Weatherproof 70V/100V 2-way Speakers

P/Ns 21643 / 21645

User's Manual

SAFETY WARNINGS AND GUIDELINES

Please read this entire manual before using this device, paying extra attention to these safety warnings and guidelines. Please keep this manual in a safe place for future reference.

- These speakers are weatherproof with an IPx4 Ingress Protection rating, which means that they can withstand dripping or splashing water for 10 minutes.
- Although they are protected against splashing water for a short period of time, these speakers should be installed in a covered location. Additionally, they should not be allowed to sit in standing water.
- These speakers are only weatherproof when mounted in a vertical orientation, with the tweeter at the top, or horizontally with the tweeter on the left.
- The speaker terminals on the rear of the speakers are weather resistant, not weather proof. Take care to avoid exposing them to water.
- Power off and unplug all Audio/Video components when making wired connections. Only apply power after all connections have been made.
- Double-check all connections prior to applying power to ensure that speaker polarity is properly made and that there are no stray wire strands, which could short the connections, either on the back of the speakers or the AV receiver/amplifier.
- Do not use full volume until after the speakers have been fully broken-in.
- If you hear distortion reduce the volume until the distortion is no longer audible. Distortion can sound like a buzzing, scratching, or hammering sound. Distortion can damage or destroy the delicate speaker coils.
- Do not use cleaning fluids, solvents, or other chemicals to clean the speaker cabinets.
- Do not use excessive volume when listening to this speaker system. If you experience pain, discomfort, or dizziness, reduce volume immediately. Prolonged exposure to excessive volume can cause permanent hearing damage.
- Do not disassemble or attempt to service these speakers.
- If installing speaker wire inside or through walls, you must use in-wall rated speaker wire.

INTRODUCTION

Thank you for purchasing these Weatherproof 70V/100V 2-way Speakers!

These speakers feature a weatherproof enclosure, which is capable of withstanding the splashing water jets for several minutes, making them well-suited to outdoor installations.

FEATURES

- Weatherproof plastic housing
- IPx4 ingress protection rating
- Includes wall mounting brackets
- 8 ohms nominal impedance
- 70V and 100V constant voltage taps
- Weather resistant push terminals

CUSTOMER SERVICE

The Monoprice Customer Service department is dedicated to ensuring that your ordering, purchasing, and delivery experience is second to none. If you have any problem with your order, please give us an opportunity to make it right. You can contact a Monoprice Customer Service representative through the Live Chat link on our website **www.monoprice.com** during normal business hours (Mon-Fri: 5am-7pm PT, Sat-Sun: 9am-6pm PT) or via email at **support@monoprice.com**

PACKAGE CONTENTS

Please take an inventory of the package contents to ensure you have all the items listed below. If anything is missing or damaged, please contact Monoprice Customer Service for a replacement.

2x Weatherproof 70V/100V 2-way speakers

2x Wall mounting brackets

4x M4x40 mounting screws (6.5-inch model only)

6x M3.5x15 mounting screws (6.5-inch model only)

8x M4x25 mounting screws (4-inch model only)

1x User's manual

CONSTANT VOLTAGE VS 8-OHM SPEAKER SYSTEMS

A constant voltage speaker system differs from a traditional 8-ohm speaker system in that it uses a step-up transformer at the audio source to raise the voltage and lower the current on the transmission line. At the speaker end, a step-down transformer converts the signal back to a normal speaker level voltage. This reduces power loss during transmission, which allows for the use of longer speaker wire runs using smaller gauge wire.

Additionally, a constant voltage speaker system allows for the use of multiple speakers on each channel, without the need for complicated impedance calculations and configurations. In a constant voltage system, all speakers on a given channel are connected in parallel and the complicated impedance calculations are replaced by simple wattage calculations.

For example, if you want to connect two speakers per channel in a traditional 8-ohm speaker system, you must either connect them in series, which results in an overall 16-ohm impedance, or in parallel, which results in an overall 4-ohm impedance. In the first case, the 16-ohms impedance effectively halves the output power of your amplifier, resulting in lower overall volume levels. In the latter case, the 4-ohms impedance means that your amplifier will have to work harder and must be rated as stable at 4 ohms. Adding a third

speaker to the mix would complicate it further, producing either a 24-ohm or 2.67-ohm overall impedance. Note that very few amplifiers are stable under 2-ohm loads, so that is usually not an option.

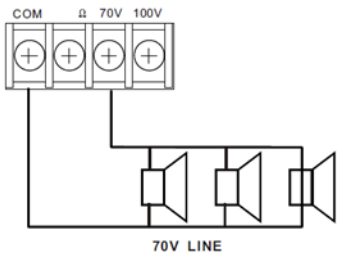
On the other hand, with a constant voltage system, you consider first the RMS output wattage of the amplifier. This should be reduced by 20% to compensate for insertion loss. For example, if using a 100-watt amplifier, the total load from speakers should not exceed 80 watts.

Each individual speaker on a given channel is set to a value such that the total does not exceed the rated power, less 20%. You do not need to worry about making the total as close as possible to the limit; just ensure that the total does not exceed the limit.

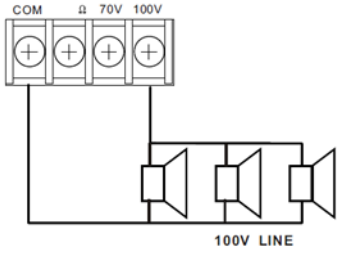
If all speakers are set to the same wattage value, they will all have the same volume level. If one speaker is set to a higher wattage value, it will be louder than the others, while a speaker set to a smaller value will be quieter than the others. This allows you to compensate for the environment in which the speaker is placed. For example, a speaker placed outside would need to be louder than a speaker placed in a small room.

SPEAKER WIRING

Most constant voltage speaker installations will consist of multiple speakers per channel, with all speakers connected in parallel, as shown in the diagram to the right.



To wire speakers in parallel, connect the first speaker to the amplifier as normal. Connect the positive terminal on the first speaker to the positive terminal of the second speaker, and the negative terminal on the first speaker to the negative terminal on the second. Repeat for each additional speaker in the array



SPEAKER BREAK-IN

In the same way that a new car requires a break-in period before it can be safely operated at high engine RPMs, speakers require a break-in period before they can be safely operated at maximum volume levels. Proper break-in ensures that the moving parts of the speaker (the cone and cone suspension) are allowed to flex and soften, losing the initial stiffness and allowing the speaker to move through its full intended range. After the break-in period, the speakers will produce richer and fatter sounding lows, warmer and smoother sounding mids, and cleaner and more accurate highs, without any hint of distortion.

The best way to break-in speakers is simply to play normal music or watch movies at moderate volume levels. The amount of time required for speaker break-in varies based on the operating environment, but is typically in the area of 50~80 hours. It will take a bit longer in a cold or dry environment and a little less time in a warm or humid environment.

Note that the break-in period does not have to be continuous.

SPEAKER WIRE PREPARATION

Before attempting to make any connections it is best to look at the situation, get all the necessary materials together, and then make all the connections at once.

First, look at the back of your amplifier or receiver to determine what options it offers for making connections. Amplifiers and receivers typically employ either 5-way binding posts, spring-loaded terminals, or a combination of both for the speaker connections.

A 5-way binding post can accept bare speaker wire, spade plugs, pin plugs, and banana plugs, while spring loaded terminals can accept either bare speaker wire or pin plugs. Refer to the documentation that came with your amplifier or receiver to determine the maximum size/gauge speaker wire the speaker terminals can accept.

These speakers feature water resistant push terminals, which can accept bare wire up to 14AWG. If your amplifier can accept it, you should use 14AWG speaker wire.

Rather than using fixed length speaker wires, it is best to get a roll and cut the wires to the length you will need them. This ensures that there is a minimum amount of excess wire. However, even if your amplifier is off-center, the lengths of wire used for each speaker pair

should be identical. This keeps the impedance on each channel the same, which ensures that the volume levels, frequency ranges, and tonalities are identical. Any excess wire should be snaked back and forth, not coiled, to avoid creating an inductor/antenna for stray radio signals.

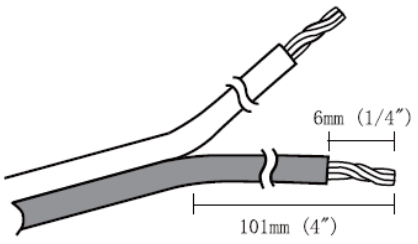
Before making the actual connections, cut each length of wire to size. Note the markings on the wire that differentiate between each conductor. Sometimes the marking clearly identifies a positive and negative side. Some common clearly positive and negative markings or identifiers are:

Positive	Negative
Red	Black
Copper	Silver
+ + +	- - -

In many cases, the mark is a single stripe on the jacket of one of the connectors. In this case the side with the stripe is generally considered the positive side, but it really does not matter as long as you are consistent and always using the stripe as positive or always using it as negative.

Note that if you will be installing the speaker wire within or through walls, you must use in-wall rated speaker wire.

Separate about 4" of wire, then strip about 1/4" (6mm) insulation from the end and twist it to prevent stray strands. If you plan to use banana or pin plugs to connect to your amplifier (highly recommended), install the plugs on one end of the wire.



INSTALLATION

These speakers include wall mounting brackets and mounting screws for installation to wooden supporting surfaces. If you need to mount to a different type of surface, you will need to supply the appropriate mounting hardware. The brackets are compatible with screw sizes up to M4.

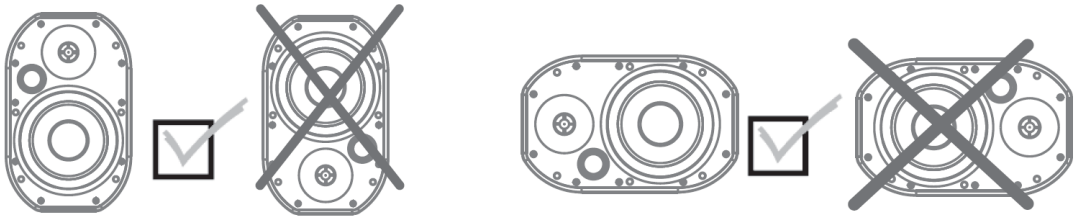
Determine where you will install the speakers. This should be on a vertical surface that is capable of supporting the weight of the speaker and the mounting bracket. If possible you should mount the speakers symmetrical to your listening location. The speakers should be mounted in a covered location, protected from direct rainfall.

6.5-Inch Speaker Installation (21645 only)

Perform the following steps to mount and connect the 6.5-inch version of these outdoor speakers. Installation of the 4-inch model is detailed in the following section.

1. For each speaker, unscrew that end caps which attach the bracket to the speaker housing and remove the brackets.
2. The brackets include two 2-way keyhole screw mount locations, which allow for both vertical and horizontal mounting options.
3. Place the bracket against the mounting location. Use a carpenter's level to ensure that the bracket is straight, then use a pencil to mark the end of each keyhole.
4. Use a drill of the appropriate size to drill pilot holes for the screws or holes for the screw anchors.
5. If using screw anchors, insert them into the holes and tap them in place using a hammer.
6. Insert the screws into the pilot holes or screw anchors and tighten them until they are about 1/4" from being fully driven into the mounting surface.
7. Position the keyholes over the screw heads with the narrow portions of the keyholes above the screw bodies. Slide the bracket down until the screw bodies are at the end of the narrow portions of the keyholes.

8. Tighten the screws the rest of the way. Ensure that the bracket is secure against the surface without any wiggle or wobble.
9. Push the red terminal on the rear of the speaker and insert the positive lead of the speaker wire. Ensure that there is no copper showing.
10. Push the black terminal on the rear of the speaker and insert the negative lead of the speaker wire. Ensure that there is no copper showing.
11. Position the speaker in the bracket and thread the two end caps into place. Tighten the end caps partially so that the speaker can still be rotated within the bracket. **Note that the speaker is only weatherproof when the speakers are mounted vertically, with the tweeter at the top, or horizontally with the tweeter on the left.**



12. Angle the speaker as desired, then tighten the end caps to lock the speaker in position on the bracket.
13. Repeat steps 3-12 for the second speaker.
14. Route your speaker wires to your amplifier. Note that if you will be routing wires inside or through walls, you should use in-wall rated speaker wire.
15. Connect the positive and negative leads of each speaker wire to the left and right channel speaker outputs on your amplifier. Ensure that your amplifier is powered off and unplugged prior making the connections.

Congratulations, your speakers are installed and ready for use!

4-Inch Speaker Installation (21643 only)

Perform the following steps to mount and connect the 4-inch versions of these outdoor speakers. Installation of the 6.5-inch models are detailed in the previous section.

1. Place the bracket against the mounting location. Use a carpenter's level to ensure that the bracket is straight, then use a pencil to mark each screw hole.
2. Use a drill of the appropriate size to drill pilot holes for the screws or holes for the screw anchors.
3. If using screw anchors, insert them into the holes and tap them in place using a hammer.
4. Position the bracket against the wall and insert the screws into each hole. Tighten the screws to secure the bracket against the mounting surface.
5. Loosen the vertical adjustment knob and straighten out the bracket so that the mounting screw is sticking straight out, then tighten the knob.
6. Rotate the nut on the mounting screw clockwise so that about 1 inch of bare threads are visible.
7. The speaker has two mounting locations. Position one of them over the mounting screw and rotate the speaker clockwise to tighten it onto the mounting screw. Continue rotating the speaker until it is tight on the mounting screw.
8. If the speaker is not straight, rotate it counterclockwise until it is straight.
9. Rotate the nut on the mounting screw counterclockwise until it is tight against the rear of the speaker body. Use a wrench to tighten in place. Ensure that the speaker is secure on the bracket.
10. Loosen the vertical adjustment knob and angle the speaker down so that you can get access to the speaker wire terminals on the rear. Tighten the knob to keep the speaker in this position.
11. Push the red terminal on the rear of the speaker and insert the positive lead of the speaker wire. Ensure that there is no copper showing.
12. Push the black terminal on the rear of the speaker and insert the negative lead of the speaker wire. Ensure that there is no copper showing.

13. Loosen the vertical and horizontal adjustment knobs and angle the speaker as desired. Tighten the knobs to secure the speaker in position.
14. Repeat steps 1-13 for the second speaker.
15. Route your speaker wires to your amplifier. Note that if you will be routing wires inside or through walls, you should use in-wall rated speaker wire.
16. Connect the positive and negative leads of each speaker wire to the left and right channel speaker outputs on your amplifier. Ensure that your amplifier is powered off and unplugged prior making the connections.

Congratulations, your speakers are installed and ready for use!

TECHNICAL SUPPORT

Monoprice is pleased to provide free, live, online technical support to assist you with any questions you may have about installation, setup, troubleshooting, or product recommendations. If you ever need assistance with your new product, please come online to talk to one of our friendly and knowledgeable Tech Support Associates. Technical support is available through the online chat button on our website **www.monoprice.com** during regular business hours, 7 days a week. You can also get assistance through email by sending a message to **tech@monoprice.com**

SPECIFICATIONS

Model	21643	21645
Type	2-way Indoor / Outdoor	2-way Indoor / Outdoor
Ingress Protection Rating	IPx4	IPx4
Woofer Size/Type	4" polypropylene + mica cone with rubber surround	6.5" polypropylene + mica cone with rubber surround
Woofer Magnet	8 oz.	17.7 oz.
Tweeter Size/Type	0.5" PEI dome	1" PEI dome
Frequency Response	125 Hz ~ 20 kHz	125 Hz ~ 20 kHz
Sensitivity (2.83V)	84dB	85dB
Nominal Impedance	8 ohms	8 ohms
Power Handling Capacity (RMS)	30 watts	50 watts
Power Handling Capacity (Max)	60 watts	100 watts
70V Constant Voltage Taps	7.5, 15, and 30 watts	12.5, 25, and 50 watts
100V Constant Voltage Taps	15 and 30 watts	25 and 50 watts
Dimensions	7.9" x 5.0" x 5.1" (200 x 126 x 130 mm)	14.1" x 10.0" x 4.0" (358 x 255 x 103 mm)
Weight (each including bracket)	4.4 lbs. (2.0 kg)	10.0 lbs. (3.5 kg)