

## INSTALLATION & OPERATION GUIDE

WMVC100



WMVC100E

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Weatherproof Muting Stereo Volume Controls



BLENDING HIGH FIDELITY AND ARCHITECTURE®



NILES®

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# WMVC 100

# WMVC 100E

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## INTRODUCTION

The WMVC 100 and WMVC 100E are weatherproof muting stereo volume controls with a programmable automatic muting feature. They connect between a Niles MVC HUB4 Distribution Hub and your speakers.

The WMVC 100 is a wall-mounted muting volume control designed specifically for environmental use. The WMVC 100E is a freestanding muting volume control mounted in a PVC junction box for use in environmental where a wall-mounted muting volume control would be impractical.

Both models adjust the volume of remotely located speakers to which they are connected by attenuating the amplifier signal. The mute button opens and closes a relay to turn those speakers on or off.

To assure minimal dissipation of internal power with virtually no power wasted as heat, they use autoformers instead of L-pads as the volume-controlling element.

The WMVC 100 and WMVC 100E are impedance-magnifying (IM) volume controls. Unlike other brands, they have additional autoformer windings that magnify the impedance of connected speakers, while allowing all 12 steps to adjust the volume of the sound. Switches on the PC board select these windings.

With the volume control providing impedance protection for your amplifier, you can create systems with no additional impedance-matching devices between the volume control and the amplifier.

In a typical application of IM controls, a system has eight pairs of 8-ohm speakers throughout the house and in outdoor locations. Connect each pair of speakers to an IM volume control

with its switch in the 8x position, eliminating the need for an external impedance-matching device to protect the amplifier. Even when playing all eight speaker pairs at once, the amplifier runs at normal operating temperatures.

## FEATURES AND BENEFITS

The weatherproof WMVC 100 and WMVC 100E offer a number of improvements over other weatherproof muting volume controls:

- **WMVC 100:** Designed for environmental wall-mount installation.
- **WMVC 100E:** Enclosed in a freestanding PVC junction box, designed for installations where wall mounting would be impractical.
- Both models: A rubber gasket fits behind the faceplate during installation to seal out moisture.
- Allows you to mute speakers with the simple push of a button at the volume control, without having to turn the volume-adjustment knob.
- The automatic muting feature is programmable allowing certain locations (such as the sauna and porch) to remain muted when system activation turns on other locations (such as the kitchen and pool area).

- An impedance-magnifying switch on the front of the volume control sets the impedance of connected speakers. You can magnify the speakers' impedance by a factor of two, four, or eight.
- Unlike other impedance-matching volume-control products, Niles IM volume controls maintain a 12-position adjustment regardless of how much impedance magnification you use, with total attenuation >48dB.
- Pop-free switching between all steps.
- 100-percent tested, electronically and acoustically, for frequency response, distortion, and power handling.
- **WMVC 100:** Mounting depth of only 2-9/16". Fits into standard 18-cubic-inch one-gang junction boxes.
- **WMVC 100E:** Fits into PVC junction box (supplied).
- Standard faceplate and knob included.

### TECH TIP

**Some speakers have selectable impedance. Before you proceed, please confirm that any selectable-impedance speakers in your system are properly set for the system you are installing.**

- Isolated left- and right-channel grounds ensure safety with any amplifier.
- May be used with 4-, 6-, or 8-ohm speaker systems.
- Ideal for home and commercial sound installations.
- UL-rated to comply with all local building codes.
- Installation requires only a screwdriver and wire stripper.
- Power handling: 100W/channel RMS.
- Frequency response: 20Hz to 20kHz  $\pm 1.5$ dB.
- **WMVC 100:** Available colors: Bone and White.
- 10 years parts and labor warranty.

## INSTALLATION CONSIDERATIONS

### Calculating the Impedance Magnification Setting

Use the following instructions and the accompanying charts to select the correct switch setting for the number and type of speakers in your system.

**CAUTION! Every speaker pair in the system must be connected to an impedance-magnifying volume control and set to the same magnification.**

1. Count the number of pairs of 4-ohm speakers and the number of pairs of 8-ohm speakers you are connecting. Count pairs of 6-ohm speakers as 4-ohm pairs.
2. Determine whether the amplifier should see a 4-ohm load or an 8-ohm load. You should find this information in the owner's manual of the amplifier.
3. Read the correct switch position from the charts on the next page. See **Figure 3** if your amplifier can drive a 4-ohm load. See **Figure 4** if your amplifier must have an 8-ohm speaker load.
4. Set the switches on all of the controls to the same position (1x, 2x, 4x, or 8x).

### Limitations in Volume with High Magnification Settings

Using an 8x setting limits the power to each speaker pair to one-eighth of the amplifier's output.

### TOOLS REQUIRED

- 1/8" Standard Slotted Screwdriver
- 1/4" Standard Slotted Screwdriver
- Wire Stripper

In a typical application of IM volume controls, a system has eight pairs of 8-ohm speakers throughout the house. Each pair of speakers is connected to an IM volume control with its switches set for 8x.

With eight pairs of speakers, one-eighth of the amplifier's power is available to any pair. Therefore, an amplifier rated at 100W per channel RMS into 8 ohms will deliver up to 12.5W to each of the eight pairs – whether you play all eight pairs or just one pair. This translates into a drop in the maximum volume capability of about 9dB at the 8x setting.

## USING SPEAKER SELECTORS WITH IM VOLUME CONTROLS

Although IM controls provide volume and on/off at the volume-control location, they do not give you central control of speakers playing throughout the house.

Speaker-selection systems give you central control, but some speaker selectors have non-defeatable impedance-protection circuits. Combining IM controls with such a selector will

12 AWG



14 AWG



### TECH TIP

Wire size is expressed by its AWG (American Wire Gauge) number. The lower the AWG number, the larger the wire. Thus, 12 AWG wire is physically larger than 14 AWG.

reduce your maximum volume substantially. To solve this problem, specify a speaker selector with a defeatable protection circuit (Niles models HDL-4, HDL-6, SPS-4, or SPS-6). Then keep the protection circuit off at all times.

## JUNCTION BOXES

**WMVC 100:** The mounting depth of the MVC 100 is 2-9/16". When installed, the unit extends 2-1/16" behind the sheetrock wall (assuming 1/2" sheetrock). For installation, use a standard 18-cubic-inch (or larger) junction box. Suitable junction boxes are available from your Niles dealer or local electrical-supply company.

**WMVC 100E:** Use the PVC junction box (supplied), mounted atop a PVC conduit through which the wires will run.

## TYPE OF SPEAKER WIRE

We recommend 16-gauge stranded copper speaker wire for most connections, and 14-gauge wire for runs longer than 80 feet. Don't use speaker wire larger than 14 gauge, because larger wire may not fit into the connectors. Never use solid-core, aluminum, or Romex wire with an IM volume control. For speaker-wire runs within walls, most U.S. states and municipalities require a special type of speaker wire with a specific CL fire rating, such as CL-2 or CL-3. Consult your Niles dealer, building contractor, or local building-inspection department if you aren't sure what kind of wire is best for your application.

**MOUNTING LOCATION**

**WMVC 100:** Convenient mounting locations include:

- On a porch or patio wall.
- Near doorways.
- Close to a telephone.

**WMVC 100E:** Convenient mounting locations include:

- At poolside.
- Near a hot tub.
- Near a barbecue.

Some states or municipalities allow installation of devices such as the MVC 100 in the same junction box as 110V devices, with a low-voltage partition between the devices. We do not recommend this, because speaker wires can act as an antenna for electrical noise. Locating speaker wires too close to a light switch or dimmer may cause the speakers to emit a popping or buzzing sound. If you must locate the IM volume control near electrical devices, install it in a separate metal junction box, ground the box to the electrical-system ground, and route the speaker wires several feet away from the electrical wiring.

**PREPARING FOR INSTALLATION**

**NOTE:** The WMVC 100 and WMV 100E require 12VDC

power to operate the muting function of the volume control. Therefore, two conductor power wire must be run to each volume control location along with four conductor speaker wire.

**WMVC 100:** Before you install the WMVC 100 into an existing wall, consider the possibility of hidden obstructions inside the wall, such as wood and metal studs; electrical, telephone, or other wiring; plumbing; and conduit.

1. Install the junction box in the usual manner.
2. Run all necessary wiring to the volume control. Label the wires for future reference.

**WMVC 100E:**

1. Run the necessary wiring up through the conduit and the opening at the base of the enclosure. Label the wires for future reference.
2. Mount the entire enclosure atop the PVC conduit.

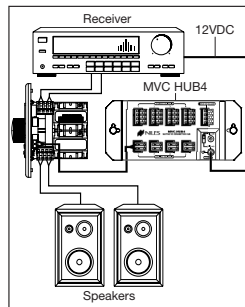
**INSTALLATION**

1. Locate the 4 pin speaker wire connector plugs (and remove them if they are plugged in). See **Figure 5**.
2. Strip 1/4" of insulation from the end of each wire. Tightly twist the end of each wire until no frayed ends remain.

3. Use a small flathead screwdriver or your thumbnail to raise the locking tabs, exposing the holes on the removable connector plug.
4. Insert each wire into the appropriate hole on the removable connector plug, and snap the locking tab down.

**NOTE:** Maintain proper phasing. Connect the positive terminals on the volume control to the positive terminals on the amplifier and speakers, and connect the negative terminals on the volume control to the negative terminals on the amplifier and speakers. To help you avoid improper phasing, the connector plug is keyed. Insert the smooth side of the connector plug into the smooth side of the socket. Don't force the scalloped side of the connector plug into the smooth side of the socket. See **Figure 5**.

5. Locate the 2 pin voltage connector (see **Figure 7**). Strip 1/4" of insulation from the end of each wire. Tightly twist the end of each wire until no frayed ends remain and insert each wire into the appropriate hole on the connector. Use a small flathead screwdriver to tighten the screws in place.



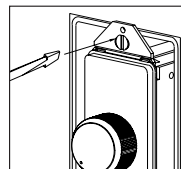
**Figure 1**  
Wiring Diagram

6. Set the Impedance Magnification Switch (See **Figure 6**) as determined by the IM charts (**Figures 3 and 4**).
7. Plug the connectors into the volume control as shown in **Figure 5**. The inputs of the IM volume control are the connector pins labeled AMPLIFIER. The outputs are the connector pins labeled SPEAKERS.

**NOTE:** If you reverse these connections, the volume control won't function properly.

8. Connect the power-supply wiring between the volume control and the Niles MVC HUB4 Speaker/ Power Hub.

9. Secure the volume control to the junction box. Insert the 1-1/4" device screws into the oblong screw holes on the top and bottom of the volume control. The oblong shape of the screw holes helps you place the volume control in a vertical position. Align the screws with the threaded holes in the junction box. Tighten the screws using a Phillips screwdriver. DO NOT OVERTIGHTEN. If necessary, loosen these screws several turns so the volume control fits flush with the faceplate.



**Figure 2**  
Loosening the  
Screws for a Flush Fit

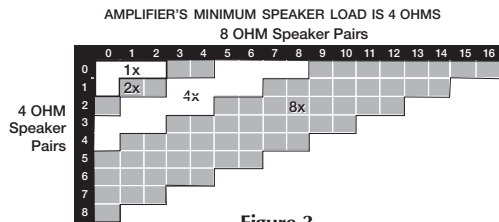


Figure 3

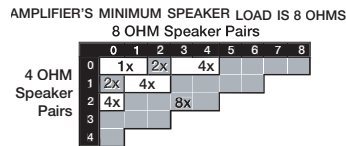


Figure 4

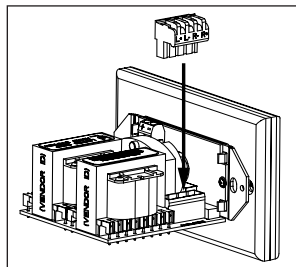


Figure 5

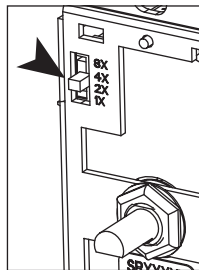


Figure 6

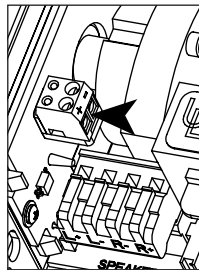


Figure 7

- Set the rubber gasket inside the faceplate and be sure it is seated properly.
- Use the shorter plate screws to fasten the gasketed faceplate to the volume control. **DON'T OVERTIGHTEN THE PLATE SCREWS, WHICH COULD DAMAGE THE FACEPLATE.** Align all the screws in the same direction for a clean, finished look.

**OPERATION**

- Make sure the amplifier or receiver power is OFF and set the volume to minimum.
- Set the volume on the volume control to maximum (fully clockwise).
- If you are using a Niles speaker-selection system, locate the ON/OFF button that corresponds to the speaker pair you wish to play. Set it to the ON position. Make sure the defeatable protection circuit is not enabled. See *Using Speaker Selectors with IM Volume Controls*, on page 4.
- Turn ON the amplifier or receiver and select a source, such as the tuner or CD player.
- Slowly turn up the amplifier or receiver volume and set it to a comfortable – *not maximum* – listening level. Don't overdrive or "clip" your amplifier. If the sound becomes muddy or distorted, you have reached the limit of your amplifier's

volume capability. Reduce the volume at once to avoid damaging your speakers.

- Use the volume control to adjust the volume of the speakers to the desired listening level. If all the speaker pairs in your system are equipped with Niles volume controls, you can leave the amplifier or receiver volume set at one position and use the Niles controls exclusively.
- To mute the speakers without adjusting the volume control, press the mute button.
- To unmute speakers that have been muted, press the mute button again.

**PROGRAMMING CAPABILITY**

You can program individual WMVC 100 and WMVC 100E Muting Volume Controls attached to an MVC HUB4, allowing certain locations (such as the guest bedroom and porch) to remain muted when system activation turns on other locations (such as the kitchen and family room).

To program a WMVC 100 or WMVC 100E for automatic muting or unmuting, press and hold the mute button for 10 seconds. An LED blinks to indicate that programming has occurred.

The WMVC 100 and WMVC 100E come from the factory pre-programmed in the automatic mute mode.

**SPECIFICATIONS**Audio Power Handling

100W/channel RMS  
200W/channel peak music power

Mounting

**WMVC 100:** In-wall, fits into most 18-cubic-inch single-gang junction boxes at least 2-3/4" deep

**WMVC 100E:** Enclosed in a PVC junction box (supplied)

Wiring Requirements

14-18 gauge, two individual runs of two-conductor speaker wire, or one run of four-conductor speaker wire.

Unit Dimensions

1-5/8" wide x 2-5/8" high

Faceplate Dimensions

**WMVC 100:** Faceplate: 2-3/4" wide x 4-1/2" high

Depth Behind Faceplate

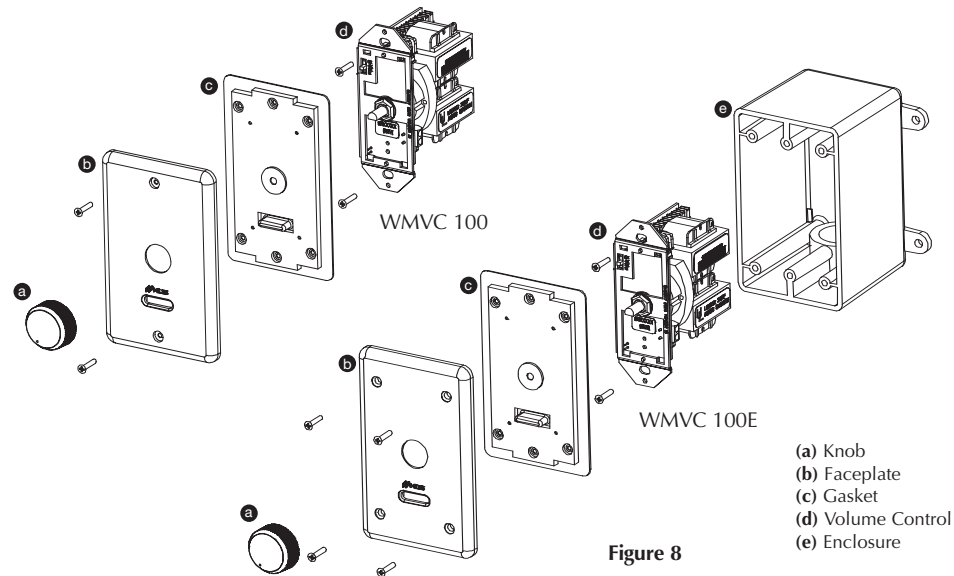
2-9/16"

**CONTENTS**WMVC 100

- WMVC100 volume control
- Standard wallplate
- Knob
- Device mounting screws X2
- Faceplate screws X2
- Removable speaker connector X2
- Gasket

WMVC 100E

- WMVC100E Volume Control
- Knob
- Device mounting screws X2
- Removable speaker connector X2
- Standard Faceplate screws X4
- Enclosure X1
- Gasket

**Figure 8**

- (a) Knob
- (b) Faceplate
- (c) Gasket
- (d) Volume Control
- (e) Enclosure