



INSTALLATION & OPERATING MANUAL

RW SERIES WALL-MOUNT RECTIFIERS

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1 Principles of Operation

1.1 Introduction

The RW range of freestanding convection, cooled wall-mount rectifiers consist of the following models:

Models

Model	Input Volts	Max Input Current	Nominal Voltage	Rated Voltage	Voltage Range	Maximum Current	Power Rating
RW312U	110 – 220V	4A	12V	14.5V	11.5-15V	20A	300W
RW324U	110 – 220V	4A	24V	29V	22-30V	10A	300W
RW348U	110 – 220V	4A	48V	58V	45-60V	6A	300W
RW512U	110 – 220V	8.5A	12V	14.5V	11.5-15V	35A	500W
RW624U	110 – 220V	8.5A	24V	29V	22-30V	22A	600W
RW748U	110 – 220V	4A	48V	58V	45-60V	12A	700W

The features of the rectifiers are:

- Convection Cooled
- Thermal Protection
- Power Factor Corrected
- Input/Output Voltage and Current Protected
- Temperature Compensation
- Built in LVD - Battery Low Voltage Disconnect (Option)
- Automatic Boost/Float Charge cycle
- Active Load Sharing when operated in parallel with another rectifier
- External Alarm and Control interface (Option)
- Bar Graph Current Indicator
- Integrated Alarm Outputs (Option)

Custom configurations of the rectifier are available for particular requirements, and some features may not be (or extra features may be) present in each unit.

1.2 LEDs

There are 4 LEDs that indicate the operational state of the rectifier. These LEDs can be used to determine the present state of the rectifier and diagnose faults.

Mains On: This LED glows green to indicate that mains power is connected to the unit and that the primary stages of the rectifier are operating.

Off Normal LED:

- Yellow – Rectifier in “Current Limit”
- Red – Rectifier shutdown through over voltage or over temperature.

Float/Boost LED:

- Green – Rectifier operating in “Float Charge” mode
- Yellow – Rectifier operating in “Boost Charge” mode

Temperature Probe LED:

- Green – Temperature Compensation Probe connected and within limits

- Red – Rectifier has failed– also lights if the output voltage is externally forced above the rectifier output voltage + 4.5%. Powered from the battery. Off if the LVD has tripped.
- Note that if the Temperature Compensation Probe is connected and the rectifier fails, the LED may not show. The monitor external signals are still correct. To verify the condition, unplug the Temperature Compensation Probe.

1.3 Display

A row of LEDs on the front panel indicates the approximate percentage current output from the rectifier (only 1 LED is lit at any one time). So if the 60% LED is displayed on a RW 312 rectifier, then the current being drawn from the rectifier is 60% of 20A = 12Amps.

1.4 Auto Float Boost

When the rectifier is powered on, the rectifier starts in Boost Charge mode. If the battery charge current is above the Boost to Float Current threshold, it will stay in Boost Charge mode. When the battery charge current falls below the Boost to Float Current threshold for more than 10 seconds, it will switch to Float Charge mode. If for some reason the battery charge current rises above the Boost to Float Current threshold, the rectifier will switch back into Boost Charge mode (there is no time delay).

A Boost Timer limits the time the rectifier stays in Boost Charge mode. While the rectifier is in Boost Charge mode and in Current Limit, the Boost Timer is inhibited. When the rectifier comes out of Current Limit, the Boost Timer starts and will automatically switch the rectifier into Float Charge mode after about 4 hours, even if the battery current remains above the Boost to Float Current threshold.

The Boost and Float voltages are preset in the factory but may be adjusted to suit the specific battery installation.

1.5 Low Voltage Disconnect and Reset (Option)

The Low Voltage Disconnect (LVD) feature is designed to protect the battery from deep discharge when the battery is supplying the load current (i.e. mains is off, or the load is drawing more than the rectifier capacity).

The rectifier monitors the battery voltage when the battery is supplying current, and disconnects the load from the battery when the battery voltage falls to a preset level. When the battery voltage has increased above the LVD Hysterisis voltage the load is automatically reconnected back to the battery.

The LVD may be manually reset when it has operated by pressing the LVD Reset button on the front of the rectifier.

The LVD switches the battery +ve supply (the -ve is common with the battery). Do not connect the Battery and Load +ve together.

The LVD voltage and the LVD Hysterisis voltage are preset in the factory, but may be adjusted to suit the specific battery installation.

Low Voltage Disconnect

Model	Voltage Adjustment Range	Maximum Load Current
RW312U	9.5 to 12V	20A
RW324U	19 to 24V	10A
RW348U	38 to 48V	6A
RW512U	9.5 to 12V	35A
RW624U	19 to 24V	22A
RW748U	38 to 48V	12A

Do not exceed the maximum load current, as the rectifier LVD circuitry may be damaged. The LVD circuitry is protected by shutting down if its circuitry is overheated due to over current conditions. Excessive overloading will cause an internal protection fuse to rupture.

If the LVD functionality is not required, then the load should still be connected to the Load connection on the rectifier, as the rectifier senses the current on the Battery connection (not the load) for the Auto Float Boost function.

1.6 Temperature Compensation

Batteries require different charging voltages depending on the ambient temperature of the battery. The colder the battery, the higher the voltage required to charge the battery. The battery temperature is measured by connecting a Temperature Compensation Probe (available separately) to one of the battery terminals. The rectifier will then automatically adjust the charging voltage.

The Temperature Compensation Slope is preset in the factory but is adjustable from 0.1% to 0.2% change in charge voltage per degree C.

If the Temperature Compensation Probe is not connected, then the rectifier will assume a battery temperature of 25°C.

1.7 Current Limit

The rectifier automatically limits the rectifier output current. The maximum output current is preset in the factory but may be adjusted down.

1.8 Output Over Voltage Shut Down

The rectifier will automatically shutdown if the output voltage exceeds the preset value. The Over Voltage Shutdown voltage is preset in the factory but may be adjusted.

1.9 Input Over Voltage Shut Down

If the input voltage is outside the specified range, the rectifier may shut down until the allowed voltage is restored.

1.10 Input Inrush Current Limiter

On startup, the peak mains inrush current is limited to twice the maximum operating current. The output voltage and current rise slowly from zero during startup.

1.11 Over Temperature Shutdown

When the rectifier reaches its maximum operating temperature, the rectifier will progressively reduce the output current to attempt to reduce the heat within the unit. In extreme circumstances, the rectifier will totally shutdown.

The maximum operating temperature range is:

Model	Temperature
312U, 324U, 348U	-10 to 65 degrees C
512U, 624U, 748U	-10 to 50 degrees C

1.12 Reverse Polarity Protection

The rectifier has an internal reverse polarity protection fuse and crowbar diode fitted. These parts are not user serviceable, and the rectifier will require returning the rectifier for servicing if they fail.

1.13 Parallel Rectifier Operation

The rectifiers may be connected in parallel to source more current, or to provide a degree of redundancy. The rectifiers **should** have the load share signal connected between the rectifiers. The rectifiers should have the load share signal connected between the rectifiers. This is achieved by connecting the load share signal line on the Alarm & Control Interface port on each rectifier. The rectifiers with the higher voltage output will automatically adjust their output voltage down so that they each take a uniform share of the load.

The rectifiers connected in parallel must all be of the same brand and voltage rating. A 300W model may be connected in parallel with a 600W model (e.g. a 324 with a 624).

1.14 External Shutdown

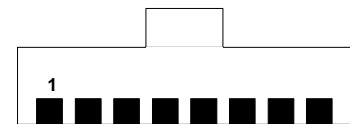
The rectifier can be remotely forced to shutdown by applying a 10-12V signal to the rectifier load share pin of the Monitor connector.

1.15 Alarm & Control Interface

The monitor connection allows remote monitoring of the rectifier. The monitor connection is a RJ45 socket. The pinout of the socket is as follows:

Pin descriptions

Pin #	Description
Pin 1	Load Share signal (0-5V), external shutdown (10-12V in)
Pin 2	LVD Synch signal
Pin 3	Temp Comp Probe/Output Voltage Control
Pin 4	Rectifier Failed Signal – Pulls to ground via 4k7 resistor
Pin 5	-ve for Temp Comp Probe (signal Gnd)
Pin 6	Rectifier “Off Normal” alarm (open collector output)
Pin 7	+V Battery Out (max 250mA)
Pin 8	Mains fail (open collector output) (off = mains present)



Pin 1 is the left most pin, when facing the socket with the pins on the bottom.

The open collector outputs are rated at 100V, 10mA.

1.16 Internal Alarm card (Option)

The internal alarm card may be fitted to a rectifier. The alarm card provides voltage free relay contacts in the event of:

- Mains failure
- Rectifier failure
- Rectifier Off Normal (over temperature, over voltage, current limit)
- High voltage output
- Low voltage output

When rectifiers are connected in parallel using an RJ45 cable to connect between the alarm and control interface on each rectifier the alarm outputs on the Alarm Card give the status of all the connected units. This means that only one alarm card needs to be connected to the alarm circuitry when the rectifiers are connected in parallel

2 Installation

2.1 General Warnings

This rectifier contains no user serviceable components. Do not disassemble the rectifier.

To isolate the rectifier from the mains power, simply unplug the IEC mains connector from the rectifier.

DANGER

Do not operate the rectifier if the covers are damaged or removed in any way.

- **The rectifier contains voltages that may be lethal even after the input supply has been removed**
- **The rectifier contains components at High Temperatures that may burn if touched**

2.2 Positioning of Rectifier

A great deal of care should be taken with the positioning of the rectifier, as the position can affect the rectifier's life expectancy and performance.

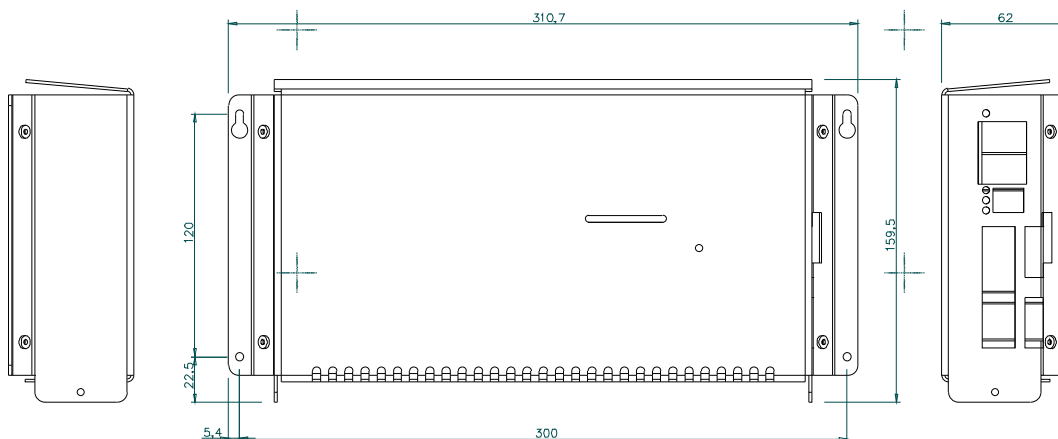
This rectifier **MUST** be mounted on a wall or vertical surface using the side mounts.

The rectifier should be positioned close to the load and batteries, so as to keep the length of the low voltage cables to a minimum. These cables are carrying high currents, and voltage drop in the cables must be kept to a minimum. It is better to have a long mains lead and short low voltage cables.

The rectifier must be positioned so that airflow through the rectifier is not impeded in any way. These rectifiers are convection cooled – their performance and life expectancy is reduced if the airflow is impeded.

The rectifier should not be mounted above another rectifier or a source of heat.

The rectifier should be mounted 50mm clear of any other solid object, and care should be taken to ensure that air entering the rectifier is cool air, and has not been heated by other equipment.



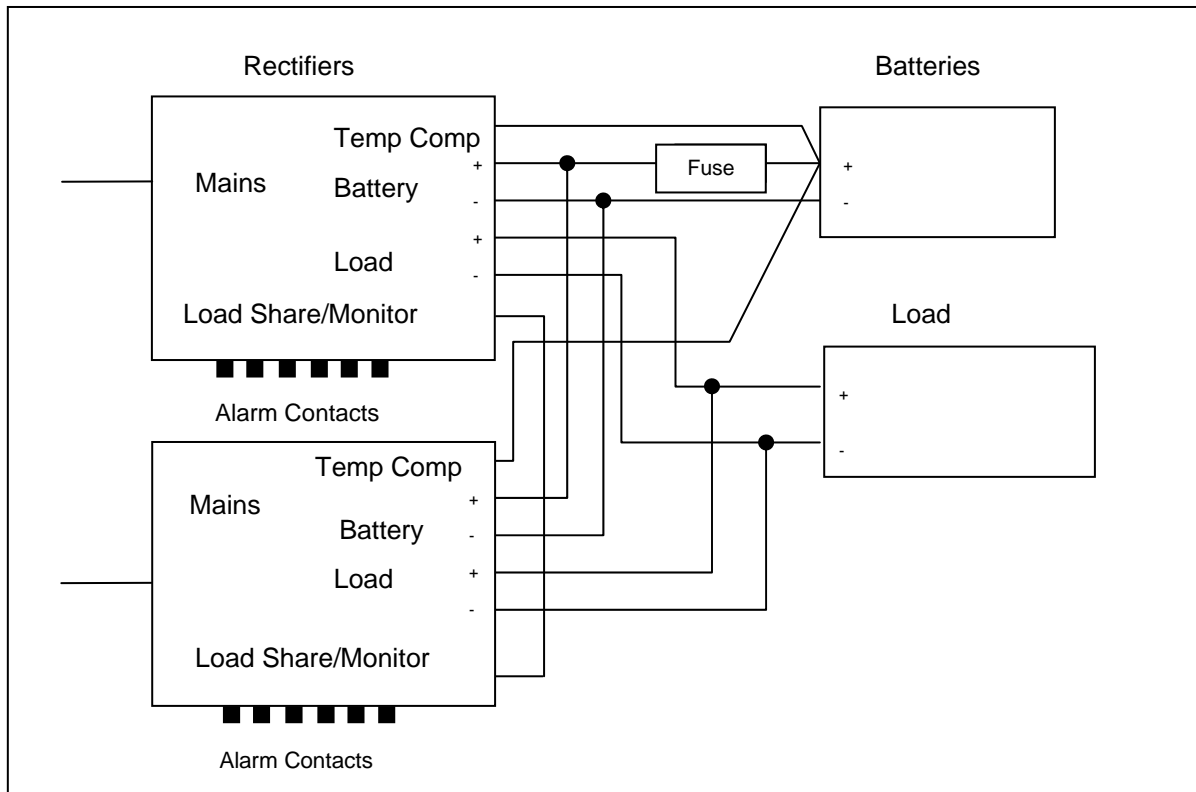
Caution:

The rectifier must be mounted on a vertical surface so that it stands vertically, and is not laid flat on its side.

Do not mount rectifiers above each other

2.3 Cabling

It is important that all cables (except mains) are less than 3m in length. The rectifier is not designed for cables greater than 3m or for connection to outside cables.



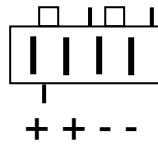
Mains: The length of the mains cable to the rectifier is not critical. The rectifiers only draw 300W or 700W and they will accept a wide range of input voltages. The mains cable to the rectifier should be switched at its supply, so the rectifier can be isolated for installation or servicing. It is recommended that a switched permanent outlet be used, so the rectifier will not be accidentally unplugged from the supply.

Load and Battery: Standard length cables are available from the rectifier supplier. It is important that the lengths of these cables are kept to a minimum to reduce voltage drop (the length of the cables should be adjusted). A fuse **MUST** be installed between the battery and the rectifier, to protect the rectifier, load and battery. The fuse should be mounted close to the battery, and have a high rupture current capability just above the rectifier capability. This fuse protects the wiring and the rectifier from over current.

If the LVD functionality is not required, the load must still be connected to the Load connection (not directly onto the battery).

When custom made load and battery wires are used, it is recommended that two wires are run in parallel for both the +ve and -ve Battery and Load connections. 1.5mm² wire should be used for the connectors. In situations where voltage drop is a concern, then a short length of 1.5mm² wire should be used from the rectifier, connecting to a longer length of large cross section wire. Connectors supplied for the rectifier are 4W Lumberg IDC connectors (insulation displacement). Each terminal on the connector is rated at 20Amps at 50°C.

To crimp the cable into the connector, simply insert the correct wire into the connector, and squeeze the connector in a vice or with a small press. Vice grips can be used provided a metal plate is used either side of the connection to protect the plastic. Once the connector has been crimped, it cannot be reused, so take great care to make sure that the correct wire and polarity colour is inserted before crimping. Additional spare connectors are available from the rectifier supplier.



DC Connector

4 Way Lumberg layout (viewed facing the front of the plug)

2.4 Temperature Compensation

Temperature Compensation Probes are available in different lengths. The end of the Temperature Compensation Probe should be attached to a terminal on a battery (the lug is isolated, so it doesn't matter which terminal). Any excess cable should be neatly coiled. As the current in the Temperature Compensation Probe is minimal, it does not matter if the cable is longer than necessary (unlike the current carrying load and battery cables).

Warning

Do not reverse the polarity of the cables from the battery. This will blow an internal protection fuse, requiring the rectifier to be returned for servicing

Do not connect the Temperature Compensation Probe to the rectifier until commissioning see Section 2.7.- Commissioning the Rectifier

2.5 Multiple Rectifiers

The rectifiers may be operated in parallel to provide greater current capability and to provide redundancy.

When rectifiers are connected in parallel (and load sharing), alarm outputs on the rectifiers give the status of all the units. This means that you only need to connect one alarm card to the alarm circuitry when the rectifiers are connected in parallel.

The load and battery cables should be wired in parallel to the rectifiers as per the diagram in section 2.3. Each rectifier should be fitted with a Temperature Compensation Probe connected to the same terminal on the same battery.

For load and alarm sharing, an alarm and control interface cable **should** be connected to each parallel rectifier to ensure that all rectifiers load share automatically. When two or more units are connected in parallel, then you can use a simple RJ45 double adaptor to daisy chain the connection cable (max 6 rectifiers).

Any fuses or circuit breakers on the output of the rectifier, must be placed after the rectifier outputs have been connected together.

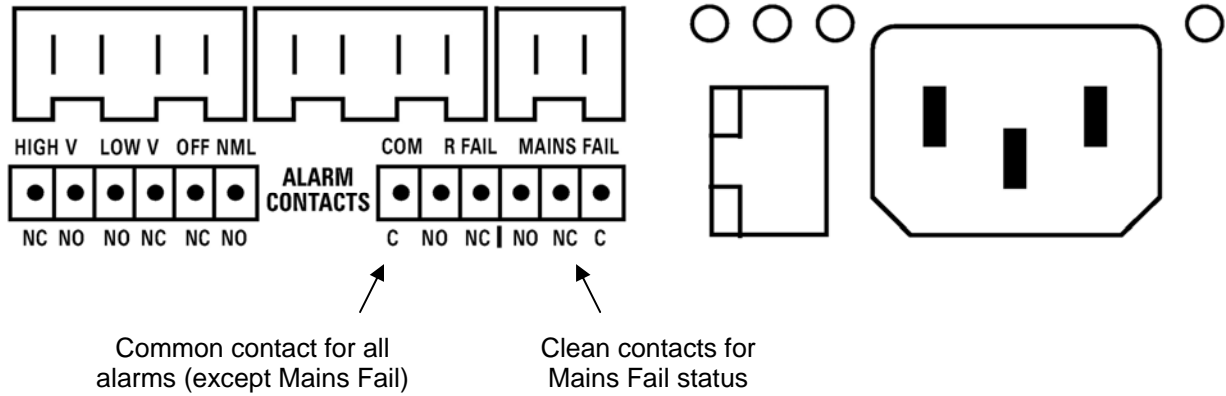
2.6 Internal Alarm card (Option)

The internal alarm card may be fitted to a rectifier. The alarm card provides voltage free relay contacts in the event of:

- Mains failure
- Rectifier failure
- Rectifier Off Normal (over temperature, over voltage, current limit)
- High voltage output
- Low voltage output

When rectifiers are connected in parallel using an RJ45 cable to connect between the alarm and control interface, the alarm outputs on the Alarm Card give the status of all the connected units. This means that you only need one alarm card needs to be connected to the alarm circuitry when the rectifiers are connected in parallel.

The diagram below describes the alarm contacts found on the front panel of the unit.



NC = Normally Closed
NO = Normally Open

Refer to section 4.9 for information on adjusting the alarm output volt low/high settings.

2.6.1 Relays

The relays are Single Pole Double Throw (or changeover). Both Normally Closed (NC) and Normally Open (NO) contacts are provided. Contact rating is 100v DC, 1A max and all contacts are isolated from the rectifiers' internal circuitry. Do NOT connect AC supply to the relays.

When the rectifier is operating normally (ie with no fault, or abnormal conditions) the relay outputs designated NC will be connected to the common terminal, and the relay outputs designated NO will be open circuit. Upon an alarm condition occurring the NO contacts will be connected to the common terminal, and the NC contacts will be open circuit.

The internal alarm card is powered from the batteries connected to the rectifier. This allows the alarm card to operate correctly even when the mains have failed.

If the rectifier does not have a battery connected and the mains fails, then the Mains Fail relay still reflects the state of the mains, however the Rectifier Fail alarm, Rectifier Off Normal and the Low Volts alarms will also activate.

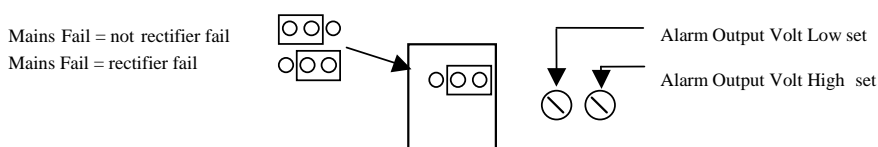
Note that the Mains Fail Relay has its own "Common" connector, but all the other alarm outputs share a "Common" contact.

2.6.2 Rectifier Fail/Mains Fail

The Mains Fail Alarm is activated while the mains power is not present.

The Rectifier Fail Alarm can be configured to activate when the mains has failed (as well as when the Rectifier Fails). Alternatively, the Rectifier Fail can be configured to not activate if the mains fails, so that you can remotely determine if the problem is the mains failure or a rectifier failure.

The diagram below shows the jumper configuration for Mains Fail/Rectifier Fail options.



2.6.3 Rectifiers in Parallel

The internal alarm cards of multiple parallel rectifiers can be connected in parallel so that the alarm condition can be reported if any alarm is triggered in any rectifier.

When rectifiers are connected in parallel (and load sharing), the alarm outputs on the rectifiers give the status of all the units in parallel. This means that you only need to connect one alarm card to the alarm circuitry when the rectifiers are connected in parallel.

2.7 Commissioning the Rectifier

- 1) Make sure that all cables and wires are disconnected from the rectifier.
- 2) Plug the Mains cable into the rectifier and switch the mains on at the outlet. The Mains LED should glow green.
- 3) Disconnect the mains, then plug in the Temperature Compensation Probe, re-connect the mains and check that the Temperature Probe LED is green.
- 4) Disconnect the mains, then double check the polarity of the cables from the battery (there should be an HRC fuse in the battery lead as close as possible to the battery to protect the wiring from faulty connections) and then plug them into the rectifier. Re-connect the mains and the Float Boost LED should glow first yellow then after about 10 seconds either green or yellow depending on the charge of the battery. The display LEDs should give an indication of the current from the rectifier.
- 5) Disconnect the mains, then double check the polarity of the cables to the load, and then plug them into the rectifier. Re-connect the mains.
- 6) If there is more than one rectifier connected in parallel, then follow the above procedure for each rectifier in turn (with the other rectifiers all disconnected). Ensure all rectifiers are adjusted to the same output voltage (better than $\pm 0.1V$) Finally connect the Load Share Signal cable between the rectifiers, and check that all rectifiers are indicating near equal current (should be better than 10% of full load).
- 7) Connect the alarms (if fitted/used) and check their operation.

3 Servicing

If the rectifier develops an operational fault or is damaged in any way an Authorised Service Centre should service it immediately.

3.1 Warnings

This rectifier contains no user serviceable components. Do not disassemble the rectifier.

To isolate the rectifier from the mains, simply unplug the IEC mains connector from the rectifier.

DANGER

Do not operate the rectifier if the covers are damaged or removed in any way.

- **The rectifier contains voltages that may be lethal even after the input supply has been removed**
- **The rectifier contains components at High Temperatures that may burn if touched**

3.2 Troubleshooting

Basic operation checks:

- Check power to the rectifier – check that the Mains LED is on
- Check and resolve any fault conditions indicated by the rectifier
- Check that the display on the rectifier is showing that the rectifier is delivering current
- Disconnect load and battery leads. Connect a load to the battery terminals. Check the voltage across the load is as expected
- Connect a current meter in series with the load. Adjust the load and check the current delivered by the rectifier is as expected

Load Checks:

- Connect battery but disconnect the main load to rectifier. Connect a current meter in series with the battery. Verify the current drawn by the battery from the rectifier is as expected. Check that the battery takes the charge.
- Connect the main load to the rectifier (mains off) and disconnect the battery. Turn the mains on and check that the current drawn by the load is as expected, and within the capabilities of the rectifier and battery.

Fine Adjustment Checks: (see section on adjustments for instructions)

- Check Boost and Float voltages
- Check Boost to Float current
- Check Temperature Compensation Slope
- Check LVD operation

3.3 Fuses

Although there are fuses inside the rectifier, these are rated such that their failure indicates a fault requiring qualified service. **Do not attempt to repair these fuses.**

However for IEC 60950 the fuse ratings are required to be specified. The following fuses are soldered to the PCB:

- FH101 – 125mA 250V ETF Bussmann

Fuse specifications

Model	FH1, FH2	FH200, FH401	FH201, FH402
RR 312U	5A 250V ceramic slow blow	40A 32V Blade	-
RR 324U	5A 250V ceramic slow blow	40A 32V Blade	-
RR 348U	5A 250V ceramic slow blow	40A 58V Blade	-
RR 512U	10A 250V ceramic slow blow	40A 32V Blade	40A 32V Blade
RR 624U	10A 250V ceramic slow blow	40A 32V Blade	
RR 748U	10A 250V ceramic slow blow	40A 58V Blade	

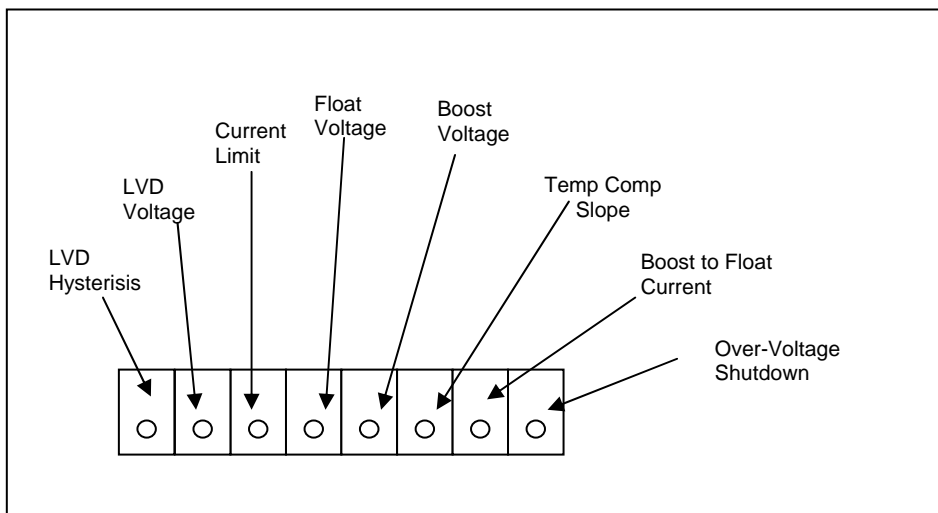
4 Adjustments

The rectifier is supplied from the factory with all the adjustments set for normal operation. These settings are detailed below. A competent technician only should adjust these settings.

To adjust the settings, appropriate test equipment is necessary (depending on the adjustment). A variable load, a variable DC power supply, and an accurate voltage and current meter are required. The rectifier should be unscrewed from its mounting. The rectifier must be disconnected from the battery and load. The adjustment trimpots are accessible on the rear side of the rectifier.

4.1 Standard Settings

Item	RW312U	RW324U	RW348U	RW512U	RW624U	RW748U
Boost Voltage	14.2V	28.8V	57V	14.2V	28.8V	57V
Float Voltage	13.7V	27.4V	54V	13.7V	27.4V	54V
Boost to Float Current	2A	1A	0.5A	3A	2A	1A
Over Voltage Shutdown	16V	32V	60V	16V	32V	60V
Temp Comp 25°C	13.7V	27.4V	54V	13.7V	27.4V	54V
Temp Comp 5°C	14.16V	28.32V	55.9V	14.16V	28.32V	55.9V
LVD On Voltage	12V	24V	48V	12V	24V	48V
LVD Off Voltage	10V	20V	40V	10V	20V	40V
Current Limit	20A	10A	6A	35A	20A	12A



4.2 Adjust Float Voltage

Connect a variable load (set to minimum load) to the battery connections of the rectifier. Disconnect the Temperature Compensation Probe. Connect an accurate voltmeter across the load. Turn the mains on to the rectifier. Wait approximately 10 seconds for the rectifier to switch back to Float Charge mode. Check that the rectifier is in Float Charge mode (as indicated on the LEDs).

Adjust the Float Voltage trimpot to set the required float voltage.

4.3 Adjust Boost Voltage

Connect a variable load (set to minimum load) to the battery connections of the rectifier. Disconnect the Temperature Compensation Probe. Connect an accurate voltmeter across the load. Turn the mains on to the rectifier and adjust the load until the rectifier goes into Boost Charge mode (as indicated on the LEDs).

Note that there is a 10 second delay when switching from Boost Charge mode to Float Charge mode, but no delay when switching from Float to Boost.

Adjust the Boost Voltage trimpot to set the required boost voltage.

4.4 Adjust Boost to Float Current Threshold

Connect a variable load (set to minimum load) to the battery connections of the rectifier. Disconnect the Temperature Compensation Probe. Connect an accurate current meter in series with the load. Turn the mains on to the rectifier, wait 10 seconds and then adjust the load up slowly until the rectifier goes into Boost Charge mode (as indicated on the LEDs). Slowly decrease the load until the rectifier switches to Float Charge mode.

Note that there is a 10 second delay when switching from Boost Charge mode to Float Charge mode, but no delay when switching from Float to Boost.

Adjust the Boost to Float Current trimpot to set the required current value (0.1A to 40% of full load).

4.5 Adjust Current Limit

Connect a variable load (set to minimum load) to the load connections of the rectifier. Disconnect the Temperature Compensation Probe. Connect an accurate current meter in series with the load. Turn the mains on to the rectifier and adjust the load until the rectifier goes into current limit (as indicated on the LEDs).

Adjust the Current Limit trimpot slowly to set the required current limit. Do not exceed 100% of the rated current. Note that the current output requires time to settle when you adjust the trimpot.

4.6 Adjust Over-Voltage Shutdown

This adjustment requires a variable voltage power supply (that has a maximum voltage exceeding the over-voltage value to be set).

Connect the variable voltage power supply across the load connections of the rectifier (ensure that +ve output of the variable supply is connected to the +ve load connection). Disconnect the Temperature Compensation Probe. Connect an accurate voltmeter across the output. Turn the mains on to the rectifier and adjust the variable voltage power supply up until the rectifier goes into over-voltage shutdown (as indicated on the LEDs).

Adjust the Over-Voltage Shutdown trimpot to set the required voltage limit. Note that the rectifier will cycle on and off – this is normal.

4.7 Adjust Low Voltage Disconnect and Hysterisis

This adjustment requires a variable voltage power supply (that has a maximum voltage exceeding the voltage value to be set).

Connect the variable voltage power supply across the battery connections of the rectifier (ensure that +ve output of the variable supply is connected to the +ve battery connection). Connect an accurate voltmeter across the load connections of the rectifiers.

Leave the rectifier disconnected from the mains. Switch on the variable power supply and adjust the voltage up until there is voltage on the load connections. Adjust the variable voltage down slowly until the load voltage drops suddenly, indicating the load has been disconnected.

First - Adjust the LVD Voltage trimpot to set the required 'on' voltage limit.

Second - Adjust the LVD Hysterisis trimpot to set the required 'off' voltage limit.

4.8 Adjust Temperature Compensation Slope

The rectifier assumes that the battery temperature is 25°C when the Temperature Compensation Probe is not connected. Disconnect the Temperature Compensation Probe, and adjust the boost and float charge voltages to that required for 25°C. Reconnect the Temperature Compensation Probe and cool the metal lug to 0°C (using a container containing ice and water - do not immerse the probe in the water as it is not waterproof).

Adjust the Temperature Compensation Slope to set the required charging voltage at this temperature as determined by the manufacturer's specification.

4.9 Adjusting the alarm output volt low/high setting

The High Volts and Low Volts Alarm Thresholds can be adjusted to suit the application. This adjustment requires a variable voltage power supply (that has a maximum voltage exceeding the over-voltage value to be set).

Connect the variable voltage power supply across the load connections of the rectifier (ensure that +ve output of the variable supply is connected to the +ve load connection). Disconnect the Temperature Compensation Probe. Connect an accurate voltmeter across the output. Turn the mains on to the rectifier and adjust the variable voltage power supply up until the alarm activates. Adjust the '*Alarm Output High*' trimpot to adjust the alarm limits. Use the same procedure to adjust the '*Alarm Output Low*' limits. See diagram with section 2.6.2. - Rectifier Fail/Mains Fail

5 Warranty

UNIPOWER warrants that this product is free from defects in material and workmanship and agrees to remedy any defect (or at its option replace the product) for a period of one year from the date of purchase. This warranty covers both parts and labour. Parts may be replaced under this warranty with new or remanufactured parts.

This warranty will not apply to any product that has been improperly installed (as described in the installation manual), misused, abused, used in ways the product was not designed, altered or repaired in any way which may affect the performance or reliability of operation, sustained damage by power surges or electrical storms, or sustained shipping damage, or repaired by any unauthorised repair centre.

Please contact UNIPOWER Customer Service to obtain a Returned Materials Authorisation (RMA) prior to shipping any products for repair. All shipments must be shipped prepaid and include proof of the date of your original purchase. Please include your name, address, phone number, email address and a brief description of the problem.

UNIPOWER makes no other warranties, express or implied, including any warranty of fitness for a particular purpose. In no event shall UNIPOWER be responsible for indirect or consequential damages or lost profits even if UNIPOWER has been advised of the possibility of such damages. UNIPOWER's sole obligation to you shall be the repair or replacement of a non-conforming product.