Part No. Z1-002-902, IA002963
Jan 2007

OPERATION MANUAL

REMOTE CONTROLLER
PCR-LA Series

RC04-PCR-LA

KIKUSUI

Use of Operation Manual

Please read through and understand this Operation Manual before operating the product. After reading, always keep the manual nearby so that you may refer to it as needed. When moving the product to another location, be sure to bring the manual as well.

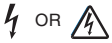
If you find any incorrectly arranged or missing pages in this manual, they will be replaced. If the manual it gets lost or soiled, a new copy can be provided for a fee. In either case, please contact Kikusui distributor/agent, and provide the “Kikusui Part No.” given on cover.

This manual has been prepared with the utmost care; however, if you have any questions, or note any errors or omissions, please contact Kikusui distributor/agent.

Printed in Japan

⚠ Safety Symbols

For the safe use and safe maintenance of this product, the following symbols are used throughout this manual and on the product. Understand the meanings of the symbols and observe the instructions they indicate (the choice of symbols used depends on the products).

	Indicates that a high voltage (over 1 000 V) is used here. Touching the part causes a possibly fatal electric shock. If physical contact is required by your work, start work only after you make sure that no voltage is output here.
DANGER	Indicates an imminently hazardous situation which, if ignored, will result in death or serious injury.
	Indicates a potentially hazardous situation which, if ignored, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if ignored, may result in damage to the product and other property.
	Shows that the act indicated is prohibited.
	Is placed before the sign “DANGER,” “WARNING,” or “CAUTION” to emphasize these. When this symbol is marked on the product, see the relevant sections in this manual.
	Indicates a protective conductor terminal.
	Indicates a chassis (frame) terminal.

Arrangement of this manual

This Operation Manual is made up of the following sections.

Chapter 1 General

Outlines and describes the features of the RC04-PCR-LA Remote Controller.

Chapter 2 Precautions and Preparation for Use

Provides the precautions and preparation information that must be understood for use of the Remote Controller.

Chapter 3 Operation Check

Describes the operation check that must be conducted prior to operation of the Remote Controller.

Chapter 4 Operation Method

Describes the operations of the Remote Controller and the extended functions of the PCR-LA AC power supply.

Chapter 5 Parts Names and Functions

Denotes the names of the switches, indications, and other parts of the RC04-PCR-LA, and describes their functions.

Chapter 6 Maintenance

Describes the maintenance procedures for the RC04-PCR-LA.

Chapter 7 Specifications

Contains a list of the specifications.

Appendix

Contains the Hierarchy of Remote Controller Key Operating Menus, the Power Line Abnormality Simulation Operation Setting Sheet, and the Sequence Operation Setting Sheet.

Contents

Chapter 1 General

Outlines and describes the features of the RC04-PCR-LA Remote Controller.

1.1 Outline

This device (RC04-PCR-LA) is a remote controller for the PCR-LA Series AC power supplies.

Use of the RC04-PCR-LA with a PCR-LA AC power supply significantly extends the power supply functions.

1.2 Features

Use of the Remote Controller allows the PCR-LA AC power supplies to utilize the following enhanced functions in addition to the power supplies' standard functions.

Power line abnormality simulation

This function enables simulation of interruption, fast voltage dip (dip) or fast voltage swell (pop).

The function is used to test switching power supplies or electronics devices.

Sequence operation

Sequence operation permits automatic operation by combining output voltage and frequency or other parameters with duration time. This function allows the settings of combinations of output voltage, frequency, time, and other factors that have been stored in advance to be retrieved and output in sequence. This action (sequence operation) enables automatic operations.

This function can be used to test the power supply environment of a variety of devices and equipment.

Harmonic current analysis function

This function allows analysis of the harmonic components of an output current. (Because a simplified measurement method is employed, it does not conform to IEC or other standards.)

Special waveform output

This function allows the “peak-clipped waveform,” in which the peak of a sine wave is suppressed, to be output as standard. This function can be used not only for a variety of electronics devices but also for chemical experiments and production equipment.

Output impedance setting

The PCR-LA AC power supplies have almost 0 ohm output impedance (output resistance); an actual commercial power line has several milliohm to several ohm impedance (resistance). When the Remote Controller is connected to a PCR-LA AC power supply, the PCR-LA power supply can vary the output impedance. This allows simulation of an environment similar to that of an actual commercial power line.

Measurements of power factor, VA, and peak holding current

The PCR-LA AC power supplies have a variety of measurement functions. Connecting the Remote Controller to a PCR-LA power supply allows additional measurements of the power factor, VA, and peak holding current to be performed.

The peak holding current measurement function is useful for measuring an inrush current.

Output ON/OFF phase setting

This function allows output ON/OFF phase setting to be performed separately.

It can be used if it is necessary to set an output ON/OFF phase during simulation of an inrush current.

AC + DC mode

This function allows the PCR-LA AC power supply to output voltage waveforms in which AC voltage is superimposed on DC voltage.

The function can be used in chemical experiments and for production equipment.

Expansion of the Memory Function

The PCR-LA AC power supplies have a function for storing nine sets of voltage and frequency settings in the memory (memory addresses 1 to 9), and reading the data for output as necessary.

Connecting the device to the PCR-LA power supply allows a maximum of 99 sets of voltage and frequency to be stored in the memory.

Regulation adjustment

With regulation adjustment, the output voltage is adjusted automatically to compensate for a voltage drop caused by the output current. This function is used for the same purpose as the sensing function. The sensing function measures the sensing-point voltage in order to maintain a constant sensing-point voltage; with regulation adjustment, the voltage drop caused by the output current is calculated, and the output voltage is raised by an amount equivalent to the drop.

The function ensures stabilized voltage at the load end without using sensing cables even if there is a substantial distance between the load and the PCR-LA AC power supply.

NOTE • When regulation adjustment is performed, the PCR-LA AC power supply's voltage stability accuracy, distortion factor, and response speed decrease below the normal capability. Therefore, this function may not be suitable for some applications. Check the load conditions and other factors before use.

1.3 Applicable Product Version

This Remote Controller requires the PCR-LA Series AC power supplies equipped with ROM of version 3.08 or later.

This Operation Manual applies to the RC04-PCR-LA Remote Controllers equipped with ROM of version 1.0X.

When making an inquiry about the product, please provide us with the following information:

- Model name
- ROM version
- Serial number

For the procedure for checking the ROM version of the Remote Controller, see "3.2 Operation Check". For the procedure for checking the ROM version of the PCR-LA Series AC power supply, see the PCR-LA Series AC Power Supply Operation Manual.

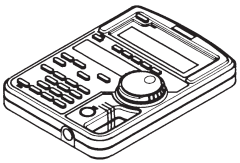
Chapter 2 Precautions and Preparation for Use

Provides the precautions and preparation information that must be understood for use of the Remote Controller.

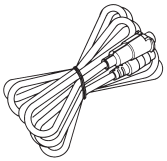
2.1 Check at Unpacking

The RC04-PCR-LA Remote Controller was carefully tested and inspected, both mechanically and electrically, before shipment to ensure its normal operation. Check the Remote Controller upon receipt for damage that might have occurred during transportation. Also, check that all items listed below have been provided.

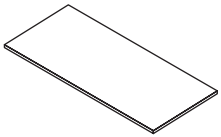
If the device appears to be damaged or if any accessory missing, notify Kikusui distributor/agent.



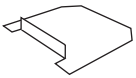
☐ Remote controller (1)



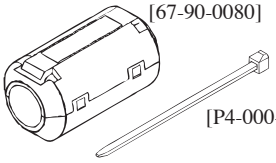
☐ Remote controller cable (1 pc.)
[85-50-0140]



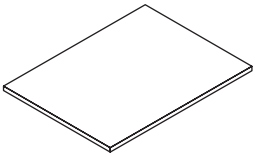
☐ Magnet sheet (1 sheet)
[R7-000-001]



☐ Connector cover (1)
[Q1-300-006]



☐ Split cores (with stopper bands) (2 pcs.)
[67-90-0080] [P4-000-551]



☐ Operation Manual (1 copy)
[Z1-002-902]

Fig.2-1 Items Contained in Package

2.2 Handling Precautions

- **Never drop the remote controller or subject it to other impact.**
- **Do not place the remote controller where it could be exposed to water or other liquid.**
- **Do not use or store the remote controller in direct sunlight.**
- **Do not use of store the remote controller in an area susceptible to rapid temperature changes.**
- **When the remote controller is used with the provided magnet sheet, which attaches to the back of the remote controller, never place the remote controller near magnetic-susceptible items, such as floppy disks and credit cards.**

2.3 Combination with Other Options

The PCR-LA Series has various other options in addition to the Remote Controller. Note that the following options cannot be used in conjunction with the Remote Controller.

Table 2-1 Option That Cannot be Installed or Used Together with the RC04-PCR-LA

Option name	Model name
Remote Controller	RC03-PCR-LA

Table 2-2 Option That Can be Installed Together with the RC04-PCR-LA, but Cannot be Used Simultaneously

Option name	Model name
GPIB Interface	IB03-PCR-LA

2.4 Connecting the Remote Controller Cable

⚠CAUTION • Before connecting the controller cable, always turn OFF the PCR-LA AC power supply POWER switch. When removing the cable, first turn the POWER switch of the PCR-LA power supply OFF.

NOTE • When turning ON the PCR-LA AC power supply POWER switch, the PCR-LA AC power supply identifies the Remote Controller that is connected. Therefore, before turning ON the PCR-LA AC power supply POWER switch, connect the Remote Controller to the PCR-LA AC power supply.

1. Connect the controller cable connector with a protection cover to one of the two connectors (see Fig. 2-2) in the remote controller. Exercise care that the orientation of the connector is correct.
2. Insert the protection cover, cover the connector and turn the cover clockwise to fix it securely.
3. Connect the other connector of the remote cable to the TO REMOTE CONTROLLER connector on the front of the PCR-LA power supply. In this case, align the cable connector such that it is oriented with that of the connector on the front panel.

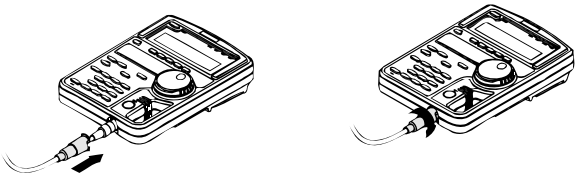


Fig.2-2 Connecting the Remote Controller Cable

2.5 Installation of the Split Cores

1. Unlock the core and open it.
2. Close the core so that the cable is not caught in it.
3. As shown in Fig. 2-3, tie up the cable with the accompanying stopper band. Keep the distance between the plug and the core below 100 mm.

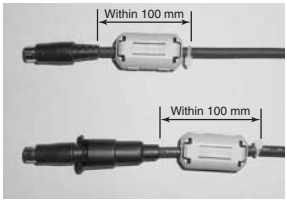


Fig.2-3 Location of Split Core Installation

2.6 Installation of the Connector Cover

Install the connector cover of the 8P mini plug connector which is not used.

Installation

1. As shown in Fig. 2-4, insert the accompanying connector cover from the lower part of the connector.
2. Insert the cover till it is locked.

Fig.2-4 Connector Cover Installation

Removal

1. As shown in Fig. 2-5, unlock the connector cover with tweezers.
2. Slowly pulled down the connector cover.

Fig.2-5 Connector Cover Removal

2.7 Moving Precautions

■ **Before moving the PCR-LA AC power supply, always disconnect the controller cable.**

Moving a PCR-LA AC power supply with this device connected may place unreasonable stress on the remote controller cable or cause the remote controller to fall.

■ **When the magnet sheet is used, do not move a PCR-LA AC power supply with the remote controller attached to the side of the equipment.**

Vibration during movement may cause the remote controller to fall.

■ **When moving the equipment, follow the instructions given in the PCR-LA AC Power Supply Operation Manual.**

2.8 How to Use the Magnet Sheet

The Remote Controller has a magnet sheet that can be attached to the back of the remote controller. This allows the remote controller to be placed on the side panel of the PCR-LA AC power supply or other steel surface.

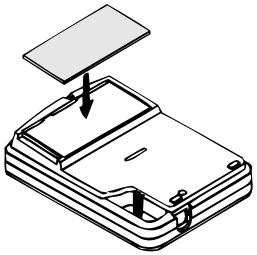


Fig.2-6 Attaching the Magnet Sheet

⚠ **CAUTION** • When the provided magnet sheet is on the back of the remote controller, never place the remote controller near magnetic-susceptible items, such as floppy disks and credit cards.

2.9 Quick Reference Card

The remote controller has a quick reference card that briefly describes keys and simulation waveforms. This card is useful when using the memory, sequence, or special waveform output functions.

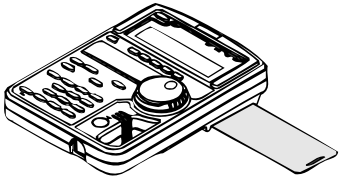


Fig.2-7 Quick Reference Card

Chapter 3 Operation Check

Describes the operation check that must be conducted prior to operation of the Remote Controller.

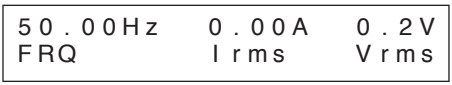
After connecting the Remote Controller by the steps described in Chapter 2, check the Initial Setup Status and make an operation check.

Always make an operation check as described in this chapter, if you have installed a new Remote Controller or changed its location, if the operator changes, or if the Remote Controller has not been used for a long time.

Before operating this device, read through the PCR-LA AC Power Supply Operation Manual and gain an understanding of the basic operations of the AC power supply.

3.1 Checking the Initial Setup Status

The condition in which a PCR-LA AC power supply and this device are simultaneously purchased and power is fed for the first time (factory shipment status) is called Initial Setup Status. The following figure shows the remote controller LCD display under this condition.



The main setting in the Initial Setup Status are as follows:

- OUTPUT OFF
- RANGE 100 V
- AC/DC AC
- Frequency 50.00 Hz
- Voltage 0.0 V
- Voltage display mode RMS
- Current display mode RMS

If the Remote Controller is not in the Initial Setup Status, use the reset function to activate the Initial Setup Status. Reset can be performed either on the PCR-LA AC power supply or via the Remote Controller. To perform a reset on the PCR-LA AC power supply, see instructions

in the PCR-LA AC Power Supply Operation Manual.

Note that performing a reset cancels all settings made thus far and activates the Initial Setup Status.

Resetting Procedure Using the Remote Controller

1. Call the Home Position.
   See the Home Position description given below.
2. Press the RESET (SHIFT, 6) key.
3. Verify that the ENTER LED blinks, activating ENTER wait status.
4. Press the (SHIFT, ENTER) keys. This executes a reset.

DESCRIPTION • Home Position

The status in effect immediately after the POWER switch is turned ON is called the Home Position (regardless of OUTPUT ON/OFF). To return to the Home Position from another mode, press the ESC key.

• ENTER Wait

This is the condition in which the ENTER key has not yet been pressed to initiate the operations performed thus far. In this condition, the ENTER LED on the Remote Controller blinks.

To cancel a operation before pressing the ENTER key, press the ESC key.

ENTER Wait for this device has the same meaning as the ENT Wait of the PCR-LA AC power supplies.

LCD (Liquid Crystal Display) Contrast Adjustment

To adjust the contrast of the Remote Controller LCD unit, use a small screwdriver to turn the part shown in the figure. Adjust LCD contrast to match lighting conditions at the operating location to obtain an easy-to-see display.

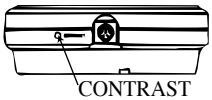


Fig.3-1 Contrast Adjustment

3.2 Operation Check

⚠CAUTION • Remote Controller operation must be checked after the operation check of the PCR-LA AC power supply has been completed.

Operation Check Procedure

The following describes how to make an operation check from the Initial Setup Status.

1. Turn the PCR-LA AC power supply POWER switch ON.

   The remote controller LCD displays the following Initial Setup Status for a few seconds.

   ```
   PCR1000LA     Ver3.00
   RC04-PCR-LA   Ver1.00
   ```

   The upper part of the LCD displays the model and the ROM version of the PCR-LA AC power supply connected, while the lower part displays the model and ROM version of the Remote controller.

   Regarding the appearance of any display other than the display above, see the Note on the next page.

   After a few seconds, the Home Position appears.

2. Press the F5 (Vrms) key to enter the voltage setting mode.

   This changes the F5 Vrms indication to Vset.

   ```
   50.00Hz    0.00A    0.0V
   FRQ        Irms     Vset
   ```

   F1 F2 F3 F4 F5

3. Turn JOG or SHUTTLE to check that the voltage changes on the display.

This completes the operation check.

This operation check does not check all functions. However, if the operation check has been complete, the main functions operate correctly.

NOTE

- When using the PCR-LA AC power supply with options shown as follows, the Initial Setup Status display is different by the option(s).
  - Using the Single-phase Three-wire Driver (2P03-PCR-LA)

```
PCR-LA 2P
RC04-PCR-LA Ver1.00
```

  - Using the Three-phase Driver (3P03-PCR-LA)

```
PCR-LA 3P
RC04-PCR-LA Ver1.00
```

  - Using the Parallel-operation Driver (PD03M-PCR-LA and PD03S-PCR-LA) and Single-phase Three-wire Driver (2P03-PCR-LA), or the Single-phase/Single-phase Three-wire Output Terminal Kit (OT01-PCR4000LA/2, OT01-PCR8000LA/2, or T01-PCR12000LA/2)

```
PCR-LA PD 2P
RC04-PCR-LA Ver1.00
```

  - Using the Parallel-operation Driver (PD03M-PCR-LA and PD03S-PCR-LA) and Three-phase Driver (3P03-PCR-LA), or the Single-phase/Three-phase Output Terminal Kit (OT01-PCR6000LA/3, OT01-PCR12000LA/3, or OT01-PCR18000LA/3)

```
PCR-LA PD 3P
RC04-PCR-LA Ver1.00
```

- If the following display or other messages appear, wait for about ten seconds, then the display should change to the Initial Setup Status. In this condition, the PCR-LA AC power supply back-up data has been lost for some reasons. Re-check the steps described in sections 2.4 and 2.5. If this still does not remedy the condition, notify Kikusui distributor/agent.

```
PANEL BACK UP LOST
  INITIAL   SET !!!
```

Chapter 4 Operation Method

Describes the operations of the Remote Controller and the extended functions of the PCR-LA AC power supply.

4.1 Basic Operation of the Remote Controller

Remote controller operation is designed to be as much as possible the same as that of the PCR-LA AC power supply control panel. However, part of the operation and operation of new functions provided by the Remote Controller differ from that of the PCR-LA power supply control panel.

The basic operating method of the Remote Controller is as follows:

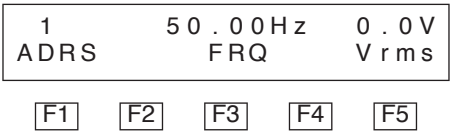
1. To enter main function setting or execution status, press the relevant key (MEM, SEQ, SIM, WAVE, or MODE).

   Note that these keys are accepted only in the Home Position. For information on how to use JOG and SHUTTLE, see "3.1.2 How to Use JOG and SHUTTLE" in the PCR-LA AC Power Supply Operation Manual.

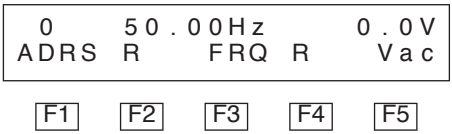
2. After entering each function setting or execution status, press the F1 to F5 function keys (located right below the items displayed at the lower part of the display). The function keys correspond to the displayed items.

   For example, in the following display (memory edit display), the F1 key corresponds to "ADRS", the F3 key to "FRQ", and the F5 key to "Vrms".

   Note that there are slight deviations between the displayed letters and key positions.



   In the figure below (next page example, sequence setting display), the F1 to F5 keys correspond to the five items displayed at the lower part of the display respectively.



- If there are several operation displays, the MENU LED lights. Press the MENU key to access the next display. Press the (SHIFT, MENU) keys to return to the previous display.
- To exit the current status, press the ESC key.
- Blinking of the ENTER LED during operation means that the ENTER wait status is activated.
- In the ENTER wait status, operation input thus far is not initiated until the ENTER key is pressed. Pressing the ESC key cancels the ENTER Wait status.

4.2 Functions in Common with the PCR-LA AC Power Supply

This section discusses the functions common to the Remote Controller and the PCR-LA AC power supply control panel. The functions are separated into those that can be accomplished in the same way as on the PCR-LA AC power supply and those requiring different key operation.

4.2.1 Functions Whose Key Operation is the Same as That of the PCR-LA AC Power Supply

The following functions are the same key operation as that of the PCR-LA AC power supply control panel. For details about operation, refer to the PCR-LA AC Power Supply Operation Manual.

Table 4-1 Functions Whose Key Operation is the Same as That of the PCR-LA AC Power Supply

Functions	Key operation
OUTPUT ON/OFF	OUTPUT key
Self-test function	SELF TEST (SHIFT, 3)
Key-lock function	KEYLOCK (SHIFT, 4)
Sensing function	SENSING (SHIFT, 5)
Reset function	RESET (SHIFT, 6)
Output voltage range change	RANGE (SHIFT, 7)
Synchronization function	SYNC (SHIFT, 9)

4.2.2 Functions Whose Key Operation Differs from That of the PCR-LA AC Power Supply

Some functions available on the PCR-LA AC power supply control panel require slightly different key operation on the Remote Controller because of the device's key arrangement.

Table 4-2 Functions Whose Key Operation Differs from That of the PCR-LA AC Power Supply

Functions	PCR-LA AC Power Supply	Remote Controller
Voltage setting function	V key	F5 (Vrms/Vpk/Vset/Vave) key
Frequency setting function	F key	F1 (FRQ) key
Limit value setting function	V key	F5 (Vmax/Vmin) key
	F key	F1 (Fmax/Fmin) key
	I key	F3 (Imax) key
Voltage display mode change	(SHIFT, V) key	Vrms/Vpk/Vset/Vave (SHIFT, F5) key
Current display mode change	(SHIFT, I) key	Irms/Ip/Iph/WATT/Iave (SHIFT, F3) key

The meaning of the abbreviations Vrms, Vpk, Vset, etc, are as follows:

Vrms = rms voltage	Fmax = maximum frequency
Vpk = peak voltage	Fmin = minimum frequency
Vset = set voltage	Imax = maximum current
Vave = average voltage	Irms = rms current
FRQ = frequency	Ip = peak current
Vmax = maximum voltage	Iph = peak holding current
Vmin = minimum voltage	WATT = power
	Iave = average current

For an explanation of set values, rms, peak values, and average values, see the Description "Voltage Display Mode" in "8.7 Voltage Display Modes and Measurement Methods" of the PCR-LA AC Power Supply Operation Manual.

Voltage setting function

To enter the voltage setting mode on the Remote Controller, press the F5 (Vrms/Vpk/Vset/Vave) key in the Home Position. (On the PCR-LA AC power supply, press the V key.)

Frequency setting function

To enter the frequency setting mode on the Remote Controller, press the F1 (FRQ) key in the Home Position. (On the PCR-LA AC power supply, press the F key.)

Limit value setting function

To enter the voltage, frequency, or current limit value setting mode on the Remote Controller, press the LIMIT (SHIFT, 1) key in the Home Position status to enter the limit value display mode, and then press the F5 (Vmax/Vmin), F1 (Fmax/Fmin), or F3 (Imax) key. (On the PCR-LA AC power supply, press the LIMIT (SHIFT, 1) key to enter the limit value display mode, then press the V, F, or I key.)

This function is valid only in AC or DC mode.

Voltage display mode change

To switch the voltage display mode on the Remote Controller, press the Vrms/Vpk/Vset/Vave (SHIFT, F5) key. (On the PCR-LA AC power supply, press the (SHIFT, V) keys.)

Current display mode change

To switch the current display mode on the Remote Controller, press the Irms/Ip/Iph/WATT/Iave (SHIFT, F3) key. (On the PCR-LA AC power supply, press the (SHIFT, I) keys.)

The PCR-LA AC power supply control panel has no “Iph” display mode. This function is added by the Remote Controller. For details, see “4.3.4 Peak Holding Current Measurement Mode”.

4.3 Functions Extended by Using the Remote Controller

The Remote Controller extends some of the PCR-LA AC power supply functions. This section describes the extended functions and how to use them.

4.3.1 AC + DC Mode

The PCR-LA AC power supplies allow three output voltage modes, AC, AC-S and DC. Use of the Remote Controller allows an additional output voltage mode, AC + DC mode. The AC + DC mode is a function that superimposes DC voltage on AC voltage or vice versa.

Output Voltage Mode Change Procedure

1. Press the OUTPUT key to turn output OFF.
2. Press the ESC key to call the Home Position.

   The following display shows the Home Position in the Initial Setup Status. The display differs depending on the content stored.

50.00Hz	0.01A	0.2V
FRQ	Irms	Vrms

3. Press the AC/DC (SHIFT, 8) key to activate the ENTER Wait status.

   Each time the AC/DC (SHIFT, 8) key is pressed, the AC, AC-S, DC, or AC + DC output voltage mode will be selected and confirmed as shown below.

In the AC + DC mode, the AC + DC voltage peak value can be set in the DC voltage setting range.

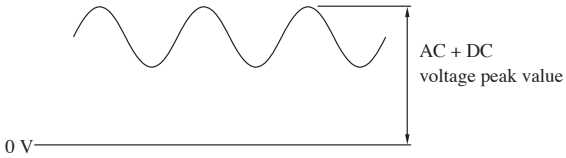


Fig.4-1 AC + DC Voltage Peak Value

- In the AC + DC mode, the voltage and frequency limit values respectively set in the AC or DC modes are valid. The AC + DC mode does not allow current limit change.

Output Voltage Setting Procedure

1. Press the ESC key to call the Home Position.
2. Press the F5 key to activate the voltage setting mode.

   Each time the F5 key is pressed, the AC voltage setting mode and DC voltage setting mode change alternately.

   In the AC voltage setting mode, “AC” blinks in the MODE display area of the device; in the DC voltage setting mode, “DC” blinks in the MODE display area. Use the numeric keys or JOG/SHUTTLE to set the AC or DC output voltage. For setting using the numeric keys, press the ENTER key to confirm the value.

4.3.2 Memory Function

The PCR-LA AC power supplies have the memory function that stores nine sets of voltage and frequency settings in memory addresses up to 9 and allows them to be read for output whenever necessary. Connecting the Remote Controller to a PCR-LA AC power supply allows the number of set values stored in the memory (memory addresses) to be extended to 99.

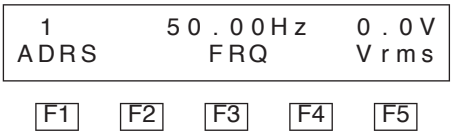
The Remote Controller also offers memory operation in the AC + DC mode, allowing simultaneous output of AC and DC voltages stored in the same memory address. For memory addresses 1 to 9, setting is common to both the PCR-LA AC power supply and the Remote Controller.

The procedure to store data in the memory is as follows:

Memory Setting Procedure

Memory setting is available only in the Home Position.

1. Press the ESC key to call the Home Position.
2. Press the M-EDIT (SHIFT, MEN) key to enter the memory edit mode.



3. Using the F1, F3, and F5 function keys and the MENU key, select the desired item.

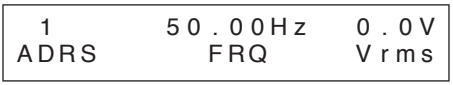
   Selectable items are shown in Table 4-3. To select an item, follow steps 4 onward.

   The Setting display consists of two displays that can be switched using the MENU key.

Table 4-3 Items That Can be Set

Display	Key	Setting items	Mode available
First display	F1 (ADRS)	Memory address (step 4)	
	F3 (FRQ)	Frequency (step 4)	AC or AC + DC mode
	F5 (Vrms)	AC voltage (step 4)	AC or AC + DC mode
Second display	MENU, then F1 (ADRS)	Memory address	
	MENU, then F3 (WAVE)	Waveform bank (step 5)	AC or AC + DC mode
	MENU, then F5 (Vdc)	DC voltage (step 5)	DC or AC + DC mode

4. The cursor blinks at "1" of ADRS. Enter the desired address and press the ENTER key to confirm it.



Next, press the F3 key to set frequency or the F5 key to set AC voltage. The cursor moves to "FRQ" or "Vrms". Set the value you wish to store in the memory using the numeric keys or JOG/SHUTTLE.

5. To set waveform bank or DC voltage, press the MENU key to call the following display, then set waveform bank (F3) or DC voltage (F5).

For the waveform banks, see "4.3.8 Special Waveform Output".

6. Press the ESC key to quit the memory edit mode.

NOTE • Note that when voltage data is read from the memory in the AC + DC mode for output, output voltage changes as follows:

An AC voltage set value (Vrms) and DC voltage set value (Vdc) are independently stored in the memory. When they are read, the AC voltage value (Vrms) is output slightly faster (approximately 30 μs) than the DC voltage value (Vdc).

Therefore, output voltage changes as follows:

Example	ADRS 1:	Vrms = 0V,	Vdc = +100V
	ADRS 2:	Vrms = 100V,	Vdc = 0V
	ADRS 3:	Vrms = 0V,	Vdc = +100V

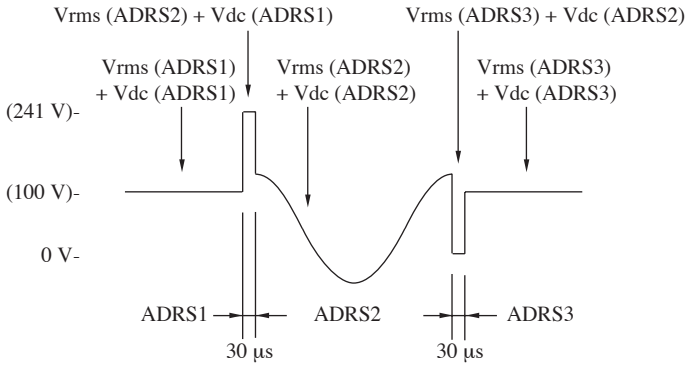


Fig.4-2 Changes in the Output Voltage in Reading Data from Memory

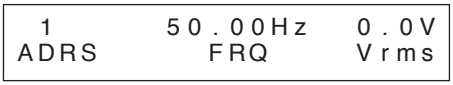
In the actual case, the duration of 30 μs shown in the above figure is very short in comparison with each ADRS time. Output voltage changes like pulse.

Memory Read Procedure

Select the same output voltage mode (AC, DC, or AC + DC) as used for setting of the memory.

To read data set in each address (“ADRS”), take the following steps.

1. Press the ESC key to call the Home Position.
2. Press the MEM key to display the memory content.



(First display)

(Example of Initial Setup Status)

3. Press the numeric keys or use JOG/SHUTTLE to enter a memory address.

   This will cause the set values stored in the entered memory address to be read out. The set values to be read differ depending on the output voltage mode. For more information, see Table 4-3.

(First display)

(Example of the display showing that FRQ = 100 Hz and Vrms = 100 V are set in ADRS2)

   To display waveform bank and DC voltage set in the same address, press the MENU key.

(Second display)

(Example of the display showing that waveform bank W00 and DC voltage +0 V are set in ADRS2)

4. To confirm the read set values, press the ENTER key. To cancel them, press the ESC key.

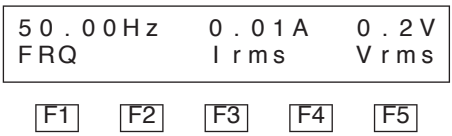
   Pressing the ESC key allows you to exit the memory content-indicating display. Press the ENTER key to confirm the set values, then press the ESC key to end the memory read operation.

4.3.3 Power, Power Factor, and Apparent Power Measurement Mode

The PCR-LA AC power supplies have a power display function. However, using the Remote Controller allows simultaneous display of power, power factor, and apparent power (VA).

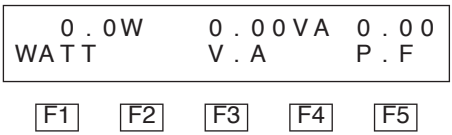
Procedure for Switching to Power, Power Factor, and Apparent Power Display

1. Press the ESC key to call the Home Position.



2. Press the MENU key.

   This causes the power (WATT), apparent power (VA) and power factor (PF) display to appear.



   Press the MENU key again, or press the ESC key to call the Home Position.

4.3.4 Peak Holding Current Measurement Mode

The PCR-LA AC power supplies have the peak current display function. However, using the Remote Controller allows peak holding current display in addition to peak current display. The difference between peak value and peak holding value measurements is as follows:

Peak Value Measurement

In peak value measurement, the peak value is cleared for every measurement cycle. The Remote Controller's peak value measurement measures the current peak using the analog peak holding circuit and obtains the maximum absolute value of that data. Therefore, peak current display shows an absolute value (no positive or negative symbol). A peak value can be measured in the AC, DC, or AC + DC mode.

Peak Holding Value Measurement

Peak holding value measurement holds the maximum peak value until a peak clear signal is received. One of the following signal applies to generate a peak clear operation. Peak holding current measurement is useful in measuring inrush current of a load occurring at power ON.

The Remote Controller's peak holding value measurement measures peak current using the analog peak holding circuit. It obtains the maximum absolute value of that data. Therefore, peak current display shows an absolute value, which has no positive or negative symbol. The peak holding value can be measured in the AC, DC, or AC + DC mode.

Peak Clear Procedure

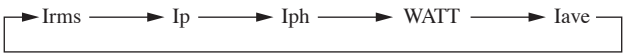
The following three methods can be used to clear a peak in the peak holding current measurement.

- Press the F4 (clr) key on the Remote Controller.
- Short circuit the input of the PEAK INIT IN terminal (BNC connector) on the upper rear of the PCR-LA power supply (see the Description on page 4-12).
- Send a peak clear message via the GPIB or RS-232C interface (see the PCR-LA AC Power Supply Operation Manual).

Peak Holding Current Measurement Mode Operating Procedure

Press the (SHIFT, F3) keys in the same way as current measurement mode change. This causes the indication to change in the following order in the AC mode.

In the DC or AC + DC mode, the indication changes as follows:



Where "Ip" is peak current value display and "Iph" is peak holding current value display.

DESCRIPTION • Peak Initializing Signal

To execute a peak clear, input to the PEAK INIT IN terminal (BNC connector) at the rear of the PCR-LA power supply is shorted. The time required can be two or more output current measurement cycles (approximately 1 to 2 sec). The circuit in this part (the inside of the PCR-LA AC power supply) is as shown in Fig. 4-3. Approximately 5 V appears when the PEAK INIT IN terminal is open. The impedance (resistance) of the circuit to be shorted should be to 50 ohms or less.

The BNC connector is isolated from the INPUT and OUTPUT terminal boards in the PCR-LA AC power supply. However, since the common line for the PEAK INIT IN, SEQ TRG OUT and SEQ STAT OUT signals are connected together in the PCR-LA AC power supply, the peak initial signal is not isolated from the other two signals. Also, the BNC connector is not isolated the slot internal circuit.

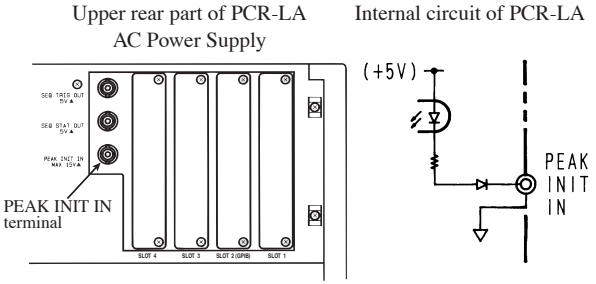
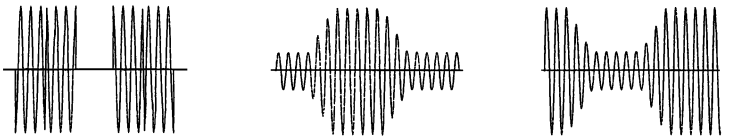


Fig.4-3 PEAK INIT IN Terminal and Its Circuit

4.3.5 Power Line Abnormality Simulation

This function allows the PCR-LA power supply to simulate a interruption, fast voltage swell (pops), or fast voltage dip (dips) to conduct a power line abnormality simulation in the AC mode.



Power interruption waveform | Fast voltage swell (pop) | Fast voltage dip (dip)

Fig.4-4 Simulated Power Line Abnormality Waveforms

NOTE • Power line abnormality simulation allows sine waveform output only. Even if a special waveform is selected as described in "4.3.8 Special Waveform Output", performing power line abnormality simulation causes the waveform to be output as a sine waveform.

Operation of power line abnormality simulation consists of the parameter setting and execution modes.

The setting mode display consists of three displays that can be switched using the MENU key. The parameters of the setting display can be selected using the F1 to F5 keys, and a value is set using the numeric keys or JOG/SHUTTLE. (For setting using the numeric keys, press the ENTER key to confirm the value.)

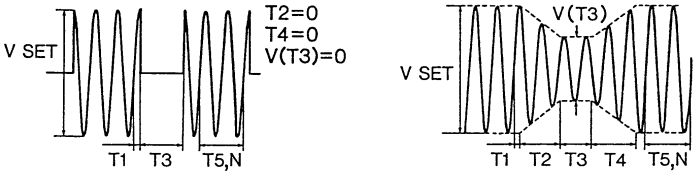


Fig.4-5 Simulated Waveforms and Parameters

Table 4-4 Descriptions of Parameters of the Setting Display

First display	T1	Voltage change start time (phase) Time or phase before starting the change. Time or phase from the point that the waveform crosses the zero level to the starting point of abnormal change, such as voltage increase or decrease. Select ms or deg as the unit. For more information, see the Description on page 4-18.
	T2	Slope time 1 Interval of time for the voltage to increase (pop) or decrease (dip) from the initial value to the final value specified as abnormal voltage
	T3	Voltage change duration Interval of the time which elapses from the end of previous voltage change to the beginning of the next voltage change the voltage is maintained for Variation Voltage during the interval. Specifying zero(0) for this T3 disables this function.
Second display	T4	Slope time 2 Interval of time for the voltage to increase (pop) or decrease (dip) from the value specified as abnormal voltage (Variation Voltage) to the initial value.
	T5	Restoration duration The time during the condition that the voltage recovered to the initial value and has been maintained.
	N	Restoration cycle The number of cycles during the condition that the voltage recovered to the initial value and has been maintained. The number of cycles should be specified at current frequency.
	V (T3)	Variation voltage The final voltage value increased (pop) or decreased (dip). This value is specified at the interval of T3.
Third display	RPT	Repetition count The number of repetitions from T1 to T5 (N).

- For items T5 or N, specify one

Table 4-5 shows the settable data items and setting ranges. Magnification for display can be selected from among the alternatives shown in the table.

Table 4-5 Parameter Settable Range

Display item	Magnification	Setting range
T1	x1 ms x1 deg	0.0 ms to 999.9 ms 0 deg to 360 deg
T2	x1 x10	0 ms to 9999 ms 0.00 s to 99.99 s
T3	x1 x10	0.0 ms to 999.9 ms 0 ms to 9999 ms
T4	x1 x10	0 ms to 9999 ms 0.00 s to 99.99 s
T5	x1 x10	0 ms to 9999 ms 0.00 s to 99.99 s
N	x1 x10 x100	0 to 9999 0 to 99990 0 to 999900
V (T3)		0 to rated voltage
RPT		0 to 9998, ∞ (Set 9999 to select ∞.)

- T5 and/or N may lead or lag by one cycle depending on the setting of T1 to T4.
- Set the start and end of power line abnormality simulation using the execution mode display following the final setting mode display (third display).
- When T5 is set to other than integral multiple of 1 cycle, the real restoration duration gets longer than the set T5 time because the voltage change is started after the waveform crossed the zero level.

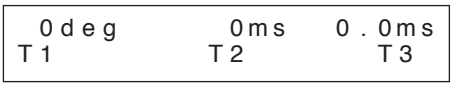
Power Line Abnormality Simulation Operating Procedure

- Preset the steady status voltage and frequency.

1. Press the ESC key to call the Home Position.
2. Set OUTPUT to OFF.
3. Set the output voltage mode to AC using the AC/DC (SHIFT, 8), and then press the ENTER key.
4. Press the SIM key.

   The PCR-LA power supply will enter the key-lock mode automatically.

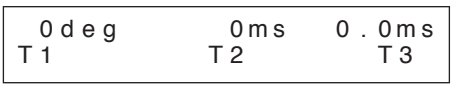
   This causes the first display to appear as shown below.



(First display)

F1 F2 F3 F4 F5

5. Press the F1, F3, or F5 function key to move the cursor to the desired item.



(First display)

F1 F2 F3 F4 F5

6. Set a value using the numeric keys or JOG/SHUTTLE

   For setting using the numeric keys, press the ENTER key to confirm the value.

   Select the desired magnification for item T1 to T5 and N using keys as shown below.

   Keying operation is valid with respect to the selected item.

Table 4-6 Magnifications and Keys for Switching

Item	Magnification	Key operation
T1	x1 ms/x1 deg	T1 (SHIFT, F1)
T2	x1/x10	T2 (SHIFT, F3)
T3	x1/x10	T3 (SHIFT, F5)
T4	x1/x10	T4 (SHIFT, F1)
T5	x1/x10	T5 (SHIFT, F3)
N	x1/x10/x100	T5 (SHIFT, F3)

7. Use the +/- (SHIFT, 0) key to set the voltage change start polarity (POL).

   Voltage change start polarity (POL) is positive (+) in the Initial Setup Status. To change the polarity to negative (-), press the +/- (SHIFT, 0) key.

   The set polarity will be displayed in the "POL" area of the Remote Controller. For the voltage regulation start polarity (POL), see the Description on page 4-18.

8. Press the MENU key to call the second display.

```
     0ms        0ms      0.0V
T4              T5      V(T3)
```
(Second display)

F1 F2 F3 F4 F5

Set each item in the same way as in steps 5 to 7.

9. Press the MENU key to display the third display.

```
      ∞
PRT
```
(Third display)

F1 F2 F3 F4 F5

Set each item in the same way as in steps 5 to 7.

- The display is switched in the order of the first to third and the execution mode display whenever the MENU key is pressed.
- To return to the previous display, press the (SHIFT, MENU) keys.

10. Press the MENU key to display the execution mode, which is the 4th display.

```
Simulation Stop
RUN        STOP
```

F1 F2 F3 F4 F5

11. Set the OUTPUT key to ON.

    If the T2 and T4 set values are any values other than 0 ms, this step may be performed prior to step 4.

12. Press the F1 (RUN) key. This starts the simulation of power line abnormality.

    During power line abnormality simulation, the "RUN" indication on the Remote Controller lights up and "1" in the S-MODE area on the PCR-LA power supply control panel lights up.

NOTE • A setting item can be changed in either the OUTPUT ON or OUTPUT OFF condition. However, the timing of RUN (simulation start) is as described below.

When T2 = T4 = 0:	Before performing RUN, always set OUTPUT OFF. (Then, set OUTPUT ON again and press the F1 (RUN) key to start a simulation.)
When T2 ≠ 0 or T4 ≠ 0:	Setting items can be changed while the OUTPUT ON condition is maintained, and then RUN can be performed.

13. Press the F3 (STOP) key. This stops simulation of power line abnormality.
14. Press the ESC key to exit the power line abnormality simulation function.

    This will cancel the key-lock mode in the PCR-LA power supply. Pressing the ESC key on the PCR-LA power supply also allows you to exit the power line abnormality simulation function in the same way.

DESCRIPTION • Voltage Change Start Polarity (POL)

Switching the voltage change start characteristic (POL) causes zero crossing (the time at which voltage reaches the zero level), which is the start point of T1 to be set to a positive zero crossing or negative zero crossing shown in the figure below. This function changes phase by 180 degrees. In this case, the output voltage (waveform) of L is based on N of the PCR-LA AC power supply OUTPUT terminal board.

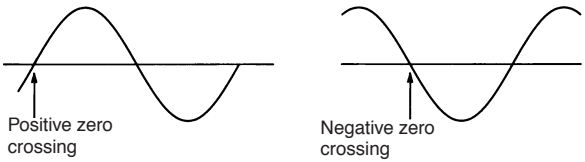


Fig.4-6 Zero Crossing

DESCRIPTION • The status signal outputs while the period of time set for the T2, T3 and T4 (if T2=T4=0, this case applies T3). For detail of the output terminal, see "• Status Signal" on page 4-26.

4.3.6 Sequence Operation

Sequence operation is the action of retrieving and outputting in sequence the settings of combinations of output voltage, frequency, time, and other factors that have been stored in advance. This function allows the AC power supply to perform automatic operation. Sequence operation is accomplished by setting sequence content in the sequence setting mode, and then executing operation in the sequence execution mode.

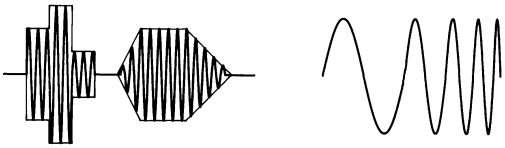
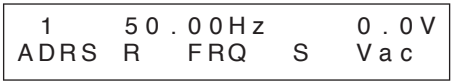


Fig.4-7 Example of Sequence Operation

The sequence setting mode has the four displays. There are 10 sequence setting items, including address designation, AC voltage, DC voltage, specifying ramp for AC voltage and frequency change characteristics (see the Description on page 4-22), time, and waveform. Set the desired items from among these.

The setting items contained on each display are as shown in Fig. 4-8. In addition, the validity/invalidity of set values in sequence operation is determined by the output mode used to run a sequence. In Fig. 4-8, the relationship between the validity and the output modes is also shown.

First display



F1 F2 F3 F4 F5

Function key	Mode validity AC	DC	AC+DC	Setting items
F1 (ADRS)	✔	✔	✔	Sequence address
F2 (R)	✔		✔	Frequency change characteristic Ramp (R)/Step (S)
F3 (FRQ)	✔		✔	Frequency
F4 (R/S)	✔		✔	AC voltage change characteristic Ramp (R)/Step (S)
F5 (Vac)	✔		✔	AC voltage

Second display

F1 F2 F3 F4 F5

Function key	Mode validity AC	DC	AC+DC	Setting items
F1 (ADRS)	✔	✔	✔	Sequence address
F3 (TIME)	✔	✔	✔	Time (*1)
F (WAVE)	✔		✔	Waveform

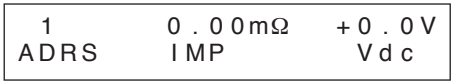
*1 When you select the F3 (TIME) key, the display below appears. Then press any of the F1 (HOUR), F3 (MIN), or F5 (SEC) key to select timing setting unit.

F1 F2 F3 F4 F5

		Setting range
TIME	HOUR	0 hr to 999 hrs 59 min
	MIN	0 min to 999 min 59 sec
	SEC	0.001 sec to 999.999 sec

Fig.4-8 Sequence Setting Mode

Third display



F1 F2 F3 F4 F5

Function key	Mode validity			Setting items
	AC	DC	AC+DC	
F1 (ADRS)	✔	✔	✔	Sequence address
F3 (IMP)	✔			Output impedance (resistance)
F5 (Vdc)		✔	✔	DC voltage

Fourth display

F1 F2 F3 F4 F5

Function key	Mode validity			Setting items
	AC	DC	AC+DC	
F1 (ADRS)	✔	✔	✔	Sequence address
F3 (STAT)	✔	✔	✔	Status signal ON/OFF
F4 (TRG)	✔	✔	✔	Trigger signal ON/OFF
F5 (OUT)	✔	✔	✔	OUTPUT ON/OFF

Fig.4-8 Sequence Setting Mode (Cont'd)

DESCRIPTION • AC Voltage Change Characteristics

Changing the frequency or AC voltage linearly over the set time is called “ramp.” When ramp is specified, frequency or AC voltage changes from the value set in an address one before to the set value at the Ramp-specified address, taking the time specified for ramp. Ramp specification causes “R” to appear in the F2 or F4 display area.

Changing the frequency or AC voltage in a stepwise manner is referred to as “step.” In this case, the frequency or AC voltage changes in a stepwise manner from the value stored in an address previous to the address specified for step to the set value in the step-specified address. When step is specified, “S” appears in the F2 or F4 display area.

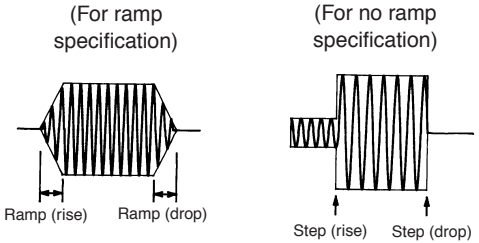


Fig.4-9 Ramp Specification and Step Specification

- Address 0 does not allow ramp specification.
- Ramp specified at the start address is ignored during execution, and frequency or AC voltage changes by steps.
- Ramp operation is not available in DC mode.

Sequence Setting Mode Operating Procedure

- Select the AC, DC, or AC + DC mode for voltage output. (See "Output Voltage Setting Procedure" on page 4-5.)

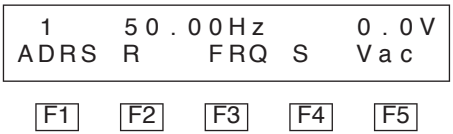
1. Press the ESC key to call the Home Position.
2. Press the S-EDIT (SHIFT, SEQ).

   The PCR-LA power supply will enter the key-lock mode automatically.

   This causes the first display to appear, as follows.

   The display can be switched in the order of the first to fourth displays whenever the MENU key is pressed.

   To return to the previous display, press the (SHIFT, MENU) keys.



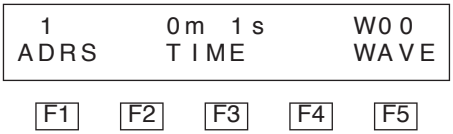
(First display)

3. Use the F1 to F5 function keys to move the cursor to the desired item.

   Enter a value using the numeric keys or JOG/SHUTTLE (for entry using the numeric keys, press the ENTER key to confirm the value).

   For the change characteristics, each time the relevant function key is pressed, “R” (run) and “S” (step) are switched alternately.

4. Press the MENU key to display the second display.

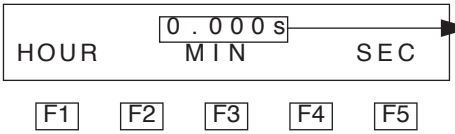


(Second display)

5. Set each item in the same way as in step 3.

   When the F3 key is pressed, the display changes as shown below.

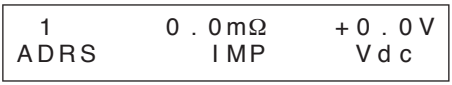
   When the ESC key is pressed, the display below returns to the second display.



Key	Indication
F1	0h0m
F3	0m0s
F5	0.000s

The time indication in the center of the display changes as shown in the table when the relevant function key is pressed.

6. Then, press the MENU key to display the third and forth displays, and set each item of these in the same way as in step 3.

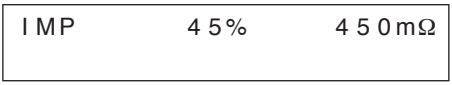


(Third display)

F1 F2 F3 F4 F5

When the F3 key is pressed, the display shown below appears.

When the ESC key is pressed, the display below returns to the third display.



(Fourth display)

F1 F2 F3 F4 F5

Each time the F3, F4, or F5 key is pressed, ON and OFF change alternately.

7. Press the ESC key to exit the sequence setting mode.

This will cancel the key-lock mode in the PCR-LA power supply. Pressing the ESC key on the PCR-LA power supply also allows you to exit the sequence setting mode in the same way.

- Address 0 allows no ramp specification. Ramp specified for the start address is ignored, and frequency or AC voltage changes in step form.
- Starting sequence operation in the DC mode causes frequency and AC voltage setting to be ignored.

NOTE • Note that when voltage data is read from memory in the AC + DC mode for output, the output voltage changes as shown below:

An AC voltage set value (Vac) and DC voltage set value (Vdc) are stored independently in the memory. When they are read, AC voltage (Vac) is output slightly faster (approximately 30 μs) than DC voltage (Vdc). Therefore, output voltage changes as follows:

Example ADRS1: Vrms = 0 V, Vdc = +100 V
ADRS2: Vrms = 100 V, Vdc = 0 V
ADRS3: Vrms = 0 V, Vdc = +100 V

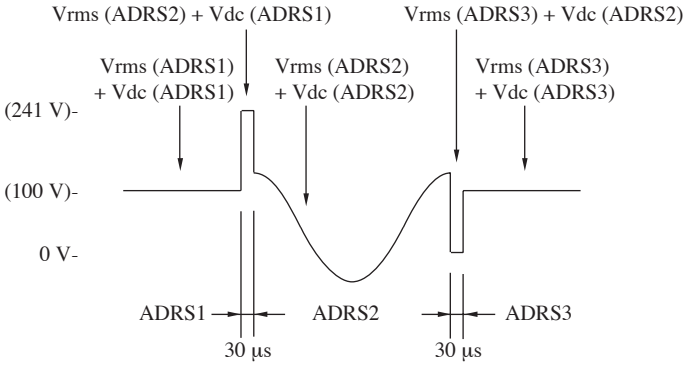


Fig.4-10 Changes in the Output Voltage in Reading Data from Memory

In the actual waveform, since the 30 μs shown in the above figure is very short in comparison with each ADRS time, output voltage changes like pulse.

DESCRIPTION • Status Signal

The status signal outputs while the period of time set for the T2, T3 and T4 (if T2=T4=0, this case applies T3) in the Power Line Abnormality Simulation or the setting time of address in the Sequence Operation.

When a status signal is specified to be ON, the signal “L” is output to the SEQ STAT OUT terminal (BNC connector) on the rear of the PCR-LA series. When a status signal is specified to be OFF, the signal “H” is output. “H” is approximately 5 V, and the “L” is approximately 0 V.

The BNC connectors are isolated from the INPUT terminal board and the OUTPUT terminal board of the PCR-LA series. Note that the common line of each signal for the PEAK INIT IN, SEQ TRG OUT, and SEQ STAT OUT are not isolated, because they are internally shared in the unit of PCR-LA series. And the internal circuits of Slot’s are also not isolated. There is a slight time difference (approx. 100 μs) between the status-signal outputs and the actual output changes.

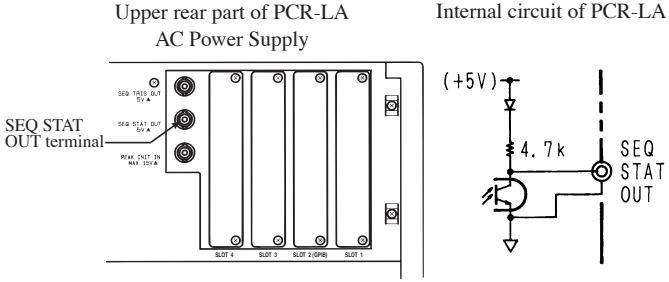


Fig.4-11 SEQ STAT OUT Terminal and Its Circuit

NOTE • The status signal may output when any change occurred in the parameter setting under the Power Line Abnormality Simulation or in the sequence setting under the Sequence Operation.

DESCRIPTION • Trigger Signal

The trigger signal outputs while the Sequence Operation is executed.

When a trigger signal is specified to be ON, the signal "L" is output to the SEQ TRIG OUT terminal (BNC connector) on the rear of the PCR-LA series for several tens of μs at the instant the value set in that address is reached. When a status signal is specified to be OFF, the signal "H" is output. "H" is approximately 5 V, and the "L" is approximately 0 V.

The BNC connectors are isolated from the INPUT terminal board and the OUTPUT terminal board of the PCR-LA series. Note that the common line of each signal for the PEAK INIT IN, SEQ TRG OUT, and SEQ STAT OUT are not isolated, because they are internally shared in the unit of PCR-LA series. And the internal circuits of Slot's are also not isolated. There is a slight time difference (approx. 100 μs) between the status-signal outputs and the actual output changes.

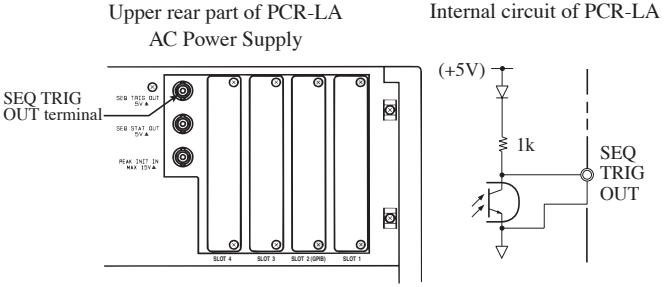


Fig.4-12 SEQ TRIG OUT Terminal and Its Circuit

NOTE • The trigger signal may output when any change occurred in the condition of sequence.

Sequence Execution Mode Operating Procedure

The sequence execution mode allows the items set in the sequence setting mode to be executed in order. Specify the sequence start address, end address, and repetition count to execute the sequence.

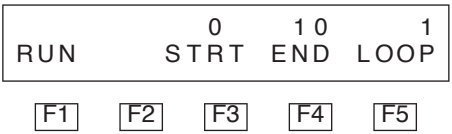
1. Press the ESC key to call the Home Position.
2. Press the SEQ key.

   The PCR-LA power supply will enter the key-lock mode automatically.

3. Press the F4 key to move the cursor to the “END” area on the upper part of the display, and set a sequence end address value using the numeric keys or JOG/SHUTTLE.

   For setting using the numeric keys, press the ENTER key to confirm the value.

   Setting is established as long as the start address is less that the end address. When setting the start and end addresses, always ensure this relationship is satisfied.



(Example of setting the end address to “10”)

4. Press the F3 key to move the cursor to the “START” area, and set a sequence start address value in the same way as the sequence end address.

(Example of setting the start address to “1”)

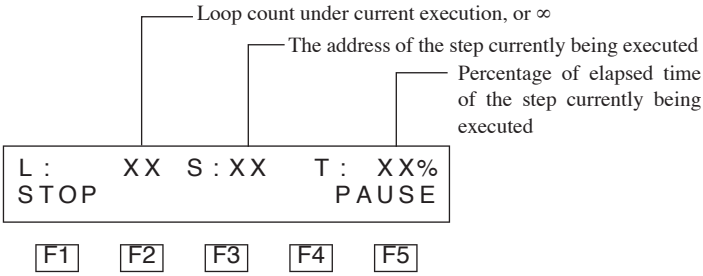
5. Press the F5 key to set the number of repetitions from the sequence start address to end address in the same way as the above steps.

(Example of setting the number of repetitions to "100")

6. Press the F1 (RUN) key. This start the sequence.

This will cause the "RUN" indication on the device and "1" in the S-MODE area on the PCR-LA power supply control panel to light up.

Display during execution of sequence operation



- Press the F1 (STOP), ESC, or OUTPUT key to stop the sequence. Pressing the ESC key on the PCR-LA power supply also stops the sequence in the same way. The key-lock mode of the PCR-LA power supply will be cancelled when the power supply returns to the Home Position by pressing the ESC key.
- When the F5 (PAUSE) key is pressed, the sequence will be paused. If the F5 key is pressed again, the pause status will be canceled. Setting OUTPUT key to OFF or pressing the ESC key in the pause status causes the sequence to stop.
- During execution of the sequence, "1" in the S-MODE area on the PCR-LA power supply control panel lights up.

- When the set number of repetitions has been executed, the sequence ends and the display changes to the sequence execution mode display.

NOTE

- To set OUTPUT OFF when the sequence has been executed the set number of times, set OUTPUT OFF as the end address.
- Stopping a sequence by pressing the OUTPUT key is by internally activates F1 (STOP) and then sets OUTPUT to OFF. Therefore, OUTPUT is not set to OFF until after the step being executed when the OUTPUT key was pressed has been output for several hundred ms.

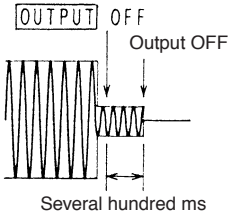


Fig.4-13 Lagged OUTPUT OFF

Example of Sequence Operation

Sequence operation allows output of a variety of simulation waveforms, such as output frequency/voltage sweep, power line environment change (such as voltage variation, instantaneous voltage drop, voltage drop, and voltage rise), and AC + DC output. Also, output of a peak-clipped waveform in addition to sine wave allows various tests of the power supply environment.

NOTE

- Displayed output voltage/current value is calculated from data obtained by sampling of the output voltage/current. There are following three sampling methods for set-frequency. When you set the output frequency which goes across following three frequency-ranges in the sequence mode, sampling method is fixed in the method for the highest frequency in frequencies which you have set. When you set address setup time which did not meet the measurement cycle in sequence setting, waveform of the address is not measured correctly.

1. Set-frequency is between ≥1 Hz and <16 Hz.

   256 points are sampled in one period of waveform as actual time. Because data for calculation are obtained in one period of waveform, measurement window is one period.

2. Set-frequency is between ≥16 Hz and <256 Hz.

   16 points are sampled in one period of waveform. This sampling is repeated 16 times, and 256 points of data are obtained. Because 16 periods of waveform is required to obtain data for calculation, measurement window is 16 periods.

3. Set-frequency is between ≥256 Hz and <1 kHz

   One point is sampled in one period of waveform. This sampling is repeated 256 times, and 256 points of data are obtained. Because 256 periods of waveform is required to obtain data for calculation, measurement window is 256 periods.

The following are examples of sequence operations and their sequence set values.

1. Output frequency/voltage sweep

This example shows that a voltage of 50 V at 20 Hz was output for 0.2 sec, both voltage and frequency were ramp changed to 100 V and 60 Hz over 0.3 sec, and then an output of 100 V at 60 Hz was held for 0.2 sec.

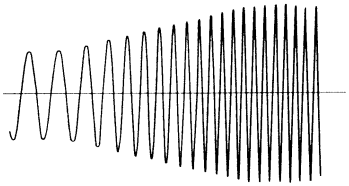


Fig.4-14

2. Automatic power line environment test

In this example, voltage was first changed from 0 V (for 0.2 sec) to 100 V, 132 V, and then to 85 V at 0.1 second intervals, instantaneously dropped to 30 V for 0.05 second, and recovered to 132 V. Then, 0.05 second later, the voltage was ramp changed to 0 V over 0.15 second and held at 0 V for 0.1 second. Finally, the voltage was ramp changed to 85 V over 0.15 second and held at 85 V for 0.2 second.

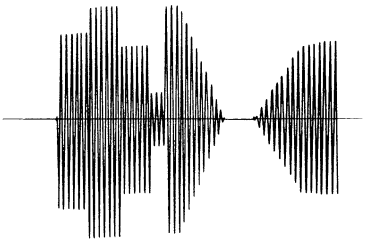


Fig.4-15

3. AC + DC Output

In this example, 16 Hz, 50 VAC voltage was superimposed on +48 VDC voltage and output for one second. Then 16 Hz, 50 VAC voltage was superimposed on -48 VDC voltage and output for one second.

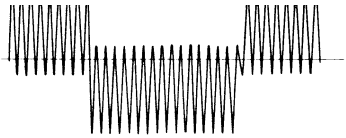


Fig.4-16

The set values of these sequence operation examples are given in the setting sheet on the next page. The setting sheet is included in the “Appendix”.

Sequence Operation Setting Sheet

PCR-LA Series

TITLE Example of Sequence Operation DATE_____ No._____

ADR	R	F	R	Vac	Th	Tm	Ts	WAVE	IMP	Vdc	STRT	TRG	OUT
1	—	20	—	50			0.2						
2	R	60	R	100			0.3						
3	—	60	—	100			0.2						
4	—	60	—	0			0.2						
5	—	↓	—	100			0.1						
6	—	↓	—	132			0.1						
7	—	↓	—	85			0.1						
8	—	↓	—	30			0.05						
9	—	↓	—	132			0.05						
10	—	↓	R	0			0.15						
11	—	↓	—	0			0.1						
12	—	↓	R	85			0.15						
13	—	▼	—	85			0.2						
14	—	16	—	50			1			+48			
15	—	16	—	50			1			-48			

MEMO

(1) ADR 1 to 3 Output frequency/voltage sweep
(20 Hz, 50 V to 60 Hz, 100 V)

(2) ADR 4 to 13 Automatic power line environment test
(voltage variation, instantaneous voltage drop, voltage drop, and voltage rise)

(3) ADR 14 to 15 AC + DC output
(50 Vrms AC at 16 Hz, +48 V/-48 V DC)

4.3.7 Harmonic Current Analysis Function

Use of the Remote Controller allows output current harmonic analysis. Because the measurement method employed is simplified, it does not conform to IEC or other standards. To conduct standard-compliant measurements, use our HA01F-PCR-L Harmonics Analyzer.

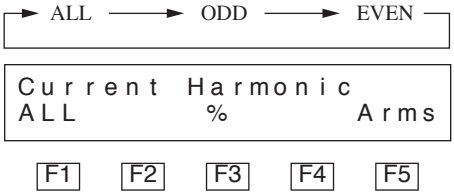
Harmonic Current Analysis Function Operating Procedure

- The harmonic current analysis function is available only in the AC or AC-S mode.

1. Press the ESC key to call the home position.
2. Press the CUR HMNC (SHIFT, SIM).

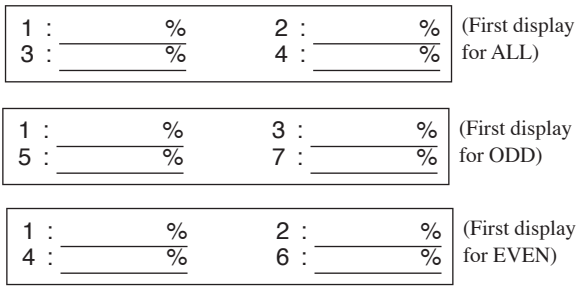
   The PCR-LA power supply will enter the key-lock mode automatically.
3. Press the F1 (ALL/ODD/EVEN) key to select “ALL” (all harmonics), “ODD” (odd number harmonics), or “EVEN” (even number harmonics).

   Selection changes in the following order whenever the F1 key is pressed.

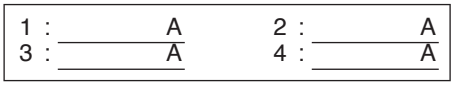


4. Press the F3 (%) key or F5 (Arms) key to select “%” or “Arms”.

   When the F3 (%) key is pressed, the harmonic current value is displayed as a percentage, with a current value not containing harmonic current regarded as 100%.



For the F5 (Arms) key, the each harmonic component is indicated as a current value. The unit is Arms.

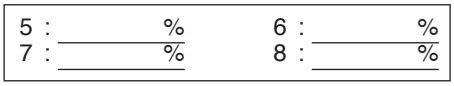


(First display for ALL)

5. Press the MENU key to switch the display and change the displayed harmonic order.

   If "ALL" is selected in step 3, ten displays (up to the 40th order) are available. For "ODD" or "EVEN", five displays are provided.

   The display changes whenever the MENU key is pressed.



(First display for ALL. Percentage display)

   To return to the previous display, press the (SHIFT, MENU) keys.

6. Press the ESC key to return to the Home Position.

   This will cancel the key-lock mode in the PCR-LA power supply. Pressing the ESC key on the PCR-LA power supply also returns the status to the Home Position.

NOTE
- Harmonic analysis can be performed using the PCR-LA Series only. However, harmonic analysis generally requires that line impedance is adjusted to the standard value. Therefore, the Line Impedance Network (LIN Series) is also necessary.

4.3.8 Special Waveform Output

Use of the Remote Controller allows the PCR-LA power supply to output not only a sine wave, but also a “peak-clipped waveform” in which the peak of a sine wave is suppressed. This function can be used not only for a variety of electronics devices but also for chemical experiments and production facilities.

To use this feature, set the waveform in the waveform banks in the special waveform setting mode, and read the waveform in the special waveform output mode for output.

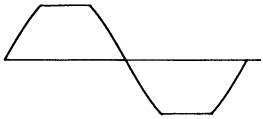


Fig.4-17 Peak-clipped Waveform

- Only sine waves and peak-clipped waveforms can be set using this device. However, user-defined waveforms created via the Remote Interface can also be read.

DESCRIPTION • Waveform Bank

The Remote Controller stores output voltage waveform data in the internal memory and generates the reference waveform for output voltage by D/A conversion of such data. An area of the memory for one waveform of such waveform data is called a waveform bank. A waveform banks for 15 waveforms are provided; these are numbered W00 to W14. A waveform is selected using such a number. Waveform bank W00 stores the sine wave, which is the reference voltage waveform of the PCR-LA AC power supply. The W00 content cannot be restored. In the Initial Setup Status, the same waveform as that of W00 (that is, a sine wave) is stored in all the waveform banks.

Waveform bank display

SIN: Sine waveform

P.C: Peak-clipped waveform

USR: User defined waveform (see the PCR-LA AC Power Supply Operation Manual.)

• Crest Factor

Crest factor is the ratio between AC waveform rms and peak values.

Crest factor = Peak value / rms value

For a sine wave, the crest factor is 1.41.

For a commercial power line voltage waveform, the sine wave crest factor should be 1.41. However, since the peak of the actual waveform is suppressed, the crest factor is between 1.2 and 1.4.

NOTE

- A sine wave, peak-clipped waveform, and user-defined waveform can be arbitrarily assigned to waveform banks W01 to W14.

  However, a user-defined waveform is only temporarily captured in the PCR-LA power supply, and is erased when the POWER switch of the power supply is turned OFF. (Note that the sine waves and peak-clipped waveforms are backed up in the power supply.)

Special Waveform Setting Procedure

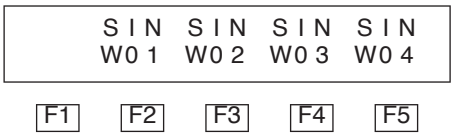
A special waveform can be set only when the OUTPUT key is OFF in the Home Position.

- Special waveform setting is available only in the AC, AC-S, or AC + DC mode.
- There are 15 waveform banks, W00 to W14, but W00 is for read only.

1. Press the ESC key to call the Home Position.
2. Press the W-EDIT (SHIFT, WAVE) key.

   The PCR-LA power supply will enter the key-lock mode automatically.

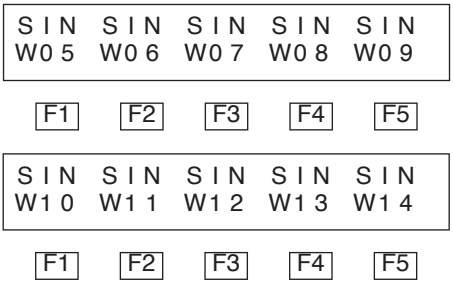
   In the Initial Setup Status, the following display (first display) appears.



(Sine waves have already been set to waveform banks W00 through W04.)

3. Press the MENU key to select the display to change the waveform banks to be displayed.

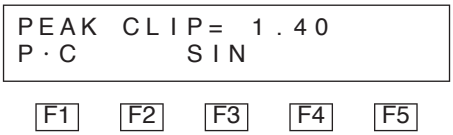
   Three displays are provided. These are selected in turn whenever the MENU key is pressed.



To return to the previous display, press the (SHIFT, MENU) keys.

4. Press one of the F1 to F5 keys to select the bank (waveform bank) in which you wish to store waveform data.

5. Press the F1 (PC) key to activate the peak-clipped waveform setting mode.



Using the numeric keys or JOG/SHUTTLE, set the peak-clipped waveform crest factor (see the Description) in the range of 1.10 to 1.40 (for setting using the numeric keys, press the ENTER key to fix the value).

6. To return the peak-clipped waveform to a sine wave, press the F3 (SIN) key.
7. Press the ESC key to return to the Home Position.

   This will cancel the key-lock mode in the PCR-LA power supply. Pressing the ESC key on the PCR-LA power supply also returns the status to the Home Position.

Special Waveform Output Mode Operating Procedure

- Special waveform output is available only in the AC or AC + DC mode.

1. Press the ESC key to call the Home Position.

2. Press the WAVE key.

   The PCR-LA power supply will enter the key-lock mode automatically.

3. Press the MENU key to select the display and change the displayed waveform banks.

   Three displays are provided. These can be selected in turn whenever the MENU key is pressed.

   To return to the previous display, press the (SHIFT, MENU) key.

SIN W00	SIN W01	SIN W02	SIN W03	SIN W04
F1	F2	F3	F4	F5

4. Press one of the F1 to F5 keys to select the waveform bank you wish to output.

5. This activates the ENTER wait status. Press the ENTER key to initiate operation.

   Set OUTPUT to ON (if OUTPUT is not already ON) to output the selected waveform. When any waveform bank other than "W00" is selected, "3" lights in the PCR-LA AC power supply S-MODE area. To return the waveform to ordinary status (sine wave), select W00.

6. Press the ESC key to return to the Home Position and exit the special waveform output mode.

   This will cancel the key-lock mode in the PCR-LA power supply. Pressing the ESC key on the PCR-LA power supply also allows you to exit the special waveform output mode in the same way.

NOTE • The waveform always switches to the selected one after completing a single cycle.

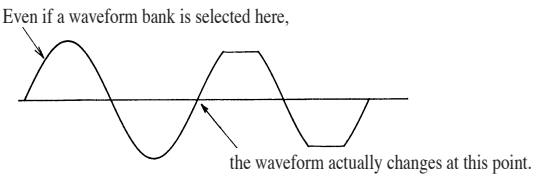


Fig.4-18 Waveform Switching

4.3.9 Output Impedance Setting

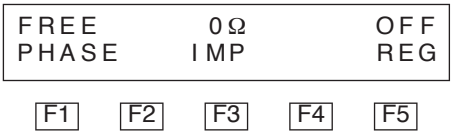
The PCR-LA AC power supplies have almost 0 ohm output impedance (output resistance); an actual commercial power line has several milliohm to several ohm impedance (resistance). When the Remote Controller is connected to a PCR-LA AC power supply, the equipment allows output impedance to vary. This enables simulation of an environment similar to that of an actual commercial power line.

Output Impedance Setting Procedure

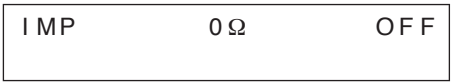
- Output impedance setting is available only in the AC mode.

1. Press the ESC key to call the Home Position.
2. Press the MODE key.

   The PCR-LA power supply will enter the key-lock mode automatically.

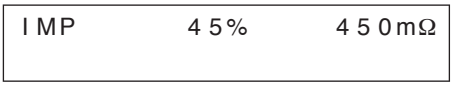


3. Press the F3 (IMP) key to select the output impedance setting mode.



4. Using the numeric keys of JOG/SHUTTLE, set output impedance in steps of 1% by regarding the maximum value as 100%.

   A resistance value equivalent to the set % value is simultaneously displayed.



(Example of the 100 V output range of PCR2000LA)

Setting 0 ohm cancels output impedance setting.

Switching the PCR-LA AC power supply output range always sets output impedance to 0 ohm.

When the output impedance setting function is operating, “2” lights up in the PCR-LA AC power supply S-MODE area.

5. Press the ESC key to return to the Home Position.

This will cancel the key-lock mode in the PCR-LA power supply. Pressing the ESC key on the PCR-LA power supply also returns the status to the Home Position.

This function is backed up inside the PCR-LA AC power supply. Therefor, once a setting is made using the Remote Controller, the power supply can operate in the same condition continuously even if the device is disconnected, as long as the setting conditions remain the same.

NOTE

- For the impedance needed for harmonic current analysis, an impedance component is specified. However, only a resistance component is available for this output impedance. Therefore, data obtained by output impedance setting can be used only as a approximation of harmonic current analysis. Accurate data acquisition requires that the Line Impedance Network (LIN Series) should be used.

4.3.10 Output ON/OFF Phase Setting

Output ON/OFF phase setting is available separately. In the Initial Setup Status, no output ON/OFF phase is set in the Remote Controller (phase is random). This function is used if output ON/OFF phase setting is required for a case such as inrush current simulation.

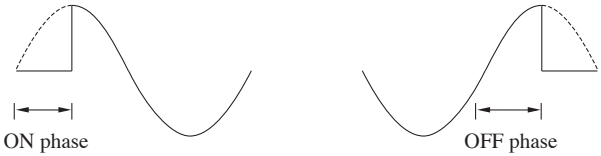


Fig.4-19 Output ON/OFF Phase

Output ON/OFF Phase Setting Procedure

- Output impedance setting is available only in the AC mode.

1. Press the ESC key to call the Home Position.
2. Press the MODE key.

   The PCR-LA power supply will enter the key-lock mode automatically.

F	R	E	E	1	.	0	0Ω			O	F	F
P	H	A	S	E		I	M	P		R	E	G

F1 F2 F3 F4 F5

3. Press the F1 (PHASE) key to select the output ON/OFF phase setting mode.

P	H	A	S	E			F	R	E	E		F	R	E	E
				O	U	T	–	O	N		O	U	T	–	O	F	F

F1 F2 F3 F4 F5

4. Press the F3 (OUT_ON) or F5 (OUT_OFF) key to select ON or OFF phase.

   If the F3 (OUT_ON) key is pressed, the following display appears.

If either the F3 (OUT_ON) or F5 (OUT_OFF) key is pressed, the "FREE" (no setting) and "_deg" (setting) indications appears alternately.

5. For selection of "_deg" (setting), set phase using the numeric keys or JOG/SHUTTLE (for setting using the numeric keys, press the ENTER key to fix the selection).

   When the output ON/OFF phase setting function is operating, "4" lights in the PCR-LA AC power supply S-MODE area.

6. Press the ESC key to exit the output ON/OFF phase setting mode.

   This will cancel the key-lock mode in the PCR-LA power supply. Pressing the ESC key on the PCR-LA power supply also allows you to exit the phase setting mode in the same way.

The set content is backed up inside the PCR-LA AC power supply. Therefore, once a setting is made using the Remote Controller, the power supply can operate in the same condition continuously even if the device is disconnected, as long as the setting conditions remain the same.

4.3.11 Regulation Adjustment

With regulation adjustment, the output voltage is adjusted automatically in accordance with output current. This function is used for the same purpose as the sensing function. The sensing function measures the sensing-point voltage in order to maintain a constant sensing-point voltage; with regulation adjustment, the voltage drop caused by the output current is calculated in order to raise the output voltage by an amount equivalent to the drop. This function is used to stabilize voltage at the load end without using sensing cables if there is a considerable distance between the load and the PCR-LA AC power supply.

NOTE

- When regulation adjustment is performed, the PCR-LA power supply's voltage stability accuracy, distortion factor, and response time decrease below the normal capability. Therefore, this function may not be suitable for some applications. Check the load conditions and other requirements carefully before use.
- Regulation adjustment is not available in the power line abnormality simulation or sequence operation

Regulation Adjustment Setting Procedure

- Connect a load to the PCR-LA AC power supply in accordance with "2.8 Connecting a Load" of the PCR-LA AC Power Supply Operation Manual. Set OUTPUT to ON, and set output voltage to the level required at the load end. At the load end, the voltage falls below the voltage level at the PCR-LA power supply because of a voltage drop caused by the load cable. Prepare a voltmeter to check if the voltage at the load end has the required level. To perform regulation adjustment, the output current must be at least 1/10 of the PCR-LA power supply rated current
- The voltage that can be corrected using the regulation adjustment function is up to +10% of the PCR-LA power supply output voltage.

1. Press the ESC key to call the Home Position.
2. Press the MODE key.

   The PCR-LA power supply will enter the key-lock mode automatically.

0deg	0Ω	ON
PHASE	IMP	REG

F1 F2 F3 F4 F5

3. Press the F5 key (pressing this key toggles between ON and OFF) to set regulation adjustment to ON.

0deg	0Ω	ON
PHASE	IMP	REG

F1 F2 F3 F4 F5

4. When this function is set ON, flow current to the load. By observing the voltmeter connected to the load end, adjust the voltage using JOG/SHUTTLE so that the voltage at the load end attains the required voltage value.

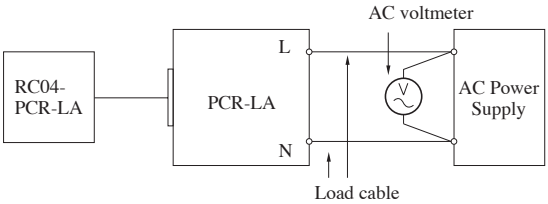


Fig.4-20 Adjusting the Voltage Using Regulation Adjustment

5. Press the ESC key to return to the Home Position.

This will cancel the key-lock mode in the PCR-LA power supply. Pressing the ESC key on the PCR-LA power supply also returns the status to the Home Position.

4.3.12 Zero Calibration Function for Measured Current Values

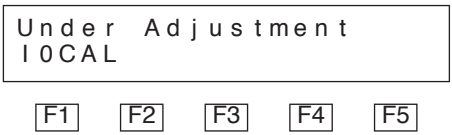
When the PD03M-PCR-LA and PD03S-PCR-LA options are used to perform master-slave operations for the first time, there may be an offset (indication of a slight value under no-load conditions) in the current, power, power factor, and VA displays, and the analyzed harmonic current value, which are related to current measurements. In this case, use the Remote Controller as described below to perform zero calibration.

Zero calibration operating procedure

In addition, be sure to read the Operation Manual of the PD03M/S-PCR-LA.

1. Press the ESC key to select the Home Position.
2. Press the (SHIFT, MODE) keys.

3. Press the F1 key. This starts zero calibration, and the following display appears on the display unit.



When zero calibration ends several tens of seconds later, the following display appears on the display unit.

4. Press the ESC key to exit the zero calibration mode.

The calibrated value will be stored in the PCR-LA power supply. However, re-calibration must be performed, depending on changes in ambient temperature and the like.

Chapter 5 Parts Names and Functions

Denotes the names of the switches, indications, and other parts of the RC04-PCR-LA, and describes their functions.

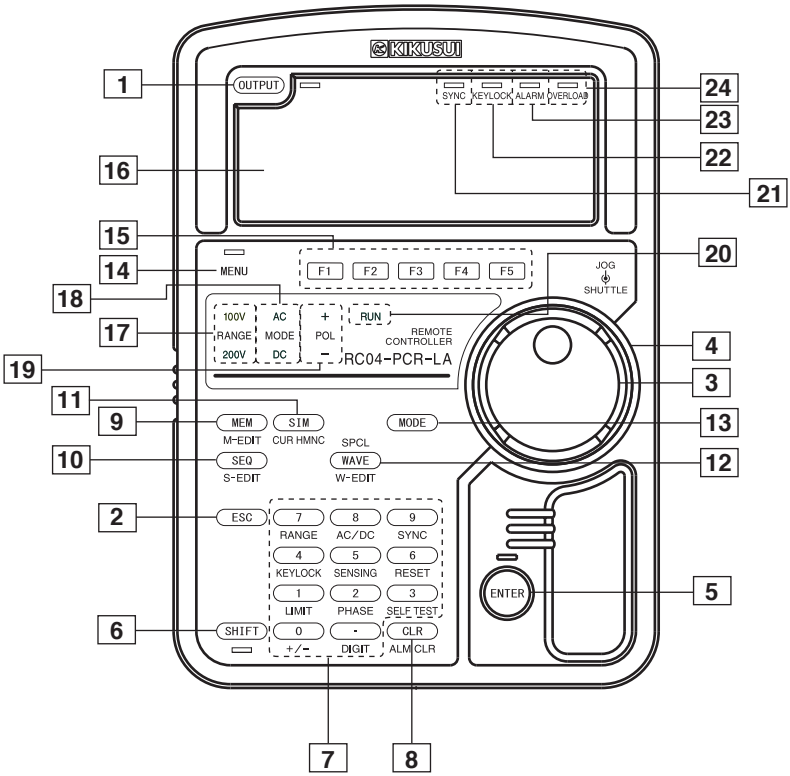


Fig.5-1 RC04-PCR-LA (front view)

[1] OUTPUT key

Selects output ON/OFF. (Whenever this switch is pressed, output ON/OFF is switched alternately.) When output is ON, the LED at the right of the key lights up. Immediately after the POWER switch is turned ON, output is OFF.

[2] ESC key

Used to end or cancel each operation.

[3] JOG

Used to set voltage, frequency, and other parameters. This is a rotary encoder with 10 clicks per rotation. The encoder increases the set value when it is turned clockwise; it decreases the set value when it is turned counterclockwise.

[4] SHUTTLE

Used to set voltage, frequency, and other parameters. You can choose from among four levels by setting the change speed, which varies with the angle to which the SHUTTLE is turned. The set value increases when the SHUTTLE is turned clockwise; it decreases when the SHUTTLE is turned counterclockwise.

[5] ENTER key

Establishes the key operation. The LED above this key blinks during ENTER wait. This key has the same function as ENT on the PCR-LA AC power supply control panel.

[6] SHIFT key

Enables the function set in blue letters below each key.

If the SHIFT key is pressed, the LED below this key lights up.

[7] 0, 1, 2, 3, ... 9 keys (numeric keys) and the "." key

Used to directly enter the voltage, current and frequency values. (.: Decimal point)

An input value is confirmed when the ENTER key is pressed. It is canceled if the ESC key or the CLR key is pressed.

+/- (SHIFT, 0) key

Switches polarity of the DC mode voltage (+/-).

For power line abnormality simulation, this switches the simulation start phase.

LIMIT (SHIFT, 1) key

Selects the limit value display mode for voltage, frequency, and current.

PHASE (SHIFT, 2) key

Available when the device is connected to a three-phase system PCR-LA power supply.

SELFTEST (SHIFT, 3) key

Selects the self-test mode in the event of an alarm or overload.

KEYLOCK (SHIFT, 4) key

Selects the key-lock mode.

In the key-lock mode, KEYLOCK lights up, and all keys except the OUTPUT key and the KEYLOCK (SHIFT, 4) key are disabled.

SENSING (SHIFT, 5) key

Selects the sensing mode.

To set the sensing mode, connect the sense wires to the sensing terminals, set the voltage, and press this key. The sensing mode allows no voltage change.

RESET (SHIFT, 6) key

Reset all set values (including those in the PCR-LA AC power supply memory). When a reset is performed, all set values return to their Initial Setup Status (factory shipment status).

A reset can be established by pressing (SHIFT, ENTER).

RANGE (SHIFT, 7) key

Selects output voltage range.

The "100V" indication in the RANGE area lights up when equipment is in the 100V range, "200V" lights up when it is in the 200V range.

When the RANGE key is pressed, the range indication to be selected blinks. Press the ENTER key to confirm the mode selection.

AC/DC (SHIFT, 8) key

Switches the mode among the AC, DC, and AC + DC modes.

The "AC" indication in the MODE area lights up in the AC mode, "DC" lights up in the DC mode, and both "AC" and "DC" light up in the AC + DC mode.

When the AC/DC key is pressed, the mode to be selected blinks. Press the ENTER key to confirm the mode selection.

SYNC (SHIFT, 9) key

Selects synchronized operation.

DIGIT (SHIFT, .) key

Selects the digit mode that enables a specified or higher digits to change in the voltage setting or frequency setting mode.

In the digit mode, the cursor (under bar) blinks below the digit to change in the LCD's voltage or frequency display area, thereby allowing the relevant digit and higher digits (left of the relevant digit) to be changed.

[8] CLR key

Cancels the set value and recalls the previous value.

ALMCLR (SHIFT, CLR) key

Clears the alarm status in the event of an alarm.

[9] MEM key

Calls voltage (and frequency) value (or values) from the memory.

Pressing the MEM key and then selecting a memory address using the numeric keys or JOG/SHUTTLE will call the address and the voltage (and frequency) value (or values) stored in that address on the LCD.

Press the ENTER key to set the value retrieved in the output mode.

M-EDIT (SHIFT, MEM) key

Stores the set value in the memory.

Set the setting you wish to store and the relevant address, then press ENTER. This will store the value (or values) in the memory.

[10]SEQ key

Selects the sequence execution mode.

To start the sequence, press the SEQ key. Then, press the F4 (END) key to set the end address, the F3 (STRT) key to set start address, and the F5 (LOOP) key to set the sequence repetition count. Finally, press the F1 (RUN) key to start the sequence.

S-EDIT (SHIFT, SEQ) key

Selects the sequence setting mode.

In the sequence setting mode, press the MENU key to change the setting display select the desired item using the F1 to F5 key and set the sequence data.

[11]SIM key

Selects the power line abnormality simulation mode.

In the power line abnormality simulation mode, press the MENU key to switch to the setting display, then select the desired item using the F1 to F5 key for data setting.

CUR HMNC (SHIFT, SEQ) key

Selects the harmonic current analysis mode.

In the harmonic current analysis mode, press the F1 (ALL/ODD/

EVEN) to set the display degree to all degrees, odd-number degrees, or even-number degrees. Then, press the F3 (%) key or the F5 (Arms) key to select the harmonic current display method.

[12]WAVE key

Selects the special waveform output mode.

Special waveform used a peak-clipped waveform as the standard.

W-EDIT (SHIFT, WAVE) key

Selects special waveform setting mode.

[13]MODE key

Allows switching of output ON/OFF phase, output impedance setting, and regulation adjustment.

[14]MENU key

Selects the next display if there are two or more displays.

(SHIFT, MENU) key

Selects the previous screen if there are two or more displays.

[15]F1, F2, F3, F4, F5 (function keys)

Used to select the items displayed on the LCD.

[16]Liquid Crystal Display (LCD)

An LCD unit with backlight.

[17]RANGE indication

Displays the output voltage range.

"100V" lights up above the RANGE indication for the 100V range; "200V" lights up for the 200V range.

[18]MODE indication

Displays the output voltage mode.

"AC" lights up in the AC mode, "DC" in the DC mode, and both "AC" and "DC" in the AC + DC mode.

[19]POL indication

Displays the voltage change start polarity. For positive polarity, "+" lights up; for negative polarity, "-" lights up.

[20]RUN indication

Lights up while a sequence or simulation is in operation.

[21]SYNC indication

Lights up during execution of synchronized operation.

If synchronized operation is not conducted properly, this indication blinks.

[22]KEYLOCK indication

Lights up in the key-lock mode.

[23]ALARM indication

In the event of alarm, this indication blinks, and an intermittent buzzer tone sounds.

[24]OVERLOAD indication

Lights in the event of an overload (over current).

If the overload continues for a few seconds, output goes OFF. This generates an alarm and sounds intermittent buzzer tones.

[25]Contrast

Used to adjust the brightness of text displayed on the LCD.

[26]8-contacts mini-plug connectors.

Used for connecting the remote controller cable. Use one of these connectors.

[27]Magnet sheet attachment area

The provided magnet sheet is attached here. Use of the magnet sheet allows the remote controller to stick on the side of a PCR-LA AC power supply or other vertical steel surface.

[28]Quick reference card

Briefly describes keys and simulation waveforms.

Pull it out and use as necessary.

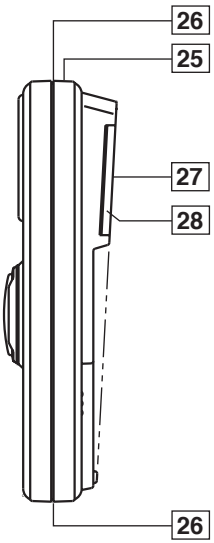


Fig.5-2 RC04-PCR-LA (side view)

Chapter 6 Maintenance

Describes the maintenance procedures for the RC04-PCR-LA.

6.1 Cleaning

If the panel surface becomes soiled, wet a piece of soft cloth with a water-diluted neutral detergent, and wipe the panel gently.

⚠ CAUTION

- Be sure to turn the POWER switch of the PCR-LA power supply OFF before performing maintenance.
- Do not use volatile solvents such as thinner or benzine, as they may discolor the device surface coating, erase printed characters, or make the face of the display unit opaque.

6.2 Before Requesting a Repair

If a problem occurs in the RC04-PCR-LA, check that problem in accordance with the following Table 6-1. Also, disconnect the Remote Controller from the PCR-LA AC power supply and check if the power supply alone operates normally. If it is not possible to recover a normal status, contact Kikusui distributor/agent to request repairs.

Table 6-1 Troubleshooting Check Sheet

Problem	Check item	Results	Possible causes
LCD display does not appear, or display content is not normal.	Check if the remote controller cable has been correctly connected.	NO	Improper remote controller cable connection (see 2.4)
	Check the contrast adjustment.	NO	Improper contrast adjustment (see 3.1)
The Remote Controller cannot be operated.	Check if the remote controller cable has been correctly connected.	NO	Improper remote controller cable connection (see 2.4)
	Check if the PCR-LA AC power supply display unit indicates “GPIB” or “RS-232C.”	YES	The PCR-LA AC power supply is under control of the GPIB Interface or RS-232C Interface.

Chapter 7 Specifications

Contains a list of the specifications.

7.1 Specifications

Setting functions

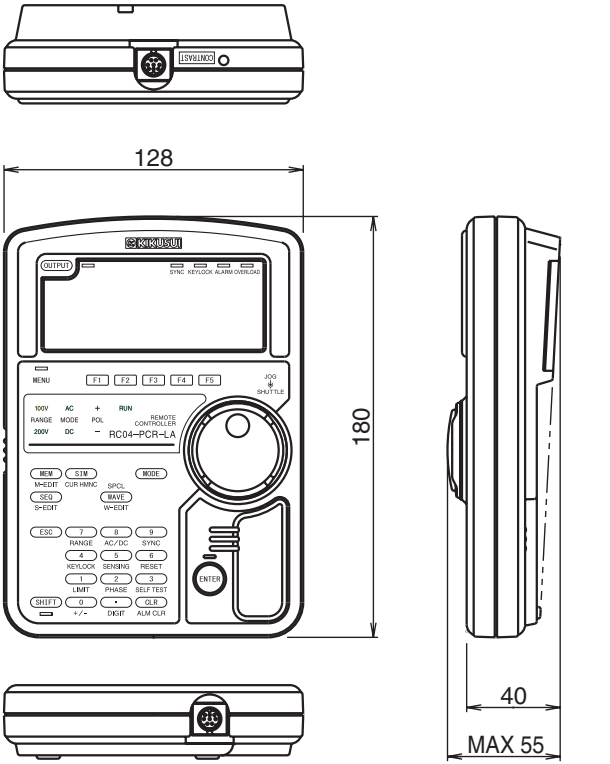
Item			Setting range	Resolution	Setting accuracy
Power line abnormality simulation					
	T1	x1 deg	0 deg to 360 deg	1 deg	For T2 = T4 = 0, 1 deg For T2 ≠ 0 or T4 ≠ 0, 1 ms
		x1 ms	0.0 ms to 999.9 ms	0.1 ms	For T2 = T4 = 0, $\pm(1 \times 10^{-3} + 0.1$ ms) For T2 ≠ 0 or T4 ≠ 0 $\pm(1 \times 10^{-3} + 1$ ms)
	T2	x1	0 ms to 9999 ms	1 ms	$\pm(1 \times 10^{-3} + 1$ ms)
		x10	0.00 s to 99.99 s		
	T3	x1	0.0 ms to 999.9 ms	0.1 ms	For T2 = T4 = 0, $\pm(1 \times 10^{-3} + 0.1$ ms) For T2 ≠ 0 or T4 ≠ 0, $\pm(1 \times 10^{-3} + 1$ ms)
		x10	0 ms to 9999ms		
	T4	x1	0 ms to 9999 ms	1 ms	$\pm(1 \times 10^{-3} + 1$ ms)
		x10	0.00 s to 99.99 s		
	T5	x1	0 ms to 9999 ms	1 ms	1 cycle
		x10	0.00 s to 99.99 s	10 ms	
	N	x1	0 cycle to 9999 cycles	1 cycle	1 cycle
		x10	0 cycle to 99990 cycles	10 cycles	
		x100	0 cycle to 999900 cycles	100 cycles	
	V (T3)		Same as output voltage setting range	0.1 V	_____
	RPT		0 to 9998 times or ∞	Once	Once

Item			Setting range	Resolution	Setting accuracy
Sequence operation					
	ADR		0 to 99	1	————
	FRQ		Same as output frequency setting range	Same as at the left	Same as at the left
	Vac		Same as output voltage setting range	Same as at the left	Same as at the left
	TIME	HOUR	0 hr to 999 hrs 59 min	1 min	±(1 x10^{-3} +0.5 min)
		MIN	0 min to 999 min 59 sec	1 s	±(1 x10^{-3} +0.5 s)
		SEC	0.001 sec to 999.999 sec	1 ms	±(1 x10^{-3} +0.5 ms)
	WAVE		Same as special waveform output	Same as at the left	————
	IMP		Same as output impedance	Same as at the left	Same as at the left
	Vdc		Same as output voltage setting range	Same as at the left	Same as at the left
AC + DC mode					
	Voltage setting		AC voltage setting range is the same as that of AC mode. DC voltage setting range is the same as that of DC mode. However, the peak value for AC + DC voltage should be within the DC voltage setting range.	Same as AC and DC modes	————
	Maximum current		Same as that of DC mode	————	————
	Power capacity		Same as that of DC mode	————	————
	Frequency		Same as that of AC mode	Same as at the left	————
Special waveform output					
	Waveform bank		0 to 14 (0 for read only	0	————
	Crest factor		1.10 to 1.40	0.01	0.01
Output impedance setting					
	PCR 500LA	100 V range	0 Ω to 4.0 Ω	40 mΩ	± (20 % +80 mΩ)
		200 V range	0 Ω to 16.0 Ω	160 mΩ	± (20 % +320 mΩ)
	PCR 1000LA	100 V range	0 Ω to 2.0 Ω	20 mΩ	± (20 % +40 mΩ)
		200 V range	0 Ω to 8.0 Ω	80 mΩ	± (20 % +160 mΩ)
	PCR 2000LA	100 V range	0 Ω to 1.0 Ω	10 mΩ	± (20 % +20 mΩ)
		200 V range	0 Ω to 4.0 Ω	40 mΩ	± (20 % +80 mΩ)
	PCR 4000LA	100 V range	0 Ω to 0.5 Ω	5 mΩ	± (20 % +10 mΩ)
		200 V range	0 Ω to 2.0 Ω	20 mΩ	± (20 % +40 mΩ)
	PCR 6000LA	100 V range	0 Ω to 0.333 Ω	3.33 mΩ	± (20 % +6.67 mΩ)
		200 V range	0 Ω to 1.333 Ω	13.33 mΩ	± (20 % +26.67 mΩ)
Output ON/OFF phase setting			0 deg to 360 deg	1 deg	1 deg

Measurement function

Item		Setting range	Resolution	Setting accuracy
Indicator				
	VA measurement	———	0.01 VA minimum (changes with VA value)	Same as that of wattmeter
	Power factor measurement	———	0.01	Same as that of wattmeter
	Peak holding current measurement	———	Same as that of peak ammeter	Within ± (2 % of rdg + 16 digits) (from 5 % of maximum rated current to maximum rated peak current at normal temperature)

7.2 Dimensions



Unit: mm

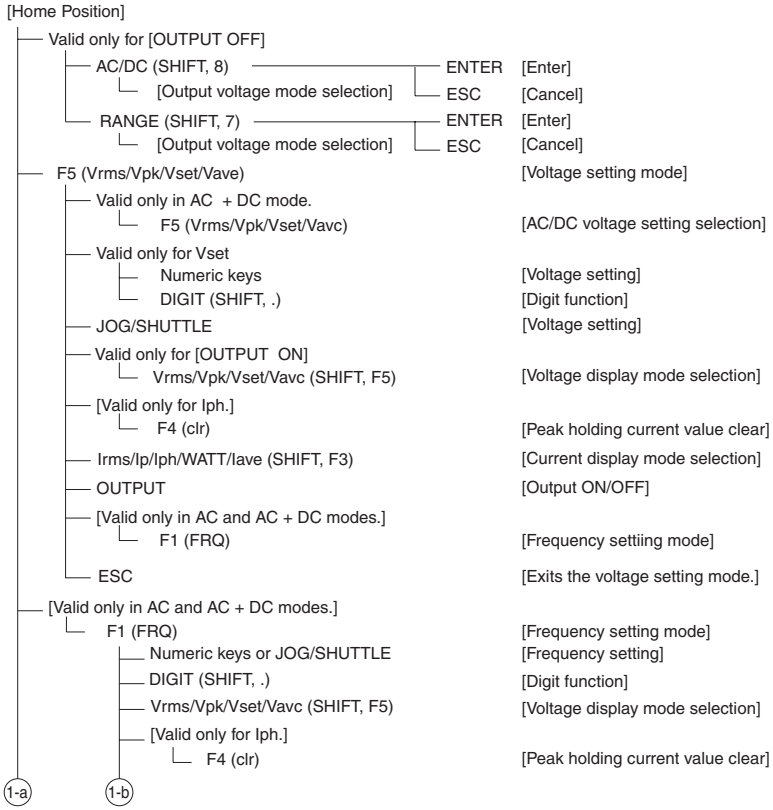
Fig.7-1 Dimension of RC04-PCR-LA

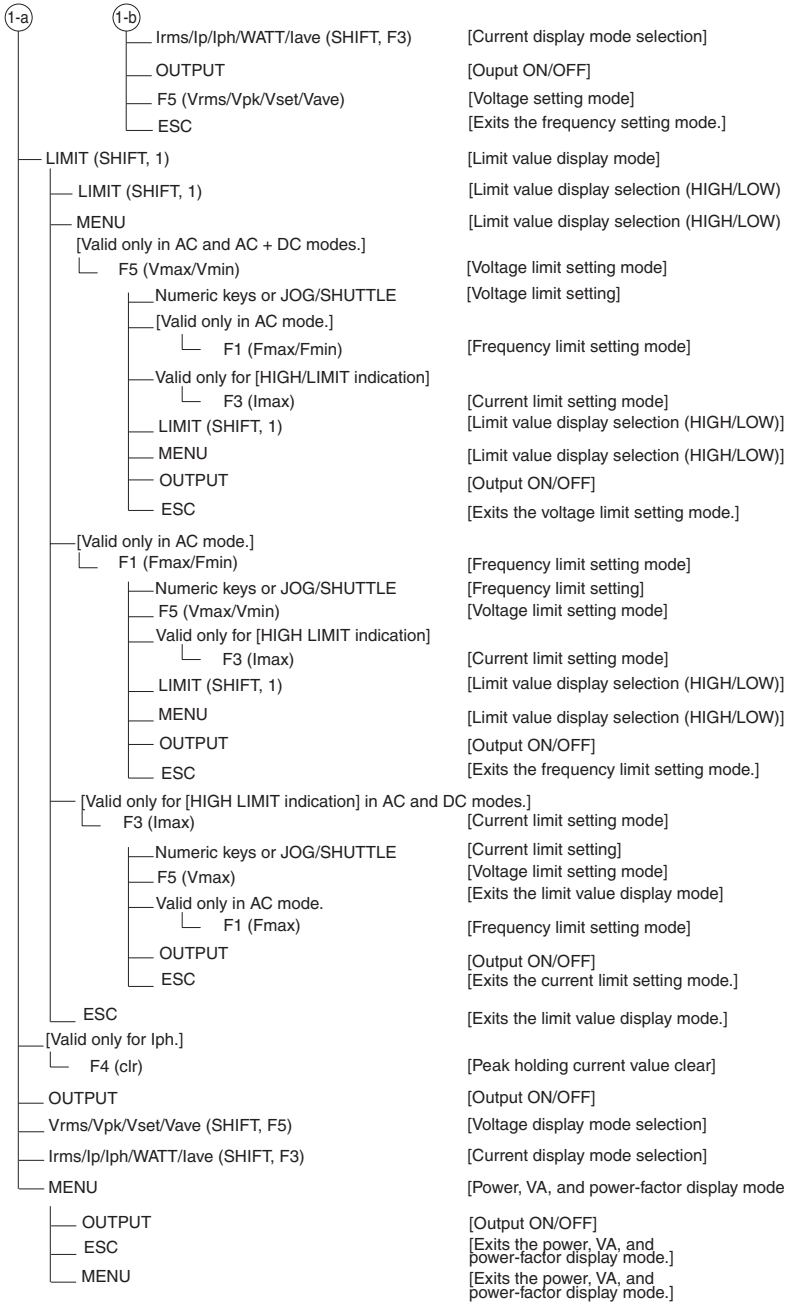
Appendix

Contains the Hierarchy of Remote Controller Key Operating Menus, the Power Line Abnormality Simulation Operation Setting Sheet, and the Sequence Operation Setting Sheet.

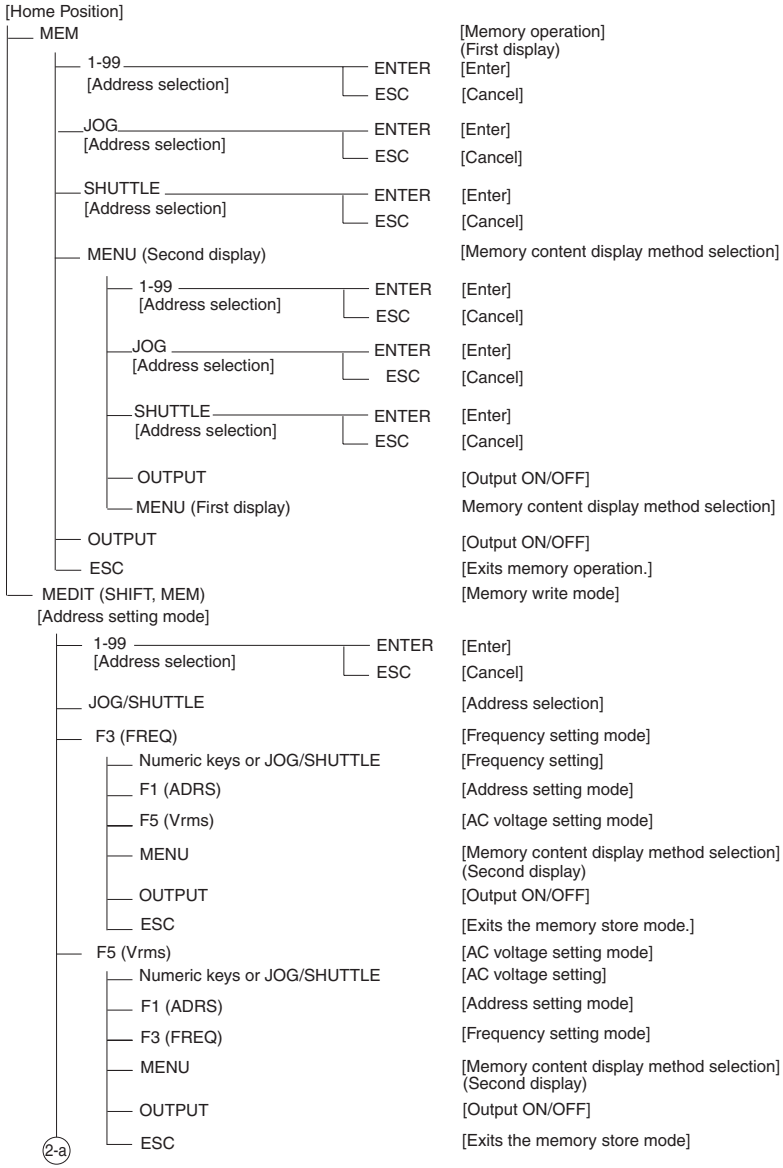
A.1 Hierarchy of Remote Controller Key Operating Menus

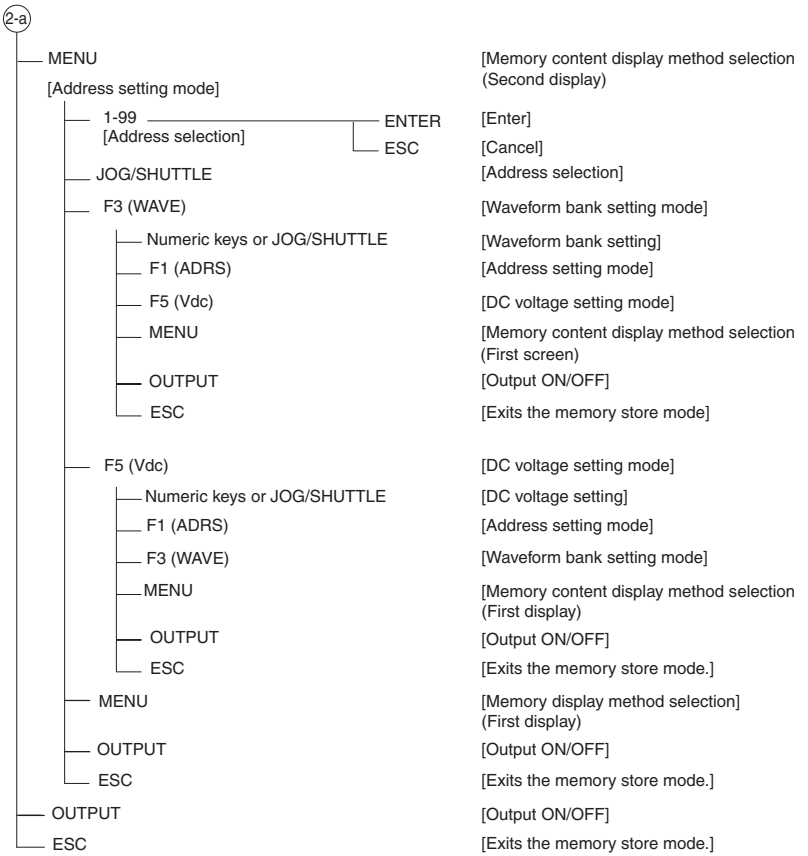
(1)Hierarchy of Voltage, Current, Frequency, and Other Factor Setting and Display Operating Menus



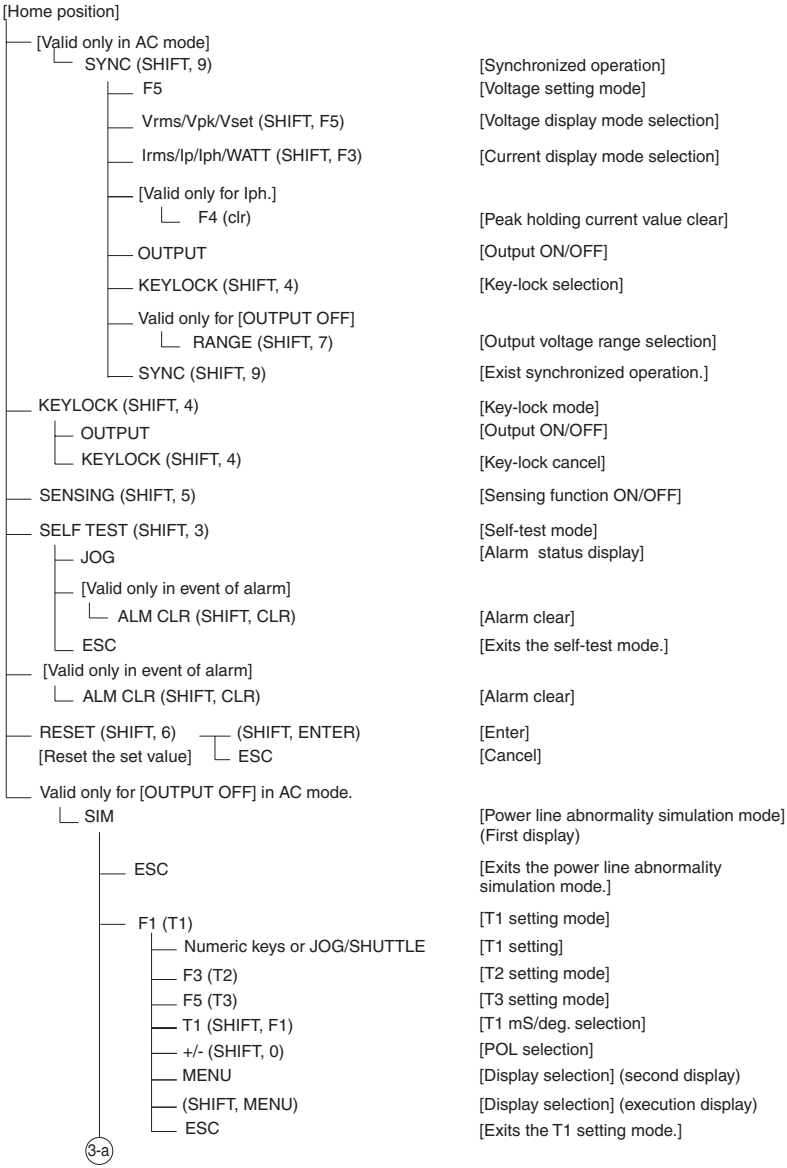

1-a
1-b
Irms/Ip/Iph/WATT/Iave (SHIFT, F3) [Current display mode selection]
OUTPUT [Ouput ON/OFF]
F5 (Vrms/Vpk/Vset/Vave) [Voltage setting mode]
ESC [Exits the frequency setting mode.]
LIMIT (SHIFT, 1) [Limit value display mode]
LIMIT (SHIFT, 1) [Limit value display selection (HIGH/LOW)
MENU [Limit value display selection (HIGH/LOW)
[Valid only in AC and AC + DC modes.]
F5 (Vmax/Vmin) [Voltage limit setting mode]
Numeric keys or JOG/SHUTTLE [Voltage limit setting]
[Valid only in AC mode.]
F1 (Fmax/Fmin) [Frequency limit setting mode]
Valid only for [HIGH/LIMIT indication]
F3 (Imax) [Current limit setting mode]
LIMIT (SHIFT, 1) [Limit value display selection (HIGH/LOW)]
MENU [Limit value display selection (HIGH/LOW)]
OUTPUT [Output ON/OFF]
ESC [Exits the voltage limit setting mode.]
[Valid only in AC mode.]
F1 (Fmax/Fmin) [Frequency limit setting mode]
Numeric keys or JOG/SHUTTLE [Frequency limit setting]
F5 (Vmax/Vmin) [Voltage limit setting mode]
Valid only for [HIGH LIMIT indication]
F3 (Imax) [Current limit setting mode]
LIMIT (SHIFT, 1) [Limit value display selection (HIGH/LOW)]
MENU [Limit value display selection (HIGH/LOW)]
OUTPUT [Output ON/OFF]
ESC [Exits the frequency limit setting mode.]
[Valid only for [HIGH LIMIT indication] in AC and DC modes.]
F3 (Imax) [Current limit setting mode]
Numeric keys or JOG/SHUTTLE [Current limit setting]
F5 (Vmax) [Voltage limit setting mode]
Valid only in AC mode. [Exits the limit value display mode]
F1 (Fmax) [Frequency limit setting mode]
OUTPUT [Output ON/OFF]
ESC [Exits the current limit setting mode.]
ESC [Exits the limit value display mode.]
[Valid only for Iph.]
F4 (clr) [Peak holding current value clear]
OUTPUT [Output ON/OFF]
Vrms/Vpk/Vset/Vave (SHIFT, F5) [Voltage display mode selection]
Irms/Ip/Iph/WATT/Iave (SHIFT, F3) [Current display mode selection]
MENU [Power, VA, and power-factor display mode
OUTPUT [Output ON/OFF]
ESC [Exits the power, VA, and power-factor display mode.]
MENU [Exits the power, VA, and power-factor display mode.]

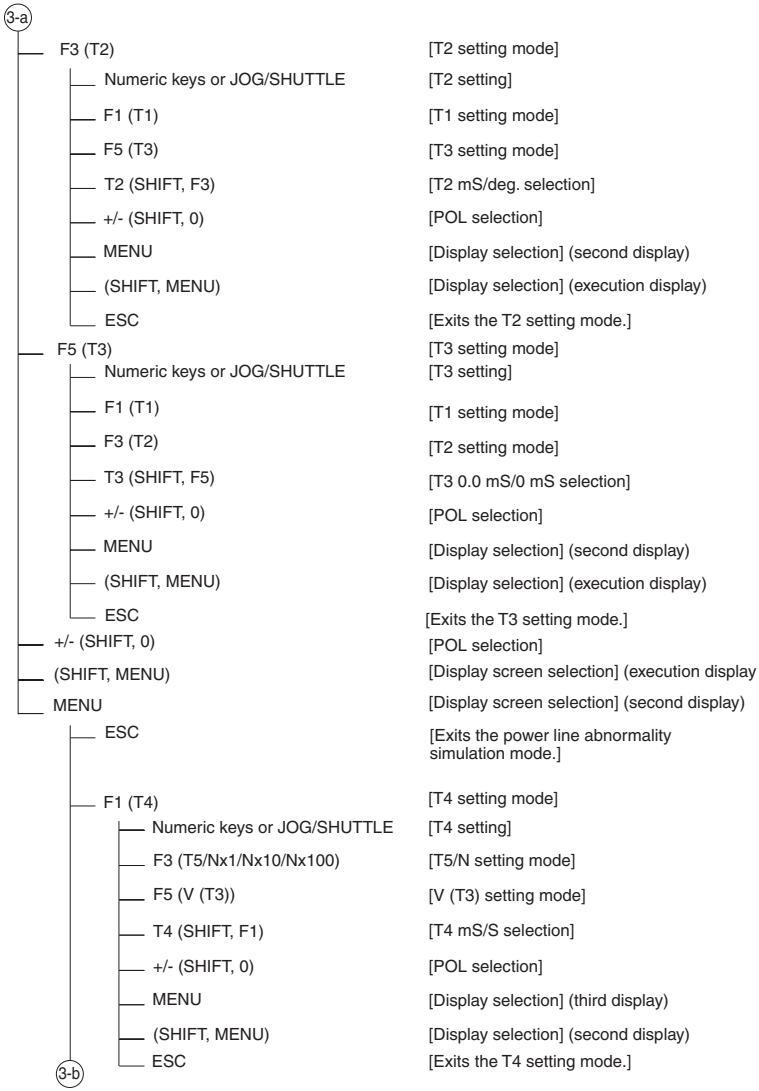
(2)Hierarchy of Memory Operating Menu

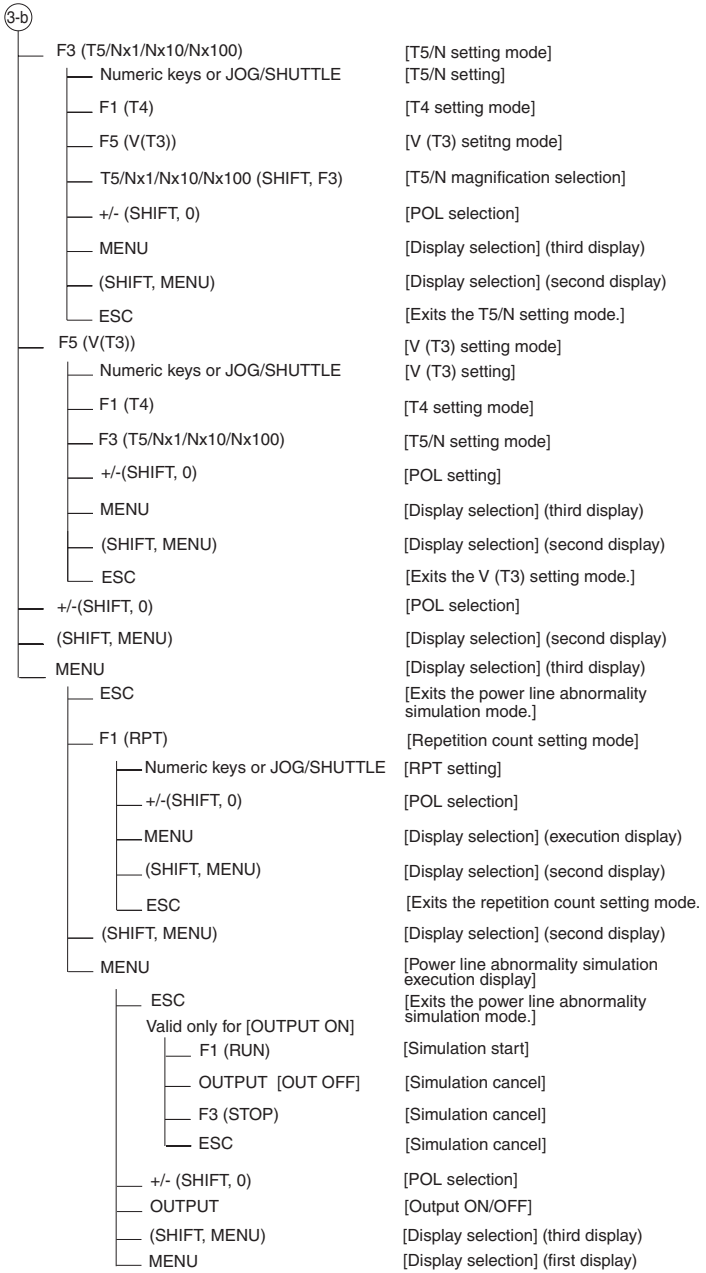



2-a
MENU
[Memory content display method selection (Second display)
[Address setting mode]
1-99
[Address selection]
ENTER
[Enter]
ESC
[Cancel]
JOG/SHUTTLE
[Address selection]
F3 (WAVE)
[Waveform bank setting mode]
Numeric keys or JOG/SHUTTLE
[Waveform bank setting]
F1 (ADRS)
[Address setting mode]
F5 (Vdc)
[DC voltage setting mode]
MENU
[Memory content display method selection (First screen)
OUTPUT
[Output ON/OFF]
ESC
[Exits the memory store mode]
F5 (Vdc)
[DC voltage setting mode]
Numeric keys or JOG/SHUTTLE
[DC voltage setting]
F1 (ADRS)
[Address setting mode]
F3 (WAVE)
[Waveform bank setting mode]
MENU
[Memory content display method selection (First display)
OUTPUT
[Output ON/OFF]
ESC
[Exits the memory store mode.]
MENU
[Memory display method selection] (First display)
OUTPUT
[Output ON/OFF]
ESC
[Exits the memory store mode.]
OUTPUT
[Output ON/OFF]
ESC
[Exits the memory store mode.]

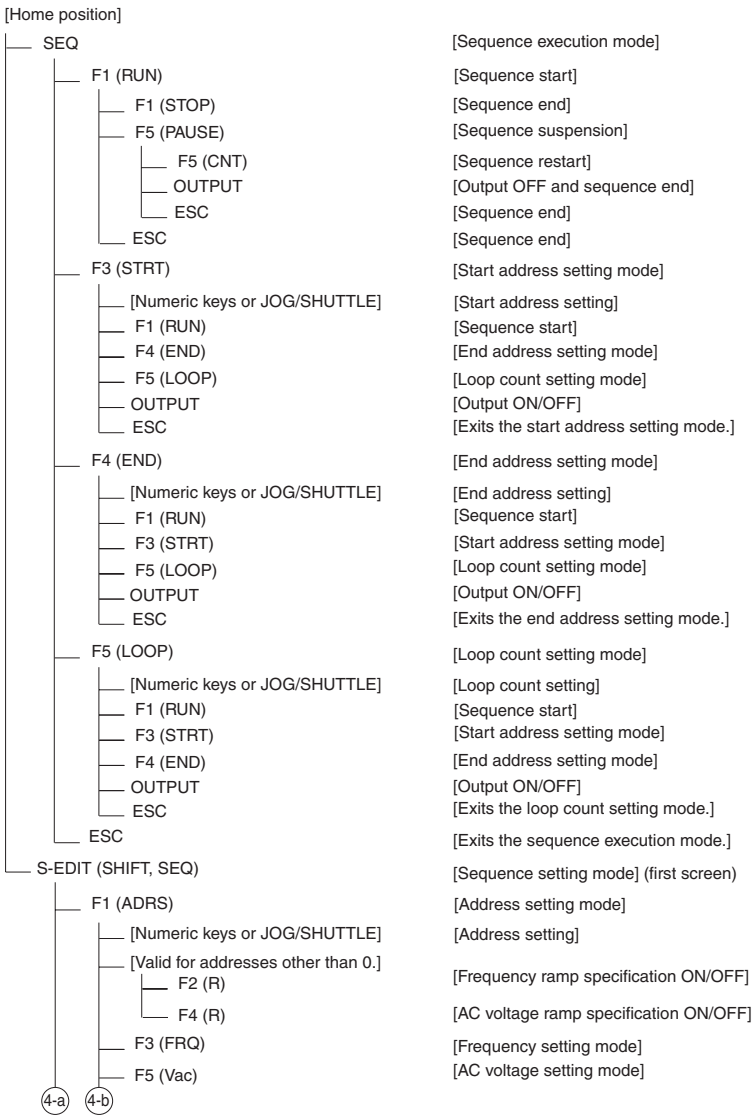
(3)Hierarchy of Power Line Abnormality Simulation and Other Operating Menus

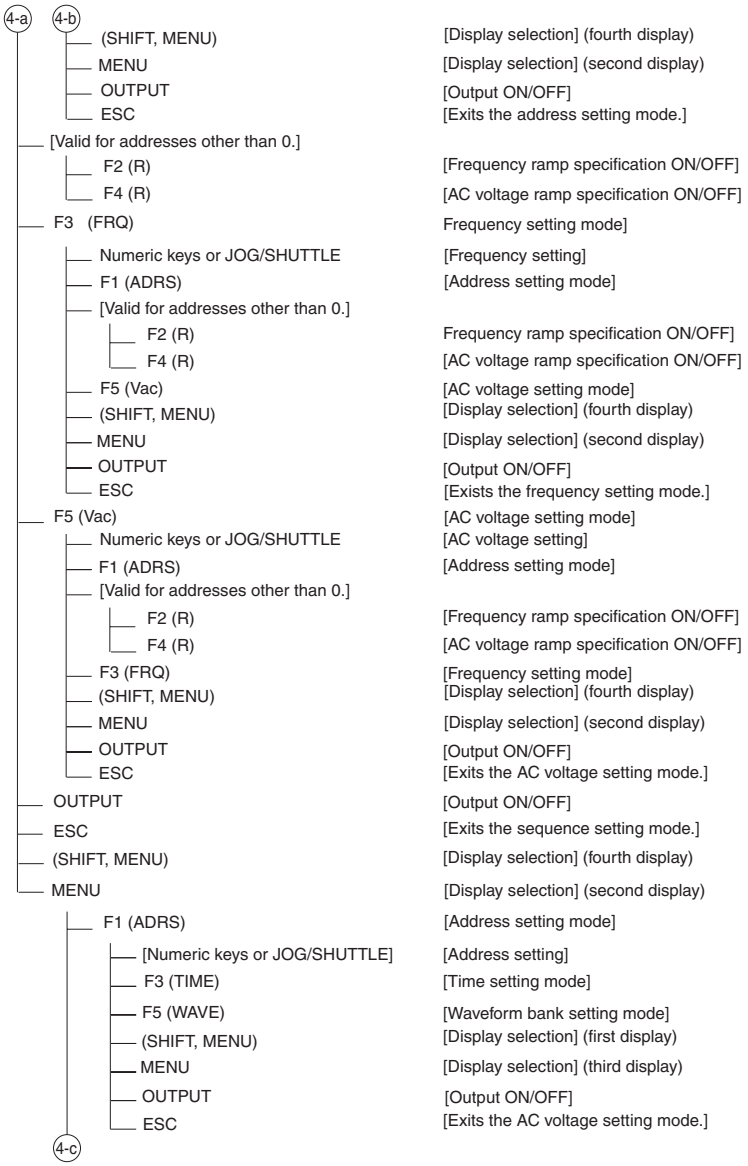


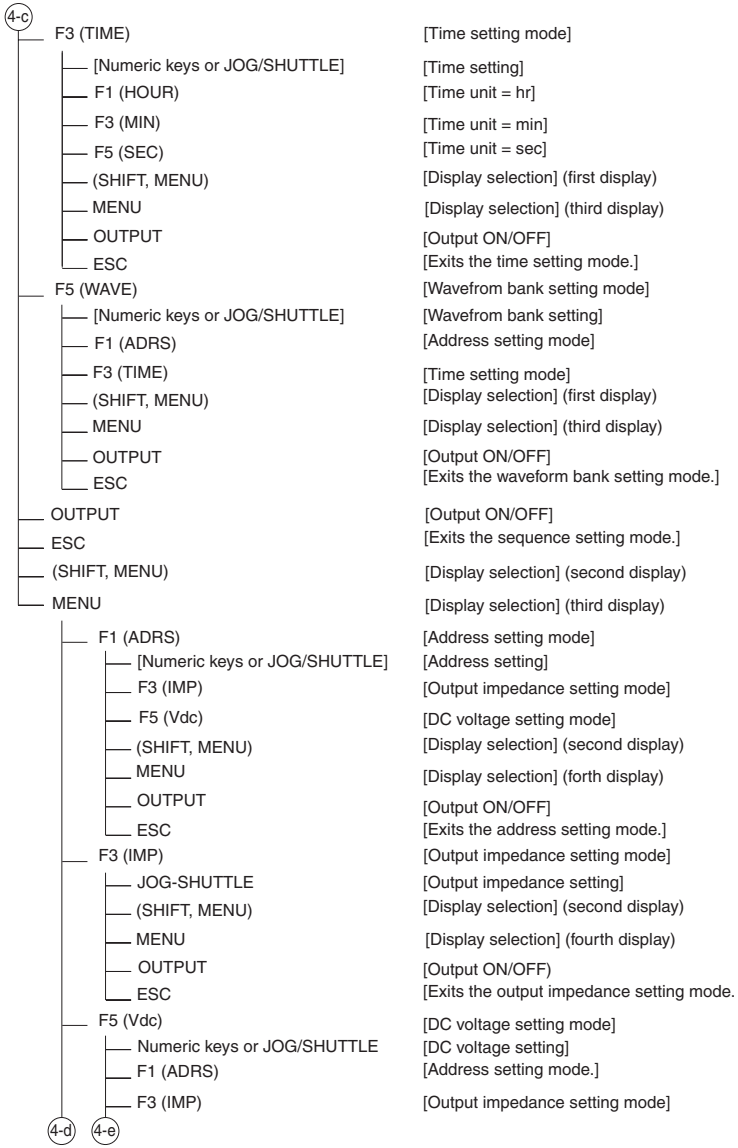

3-a
F3 (T2)
[T2 setting mode]
Numeric keys or JOG/SHUTTLE
[T2 setting]
F1 (T1)
[T1 setting mode]
F5 (T3)
[T3 setting mode]
T2 (SHIFT, F3)
[T2 mS/deg. selection]
+/- (SHIFT, 0)
[POL selection]
MENU
[Display selection] (second display)
(SHIFT, MENU)
[Display selection] (execution display)
ESC
[Exits the T2 setting mode.]
F5 (T3)
[T3 setting mode]
Numeric keys or JOG/SHUTTLE
[T3 setting]
F1 (T1)
[T1 setting mode]
F3 (T2)
[T2 setting mode]
T3 (SHIFT, F5)
[T3 0.0 mS/0 mS selection]
+/- (SHIFT, 0)
[POL selection]
MENU
[Display selection] (second display)
(SHIFT, MENU)
[Display selection] (execution display)
ESC
[Exits the T3 setting mode.]
+/- (SHIFT, 0)
[POL selection]
(SHIFT, MENU)
[Display screen selection] (execution display
MENU
[Display screen selection] (second display)
ESC
[Exits the power line abnormality simulation mode.]
F1 (T4)
[T4 setting mode]
Numeric keys or JOG/SHUTTLE
[T4 setting]
F3 (T5/Nx1/Nx10/Nx100)
[T5/N setting mode]
F5 (V (T3))
[V (T3) setting mode]
T4 (SHIFT, F1)
[T4 mS/S selection]
+/- (SHIFT, 0)
[POL selection]
MENU
[Display selection] (third display)
(SHIFT, MENU)
[Display selection] (second display)
ESC
[Exits the T4 setting mode.]
3-b

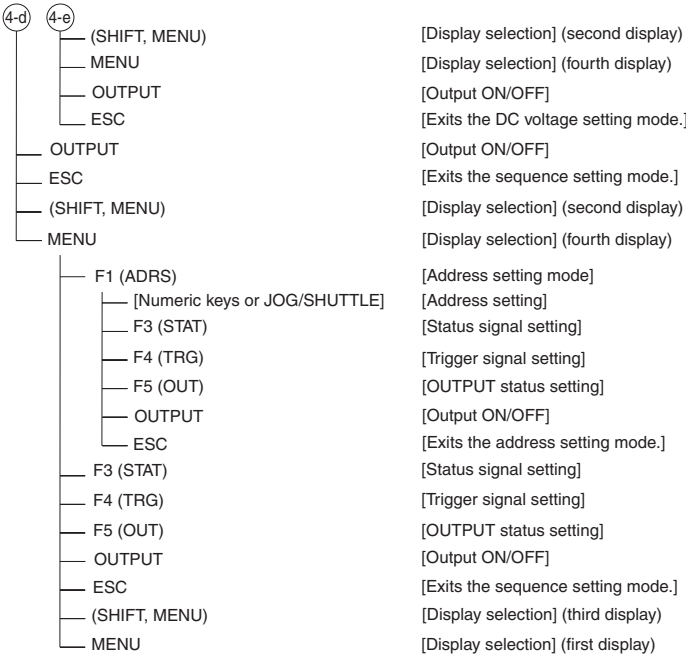

3-b
F3 (T5/Nx1/Nx10/Nx100)
[T5/N setting mode]
Numeric keys or JOG/SHUTTLE
[T5/N setting]
F1 (T4)
[T4 setting mode]
F5 (V(T3))
[V (T3) setitng mode]
T5/Nx1/Nx10/Nx100 (SHIFT, F3)
[T5/N magnification selection]
+/- (SHIFT, 0)
[POL selection]
MENU
[Display selection] (third display)
(SHIFT, MENU)
[Display selection] (second display)
ESC
[Exits the T5/N setting mode.]
F5 (V(T3))
[V (T3) setting mode]
Numeric keys or JOG/SHUTTLE
[V (T3) setting]
F1 (T4)
[T4 setting mode]
F3 (T5/Nx1/Nx10/Nx100)
[T5/N setting mode]
+/-(SHIFT, 0)
[POL setting]
MENU
[Display selection] (third display)
(SHIFT, MENU)
[Display selection] (second display)
ESC
[Exits the V (T3) setting mode.]
+/-(SHIFT, 0)
[POL selection]
(SHIFT, MENU)
[Display selection] (second display)
MENU
[Display selection] (third display)
ESC
[Exits the power line abnormality simulation mode.]
F1 (RPT)
[Repetition count setting mode]
Numeric keys or JOG/SHUTTLE
[RPT setting]
+/-(SHIFT, 0)
[POL selection]
MENU
[Display selection] (execution display)
(SHIFT, MENU)
[Display selection] (second display)
ESC
[Exits the repetition count setting mode.
(SHIFT, MENU)
[Display selection] (second display)
MENU
[Power line abnormality simulation execution display]
ESC
[Exits the power line abnormality simulation mode.]
Valid only for [OUTPUT ON]
F1 (RUN)
[Simulation start]
OUTPUT [OUT OFF]
[Simulation cancel]
F3 (STOP)
[Simulation cancel]
ESC
[Simulation cancel]
+/- (SHIFT, 0)
[POL selection]
OUTPUT
[Output ON/OFF]
(SHIFT, MENU)
[Display selection] (third display)
MENU
[Display selection] (first display)

(4)Hierarchy of Sequence Operating Menu

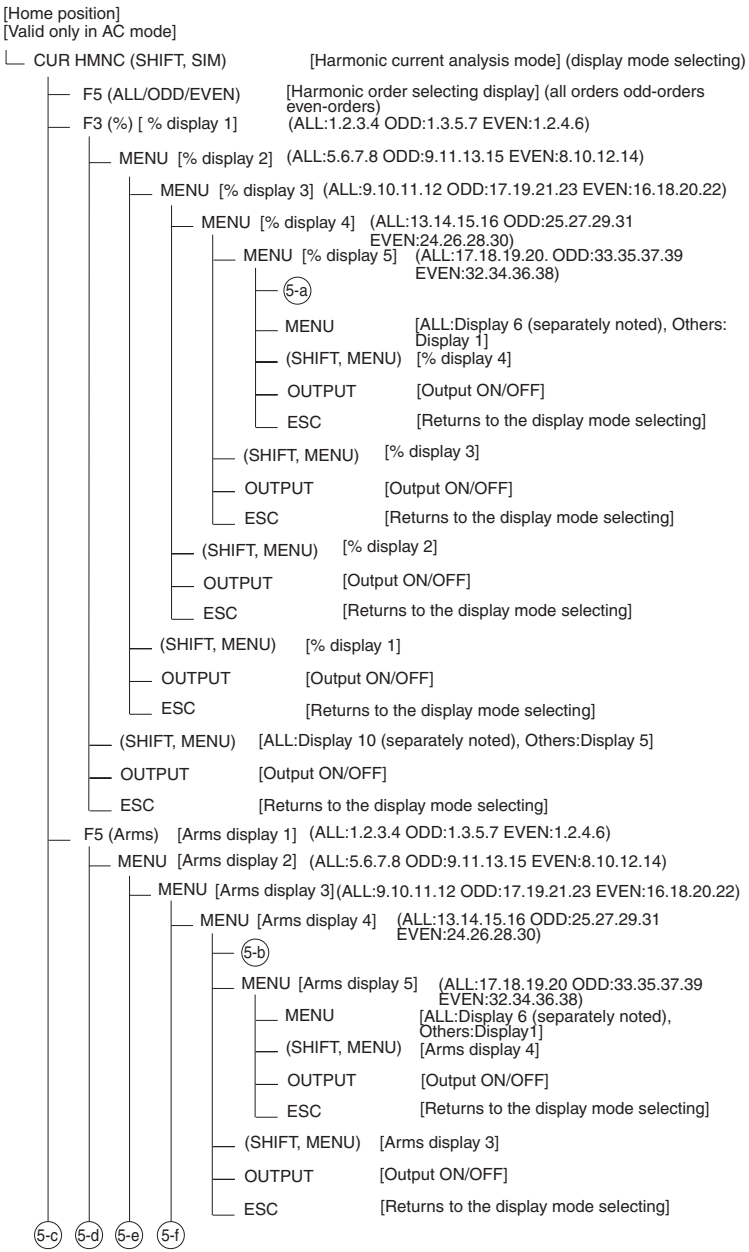


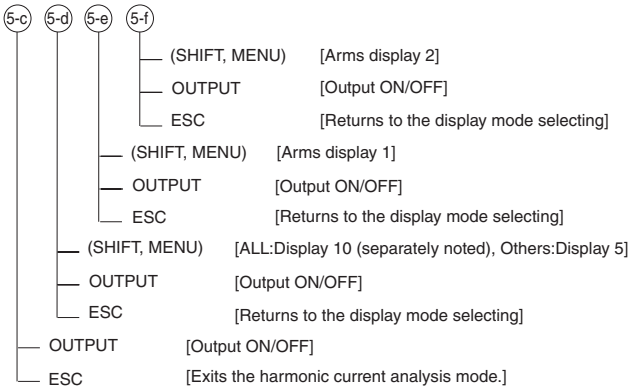

4-a
4-b
(SHIFT, MENU)
[Display selection] (fourth display)
MENU
[Display selection] (second display)
OUTPUT
[Output ON/OFF]
ESC
[Exits the address setting mode.]
[Valid for addresses other than 0.]
F2 (R)
[Frequency ramp specification ON/OFF]
F4 (R)
[AC voltage ramp specification ON/OFF]
F3 (FRQ)
Frequency setting mode]
Numeric keys or JOG/SHUTTLE
[Frequency setting]
F1 (ADRS)
[Address setting mode]
[Valid for addresses other than 0.]
F2 (R)
Frequency ramp specification ON/OFF]
F4 (R)
[AC voltage ramp specification ON/OFF]
F5 (Vac)
[AC voltage setting mode]
(SHIFT, MENU)
[Display selection] (fourth display)
MENU
[Display selection] (second display)
OUTPUT
[Output ON/OFF]
ESC
[Exists the frequency setting mode.]
F5 (Vac)
[AC voltage setting mode]
Numeric keys or JOG/SHUTTLE
[AC voltage setting]
F1 (ADRS)
[Address setting mode]
[Valid for addresses other than 0.]
F2 (R)
[Frequency ramp specification ON/OFF]
F4 (R)
[AC voltage ramp specification ON/OFF]
F3 (FRQ)
[Frequency setting mode]
(SHIFT, MENU)
[Display selection] (fourth display)
MENU
[Display selection] (second display)
OUTPUT
[Output ON/OFF]
ESC
[Exits the AC voltage setting mode.]
OUTPUT
[Output ON/OFF]
ESC
[Exits the sequence setting mode.]
(SHIFT, MENU)
[Display selection] (fourth display)
MENU
[Display selection] (second display)
F1 (ADRS)
[Address setting mode]
[Numeric keys or JOG/SHUTTLE]
[Address setting]
F3 (TIME)
[Time setting mode]
F5 (WAVE)
[Waveform bank setting mode]
(SHIFT, MENU)
[Display selection] (first display)
MENU
[Display selection] (third display)
OUTPUT
[Output ON/OFF]
ESC
[Exits the AC voltage setting mode.]
4-c

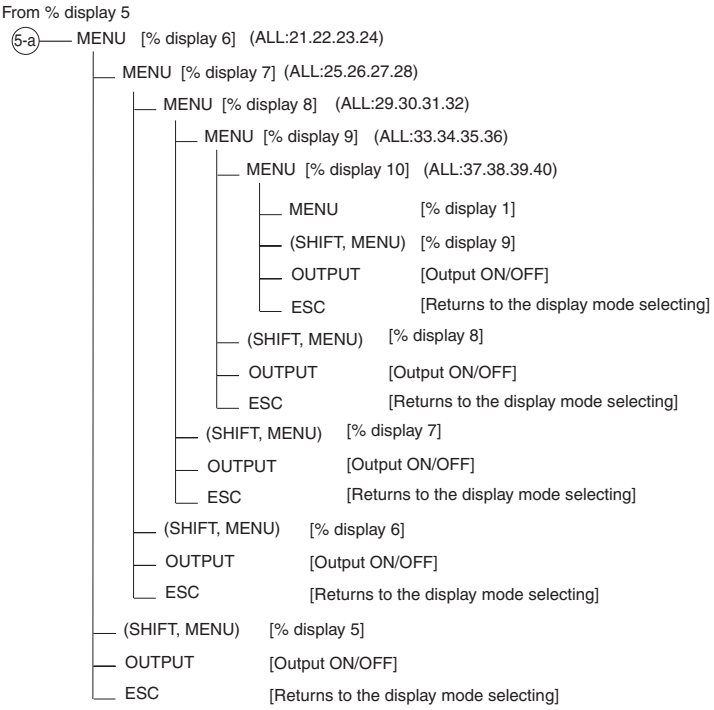

4-c
F3 (TIME)
[Time setting mode]
[Numeric keys or JOG/SHUTTLE]
[Time setting]
F1 (HOUR)
[Time unit = hr]
F3 (MIN)
[Time unit = min]
F5 (SEC)
[Time unit = sec]
(SHIFT, MENU)
[Display selection] (first display)
MENU
[Display selection] (third display)
OUTPUT
[Output ON/OFF]
ESC
[Exits the time setting mode.]
F5 (WAVE)
[Wavefrom bank setting mode]
[Numeric keys or JOG/SHUTTLE]
[Wavefrom bank setting]
F1 (ADRS)
[Address setting mode]
F3 (TIME)
[Time setting mode]
(SHIFT, MENU)
[Display selection] (first display)
MENU
[Display selection] (third display)
OUTPUT
[Output ON/OFF]
ESC
[Exits the waveform bank setting mode.]
OUTPUT
[Output ON/OFF]
ESC
[Exits the sequence setting mode.]
(SHIFT, MENU)
[Display selection] (second display)
MENU
[Display selection] (third display)
F1 (ADRS)
[Address setting mode]
[Numeric keys or JOG/SHUTTLE]
[Address setting]
F3 (IMP)
[Output impedance setting mode]
F5 (Vdc)
[DC voltage setting mode]
(SHIFT, MENU)
[Display selection] (second display)
MENU
[Display selection] (forth display)
OUTPUT
[Output ON/OFF]
ESC
[Exits the address setting mode.]
F3 (IMP)
[Output impedance setting mode]
JOG-SHUTTLE
[Output impedance setting]
(SHIFT, MENU)
[Display selection] (second display)
MENU
[Display selection] (fourth display)
OUTPUT
[Output ON/OFF)
ESC
[Exits the output impedance setting mode.
F5 (Vdc)
[DC voltage setting mode]
Numeric keys or JOG/SHUTTLE
[DC voltage setting]
F1 (ADRS)
[Address setting mode.]
F3 (IMP)
[Output impedance setting mode]
4-d
4-e

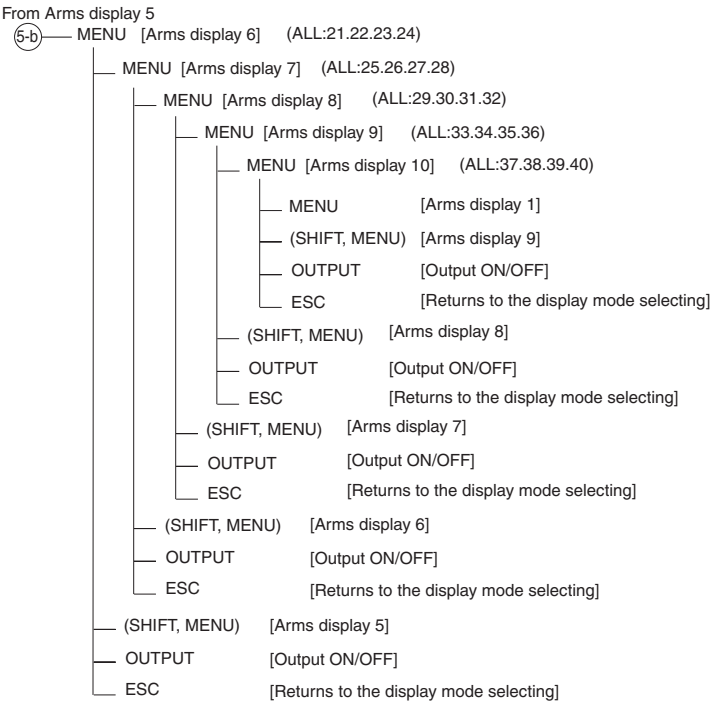

4-d
4-e
(SHIFT, MENU)
[Display selection] (second display)
MENU
[Display selection] (fourth display)
OUTPUT
[Output ON/OFF]
ESC
[Exits the DC voltage setting mode.]
OUTPUT
[Output ON/OFF]
ESC
[Exits the sequence setting mode.]
(SHIFT, MENU)
[Display selection] (second display)
MENU
[Display selection] (fourth display)
F1 (ADRS)
[Address setting mode]
[Numeric keys or JOG/SHUTTLE]
[Address setting]
F3 (STAT)
[Status signal setting]
F4 (TRG)
[Trigger signal setting]
F5 (OUT)
[OUTPUT status setting]
OUTPUT
[Output ON/OFF]
ESC
[Exits the address setting mode.]
F3 (STAT)
[Status signal setting]
F4 (TRG)
[Trigger signal setting]
F5 (OUT)
[OUTPUT status setting]
OUTPUT
[Output ON/OFF]
ESC
[Exits the sequence setting mode.]
(SHIFT, MENU)
[Display selection] (third display)
MENU
[Display selection] (first display)

(5)Hierarchy of Harmonic Current Analysis Operating Menu

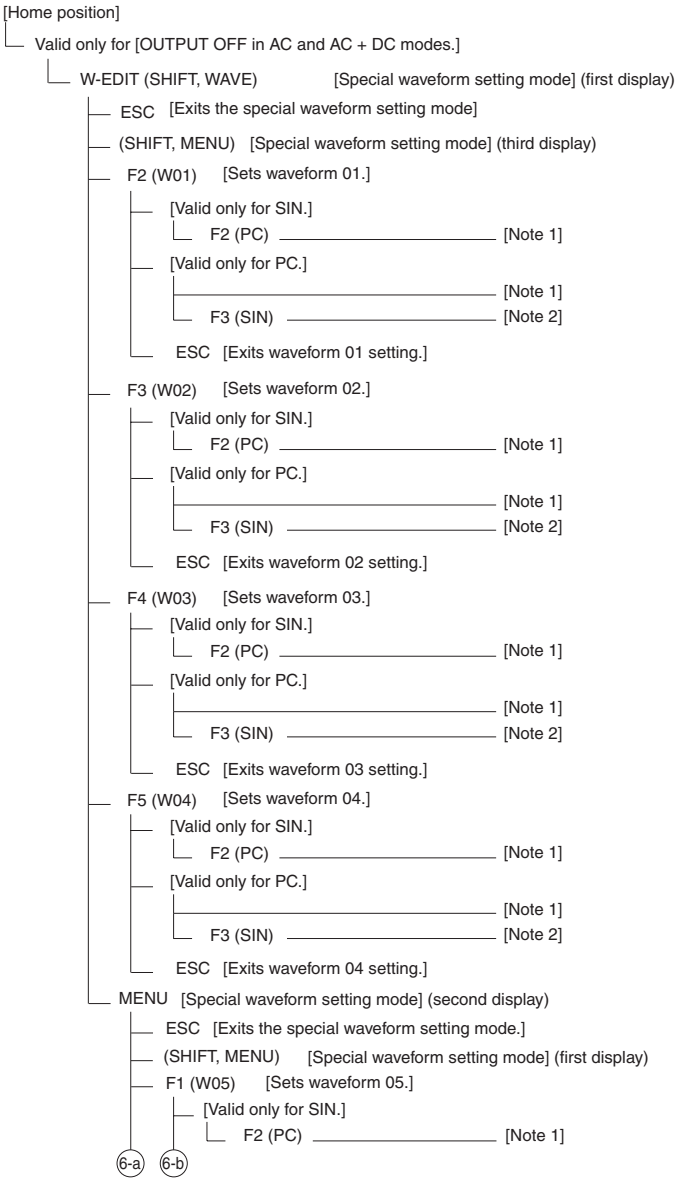


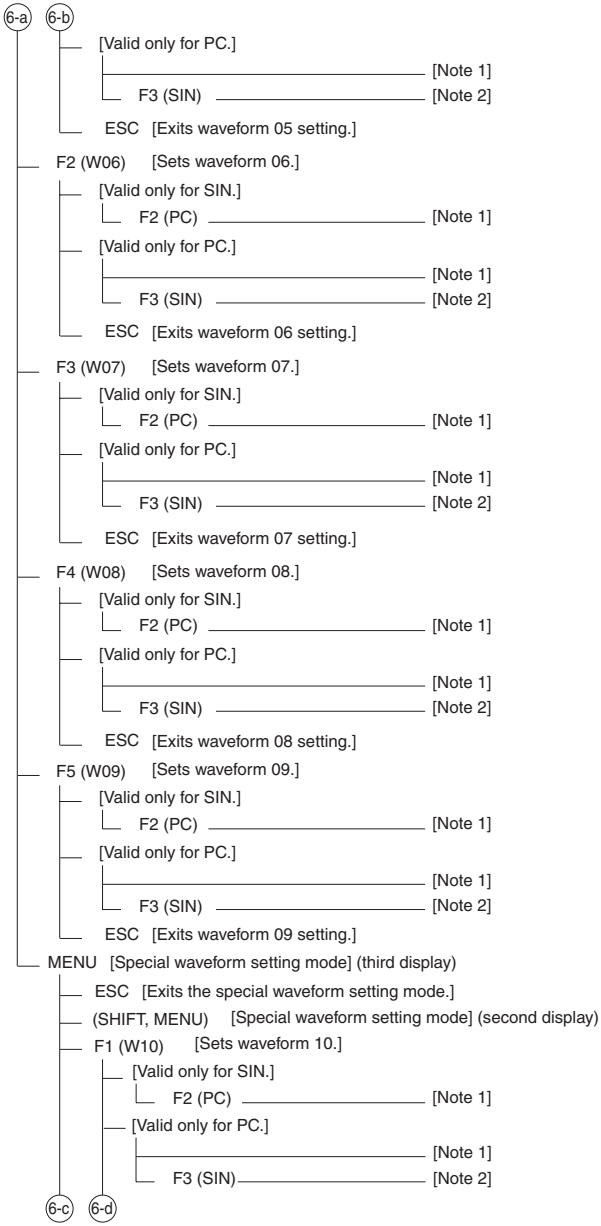

5-c
5-d
5-e
5-f
(SHIFT, MENU) [Arms display 2]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
(SHIFT, MENU) [Arms display 1]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
(SHIFT, MENU) [ALL:Display 10 (separately noted), Others:Display 5]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
OUTPUT [Output ON/OFF]
ESC [Exits the harmonic current analysis mode.]

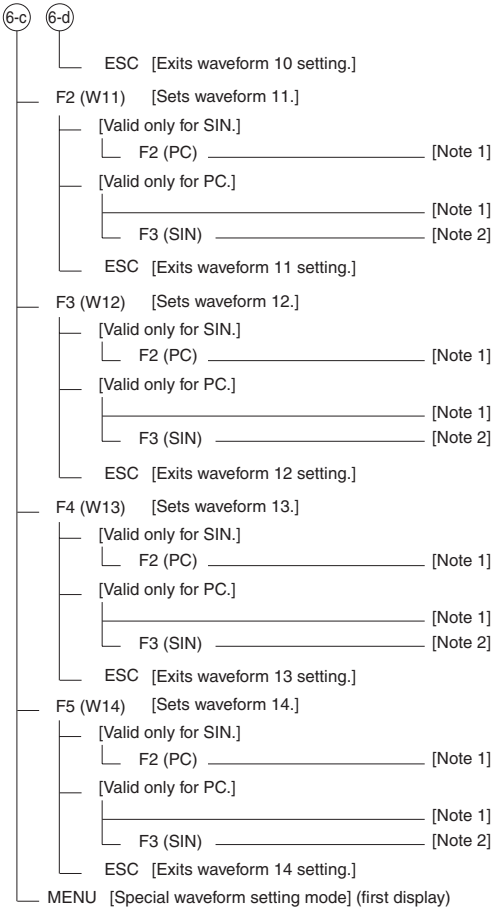

From % display 5
5-a
MENU [% display 6] (ALL:21.22.23.24)
MENU [% display 7] (ALL:25.26.27.28)
MENU [% display 8] (ALL:29.30.31.32)
MENU [% display 9] (ALL:33.34.35.36)
MENU [% display 10] (ALL:37.38.39.40)
MENU [% display 1]
(SHIFT, MENU) [% display 9]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
(SHIFT, MENU) [% display 8]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
(SHIFT, MENU) [% display 7]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
(SHIFT, MENU) [% display 6]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
(SHIFT, MENU) [% display 5]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]


From Arms display 5
5-b
MENU [Arms display 6] (ALL:21.22.23.24)
MENU [Arms display 7] (ALL:25.26.27.28)
MENU [Arms display 8] (ALL:29.30.31.32)
MENU [Arms display 9] (ALL:33.34.35.36)
MENU [Arms display 10] (ALL:37.38.39.40)
MENU [Arms display 1]
(SHIFT, MENU) [Arms display 9]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
(SHIFT, MENU) [Arms display 8]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
(SHIFT, MENU) [Arms display 7]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
(SHIFT, MENU) [Arms display 6]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]
(SHIFT, MENU) [Arms display 5]
OUTPUT [Output ON/OFF]
ESC [Returns to the display mode selecting]

(6)Hierarchy of Special Waveform Setting Menu




6-a
6-b
[Valid only for PC.]
[Note 1]
F3 (SIN)
[Note 2]
ESC [Exits waveform 05 setting.]
F2 (W06) [Sets waveform 06.]
[Valid only for SIN.]
F2 (PC)
[Note 1]
[Valid only for PC.]
[Note 1]
F3 (SIN)
[Note 2]
ESC [Exits waveform 06 setting.]
F3 (W07) [Sets waveform 07.]
[Valid only for SIN.]
F2 (PC)
[Note 1]
[Valid only for PC.]
[Note 1]
F3 (SIN)
[Note 2]
ESC [Exits waveform 07 setting.]
F4 (W08) [Sets waveform 08.]
[Valid only for SIN.]
F2 (PC)
[Note 1]
[Valid only for PC.]
[Note 1]
F3 (SIN)
[Note 2]
ESC [Exits waveform 08 setting.]
F5 (W09) [Sets waveform 09.]
[Valid only for SIN.]
F2 (PC)
[Note 1]
[Valid only for PC.]
[Note 1]
F3 (SIN)
[Note 2]
ESC [Exits waveform 09 setting.]
MENU [Special waveform setting mode] (third display)
ESC [Exits the special waveform setting mode.]
(SHIFT, MENU) [Special waveform setting mode] (second display)
F1 (W10) [Sets waveform 10.]
[Valid only for SIN.]
F2 (PC)
[Note 1]
[Valid only for PC.]
[Note 1]
F3 (SIN)
[Note 2]
6-c
6-d



[Note 1]
- Numeric keys or JOG/SHUTTLE
- [Peak clipped voltage waveform setting]
- ESC [Exits the peak clipped voltage waveform setting mode.]

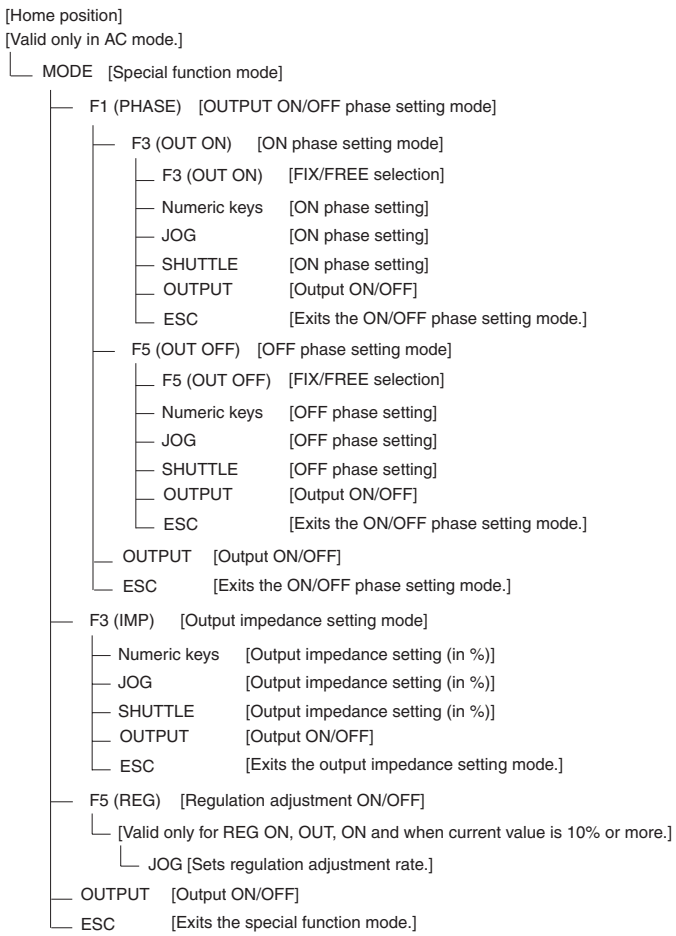
[Note 2]
- F2 (YES) [Waveform clear (change to sine wave)]
- ENTER [Waveform clear (change to sine wave)]
- F4 (NO) [Waveform clear/cancel]
- ESC [Waveform clear/cancel]

(7)Hierarchy of Special Waveform Output Operating Menu

[Home position]
[Valid only in AC and AC + DC modes.]

- WAVE [Special waveform output mode] (first display)
  - OUTPUT [Output ON/OFF]
  - ESC [Exits the special waveform output mode.]
  - (SHIFT, MENU) [Special waveform output mode] (third display)
  - F1 (W00) — ENTER [Enter]; [Set waveform to 00.] — ESC [Cancel]
  - F2 (W01) — ENTER [Enter]; [Set waveform to 01.] — ESC [Cancel]
  - F3 (W02) — ENTER [Enter]; [Set waveform to 02.] — ESC [Cancel]
  - F4 (W03) — ENTER [Enter]; [Set waveform to 03.] — ESC [Cancel]
  - F5 (W04) — ENTER [Enter]; [Set waveform to 04.] — ESC [Cancel]
  - MENU [Special waveform output mode] (second display)
    - OUTPUT [Output ON/OFF]
    - ESC [Exits the special waveform output mode.]
    - (SHIFT, MENU) [Special waveform output mode] (first display)
    - F1 (W05) — ENTER [Enter]; [Set waveform to 05.] — ESC [Cancel]
    - F2 (W06) — ENTER [Enter]; [Set waveform to 06.] — ESC [Cancel]
    - F3 (W07) — ENTER [Enter]; [Set waveform to 07.] — ESC [Cancel]
    - F4 (W08) — ENTER [Enter]; [Set waveform to 08.] — ESC [Cancel]
    - F5 (W09) — ENTER [Enter]; [Set waveform to 09.] — ESC [Cancel]
    - MENU [Special waveform output mode] (third display)
      - OUTPUT [Output ON/OFF]
      - ESC [Exits the special waveform output mode.]
      - SHIFT + MENU [Special waveform output mode] (Second display)
      - F1 (W10) — ENTER [Enter]; [Set waveform to 10.] — ESC [Cancel]
      - F2 (W11) — ENTER [Enter]; [Set waveform to 11.] — ESC [Cancel]
      - F3 (W12) — ENTER [Enter]; [Set waveform to 12.] — ESC [Cancel]
      - F4 (W13) — ENTER [Enter]; [Set waveform to 13.] — ESC [Cancel]
      - F5 (W14) — ENTER [Enter]; [Set waveform to 14.] — ESC [Cancel]
      - MENU [Special waveform output mode] (first display)

(8)Hierarchy of Special Function Operating Menu



A.2 Power Line Abnormality Simulation Operation Setting Sheet

PCR-LA Series

TITLE _____ DATE_____ No._____

No	T1	T2	T3	T4	T5/N	V(T3)	RPT	POL	MEMO

MEMO

A.3 Sequence Operation Setting Sheet

PCR-LA Series

TITLE _____ DATE_____ No._____

START _____ END_____ LOOP_____

ADR	R	F	R	Vac	Th	Tm	Ts	WAVE	IMP	Vdc	STRT	TRG	OUT

MEMO

Index

T

V

W