

# YAMAHA

# CRW4416SX

## SERIES

English

Français

Deutsch

## User Guide

## Guide de l'utilisateur

## Bedienungsanleitung



# COMPLIANCE INFORMATION STATEMENT

## (DECLARATION OF CONFORMITY PROCEDURE)

Responsible Party: Yamaha Systems Technology, Inc.  
Address: 100 Century Center Court  
San Jose, California 95112  
Telephone: (408) 467-2330  
FAX: (408) 437-8791  
Type of Equipment: CD Recorder  
Model Name: CRW4416SX

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following conditions:

- 1) this device may not cause harmful interference, and
- 2) this device must accept any interference received including interference that may cause undesired operation.

See user manual instructions if interference to radio reception is suspected.

### FCC INFORMATION (U.S.A.)

**1. IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!**

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.

- 2. IMPORTANT:** When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product **MUST** be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

- 3. NOTE:** This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the product "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

Relocate either this product or the device that is being affected by the interference.

Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s.

In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial type cable.

If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Systems Technology, Inc. 100 Century Center Court, San Jose, CA95112, U.S.A.

**Laser Diode Properties**

Material : GaAlAs

Wavelength : 783-789 nm

Emission Duration : Continuous

Laser Output Power : Less than 44.6  $\mu$ W\*

\* This output is value measured at a distance 200mm from the objective lens surface on the optical pick-up block.  
ANSI Class : Class 1

**CAUTION**

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

**ADVARSEL**

USYNLIG LASERSTRÅLING VED ÅBNING.  
UNDGÅ UDSÆTTELSE FOR STRÅLING.

**VAROITUS**

LAITTEEN KÄYTTÄMINEN MUULLA  
KUIN TÄSSÄ KÄYTTÖOHJEESA  
MAINITULLA TAVALLA SAAKTA  
ALTISTAA KÄYTTÄJÄN  
TURVALLISUUSLUOKAN 1  
YLITTÄVÄLLE NÄKYMÄTTÖMÄLLE  
LASERSÄTEILYLLE.

**VARNING**

OM APPARATEN ANVÄNDS PÅ ANNAT  
SÄTT ÄN I DENNABRUKSANVISNING  
SPECIFICERATS, KAN ANVÄNDAREN  
UTSÄTTAS FÖR OSYNLIG  
LASERSTRÅLNING, SOM ÖVERSKRIDER  
GRÄNSEN FÖR LASERKLASS 1.

CLASS 1 LASER PRODUCT  
LASER KLASSE 1 PRODUKT  
LUOKAN 1 LASERLAITE  
PRODUIT LASER DE CLASSE 1

This compact disc player is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT label must be located on the exterior.

VORSICHT : UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG  
GEOFFNET. NICHT DEM STRAHL AUSSETZEN.

VARNING : OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH  
SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN ÄR FARLIG.

VARO! : AVIATAESSA JA SUOJALUKITUS OHITETTAESSA OLET  
ALTINA NÄKYMÄTTÖMÄLLE LASERS TEILYLLE. ÄLÄ KATSO SÄTESSEN.

ADVARSEL : USYNLIG LASERSTRÅLNING VED ÅBNING NÄR SIKKERHETS-  
BYDERE ER UDE AF FUNKTION. UNGDÅ UDSÆTTELS FOR STRÅLING.

Varningsanvisning för laserstrålning.

## Important Precautions

Please read the following precautions before operating CRW4416SX.

- Do not remove the CRW4416SX's top cover. This device uses semiconductor laser. Refer all servicing to qualified personnel.
- Do not attempt to touch the inside of the CRW4416SX. Electricity may have been built up even after you turn off the power.
- CRW4416SX is a sophisticated electronic device. Handle it with care.
- If the fuse blows, CRW4416SX should be checked by a qualified engineer. Do not just replace the fuse. Replacing the fuse by yourself may cause the protection circuit to be damaged.
- The CRW4416SX uses high-density circuits and LSIs. Even a small incident may cause malfunctions to occur.
- If CRW4416SX operates incorrectly, See "Trouble-shooting" on page 13. If the problem persists, consult your CRW4416SX dealer.
- Yamaha is not responsible for any data or information losses resulting from the operation of CRW4416SX.

## **Installation Precautions**

- Install CRW4416SX on a level surface.
- Do not install CRW4416SX near water, in direct sunlight, close to heating units, or in areas subject to high or low temperature extremes, excessive dust, vibration, or severe shocks.
- Do not expose CRW4416SX to extremes of humidity.
- The ambient temperature where CRW4416SX is installed should be between 5°C and 40°C (41°F–104°F).
- Using CRW4416SX close to a television or radio may cause interference. Install CRW4416SX at least one meter away from television and radio equipment.
- Do not block the CRW4416SX ventilation slots. Install CRW4416SX with at least 10 cm of free space all-around.
- Make sure the CRW4416SX power cord is not located in a position where it is likely to be walked on or pinched by other equipment.

## **Operating Precautions**

- Do not subject CRW4416SX to impact or shock when in use. This may impair recording or playback.
- Do not place heavy objects on CRW4416SX.
- Avoid moving CRW4416SX from cold to warm places, and avoid sudden room temperature rises, as condensation that could cause CRW4416SX to malfunction may occur. If condensation does occur, wait at least one hour before operating CRW4416SX.
- Do not let liquid or other foreign objects enter CRW4416SX.
- To reduce the risk of electric shock, do not expose CRW4416SX to rain or moisture.
- Always remove the disc before transporting CRW4416SX.
- CRW4416SX uses an optical pickup that is sensitive to dust and dirt. Make sure that the disc tray and disc are free of dust and dirt before loading.
- Use only the power cable supplied. Other cables may cause interference when CRW4416SX is used near to radio and television equipment.
- CRW4416SX should be connected only to an AC receptacle of the type described in this User Guide or as marked on the rear panel of CRW4416SX.
- Use a soft dry cloth to clean CRW4416SX. Stubborn dirt can be removed using a cloth dampened with water and neutral detergent solution. Do not use benzine or solvent based cleaners on CRW4416SX.

## Preventing Premature Disc Failure

The NUMBER ONE cause of premature disc failure with recordable CDs is contamination of the recording surface before recording is completed. To minimize disc failure, use the following disc-handling guidelines:

- Keep the disc tray and disc as clean and dust-free as humanly possible during the record process. DO NOT touch the recording surface, and do not expose the disc tray and disc to dust or dirt.
- DO NOT BLOW ON THE DISC to remove dust or dirt. To remove dust from the recording surface use a camera lens bulb. Be sure to follow the instructions when using the cloth.
- To remove stubborn dirt or grease from the recording surface use only nonabrasive foam-tipped swabs (such as Chemtronics Foamtips #120) with a small amount of pure, denatured alcohol. To avoid scratching the recording surface BE SURE TO USE ONLY LIGHT STROKES, beginning at the disc center, pulling directly towards the disc's outer edge.
- Always record in a dust-free environment. If the disc must be removed from CRW4416SX before recording is finished, store the disc in a clean, dust-free environment.
- If a disc tray accumulates dust, DO NOT USE IT FOR DISC RECORDING. Always use a clean, dust-free tray for disc recording.

If CRW4416SX is vibrated while recording, the recording may fail. To avoid such failures observe the following practices:

- Place CRW4416SX on a solid, stable surface, away from high-traffic areas. The surface must allow CRW4416SX to operate in a level, horizontal position.
- Avoid touching or handling CRW4416SX when recording.

**Note:** *Once the disc has been finalized (and no more recording is possible), it can be handled with the same care that any CD should be handled.*

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## Introduction

Thank you for purchasing a Yamaha CRW4416SX drive.

Please read this manual before using the drive in order to make the best use of the superior CRW4416SX functions.

After reading, please retain this manual for future reference.

### **CRW4416SX Features**

- **4xS Recording (Rewritable) - 4xS Recording (Recordable) - 16xS Reading**

The CRW4416SX is able to write (overwrite) CD-RW discs at quad speed, double speed, and is able to write CD-R discs at quad speed, double speed, or normal speed.

CD-R discs can also be read at a maximum of 16X speed.

- **Compatible with Seven Different Formats**

The CRW4416SX can both record and read seven different formats: CD-ROM, CD-ROM XA, CD-I, CD-DA, CD-Bridge (multisession), CD-Extra, and Video CD.

The CRW4416SX is also equipped with an analog audio output terminal (headphones) for CD-DA.

- **SCSI 2 Interface**

The CRW4416SX features SCSI 2 interface for connecting computers and peripheral devices.

- **Compatible with Windows 95, Windows 98 Plug and Play**

SCSI IDs are set automatically by the SCAM protocol (level 1).

- **Orange Book Part 2, Part 3 Compatible 5-Mode Recording**

The CRW4416SX conforms to the five recording modes outlined in the Orange Book Part 2 and 3: Track at Once, Multisession, Disc at Once, Session at Once, and Packet Writing.

### Orange Book Compatible Recording

#### **Track at Once**

In this mode, data can be recorded to disc one track at a time. Discs recorded in this mode cannot be played in CD players or CD-ROM drives other than a CD-RW or a CD-R drive until the session is closed.

#### **Multisession**

In this mode, data can be recorded to disc in stages (one session at a time). Additional data can be written later.

#### **Disc at Once**

In this mode, data can be recorded to an entire disc in one pass. It is not possible to write additional data later.

#### **Session at Once**

In this mode, data can be recorded to disc one session at a time. To use this mode, your software must support Session at Once recording. New sessions can be written later.

#### **Packet Writing**

This is useful for data back-up. Smaller units of data can be added to tracks. To use this mode, your software must support Packet Writing. The CRW4416SX supports both sequential and random packet writing.

## Chapter 1 - System Configuration

Before using the CRW4416SX, make sure that you have all of the items on the list of included items.

In order to use the CRW4416SX, you will require the following.

### Computer

The following operating environment is required:

#### For an IBM/AT compatible computer

- 100MHz or faster Pentium CPU (in order to write at 4x speed)
- A vacant slot in which to install a SCSI card or a pre-installed SCSI card
- Windows 95, Windows 98 or Windows NT4.0(Service Pack 3)
- Sufficient hard disk space

**Note:** *If you wish to create an image file and write it to a CD-R or CD-RW, you will need approximately 750 MB of free space on your hard disk as work area.*

- SCSI card

This is required in order to connect a SCSI device (the Yamaha CRW4416SX) to your computer.

We recommend the following:

Adaptec SCSI cards: AHA-2940 (PCI), AHA-154x (ISA)

#### For a Macintosh computer

- A Macintosh computer that is equipped with a Power PC CPU or Higher

**Note:** *If you wish to create an image file and write it to a CD-R or CD-RW, you will need approximately 750 MB of free space on your hard disk as work area.*

### Software

Use writing software or packet writing software which supports the CRW4416SX or CRW4416S.

For software-related questions, please read the owner's manual for your software.

### Discs

#### ■ CD-R discs

Please use discs that are compliant with Orange Book Part 2.

(If you wish to write data at 4X speed, you must use discs which support high-speed writing.)

#### ■ CD-RW discs


Please use discs that are compliant with Orange Book Part 2.


(If you wish to write data at 4X speed, you must use discs which support 4X speed writing.)

Yamaha recommends the following Yamaha CD-RW discs:

- CRWM74B4X (φ120mm, 74 minutes)
- CRWM74R4X (φ120mm, 74 minutes)

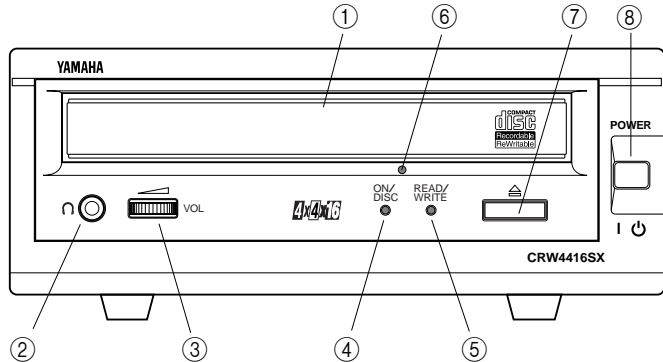
#### ■ Read-only Discs

You can use discs with the  logo which conform to the Compact Disc Read Only Memory standard (CD-ROM standard, Yellow Book).

If you wish to use the audio functions, use discs with the  logo, which conform to the Compact Disc Digital Audio standard (Red Book).

## Chapter 2 - Touring Around CRW4416SX

### Front Panel



① **Disc tray**

The disc is inserted and ejected here. Pressing the eject button will open the tray.

② **Headphone jack**

This stereo mini jack allows you to connect headphones and listen to audio.

③ **Headphone volume control**

This control adjusts the volume level of the headphone output. Rotating the control clockwise will increase the volume level.

④ **ON/DISC LED**

This indicator lights up in orange when the CRW4416SX is powered on, and lights up in green when the CRW4416SX contains a disc.

⑤ **READ/WRITE LED**

This indicator lights up in green when data is being read, and flashes when data is being accessed. It also lights up in orange when data is being recorded on a disc.

⑥ **Manual Eject hole**

This is used to manually eject a disc that cannot be ejected in the normal way. It is for emergency use only.

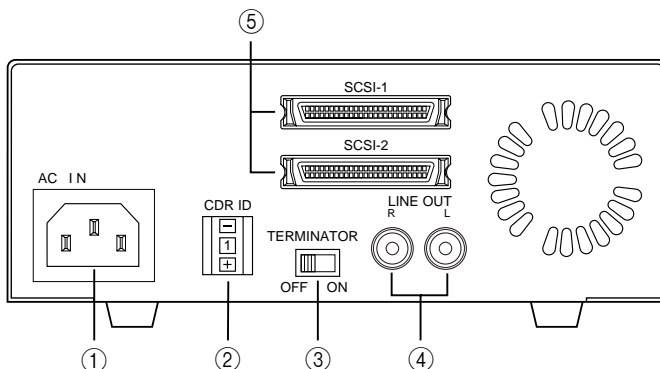
⑦ **Eject button**

This button is used to open or close the tray.

⑧ **POWER switch**

This is the main power switch. Use it to power CRW4416SX on and off. CRW4416SX and any other devices connected to the SCSI chain must be powered on before the host computer is powered on.

### Rear Panel



① **AC IN**

Connect the included power cable here.

② **CDR ID**

Use this switch to set a unique SCSI ID number for the CRW4416SX.

③ **TERMINATOR**

This switch is used to set termination. Refer to the terminator setting section for details.

④ **LINE OUT (L, R)**

These jacks are used to output audio to the amplifier.

⑤ **SCSI-1, SCSI-2**

These connectors are used to connect the CRW4416SX in the SCSI daisy chain.

## Chapter 3 - Installing the Yamaha CRW4416SX Drive

### CRW4416SX drive settings

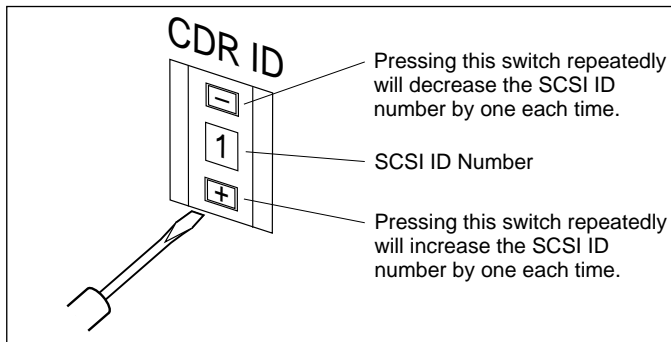
#### ■ SCSI ID settings

The SCSI ID number is used so that the computer will recognize a connected SCSI device. You can assign 0 through 7 as the SCSI ID number. Usually, “7” is reserved for the SCSI card ID number, and “0” is reserved for the first SCSI device in the chain. Use a number between 1 and 6 for the CRW4416SX.

Use the switch on the rear panel to set a SCSI ID number. The factory set ID number is “1”.

**Caution:** *If you are using other SCSI devices, be sure to use a unique ID number for each device. Be sure to turn off the power to the drive before you set the SCSI ID number.*

**Note:** *When you are using Windows 95 or Windows 98, and if the SCSI ID setting on the rear panel is the same as the number assigned to another SCSI device, the Plug and Play component of Windows 95 or Windows 98 will automatically assign an unused number to the CRW4416SX (SCAM protocol level 1).*




### ■ Terminator setting

The terminator setting indicates whether or not this device is the last connected SCSI device.

#### Terminator ON

TERMINATOR  Use this setting if the CRW4416SX is the last device in the SCSI daisy-chain.

#### Terminator OFF

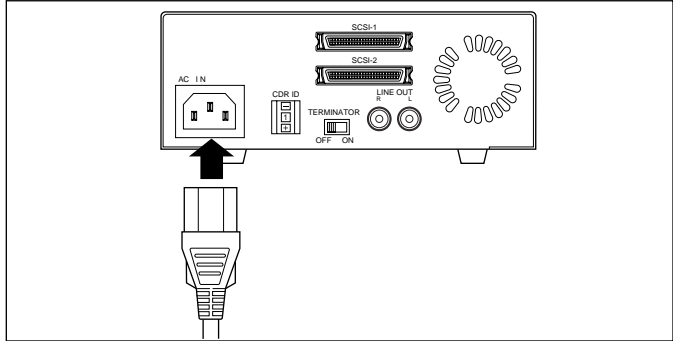
TERMINATOR  Use this setting if devices other than the CRW4416SX are in the SCSI daisy-chain and the CRW4416SX is not the last device.



## Cable Connection

### Power cable

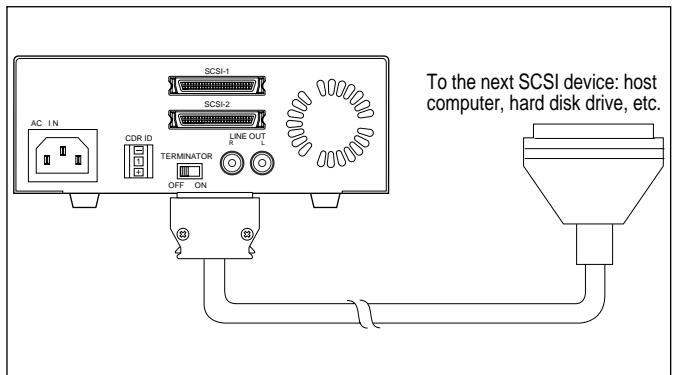
Insert the power cable securely to the “AC IN” connector on the rear panel.



### SCSI cable

Connect the SCSI cable to either of the CRW4416SX rear panel SCSI connectors (1) or (2), and connect the other end of the SCSI cable to the host computer.

The CRW4416SX is not supplied with a SCSI cable. You will need to obtain one that will fit the drive and the host computer connectors.

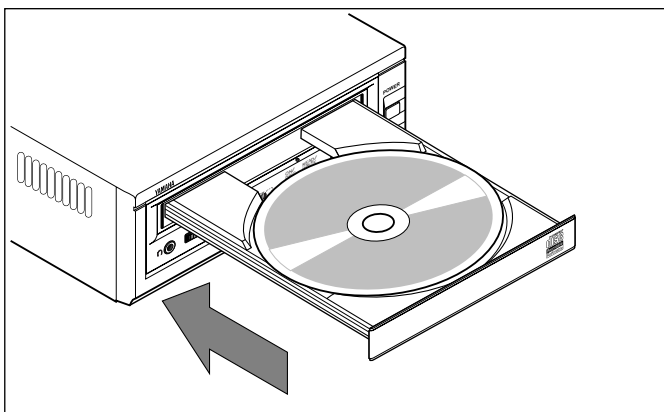


## Chapter 4 - Operation

### Loading a Disc

1. Press the eject button to open the tray.
2. Carefully place the disc, label-side up, on the disc tray.
3. Press the eject button again to close the disc tray.

**Important:** Take great care when handling CD-ROM discs. They are more sensitive to damage than audio CDs, and the slightest scratch can render a disc useless. Do not expose discs to dust, dirt, heat, or moisture.



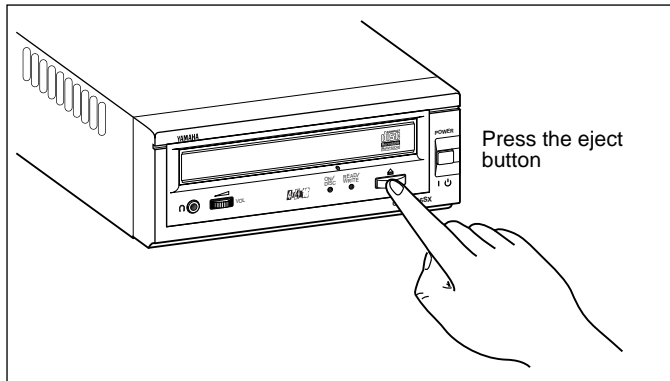
## Ejecting the Disc

### If the CRW4416SX is powered on:

Press the eject button to eject the disc.

**Note:** You cannot eject the disc if the SCSI command prohibits the eject operation while the CRW4416SX is reading data.

**Caution:** Be sure to remove the disc after it is completely ejected. (Trying to remove the disc before it is completely ejected may cause the drive to malfunction.)



### If the CRW4416SX is not powered on:

Pressing the eject button will not eject the disc.

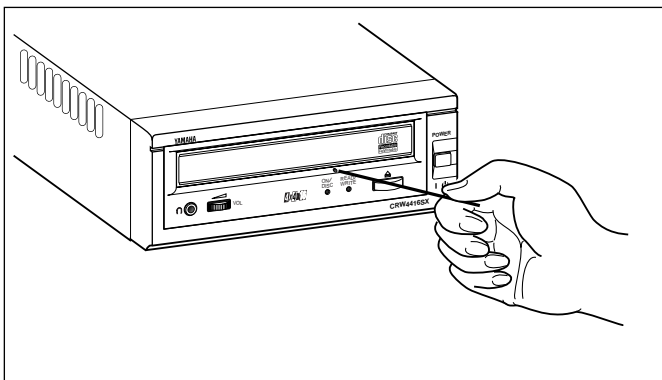
### Manual Eject (emergency use)

Here we explain how to eject the disc when it cannot be ejected in the normal way; for example, the power is shut off inadvertently or the loading mechanism fails. This technique should be used only as a last resort. Frequent use may lead to malfunction.

You'll need a pin-like object of 2 mm or less in diameter to do this. A straightened paper clip makes an ideal tool.

- 1. Insert the pin-like tool into the manual eject hole and push gently.**

The spring-loaded mechanism ejects the disc.



- 2. After manually ejecting a disc, you must turn off the power supplied to the CRW4416SX, then turn it on before continuing.**

## Troubleshooting

If CRW4416SX is not performing as expected, look up the symptoms in the following table, and take the appropriate corrective action.

| <b>Symptoms</b>                                 | <b>Corrective action</b>  |
|---|---|
| The power to the CRW4416SX is off               | <ul style="list-style-type: none"> <li>• Check the AC power cable connection.</li> </ul>  |
| The power to the computer is off                | <ul style="list-style-type: none"> <li>• Check to see if the SCSI card is correctly installed.</li> </ul>   |
| The CRW4416SX is not recognized by the computer | <ul style="list-style-type: none"> <li>• Check the SCSI cable connection.</li> <li>• Make sure that SCSI ID numbers are assigned exclusively.</li> <li>• Make sure that the last device in the SCSI daisy chain is terminated correctly.</li> </ul>           |
| The disc tray will not open                     | <ul style="list-style-type: none"> <li>• Make sure that the power to the drive is turned on.</li> </ul>   |
| The disc ejects                                 | <ul style="list-style-type: none"> <li>• Make sure that the disc is seated in the tray correctly.</li> </ul>  |
| Incorrect operation                             | <ul style="list-style-type: none"> <li>• Make sure that the disc is seated in the tray correctly.</li> <li>• Make sure that you are using the correct disc.</li> <li>• Make sure that there is no dust, dirt, or condensation on the disc or tray.</li> </ul> |

**Caution:** *Applying physical shock or vibration to the CRW4416SX while a CD-R disc or CD-RW disc is being written may produce writing errors.*

**Note:** *In the case of CD-RW fixed packet writing, the recordable capacity will be approximately 100 Mbytes less than the capacity indicated on the blank disc. This is due to differences in the recording format.*

# Appendix

## Specifications

|                             |  |
|-----------------------------|--|
| Interface                   | SCSI 2   |
| Data Capacity               | 650MB (74 minutes disc)<br>550MB (63 minutes disc)   |
| Record/Read Speed           | Writing (CD-RW):<br>2X speed, 4X speed (when 4X compatible discs are used)<br>Writing (CD-R): 1X speed (real-time), 2X speed, 4X speed<br>playback: 9 - 16X speed [Max] (partial CAV)<br>Note) Read CD-DA: 10X speed [Max]<br>Read Video CD: 6X speed [Max]<br>CD-DA output is 1X speed playback only<br>Finalized Disc<br>CD-R: 16X speed [Max] (packet writing is 10X speed [Max])<br>CD-RW: 6X speed [Max] (packet writing is 6X speed [Max])<br>Unfinalized Disc: 6X speed [Max] |
| Data Transfer Rate          | 150 - 2400KB/sec   |
| Burst Transfer Rate         | 5MB/Sec [Max] (asynchronous transfer)<br>8MB/Sec [Max] (synchronous transfer)  |
| Buffer Size                 | 2MB (666 sectors)  |
| Access Speed                | 180 ms (Random access at reading)  |
| Installation                | Horizontal   |
| Disc Loading                | Tray   |
| Audio Out<br>(normal speed) | Frequency Response 20 - 20,000Hz (Line Out)<br>Output Level 1 Vrms (Line Out)  |
| Power Consumption           | 16W (read/write)   |
| Power Supply                | 100 - 240V, 0.3A   |
| Environment                 | Temperature: +5°C - +40°C<br>Humidity: 25 - 80% (condensation must not occur)  |
| Dimensions (WxHxD)          | 170 x 68 x 327 mm<br>(Excepting the projection on the bottom of the front panel.)  |
| Weight                      | 2.6 kg   |

Specifications are subject to change without prior notice.

## Front Panel Indicator Key

- on: green                      ☼ flashing: green                      — off
- on: orange                      ☼ flashing: orange

| Status                | ON/DISC | READ/WRITE |
|-----------------------|---------|------------|
| Reset                 | ○ ■■ —  | ○ ■■ —     |
| Ready (no disc)       | ○       | —          |
| Inserting disc        | ☼ ■■ ☼  | —          |
| Ejecting disc         | ☼       | —          |
| Ready (disc inserted) | ●       | —          |
| Seeking               | ●       | ☼          |
| Preparing to write    | ●       | ☼          |
| Writing               | ●       | ○          |
| Writing (test mode)   | ●       | ☼          |
| Playback              | ●       | ●          |



English: If you have any questions, please contact your dealer or one of the following companies.

French: Pour plus de détails sur les produits, veuillez vous adresser à Yamaha ou au distributeur le plus proche figurant dans la liste suivante :

German: Bei weiteren Fragen wenden Sie sich Bitte an Ihren Händler oder eine der folgenden Firmen.

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