

INSTRUCTION MANUAL

PROBE SELECTOR

MODEL PS02-COS

KIKUSUI ELECTRONICS CORPORATION

52.47

TABLE OF CONTENTS

	<u>PAGE</u>
1. GENERAL .....	1
2. SPECIFICATIONS .....	1
3. GENERAL PRECAUTIONS .....	3
3-1. Unpacking .....	3
3-2. Ambient Conditions .....	3
3-3. Maximum Allowable Voltage of Input Terminals .....	3
3-4. Inter-device Connection Cables (24P, 14P) .....	3
3-5. Output Termination .....	3
3-6. Battery for Memory Backup .....	4
3-7. AC Line Voltage Setting .....	4
4. DESCRIPTION OF PANEL ITEMS .....	5
4-1. Description of Front Panel Items .....	5
4-2. Description of Rear Panel Items .....	5
5. OPERATION METHOD .....	8
5-1. Inter-device Connections .....	8
5-2. WRITE Operation .....	9
5-3. READ Operation .....	9
5-4. Gain Setting of Individual Inputs .....	10

## 1. GENERAL

Probe Selector PS02-COS is used in conjunction with a Kikusui Electronic Programmable Oscilloscope. It is capable of handling ten probes for each of the two channels, or total twenty probes. Since the Probe Selector has a memory unit, probes can be selected in response to step changes dictated by Remote Controller RC01-COS or Memory Unit MU01-COS. The memory unit employs a C-MOS RAM, which enables easy read/write operations. The memory unit is backed up by a battery, to store programs for a period of about one year.

## 2. SPECIFICATIONS

Item	Specification	Remarks
Number of inputs	10 inputs × 2 channels (= total 20 inputs)	BNC connector
Input impedance	1 MΩ ±2%, 35 pF ±2 pF	In parallel
Allowable maximum input voltage	400 V <sub>p-p</sub> (DC + AC peak)	AC component not higher than 1 kHz
Frequency bandwidth	DC - 50 MHz	With reference to 50 kHz
Crosstalk	60 dB or less (10 MHz)	Between channels
Number of outputs	1 output × 2 channels	BNC connector
Output impedance	50 Ω ±5%	
Gain	1 ±5%	With 50-ohm termination
Power requirements	Voltage: 100 V, 115 V, 215 V, 230 V. (with tolerance of ±10% of each voltage)  Frequency: 50 - 60 Hz  Power consumption: Approx. 25 VA	

Item	Specification	Remarks
External dimensions	360 W × 85 H × 430 D mm (14.17 W × 3.34 H × 16.92 D in.)	Maximum dimensions
	360 W × 70 H × 400 D mm (14.17 W × 2.75 H × 15.74 D in.)	Chassis dimensions
Weight	Approx. 8.5 kg	

Ambient conditions (temperature and humidity)

Ranges to satisfy specifications: +5°C to +35°C (41°F to 95°F),  
up to 85% RH

Maximum operable ranges: 0°C to 40°C (32°F to 104°F),  
up to 90% RH

Accessories

	Kikusui code	Q'ty
Inter-device connection cable (24P) ....	(89-04-0130) ....	1
Inter-device connection cable (14P) ....	(89-04-0110) ....	1
50-ohm termination resistors (1/2W) ....	( ) ....	2
50-ohm coaxial cables .....	( ) ....	2
Instruction manual .....	( ) ....	1
Fuse, 0.2A, slow blow .....	(99-02-0112) ....	1
Fuse, 0.4A, slow blow .....	(99-02-0114) ....	1

### 3. GENERAL PRECAUTIONS

#### 3-1. Unpacking

Please unpack the device immediately when it is delivered to you and check for any signs of damage which might have been sustained when in transportation. If any sign of damage is found, please immediately notify the bearer and your Kikusui dealer.

#### 3-2. Ambient Conditions

The maximum operable temperature range of the device is 0°C to 40°C (32°F to 104°F). Note that, if the device is operated for a long time in high temperature and high humidity, the device may become malfunctioning or its service life may be shortened.

#### 3-3. Maximum Allowable Voltage of Input Terminals

The maximum allowable voltage of the input terminals is as shown in below. Note that the device may be unretrievably damaged if a voltage higher than the allowable maximum voltage is applied.

Input terminals (BNC connector)	400 Vp-p (DC + AC peak)
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AC component not higher than 1 kHz

#### 3-4. Inter-device Connection Cables (24P, 14P)

Before connecting or disconnecting the inter-device connection cable, make it sure that the power of this device and the programmable oscilloscope are turned off. After making it sure that the cables are securely connected (making it sure that the cables are engaged by the connector lock springs of the main unit), turn on the power switch.

#### 3-5. Output Termination

The output impedance of this device is 50 ohms ( $\pm 5\%$ ). Be sure to use the 50-ohm coaxial cables and 50-ohm termination resistors supplied. Note that the wattage of the 50-ohm resistors is 1/2 W.

### 3-6. Battery for Memory Backup

This device has a memory backup battery source (two dry cells, Type SUM-3) to maintain the programs stored in the memory unit. The battery source is automatically disconnected from the circuit when the device is operated on an AC line power.

When the device power is off, a backup current is fed to the memory unit from the battery source. The current is very small (several tens microamperes) as the memory unit is a C-MOS type. Thus, even when the device power is left turned off continuously, the battery source serves for more than twelve months. For better reliability, however, it is recommended to replace the dry cells within twelve months after purchasing the device. (The device is delivered to you with the dry cells installed in it.)

### 3-7. AC Line Voltage Setting

The line voltage on which this device operates can be selected by means of the voltage selector plug at the rear of the device. Before operating the device on an AC line, confirm that the voltage selector plug is correctly set for the line voltage. When the voltage is changed, change also the fuse as required. Note that the device may not normally operate or may be damaged if it is operated on a wrong AC line voltage.

Setting position	Nominal voltage	Operable voltage range	Fuse
A	100 V	90 - 110 V	0.4 A
B	115 V	104 - 126 V	Slow blow
C	215 V	194 - 236 V	0.2 A
D	230 V	207 - 253 V	Slow blow

## 4. DESCRIPTION OF PANEL ITEMS

### 4-1. Description of Front Panel Items

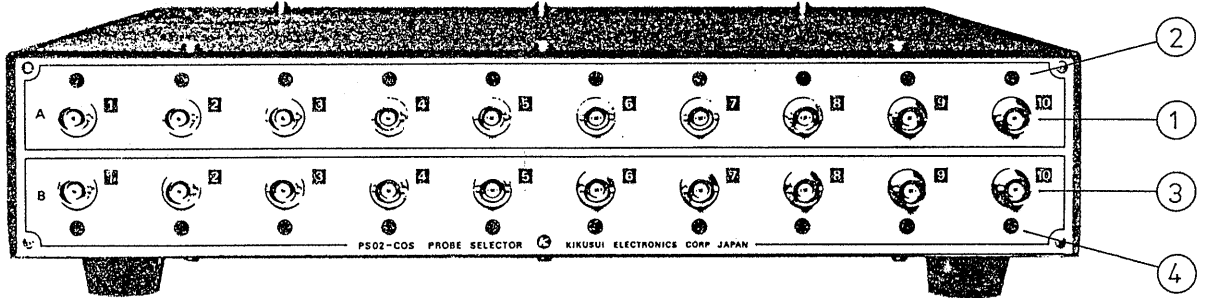


Figure 1

- ① Input connectors of channel A (ten connectors corresponding to indicator lights 1 - 10 )
- ② Selection indicator lights (LEDs) for input connectors of channel A
- ③ Input connectors of channel B (ten connectors corresponding to indicator lights 1 - 10 )
- ④ Selection indicator lights (LEDs) for input connectors of Channel B

### 4-2. Description of Rear Panel Items

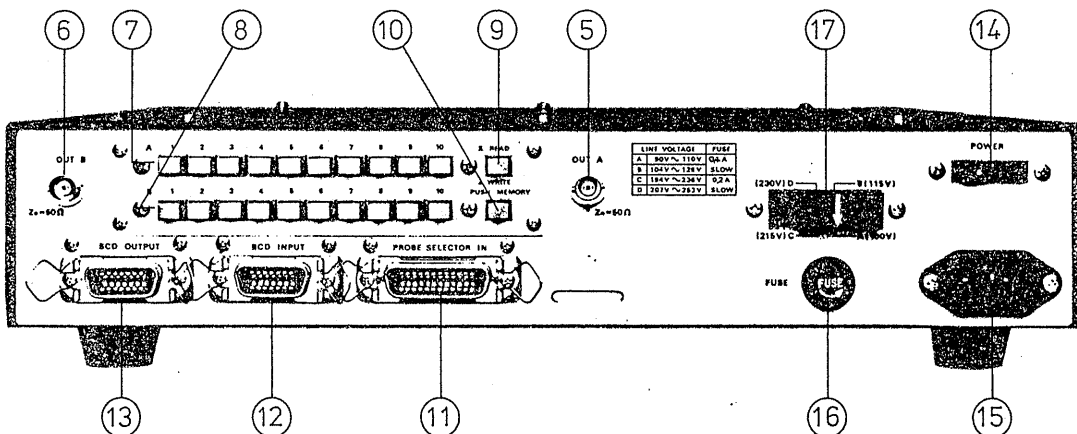


Figure 2

⑤ OUT A ( $Z_0 = 50 \Omega$ ) connector:

Output connector of channel A

⑥ OUT B ( $Z_0 = 50 \Omega$ ) connector:

Output connector of channel B

⑦ A 1 - 10 switches:

Selector switches to select one of inputs 1 - 10 of channel A

⑧ B 1 - 10 switches:

Selector switches to select one of inputs 1 - 10 of channel B

⑨  READ,  WRITE switch:

To select operation of memory. When this switch is set in the READ () state, information stored in memory is called out in response to the signal of ⑫ BCD INPUT terminal and one of inputs 1 - 10 of each of channels A and B is selected. When the switch is set in the WRITE () state, an input terminal corresponding to the number selected by input selector switches 1 - 10 of each of channel A ⑦ and channel B ⑧ is selected.

⑩ PUSH MEMORY switch:

As this switch is pressed when ⑨ READ/WRITE switch is in the WRITE state, information can be written on memory in response to the data (steps selected by Step Controller) of ⑫ BCD INPUT terminal.



⑪ PROBE SELECTOR IN terminal:

This terminal is an input data connector for the input sensitivity and input coupling data for the device. This terminal is to be connected to the PROBE SELECTOR terminal of Oscilloscope COS5030-PG using the 24-pin cable supplied.

⑫ BCD INPUT terminal:

This terminal is an input connector which accepts BCD signals corresponding to steps dictated by Step Controller SC01-COS or SC02-COS.

⑬ BCD OUTPUT terminal:

This terminal provides BCD signals for other devices or jigs. This terminal is connected in parallel to ⑫ BCD INPUT terminal.

⑭ POWER switch:

The POWER switch of this device.

⑮ Power input terminal:

The AC power input terminal of the device. The power cord (supplied) is to be connected to this terminal.

⑯ FUSE holder:

Holds a slow-blow fuse of 0.4 A or 0.2 A. To remove the cap for fuse replacement, turn the cap counterclockwise.

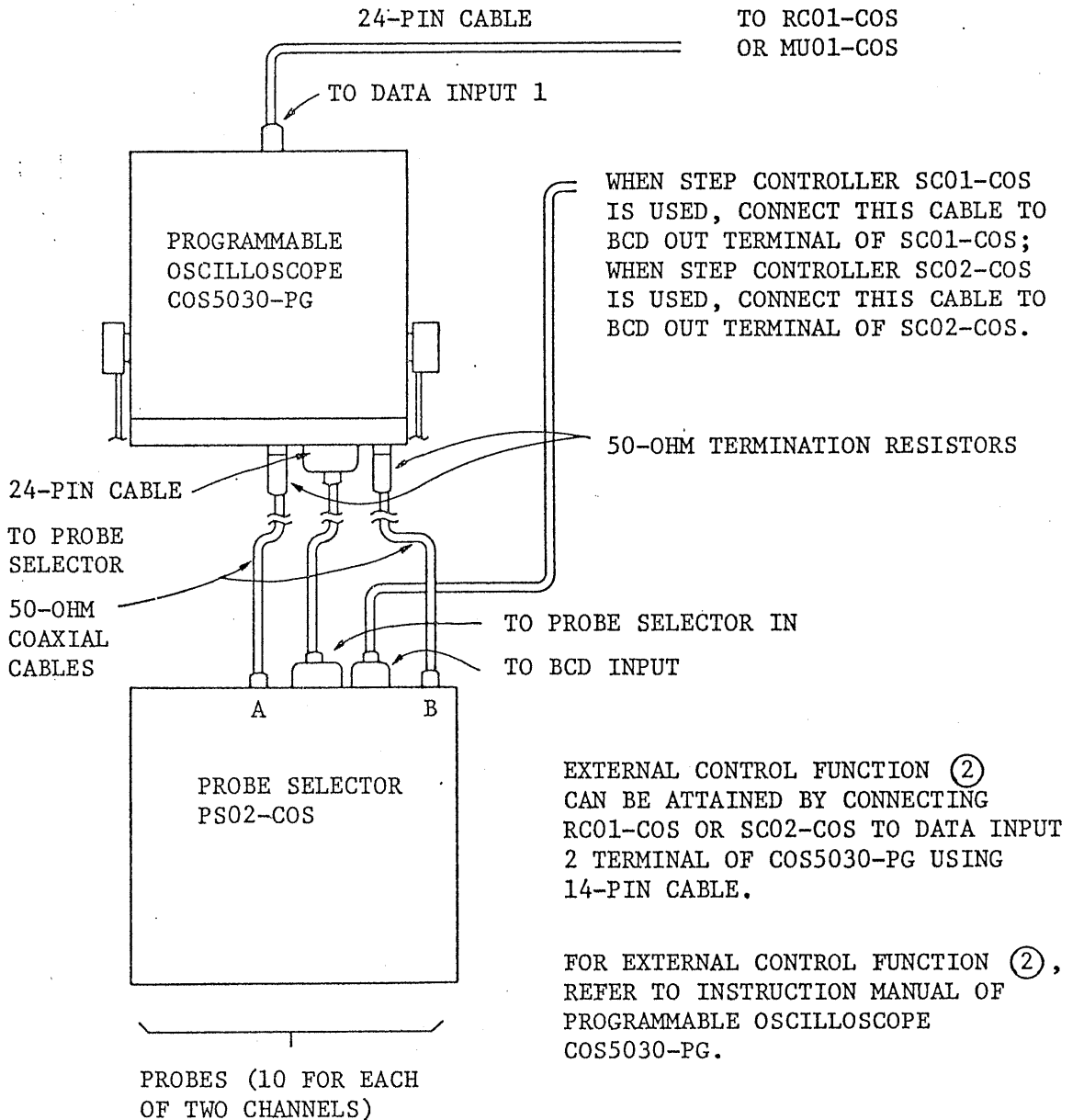
⑰ AC line voltage selector plug:

This plug selects an AC line voltage on which the device is to be operated. Before starting operating the device, confirm that the plug is set in the correct position for the AC line voltage on which the device is to be operated.

## 5. OPERATION METHOD

### 5-1. Inter-device Connections

Connect Probe Selector PS02-COS with Programmable Oscilloscope COS5030-PG as shown in the following:



NOTE: BE SURE TO USE THE 50-OHM TERMINATION RESISTORS AND 50-OHM COAXIAL CABLES WHICH ARE SUPPLIED ACCOMPANYING THE PROBE SELECTOR.

Figure 3

For inter-device connections of Remote Controller RC01-COS, Memory Unit MU01-COS or Step Controller SC01-COS (SC02-COS) to Programmable Oscilloscope COS5030-PG, refer to the instruction manuals of respective devices.

### 5-2. WRITE Operation

WRITE operation is done in response to steps of Step Controller SC01-COS or SC02-COS.

- (1) Set the READ/WRITE switch (9) on the rear panel to the WRITE (□) state.
- (2) Set the START and END digital switches of Remote Controller RC01-COS to the start and end points, respectively, of the stops to be programmed.
- (3) Press the RESET switch of the Step Controller and set the step to the start point.
- (4) Select the required input by operating the input selector switches (7) and (8) on the rear panel.
- (5) Press the PUSH MEMORY switch (10).

By the above procedure, the input number selected by the above item (4) is stored in the START step selected by item (2). To proceed to the next step, advance the step by operating the Step Controller and repeat the procedure of items (4) to (5).

### 5-3. READ Operation

READ operation also is done in response to steps of Step Controller SC01-COS or SC02-COS as is the case for WRITE operation.

- (1) Set the READ/WRITE switch (9) on the rear panel to the READ (□) state.
- (2) Set the START and END digital switches of Remote Controller RC01-COS to the start and end points, respectively, of the steps to be read.

- (3) Press the RESET switch of the Step Controller and set the step to the start point. (When this is done, memory of Probe Selector PS02-COS is accessed and the LED light corresponding to the stored input number turns on.)
- (4) Operate the UP/DOWN switch of the Step Controller so that steps change and the input terminal of the stored number is selected.

By the above procedure, Probe Selector PS02-COS can be operated in conjunction with Programmable Oscilloscope COS5030-PG in a programmed manner.

#### 5-4. Gain Setting of Individual Inputs

When shipped from the factory, Probe Selector PS02-COS is so adjusted that the ratio between each input and output is 1 (with 50-ohm termination, accuracy  $\pm 5\%$ ). The gain is adjustable continuously-variably down to approximately 1/3 by the user as required. This adjustment can be made with semi-fixed potentiometers inside the case.

To gain access to A-channel input circuit, selector circuit and output circuit, remove the case. To gain access to B-channel input circuit, selector circuit and output circuit, remove the bottom panel.

Gain is adjustable with the blue semi-fixed potentiometers mounted on A4 PC board. They correspond to respective inputs and when the device is shipped from the factory, all of them are set in the extreme clockwise positions. Gain can be reduced by turning them counterclockwise. Note, however, that, when the potentiometer is turned, DC balance of its circuit is disturbed and, consequently, DC balance adjustment must be done in conjunction as gain adjustment is done. (See Figure 5 for the layout of the GAIN and DC BAL controls.)

Note: Never turn other semi-fixed potentiometers than the DC BAL and GAIN adjustment semi-fixed potentiometers.

For gain adjustment of B-channel inputs, remove the bottom panel of the device. The layout of the semi-fixed potentiometers and the adjustment procedure are the same with those of A-channel inputs.

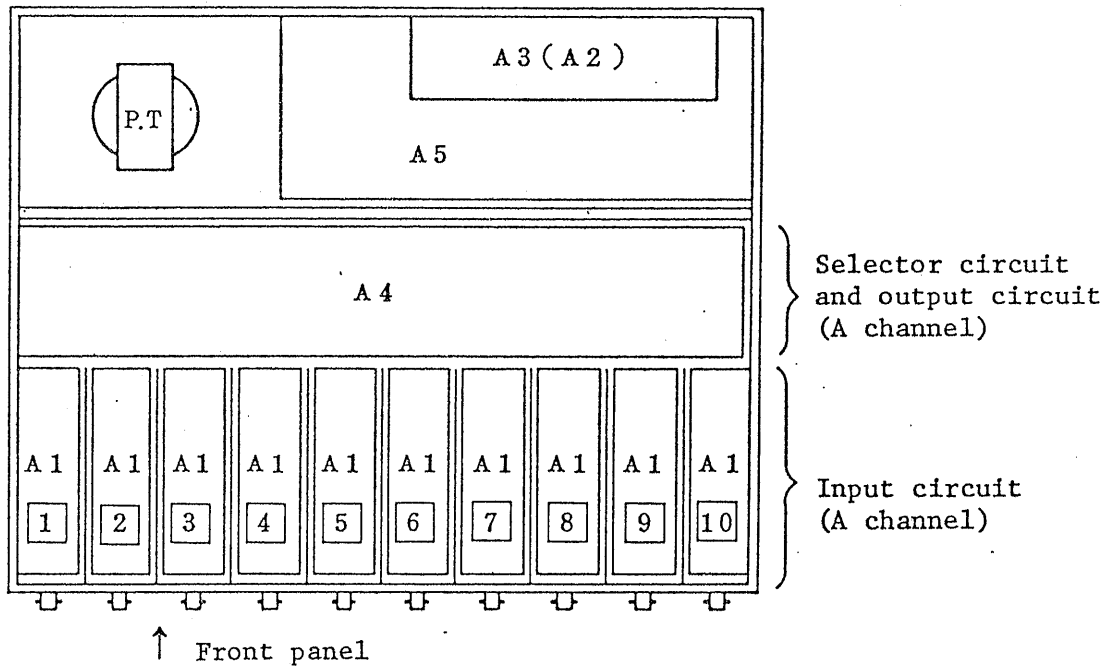


Figure 4. Layout of PC boards of A channel

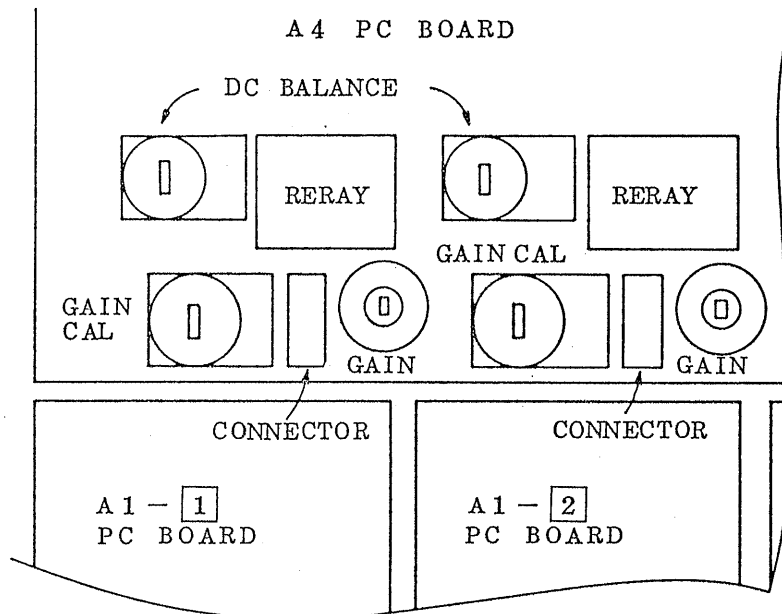


Figure 5. Layout of semi-fixed potentiometers