

Rectifier RC-series

Manual
Wall and 19”
English



Presentation

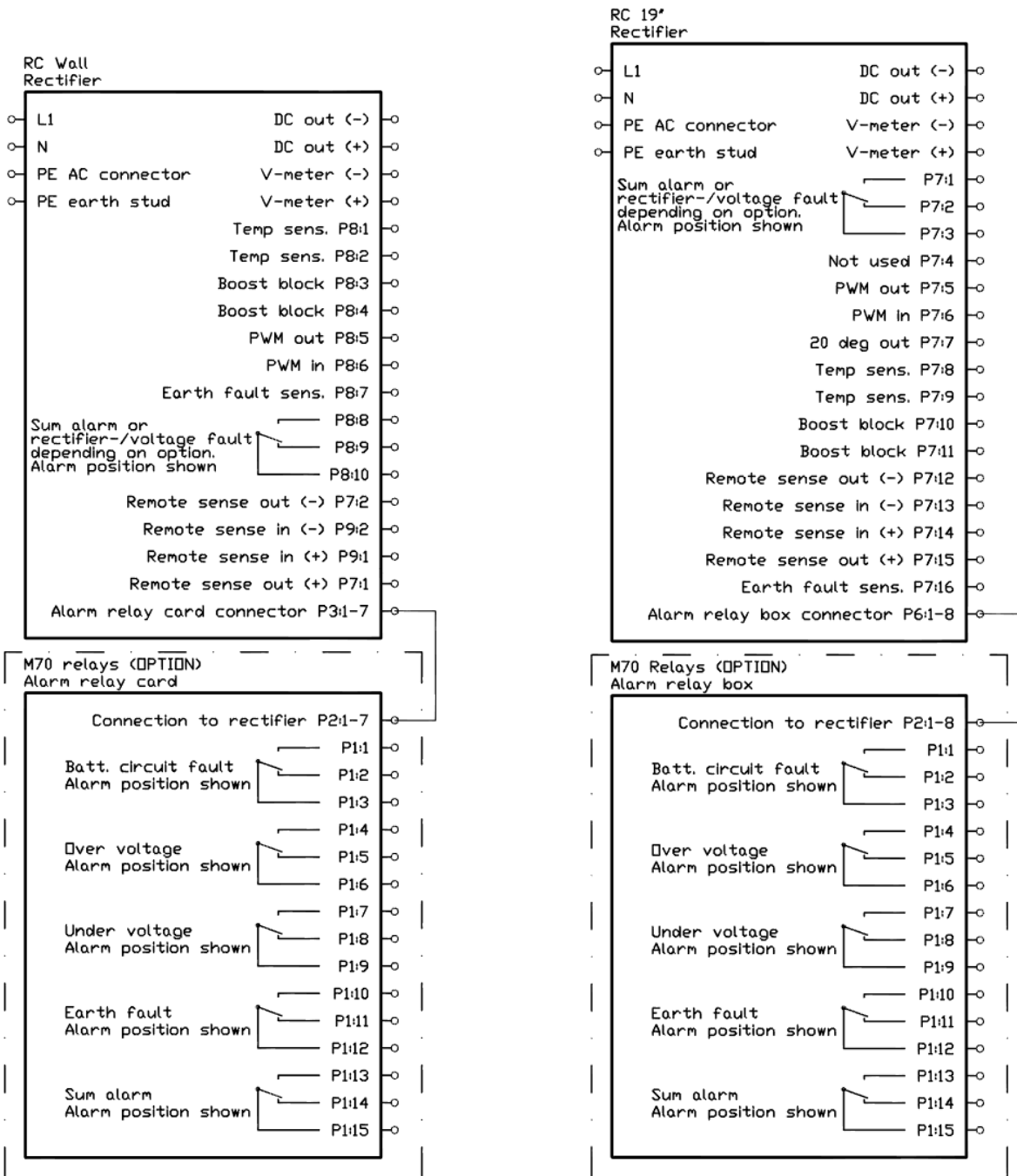
The RC-series is a rectifier for either directly powering the load or for use together with batteries. It is designed for either 19" or wall mount. Voltages 12-220VDC and power range 150-1600W.

Standard equipped it has alarms for mains fault, power unit fault, voltage fault, temperature sensor fault and remote sense fault. Alarms are given using indicators and standard sum alarm relay.

With option M60 it also has alarms for high voltage, low voltage, battery circuit fault and earth fault. Alarms are given using indicators and standard sum alarm relay.

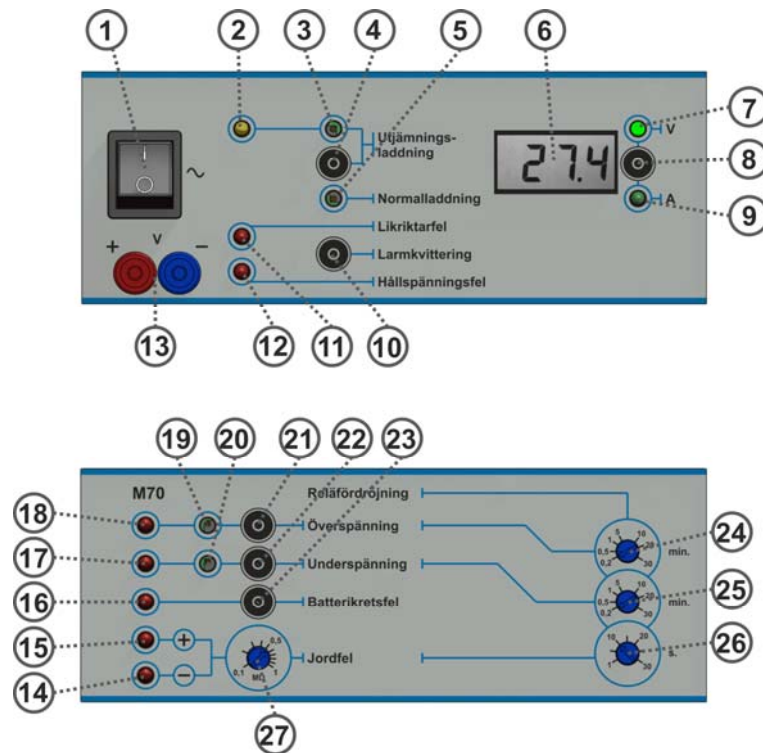
With option M70 it has the same alarms as with M60 and also adds separate relays for high voltage, low voltage, battery circuit fault and earth fault and separate delays for high voltage, low voltage and earth fault.

Symbols



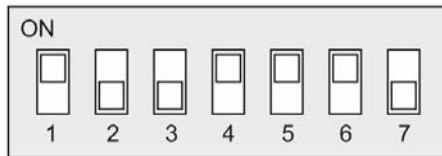
Indicators and settings

For more detailed descriptions, see chapter "Features, settings and alarms".



1. On/off switch for AC-input.
2. Yellow indicator blinks when boost charging.
3. Potentiometer for boost charge voltage level.
4. Button for start/stop of boost charge.
5. Potentiometer for normal charge voltage level.
6. Display for voltage, current and alarm levels.
7. Green indicator is lit when displaying voltage.
8. Button for switching display mode between voltage and current.
9. Green indicator is lit when displaying current.
10. Button for alarm reset.
11. Red indicator blinks when rectifier fault is active or not yet reset.
12. Red indicator blinks when voltage fault is active or not yet reset.
13. Measurement connector for external voltmeter.
14. Red indicator blinks when negative earth fault is active or not yet reset.
15. Red indicator blinks when positive earth fault is active or not yet reset.
16. Red indicator blinks when battery circuit fault is active or not yet reset.
17. Red indicator blinks when low voltage fault is active or not yet reset.
18. Red indicator blinks when high voltage fault is active or not yet reset.
19. Potentiometer for high voltage alarm level.
20. Potentiometer for low voltage alarm level.
21. Button for displaying high voltage alarm level.
22. Button for displaying low voltage alarm level.
23. Button for manual start of battery circuit test.
24. Potentiometer for high voltage alarm relay delay.
25. Potentiometer for low voltage alarm relay delay.
26. Potentiometer for earth fault alarm relay delay.
27. Potentiometer for earth fault alarm level.

SW1 on board 7781 (wall model)



SW1:1 = ON: Delay for standard relay 10 seconds (default).

SW1:1 = OFF: Delay for standard relay 10 minutes.

SW1:2 = ON: Automatic alarm reset is on (button does not need to be pushed for reset).

SW1:2 = OFF: Automatic alarm reset is off (button needs to be pushed for reset) (default).

SW1:3 = ON: Battery circuit fault alarm blocked.

SW1:3 = OFF: Battery circuit fault alarm not blocked (default).

SW1:4 = ON: Rectifier fault alarm not blocked (default).

SW1:4 = OFF: Rectifier fault alarm blocked.

SW1:5 = ON: Voltage fault alarm not blocked (default).

SW1:5 = OFF: Voltage fault alarm blocked.

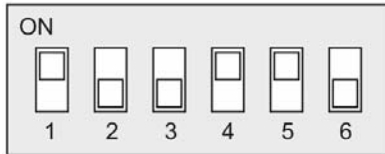
SW1:6 = ON: Internal simulation of +20°C on, for use without temp sensor (default).

SW1:6 = OFF: Internal simulation of +20°C off, for use with temp sensor.

SW1:7 = ON: Automatic boost charge on.

SW1:7 = OFF: Automatic boost charge off (default).

SW1 on board 7794 (19"-model)



SW1:1 = ON: Delay for standard relay 10 seconds (default).

SW1:1 = OFF: Delay for standard relay 10 minutes.

SW1:2 = ON: Automatic alarm reset is on (button does not need to be pushed for reset).

SW1:2 = OFF: Automatic alarm reset is off (button needs to be pushed for reset) (default).

SW1:3 = ON: Battery circuit fault alarm blocked.

SW1:3 = OFF: Battery circuit fault alarm not blocked (default).

SW1:4 = ON: Rectifier fault alarm not blocked (default).

SW1:4 = OFF: Rectifier fault alarm blocked.

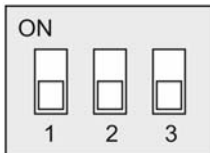
SW1:5 = ON: Voltage fault alarm not blocked (default).

SW1:5 = OFF: Voltage fault alarm blocked.

SW1:6 = ON: Automatic boost charge on.

SW1:6 = OFF: Automatic boost charge off (default).

SW4 on backside of display board 7782 (wall- and 19"-model)



Setting of timer for boost charge length.

	2 h	4 h	8 h	24 h (default)
SW4:1	ON	OFF	OFF	OFF
SW4:2	OFF	ON	OFF	OFF
SW4:3	OFF	OFF	ON	OFF

Mounting, connections and start-up

1. The rectifier must only be installed by authorized personnel. Hazardous voltages can occur on both the primary and the secondary side.
2. The rectifier is designed for stationary mounting on wall or 19"-rack mount depending on model.
3. Read the manual and configure the rectifier according to the manual in case of different settings needed compared to factory default.
4. Mount the rectifier in such way that circulation of air is possibly.
5. For models with DC output of 60-220VDC, mount the rectifier according to at least IP20.
6. Inspect the rectifier so nothing is dusty, dirty or damaged.
7. Check that the AC and DC fuses in the target installation is correct in respect to the rectifiers type label.
8. Check that the mains switch is in position "0"/Off.
9. Connect protective earth cable with necessary gauge to the earth stud.
10. Inspect and disconnect primary and secondary fuses.
11. Connect AC input.
12. Connect DC output. Observe correct polarity.
13. When using M70 19"-model: connect the relay box with cable RJ45 between P2 on the relay box and P6 card 7794 (backside).
14. Connect any required signaling (relay outputs, boost block, temperature sense, remote sense, master/slave configuration, earth fault sense).
15. Connect the primary fuse.
16. Put mains switch into position "1"/On.
17. Check and if needed adjust the normal voltage and boost voltage (if boost charge is to be used). Follow the battery manufacturer's instructions.
Important: Temperature compensation influences the voltage levels. It is recommended to disable the temperature compensation feature when setting the voltage levels. See chapter "Temperature compensated charge voltage".
18. Check alarm levels and adjust if needed.
19. Connect the secondary fuse.
20. Done.

Features, settings and alarms.

In the text below there are references to the front panel illustration on earlier page by stating number inside parentheses, ex. (7).

Mains input

Wall model: Terminals inside the rectifier on the DIN-rail.

19"-modell: As mains inlet on the backside.

Earth stud

Connect the protective earth with adequate gauge to the earth stud.

DC output

Connection terminal for DC output. Observe correct polarity.

Mains switch

The mains switch (1) are used for turning on and off the incoming mains supply for the rectifier. It breaks both neutral and phase. Although the incoming mains are switched off the alarm and logic part of the rectifier can still be powered from the DC side through the DC-output.

Measurement output

Connect an external volt meter to the measurement output (13) in order to get better resolution and to check correct functioning of the internal display. The voltage in the measurement output follows the temperature compensated voltage and also the remote sense voltage. The measurement output is short circuit protected. The measurement output cannot be used for powering the load.

Display

The display (6) shows the voltage and current and also alarm level settings for high voltage and low voltage alarms. Push the display mode button (8) to switch between voltage and current. The mode is indicated with either green indicator for voltage display "V" (7) or green indicator for current display "A" (9).

Normal charge and boost charge

The rectifier has two different charge modes which gives two different voltage levels. Normal charge and boost charge. Boost charge is started either manually with button (4) or automatically with the "automatic boost charge" feature (see chapter "Automatic boost charge"). When the boost charge mode is active it is indicated by a yellow blinking indicator (2). After being started the boost charge continues according to the preset length of time. The length is set on the backside of display card 7782 according to table below:

	2 h	4 h	8 h	24 h
SW4:1	ON	OFF	OFF	OFF
SW4:2	OFF	ON	OFF	OFF
SW4:3	OFF	OFF	ON	OFF

Factory default setting is 24 hours (unless other setting is requested by delivery).

In order to set the normal charge level, make sure the rectifier is in normal charge mode and that the display is showing voltage. Adjust using the potentiometer for normal charge level (5). In order to set the boost charge level, make sure the rectifier is in boost charge mode and that the display is showing voltage. Adjust using the potentiometer for boost charge level (3). Before adjusting any voltage, make sure the rectifier is not in current limiting operation. **Important:** Temperature compensation influences the voltage levels. It is recommended to disable the temperature compensation feature when setting

the voltage levels. See chapter "Temperature compensated charge voltage".

Boost charge blocking is set according to below:

Wall model: Card 7781 P8:3 and P8:4 jumpered = Unblocked. Not jumpered = Blocked.

19"-model: Card 7794 P7:10 and P7:11 jumpered = Unblocked. Not jumpered = Blocked.

Factory default setting is not jumpered (unless other setting is requested by delivery).

Adjustment ranges:

Unom	Adjustment range
12 VDC	11.4-14.4 VDC
24 VDC	22.8-28.8 VDC
36 VDC	34.2-43.2 VDC
48 VDC	45.6-57.6 VDC
60 VDC	57.0-72.0 VDC
110 VDC	104.5-132.0 VDC
120 VDC	114.0-144.0 VDC
220 VDC	209.0-264.0 VDC

Factory default setting (unless other setting is requested by delivery):

Unom	No. of cells	Normal charge 2,28V/cell	Boost charge 2,35V/cell	Voltage prot. level DC
12 VDC	6 cells	13.7 VDC	14.1 VDC	15.1 VDC
24 VDC	12 cells	27.4 VDC	28.2 VDC	30.2 VDC
36 VDC	18 cells	41.1 VDC	42.3 VDC	45.3 VDC
48 VDC	24 cells	54.7 VDC	56.4 VDC	60.5 VDC
60 VDC	30 cells	68.4 VDC	70.5 VDC	75.6 VDC
110 VDC	54 cells	123.1 VDC	126.9 VDC	133.5 VDC
120 VDC	60 cells	136.8 VDC	141.0 VDC	151.2 VDC
220 VDC	108 cells	246.2 VDC	253.8 VDC	272.1 VDC

Automatic boost charge

If the rectifier goes into current limit mode during the first 30 seconds after being turned on (or powered after black out) the boost charge mode is started. After being started the boost charge continues according to the preset length of time. See chapter "Normal charge and boost charge" for settings.

Automatic boost charge can be turned on and off according to below:

Wall model: Card 7781 SW1:7 ON = Automatic boost charge is on. OFF = off.

19"-model: Card 7794 SW1:6 ON = Automatic boost charge is on. OFF = off.

Factory default setting is OFF (unless other setting is requested by delivery).

In order for the automatic boost charge feature to function the rectifier fault alarm must not be blocked. See chapter "Rectifier fault".

Alarm logic

When a fault occurs the alarm indicator in question (11, 12, 14, 15, 16, 17, 18) starts to blink instantly, without delay. If the fault is remedied before the delay time is met, the indicator stops blinking. If the alarm is not remedied before the delay time is met the alarm relay is triggered and the indicator goes into a mode where it has to be reset (see below) in order to stop blinking. When the fault is remedied the relay is released instantly but the indicator continues to blink until it is reset by the alarm reset button (10). The indicator can also be reset instantly when the fault is remedied by the automatic alarm reset feature.

Without M60/M70 and with M60 all alarms trigger the standard mounted relay which then functions as a sum alarm relay.

With M70 there are additional relays for high voltage, low voltage, earth fault, battery circuit fault and sum alarm. The standard relay are then not used as a sum alarm relay, it is instead only used for rectifier fault and voltage fault. The sum alarm function is taken over by the relay that comes with the M70.

No alarms are transferred between rectifiers in parallel. The alarms in the slaves does not trigger the sum alarm relay in the master. The alarm relays in the slaves must be connected separately.

The automatic alarm reset feature is set according to below (common setting for all indicators):

Wall model: Card 7781 SW1:2 ON = Automatic alarm reset on. OFF = off.

19"-modell: Card 7794 SW1:2 ON = Automatic alarm reset on. OFF = off.

Factory default setting is OFF (unless other setting is requested by delivery).

The standard sum alarm relay's delay is set according to below:

Wall model: Card 7781 SW1:1 ON = 10 seconds. OFF = 10 minutes.

19"-modell: Card 7794 SW1:1 ON = 10 seconds. OFF = 10 minutes.

Factory default setting is ON (unless other setting is requested by delivery).

With M70 the delays for high voltage fault, low voltage fault and earth fault are set using the delay potentiometers (24, 25, 26). The battery circuit fault relay has no delay.

Relay outputs

Wall model: Standard relay is output on connector P8 card 7781

P8:8 Open during alarm

P8:9 Closed during alarm

P8:10 Common

19"-model: Standard relay is output on connector P7 card 7794 (backside)

P7:1 Open during alarm

P7:2 Closed during alarm

P7:3 Common

Wall model and 19"-model with M70:

External relay box (19"-model) or internal relay card (wall model).

	P1:1	Open during alarm
Battery circuit fault	P1:2	Closed during alarm
	P1:3	Common

	P1:4	Open during alarm
High voltage U>	P1:5	Closed during alarm
	P1:6	Common

	P1:7	Open during alarm
Low voltage U<	P1:8	Closed during alarm
	P1:9	Common

	P1:10	Open during alarm
Earth fault	P1:11	Closed during alarm
	P1:12	Common

	P1:13	Open during alarm
Sum alarm	P1:14	Closed during alarm
	P1:15	Common

No alarms are transferred between rectifiers in parallel. The alarms in the slaves does not trigger the sum alarm relay in the master. The alarm relays in the slaves must be connected separately.

Rectifier fault

Alarm is given at mains fault (black out or faulty mains fuse), internal fuse fault (fuse on power unit) or power unit fault.

Rectifier fault blocking is set according to below:

Wall model: Card 7781 SW1:4 ON = Unblocked. OFF = Blocked.

19"-model: Card 7794 SW1:4 ON = Unblocked. OFF = Blocked.

Factory default setting is ON (unless other setting is requested by delivery).

In order for the automatic boost charge feature to function the rectifier fault alarm must not be blocked. For description of alarm logic see chapter "Alarm logic".

Voltage fault

Alarm is given during faulty output voltage ($\pm 2\%$ deviation from set voltage), temperature fault (hotter than $+40^{\circ}\text{C}$, colder than -5°C or if circuit is short circuited or open) and remote sense fault.

Rectifier fault blocking is set according to below:

Wall model: Card 7781 SW1:5 ON = Unblocked. OFF = Blocked.

19"-model: Card 7794 SW1:5 ON = Unblocked. OFF = Blocked.

Factory default setting is ON (unless other setting is requested by delivery).

For description of alarm logic see chapter "Alarm logic".

High voltage (option M60/M70)

Alarm is given when voltage level is above set alarm level. To set the alarm level push button for high voltage alarm level (21) and keep pushing the button. The display shows the set alarm level. Adjust using potentiometer for alarm level (19). To block the alarm, turn the potentiometer max clockwise.

Release the button (21) after setting is done. To set the delay, use the potentiometer for delay (24).

For description of alarm logic see chapter "Alarm logic".

Factory default setting (unless other setting is requested by delivery):

Unom	High volt. alarm
	2,33V/cell
12 VDC	14.0 VDC
24 VDC	28.0 VDC
36 VDC	42.0 VDC
48 VDC	55.9 VDC
60 VDC	69.9 VDC
110 VDC	126.0 VDC
120 VDC	140.0 VDC
220 VDC	252.0 VDC

Low voltage (option M60/M70)

Alarm is given when voltage level is below set alarm level. To set the alarm level push button for low voltage alarm level (22) and keep pushing the button. The display shows the set alarm level. Adjust using potentiometer for alarm level (20). To block the alarm, turn the potentiometer max counter clockwise. Release the button (22) after setting is done. To set the delay, use the potentiometer for delay (25).

For description of alarm logic see chapter "Alarm logic".

Factory default setting (unless other setting is requested by delivery):

Unom	Low volt. alarm
	95% of Unom
12 VDC	11.4 VDC
24 VDC	22.8 VDC
36 VDC	34.2 VDC
48 VDC	45.6 VDC
60 VDC	57.0 VDC
110 VDC	105.0 VDC
120 VDC	114.0 VDC
220 VDC	209.0 VDC

Battery circuit fault (option M60/M70)

Test is started automatically once per day or manually with button (23). The rectifier lowers the voltage to 1.9V/cell for about 5 seconds. If the battery does not keep the voltage at least about 3% higher (1.96V/cell) than the test level, the alarm will trigger. In order to reset the alarm a new test with

a working battery has to be done.

The battery circuit fault alarm can be blocked according to below:

Wall model: Card 7781 SW1:3 ON=Battery circuit fault alarm is blocked. OFF = Unblocked.

19"-model: Card 7794 SW1:3 ON= Battery circuit fault alarm is blocked. OFF = Unblocked.

Factory default setting is OFF (unless other setting is requested by delivery).

For description of alarm logic see chapter "Alarm logic".

The test level can be adjusted by using a screw driver from the backside of alarm card 7783 and rotate RT3. Only for authorized personnel.

Factory default setting (unless other setting is requested by delivery):

Unom	Test level	Alarm level
	1.9V/cell	1.96V/cell
12 VDC	11.4 VDC	11.8 VDC
24 VDC	22.8 VDC	23.5 VDC
36 VDC	34.2 VDC	35.3 VDC
48 VDC	45.6 VDC	47.0 VDC
60 VDC	57.0 VDC	58.8 VDC
110 VDC	102.6 VDC	105.8 VDC
120 VDC	114.0 VDC	117.6 VDC
220 VDC	205.2 VDC	211.7 VDC

Earth fault (option M60/M70)

Alarm is given when the resistance in the earth fault (positive or negative) goes below the set earth fault level. To set the alarm level (positive and negative), turn potentiometer for alarm level (27). To set the delay, turn potentiometer for delay (26).

The earth sense is enabled by connecting the earth sense cable and disabled by disconnecting the earth sense cable. It is located according to below:

Wall model: The earth sense cable is connected to terminal P8:7 card 7781.

19"-model: The earth sense cable is connected to terminal 7:16 card 7794 (backside).

Important: Do not conduct a hi-pot test on the rectifier when the earth sense cable is connected. The sense resistors will be damaged.

Factory default setting (unless other setting is requested by delivery): 500Kohm

For description of alarm logic see chapter "Alarm logic".

Temperature compensated charge voltage

By raising the charge voltage when the battery temperature is low and by lowering the charge voltage when the battery voltage is high the battery is given increased life.

At +20°C there is no compensation. Above +20°C the compensation is -3,3mV per °C and cell. Below +20°C the compensation is +3,3mV per °C and cell.

Above +40°C or if the temperature sensor is short circuited the charge voltage is set to 2.1-2,2V/cell and voltage fault alarm is given.

Below -5°C or if the temperature sensor is open the charge voltage is set according to +10°C and voltage fault alarm is given.

To enable temperature compensation (wall model):

Disable the simulation of +20°C by setting SW1:6 card 7781 to OFF. Connect the temperature sensor between P8:1 and P8:2 card 7781 and attach it to the battery.

To disable temperature compensation (wall model):

Enable the simulation of +20°C by setting SW1:6 card 7781 to ON. Disconnect the temperature sensor between P8:1 and P8:2 card 7781.

To enable temperature compensation (19"-model):

Disable the simulation of +20°C by removing the jumper between P7:7 and P7:8 card 7794 (backside). Connect the temperature sensor between P7:8 and P7:9 card 7794 (backside) and attach it to the battery.

To disable temperature compensation (19"-model):

Enable the simulation of +20°C by attaching the jumper between P7:7 and P7:8 card 7794 (backside). Disconnect the temperature sensor between P7:8 and P7:9 card 7794 (backside).

Factory default setting (unless other setting is requested by delivery): Temperature compensation simulated to +20°C.

Parallel connection

Several rectifiers can be connected in parallel in order to output higher power. Different power classes can be mixed as long as the output voltage is the same. One rectifier is chosen as master and the rest will be slaves. The slaves follow the master's voltage setting.

Connection: Chose a rectifier to be master. Connect the master's PWM-out (Wall: P8:5 card 7781, 19": P7:5 card 7794) to the slave's PWM-in (Wall: P8:6, 19": P7:6). For more slaves, connect the slave's PWM-out to the next slaves PWM-in, and so on. Always leave the master's PWN-in empty.

In parallel connection the slave's voltage cannot be adjusted on the slaves. They are controlled by the master.

Temperature compensation and remote sense must be connected to the master.

In order to avoid voltage fault alarm on the slaves the voltage fault alarm must be blocked. See chapter "Voltage fault".

If a slave is equipped with M60/M70, that slave's battery circuit alarm must be blocked. See chapter "Battery circuit fault (option M60/M70)".

Load balancing is done automatically. For 500, 1000 and 1600W: In case the load balancing needs to be adjusted, use the trimmer RT6 (Wall: card 7781, 19": card 7794). Only for authorized personnel.

No alarms are transferred between rectifiers in parallel. The alarms in the slaves does not trigger the sum alarm relay in the master. The alarm relays in the slaves must be connected separately.

Remote sense

When using long cables and/or high current there can occur a voltage loss along the cables which results in the batteries/load does not receive the correct voltage. With remote sense the rectifier is compensating for the loss by raising the voltage on the DC output. The rectifier can compensate a maximum of +3% of set voltage level. During an open circuit fault in the remote sense cables the rectifier will output a voltage 3% above the set voltage level and will trigger the voltage fault alarm.

Enable remote sense (wall model):

Remove the cable between connector P7 7781 and terminal P9 card 7781. Important: start with disconnecting P7. Connect plus and minus from the point where correct voltage is required to P9 (+) and (-) card 7781. Important: Observe correct polarity and use correct fuses. Shown voltage in the display (6) and the voltage in the measurement output (13) follow the voltage at the remote sense point.

Disable the remote sense (wall model):

Remove the incoming remote sense cable from terminal P9 card 7781. Connect the cable between terminal P9 (+) and (-) card 7781 and connector P7 card 7781. Red cable is (+) and blue cable is (-). Important: Start with connecting P9.

Enable remote sense (19"-model):

Remove jumpers between terminals P7:12, P7:13 and between P7:14, P7:15 card 7794 (backside). Connect plus and minus from the point where correct voltage is required to P7:13 (-) and P7:14 (+). Important: Observe correct polarity and use correct fuses. Shown voltage in the display (6) and the voltage in the measurement output (13) follow the voltage at the remote sense point.

Disable remote sense (19"-model):

Remove the incoming remote sense cable from terminals P7:13 (-) and P7:14 (+) card 7794 (backside). Install jumpers between P7:12, P7:13 and between P7:14, P7:15 card 7794 (backside).

Factory default setting (unless other setting is requested by delivery): Jumpers installed/remote sense disabled.

Troubleshooting

Symptom	Problem	Solution
The indicator for rectifier fault is blinking.	Mains fault.	Check that mains voltage is present and that the mains fuse is working.
	Rectifier fault.	Check the charge voltage. The rectifier may have detected high DC voltage. Try to reset the alarm by shutting the rectifier off and then on. <u>150-600W</u> If the rectifier does not output any DC voltage, check the internal fuse on card 7778. <u>500, 1000-1600W</u> If the rectifier does not output any DC voltage even if there is mains voltage, contact service agent.
	DC fuse fault.	Check the DC fuse F1 on card 7794 or 7796.
The indicator for voltage fault is blinking.	Incorrent charge voltage.	The rectifier is in current limiting operation. This is normal if the battery is discharged and is being charged. Check the load so it is not too big.
	Temperature sensor fault.	Check the battery temperature. Alarm is gives at $< -5^{\circ}\text{C}$ and at $> +40^{\circ}\text{C}$. Check that there is no open circuit or short circuit and that the sensor is correctly connected. See chapter "Temperature compensated charge voltage".
	Fault in remote sense.	Check that the remote sense cables are correctly connected. See chapter "Remote sense". Check the voltage loss between the rectifiers DC output terminal and the battery/load where the remote sense cables are connected. The voltage loss must not be greater than 3%.

Models Wall

Type	Power	Mains fuse	Dimensions	Weight
RC 12/10	150 W	6 A	h410 x b270 x d115 mm	5 kg
RC 12/20	300 W	6 A	h410 x b270 x d115 mm	6 kg
RC 12/35	500 W	6 A	h455 x b355 x d210 mm	14 kg
RC 12/80	1200 W	10 A	h455 x b355 x d210 mm	16.5 kg
RC 24/6	150 W	6 A	h410 x b270 x d115 mm	5 kg
RC 24/10	300 W	6 A	h410 x b270 x d115 mm	5 kg
RC 24/20	600 W	6 A	h410 x b270 x d115 mm	6 kg
RC 24/35	1000 W	10 A	h455 x b355 x d210 mm	14kg
RC 24/60	1600 W	10 A	h455 x b355 x d210 mm	17.5 kg
RC 36/8	300 W	6 A	h410 x b270 x d115 mm	5 kg
RC 36/16	600 W	6 A	h410 x b270 x d115 mm	6 kg
RC 48/6	300 W	6 A	h410 x b270 x d115 mm	5 kg
RC 48/12	600 W	6 A	h410 x b270 x d115 mm	6 kg
RC 48/20	1000 W	10 A	h455 x b355 x d210 mm	14 kg
RC 48/35	1600 W	10 A	h455 x b355 x d210 mm	17.5kg
RC 60/5	300 W	6 A	h410 x b270 x d115 mm	5 kg
RC 60/10	600 W	6 A	h410 x b270 x d115 mm	6 kg
RC 110/2.5	300 W	6 A	h410 x b270 x d115 mm	5 kg
RC 110/5	600 W	6 A	h410 x b270 x d115 mm	6 kg
RC 110/10	1000 W	10 A	h455 x b355 x d210 mm	14 kg
RC 110/15	1600 W	10 A	h455 x b355 x d210 mm	16.5 kg
RC 120/2.2	300 W	6 A	h410 x b270 x d115 mm	5 kg
RC 120/4.5	600 W	6 A	h410 x b270 x d115 mm	6 kg
RC 120/9	1000 W	10 A	h455 x b355 x d210 mm	14 kg
RC 120/14	1600 W	10 A	h455 x b355 x d210 mm	16.5 kg
RC 220/5	1000 W	10 A	h455 x b355 x d210 mm	14 kg
RC 220/7.5	1600 W	10 A	h455 x b355 x d210 mm	16.5 kg

Models 19"

Type	Power	Mains fuse	Dimensions	Weight
RC 12/10	150 W	6 A	2HE×19"×320 mm	5 kg
RC 12/20	300 W	6 A	2HE ×19"×320 mm	6 kg
RC 12/35	500 W	6 A	2HE ×19"×320 mm	10 kg
RC 12/80	1200 W	10 A	3HE ×19"×320 mm	14 kg
RC 24/6	150 W	6 A	2HE ×19"×320 mm	5 kg
RC 24/10	300 W	6 A	2HE ×19"×320 mm	5 kg
RC 24/20	600 W	6 A	2HE ×19"×320 mm	6 kg
RC 24/35	1000 W	10 A	2HE ×19"×320 mm	10 kg
RC 24/60	1600 W	10 A	3HE ×19"×320 mm	14 kg
RC 36/8	300 W	6 A	2HE ×19"×320 mm	5 kg
RC 36/16	600 W	6 A	2HE ×19"×320 mm	6 kg
RC 48/6	300 W	6 A	2HE ×19"×320 mm	5 kg
RC 48/12	600 W	6 A	2HE ×19"×320 mm	6 kg
RC 48/20	1000 W	10 A	2HE ×19"×320 mm	10 kg
RC 48/35	1600 W	10 A	3HE ×19"×320 mm	14 kg
RC 60/5	300 W	6 A	2HE ×19"×320 mm	5 kg
RC 60/10	600 W	6 A	2HE ×19"×320 mm	6 kg
RC 110/2.5	300 W	6 A	2HE ×19"×320 mm	5 kg
RC 110/5	600 W	6 A	2HE ×19"×320 mm	6 kg
RC 110/10	1000 W	10 A	2HE ×19"×320 mm	10 kg
RC 110/15	1600 W	10 A	3HE ×19"×320 mm	14 kg
RC 120/2.2	300 W	6 A	2HE ×19"×320 mm	5 kg
RC 120/4.5	600 W	6 A	2HE ×19"×320 mm	6 kg
RC 120/9	1000 W	10 A	2HE ×19"×320 mm	10 kg
RC 120/14	1600 W	10 A	3HE ×19"×320 mm	14 kg
RC 220/5	1000 W	10 A	2HE ×19"×320 mm	10 kg
RC 220/7.5	1600 W	10 A	3HE ×19"×320 mm	14 kg

Technical data

Input voltage	230V AC, $\pm 15\%$, 1-phase, 45-65Hz
Efficiency	80-90% at 230V AC in and max load
Power factor >0,96)	>0,98 at 230V AC in and max load (exception 12/35 and 12/80:
Regulation	Primary switched regulation, regulation tolerance <0,5%.
Ripple voltage	Max 0,05% RMS of Unom Psof. max 1mV psof. (12-24V), max 2mV (36-60V)
Instrument	Digital volt and ampere meter (3½ digit LCD)
Monitoring	<ul style="list-style-type: none">- Protection for high AC-voltage and high temperature- High voltage protection DC (ca 125% of Unom)- Current limited (not 500, 1000W)- Power limited (not 150, 300, 600W)- Short circuit protected- Rectifier fault (resulting from mains fault, power unit fault, DC fuse fault)- Voltage fault (resulting from volt. fault, temp. fault, remote sense fault)
Relay outputs	8.00A at 20VDC 0.50A at 60VDC 0.28A at 100VDC 0.19A at 140VDC 0.16A at 180VDC 0.12A at 220VDC
Ambient temperature	0 to +40°C (RC 24/20 19": 0 to +45°C)
Ingress Protection	IP20 (Option wall model 150, 300, 600W: IP21)
Color	RAL 7035
Terminals	Wall: AC-in: max 4mm ² DC out (150, 300, 600W): max 25mm ² DC out (500, 1000, 1600W): max 35mm ² Signaling: max 2,5mm ² 19": AC-in: mains inlet IEC C14 DC out (150-1000W): max 10mm ² DC out (1200-1600W): max 25mm ² Signaler: max 1,5mm ²
Norms	CE-certified according to the LVD and EMC directives.