

# 30, 50 & 100 amp, -48 VDC Rectifiers

## Key Features

- **30, 50 and 100 amp Models**—for a broad range of applications
- **Internal Battery Eliminator Filter**—simplifies battery maintenance and replacement
- **Front to Rear Ventilation**—increases usable rack space
- **UL Listed**—compliance to local codes

## Description

The Lorain® 30, 50 and 100 amp B series and F series rectifiers use controlled ferroresonant circuitry to provide smooth, regulated output with high operating efficiencies for -48 VDC systems. These rectifiers can be paralleled for added capacity and load sharing to meet expansion requirements and extend equipment life. Front to back ventilation eliminates the need for heat baffles, increasing usable equipment rack space.

The following standard features ensure long equipment life and simplified rectifier operation. Selective high voltage shutdown increases rectifier reliability with a built-in overvoltage circuit which is activated by a predetermined setting. Current walk-in prevents step loading of the power line and provides smooth start-up. Current limiting protects against overload damage. The B series has remote control capability for float/equalize, rectifier on-off and restart after high voltage shutdown.

These rectifiers also feature an internal battery eliminator filter for direct connection to the load. This allows batteries to be taken off line for maintenance or replacement.

A full alarm array includes LED indicators that clearly signal power on, equalize operation, rectifier failure, low current, fuse failure, and alarm cut-off. Output voltage and current is monitored on analog meters. Also included are remote contacts for signaling rectifier failure, fuse alarms, remote control operation, equalize operation, and low current.

## Application

Ideal for a wide range of communication power applications including switch site and remote locations.



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## Specifications

### Input

Voltage: B series - taps for 208 volt (184-220) and 240 volt (212-254) AC; F series - taps for 120 (106-127), 208 (184-220) and 240 (212-254) VAC

Frequency: 1 phase, 60 Hz (57-63)

Protection: A 2 pole circuit breaker is provided. The recommended input protection at the AC cabinet is:

RL50B50 — 25 amps, time delay

RL100B50 — 45 amps, time delay

RL30F50 — 15 amps, time delay

RL50F50 — 25 amps, time delay

RL100F50 — 45 amps, time delay

### Output

Voltage:

Float — adjustable over the range of 48.0-58.0 volts, factory set at 52.08 volts  $\pm 0.2\%$

Equalize — adjustable over the range of 50.0-58.0 volts, factory set at 54.0 volts  $\pm 0.2\%$

End Cell Charging: 58 VDC at rated load at the design center input voltage

Initial (Boost) Charging: 60 VDC at design center input voltage at 15% of rated load

Current:

RL50B50 — 50 amps, full load

RL100B50 — 100 amps, full load

RL30F50 — 30 amps, full load

RL50F50 — 50 amps, full load

RL100F50 — 100 amps, full load

Regulation: Steady-state  $\pm S\%$  from no load to full load over the specified input voltage, frequency and ambient temperature ranges, within the range of 48.0 to 54.0 VDC.

Dynamic Response (On Battery): Maximum voltage transient will not exceed  $\pm 5\%$  of initial steady-state voltage

for a step load change from 20 to 100% of the full rated load. Recovery to steady-state voltage regulation range does not exceed 200 ms and all transient behavior disappears within 500 ms.

Filtering:

Voice band noise — less than 22dB<sub>BrnC</sub> when tested on batteries rated in ampere-hours at four times the rated charger output current or 32dB<sub>BrnC</sub> without batteries

Wide band noise — Less than 500 mv peak-to-peak over the frequency range of 10 Hz to 14 MHz when measured on a battery rated at four times the rated rectifier output current

Audible noise — Less than 55dBA at any point 5 feet (152.4cm) from any vertical surface of the rectifier

### Protection

Current Limit: Circuit prevents further application of current to the load if output current exceeds a preset value. Adjustable from 50% to 120% of full load, factory set at 110% of full load.

Selective High Voltage Shutdown: If output voltage increases above a preset high voltage value while the rectifier is delivering greater than 3% of the rated output current, the high voltage shutdown circuit de-energizes the main contactor. If the rectifier is connected in parallel with one or more Model RL rectifiers, only the rectifier causing the high voltage condition will shut down. The high voltage shutdown range is 52.8 to 60.0 volts, factory set at 55.0, +0.0, -0.2 volts.

Non-Selective High Voltage Shutdown: If output voltage increases above a second preset high voltage value, the high voltage shutdown circuit de-energizes the main contactor regardless of whether or not the rectifier is delivering load current. The high voltage shutdown range is 54 to 62 volts, factory set at 59.5,  $\pm 0.5$  volts.

Remote: A terminal is provided for connection of an external shutdown signal. Application of positive battery will activate the selective high voltage shutdown circuit.

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## Specifications (continued)

### Environmental

Operational Temperature: 0° C to +50° C (+32° F to +122° F)

Storage Temperature: -40° C to +85° C (-40° F to +185° F)

Humidity: 0-95%, non-condensing

Heat Dissipation: All measurements at both taps made at 52.08 VDC, full load.

RL50B50— 208 tap, 1075 Btu/hr max.; 240 tap, 1055 Btu/hr max.

RL100B50 — 208 tap, 1980 Btu/hr max.; 240 tap, 1962 Btu/hr max.

RL30F50 — 120V tap, 582 Btu/hr; 208V tap, 586 Btu/hr; 240V tap, 575 Btu/hr

RL50F50 — 120V tap, 1068 Btu/hr; 208V tap, 1075 Btu/hr; 240V tap, 1055 Btu/hr

RL100F50 — 120V tap, 1942 Btu/hr; 208V tap, 1980 Btu/hr; 240V tap, 1962 Btu/hr

Altitude: Units are capable of operation from sea level (maximum ambient temperature +50° C [+122° F]) to 10,000' (3,048m) (maximum ambient temperature +40° C [+104° F])

Note: Only B series has remote control capability

### Physical Characteristics

Mounting: Designed for front-to-back ventilation to facilitate stacking of the rectifiers one on top of the other in a 23" (58.42cm) relay rack with 1.75" (4.45cm) multiple mounting holes. Restrictions apply. See the appropriate Power Data sheet for details.

### Dimensions:

RL50B50

Height: 10.5" (26.67cm)

Width: 23" (58.42cm)

Depth: 15" (38.1cm)

Weight: 172 lbs. (78.02 kgs)

RL100B50

Height: 17.5" (44.45cm)

Width: 23" (58.42cm)

Depth: 15" (38.1cm)

Weight: 292 lbs. (132.45 kgs)

RL30F50

Height: 10.5" (26.67cm)

Width: 23" (58.42cm)

Depth: 15" (38.1cm)

Weight: 127 lbs. (57.61 kgs)

RL50F50

Height: 10.5" (26.67cm)

Width: 23" (58.42cm)

Depth: 15" (38.1cm)

Weight: 172 lbs. (78.02 kgs)

RL100F50

Height: 17.5" (44.45cm)

Width: 23" (58.42cm)

Depth: 15" (38.1cm)

Weight: 292 lbs. (132.45 kgs)

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## Additional Information

For additional specification, engineering and installation information, specify desired rectifier by model and spec number

Model RL50B50, spec. number 543202500

Model RL100B50, spec. number 545103200

Model RL30F50, spec. number 541201800

Model RL50F50, spec. number 543103900

Model RL100F50, spec. number 545103300



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