Operation Manual

Quad Amplifier

QD-4240/4480/4960
QX-4960



* Rack mount products in the Western Hemisphere(North America, South America, and the Caribbean) do not have handles installed due to customer preference.

interM

Contents

Welcome 1

Installation
- Environment 2
- Important Safety Instructions 2

Features 3

Operation 3

Suggested Applications 3

Front Panel 4

Rear Panel 5

Speaker Connections 8

Speaker Connection Procedures 12

Troubleshooting 14

Applications 15

Block Diagram 18

Specifications 22

Service
- Procedures 23
- Schematic 23
- Parts List 23

Variations and Options 23

Warranty 23

Welcome

A personal welcome to you from the management and employees of Inter-M

All of the co-workers here at Inter-M are dedicated to providing excellent products with inherently good value, and we are delighted you have purchased one of our products.

We sincerely trust this product will provide years of satisfactory service, but if anything is not to your complete satisfaction, we will endeavor to make things right.

Welcome to Inter-M, and thank you for becoming part of our worldwide extended family!



WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.



This symbol is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operation and maintenance (servicing) instructions in the literature accompanying the appliance.

Caution: To prevent electric shock do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

Attentions: Pour prévenir les chocs électriques ne pas utiliser cette fiche polarisée avec un prolongateur, une prise de courant on une autre sortie de courant, sauf si les lames peuvent étre insérées à fond sans en laisser aucune partie à découvert.

*Do not install this equipment in a confined space such as a book case or similar unit.
*The apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such vases, shall be placed on the apparatus.
*Worded: “WARNING FOR YOUR PROTECTION PLEASE READ THE FOLLOWING-WATER AND MOISTURE: Unit should not be used near water(e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so than objects do not fall and liquids are not spilled into the enclosure through openings.”

Unpacking

Although your QD-4240/4480/ 4960/ QX-4960 is neither complicated nor difficult to operate, we recommend you take a few minutes to read this brief manual and familiarize yourself with the important information regarding product features, setup and operation.

As with most electronic devices, we strongly recommend you retain the original packaging. In the unlikely event the product must be returned for servicing, the original packaging (or reasonable equivalent) is required.

Installation

Environment

Never place this product in an environment which could alter its performance or reduce its service life. Such environments usually include high levels of heat, dust, moisture, and vibration.

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



Features

- FOUR CHANNEL AMPLIFIER
Four channels in a single chassis.

- ADVANCED PROTECTION CIRCUITRY
Thermal overload protection, DC detection circuitry and power-on delay help protect your amplifier and system components.

- BRIDGED MONO OPERATION
Can operate in monaural mode for high-power and performance.

- SLIM DESIGN, COMPACT SIZE
Streamlined design fits in a compact 2RU space.

- INTEGRATED CROSSOVER
The QX-4960 features a built-in crossover for easy and convenient system integration.

Accessories

One detachable AC power cord is provided for use with this product.

Operation

Make certain that speakers and input sources are properly connected before switching on.

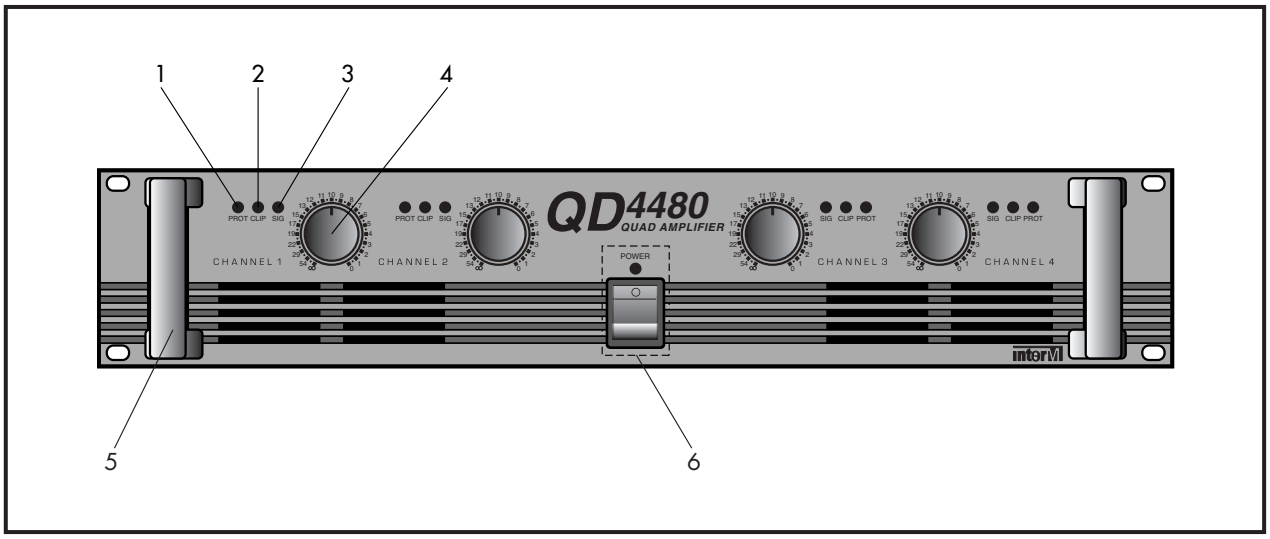
Keep volume levels at minimum gain before switching on.

NOTE: The system's operation is delayed by approximately three seconds after pressing the AC Mains power switch. This is due to the built-in protection circuitry, designed to protect speakers and other system components.

Suggested Applications

- Home Theater/Multimedia
- Surround-Sound Playback or Mixing
- Stereo System with Subwoofer
- Distributed Sound Installations

Front Panel



1. PROTECTION INDICATOR

This LED indicates the state of the amplifier's protection circuitry. When the Protection LED is on (illuminated), the protection circuitry is active, indicating that the unit is not operating normally. This is typically due to overheating or power limiting. Please check the Input and Output condition of the amplifier.

2. CLIP INDICATORS

These LEDs light when the channel's level reaches approximately 0.5%, indicating excessive input levels. When the Clip Indicators glow steadily, reduce the input to the amplifier.

3. SIGNAL INDICATORS

These LEDs light when the channel's level exceeds approximately 2Vrms, indicating the presence of audio signal input to the amplifier channel.

4. INPUT ATTENUATORS

These are 21-step detented input signal attenuators, used to increase or decrease the input level to the amplifier.

5. HANDLES

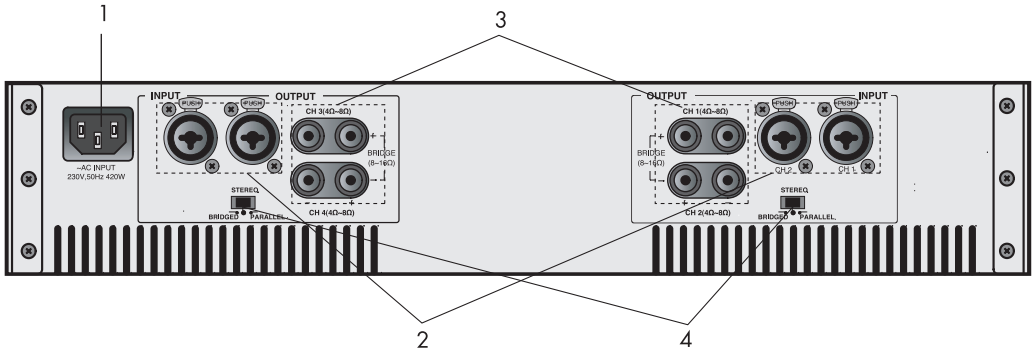
Heavy-duty handles are provided to easily carry or position the amplifier.

6. POWER SWITCH

This switch switches the unit on, as indicated by the Power LED directly above the switch.

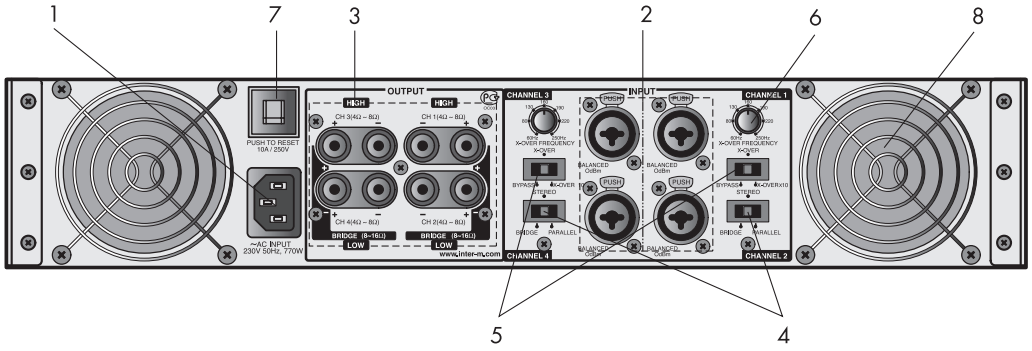
Real Panel

- QD-4240/4480



* **A NOTE ABOUT VENIILATION** : The fan vents provide hot air out of the unit. It is important to keep them free of obstructions, to prevent the unit from overheating. It us also important to operate the unit in a dust-free environment.

- QD-4960, QX-4960

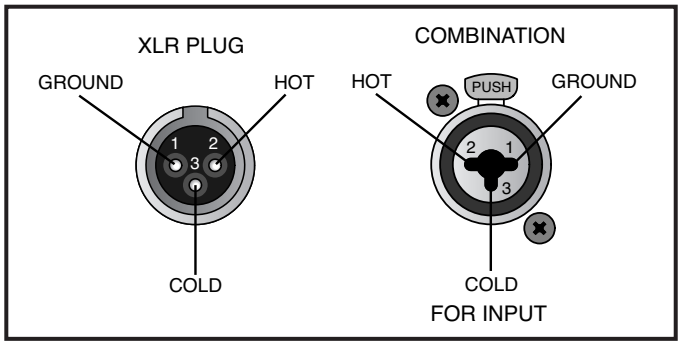


1. AC POWER INPUT

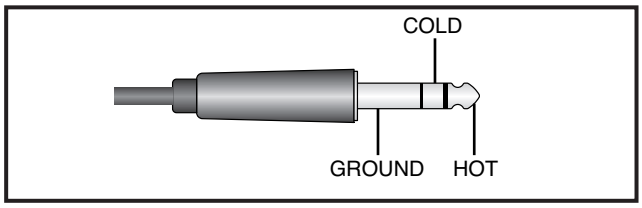
Connect the supplied standard AC input cable here.

2. AUDIO INPUTS 1-4

Balanced input connectors are provided on hybrid XLR/TRS jacks. The XLR connectors are wired with Pin 1 as Ground, Pin 2 as hot (+) and Pin 3 as cold (-), as shown below.



The TRS connectors are wired as Tip as hot (+), Ring as cold (-), and sleeve as ground, as shown below.

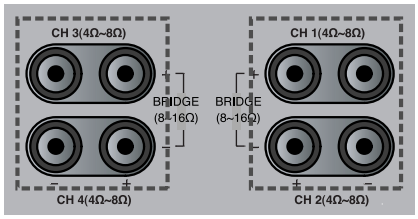


3. SPEAKER OUTPUT TERMINALS

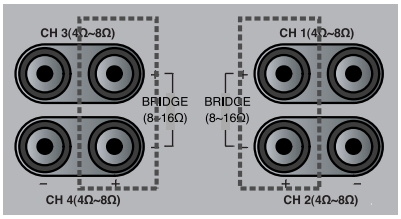
These five-way binding posts are used to connect speakers to the unit. Do not connect the two outputs of a single channel by connecting them together, or in parallel with any other amplifier.

Speakers may be connected in Stereo or Bridged Mono mode. Pleaser refer to the illustrations below.

- STEREO MODE



- BRIDGED MODE



4. MODE SELECTOR

Use this switch to select the amplifier's mode of operation.

- STEREO MODE

In this mode, each channel operates independently, with channels 1 and 2 operating as a stereo pair, and channels 3 and 4 operating as a second stereo pair. In this mode the minimum speaker impedance is 4Ω.

- BRIDGED MODE

In this mode, all four channels are bridged together and function as a single mono amplifier. In this mode the minimum speaker impedance is 8Ω. (Note that in this mode the volume controls for channels 2 and 4 are inactive.)

- PARALLEL MODE

In this mode, channels 1 and 2 operate as two separate mono amplifiers. In this mode the minimum speaker impedance is 4Ω. (Note that in this mode the volume controls for channels 3 and 4 operate identically to the volume controls for channels 1 and 2.)

5. CROSSOVER MODE SWITCH (QX-4960 ONLY)

This switch selects the operational mode of the built-in crossover circuitry.

- **BYPASS:** Select this setting when using the amp in bridged mono mode. The crossover is not used.
- **X-Over:** Select this mode when running in bi-amped mode. Amp channels 1 and 3 are used for high frequencies, channels 2 and 4 are used for low frequencies. Crossover frequency range is 60Hz ~ 250Hz.
- **X-Over x 10:** In this mode the crossover frequencies from 60Hz to 250Hz or from 600Hz to 2.5kHz are chosen by the Crossover Frequency Adjustment switch (6).

※**IMPORTANT:** To prevent speaker damage, switch off the power before changing Crossover Mode.

6. CROSSOVER FREQUENCY ADJUSTMENT (QX-4960 ONLY)

This knob controls the relative frequency of the integrated crossover.

7. CIRCUIT BREAKER

This Circuit Breaker Functions as AC overload protection. If the Circuit Breaker has been tirpped, push to reset. If the Circuit Breaker continuesto trip, refer servicing to a qualified service technician.

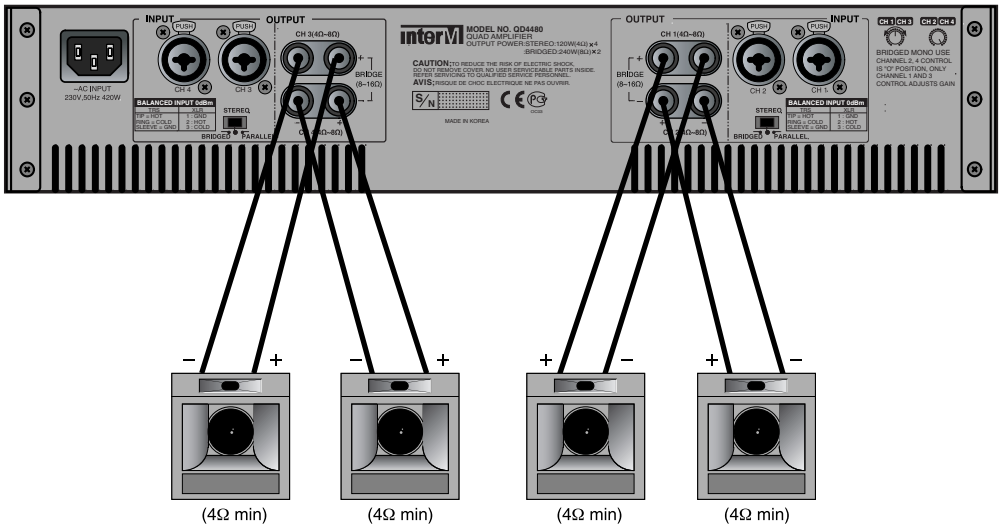
8. FAN VENTS

These vents provide hot air flow out of the unit. It is important to keep them free of obstructions, to prevent the unit from overheating. It is also important to operate the unit in a dust-free environment.

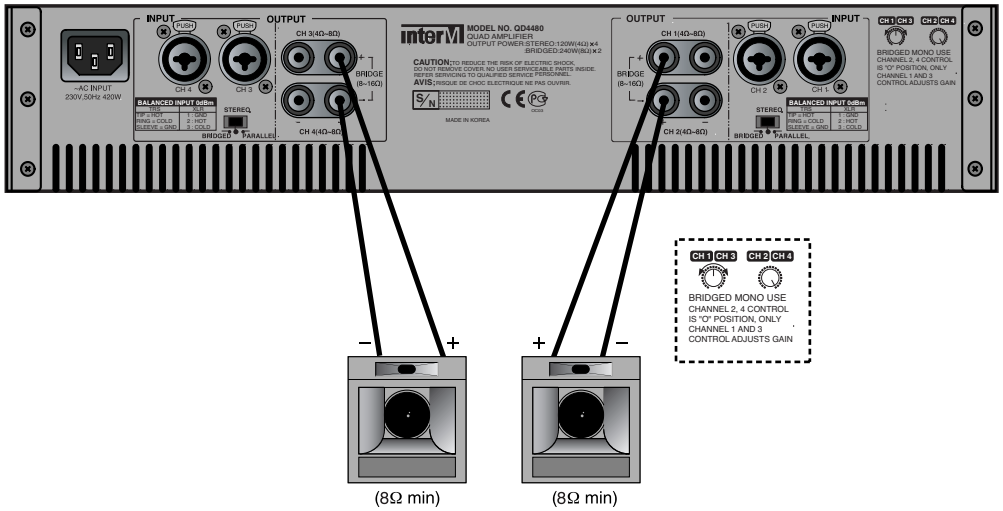
Speaker Connections (QD-4240/4480)

The QD-4240/4480 has three operational modes (Stereo/Parallel/Bridged), and speakers may be connected in parallel. The impedance varies depending on the selected mode, and caution should be used to make sure the impedance is not less than the recommended impedance.

- STEREO MODE CONNECTIONS



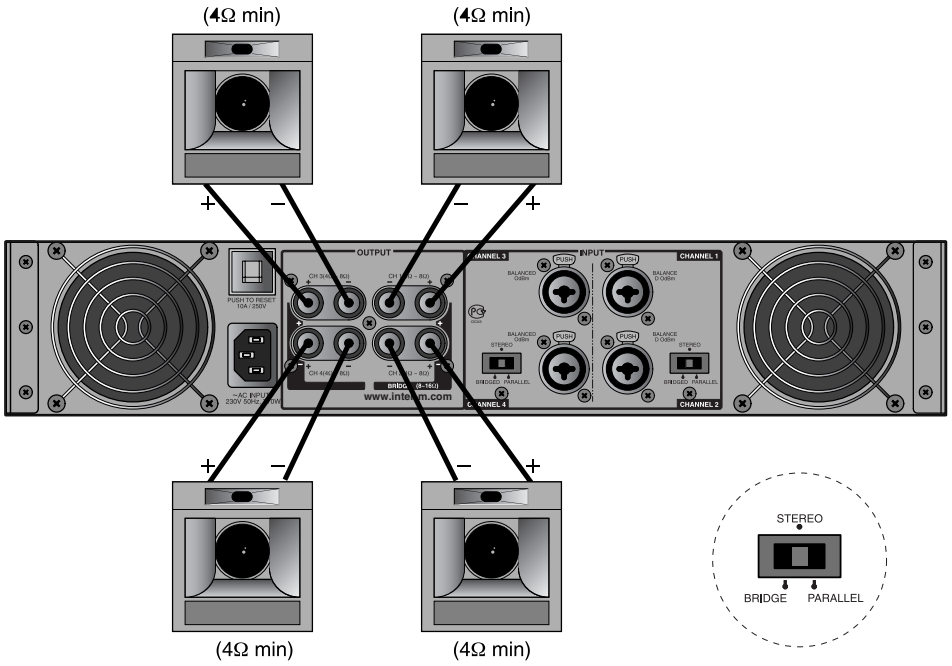
- BRIDGED MODE CONNECTIONS



Speaker Connections (QD-4960)

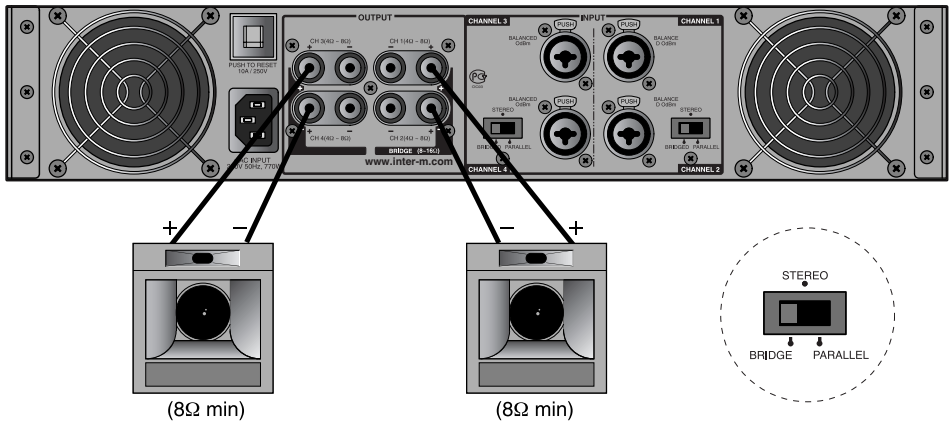
The QD-4960 has three operational modes (Stereo/Parallel/Bridged), and speakers may be connected in parallel. The impedance varies depending on the selected mode, and caution should be used to make sure the impedance is not less than the recommended impedance.

- STEREO/PARALLEL MODE CONNECTIONS



*** CAUTION:** The parallel mode is the same connections with stereo mode, but you must set the switch to parallel mode and apply input to CH1 & CH3.

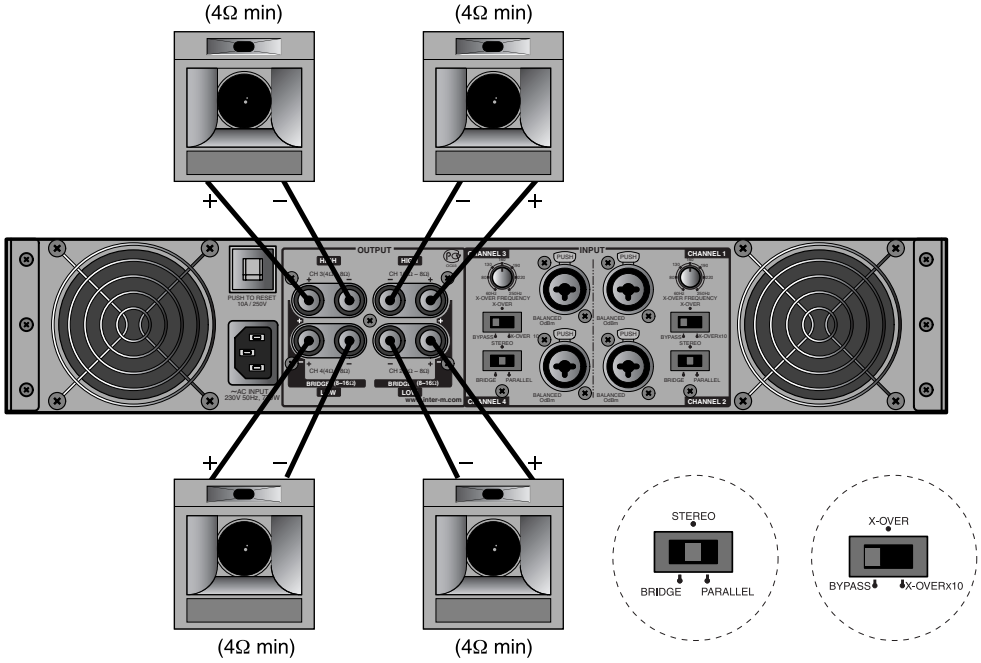
- BRIDGED MONO CONNECTIONS



Speaker Connections (QX-4960)

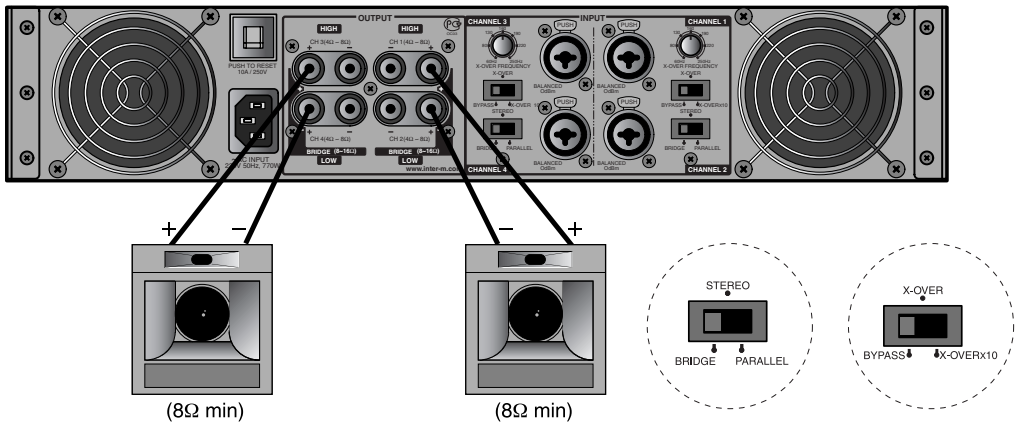
The QX-4960 has five operational modes (Stereo/Parallel/Bridged/X-Over/X-Over x 10), and speakers may be connected in parallel. The impedance varies depending on the selected mode, and caution should be used to make sure the impedance is not less than the recommended impedance.

- STEREO/PARALLEL MODE CONNECTIONS



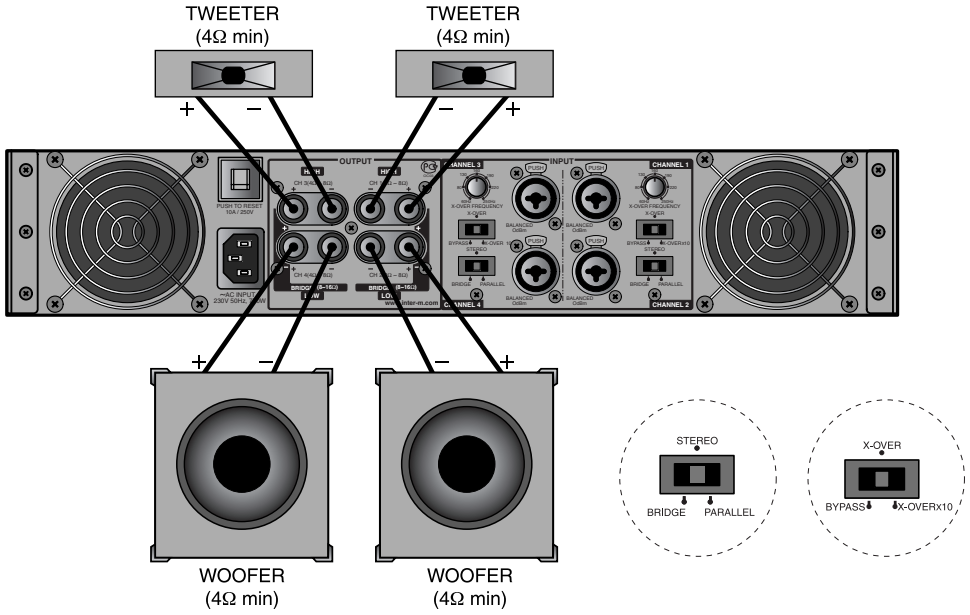
* **CAUTION:** 1. The parallel mode is the same connections with stereo mode, but you must set the switch to parallel mode and apply input to CH1 & CH3.
2. When you apply to the parallel mode, you must select crossover switch to bypass.

- BRIDGED MONO CONNECTIONS



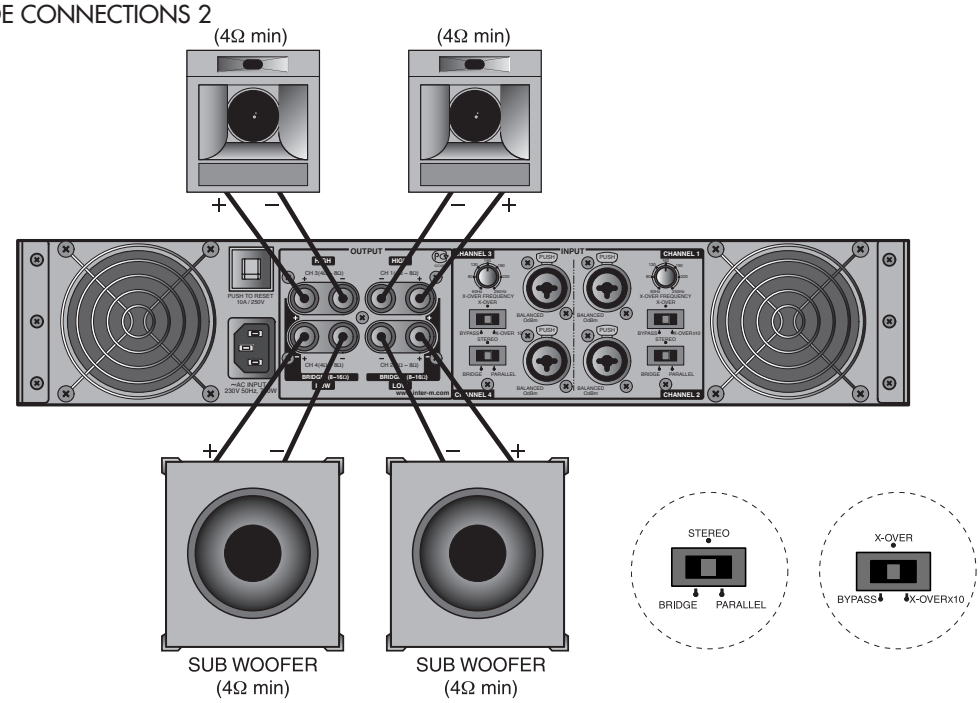
* **CAUTION:** When you apply to the bridged mode, you must select crossover switch to bypass.

- X-OVER MODE CONNECTIONS 1



*** CAUTION:** When you apply to X-OVER MODE, you must connect correctly for protecting speakers from being damaged. First, confirm output terminal on the rear panel of QX-4960, and then connect tweeter speakers to CH1 & CH3 output and woofer speakers to CH2 & CH4 output.

- X-OVER MODE CONNECTIONS 2

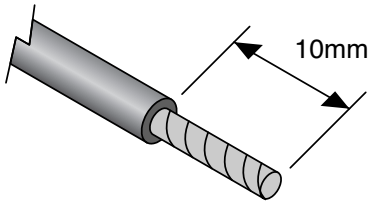


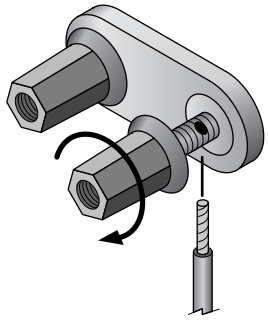
*** CAUTION:** When you apply to X-OVER MODE, you must connect correctly for protecting speakers from being damaged. First, confirm output terminal on the rear panel of QX-4960, and then connect tweeter speakers to CH1 & CH3 output and woofer speakers to CH2 & CH4 output.

Speaker Connection Procedures

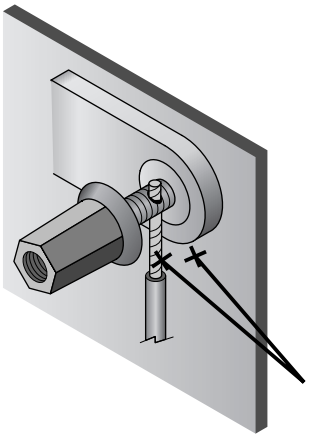
Always switch the power off before connecting speakers.

After removing approximately 10mm (1/4-inch) of insulation from the ends of the speaker cables, twist the strands tightly and pass the bare ends through the holes in the terminals, tightening the terminals to secure the wires.

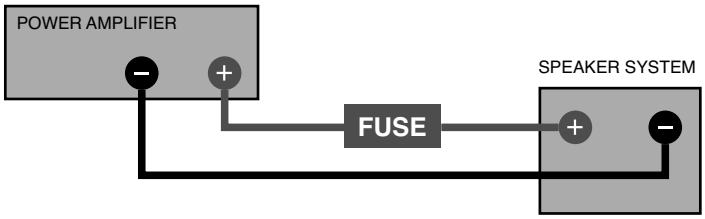




Make certain the wires do not protrude from the terminals and touch the amplifier's chassis, or an adjacent terminal.



The QD-4960/QX-4960 is capable of very high output levels. Be certain to use a speaker system that can accept high input levels. If the input capacity of your speaker system is less than the amplifier's rated output, you may protect your speakers by connecting a fuse between amplifier and speaker, as shown below:



Use the following formula to determine the needed fuse rating:

$$Po = I^2 R \rightarrow I = \sqrt{\frac{Po}{R}}$$

P0 [W]: Speaker's input capacity (RMS)
R [Ω] : Speaker's nominal impedance
I [A] : Required fuse rating

For example: If the speaker's input capacity is 100W, with 8Ω impedance.

$$I = \sqrt{\frac{100}{8}} = 3.5$$

The required fuse rating is 3.5A.

- SPEAKER CABLE

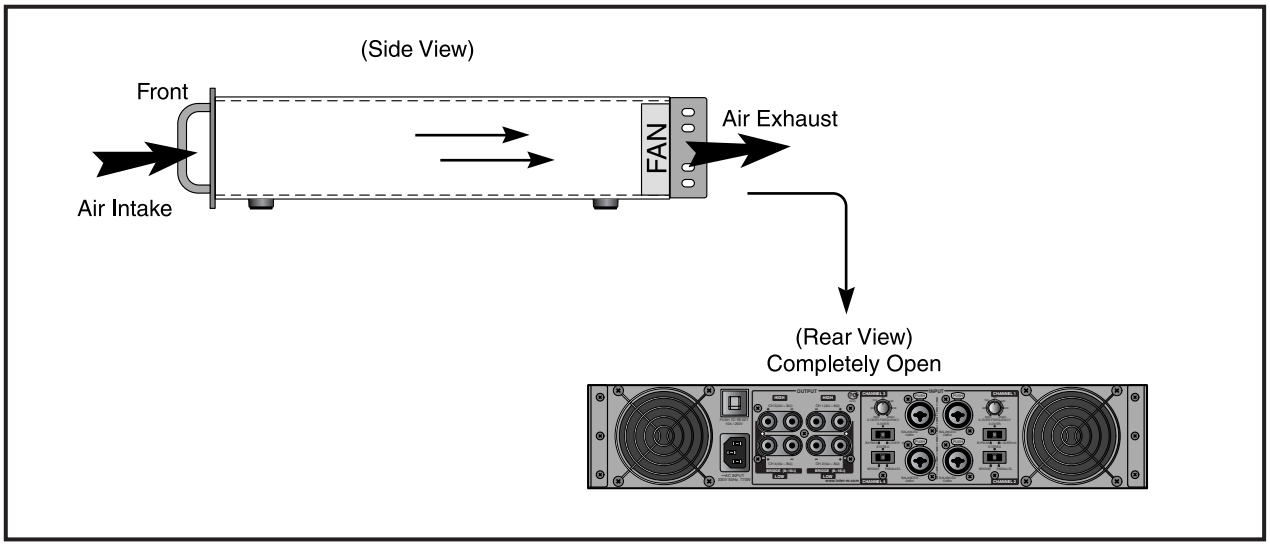
Always use the heaviest-duty (lowest gauge) speaker cable available. The terminals can accommodate very thick speaker cable.

- MAINTAINING PROPER POLARITY

It is very important to wire your speaker connectors consistently at each end of each cable, in order to maintain proper polarity. All quality cables are manufactured with clear markings to identify the different conductors – normally by color-coding, printed markings, or textured ribbing on the cable's jacket material. Always make certain to correctly wire your connections so that tip is connected to tip, and sleeve to sleeve. Failing to do so will cause your speakers to operate out of phase, resulting in significantly reduced low-frequency output from your system.

- RACK MOUNTING YOUR AMPLIFIER

The QD-4240/4480/4960, QX-4960 intakes cool air through the front panel and exhausts warm air through the rear panel. When mounting in a portable equipment rack, maintain adequate ventilation by making certain the front and rear panels are not obstructed.

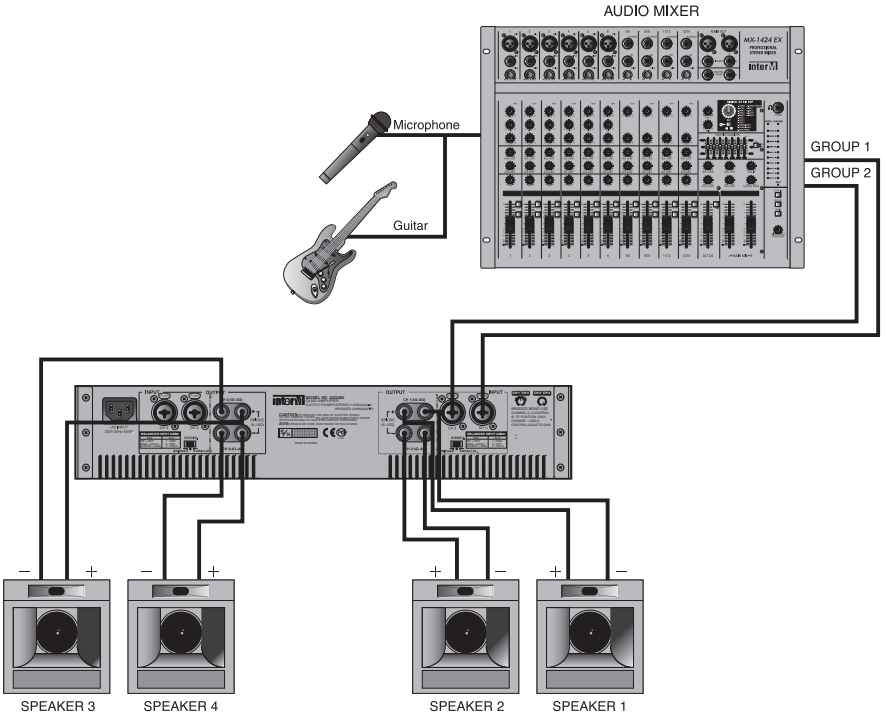


Troubleshooting

Indicator	Probable Cause	Solution	Protection Circuit
CLIP indicator lit	There is a short at a speaker terminal, amplifier terminal or speaker wire.	Locate and repair the cause of the short.	The PC limiter circuit operates, disconnecting the amplifier from the speakers.
	Excessive amplifier load.	Use a speaker system with an impedance of at least 4Ω(Stereo mode) or 8Ω(Bridged mode).	
Protection Indicator lit	The thermal temperature, measured at the heat sink, has exceeded 100 degrees Celcius	Check the amplifier for adequate ventilation. Take steps to improve the airflow conditions.	The thermal protection circuit operates, shutting the unit off.
	DC voltage of ±2V or greater was generated in the amplifier's output circuitry.	Consult your dealer.	The relay operates to protect the speaker system.

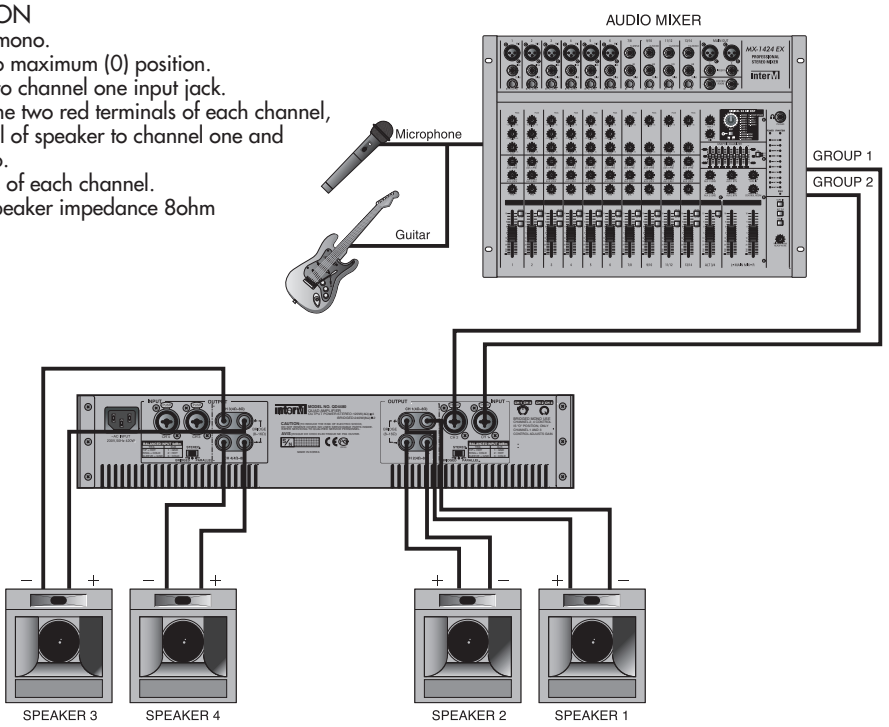
Applications (QD-4240/4480)

- SINGLE AMP SYSTEM



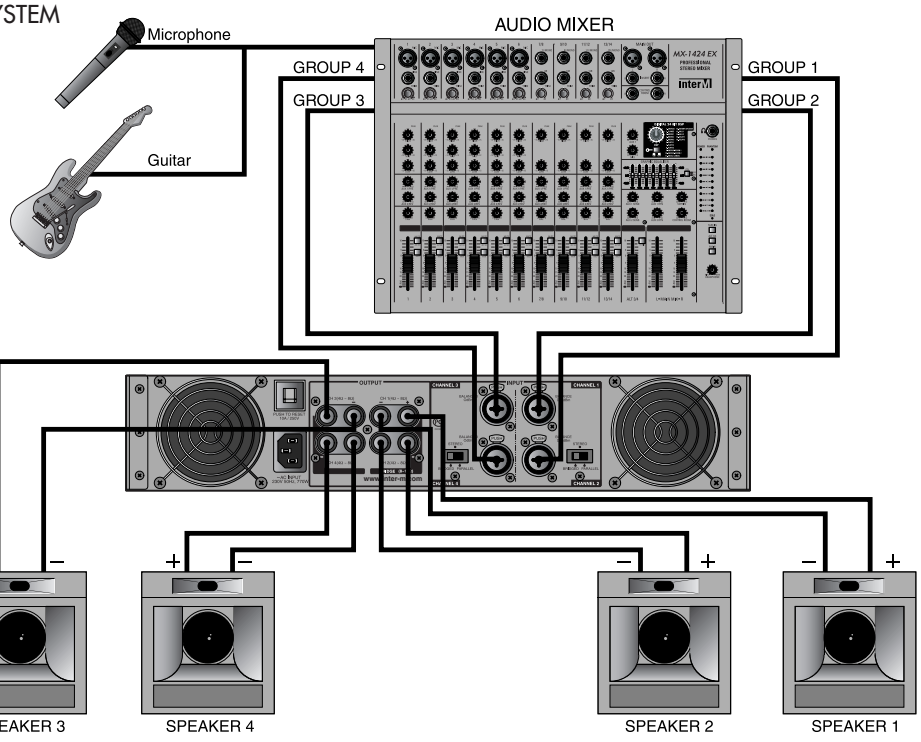
- BRIDGED MONO OPERATION

1. Set mode selector to bridged mono.
2. Set the Channel 2 and 4 VR to maximum (0) position.
3. Connect a mono input signal to channel one input jack.
4. Connect the speaker load to the two red terminals of each channel, please confirm the (+) terminal of speaker to channel one and the (–) terminal to channel two.
5. Do not use the black terminals of each channel.
6. Please notice to connect the speaker impedance 8ohm or above.



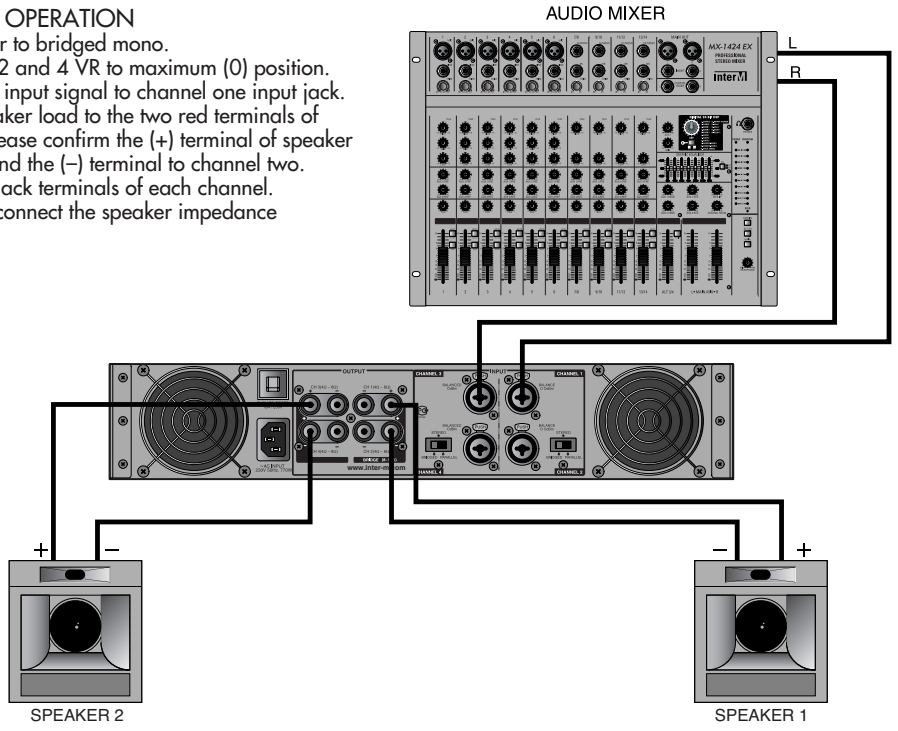
Applications (QD-4960)

- SINGLE AMP SYSTEM



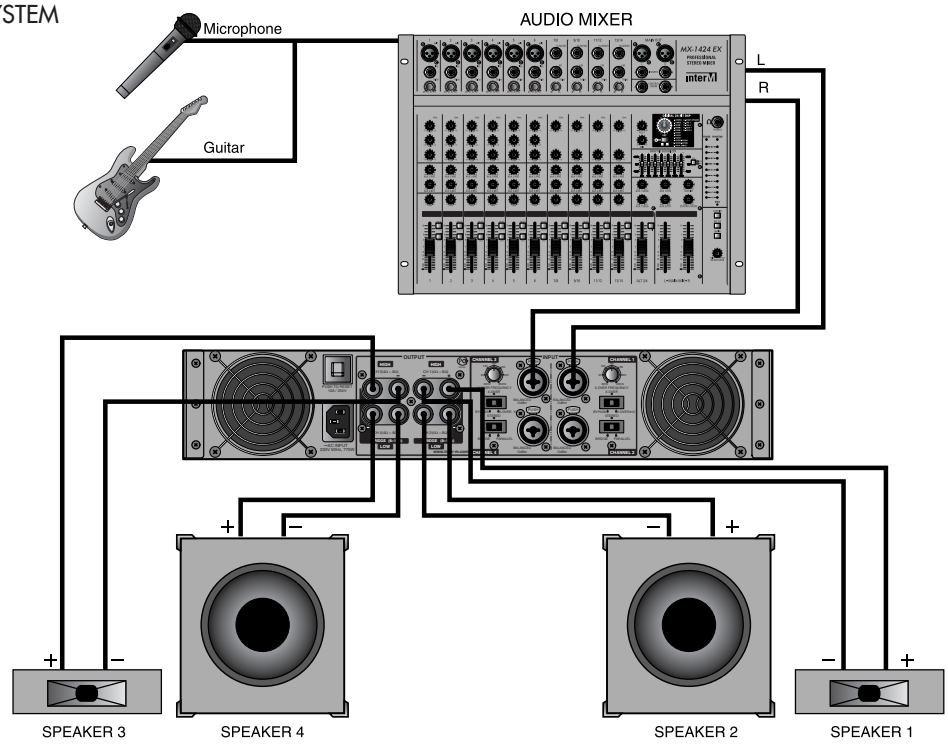
- BRIDGED MONO OPERATION

1. Set mode selector to bridged mono.
2. Set the Channel 2 and 4 VR to maximum (0) position.
3. Connect a mono input signal to channel one input jack.
4. Connect the speaker load to the two red terminals of each channel, please confirm the (+) terminal of speaker to channel one and the (–) terminal to channel two.
5. Do not use the black terminals of each channel.
6. Please notice to connect the speaker impedance 8ohm or above.

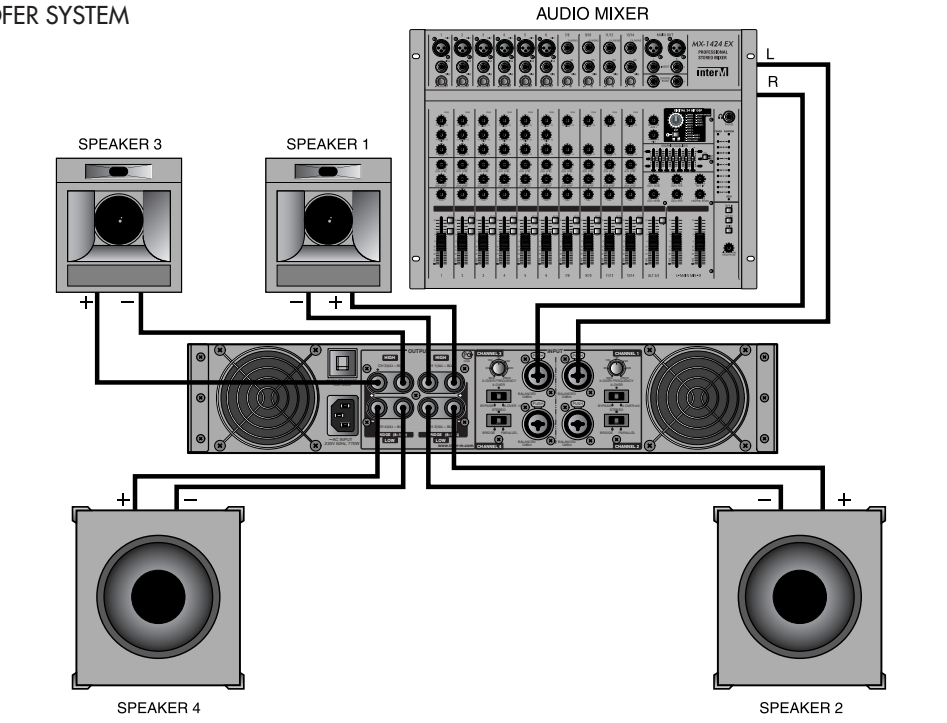


Applications (QX-4960)

- Bi-AMP SYSTEM

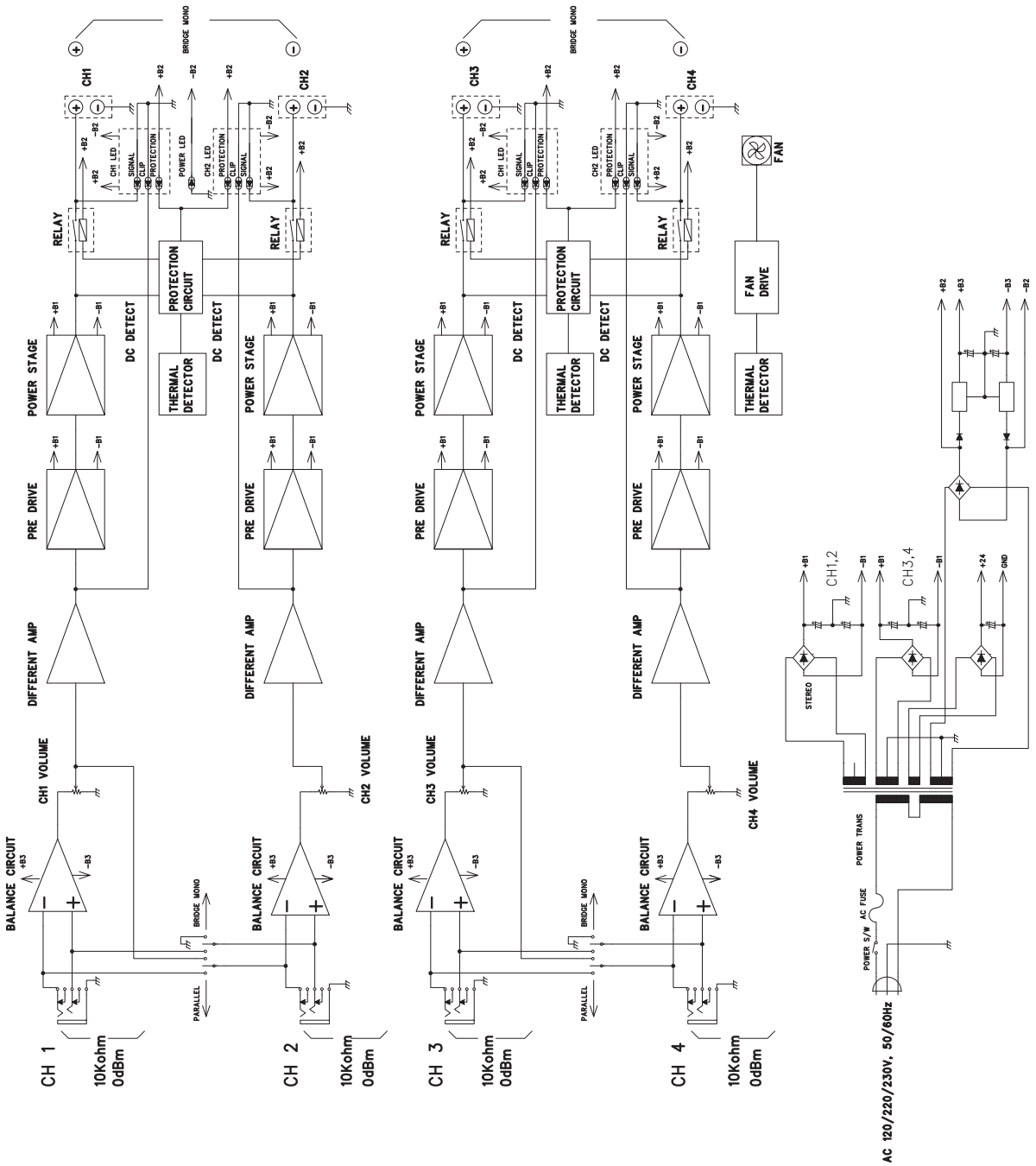


- SUB WOOFER SYSTEM

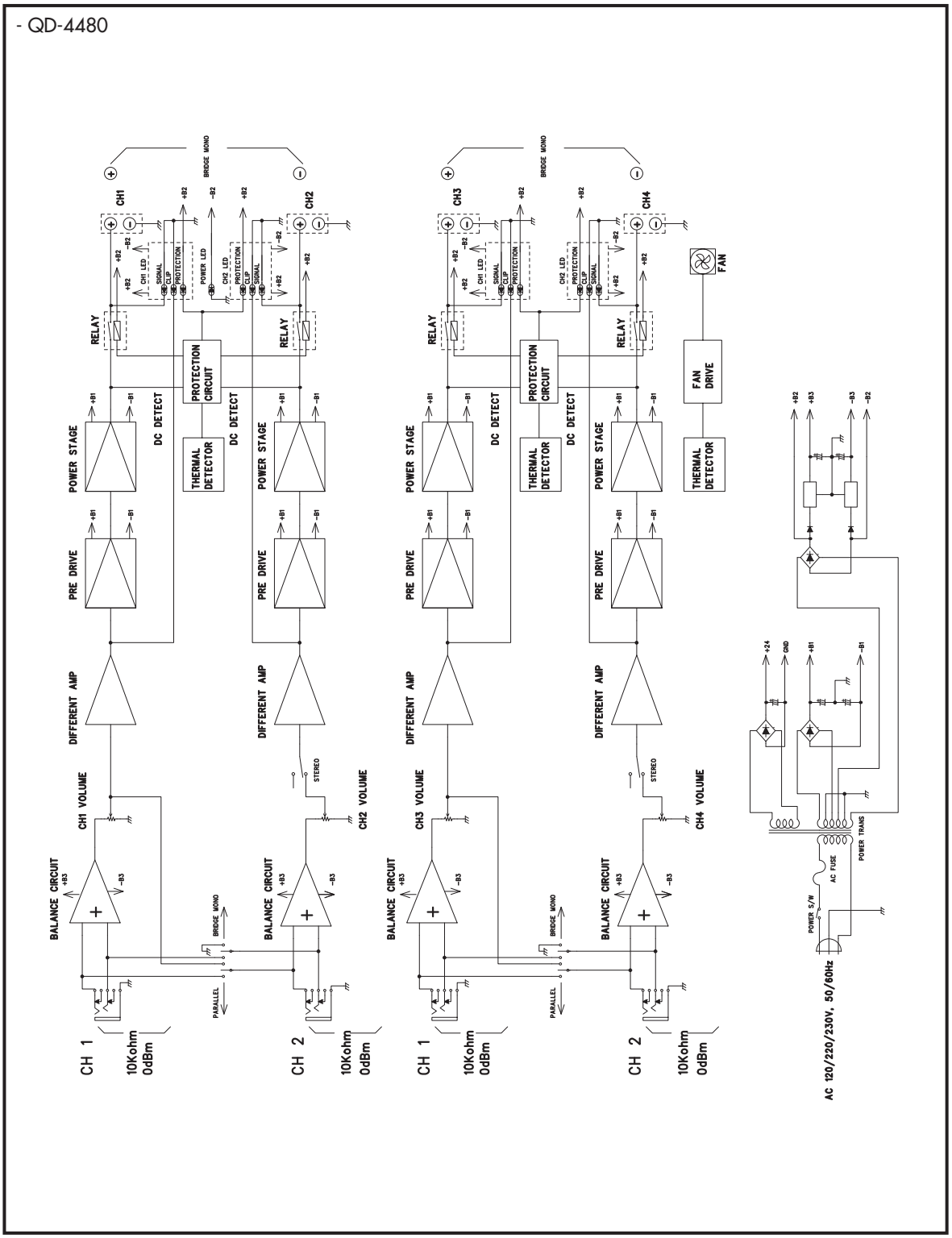


Block Diagram

- QD-4240

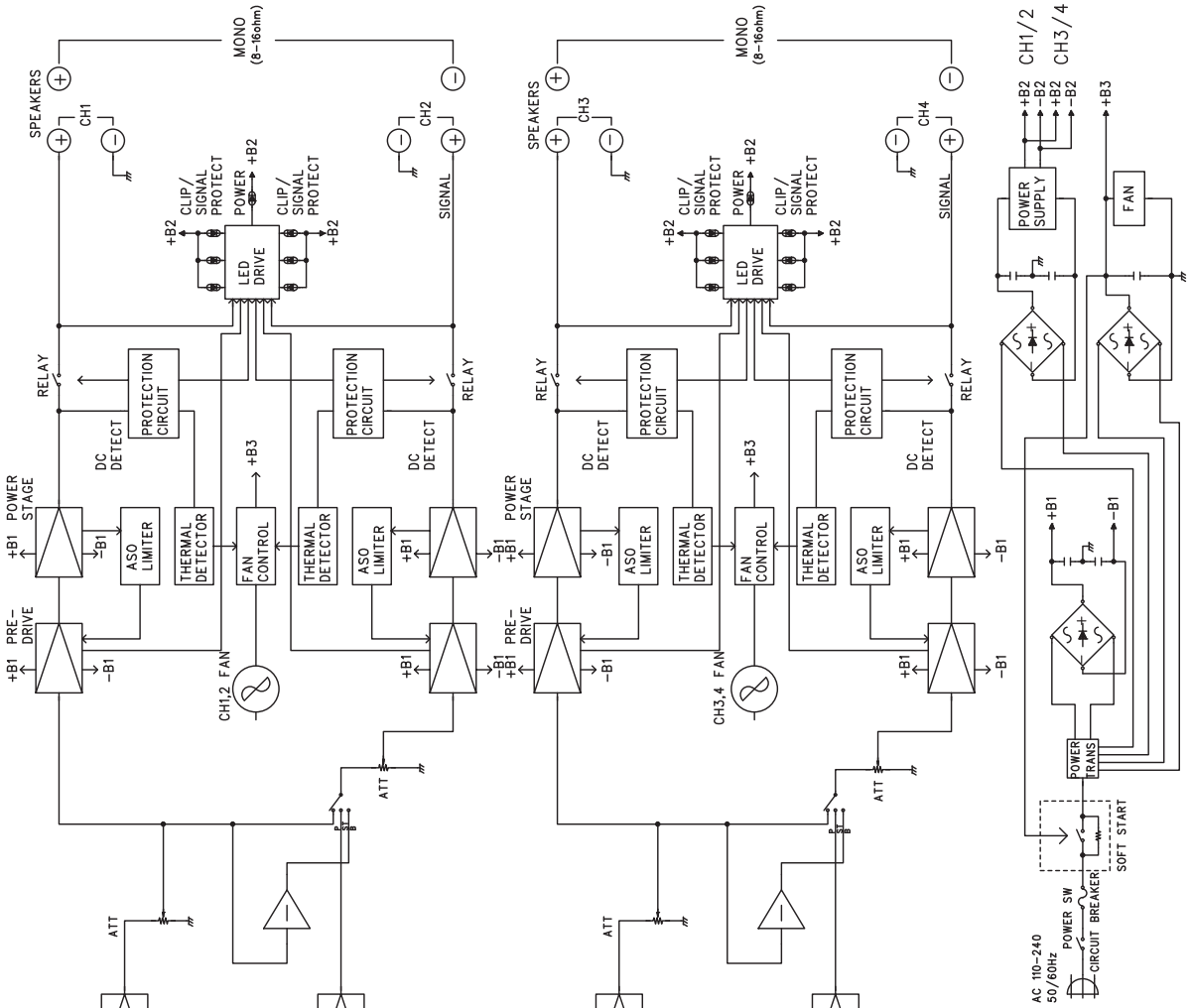


- QD-4480

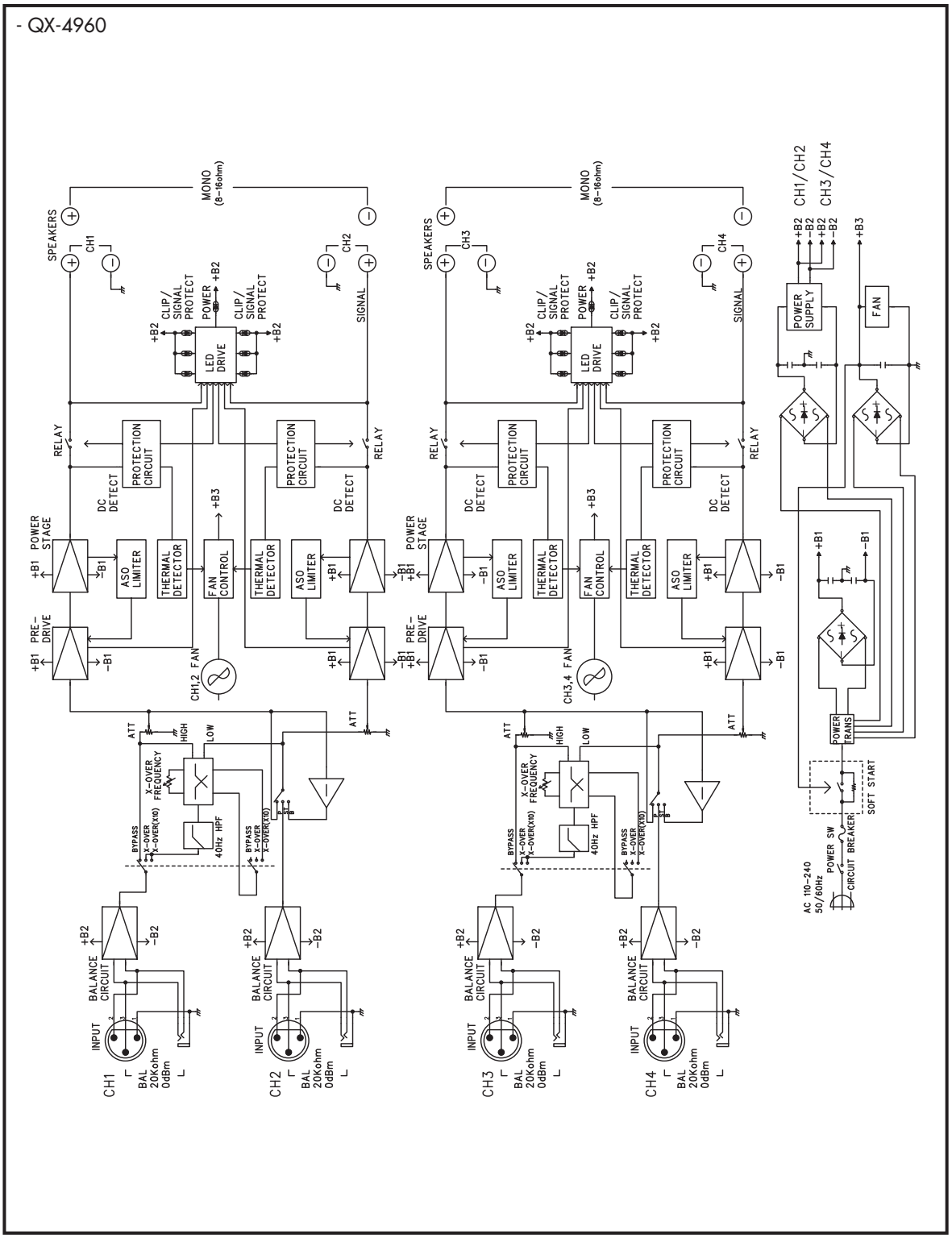

CH1
CH2
CH3
CH4
BRIDGE MONO
CH1 LED
CH2 LED
SIGNAL
CLIP
PROTECTION
POWER LED
RELAY
PROTECTION CIRCUIT
DC DETECT
THERMAL DETECTOR
FAN DRIVE
FAN
POWER STAGE
PRE DRIVE
DIFFERENT AMP
CH1 VOLUME
CH2 VOLUME
CH3 VOLUME
CH4 VOLUME
STEREO
BALANCE CIRCUIT
PARALLEL
CH 1
CH 2
10Kohm
0dBm
+24
GND
AC FUSE
POWER TRANS
POWER S/W
AC 120/220/230V, 50/60Hz

Block Diagram

- QD-4960



- QX-4960


SPEAKERS
CH1
CH2
CH3
CH4
MONO (8~16ohm)
CLIP/ SIGNAL PROTECT
POWER
+B2
LED DRIVE
SIGNAL
RELAY
PROTECTION CIRCUIT
DC DETECT
POWER STAGE
+B1
-B1
ASO LIMITER
THERMAL DETECTOR
+B3
FAN CONTROL
PRE- DRIVE
CH1,2 FAN
CH3,4 FAN
ATT
HIGH
LOW
X-OVER FREQUENCY
BYPASS
X-OVER(X10)
X-OVER(X1)
40Hz HPF
BALANCE CIRCUIT
INPUT
BAL 20Kohm 0dBm
CH1/CH2
CH3/CH4
POWER SUPPLY
FAN
POWER TRANS
SOFT START
AC 110~240 50/60Hz
POWER SW
CIRCUIT BREAKER

Specifications

*0dB=0.775Vrms, Half Power=1/2 Power Output Level (Rated Power)

	QD-4240	QD-4480	QD-4960	QX-4960
Rated Output (RMS) f=1kHz, THD+N≤0.1% (Typical) QUAD RL=8Ω RL=4Ω BRIDGEDSTEREO RL=8Ω One Channel Driven f=1KHz THD+N≤0.1% RL=4Ω	 40W 60W 120W 60W	 80W 120W 240W 120W	 170W 240W 480W 240W	
Frequency Response RL=8Ω, P=1W	20Hz~20kHz (±0.5dB)			
Power Bandwidth Half Power, THD+N≤0.1% QUAD RL=8Ω	10Hz~70kHz		10Hz~20kHz	
Total Harmonic Distortion (THD+N) f=20Hz~20kHz, Half Power QUAD RL=8Ω BRIDGED RL=8Ω	 ≤ 0.1% ≤ 0.1%			
Channel Separation Half Power RL=8Ω, f=1kHz, ATT. max. Input 600Ω shunt	≥ 80dB			
Residual Noise (DIN Audio Filter)	≤ –75dB: ATT min.		≤ –85dB: ATT min.	
Signal-to-Noise Ratio DIN Audio, Input 600Ω Shunt	≥-95dB			
Sensitivity (ATT max.) Rated Power into 4Ω 1kHz	0dB			
Input Impedance (ATT max.)	≥ 20kΩ (Balance/Unbalance)			
Indicators	Power (Red) Protection (Mute) x 4 (Red) Clip x 4 (Red) Signal x 4 (Green)		Power (Red) Protection (Mute) x 4 (Red) Clip x 4 (Orange) Signal x 4 (Green)	
Protection	Power SW ON/OFF muting Heatsink Temp ≥ 100˚C (212˚F)			
PC Limiter				
Fan Circuit	–50˚C (122˚F)–60˚C (140˚F)– Low-Speed – Variable – Hi-Speed			
Controls	(Front) Power SW: Push up On/Push down Of Attenuator: 21-position dB calibrated (Rear) Mode SW: Bridge=BTL/Stereo/Parallel			
Power Source	100-120VAC or 220-240VAC; 50/60Hz (Supplied AC mains transformer depends on country requirements)			
Power Consumption	300W	420W	770W	
Weight	11.5kg/25.3lb	15.5kg/34.2lb	17kg/37.5lb	
Dimensions	482(W) x 88(H) x 369(D) mm/19(W) x 3.5(H) x 14.5(D) in			
Connectors	Input : Combination Jack (balance) Output : 5-Way binding posts x 4			

- ACTIVE CROSSOVER (QX-4960)

Crossover Frequency	From 60Hz to 250Hz or 600Hz to 2.5kHz
Crossover Slope	24dB/octave Roll/off (Linkwitz Filter)
LOW Filter	40Hz (12dB/octave)

* Design and specification are subject to be changed for the improvement of product quality without pre notice.

Service

Procedures
Take steps to insure the problem is not related to operator error or other products within the system. Information provided in the troubleshooting portion of this manual may help with this process. Once it is certain that the problem is related to the product contact your warranty provider as described in the warranty section of this manual.

Schematic
A Schematic is available by contacting your warranty provider.

Parts List
A Parts List is available by contacting your warranty provider.

Variations and Options

Variations
Products supplied through legitimate sources are compatible with local AC power requirements.

Options
No optional items are available for this product.

Warranty

Warranty terms and conditions vary by country and may not be the same for all products. Terms and conditions of warranty for a given product may be determined first by locating the appropriate country which the product was purchased in, then by locating the product type.

To obtain specific warranty information and available service locations contact Inter-M directly or the authorized Inter-M Distributor for your specific country or region.

Inter-M, Ltd. (Korea) began operations in 1983.

Since then, Inter-M has grown to become one of the largest manufacturers
of professional audio and commercial sound electronics equipment in the world.

Inter-M has gained worldwide recognition for its own branded products,
as well as private label manufacturing of electronics sold under other names (OEM).

The company is no longer just a Korean company, but rather a global company
that is truly international in scope, with factories and offices in Korea and China,
and sales and marketing operations located in Japan, Europe, and the U.S.A.

With more than 850 employees around the globe,
Inter-M is well-poised for further growth and expansion.

Inter-M Americas, INC.
5666 CORPORATE AVE. CYPRESS, CA 90630
TEL : +1-714-828-2200, FAX : +1-714-828-2210
Home Page : http://www.inter-m.net, E-mail : info@inter-m.net

Inter-M Corporation
SEOUL OFFICE : 719, DOBONG-RO, DOBONG-GU, SEOUL, KOREA
TEL : +82-2-2289-8140~8, FAX : +82-2-2289-8149
Home Page : http://www.inter-m.com, E-mail : overseas@inter-m.com

MADE IN KOREA
June 2021 154244