

Unpacking and placement

Unpacking

Unpack your N°23.5 amplifier and keep all packing materials for future transport. Because of the weight of the unit, handles are provided front and rear so that two people may lift and carry the amplifier comfortably and without risk of injury.

Placement

Carefully inspect your N°23.5. If you find any damage or flaws, see your Mark Levinson dealer immediately.

To keep speaker cables as short as possible, locate the N°23.5 as close to the loudspeakers as practical.

The N°23.5 should be located at least three feet away from the turntable and preamplifier. Otherwise, the N°23.5 may induce hum into these sensitive components.

Ventilation

The N°23.5 may be placed in a cabinet or on a shelf, but adequate ventilation must be provided to prevent overheating. The clearance provided by the unit's feet must be maintained to allow unrestricted air flow across the heat sinks and through the vents in the bottom of the chassis (placing the N°23.5 on thick carpeting, for example, may reduce or eliminate the clearance provided by the feet). Clearance above the unit must also be maintained to allow air circulation and to prevent heat buildup.

The N°23.5 incorporates thermal sensors located near each group of output devices. If heat-sink temperature becomes excessive, these sensors will shut off the amplifier before damage results. After a brief cooling period, the amplifier can be reactivated via the switch on the front panel. If this occurs regularly during normal use, it indicates that the ventilation provided for the amplifier is inadequate. If there's adequate ventilation and the problem continues, see your Mark Levinson dealer immediately.

Custom installations

For custom installations and cabinetry, this information may be useful:

- All temperature measurements are made at the top of the heat sink, 3.5" behind the front plate.
- Normal heat-sink temperature at idle after warm-up, with unrestricted airflow at 22°C (72°F) ambient temperature: 36.5°C (97.7°F).
- Maximum permissible heat-sink temperature before thermal protection is activated: 80°C (176°F).

For exact dimensions, see "Dimensions."

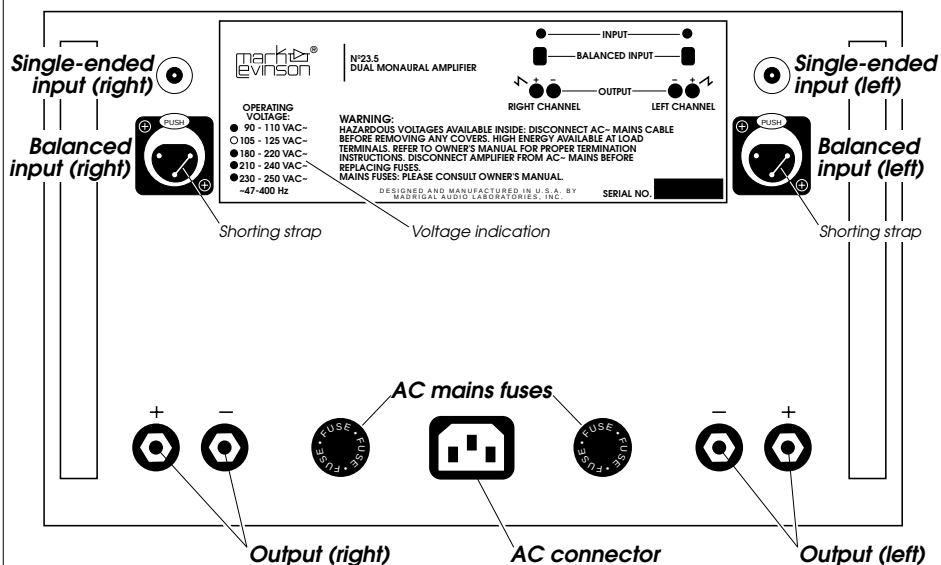
PRECAUTION

For your protection, review "Important safety instructions" before you install your N°23.5.

Voltage selection

The N°23.5 is factory-set (internally) for 100V, 120V, 200V, 220V, or 240V AC mains operation. Make sure that the label on the rear panel of the amplifier indicates the correct AC operating voltage for your location).

Figure 1: Rear panel



If the voltage indicated is incorrect, see your Mark Levinson dealer.

If you wish to change the AC operating voltage of your N°23.5, see your Mark Levinson dealer.

A N°23.5 typically uses from 225W (at idle) to 1200W (at its rated power into 8Ω). It may be powered by a 15-ampere AC mains line. For optimum performance into lower-impedance loads, however, it's recommended that the AC mains outlet used for the N°23.5 be capable of supplying a minimum of 20 amperes @ 100V and 120V AC, and 10 amperes @ 200V, 220V, and 240V AC. If other devices are also powered from the same AC circuit, their additional power consumption must be considered.

Two slow-blow 250V 3AG fuses (15 ampere @100V and 120V AC and 8 ampere @200V, 220V, and 240V AC) are located on the rear panel of the N°23.5. Replace the fuses only with the same type.

PRECAUTION

ALWAYS remove the AC cord before removing the fuses.

Signal connections

Connectors

The N°23.5 incorporates RCA-type and XLR-type connectors for audio signal input.

The Madrigal-designed RCA-type connectors used for single-ended audio interconnection are a great improvement over ordinary RCA-type connectors. The gold-plated XLR-type connectors employed are of European design, and are made to professional application standards.

Cables

When connecting the N°23.5 to a preamplifier, we recommend Madrigal Audio Laboratories HPC Interconnect Cable. HPC Interconnect Cable is available in various lengths, pre-terminated with RCA, XLR, and Camac connectors. See your Mark Levinson dealer.

Connection methods and operating modes

The N°23.5 can be operated in either single-ended or balanced mode. In each of these modes, the N°23.5 can be operated either normally (non-inverting) or inverting.

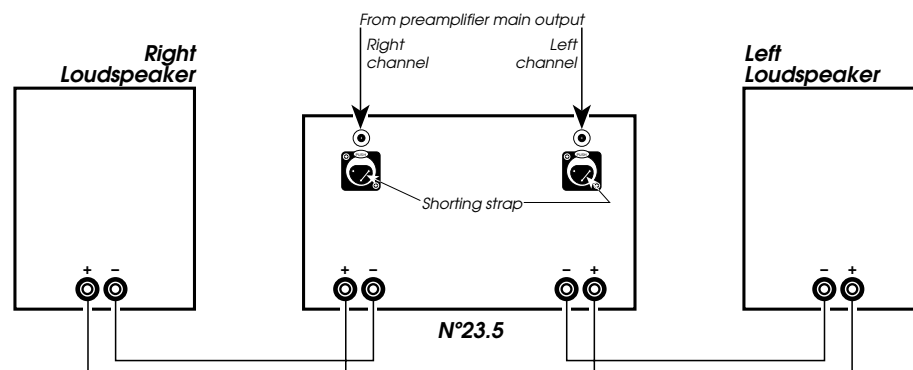
Note: This manual describes the connections for single-ended normal (non-inverting), single-ended inverting, and balanced normal (non-inverting) operation. If you have questions about these or other methods of signal connection, see your Mark Levinson dealer.

Single-ended normal (non-inverting) operation

Typical audio systems require that the amplifier be of the non-inverting type. This means that the output signal of the amplifier will be in phase with the input signal.

For this type of operation, connect the main outputs of your preamplifier to the left- and right-channel RCA-type inputs (non-inverting) on the rear panel of the N°23.5. Be sure that the shorting strap is inserted into the XLR-type connectors between Pins 1 and 3.

Figure 2: Connections for single-ended normal (non-inverting) operation

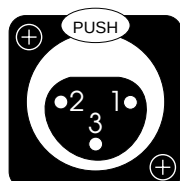


Single-ended inverting operation

Inverting operation should be used if a phase reversal is required. In this mode, the output signal of the amplifier will be 180° out-of-phase with the input signal. This may be required if one component in the system inverts the signal and absolute phase at the loudspeaker is desired.

For inverting operation, the main output cables of the preamplifier must be connected to the XLR-type inputs on the rear panel of the N°23.5. The pin assignments of these connectors are:

Figure 3: Female input connector



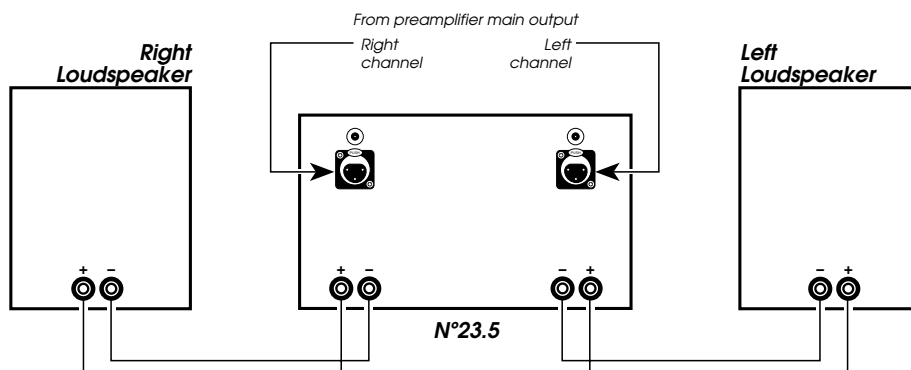
- Pin 1: Signal ground
- Pin 2: Signal + (non-inverting)
- Pin 3: Signal - (inverting)
- Connector ground lug: chassis ground

Connect the XLR-type male line-mount connector to your preamplifier's main output cable so that signal "hot" (+) connects to Pin 3 and signal ground connects to Pin 1. Be sure to also connect Pin 2 to Pin 1 inside the XLR-type male line-mount connector with a piece of copper buss wire (or similar material) at the amplifier end of the cable.

Note: If you prefer not to connect Pin 2 to Pin 1 inside the XLR-type male line-mount connector, you may purchase pre-shorted RCA-type inputs from your Mark Levinson dealer. Insert a pre-shorted RCA-type connector into each RCA-type input (non-inverting) on the rear panel of the N°23.5.

After completing the cables, connect the main outputs of your preamplifier to the left- and right-channel XLR-type inputs on the rear panel of the N°23.5. Be sure to remove the shorting strap between Pins 1 and 3 before inserting the output cable connectors.

Figure 4: Connections for single-ended inverting operation



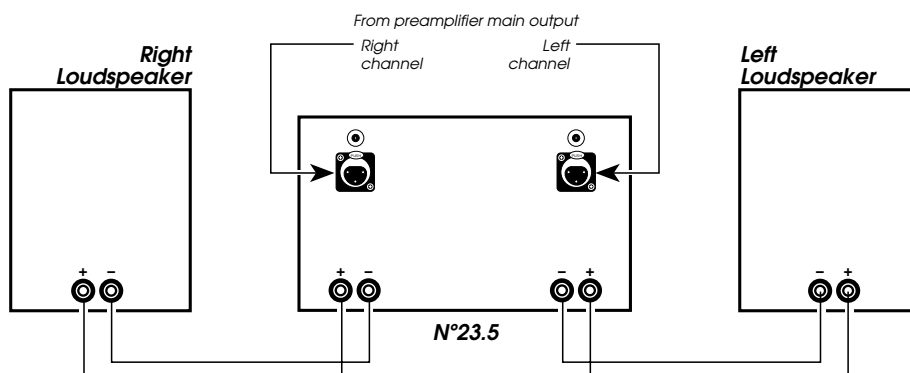
**Balanced normal
(non-inverting) operation**

If your preamplifier is equipped with a balanced main output, it's best to wire the N°23.5 for balanced operation, particularly if long lengths of cable are required between the preamplifier and the N°23.5. (See Figure 3 for the pin assignments of the XLR-type inputs on the rear panel of the N°23.5.)

Connect the XLR-type male line-mount connector to your preamplifier's main output cable according to Figure 3, carefully observing pin assignments. (Refer to your preamplifier's operating manual to verify that the pin assignments of its output correspond to the diagram above. If they don't, wire the connector so that the appropriate output pin connects to the equivalent input pin.)

When complete, connect the main outputs of the preamplifier to the left- and right-channel XLR-type inputs on the rear panel of the N°23.5. Be sure to remove the shorting strap between Pins 1 and 3 before inserting the output cable connectors.

*Figure 5: Connections for
balanced normal
(non-inverting) operation*



Note: For proper balanced operation, no connector (pre-shorted or otherwise) should be inserted into the RCA-type inputs on the rear panel of the N°23.5.

Speaker connections

PRECAUTION

NEVER connect the N°23.5's output terminals to any device other than a loudspeaker.

PRECAUTION

NEVER short-circuit the amplifier output terminals.

PRECAUTION

NEVER connect the left-channel output terminals to the right-channel output terminals.

The N°23.5 is equipped with gold-plated, high-current, five-way binding posts for output termination to a loudspeaker system. To take full advantage of the sonic quality of the N°23.5, we recommend that you use high-quality speaker cable (see your Mark Levinson dealer).

Lug connection

There are two recommended methods for connecting speaker cables to the outputs of the N°23.5. A high-quality spade- or hook-type lug, soldered to the cable, is preferred.

Figure 6: Spade and hook lugs



We confidently recommend Madrigal binding-post lugs, made of oxygen-free copper with gold-over-silver plating. These lugs are available for round cable; see your Mark Levinson dealer for more information.

Note: Many lug connectors are designed to be crimped onto the cable. However, soldering usually ensures a better electrical connection. If you have no experience in soldering, see your Mark Levinson dealer.

Pigtail connection

The "pigtail" is another method of speaker connection, using a short piece of 14-gauge wire soldered to the speaker cable. The other end of this 14-gauge wire is inserted through the hole in the five-way binding posts on the rear panel of the N°23.5.

1. Begin with 3" of 14-gauge copper wire.
2. Strip 5/8" of insulation from one end, and strip 1/2" of insulation from the opposite end.

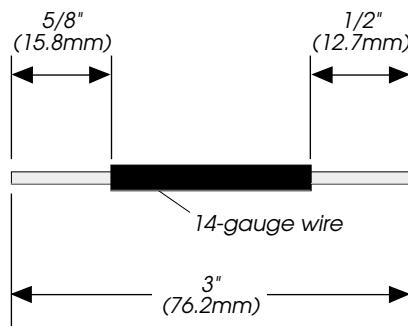
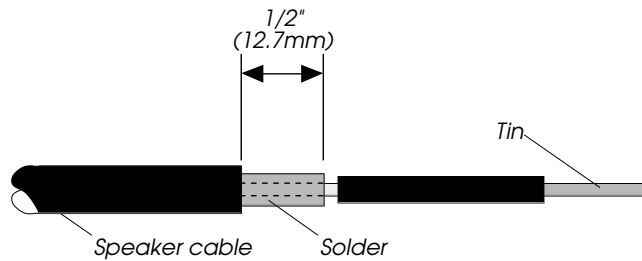


Figure 7A: Pigtail connection

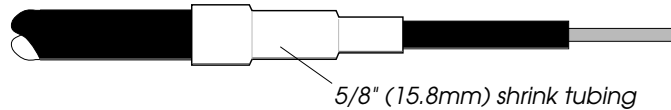
3. Strip 1/2" of insulation from the speaker cable.
4. Gently slide the (5/8") bare end of the 14-gauge wire into the center of the bare speaker cable (be careful not to spread the individual wires of the speaker cable).

Figure 7B: Pigtail connection



5. Solder this connection. A high-wattage soldering gun may be necessary to provide adequate heat.
6. Lightly "tin" the remaining (1/2") bare end of the 14-gauge wire.
7. Gently slide a 1" length of shrink tubing (5/8"-diameter tubing for HF10C) over the connection and heat to shrink. (Color-coded shrink tubing is available for polarity identification.)

Figure 7C: Pigtail connection



8. Follow this procedure for the remaining speaker connections.

Note: This procedure may also be used for the speaker end of the cable, depending upon the type of speaker terminal.

Connecting the speakers

When the speaker cables are complete, connect the left-channel + (positive or red) output post of the N°23.5 to the + (positive or red) input terminal of the appropriate loudspeaker.

Connect the left-channel - (negative or black) output post of the N°23.5 to the - (negative or black) input terminal of the other loudspeaker.

Repeat this procedure for the right channel.

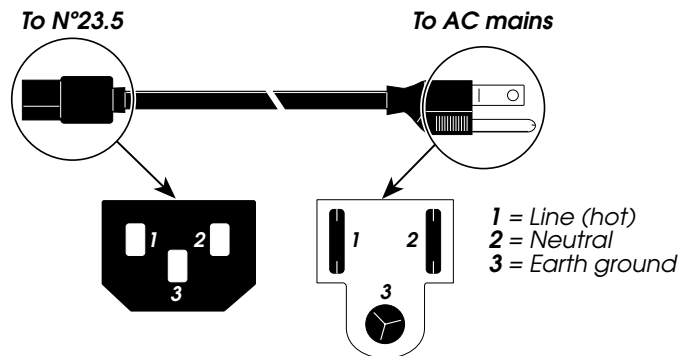
Power connection

After making the loudspeaker connections, apply power to your preamplifier and allow it to stabilize. (Mark Levinson preamplifiers, for example, require about one minute to stabilize.)

Connecting the AC power cord

Connect the AC power cord (included in the accessory pack) to the AC connector on the rear panel of the N°23.5, then to the AC mains outlet.

Figure 8: AC power cord polarity



Turn on the N°23.5 by setting the power switch on the front panel to the "I" (on) position.

Note: You may hear a transient "click" or "pop" through your speakers a few seconds after you operate the N°23.5's power switch. This noise is normal and won't damage your speakers.

Performance tips

The N°23.5 won't achieve its sonic potential right away — its sonic performance is close to the optimum after about 100 hours of use. For the best performance, you may leave your N°23.5 powered at all times, except when you won't be using it for a long period (see "Important Safety Instructions").

The N°23.5 is designed to be "power-cycled" (that is, turned on and off) without affecting its longevity. After the amplifier is turned on after being left unpowered, allow for about one hour of warmup before expecting optimal sonic performance.

Protection circuitry

Under certain conditions (an electrical malfunction or inadequate ventilation), the N°23.5's protection circuitry may activate, turning off the amplifier before damage results. When this happens, the power switch on the front panel will be set automatically to the "O" (off) position. After a brief cooling period, you can reactivate the amplifier by setting the power switch to the "I" (on) position.

If this occurs regularly during normal use, see your Mark Levinson dealer immediately.

Note: While the protection circuitry is active, the power switch won't stay in the "I" (on) position. If, after the amplifier has cooled, the power switch still won't engage, the protection circuitry still detects a malfunction; see your Mark Levinson dealer immediately.

Bridged operation

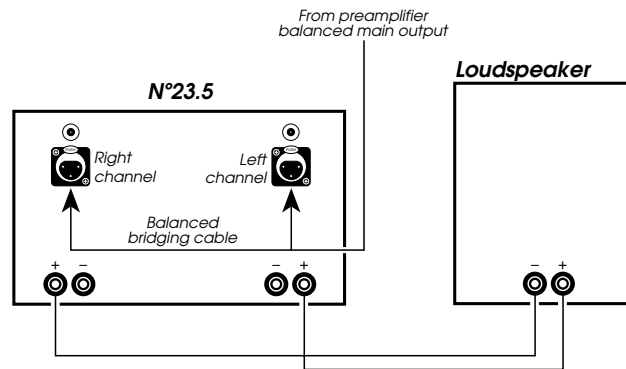
When greater power output is desired, the N°23.5 may be bridged for monophonic operation into load impedances of at least 2Ω .

Note: Make sure the loudspeaker is rated to handle extremely high power levels. For example, a bridged N°23.5 driving an 8Ω loudspeaker is capable of delivering 800W RMS.

Bridged bridged operation

For the best bridged performance, we recommend balanced interconnection. If your preamplifier provides balanced output, follow the steps below.

Figure 9: Connections for balanced bridged operation

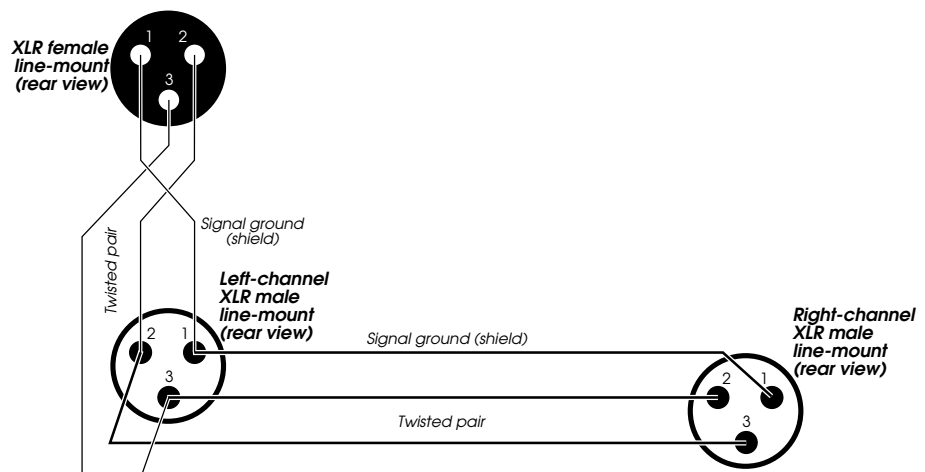


1. For balanced bridged operation, you'll need a special three-ended cable. You may fabricate such a cable according to Figure 10; it's also available through your Mark Levinson dealer as part of a balanced bridging kit.

Note: If fabricating the cable, be sure to use high-quality audio interconnect cable (such as Madrigal HPC).

Connect the bridging cable's female XLR-type connector to the appropriate channel of your preamplifier's balanced main output.

Figure 10: Balanced bridging cable

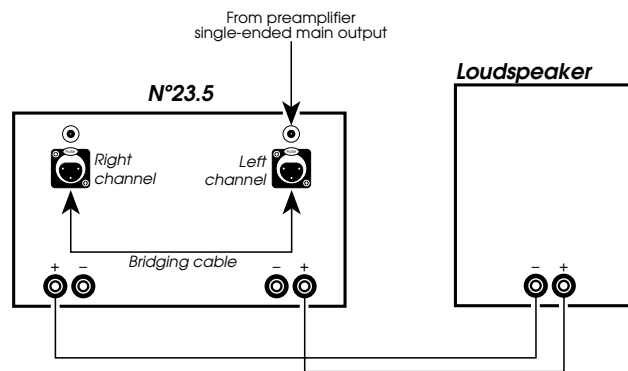


2. Connect the bridging cable's male XLR-type connectors to the N°23.5's left- and right-channel XLR-type input connectors, taking care to insert the correct cable end into its designated channel.
3. Connect the left-channel + (positive or red) output post of the N°23.5 to the + (positive or red) input terminal of the appropriate loudspeaker. Connect the right-channel + (positive or red) output post of the N°23.5 to the - (negative or black) input terminal of the same loudspeaker.
4. Repeat this procedure for the other N°23.5 to be bridged.

Single-ended bridged operation

If your preamplifier provides only single-ended output, follow the steps below.

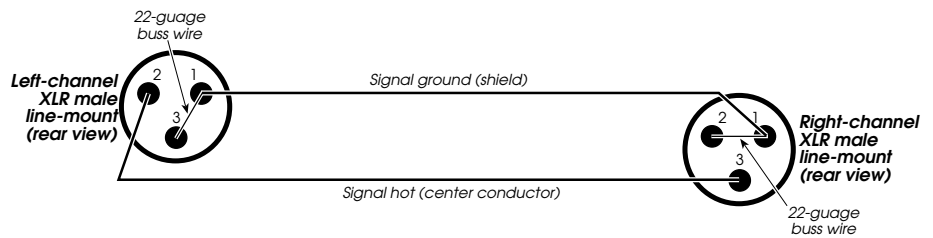
Figure 11: Connections for single-ended bridged operation



1. Connect the appropriate channel of your preamplifier's single-ended main output to the left-channel RCA-type input on the rear panel of the N°23.5.

2. Connect the bridging cable between the left- and right-channel XLR-type input connectors, taking care to insert the correct cable end into its designated channel. You may fabricate such a cable according to Figure 12; it's also available through your Mark Levinson dealer as part of a single-ended bridging kit.

Figure 12: Single-ended bridging cable



Note: If fabricating the bridging cable, be sure to use high-quality audio interconnect cable (such as Madrigal HPC).

3. Connect the left-channel + (positive or red) output post of the N°23.5 to the + (positive or red) input terminal of the appropriate loudspeaker. Connect the right-channel + (positive or red) output post of the N°23.5 to the - (negative or black) input terminal of the same loudspeaker.
4. Repeat this procedure for the other N°23.5 to be bridged.

Care and maintenance

Cleaning

To remove dust from the cabinet of the N°23.5, use a feather duster. To remove dirt and fingerprints, we recommend isopropyl alcohol and a soft cloth.

Poor connections cause sonic degradation. We recommend, therefore, that you clean all speaker connection with denatured alcohol at least once a year. See your Mark Levinson dealer for other ways to optimize connections.

Fuses

Two slow-blow 250V 3AG fuses (15 ampere @100V and 120V AC and 8 ampere @200V, 220V, and 240V AC) are located on the rear panel of the N°23.5. Replace the fuses only with the same type.

PRECAUTION

ALWAYS remove the AC cord before removing the fuses.

Specifications

The correlation between published specifications and sonic quality is unreliable. A list of numbers reveals virtually nothing. All technical measurements must be subject to qualitative as well as quantitative interpretation.

Measurements of the N°23.5 yield excellent results by any standards. However, only those specifications that apply to the actual operation of the amplifier are included here.

- **Rated power:** 200W minimum continuous sine wave power into 8Ω, with both channels driven from 20Hz to 20KHz with no more than 0.1% THD (FTC). 400W minimum continuous sine wave power into 4Ω with both channels driven from 20Hz to 20KHz with no more than 0.2% THD (FTC).
- **Peak output voltage:** 67V @ rated line voltage @ 8Ω
- **Frequency response:** (-3dB) 4Hz, 140KHz
- **Input impedance:** 50KΩ shunted by 1.5nF
- **Voltage gain:** 26.9dB
- **Power consumption:** Typically 225W @ idle; 1200W @ rated power, 8Ω
- **Overall dimensions:** See "Dimensions"
- **Shipping weight:** 105 lbs. (48kg)
- **Connector complement:** 2 RCA-type connectors
2 XLR-type connectors
4 five-way binding posts
1 IEC mains connector

For more information, see your Mark Levinson dealer or:

Madrigal Audio Laboratories, Inc.

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Middletown, Connecticut 06457 U.S.A.

Telephone: (203) 346-0896 or 344-9300
FAX: (203) 346-1540

If purchased in North America, this Mark Levinson product's warranty is owner-transferable. Warranty conditions are valid only in the country where the product was originally purchased.

For warranty information and conditions on products purchased outside of North America, contact your local dealer or regional distributor.

Dimensions

Figure 13A: Dimensions,
N°23.5, top view

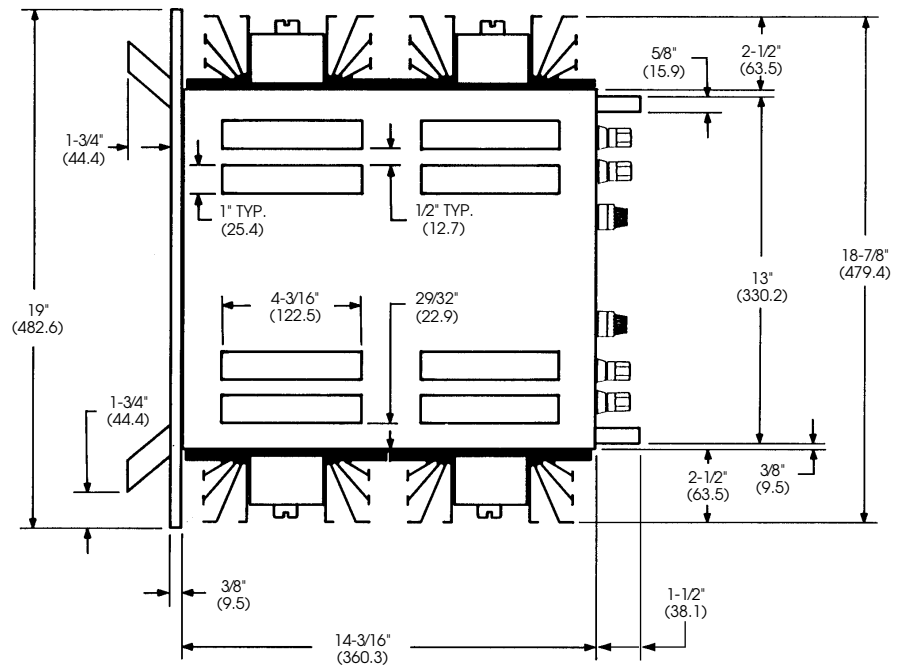
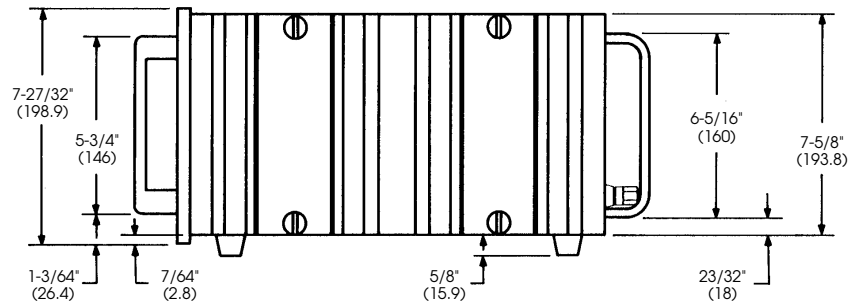


Figure 13B: Dimensions,
N°23.5, side view



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