OPERATION MANUAL

REMOTE CONTROLLER

MODEL RC01-PCR

Model RC01-PCR Remote Controller is an optional device for the PCR Series Frequency Converter. The RC01-PCR cannot be used for other equipment.

This manual covers primarily the method of hooking up the RC01-PCR to the PCR Series Frequency Converter.

When using the RC01-PCR, be sure to read also the instruction manual for the PCR Series Frequency Converter.

First Edition

KIKUSUI ELECTRONICS CORPORATION

(KIKUSUI PART NO. Z1-987-120)

M-91031

Thank you verymuch for purchasing KIKUSUI PCR series.

Due to the requests from many of the PCR users, we have decided to change a part of the functions of the PCR.

* Version: 1-1, 1-2, 1-3

  PCR stops its power line abnormality simulation mode operation when over loaded during simulation mode.

* Version: 1-6 or higher version

  PCR will continue to be in simulation mode even when over loaded for a moment. (PCR will stop its simulation mode then turn off the output voltage when the over loading condition is not removed)

* The version number of the PCR series can be checked by the operator.
  Please refer page 37.

  PCR with lower version can be upgraded to higher version with replacing a "ROM".

  Please have a contact with one of KIKUSUI's sales offices or distributors.

TABLE OF CONTENTS

1. GENERAL

1.1 Description

The RC01-PCR is a remote controller designed specifically for the PCR Series Frequency Converter. The RC01-PCR allows you to control most of the functions of the operation/display panel of the frequency converter remotely from a distance of up to approximately 5 meters. The RC01-PCR also allows "power line abnormality simulation," such as power interruption and voltage hop up and dip down, to test the performance of the load equipment.

The RC01-PCR consists of a remote controller (main unit) and an interface board.

1.2 Features

The outstanding features of the RC01-PCR can be summarized as follows:

(a) The output can be easily and rapidly set with the tenkeys and up/down switches.

(b) The power line abnormallity simulation can be obtained.

(c) Output voltages (preset voltage) and output frequencies (preset frequencies) can be programmed with 99 memory addresses for stepwise changes.

(d) The equipment is of a handheld type and easy to operate.

2. SPECIFICATIONS

The specifications given here are for the RC01-PCR as used in conjunction with a PCR Frequency Converter. For the specfication items not covered here, refer to the operation manual for the frequency converter.

2.1 Functional Specifications

2.1.1 Setting of Output Frequency and Voltage

Output Frequency	Can be set with tenkeys and up/down switches (*1)
Output Voltage	

2.1.2 Displays

Output Voltage	7-segment LED, green. (*1)
Output Current	7-segment LED, green. (*1)
Preset Frequency	7-segment LED, green. (*1)
Preset Voltage	7-segment LED, green. (*1)
Alarm	LED, red
Overload	LED, red
Voltage Limit	LED, red

*1: For the number of set digits, resolution, accuracy and functions, refer to the operation manual for the PCR Series Frequency Converter.

2.1.3 Power line Abnormality Simulation

Presettable Frequency	50.00 Hz or 60.00 Hz (fixed)

(a) Set and Displayed Items

The following items can be set (＊2), recalled and displayed.

Voltage change start time	T1	0-9.9 ms (Resolution 0.1 ms, ＊3 accuracy … +0.2ms/-0ms)
Slope time	T2	0-9999 ms (Resolution 1 ms, accuracy … ±1 ms)
Pop time/dip time, interrupt time	T3	0-9999 ms (Resolution 1 ms, accuracy … ±1 ms)
Slope time	T4	0-9999 ms (Resolution 1 ms, accuracy … ±1 ms)
Number of cycles after power restoration	N	0-9998 (Resolution 1, accuracy … ±1, 9999 for infinitive)
Voltage change start polarity	POL	Zero-line crossing in positive-going or negative-going direction (selectable)
Pop voltage/dip voltage	V (T3)	(＊4)
Mode change between hop/dip mode and interrupt mode	MODE	

＊2: Setting can be made only with the tenkeys.

＊3: When slope time is set at T2 = 0 in the pop/dip mode, the output waveform may appear as if errors were introduced into T1 due to the inaccuracy of T2. For details, see Page 26.

＊4: Setting of the number of set digits, resolution and accuracy are identical with that of the output voltage.

(b) Trigger Pulse Output

The specifications of the trigger pulse output are as follows:

Output Connector	BNC connector
Output Voltage	＞+3.5V, ＜5.25V. (＊5)
Output Impedance	Approx. 20kΩ
Pulse Width	＞5μs
Timing	The pulse is generated as zero-line crossing immediately before starting of voltage change.

＊5: For open output terminal

Note: The trigger pulse output is delivered even when the converter is remote-controlled employing the GP-IB interface (RC01-PCR) in conjunction.

2.1.4 Memory

Read/write of preset frequency in memory	○ Memory addresses: 1 - 99
Read/write of preset voltage in memory	○ Memory addresses can be set with tenkeys and up/down switches
Stepwise execution of memory data	

2.1.5 Other Functions

- ○ Output on/off control function
- ○ Key lock function

2.2 Other Specifications

(a) Ambient Oprating Temprature and Humidity

0 to +50°C, 10 to 90% RH (Non condensing)

(b) Insulation Resistance and Withstanding Voltage of Trigger Pulse Output Connector with Respect to Terminals and Casing

	Output Terminal	Input Power Terminal	Casing
Insulation Resistance	>20MΩ, with 500V DC		
Withstanding Voltage	1500V AC, for 1 minute		

(c) Dimensions and Weights

Remote Controller (Main Unit)

Dimensions	260W × 73H × 25D mm (10.24W × 2.87H × 0.98D in.)
Weight	Approx. 490 grams (17 oz)

(d) Interface Board

Dimensions	29W × 137H × 124D mm (1.14W × 5.39H × 4.88D in.)
Weight	Approx. 130 grams (4.6 oz)

(e) Accessory

Document	Operation manual ..... 1 copy
	Sheet for basic operation 1 pc.
	Double faced tape ..... 1 sh.

2.3 External Views

See Figures 2-1 and 2-2.

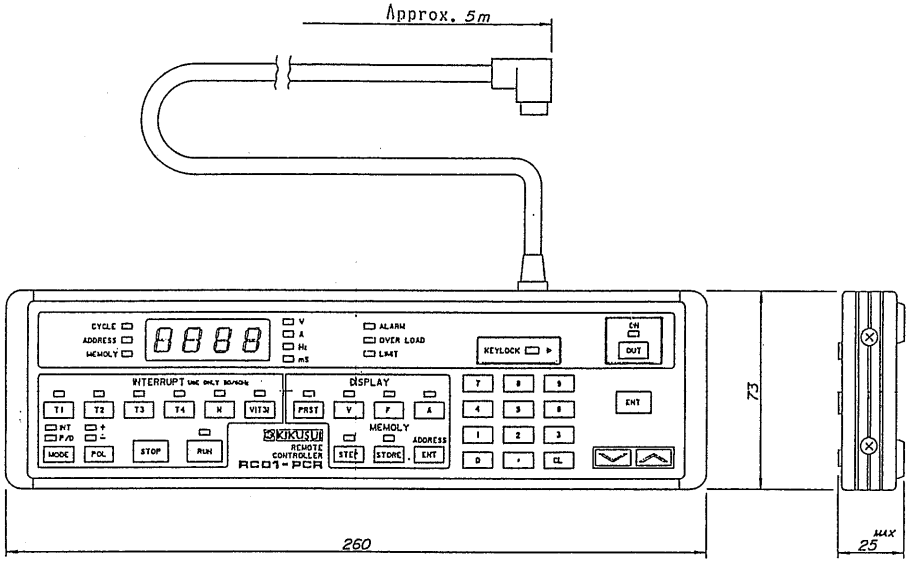


Figure 2-1. External View of Remote Controller
(Main Unit)

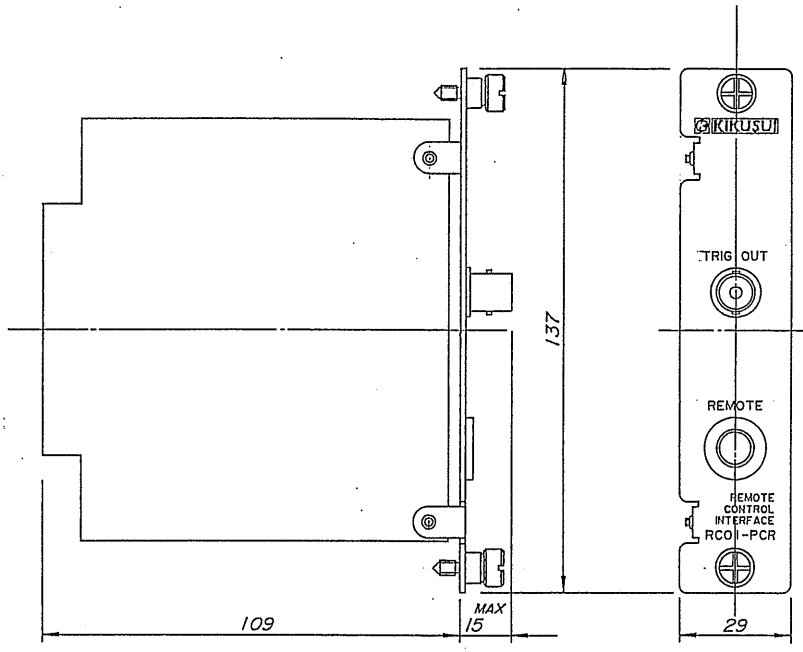


Figure 2-2. External Views of the Interface Board

3. OPERATION METHOD

3.1 Panels

3.1.1 Panel Illustrations

For illustrations of the panels, see Figures 3-1, 3-2 and 3-3.

3.1.2 Panel Description

The panel items of the remote controller are comprised of four groups, namely, a power line abnormality simulation switch group, a memory switch group, a setting switch group, and a display panel, as shown in Figures 3-2 and 3-3. The functions of the panel items are described below.

① --	T1 switch:	Sets the voltage change start time
② --	T2 switch:	Sets the slope time
③ --	T3 switch:	Sets the pop time/dip time or interrupt time
④ --	T4 switch:	Sets the slop time
⑤ --	N switch:	Sets the number of cycles after power restoration
⑥ --	V(T3) switch:	Sets pop voltage or dip voltage
⑦ --	PRESET switch:	Selects a preset voltage
⑧ --	V switch:	Selects the voltage display
⑨ --	F switch:	Selects the frequency display
⑩ --	A switch:	Selects the output current display
⑪ --	KEYLOCK switch:	Locks the keys
⑫ --	OUT switch:	Turns on/off the output
⑬ --	ENT switch:	Enters data set by tenkeys
⑭ --	UP/DOWN switch:	Sets data
⑮ --	Tenkeys:	Put data
⑯ --	ADDRESS ENT switch:	Enters address data
⑰ --	STORE switch:	Selects the STORE mode
⑱ --	STEP switch:	Selects the STEP mode

⑲ -- RUN switch: Runs the power line abnormality simulation operation

⑳ -- STOP switch: Stops the power line abnormality simulation operation

㉑ -- POL switch: Selects a voltage change start polarity

㉒ -- MODE switch: Selects the pop/dip mode or the interrupt mode

㉓ -- P/D lamp: Indicates the pop/dip mode

㉔ -- INT lamp: Indicates the interrupt mode

㉕ -- CYCLE lamp: Indicates that the number of cycles to be run after power restoration is indicated on the display panel

㉖ -- ADDRESS lamp: Indicates that the memory address number is indicated on the display panel

㉗ -- MEMORY lamp: Indicates that the memory data is indicated on the display panel

㉘ -- Display panel: Displays the various items of data

㉙ -- "V" lamp: Indicates the unit (volt) of displayed data

㉚ -- "A" lamp: Indicates the unit (ampere) of displayed data

㉛ -- "Hz" lamp: Indicates the unit (Hertz) of displayed data

㉜ -- "ms" lamp: Indicates the unit (millisecond) of displayed data

㉝ -- ALARM lamp: Indicates that PCR frequency converter is generating an alarm

㉞ -- OVERLOAD lamp: Indicates that PCR frequency converter is overloading

㉟ -- LIMIT lamp: Indicates that the preset voltage has reached the limit voltage

㊱ -- INTERFACE cable: Connects the interface board to the remote controller (main unit)

㊲ -- REMOTE connector: Connects the interface cable plug

㊳ -- TRIG OUT connector: Delivers the trigger output signal

㊴ -- Clamp screws: Fix the interface board

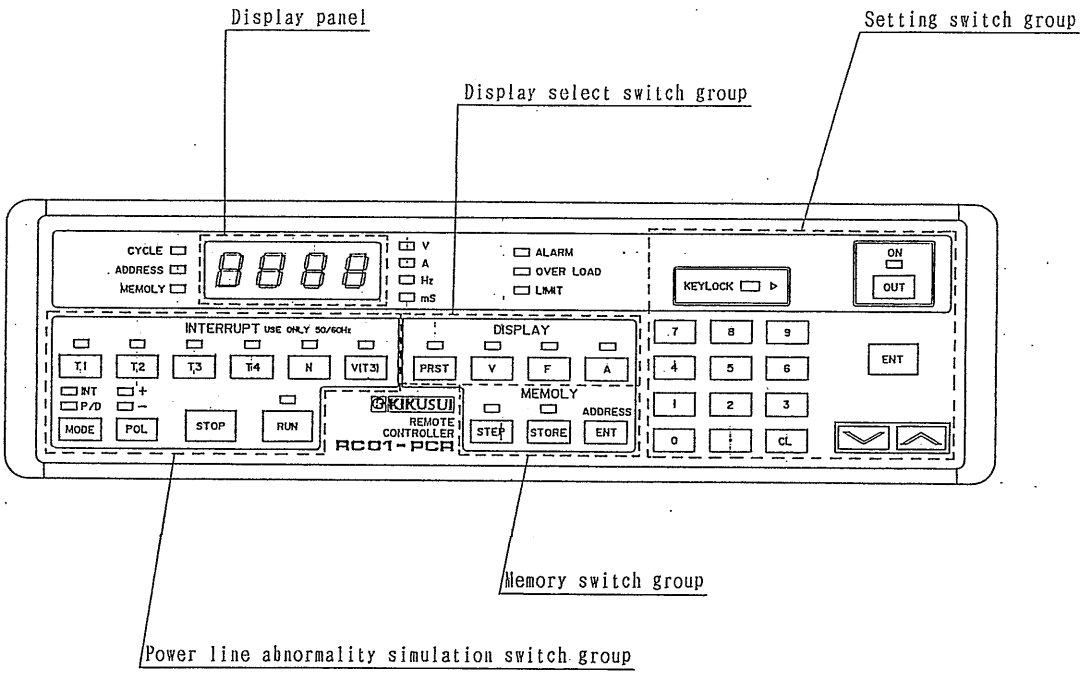


Figure 3-1. Groups of Items on Remote Controller (Main Unit) Panel

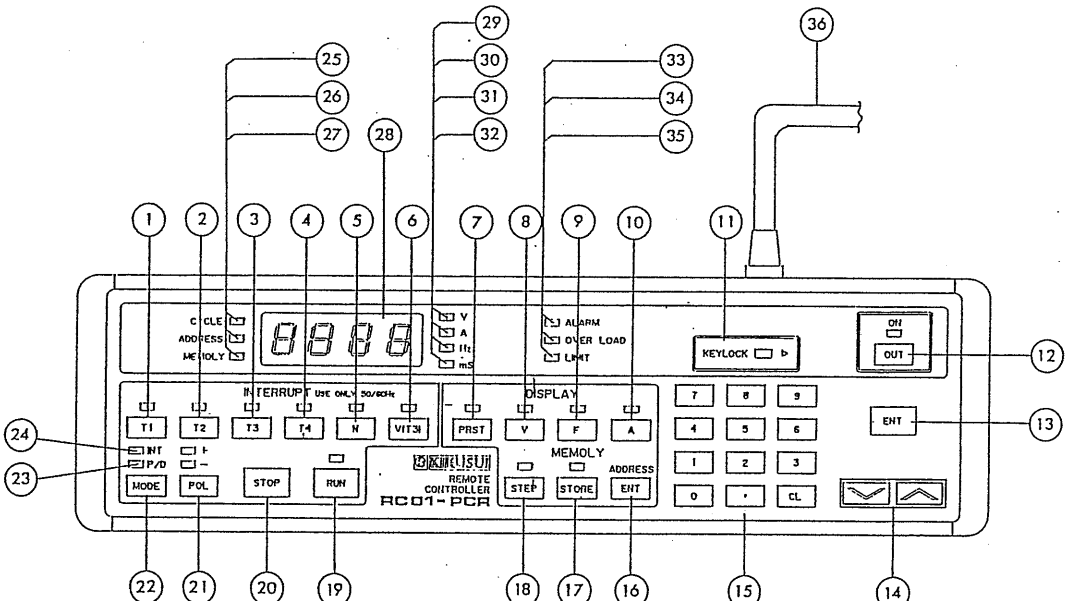


Figure 3-2. Individual Items on Remote Controller (Main Unit) Panel

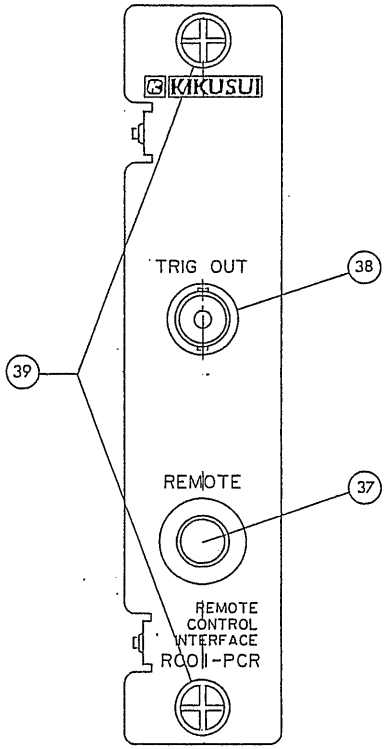


Figure 3-3. Interface Board Panel

3.2 Notes Before Use

3.2.1 Precautions

(a) Only one interface board can be used for the I/O slots (SLOTS 1 and 2) of one PCR Frequency Converter. Never use two interface boards for one converter since such may result in equipment failures.

(b) Although the remote controller is a handheld type, it must not be subjected to unreasonably large shocks. When operating it handheld, be attentive not to drop it from an unreasonable height.

(c) Although the remote controller is well protected against external noise, run its cable as apart as possible from sources of electromagnetic noise. Note that unreasonably large noise can cause erroneous operation of the equipment.

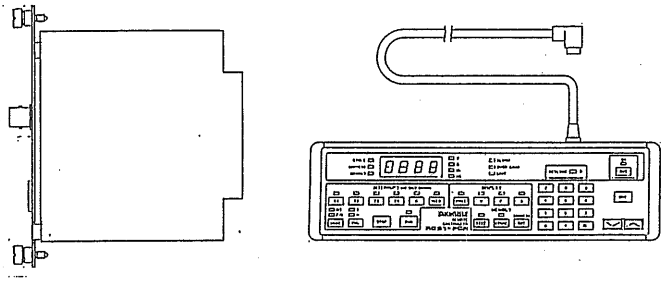
(d) When using the remote controller together with the 3P01-PCR 3-phase Driver for 3-phase operation, be sure to connect the remote controller to the PCR Frequency Converter of the U-phase.

3.2.2 Connecting the Remote Controller to the PCR Frequency Converter

Caution:	Be sure to turn off the input power of the PCR Frequency Converter before connecting the remote controller to the converter.

(1) The remote controller is comprised of a main unit and an interface board. (See Figure 3-4.)

Caution:	The interface board has a PCB mounted on it exposed and unprotected. Pay attention to static eleltricity when taking it out of the carton and installing it in the converter. Do not touch any other components than the panel of the remote controller.



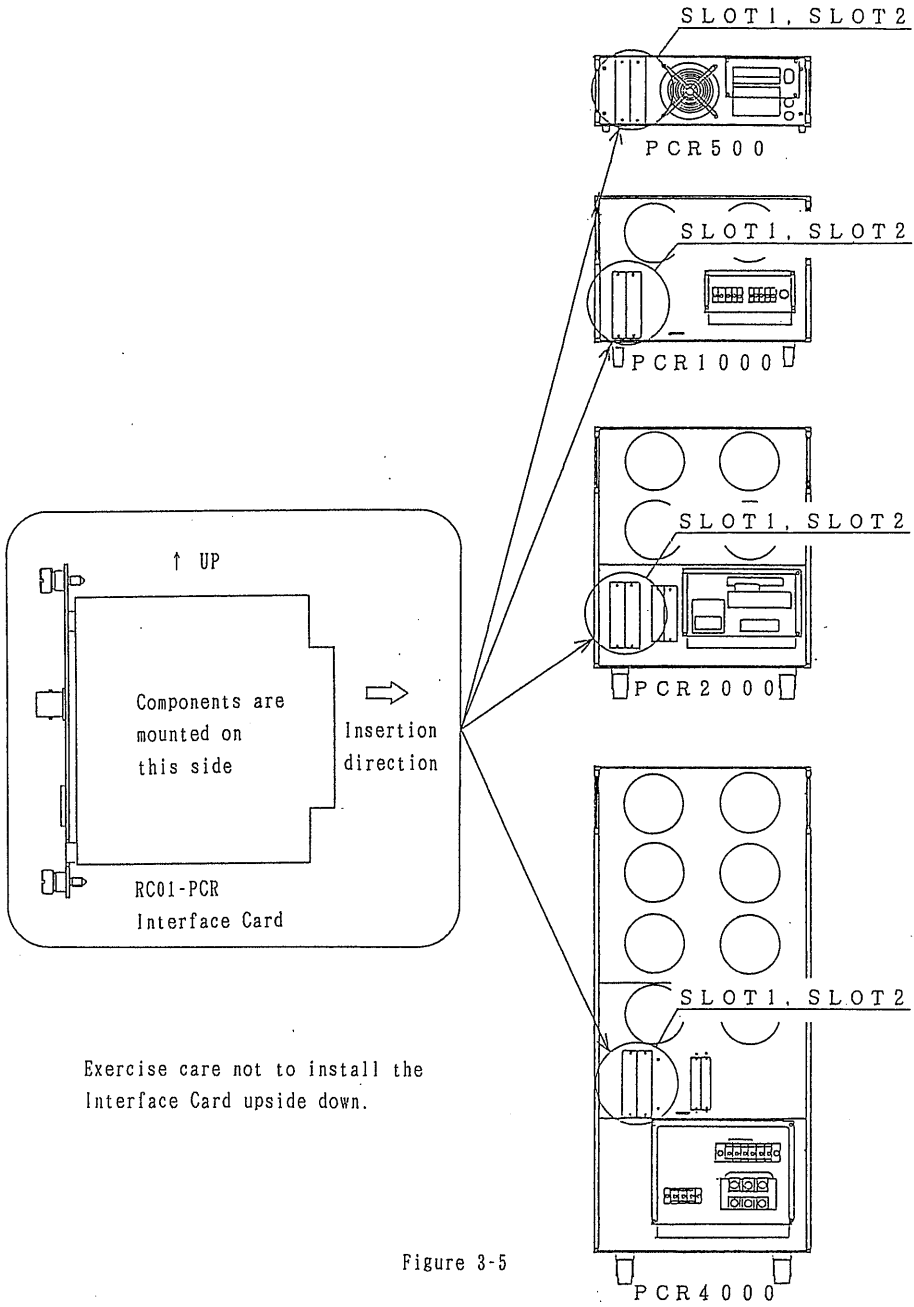
Interface Board　　Remote Controller (Main Unit)

Figure 3-4

(2) Insert the interface board in Slot 1 or 2 at the rear of the converter and fix the board securely with its clamp screws using a screw-driver.

(3) Connect the plug of the INTERFACE cable (which runs from the remote controller main unit) to the REMOTE connector on the interface board panel.

Caution:	Never connect or disconnect the plug when the equipment is in operation. If you do this, the resultant equipment operation is unpredictable.



Exercise care not to install the Interface Card upside down.

Figure 3-5

3.3 Basic Operating Procedures

This section covers the basic operating procedures of the remote controller. Be sure to read Section 3.2 "Notes Before Use" before operating the remote controller.

Each of the switches on the remote controller panel has a lamp located above the switch to indicate that the switch is enabled. Note, however, that the actions of these lamps are omitted to be mentioned in the following explanation.

3.3.1 To Lock the Keys

> Note: To operate the remote controller, turn on the KEYLOCK switch of the PCR Frequency Conventer first of all.

As you turn on the KEYLOCK switch, the switches of the operation/display panel of the converter is disabled and the switches of the remote controller is enabled.

The remote controller also has a KEYLOCK switch (see Figures 3-1 and 3-2). As you turn on the switch, the control switches on the remote controller are disabled (except the OUTPUT switch and RUN switch which remain enabled) while the monitor switches as shown in Table 3-1 remain enabled. The switch is turned on as you slide it to right and it is turnded off as you slide it to left.

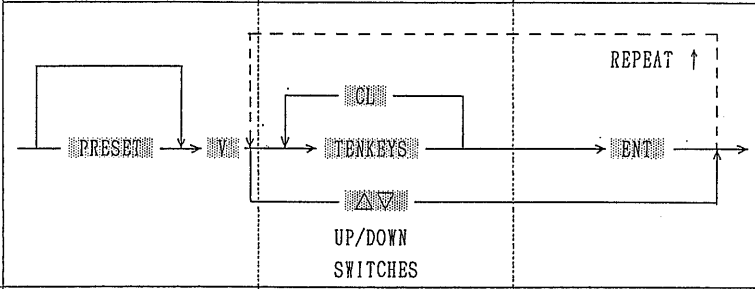
Table 3-1

Switches Which Remain Enabled	Function
T1, T2, T3, T4, V(T3)	To monitor the values set for power line abnormality simulation
RUN, STOP	To run or stop the power line abnormarity simulation operation
PRESET, V, F, A	To monitor the preset voltage, frequency and current
Tenkeys, CL, ADDRESS, ENT	To read memory
OUT	To turn on or off the output

3.3.2 To Set and Display the Output Voltage, and to Display the Preset Voltage

The output voltage can be set with the tenkeys and UP/DOWN switches. Setting for memory read and that for stepwise execution of memory data also can be done (see Sections 3.5.2 and 3.5.3).

Table 3-2

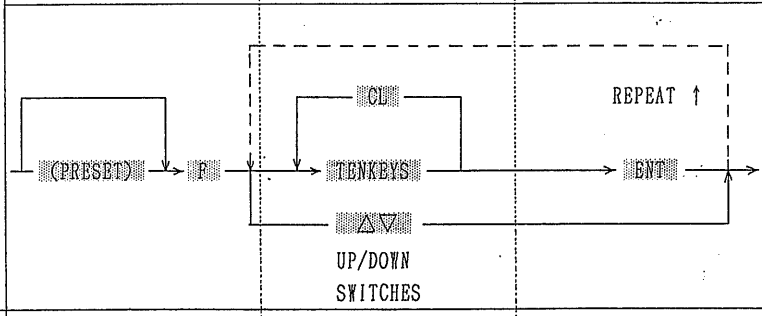
To set and Display the Output Voltage, and to Display the Preset Voltage			
	①	②	③
Procedure			
Operation	To select display	To set the output voltage When UP/DOWN switches are used, the set voltage is directly entered and the output is defined.	To enter the set voltage. (The output is defined.)
Display	When both PRESET and V switches are pressed, the preset voltage is displayed. When V switch alone is pressed, the output voltage is displayed.	The set voltage is displayed.	Returns to ①.

Note: The dotted lines indicate a loop which can be repeated.

3.3.3 To Set and Display the Output Frequency

The output frequency can be set with the tenkeys and UP/DOWN switches. Setting for memory read and that for stepwise execution of memory data also can be done (see Sections 3.5.2 and 3.5.3).

Table 3-2

To set and Display the Output Frequency			
	①	②	③
Procedure			
Operation	To select display	To set the output frequency. When UP/DOWN switches are used, the set voltage is directly entered and the output is defined.	To enter the set voltage. (The output is defined.)
Display	The preset frequency is displayed as you press the R switch, regardless of whether the PRESET switch is pressed or not.	The set frequency is displayed.	Returns to ①.

3.3.4 To Display the Output Current

As you press the A switch, the output current is indicated on the display panel.

Table 3-4

To Display the Output Current	
Procedure	Press the A switch

3.3.5 To Turn On or Off the Output

The output can be turned on or off with the OUT switch at upper right on the remote controller panel.

> Caution: The PCR Frequency Converter is a high-voltage large-power equipment. Before turning on its power, be sure to check its output voltage using its preset function and to check that the load is an appropriate one. (Refer to 1 of Tables 3-2 and 3-3.)

The OUT switch of the remote controller is linked to the output switch of the frequency converter.

3.4 Power Line Abnormality Simulation

The remote controller allows to operate the frequency converter shimulating power line abnormalities such as voltage pop up, dip down, and power interruption. For a system setup example, see Figure 3-6.

Notes: (a) Operation in the power line abnormality simulation mode can be done only at 50.00 Hz or 60.00 Hz. The frequency is fixed and not adjustable.

(b) As the equipment is set to the power line abnormality simulation mode, the SYNC mode is automatically realeased. That is, the simulation operation cannot be done in the SYNC mode.

(c) Power line abnormality simulation mode is stopped if overloding is not removed or ALARM state.
Please be aware that the output eaveforms of the PCR series may be distorted when the PCR series are over loaded.
When this has occurred, check the load current. (Refer to the operation manualfor the PCR Frequency Converter.)

(d) When in the power line abnormality simulation mode of operation, the ---- symbol appears on the display panel.

The interface board delivers a trigger output pulse which can be used as a trigger pulse for an oscilloscope to display effectively the frequency converter output waveform.

RC01-R.R

'88.12.8

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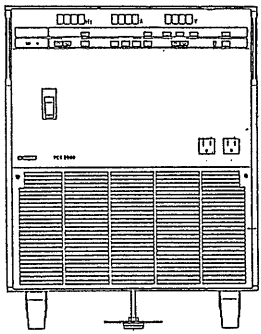
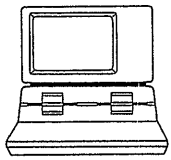
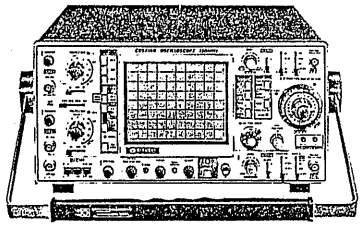
PCR Series
Frequency Converter



Computer and
Peripherals



Measuring Instrument



System Equipment

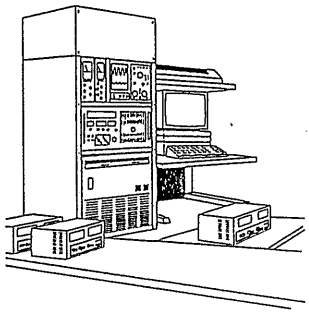


Figure 3-6

3.4.1 To Select a Mode

Either the INT mode (instantaneous power interruption mode) or the P/D mode (pop/dip mode) can be selected with the MODE switch. When power of the equipment is turned on, the MODE switch is initialized to the INT mode. As you press the MODE switch, it is changed to the P/D mode. The modes are indicated by respective lamps above the switch as shown in Table 3-5. Examples of output waveforms are shown in Figure 3-7.

Table 3-5

Lamp	Mode
INT	Power interruption mode
P/D	Pop/dip mode

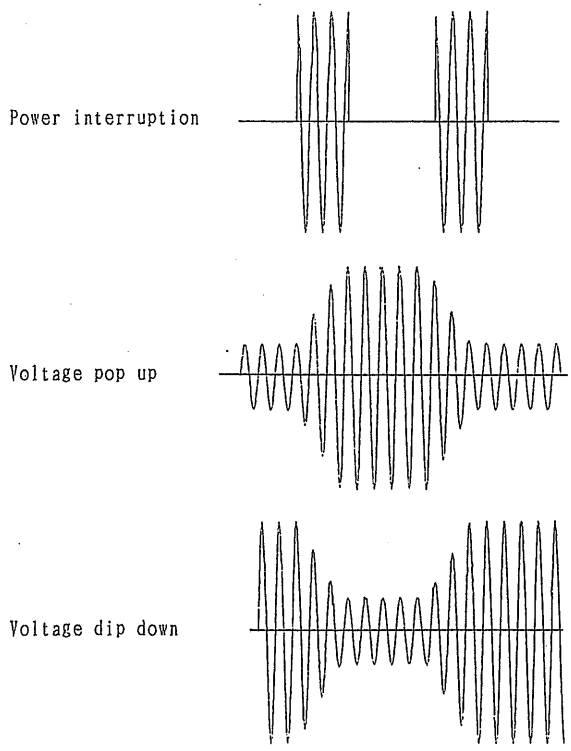


Figure 3-7

3.4.2 To Generate a Power Interruption Waveform (INT Mode)

To generate a power interruption waveform, select the INT mode with the mode switch and then proceed as described in this section.

(1) Power Interruption Waveform

A power interruption waveform is exemplified below with symbols for factors.

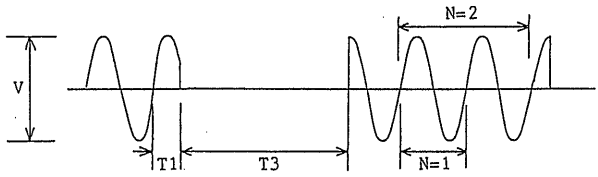


Figure 3-8

T1: Voltage change start time
Period from the instant the voltage waveform has crossed the zero level immediately before voltage change (power interruption, voltage pop up or dip down)

T3: Interruption time
Period of power interruption

N: Restoration cycles
The number of cycles to be continued after power is restored, at the frequency the same with that when power interruption has occurred.

Notes: (a) If N is set at 9999, the number of cycles after power restoration becomse infinitive and the equipment runs continuously. As you press the RUN switch when in this state, the RUN lamp above it illuminates and, as power is restored, the lamp goes off as if the STOP switch were pressed.

(b) Depending on setting of T1 and T3, N may become larger or smaller by 1.

V: Output voltage (at 50.00 Hz or 60.00 Hz)

(2) Operation Method of Switches

(2)-1 Basic Operating Procedure

To cause a power interruption occur, set the constants, run the equipment and then stop it as shown in Table 3-6.

Table 3-6

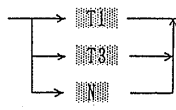
Basic Procedure for Power Interruption Generation			
	①	②	③
Procedure	Set T1, T3, N, V and F	→ RUN →	→ STOP →
Operation	Setting of constants	Execution	Ending

Note: Unless the set constants are within the specified ranges (valid values), "Err" appears on the display panel and the set data cannot be executed. To clear the "Err" state, press the CL switch.

(2)-2 To Set and Display the Constants

To set and display the constants mentioned in Section (2)-1, proceed as shown in Table 3-7. For the setting procedures of the output fequency (F) and output voltage (V), see Sections 3.3.2 and 3.3.3.

Table 3-7

To Set and Display the Constants for Power Interruption Waveform Generation			
	①	②	③
Procedure			
Operation	To select a display	To set a value	To enter the value. (The output is defined.)
Display	The esisting value is indicated on the display panel	The value entered with TENKEYS is indicated on the display panel. As you press the CL key, the entered value is cleared and the value existed before is indicated.	The display panel returns to the item which was displyed before T1, T3 or N was pressed.

3.4.3 To Generate a Voltage Pop Up or Dip Down Waveform (P/D Mode)

To generate a voltage pop up or dip down waveform, select the P/D mode with the MODE switch and then proceed as described in this section.

(1) Voltage Pop Up or Dip Down Waveform

Voltage pop up and dip down waveforms are exemplified in Figures 3-9 and 3-10 with symbols for factors.

(a) Voltage Pop Up Waveform

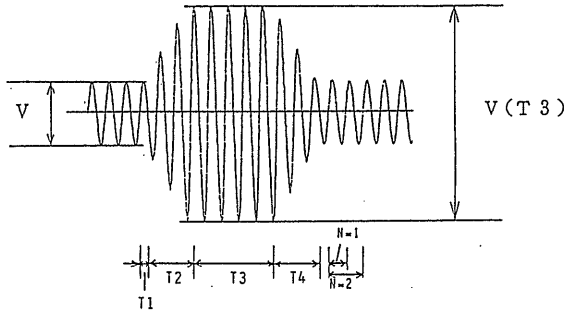


Figure 3-9

(b) Voltage Dip Down Waveform

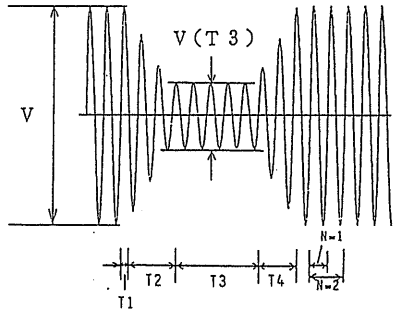


Figure 3-10

T1: Voltage change start time
Period from the instant the voltage waveform has crossed the zero level immediately before voltage change (pop up or dip down)

T2: Slope time
Period of voltage rise up when in the POP mode or that of voltage fall down when in the DIP mode.

T3: Pop time or dip time
Period of risen up voltage when in the POP mode or that of fell down voltage when in the DIP mode.

T4: Slope time
Period of voltage falling down when in the POP mode or that of voltage rise up when in the DIP mode.

N: Restoration cycles
The number of cycles after power is restored to the normal voltage, at the existing frequency.

Notes: (a) Depending on setting of T1, T2, T3 and T4, the value of N may become larger or smaller by 1.

(b) When the voltage is raised or lowerd with T2 = 0, the supply voltage change start phase (timing) may be displayed being shifted (delayed by approximately 0.8 ms) reflecting the inaccuracy of T2. If this is the case, adjust the set value of T1 by reducing it by 0.8 ms [set T1 as {(Desired value of T1) - (0.8 ms)} , where T1 ≥ 0.8ms], or use the INT made when lowering the output voltage to zero.
For example, if parameters are set as T1 = 5 ms and T2 = 0 ms, the actual supply voltage change start timing will be at approximately 5.8 ms.
To correct this, set T1 at (5 -0.8) ms = 4.2 ms.

(c) If N is set at 9999, the simulated operation is performed only once and is not repeated. In this case, if you press the RUN switch, the RUN lamp illuminates and, as power is restored, the lamp goes off as if the STOP switch were pressed.

V(T3): Pop voltage or dip voltage
Denotes the risen up voltage when in the POP mode or the fell down voltage when in the DIP mode.

V : Output voltage

F : Output frequency

(2) Operation Method of Key Switches

The operation method of key switches for voltage pop/dip waveform generation basically is identical with that for power interruption waveform generation.

(2)-1 Basic Operating Procedure

To cause a voltage pop dip occur, set the constants, run the equipment and then stop it as shown in Table 3-8.

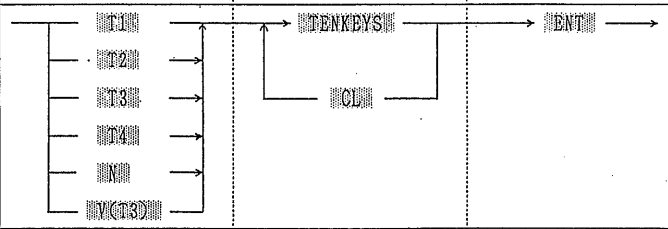
Table 3-8

Basic Procedure for Voltage Pop Up or Dip Down Generation			
	①	②	③
Procedure	Set T1, T2, T3, T4, N, V(T3), F and V.	RUN	STOP
Operation	Setting of constants	Execution	Ending

(2)-2 To Set and Display the Constants

To set and display the constants mentioned in Section (2)-1, proceed as shown in Table 3-9. For the setting procedures of the output frequency (F) and output voltage (V), see Sections 3.3.2 and 3.3.3.

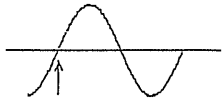
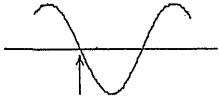
Table 3-9

To Set and Display the Constants for Voltage Pop Up or Dip Down Waveform Generation			
	①	②	③
Procedure			
Operation	To select a display	To set a value	To enter the valve. (The output is defined.)
Display	The existing value is indicated on the display panel.	The value entered with TENKEYS is indicated on the display panel. As you press the CL key, the entered value is cleared and the value existed before is indicated.	The display panel returns to the item which was displayed before T1, T2, T3, T4, N or V(T3) was pressed.

3.4.4 To Select a Voltage Change Start Polarity

With the POL switch, select either the positive-going or negative-going polariry for the voltage when crossing the zero level providing a crossing point which is used as a reference point for T1. This allows to change the phase of T1 by 0 - 360 degress. See Table 3-10.

Table 3-10

Waveform	 Positive-going crossing	 Negative-going crossing
Indication by lamp	"+"	"−"

Note: The waveforms shown here are those of the voltage of the L (live) OUTPUT terminal with respect to the N (newtral) OUTPUT terminal.

3.4.5 3-phase Operation

Caution:	Be sure to install the remote controller interface board in the frequency converter of the U-phase. Note that, if the interface board is installed in other frequency converter, operation of the equipment is not guaranteed.

By employing the 3-phase Driver 3P01-PCR (optional device) together with the Remote Controller, power line abnormality simulation for a 3-phase power line can be made. Each of the U, V and W phase lines can simulate power interruption, voltage pop up and dip down with timings identical with those of a single-phase line. Examples of power interruption waveforms are shown in Figure 3-11.

Example: Power interruption

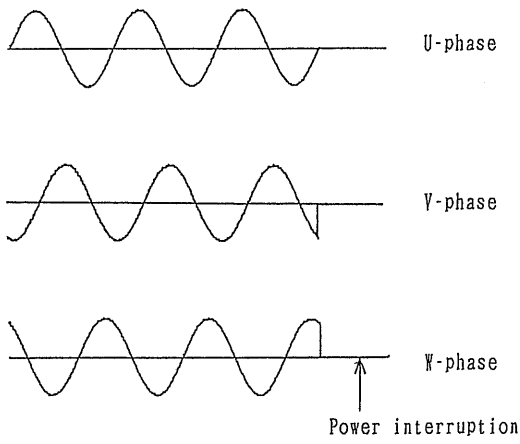


Figure 3-11

3.5 Memory Function

The remote controller has two memory units, namely, V memory for preset voltages and F memory for preset frequencies. Each of the memory units has addresses 1 - 99. Data can be written on or read from these addresses, and the data items of the individual addresses can be executed stepwise (this mode is referred to as "STEP mode") to deliver the corresponding output.

Addresses 1, 2 and 3 of the V and F memory units of the remote controller are corresponding to addresses, A, B and C of the memory units of the PCR Frequency Converter as shown below.

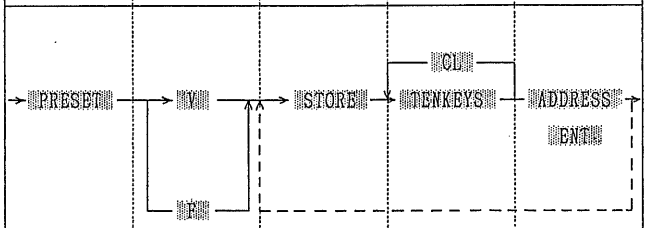
A	B	C						
1	2	3	4	5	6	------	98	99

The memory is backed up with a battery.
The entire memory can be cleared by pressing the CLEAR switch of the PCR Frequency Converter.

3.5.1 To Store Data in Memory

The data (preset voltage or preset frequency) indicated on the display penel can be stored in memory by pressing the STORE switch and specifying a memory address. This procedure is shown in Table 3-11.

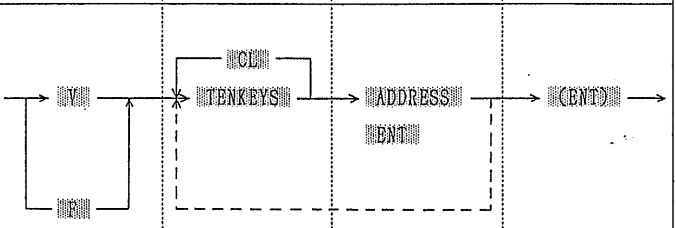
Table 3-11

To Store Data in Memory					
	①	②	③	④	⑤
Procedure					
Operation	To select the PRESET mode	To select V of F memory (To select display)	To select STORE mode	To select memory address	To enter data
Display	The display panel indicates the preset voltage when V memory is selected or the preset frequency when F memory is selected.		The display panel indicates the previously entered address.	The display panel indicates the currently entered address.	The display panel returns to that of ①.

3.5.2 To Read Memory Data

The call out the data stored in a memory onto the display panel, select the V or F mode and specify the address. This procedure is shown in Table 3-12.

Table 3-12

To Read Data Stored in Memory				
	①	②	③	④
Procedure				
Operation	To select V or F memory	To select memory address	To read data	To deliver output corresponding to the read data
Display	If the PRESET switch is pressed, the preset value is indicated on the display panel.	The display panel indicates the memory address.	Data stored at the address is indicated on the display panel. ＊1	The display panel returns to ①. ＊2

＊1: Be careful not to press the ENT key instead of the ADDRESS ENT key by mistake. If you press the ENT key, the output corresponding to the value set with the tenkeys will be delivered.

＊2: When display alone of the memory data is needed and to be returned to the start without using the ENT function, press once more the display select key.

3.5.3 To Execute Stepwise the Stored Data

To execute step by step (in the STEP mode) the data stored in memory, proceed as shown in Table 3-13.

Table 3-13

To execute stepwise the Stored Data					
	①	②	③	④	⑤
Procedure	V / F → STEP → CL / TENKEYS / △▽ UP/DOWN SWITCHES → ADDRESS ENT → ENT				
Operation	To select V or F memory (To select display)	To select the STEP mode	To select memory address	To enter memory address	To enter data. (The output is defined.)
			To UP/DOWN switches are used, the selected address is directly entered and defined.		
Display	If the PRESET switch is pressed, the preset value indicated on the display panel.	The display indicates memory address 1.	The display panel indicates the entered memory address.		The memory address indication on the display panel blinks to indicate that the output is defined.

Notes: 1. To reset from the STEP mode, press the STEP switch once more.

2. It also is possible to directly select the required address with the TENKEYS and then move upward or downward memory addresses with the UP/DOWN switches.

4. BEFORE ORDERING REPAIR SERVICE

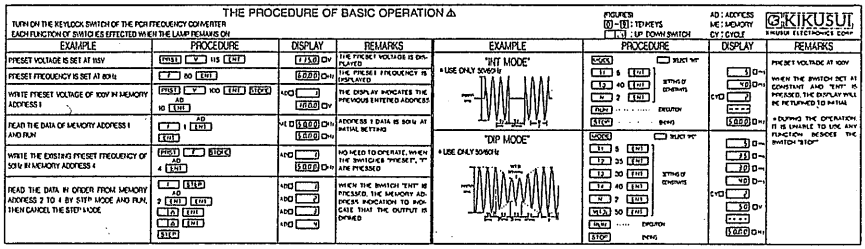
The PCR Frequency Converter must be serviced only by the qualified agents authorized by Kikusui. When your frequency converter has become apparently malfunctioning, check the items shown in Table 4-1 before ordering your Kikusui agent for repair service.

Table 4-1

Symptom	Probable Cause	Remedy
Control operation from panel is entirely or partially ineffective.	1. The KEYLOCK switch of PCR Frequency Converter is set in the ON state.	1. Set the switch to the OFF state.
	2. The KEYLOCK switch of Remote Controller is set in the ON state.	2. Set the switch to the OFF state.
"Err" is indicated on the display panel.	1. The set value is not within the valid range.	1. Set a valid value.
Power line abnormality simulation operation is unsuccessful.	1. The voltage of V (T3) is the same with the normal output voltage setting.	1. Select a different voltage for V (T3).
	2. The frequency converter is overloaded. (The OVERLOAD lamp illuminates.)	2. Correct the load (Reduce the output current.)
	3. The output frequency is not set at 50.00 Hz or 60.00 Hz	3. Set the output frequency at 50.00 Hz or 60.00Hz.
Indications on the display panel are unstable.	1. The remote control cable is subjected to large external noise.	1. Place the cable apart from the source of noise.
Others	1. Refer to Section 7 of the operation manual for the PCR Frequency Converter.	
	2. Other than the above	1. Circuit failure

Accessory sheet "THE PROCEDURE OF BASIC OPERATION"

Enclosed accessory sheet please find basic instruction for model RC01-PCR.
And please stick on this sheet to the back panel of unit using attached double faced tapes.



THE PROCEDURE OF BASIC OPERATION

TURN ON THE KEYLOCK SWITCH OF THE PCR FREQUENCY CONVERTER
EACH FUNCTION OF SWITCH IS EFFECTED WHEN THE LAMP REMARKS ON

FIGURES: [0]-[9] : TEN KEYS; [∧][∨] : UP DOWN SWITCH
AD : ADDRESS; ME : MEMORY; CY : CYCLE

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EXAMPLE	PROCEDURE	DISPLAY	REMARKS
PRESET VOLTAGE IS SET AT 115V	PRESET V 115 ENT	115.0 CV	THE PRESET VOLTAGE IS DISPLAYED
PRESET FREQUENCY IS SET AT 60Hz	F 60 ENT	60.00 CHz	THE PRESET FREQUENCY IS DISPLAYED
WRITE PRESET VOLTAGE OF 100V IN MEMORY ADDRESS 1	PRESET V 100 ENT STORE AD 10 ENT	10 CY 100.0 CV	THE DISPLAY INDICATES THE PREVIOUS ENTERED ADDRESS
READ THE DATA OF MEMORY ADDRESS 1 AND RUN	F AD 1 ENT EXE	01 CY 50.00 CHz 100.0 CV	ADDRESS 1 DATA IS 50Hz AT INITIAL SETTING
WRITE THE EXISTING PRESET FREQUENCY OF 50Hz IN MEMORY ADDRESS 4	PRESET F STORE AD 4 ENT	4 CY 50.00 CHz	NO NEED TO OPERATE, WHEN THE SWITCHES "PRESET", "F" ARE PRESSED
READ THE DATA IN ORDER FROM MEMORY ADDRESS 2 TO 4 BY STEP MODE AND RUN, THEN CANCEL THE STEP MODE	F STEP AD 2 ENT ENT 4 ENT ENT STEP	1 CY 2 CY 3 CY 4 CY	WHEN THE SWITCH "ENT" IS PRESSED, THE MEMORY ADDRESS INDICATION TO INCREASE THAT THE OUTPUT IS DRIVED

"INT MODE"
* USE ONLY 50/60Hz

"DIP MODE"
* USE ONLY 50/60Hz

EXAMPLE	PROCEDURE	DISPLAY	REMARKS
	BACK SELECT "INT" 11 5 ENT 12 40 ENT "F" 2 ENT SETTING OF CONDITIONS ENT/M ..... EXECUTION STOP ..... DRIVING	1 CY 100.0 CV **.** 1.000 CHz	PRESET VOLTAGE AT 100V. WHEN THE SWITCH SET AT CONSTANT AND "ENT" IS PRESSED, THE DISPLAY WILL BE RETURNED TO INITIAL. * DURING THE OPERATION, IT IS UNABLE TO USE ANY FUNCTION BESIDES THE SWITCH "STOP"
	BACK SELECT "INT" 11 5 ENT 12 35 ENT 12 30 ENT "F" 2 ENT 14/15 50 ENT SETTING OF CONDITIONS ENT/M ..... EXECUTION STOP ..... DRIVING	1 CY 100.0 CV 2 CY 50.00 CHz	

Accessory sheet

Double faced tapes

Back panel of unit

Version number of PCR series

The version number of the PCR series can be checked with following procedure.

(1) Turn on the POWER switch of the PCR series while MEMORY A and B switches are pressed.

(2) The version number is shown on the Ammeter on the operation/display panel.