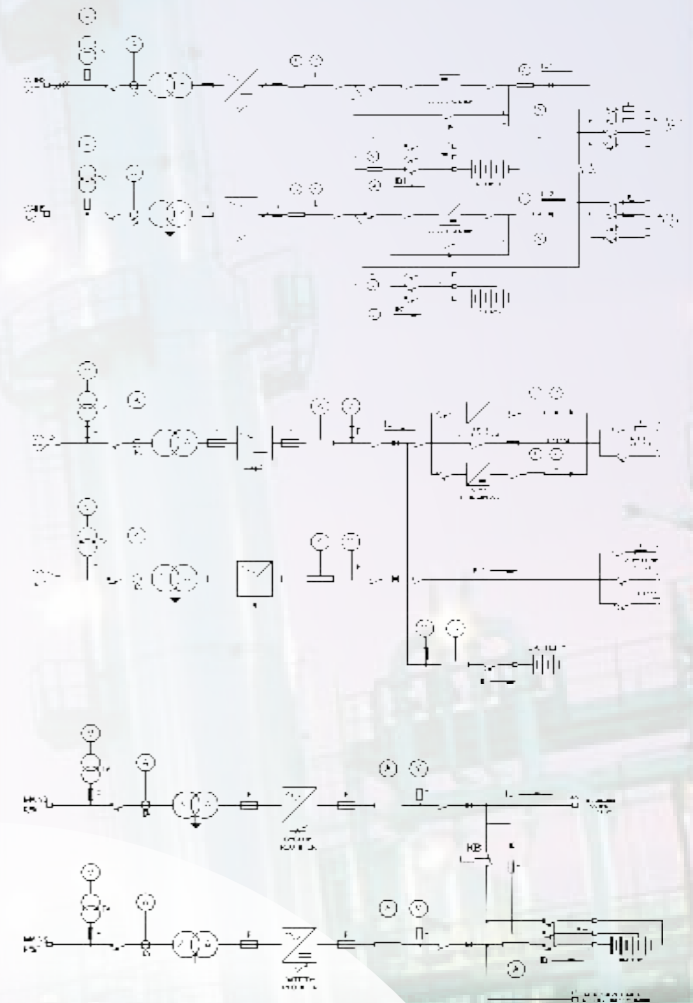
The single branch redundancy allow to keep the load and the batteries fed by a parallel of two digital rectifier, which, by dividing the currents, reduce the effort required to the single rectifier. The load, which require a lower voltage level in comparison to the batteries, are charged through a DC-DC step-down converter (also redundant). In case of failure, the remaining rectifier take upon itself the entire load.

### Double branch rectifier with LEVER "EES" (Emergency Exchange System)

The proposed equipment provides two units of AC/DC conversion that in presence of mains work independently. During normal operation, in presence of mains, the two converters are independent. The battery charger rectifier will charge the battery while the system rectifier supplies the load with a stabilized voltage with tolerance  $\pm 1\%$ . In case of total black-out of the mains or failure of both rectifiers, a sequence that provide the direct connection of load to the battery is automatically activated. In case of failure of one of the branches, the other one starts automatically to feed the load and contemporary charge the battery with a voltage equal to the 110% of the nominal one (adjustable).

When mains restores, the system in automatic will return to work leaving to each converters its own task.

Example of customized solutions.



Rectifier Model	Output Voltage	Output Current	Efficiency	Weight	Physical dimensions W - D - H
RDC 24/100	24 Vdc	100 A	>85%	270	600 - 600 - 2100
RDC 24/120		120 A		290	600 - 600 - 2100
RDC 24/150		150 A		300	600 - 600 - 2100
RDC 24/200		200 A		340	600 - 600 - 2100
RDC 24/250		250 A		350	600 - 600 - 2100
RDC 24/300		300 A		430	800 - 800 - 2100
RDC 24/400		400 A		460	800 - 800 - 2100
RDC 24/600		600 A		490	800 - 800 - 2100
RDC 24/800		800 A		510	1000 - 800 - 2100
RDC 24/1000		1000 A		640	1200 - 800 - 2100
RDC 48/60	48 Vdc	60 A	>87%	250	600 - 600 - 2100
RDC 48/80		80 A		270	600 - 600 - 2100
RDC 48/100		100 A		290	600 - 600 - 2100
RDC 48/120		120 A		300	600 - 600 - 2100
RDC 48/150		150 A		330	600 - 600 - 2100
RDC 48/200		200 A		380	800 - 800 - 2100
RDC 48/250		250 A		430	800 - 800 - 2100
RDC 48/300		300 A		470	800 - 800 - 2100
RDC 48/400		400 A		500	800 - 800 - 2100
RDC 48/600		600 A		590	1000 - 800 - 2100
RDC 48/800	800 A	610	1000 - 800 - 2100		
RDC 48/1000	1000 A	680	1200 - 800 - 2100		
RDC 110/60	110Vdc (Opt.125Vdc)	60 A	>90%	290	600 - 600 - 2100
RDC 110/80		80 A		310	600 - 600 - 2100
RDC 110/100		100 A		340	600 - 600 - 2100
RDC 110/120		120 A		370	600 - 600 - 2100
RDC 110/150		150 A		440	800 - 800 - 2100
RDC 110/200		200 A		470	800 - 800 - 2100
RDC 110/250		250 A		550	800 - 800 - 2100
RDC 110/300		300 A		700	1000 - 800 - 2100
RDC 110/400		400 A		760	1000 - 800 - 2100
RDC 110/600		600 A		970	1600 - 800 - 2100
RDC 110/800	800 A	1090	2000 - 800 - 2100		
RDC 110/1000	1000 A	1140	2000 - 1000 - 2100		
RDC 220/25	220 Vdc	25 A	>93%	270	600 - 600 - 2100
RDC 220/40		40 A		300	600 - 600 - 2100
RDC 220/60		60 A		330	600 - 600 - 2100
RDC 220/80		80 A		380	600 - 600 - 2100
RDC 220/100		100 A		440	800 - 800 - 2100
RDC 220/120		120 A		470	800 - 800 - 2100
RDC 220/150		150 A		550	1000 - 800 - 2100
RDC 220/200		200 A		710	1000 - 800 - 2100
RDC 220/250		250 A		810	1000 - 800 - 2100
RDC 220/300		300 A		1060	1600 - 800 - 2100
RDC 220/400		400 A		1170	1600 - 800 - 2100
RDC 220/600		600 A		1470	2000 - 1000 - 2100
RDC 220/800		800 A		1470	2000 - 1000 - 2100
RDC 220/1000		1000 A		1680	2400 - 1000 - 2100

## Other technical characteristics

### ELECTRICAL

Input frequency	50 Hz
Frequency range	±10%
Input voltage	400 Vac 3PH
Input voltage range	±15%
Input THD	27% with 6P, 12% with 12P, 6% with 12P + THD filter
Output voltage	4 levels (rectifier only, charge level 1,2,3)
Soft Start	yes, 0->100% in 10 sec
Dynamic Stability	±10%, 1% in 200ms
Temp. compensation, 3 probes	0/-0,3V/°C
Ripple Voltage	<1%
Overload 110/125/150%	2h/20'/1'

### COMMUNICATIONS

Remote signalling	Free voltage relays
Remote controls	ON/OFF switch, Man. charge, Temp. probes
Communication	Modbus protocol via RS485 DB9 serial port

### ENVIRONMENTAL

Cooling	Forced
Operating condition	-5/+40°C, 93% Humidity level (non condensing)
Acoustic noise	53 to 58dB depending on size

### MECHANICAL

Metal frame thickness	2,5mm
Metal door thickness	1,5mm
Frame surface	Zinc coated steel
Closed door protection degree	IP30
Open door protection degree	IP20
External colour	RAL 7035
Cable entry	From bottom, roof or side

### MAIN OPTIONS

Additional RFI filters
Additional THD filters
12 pulse bridge
Battery monitoring system
DC/DC stabilizer
Parallel active load sharing
Special color
Special protection degree
Output distribution panel