

Part No. Z1-000-941, IA000144

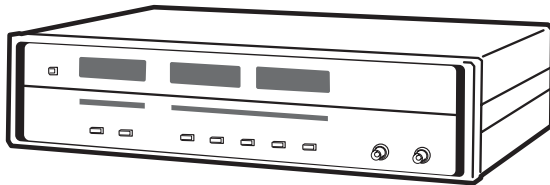
Nov. 2005

# OPERATION MANUAL

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EFM Signal Generator

# KJM2100



## 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 gets lost or soiled, a new Operation Manual can be purchased. In either case, please contact your Kikusui agent, and provide the "Kikusui Part No." given on this page.
- This manual has been prepared with the utmost care; however, if you have any questions, or note any errors or omissions, please contact your Kikusui agent.

All or any parts of this manual may not be reproduced in any forms, without express written permission of Kikusui Electronics Corporation.

The contents of this manual, including the specifications of the instrument, are subject to change without notice.

## Power Requirements of this Product

Power requirements of this product have been changed and the relevant sections of the Operation Manual should be revised accordingly. (Revision should be applied to items indicated by a check mark ✓.)

**Input voltage**

The input voltage of this product is \_\_\_\_\_ VAC,  
and the voltage range is \_\_\_\_\_ to \_\_\_\_\_ VAC.

Use the product within this range only.

**Input fuse**

The rating of this product's input fuse is

\_\_\_\_\_ A, \_\_\_\_\_ VAC, and \_\_\_\_\_ .

### **WARNING**

- To avoid electrical shock, always disconnect the AC power cord or turn off the switch on the switchboard before attempting to check or replace the fuse.
- Use a fuse element having a shape, rating, and characteristics suitable for this product. The use of a fuse with a different rating or one that short circuits the fuse holder may result in fire, electric shock, or irreparable damage.

## Power Requirements of this Product (cont'd)

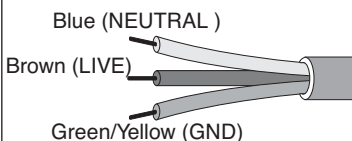
### AC power cord

The product is provided with AC power cords described below. If the cord has no power plug, attach a power plug or crimp terminals to the cord in accordance with the wire colors specified in the drawing.

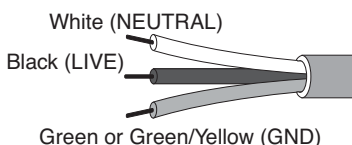
### WARNING

- The attachment of a power plug or crimp terminals must be carried out by qualified personnel.

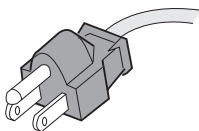
#### Without a power plug



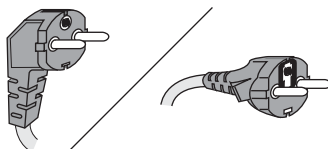
#### Without a power plug



#### Plugs for USA



#### Plugs for Europe



#### Provided by Kikusui distributor/agent

Kikusui agents can provide you with suitable AC power cord. For further information, contact Kikusui distributor/agent.

## Safety Precautions

The following safety precautions must be observed to avoid fire hazard, electrical shock, accidents, and other failures. Keep them in mind and make sure that all of them are observed properly. Kikusui assumes no liability against any damages or problems resulting from negligence of the precautions.

### ■ Users

- This product must be used only by qualified personnel who understand the contents of this operation manual.
- If it is handled by disqualified personnel, personal injury may result. Be sure to handle it under supervision of qualified personnel (those who have electrical knowledge.)

### ■ Purposes of use

- If the product is to be used for purposes not described in this manual, contact your Kikusui agent in advance.

### ■ Input power

- Use the product with the specified input power voltage.
- For applying power, use the AC power cable provided. The shape of the plug differs according to the power voltage and areas. Use the cable which is suitable for the line voltage used.

### ■ Fuse

- With products with a fuse holder on the exterior surface, the fuse can be replaced with a new one. When replacing a fuse, use the one which has appropriate shape, ratings, and specifications.

### ■ Cover

- There are parts inside the product which may cause physical hazards. Do not remove the external cover. If the cover must be removed, contact your Kikusui agent in advance.

### ■ Installation

- When installing products be sure to observe "Precautions for Installation" described in this manual.
- To avoid electrical shock, connect the protective ground terminal to electrical ground (safety ground).

- When applying power to the products from a switchboard, be sure work is performed by a qualified and licensed electrician or is conducted under the direction of such a person.
- Be sure to use the AC power cable provided. Consult your Kikusui agent if other cable than included is to be used for some reason.

## ■ Relocation

- Turn off the power switch and then disconnect all cables when relocating the product.
- Be sure the operation manual be included whenever the product is moved, relocated, or possession is passed to another party.

## ■ Operations

- Check that the AC input voltage setting and the fuse rating are satisfied and that there is no abnormality on the surface of the AC power cable. Be sure to unplug the AC power cable before checking.
- If any abnormality or failure is detected in the products, stop using it immediately. Unplug the AC power cable. Be careful not to allow the product to be used before it is completely repaired.
- For output wiring or load cables, use connection cables with larger current capacity.
- Do not disassemble or modify the product. If it must be modified, contact your Kikusui agent.

## ■ Maintenance and checking

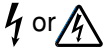
- To avoid electrical shock, be absolutely sure to unplug the AC power cable before performing maintenance or checking.
- Do not remove the cover when performing maintenance or checking. If the cover must be removed, contact your Kikusui agent in advance.
- To maintain performance and safe operation of the product, it is recommended that periodic maintenance, checking, cleaning, and calibration be performed.

## ■ Service

- Internal service is to be done by Kikusui service engineers. If the product must be adjusted or repaired, contact your Kikusui agent.

# Safety Symbols

This operation manual and this product use the following safety symbols. Note the meaning of each of the symbols to ensure safe use of the product. (Using symbols depend on the product. Therefore all of symbols may not be used.)



Indicates the presence of 1000V or higher. Never attempt to touch this part when the power switch of the product is turned on.



Indicates the possibility of personal injury or death. Never fail to follow the operating procedure.

Do not proceed beyond a WARNING sign until the noted conditions are fully understood and met.



Indicates the existence of damage to the product or connected equipment. Always follow the operating procedure.

Do not proceed beyond a CAUTION sign until the indicted conditions are fully understood and met.



Indicates additional information such as operating procedure.

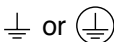


Describes technical terms used in this manual.



Indicates general warning, caution, risk of danger.

When this mark is indicated on the product, refer the relevant section of the Operation Manual.



Indicates a grounding (earth) terminal.



Indicates a chassis grounding terminal.

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# Preface

## General description

EFM Signal Generator Model KJM2100 is equipment for generates output signals (EFM signals) from the optical pickup of a compact disc (CD) player superimposed with jitters.

The highly stable jitter output recommends the Model KJM2100 for use as standard signal source for a jitter meter in the CD player production line.

## Features

- 1) Compatible with a choice of four drive speeds - standard, double, quadruple, and octuple.
- 2) The jitter rate is measured by the 22T delayed sampling method, which is patented by SONY Corporation. It can be set between 0 and 56 ns (x1).
- 3) The jitter frequency is variable (equivalent to an FM modulation frequency).

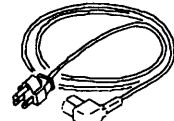


## 1.1 Checkout at Unpacking

When you unpack the product, make sure that you have all the parts and that none have been damaged during transportation. If any parts is damaged or missing, contact your Kikusui agent.

The product is provided with the following accessories

Accessory	Qty.	Check
Operation Manual	1	
AC power cable	1	
Fuse: 0.5A or 1A(inserted in the fuse holder)	2	



- Operation manual
- Fuse
- AC power cable

### CAUTION

- When transporting the product, be sure to use the original packing materials. If they are missing, contact your Kikusui agent.
- When packing the product, remove the AC power cable and all other connection cables.

## 1.2 Precautions for Installation

The following are the precautions for installation which must be observed.

■ Do not use in explosive atmosphere

To avoid explosion or fire hazard, do not use the product in any areas exposed to inflammable materials such as alcohol or thinner.

■ Do not place the product in high-temperature areas or areas exposed to direct sunlight

Do not place the product near heating element, or heater, or in areas exposed to rapid temperature changes.

Maximum operating temperature range : 10 to 40 °C

Guaranteed operating temperature range : 20 to 30 °C

The performance-guaranteed temperature range after calibration is up to  $\pm 2$  °C of the temperature in effect at calibration.

■ Do not place the product in humid areas

Do not place the product in any humid areas such as near a water heater, humidifier, or water tap.

Maximum operating humidity range : up to 85%RH

Guaranteed operating humidity range : 40 to 75%RH

■ Do not place the product in corrosive gas atmospheres

Do not install the product in corrosive gas atmospheres or in environments in which much sulfuric mist is present.

■ Do not place the product in dusty areas

Leave an open space around the product to obtain air flow.

Particularly, the Product would fail to comply with its Product specifications if the air opening on its top is blocked.

■ Do not place the product in any places where the surface tilted or vibrated

■ Do not use the product in any areas exposed to strong magnetic or electric fields.

### 1.3 Checking Input Power Fuse

Though the Product is operable from both 100 V and 200 VAC sources without needing switching, the domestic model comes supplied with a 100 VAC fuse. When operating the Product from a 200 VAC source, replace the filter for safety's sake.

Compatible fuses

Input supply voltage	Compatible fuse	
90 to 126V	1A (T)	AC250V
194 to 250V	0.5A (T)	AC250V

#### CAUTION

- Before using a fuse, check its rating.

A fuse, rated at 1 A, used with a 200 VAC source could fail to blow out even in times of failures.

#### NOTE

- While the maximum allowable input voltages are 90 to 126 V and 194 to 250 V, the Product should be used at the rated voltage of 100, 115, 215, or 230 V.

## 1.4 Grounding

Connect the KJM2100 to an earth ground by means of one of the following two methods:

1. Connect the ⊕ protective grounding terminal at the rear panel to a ground.
2. Connect the Cable to the 3-Way receptacle for which grounding installation has been done

### WARNING

- Improper or no grounding may cause electrical shock.
- Connect the ground terminal to electrical ground (safety ground.)

## 2.1 Initial Operation

1. Check that the **【POWER】** switch is turn OFF.
2. Connect the AC power cable to the power line.
3. Turn ON the **【POWER】** switch.
4. All front-panel indicators will light, indicating the model name and the ROM version number of the unit before the unit enters an initial setup state.

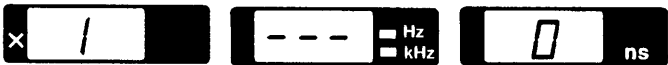
All the indicators light.



The model name "2100" is indicated.



The ROM version number is indicated.



Initial setup state	
CD speed	x 1
Jitter rate	0 ns (OFF)
Jitter frequency	1kHz

————— NOTE —————

· When the jitter rate setting is 0 ns (OFF), the frequency indication appears as "—."

5. For stable operation, warm up the KJM2100 for 60 min or more, KJM2100 has a built-in thermostat, which takes time to stabilize.
6. Press the CAL switch to start internal self-calibration. Press the switch until "CAL" is indicated  
The Calibration time is about three to five minutes to complete.

## 2.2 Setting Output Signals

1. Select the speed of CD rotation to the desired value with the two CD speed keys  
Press the ▲ key for a higher speed or the ▼ key for a lower speed.
2. Select the jitter rate to the desired value, with the two DEVIATION keys.  
Press the ▲ key for a higher rate or the ▼ key for a lower rate



CD speed	Jitter rate setting
x 1	0, 4, 8, 12, 16 · · · · · 52, 56ns
x 2	0, 2, 4, 6, 8, 10 · · · · · 26, 28ns
x 4	0, 1, 2, 3, 4, 5 · · · · · 13, 14ns
x 8	0, 0.5, 1, 1.5, 2, 2.5 · · · · · 6.5, 7ns

3. Select the frequency to the desired value, with the two MODULATION keys.  
 Press the ▲ key for a higher frequency or the ▼ key for a lower frequency.

NOTE

- When the jitter rate setting is 0 ns (OFF), the frequency indication appears as "---," but the ▲ and ▼ keys are still operable.

Jitter frequency
20, 50, 100, 200, 500, 1k, 2k, 5k, 10k 20k, 50k, 100k (Hz)

NOTE

- The KJM2100 is Designed as a calibration apparatus, this product has a guaranteed operating temperature range of 20 to 30°C, with temperature changes after calibration not exceeding ± 2 °C. Use the product in which temperature changes are regulated to 2°C or lower.
- The guaranteed operating humidity range is 40 to 75%RH

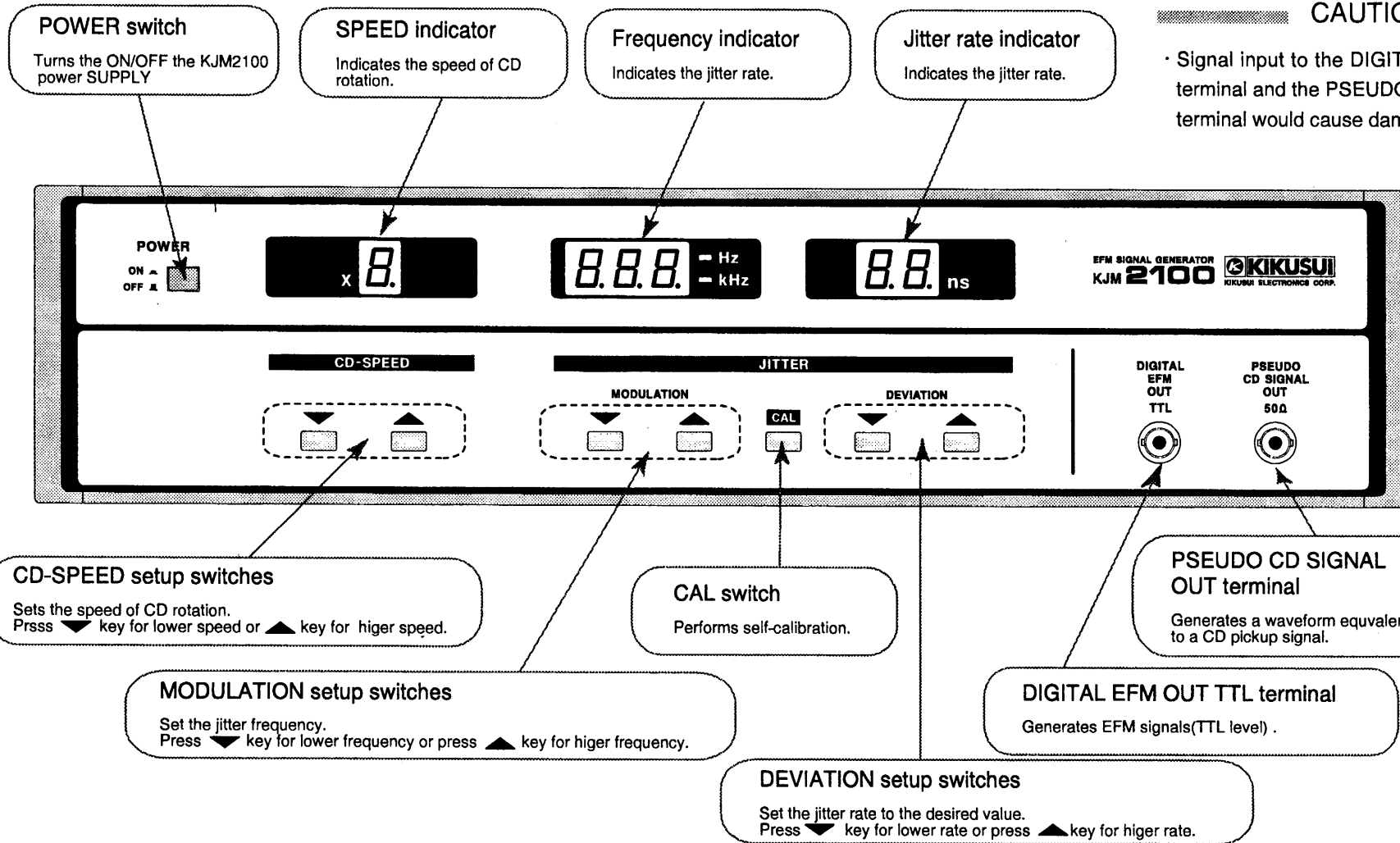


# Chapter 3 Components and Functions

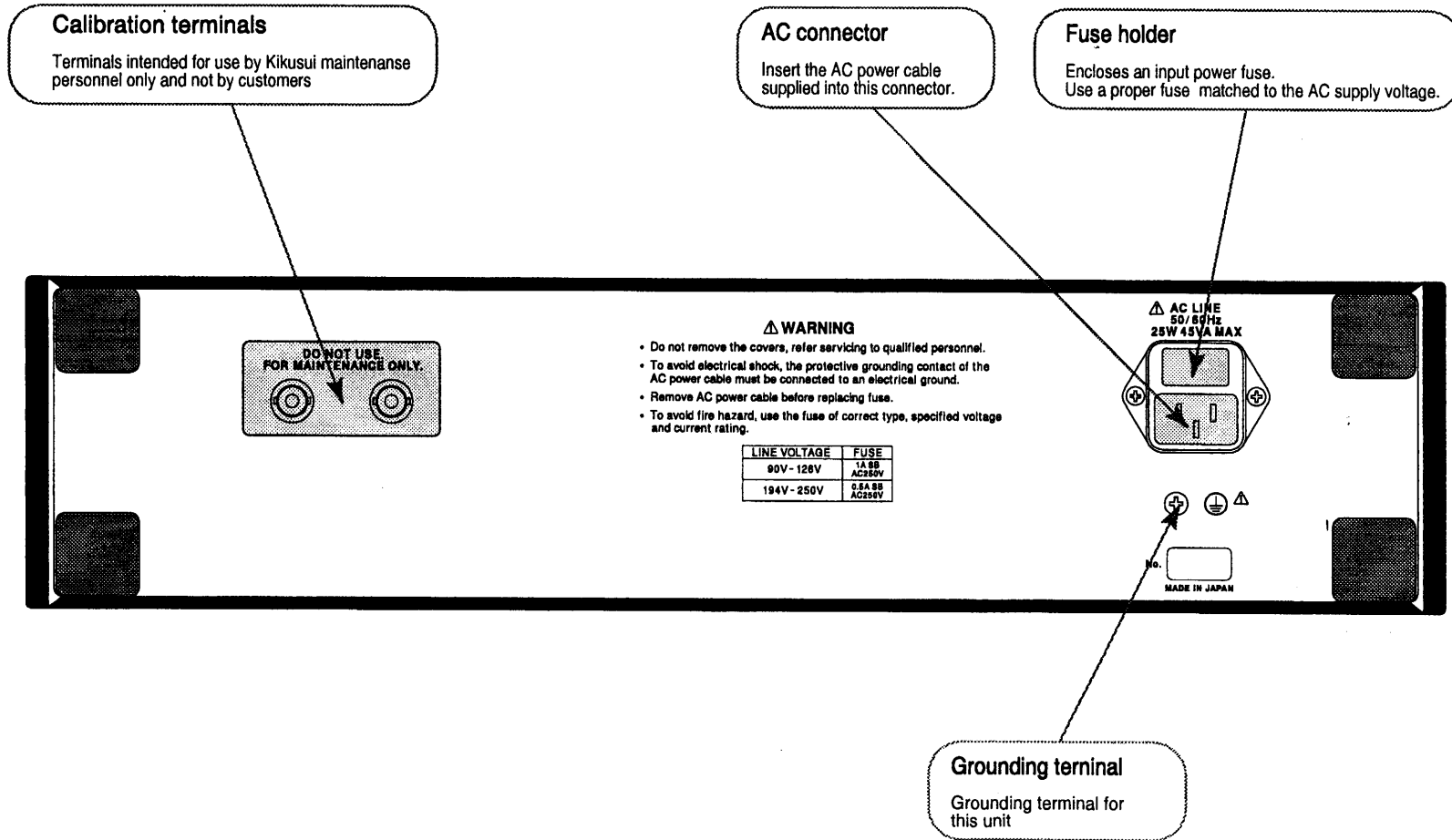
## 3.1 Front Panel

### CAUTION

- Signal input to the DIGITAL EFM OUT TTL terminal and the PSEUDO CD SIGNAL OUT terminal would cause damage to the unit.



### 3.2 Rear Panel



## Chapter 4

# Maintenance

Perform maintenance and inspections periodically to preserve initial performance over an extended period of time.

### 4.1 Cleaning

If the panel surface or any other exterior surface gets smeared, wipe them lightly with a soft cloth moistened with a neutral detergent diluted with water.

#### CAUTION

- Be sure to turn OFF the POWER switch and unplug the unit from the AC outlet before cleaning.
- Do not use organic solvents, such as thinner and benzene. Use of organic solvents could discolor surfaces, erase markings, or cause the display surface to appear white.

### 4.2 Inspection

AC power cable: Check for a broken covering, a loose plug, cracks, etc.

#### WARNING

- Broken insulation may cause electrocution. Immediately disconnect the cable if any break is found.

For accessory purchase, contact our sales representative or sales office.

## 4.3 Calibration

Though KJM2100 is factory-calibrated, it will require calibration to accommodate secular changes after many years of service.

Request calibration your Kikusui dealer or your nearest Kikusui office.

### ————— NOTE —————

- KJM2100 can be calibrated only if it used within Japan.

The following electrical performance specifications are guaranteed within  $\pm 2^{\circ}\text{C}$  of the room temperature change after the self-calibration is performed 60 min. or more after power on. When these conditions are not satisfied, reexecute the self-calibration.

#### CD read speed .....

$\times 1$ ,  $\times 2$ ,  $\times 4$ , or  $\times 8$  selectable

(center frequency: 4.3218 MHz, 8,6436 MHz, 17.2872 MHz, or 34.5744 MHz)

#### EFM signal output signal (Digital EFM signal) .....

Item	Description
Open-ended output amplitude	TTL level
Output impedance	$50\ \Omega \pm 5\%$ , unbalanced
Output terminal	BNC

#### EFM signal output signal (Pseudo CD signal) .....

Item	Description
Open-ended output amplitude (P-P)	$4\text{V} \pm 5\%$
Output impedance	$50\ \Omega \pm 5\%$ , unbalanced
Filter characteristics	MTF Filter(fifth-order phase linear filter)
Output terminal	BNC
Aerture rate	80% or less
Asymmetry	5% or less

Jitter rate

CD speed	Jitter rate setting
× 1	0, 4, 8, 12, 16 · · · · · 52, 56ns
× 2	0, 2, 4, 6, 8, 10 · · · · · 26, 28ns
× 4	0, 1, 2, 3, 4, 5 · · · · · 13, 14ns
× 8	0, 0.5, 1, 1.5, 2, 2.5 · · · · 6.5, 7ns

Jitter rate accuracy

Digital EFM signal ± 0.75%/FS ( Frequency modulation at 1kHz )

Pseudo CD signal ± 1.5%/FS ( Frequency modulation at 1kHz )

Residual jitters

Item	Description
Digital EFM signal ×1 to ×8	200 ps or less
Pseudo CD signal ×1	3.5 ns or less
Pseudo CD signal ×2	2.5 ns or less
Pseudo CD signal ×4	1.2 ns or less
Pseudo CD signal ×8	0.8 ns or less

Jitter frequency

20, 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20k, 50k, 100k(Hz)

Accuracy: ±5%



## General Specifications

Item	Description
power supply	
Rated voltage	100, 115, 215, 230V
Rated frequency	50Hz or 60Hz
Max. permissible input voltage	90 to 126VAC, 194 to 250VAC
Max. permissible input frequency	45 to 65Hz
Power consumption	25W or less (45VA or less)
Device	
Dimensions	430W × 99H × 296Dmm
Weigh	Approximately 5.6kg
Insulation resistance	30MΩ or more (500V)
Withstand voltage	1000V AC (1minute)
Environment	
Guaranteed operating temperature/humidity range	20 to 30°C, 40 to 75%
Max. operating temperature/humidity ranges	10 to 40°C 85% or less
Accessories	
Power cable	1
Operation manual	1
Fuse	2 (inserted in the fuse holder)

## Rack-Mount Options

Description	Model	Code
JIS standard rack-mount bracket	BH2M-KSG	98930
EIA standard rack-mount bracket	BH3-KSG	82800

EFM Signal Generator

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