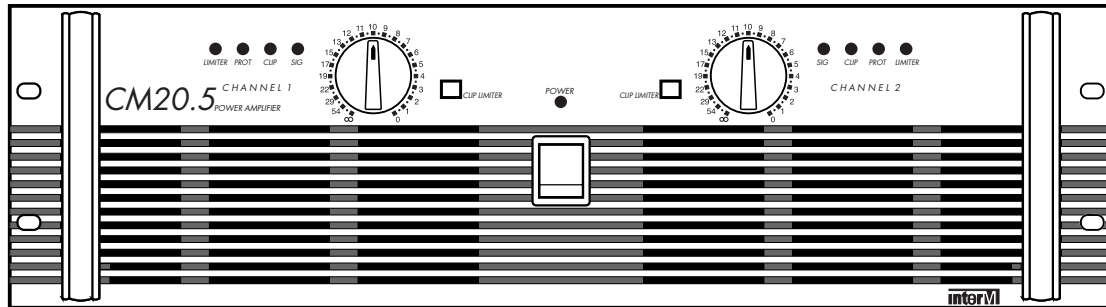


Operating Manual

CM-5.5/7.5/10.5/15.5/20.5 Power Amplifier



CH01 0Π002

interM

Contents

1. Unpacking and Installation.....	1
2. Features	2
3. Front Panel Controls.....	3
4. Rear Panel Controls	4
5. Protection Circuitry.....	6
6. Bridged and Parallel Modes	7
7. Connections.....	8
8. Link Connectors	9
9. Speaker Impedance	9
10. Caution for Speaker Connection	10
11. Portable Rack Mounting	11
12. Positioning the Housed Amplifier	12
13. Troubleshooting	12
14. Block Diagram.....	13
15. Specifications.....	14

OFFICE :





226-9 DUGJUNG - LI, HOE CHUN - EUB,
YANGJU - KUN, KYUNGKI - DO, KOREA
TEL : 82-31-860-7041~5, FAX : 82-31-858-1907

Home Page : <http://www.inter-com>

E-mail : export@inter-m.co.kr

Unpacking and Installation

Although it is neither complicated to install nor difficult to operate your power Amplifier, a few minutes of your time is required to read this manual for a properly wired installation and becoming familiar with its many features and how to use them. Please take a great care in unpacking your set and do not discard the carton and other packing necessary to return your set for when moving your set and are required if it ever becomes necessary to return your set for service. Never place the unit near radiators, in front of heating vents, to direct sun light, in excessive humid or dusty location to avoid early damage and for your years of quality use. Connect your complementary components as illustrated in the following page.

 <div style="text-align: center;"> <p>CAUTION</p> <p>RISK OF ELECTRIC SHOCK DO NOT OPEN</p> </div>  <p>CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p>	 <p>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.</p>  <p>This symbol is intended to alert the user to the presence of important operation and maintenance (servicing) instructions in the literature accompanying the appliance.</p> <p>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.</p>
<p>WARNING</p> <p>To prevent fire or shock hazard, do not expose the unit to rain or moisture.</p>	<p>Attention: Pour prévenir les chocs électriques ne pas utiliser cette fiche polarisée avec un prolongateur, une prise de courant ou une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans en laisser aucune partie à découvert.</p>

Features

- **SUBSTANTIAL PROTECTION CIRCUITARY**

To insure stability and reliability against over current and overheating extra protection circuitary is provided. In addition, turn on delay and DC detection circuitary is provided to protect the loud-speaker.

- **BRIDGED MONO FUNCTION**

These stereo amplifiers can be used for monoral powerful sound by selecting the mode switch.

- **VARIOUS DISPLAY**

To confirm the operating status, LED displays of protection, clip, signals and limits are provided on front panel.

- **COMPACT SIZE**

For valuable saving in rack space and slim exterior view, these amplifier is designed within compact size.

- **SOFT-START SYSTEM**

To prevent inrush current when turn on the amplifier, soft-start circuit is provided on primary power lines.

- **SPEED CONTROLLED FAN**

Dual temperature-sensitive speed-controlled fans for reliable cooling without thermal and overheating problems.

- **COMBINATION INPUT CONNECTOR**

Combination input connectors for each channel accommodate both balanced XLR or balanced 1/4" TRS plugs, as well as both Speakon™ and banana jack output connectors for maximum flexibility.

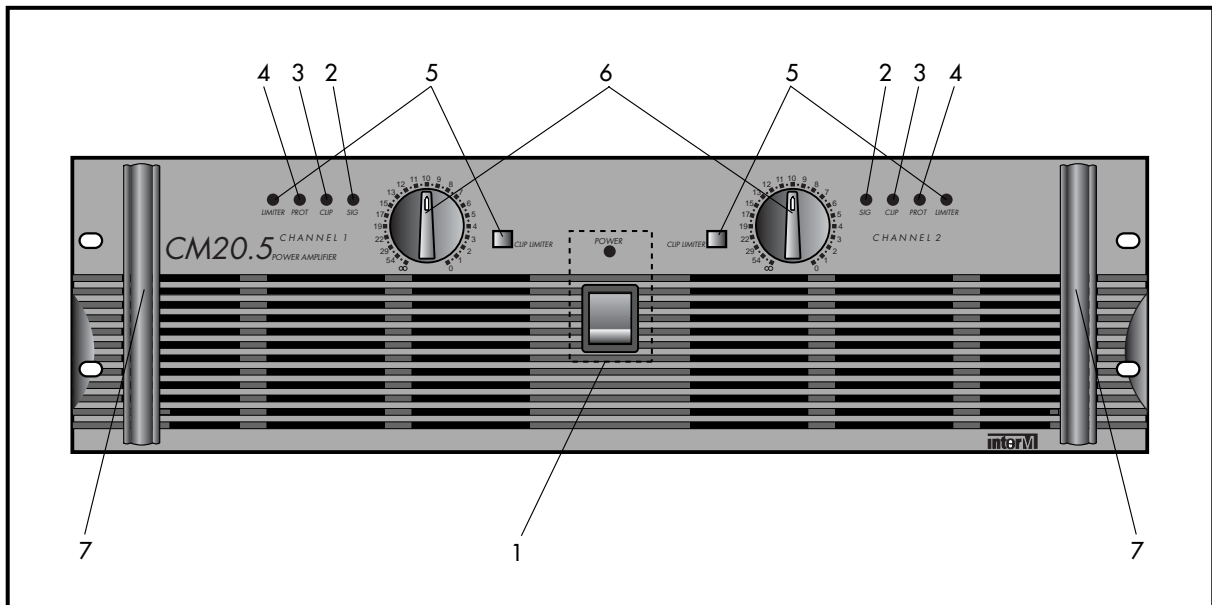
- **TRANSFORMER**

Toroidal transformer power supply for high current and low profile.

- **LIMIT**

In appearing regulate output overload, there are a function reducing the gain of amplifier to protect the speaker.

Front Panel Controls



1. POWER SWITCH AND INDICATOR

The power switch is used to turn on and off the AC main power. The power indicator lights up when the amplifier is powered ON.

2. OUTPUT LEVEL INDICATORS

Output level indicating LEDs indicate the output level of this amplifiers. These LEDs illuminate when the amplifier is receiving an audio signal.

3. CLIP INDICATORS

CLIP indicator on each channel illuminates when distortion reaches or exceeds approximately 0.1%, indicating that the amplifier is being driven by excessively high inputs.

4. PROTECTION INDICATOR

This red LED indicator lights up for approximately six seconds when the amplifier is powered ON, indicating that the soft-start protection system is working. No sound is output during soft-start up. If one of the protection systems is activated during normal use, this indicator lights up and no sound is output. The speaker system is actually disconnected from the amplifier outputs when this indicator lights up. The protection systems are activated when overheating occurs or a DC voltage is present at the amplifier outputs. If the problem is corrected, the protection systems deactivate automatically, this indicator goes out, and normal amplifier operation is resumed.

5. LIMIT SWITCH AND INDICATORS

Flashes up when the automatic limiter reduces the amplifier gain to avoid overload.

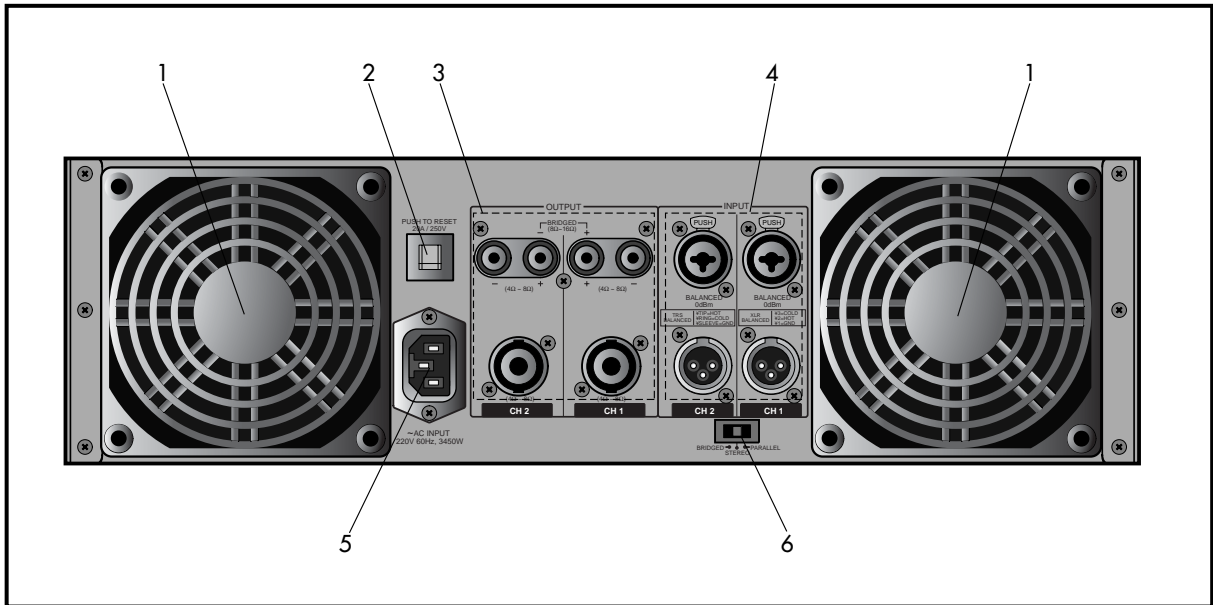
6. INPUT ATTENUATORS

Separate level controls are provided for channel one and channel two input, clockwise rotation of the controls increase level. These are 21-step detented input signal attenuators.

7. HANDLES

You can handle this amplifier easily by using these handles.

Rear Panel Controls



1. FANS

The fans should be kept free of all obstructions and be accessible to cool fresh air when possible. It is important that the fans be used in a dust free environment.

2. CIRCUIT BREAKER

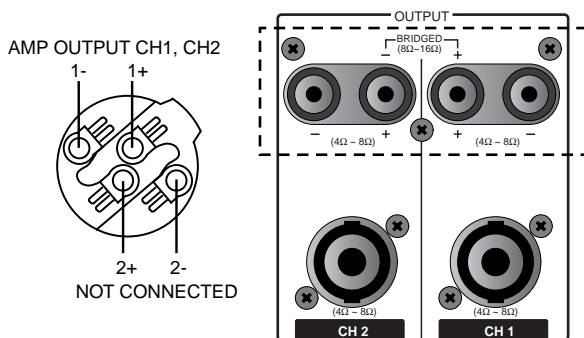
When the circuit breaker is cut, push to reset again. In case of occurring trouble to the set by means of overload or error, circuit breaker will protect the set from trouble by breaking AC power source.

3. OUTPUT TERMINALS

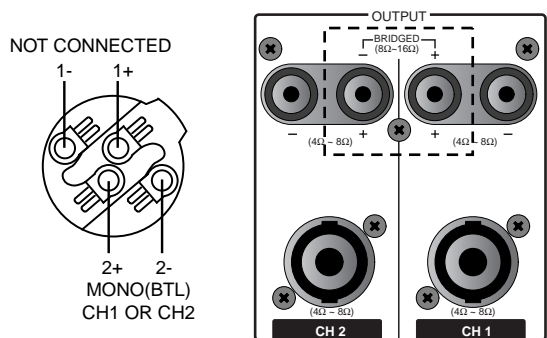
Output terminals are dual five-way binding posts and speaker connectors. Do not parallel the two outputs of each channel by connecting them (together, or parallel them) with any other amplifier output.

* When speakers are connected through speaker, please make sure correct connection of each pin, and refer speaker pin number.

- STEREO MODE



- BRIDGED MODE



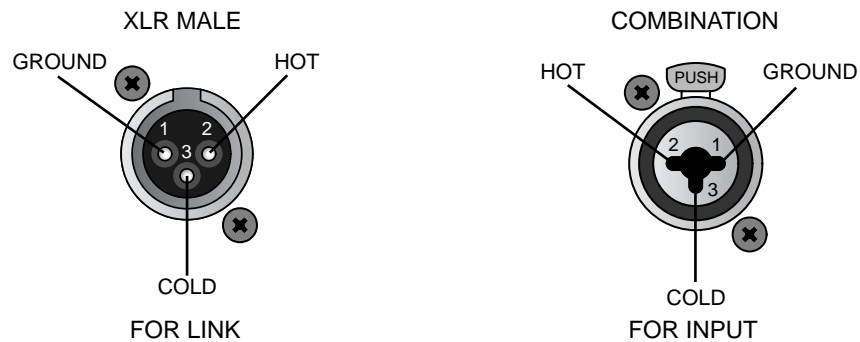
The minimum impedance for the connected speaker system is specified in "Speaker Impedance" on page 8.

4. INPUT TERMINALS (CHANNEL 1, 2)

Input connectors are provided both balanced combination jacks. Channel 1 input terminal is used in Bridge mode and parallel mode.

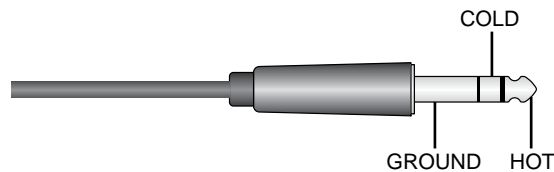
- XLR-TYPE CONNECTOR

They are wired pin 1-ground, pin 2-hot (+), and pin 3 cold (-).



- PHONE JACK

They are wired tip-hot (+), ring-cold (-), and sleeve-ground.



5. AC INLET

Plug this AC input cord into AC outlet.

6. MODE SELECTOR

Bridged mono or parallel operation are easily accessed by the slide switch. The input is applied channel one only the corresponding front panel control is used to set the level, please refer bridged mono operation or parallel operation.

WARNING: Due to the extremely high power output of the CM-5.5/7.5/10.5/15.5/20.5 when used in Bridged mode, be sure to use only loudspeakers sufficiently rated to handle the resultant wattage (in Bridged mode, these must be 8-ohm speakers).

Protection Circuitry

As noted in the "Guided Tour" section of this manual, the CM-5.5/7.5/10.5/15.5/20.5 front-panel Protection LED indicates the activity of the relay speaker connection circuitry. When the Protection LED is lit, this circuitry is active, and all connected speakers are muted, thus protecting them and preventing any audible "thump" from occurring.

The following conditions will cause the Protection LED to go on:

- INITIAL POWER-UP

For approximately five seconds after initial power-up, the protection circuitry is activated and the speaker output is muted. If everything is operating normally, you will hear an audible click at the conclusion of this brief period, as the protection circuitry is deactivated and the CM-5.5/7.5/10.5/15.5/20.5 begins delivering signal to connected speakers (at which point you'll hear a click). It is normal for the Protection LED to fade gradually after the amplifier is powered off.

WARNING: If the Protection LED fails to go out (and you fail to hear the accompanying audible click) approximately five seconds after power-up, turn the CM-5.5/7.5/10.5/15.5/20.5 off immediately and check all external devices and wiring for possible shorts or other defects.

- OVERHEATING

A temperature sensing device in the CM-5.5/7.5/10.5/15.5/20.5 will cause the protection circuitry to be activated (and the Protection LED to go on) whenever the operating temperature of the unit rises above a safe level. To guard against this problem, make sure the CM-5.5/7.5/10.5/15.5/20.5 receives adequate ventilation on all sides and that both the front and rear panels are unobstructed.

- SEVERE OVERCURRENT CONDITIONS

This occurs whenever the signal being input to the CM-5.5/7.5/10.5/15.5/20.5 rises to a level above 20% THD (Total Harmonic Distortion).

- SHORTED SPEAKER CABLES

This will occur if, due to faulty wiring, the hot and ground signals being output by the CM-5.5/7.5/10.5/15.5/20.5 short one another.

- OUTPUT IMPEDANCE DROPS BELOW 2 OHMS

This can occur if the CM-5.5/7.5/10.5/15.5/20.5 is connected to inappropriate speaker systems (see the "Setting Up and Using Your CM-5.5/7.5/10.5/15.5/20.5" section on page 8 in this manual for more information).

- DC VOLTAGE DETECTED AT SPEAKER OUTPUT

The most likely cause of this is an internal failure.

In general, any time the Protection LED lights up (other than during the approximately five seconds following initial power-up), there is reason to be concerned. If this occurs, turn the CM-5.5/7.5/10.5/15.5/20.5 off immediately and carefully check all wiring and external devices in order to locate and correct the condition that caused the LED to light up in the first place.

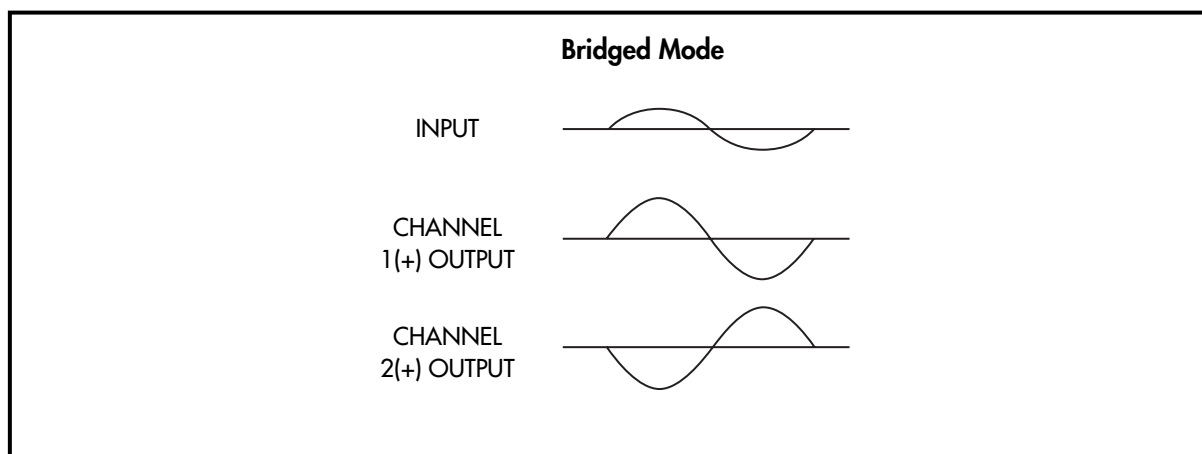
Bridged and Parallel Modes

The CM-5.5/7.5/10.5/15.5/20.5 provides a rear-panel switch that allows it to be used in either a Bridged or Parallel mode. When this switch is placed in the "STEREO" (center) position, the CM-5.5/7.5/10.5/15.5/20.5 functions as a true stereo amplifier, where both of the two independent amplifier channels (Channel 1 and Channel 2) can receive different input signals and produce independent output signals.

		CM-5.5	CM-7.5	CM-10.5	CM-15.5	CM-20.5
Rated Output	8Ω (per CH)	175W	230W	340W	510W	700W
	4Ω (per CH)	270W	360W	510W	800W	1100W
	8Ω Bridged Mono	550W	720W	1050W	1600W	2100W

WARNING: Bridged mode is to be used only when the CM-5.5/7.5/10.5/15.5/20.5 is connected to an 8Ω speaker load. Use of Bridged mode with speaker loads of 4Ωs or less can result in severe damage to the unit due to excessive heat and current limiting and will void your warranty!

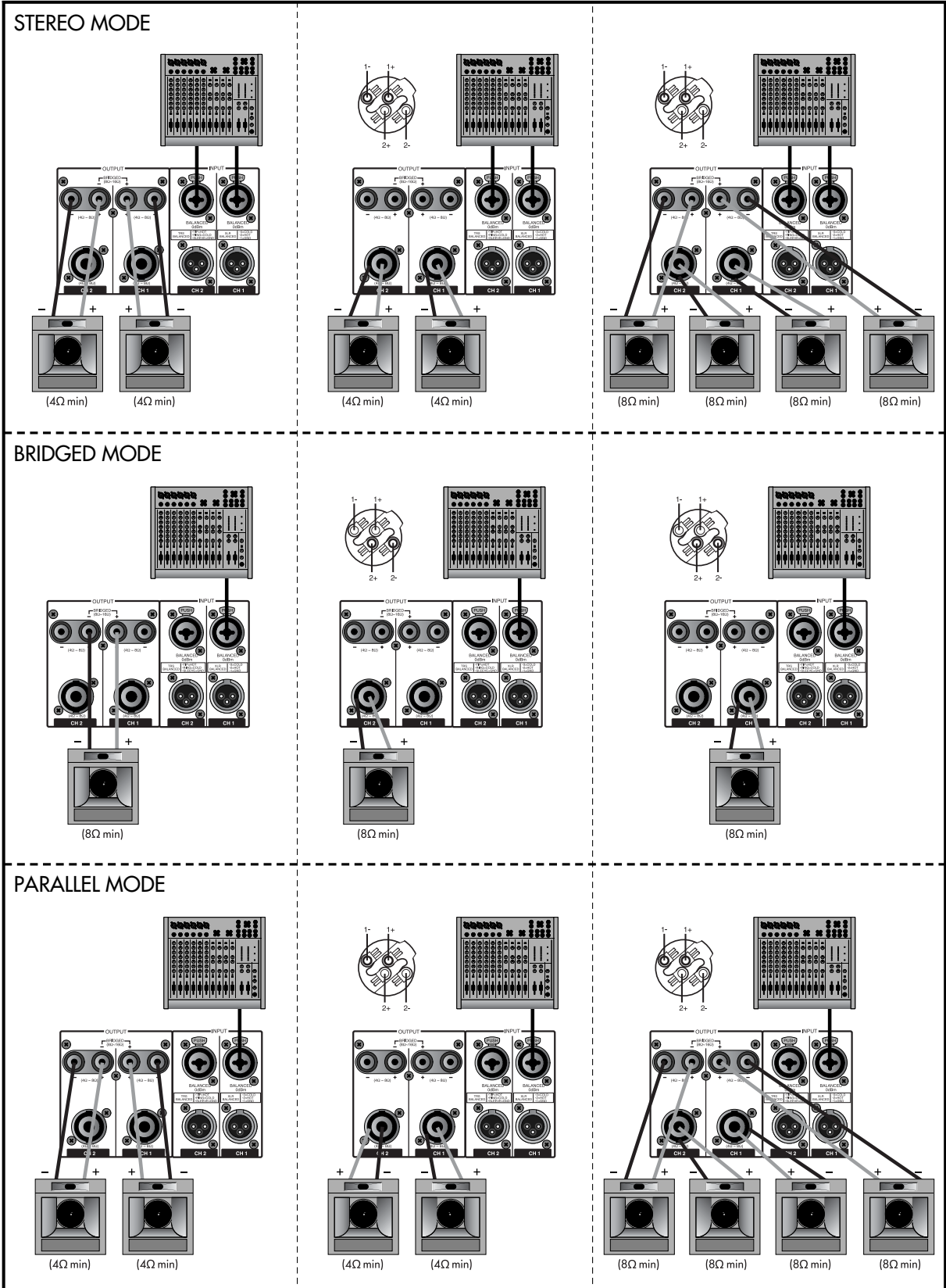
The illustration below shows how this works. In Bridged mode, the polarity (phase) of the Channel 2 output signal is reversed relative to that of the Channel 1 output signal. Both channels then process the same input signal, with the speaker load connected so that power is derived from both channels. The effective voltage swing seen by the load is thus doubled, so that the power output is doubled.



When using the CM-5.5/7.5/10.5/15.5/20.5 in Bridged mode, be sure to connected your loudspeaker as shown in the illustration on page 8 (and as silkscreened on the rear panel), with the red (+) terminal of the Channel 2 output connected to the negative input of the speaker and the red (+) terminal of the Channel 1 output connected to the positive input of the speaker. Do not use the black ground (-) output terminal of either channel (the speaker load must "float" away from the amplifier chassis).

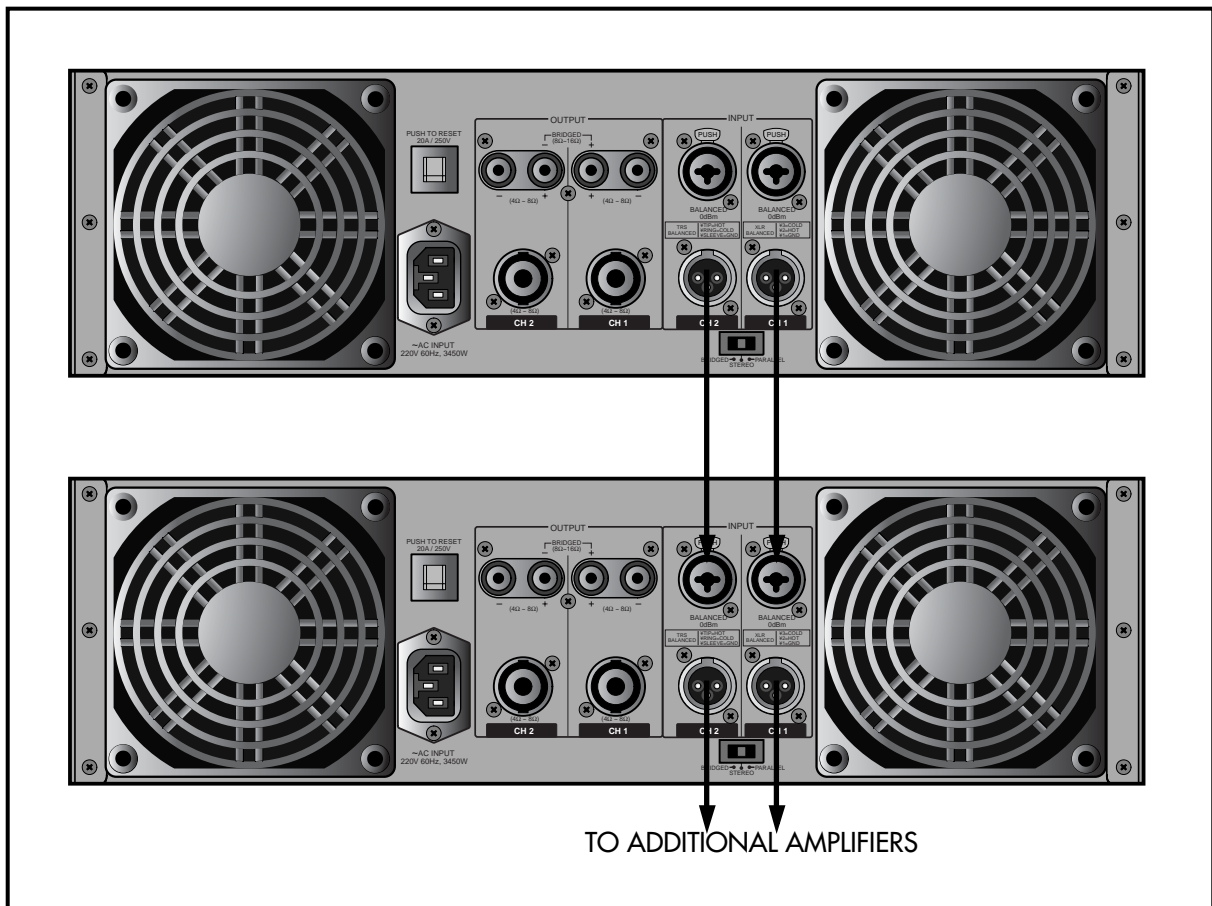
See pages 8 in this manual for interconnection diagrams when using CM-5.5/7.5/10.5/15.5/20.5 in Bridged or Parallel modes.

Connections



Link Connectors

The illustration below shows how multiple amplifiers can be interconnected using the CM-5.5/7.5/10.5/5.5/20.5 link connectors.



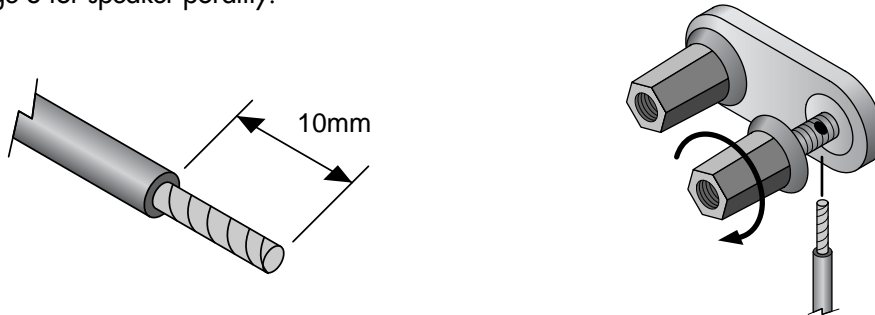
Speaker Impedance

CM-5.5/7.5/10.5/15.5/20.5 series amplifier has three operating modes: Stereo, Bridged and Parallel and allows you to connect multiple speaker systems in parallel. Therefore, the minimum speaker impedance varies depending on the combination of these speakers. Be sure that the speaker impedance falls below the specified impedance.

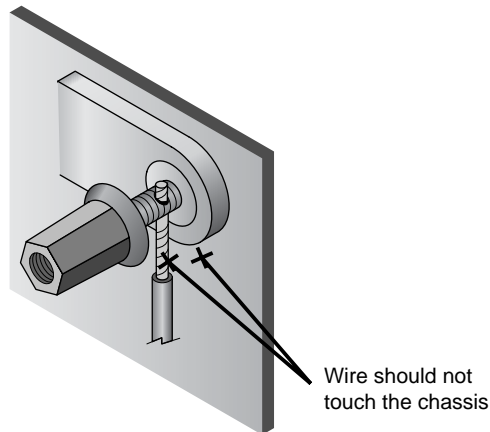
The 8 page show the examples of connection in Stereo mode and Bridged mode, and speaker systems connected in parallel in Stereo mode, and the respective minimum impedance.

Caution for Speaker Connection

1. Turn off the POWER switch.
2. After removing approx. 10mm of insulation from the ends of the speaker cables, pass the bare ends of the speaker wires through the holes in the corresponding speaker terminals and tighten the terminals to securely clamp the wires.
Refer to page 8 for speaker polarity.



At this time make sure that the bare ends of the speaker cables do not extend from the terminals in such a way that they touch the chassis.

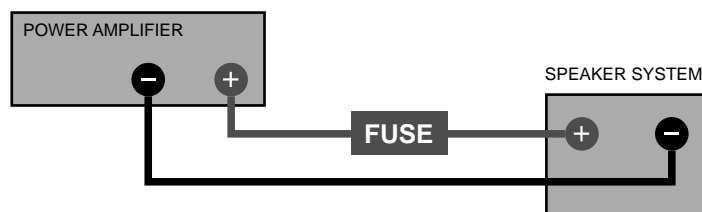


• SPEAKER FUSE

		CM-5.5	CM-7.5	CM-10.5	CM-15.5	CM-20.5
Rated Output	8Ω (per CH)	175W	230W	340W	510W	700W
	4Ω (per CH)	270W	360W	510W	800W	1100W
	8Ω Bridged Mono	550W	720W	1050W	1600W	2100W

Be sure to use a speaker system that has sufficient input capacity.

If the input capacity of your speaker system is lower than the rated output of the power amplifier, you can protect your speakers by connecting a fuse serially between the speaker and amplifier as shown below.



Use the following formula to determine the fuse capacity according to the speaker's input capacity.

$$P_0 = I^2 R \rightarrow I = \sqrt{\frac{P_0}{R}}$$

P_0 [W]: Speaker's continuous input capacity (noise or RMS)

R [Ω]: Speaker's nominal impedance

I [A]: Required fuse capacity

ex.) Speaker's continuous input capacity: 100W

Speaker's impedance: 8Ω

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

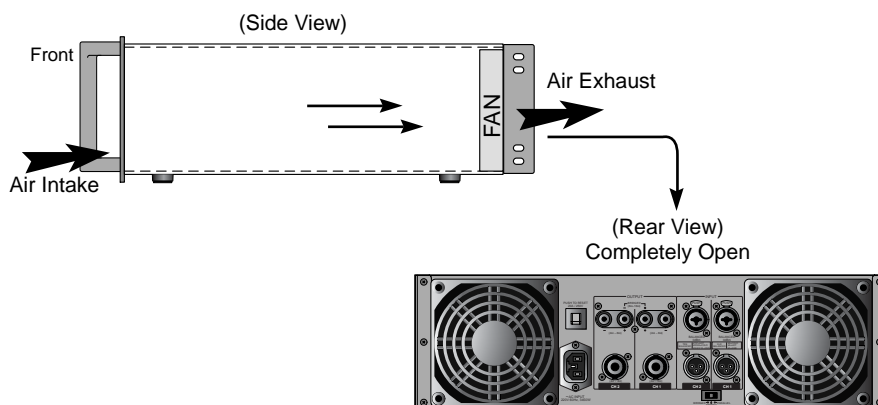
In this example, the required fuse capacity is calculated as 3.5 [A].

- SPEAKER CABLE

If you use a long speaker cable, use as thick a cable as possible to prevent deterioration of the damping factor or power loss inside the cable. Even the thickest cable can be used for the speaker terminal of this unit.

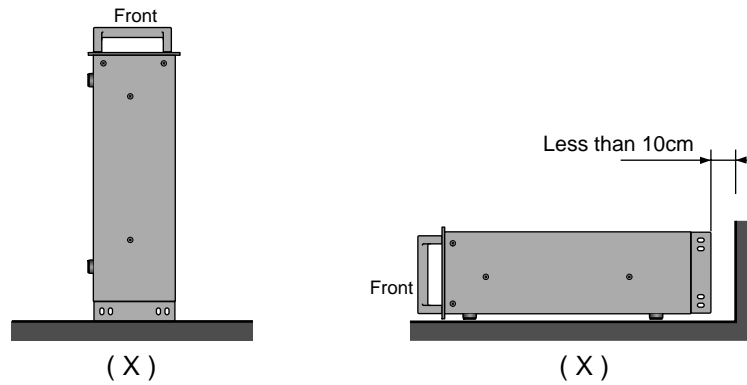
Portable Rack Mounting

The amplifier intakes cool air through the front panel and exhausts warm air out the rear panel. When mounting amplifiers in a portable rack, make sure the rear panel is completely open for ventilation.



Positioning the Housed Amplifier

Place the case so that the ventilation airflow paths are not blocked.

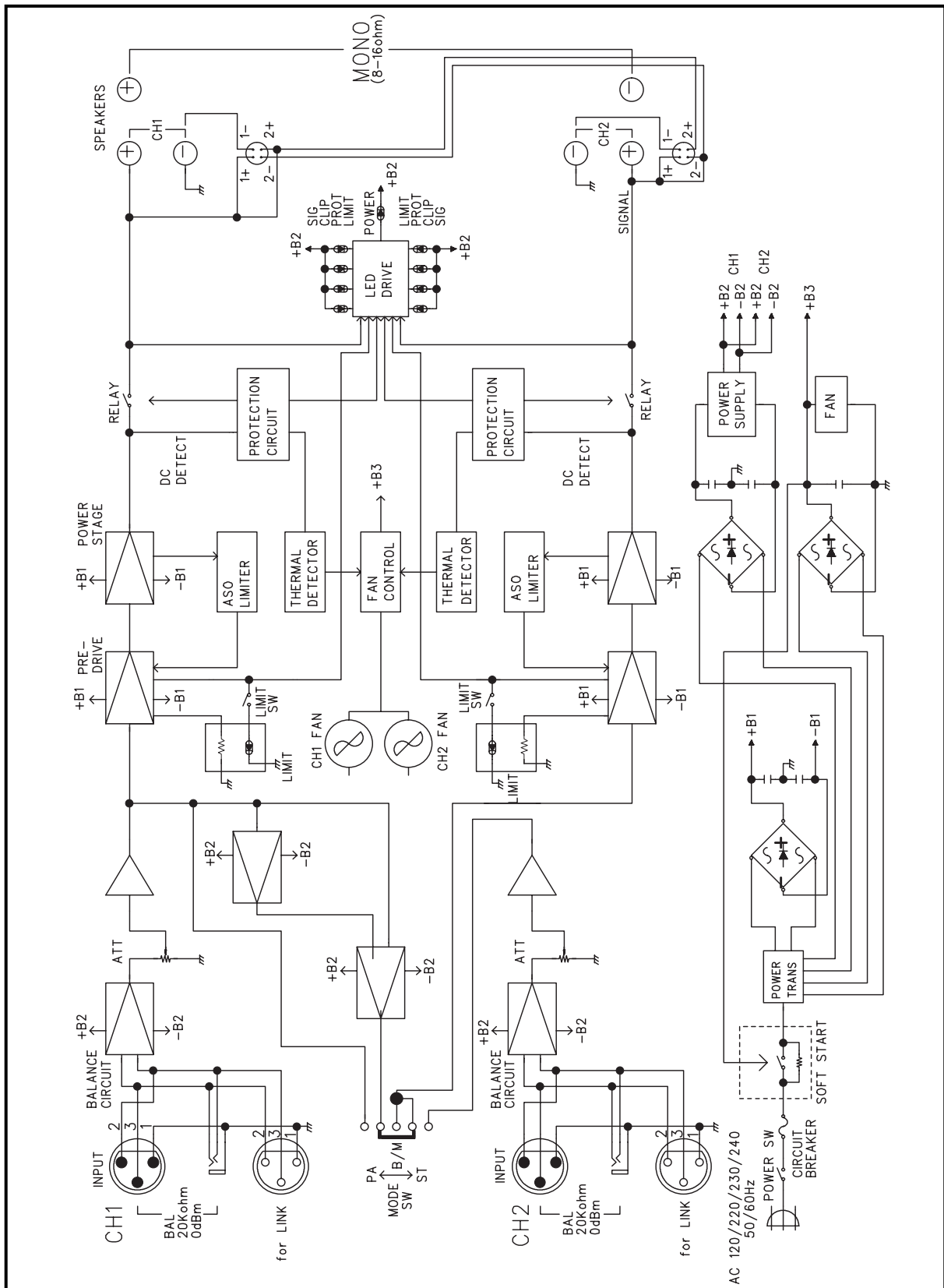


Troubleshooting

The following table lists the main causes of abnormal operation and the corrective measures required, as well as the protective circuit operation in each case.

Indicator	Probable Cause	Remedy	Protection Circuit
Signal indicator lights only.	There is a short at a speaker terminal, amplifier terminal, or wire.	Locate and correct the cause of the short.	The PC limiter circuit operates to protect the power transistors.
CLIP indicator lights.	The amplifier load is excessive.	Use a speaker system with an impedance of at least 4Ω (stereo) or 8Ω (bridge).	Same as above.
PROTECTION indicator lights.	The heat sink temperature has exceeded 100°C.	Check the amplifier ventilation conditions and take appropriate measures to improve airflow around the amplifier.	The thermal protection circuit operates to protect the power transistors.
	DC voltage of +/-2V or greater was generated in the power amplifier's output circuit.	Consult your dealer.	The relay operates to protect the speaker system.

Block Diagram



Specifications

	CM-5.5	CM-7.5	CM-10.5	CM-15.5	CM-20.5
Power Output Level f=1kHz, THD+N≤0.05% (Typical)					
STEREO RL=8Ω	175W+175W	230W+230W	340W+340W	510W+510W	700W+700W
STEREO RL=4Ω	270W+270W	360W+360W	510W+510W	800W+800W	1100W+1100W
BRIDGED RL=8Ω	550W	720W	1050W	1600W	2100W
One Channel Driven f=1kHz THD+N≤0.05% RL=8Ω	175W	230W	340W	510W	700W
Frequency Response RL=8Ω, P.=1W	0dB+0.5, -1.5dB: f=DC~55kHz				
Power Bandwidth Half Power, THD+N≤0.1% STEREO RL=8Ω	10Hz~40kHz				
Total Harmonic Distortion (THD+N) f=20Hz~20kHz, Half Power					
STEREO RL=8Ω	≤ 0.05%				
STEREO RL=4Ω	≤ 0.07%				
BRIDGED RL=8Ω	≤ 0.07%				
Channel Separation Half Power RL=8Ω, f=1kHz, ATT. max. Input 600Ω shunt	≥ 80dB				
Residual Noise (DIN Audio Filter)	≤ -70dB: ATT min.				
Signal-to-Noise Ratio DIN Audio, Input 600Ω Shunt	≥ 100dB				
Damping Factor RL=8Ω, f=1kHz	≥ 150				
Slew Rate 8Ω Full Swing	±40V/μs				
Sensitivity (ATT max.) Rated Power into 4Ω 1kHz	0dBm				
Voltage Gain (ATT max.) 4Ω 1kHz	31dB	33.5dB	35dB	37dB	38.2dB
Input Impedance (ATT max.)	≥ 20kΩ (Balance/Unbalance)				
Indicators	Power (Red) Protection (Mute) × 2 (Red) Clip × 2 (Orange) Signal × 2 (Green) Limit × 2 (Red)				
Protection	Power SW ON/OFF muting Heatsink Temp ≥ 100°C (212°F)				
PC Limiter	RL < 2Ω				
Fan Circuit	-50°C (122°F)~60°C (140°F)- Low-Speed - Variable - Hi-Speed				
Controls	(Front) Power SW: Push up On/Push down Off, Limit On/Off Attenuator: 21-position dB calibrated (Rear) Mode SW: Bridge=BTL/STEREO/PARALLEL				
Power Source	AC 110V~240V, 50/60Hz				
Power Consumption	420W	520W	770W	950W	1300W
Weight	12kg	15kg	17kg	20kg	23kg
Dimensions	482(W) × 88(H) × 369(D)			482(W) × 132(H) × 369(D) mm	
Connectors	Input XLR-3-31 type + 1/4" Phone (balanced), XLR Output 5-Way binding posts × 2, Speakon Terminal × 2				

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

* Using reactive 2Ω speakers at high power levels may cause overheating, excessive power consumption, and shutdowns.
Please note that below 2Ω the PC limiter will work. Before using 2Ω speakers in a real application, test the system completely.

* Specifications and design subject to change without notice for improvements.

NOTE
