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RMX-4104

Protection Functions

Your programmable power supply is equipped with the following protection functions. If the protection function is activated, the alarm turns on, the output turns off, or the operation is restricted.

 **Press OCP • OVP key (twice when setting the UVL) for setting the OVP trip point, the OCP trip point, UVL trip point.**

There are three methods to clear alarm.

- Press ALM CLR (SHIFT+SET).
- Set pin 5 of the J1 connector to LOW (0 V to 0.5 V) or short-circuit.
- Turn the programmable power supply off, and then turn the programmable power supply on.

If OVP2, OHP2 and SD has been activated, turn the power supply off, and then turn the power supply on.

Unless you fix the problem that caused the alarm to occur, the alarm will occur again.

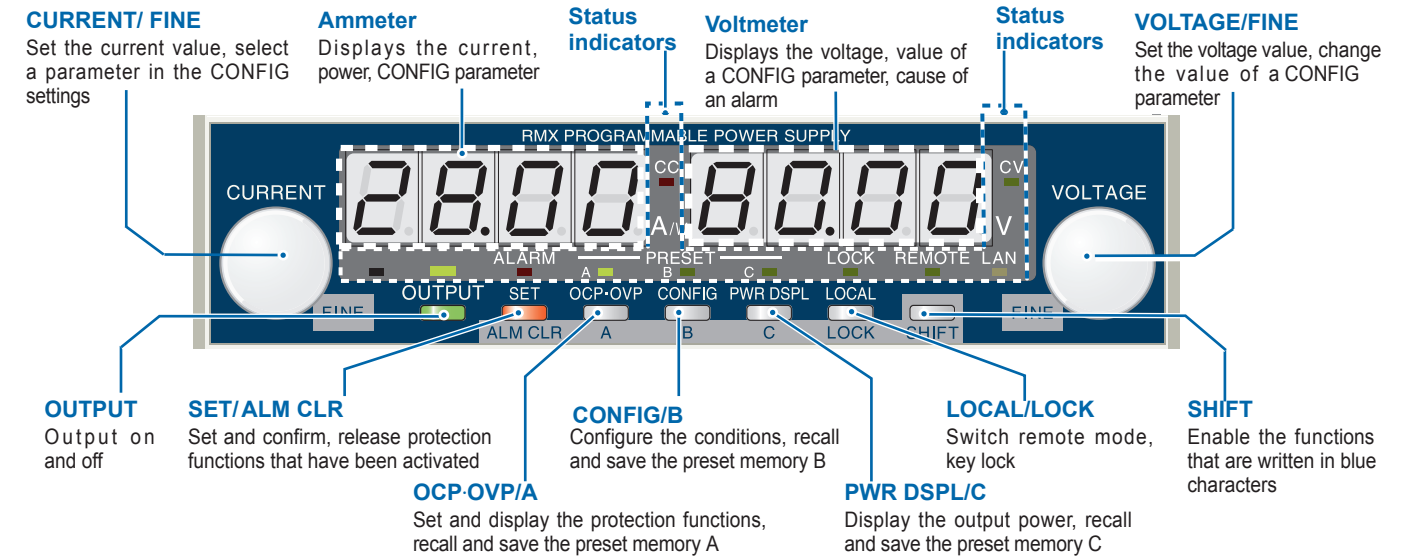
Overvoltage protection (OVP)	Activated when the output terminal voltage exceeds the set voltage (OVP trip point). Setting range: 10% to 112% of the rated output voltage.
Overvoltage protection 2 (OVP2)	Activated when the output terminal voltage exceeds 120% of the rated output voltage (when a voltage is being applied from an external source).
Overcurrent protection (OCP)	Activated when the output current exceeds the set current (OCP trip point). Setting range: 10% to 112% of the rated output current.
Undervoltage limit (UVL)	Activated when you attempt to set the output voltage to a value that is lower than the set undervoltage limit (the UVL trip point). Does not turn the output off. Setting range: 0% to 105% of the rated output voltage.
Overheat protection (OHP)	Activated when the internal temperature rises to an abnormal level.
Overheat protection 2 (OHP2)	When the used in an environment outside its operating ambient temperature an upper limit (+50 °C [122 °F]), used with its air inlet and exhaust port blocked, the fan motor has stopped.
Fan failure protection (FAN)	Activated when the number of fan rotations drops to an abnormal level.
Incorrect sensing connection protection (SENSE)	Activated when the remote sensing cables are connected with the incorrect polarity (positive or negative), and the remote sensing function is then used.
Low AC input protection (AC-FAIL)	Activated when a low AC line voltage is detected.
Shutdown (SD)	That is used to turn the output off through the application of a signal to the J1 connector when an abnormal condition occurs. Not activated as a result of the programmable power supply detecting an error.
Power limit (POWER LIMIT)	This function limits the output power to a value that is approx. 105% of the rated output power. Does not turn the output off. When the function has been activated, the ALARM LED blinks.

RMX Programmable Power Supply

Quick Reference Guide

PART NO. Z1-006-652, IB031471

Nov.2016





Panel Operations

Using the RMX Power Supply as a CV or CC Power Supply

When the programmable power supply is in CV mode, the set current is the limit of the current that can flow through the load. When the programmable power supply is in CC mode, the set voltage is the limit of the voltage that can be applied to the load. If the limit is reached, the programmable power supply automatically switches the CV/CC mode.


 **Press SET to change to the setting display.**

 **Turn the VOLTAGE knob to set the voltage, Turn the CURRENT knob to set the current.**
Voltage range: 0% to 105 % of the rated output voltage
Current range: 0% to 105 % of the rated output current


 **Press OUTPUT to turn output on.**
The output turns on and off each time you press OUTPUT.

Locking Panel Operations (Key lock)

When the keys are locked, the key is invalid. Only the OUTPUT key is valid.

 **Hold down LOCK (SHIFT+LOCAL) until the LOCK LED lights. To unlock the keys, hold down LOCK again (SHIFT+LOCAL) until the LOCK LED turns off.**

To Set the Device to Factory Default Settings

 **Hold down SHIFT+LOCAL while you turn the POWER switch on.**

Status Indicators

LEDs indicate the following states:

CC	Lights during constant current mode	■
CV	Lights during constant voltage mode	■
OUT PUT	Lights when output is turned on ■ , or Blinks when output is on and a protection function has been activated ▬	
ALARM	Lights when a protection function has been activated. However, not lights when UVL has been activated, blinks when the power limit has been activated ▬	
PRESET	Lights when the memory A, B or C values are being recalled or saved ■	
LOCK	Lights when the keys are locked ■	
REMOTE	Lights during remote control ■	
LAN	Lights and blinks when the LAN interface is in use (No Fault ■ / Fault ■ / Standby ■ / WEB Identify ▬)	

Measured Value Display and Setting Display

Measured value display

When the SET key LED is off, the measured output voltage and current are displayed. You can change the output voltage and output current settings while the measured values are displayed.

Power display


Press PWR DSPL while in the measured value display to display the output power on the ammeter.

Setting display


Press the SET key to display the output voltage and current settings.
Press the SET key again to return to the measured value display.

Preset Memory Function


You can store three groups of presets using the A, B, & C buttons. The settings stored are Output Voltage, Output Current, OVP, OCP, and UVL.

 **To save a preset memory, hold SHIFT and hold down the memory key (A, B, or C) to which you want to save the settings until their LEDs turn on.**

Recalling preset memory entries

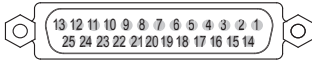
 **Hold SHIFT and press the memory key (A, B, or C) you want to recall the preset memory entry. Make sure to press the memory key once.**

- If you hold it down, the preset values in that slot will be overwritten with the current values.

 **Check the displayed settings, and press SET to enable the output.**

External Control

The rear J1 connector can be used for external control or monitoring of the power supply's current state. Multi-device master-slave operation is also controlled through this connector.



1	PRL ON COM	Common for pin 16
2	N.C.	Not connected.
3	N.C.	Not connected.
4	N.C.	Not connected.
5	ALM CLR	Alarm clear terminal. Alarms are cleared when a LOW (0 to 0.5 V) or short-circuit is applied to this terminal.
6	SHUT DOWN	Output shutdown control terminal. The output is turned off when a LOW (0 to 0.5 V) or short-circuit is applied to this terminal.
7	PRL IN-	Negative input terminal for master-slave parallel operation.
8	PRL IN+	Positive input terminal for master-slave parallel operation.
9	PRL COMP IN	Correction signal input terminal for master-slave parallel operation.
10	A COM	External signal common for pins 5 to 9, 11 to 13, 20 to 22, 24 and 25.
11	PRL OUT+	Positive output terminal for master-slave parallel operation.
12	PRL COMP OUT	Correction signal output terminal for master-slave parallel operation.
13	I SUM	Current signal terminal for master-slave parallel operation.
14	N.C.	Not connected.
15	N.C.	Not connected.
16	PRL ON	On during master-slave parallel operation ¹
17	N.C.	Not connected.
18	OUT ON/OFF CONT	Output on/off terminal.
19	A COM	External signal common for pins 5 to 9, 11 to 13, 20 to 22, 24, and 25.
20	REF OUT	External resistance control terminal. The max. output current 2.5 mA.
21	I PGM	Used to control the output current with an external voltage or external resistance.
22	V PGM	Used to control the output voltage with an external voltage or external resistance.
23	A COM	External signal common for pins 5 to 9, 11 to 13, 20 to 22, 24, and 25.
24	I MON	Output current monitor.
25	V MON	Output voltage monitor.

¹ Output through an open-collector photocoupler. Open collector output: Max. voltage of 30 V and max. current of 8 mA.



The J2 connector can be split into two parts: the socket and the detachable plug. The RMX programmable power supply ships from the factory with the plug attached to the controlled through this connector.

1	CV STATUS	On when the RMX programmable power supply is in CV mode ¹ .
2	CC STATUS	On when the RMX programmable power supply is in CC mode ¹ .
3	ALM STATUS	ON when a protection function is activated ¹ .
4	PWR ON STATUS	Outputs a low level signal when power is on ¹ .
5	OUT ON STATUS	On when output is on ¹ .
6 to 9	STATUS COM	Status signal common for pins 1 to 5 ² .

¹ Output through an open-collector photocoupler. Open collector output: Max. voltage of 30 V and max. current of 8 mA.

² That status common is floating (isolation voltage of 60 V or less), it is isolated from the control circuit.

Output voltage control

Set the CV control using an external voltage or an external resistance in the CONFIG settings so that external voltage control is enabled (CF06: on).

• Control using an external voltage (Vext)

Use pins : 22, 23

• Control using an external resistance (Rext)

For Rext, use a resistor that is rated at approx. 10 kΩ, 1/2 W or greater, that has a low temperature coefficient, and that will change little over time. Examples of such resistors are metal film or wire wound resistors.

Use pins : 20, 22, 23

Output current control

Set the CC control using an external voltage or an external resistance in the CONFIG settings so that external voltage control is enabled (CF05: on).

• Control using an external voltage (Vext)

Use pins : 21, 23

• Control using an external resistance (Rext)

For Rext, use a resistor that is rated at approx. 10 kΩ, 1/2 W or greater, that has a low temperature coefficient, and that will change little over time. Examples of such resistors are metal film or wire wound resistors.

Use pins : 20, 21, 23

Output on and off control

To use an external contact to control the output on and off states, set the appropriate CONFIG parameter (CF09: on).

Use pins : 18, 19

Output shutdown control

Use pins : 6, 19

Alarm clear control

Use pins : 5, 19

External monitoring

• External monitoring of the output voltage and output current status

Use pins : 10, 19, 23, 24, 25

• External status monitoring

Use pins : J2 1 to 9

CONFIG Settings

Press **CONFIG** and use the **CURRENT** knob to select the parameter you want to set. Use the **VOLTAGE** knob to change its value.

●: Indicates a parameter that may be affected when the panel settings are reset (CF00), or a preset memory entry is loaded. ▼: Indicates a parameter that may be affected when the master unit, slave unit, or the number of units is changed (CF01). ◆: Indicates a parameter that may be affected when the LAN interface settings are reset (CF40:LCI/dEF). ○: Indicates a parameter that is applied immediately. △: Indicates a parameter that is applied when the device is turned on. ◇: Indicates a parameter that is applied when (CF40:APPL) is executed.

SYSTEM	CF00 ¹	Resets the panel settings	—	○
	CF01	Master-slave parallel operation parameter	▼	△
	CF02 ¹	Power-on status	—	△
	CF03	Method for clearing OHP, FAN, and AC-FAIL alarms	—	△
	CF04 ¹	Memory content display parameter	—	○
	CF05 ¹	CC control using an Vext or Rext	●	○
	CF06 ¹	CV control using an Vext or Rext	●	○
	CF07 ¹	CV/CC control range parameter	—	○
	CF08	Range during voltage and current monitoring	—	○
	CF09 ¹	External control for turning output on and off	●▼	○
	CF10 ¹	External control logic for turning output on and off	▼	○
	CF11	Bleeder on/off parameter	—	○
	CF12 ¹	Output-on startup state parameter	▼	○
	CF13	Detection time of OCP activation	—	○
	CF14 ¹	Current setting limit	●▼	○
	CF15 ¹	Voltage setting limit	●▼	○
	CF16	Panel display brightness setting	—	○
	CF17	Communication monitor timer setting	—	○
	CF18	Unused	—	—
	CF19 ²	Current & power display on slave units for master-slave	—	○
INTER FACE	CF20	LAN interface parameter	▼◆ ³	△
	CF21	Command language parameter	▼	△
	CF22	Emulation parameter during remote control	▼	△
	CF23	SCPI communication error display parameter	▼	○
	CF24	Multichannel (VMCB) domain number parameter	▼◆ ³	△◇
	CF25	Multichannel (VMCB) number parameter	▼◆ ³	△◇
LAN ⁴	CF30	IP address display (1)	▼	—
	CF31	IP address display (2)	▼	—
	CF32	IP address display (3)	▼	—
	CF33	IP address display (4)	▼	—
	CF34	MAC address display (1) and (2)	▼	—
	CF35	MAC address display (3) and (4)	▼	—
	CF36	MAC address display (5) and (6)	▼	—
	CF40	Resets (LCI/dEF) or applies (APPL) the LAN settings	▼	○
	CF41	IP address assignment method	▼◆	△◇
	CF42	Manual IP address setting (1)	▼◆	△◇
	CF43	Manual IP address setting (2)	▼◆	△◇
	CF44	Manual IP address setting (3)	▼◆	△◇
	CF45	Manual IP address setting (4)	▼◆	△◇
	CF46	IP address subnet mask prefix setting	▼◆	△◇
	CF47	SCPI-RAW protocol TCP port number	▼◆	△◇
USB	CF50	VID (vendor ID) display	▼	—
	CF51	PID (product ID) display	▼	—
RS232C	CF52	RS232C baud rate parameter	▼	△

¹You can only specify this parameter when the RMX programmable power supply is being used as a master unit.

²You can only specify this parameter when the RMX programmable power supply is being used as a slave unit.

³This parameter is affected only when the LAN interface settings are reset (CF40: dEF).

⁴This parameter is displayed only when the LAN interface is in use (CF20: on).

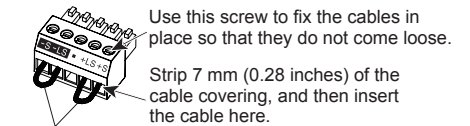
Sensing

• Local sensing

Use local sensing when your load current and/or cabling resistance is small enough that voltage drop from the output terminals to the DUT are negligible.

• Remote sensing

Use remote sensing (4-wire connection) to eliminate the voltage drop between the output terminals and the DUT when sourcing large currents and/or using long cables with significant resistance.



Local sensing jumpers

Terminal	Function
S	Negative remote sensing terminal
LS	Negative local sensing terminal Connected to the negative output terminal
•	Not connected
+LS	Positive local sensing terminal Connected to the positive output terminal
+S	Positive remote sensing terminal

The User Manual describes the following information:

- Mounting to a Rack
- Connecting to the Output Terminals
- Parallel/Series Operation
- Maintenance
- Options
- Troubleshooting

RS232C, USB, and LAN interfaces are installed as standard with a Communication feature. If you use the multichannel (VMCB) function, you can construct a multichannel power supply system with up to 31 devices controlled from a single PC.

For more information about the remote control and multichannel (VMCB) function, refer to the *RMX Programmable Power Supply User Manual* at ni.com.