



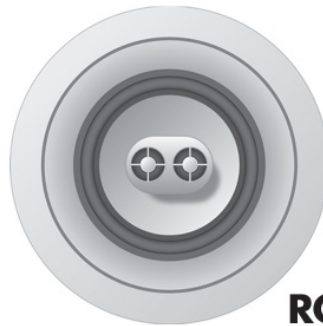
Ratio[®]

High-Efficiency Indoor Loudspeakers

Instruction Manual



RC61



RC61S



RC81



RW691



INTRODUCTION

Product Description

Russound Ratio® High-Efficiency Loudspeakers are designed to provide high acoustic output with low amplifier power. This makes them perfectly suited for use with low-powered amplified keypads and amplified volume controls.

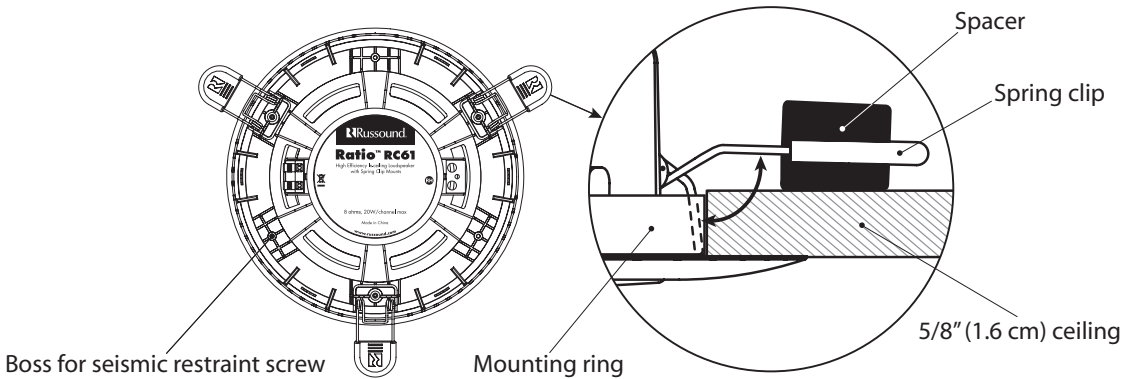
Low-mass driver materials and state-of-the-art engineering allow these speakers to produce higher sound pressure levels than conventional speakers without sacrificing sound quality.

When ordinary speakers are used with low-powered amplified keypads, they have limited output. This is because the speakers are designed to handle higher power levels from other types of amplifiers. Because of their high efficiency, Ratio speakers play more loudly than conventional speakers when used with amplified keypads.

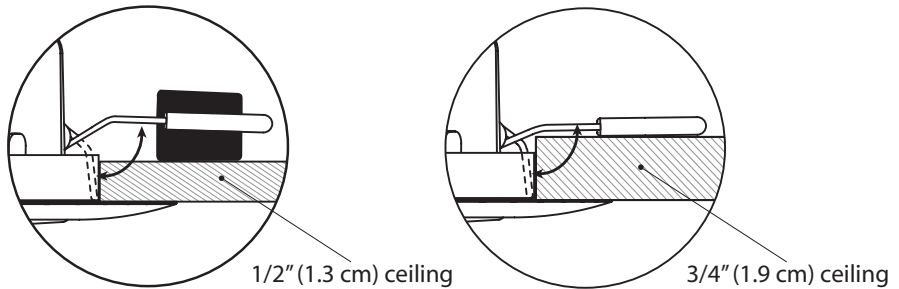
Ratio speakers are designed to reduce installation time. All models incorporate an innovative spring-clip mounting feature that makes them easier to install. Also, the ceiling speakers have preinstalled grilles. These features allow the installer to simply connect the speaker cables and press the speakers into the ceiling for a quick installation.

Caution

Ratio speakers are for use only with amplified keypads and volume controls or amplifiers with a power output of up to 20 watts per channel. Do not use Ratio speakers with receivers or amplifiers rated at more than 20 watts per channel.



Bosses opposite the spring clips on ceiling speakers can be used to attach seismic restraints. Spacers on the spring clips are factory set for a 5/8" (1.6 cm) ceiling or wall thickness.



The spring clip spacers can be inverted to accommodate a ceiling or wall thickness of 1/2" (1.3 cm) or removed for a 3/4" (1.9 cm) ceiling or wall, or when rough-in brackets are used.

Applications

Ratio speakers provide room-filling sound in any multiroom system with amplified keypads. In many cases where an external amplifier would be added for conventional speakers, a pair of Ratio speakers powered directly by the keypad will suffice.

Designed for optimal performance with amplified keypad systems, Ratio speakers make it possible to use such systems in places where higher-powered systems would otherwise be used. This provides an economical alternative to high-powered multiroom systems.

Speaker Placement

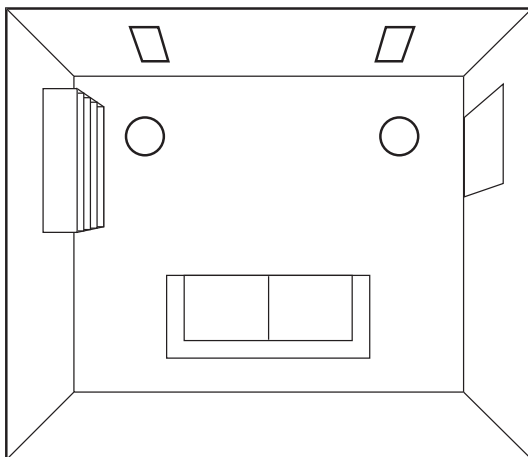
Following are some general placement guidelines for stereo listening and background music applications. Other things to consider for speaker placement include:

- Locations of unobstructed wall or ceiling cavities in which to mount the speakers
- Accessibility for running cables through the walls or ceilings to the speaker locations

Stereo music listening

Speaker placement for stereo music listening is important for proper imaging. Imaging is the ability of the speaker pair to reproduce sounds so they appear to come from between the speakers.

In a stereo music system, we recommend placing the left and right speakers about 60 degrees apart when viewed from the center listening position. In-wall speakers should be centered at ear level.

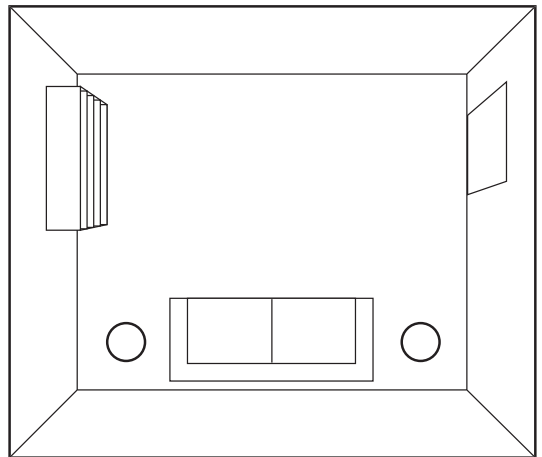


Speaker placement for stereo listening

Background music

Speaker placement for background music is less critical than for stereo listening. Often the goal is to provide even coverage throughout the room, without regard to a fixed listening position. In this case, the speakers can be placed so they cover equal portions of the room.

In other cases, the goal is to provide background music only in part of a large room or open area, often where the seating is located. In this case, the speakers can be located to provide coverage in that part of the room.



Speaker placement for background music in a seating area

Placement near corners

Placing the speakers near the corners of a room can help emphasize bass frequencies. This is fine if both speakers in a stereo pair are mounted near corners, but avoid placing one speaker in a corner and another in a large open area.

The best acoustic performance will result if the speakers face the same type of surface and are placed in similar positions on the same type of wall or ceiling surface.

Small rooms

The RC61S stereo ceiling speaker is useful for providing coverage for a small room from a single point. Usually it should be placed near the center of the room.

Avoid wet locations

Ratio indoor speakers are designed to provide reliable long-term service as long as they are not installed in wet or damp locations such as showers. Also, they should not be installed in areas continually subject to high humidity, such as unventilated bathrooms and porches in humid climates.

PREPARATION

Prewiring

Run a separate 2-conductor stranded copper speaker cable of at least 16 AWG (1.5 mm) from the amplified keypad or amplifier to each speaker. (**Note:** When using the RC61S stereo ceiling speaker, run either one 4-conductor cable or two 2-conductor cables to the speaker.)

Be sure to use cable with the appropriate fire resistance rating for the application. Check the local building code for specific requirements. Russound offers 2- and 4-conductor speaker cables with a Class 3 fire rating for in-wall installation.

When running a speaker cable parallel to an AC power cable, keep them at least 12 inches (30 cm) apart to minimize electromagnetic interference. If the speaker cables must cross AC wiring, cross them at right angles.

Leave about 2 feet (0.6 m) of cable at the keypad or amplifier end for connecting to the output terminals. Label the cables so you will know which cable connects to each channel. At each speaker location, leave enough cable so that at least 2 feet (0.6 m) can extend through the cutout for connecting to the speaker.

Cutting Holes in Existing Wallboard

Note: Ratio speakers are designed to mount to ceiling and wall material between 1/2 inch (1.3 cm) and 3/4 inch (1.9 cm) thick. Spacers on the spring clips accommodate varying thicknesses of material within this range.

1. Once you have determined roughly where to place the speakers, use a stud finder to locate the wall studs or ceiling joists and mark their location.
2. Check to make sure there are no obstructions such as electrical cables, water pipes, or heating ducts where you want to put the speakers.
3. Position the provided cutout template on the wall or ceiling and trace around it with a pencil to draw the outline of the cutout.

4. Score the outline with a utility knife to prevent chipping or tearing. Then use a drywall saw or spiral-cut tool to cut the hole. Make sure you don't make the hole any larger than the template.

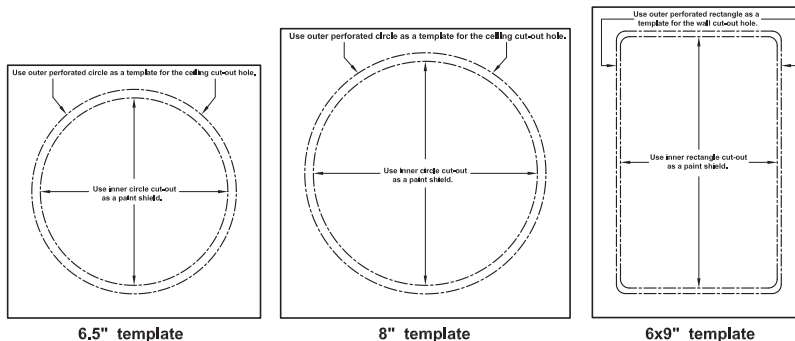
Installing Rough-In Brackets

If the walls and ceilings are not yet in place, you can use Russound rough-in brackets to mark the speaker locations and provide templates for making the cutouts. Nail or screw the wings of the rough-in bracket to the ceiling joists or wall studs, with the opening between them where you want the speaker to be. The drywall installer can then use the bracket as a template to cut the hole in the wallboard exactly the same size as the bracket ring.

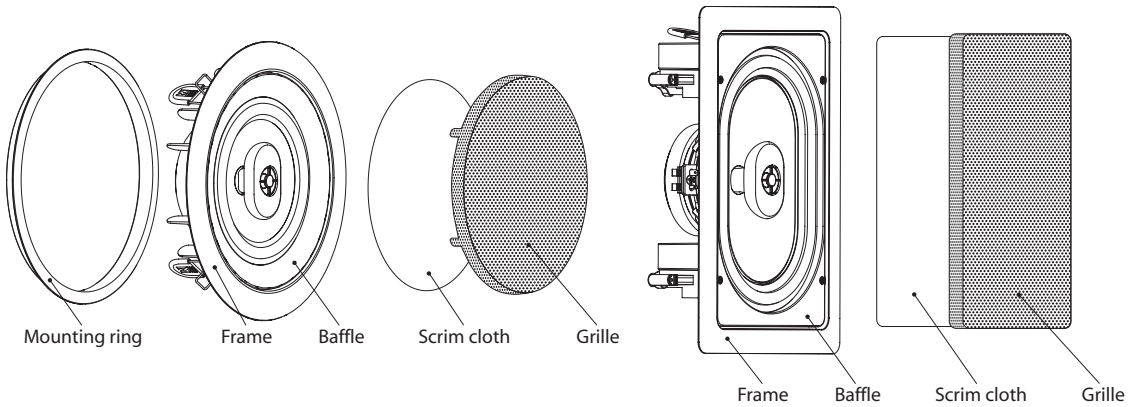
Painting the Speakers

The speaker frames and grilles can be painted to match the room décor. Be sure not to get paint on the speaker baffles or drivers.

1. Gently pull off the speaker grilles, making sure not to distort them. To remove the grilles from the ceiling speakers, first unbend the retainer tabs on the edges of the grilles. Remove the scrim cloths from inside the grilles and set them aside for reassembly.
2. Mask the baffles (the areas inside the frames that house the drivers) with the provided paint shields. If you will be spraying the frames, also mask the back of the speakers to keep overspray off the drivers.
3. Paint the frames and grilles separately. Spraying is ideal, but if you can't spray the paint, a roller with a short or medium nap will work better than a brush.
4. While the paint is still wet, clear any clogged holes in the grilles with bursts of compressed air.
5. After the paint has thoroughly dried, remove the masking.



The cardboard template supplied with each speaker has perforations for the cutout and a paint shield



In-ceiling and in-wall speaker assemblies

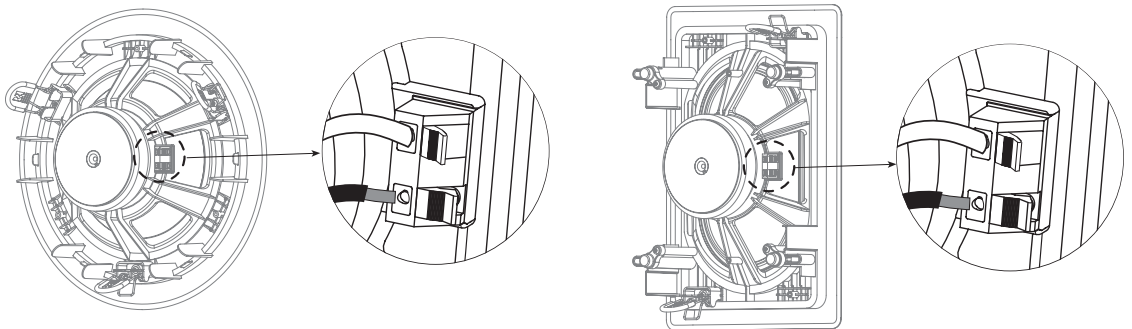
Connecting the Speakers

Note: Before connecting a ceiling speaker, place the mounting ring, flange down, around the back of the speaker.

1. Strip 1 to 2 inches (2.5 to 5 cm) off the end of the cable's outer jacket. Then strip ½ inch (1.3 cm) of insulation off each wire.
2. Twist the wire strands together so there are no strands separated from the bundle.
3. Connect the wires to the speaker terminals, being sure to observe proper polarity. For standard speaker cable with red and black wires, connect the red wire to the red positive (+) terminal and the black wire to the black negative (-) terminal.

Note: Some speaker cables have other ways of designating polarity. For example, cable with a clear jacket usually has a copper-colored wire for positive and a silver-colored wire for negative. In a cable with white and black wires, the white is positive and the black is negative. Cable with both wires the same color may have grooves, ribs, or stripes on the positive wire.

4. Check to make sure there are no stray strands of wire outside the terminals. If there are, remove the wire, twist the strands together, and reconnect the wire to the terminal.



Speaker cable connections

Final Assembly

Ceiling speakers

Reattach grille

1. If you removed the grille for painting, insert the scrim cloth into the grille and align the tabs on the edge of the grille with the slots in the baffle.
2. Gently press the grille back into place on the speaker, using even pressure around the edge. Don't press in the center of the grille.
3. Bend the retainer tabs toward the center of the speaker to secure the grille in place.

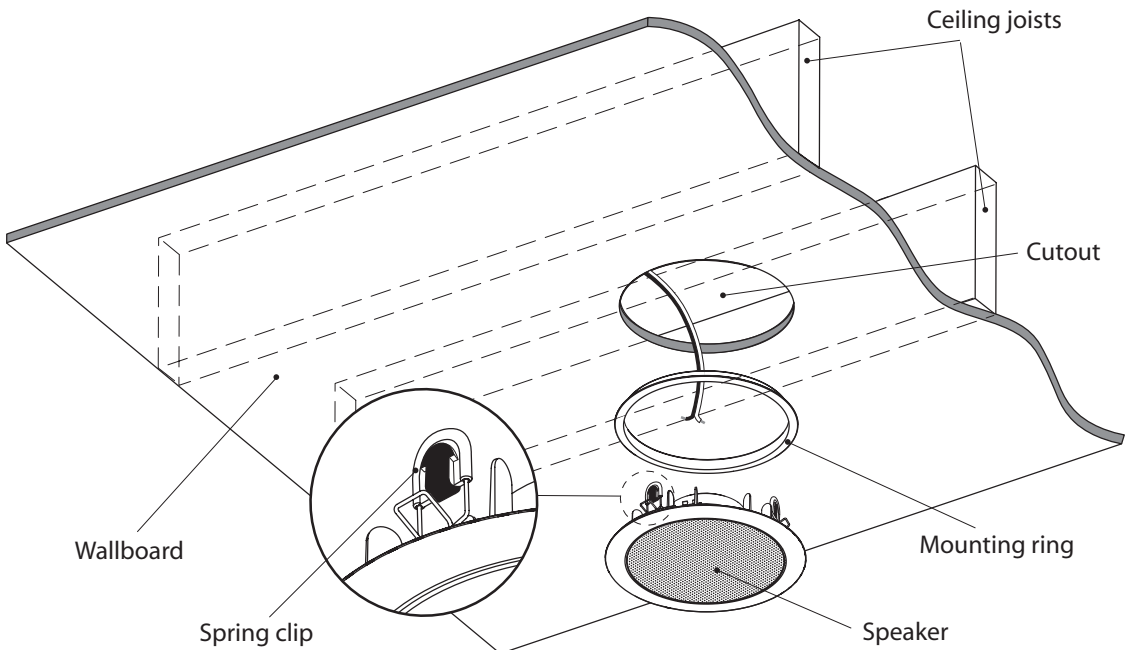
Install speaker in cutout

Note: The spring clip spacers are set at the factory for a ceiling thickness of 5/8 inch (1.6 cm). For a 1/2 inch (1.3 cm) ceiling, turn the spacers over so the thicker side faces the ceiling. Remove the spacers from the clips for a 3/4 inch (1.9 cm) ceiling, or when using rough-in brackets.

Note: Make sure the mounting ring is placed flange down around the back of the speaker.

1. If you are using a seismic restraint, pass it through the mounting ring and attach it with a screw to one of the bosses opposite the spring clips. Flip the spring clips so they point straight up.
2. Place the mounting ring so it rests on the wires of the spring clips.
3. Make sure there is no obstruction around the edge of the cutout to keep the spring clips from flipping down to hold the speaker in place.
4. Center the back of the speaker in the cutout and push it straight in until the spring clips flip down and the speaker is secure.

Note: Push only on the frame, not on the grille.



Ceiling speaker installation

Wall speakers

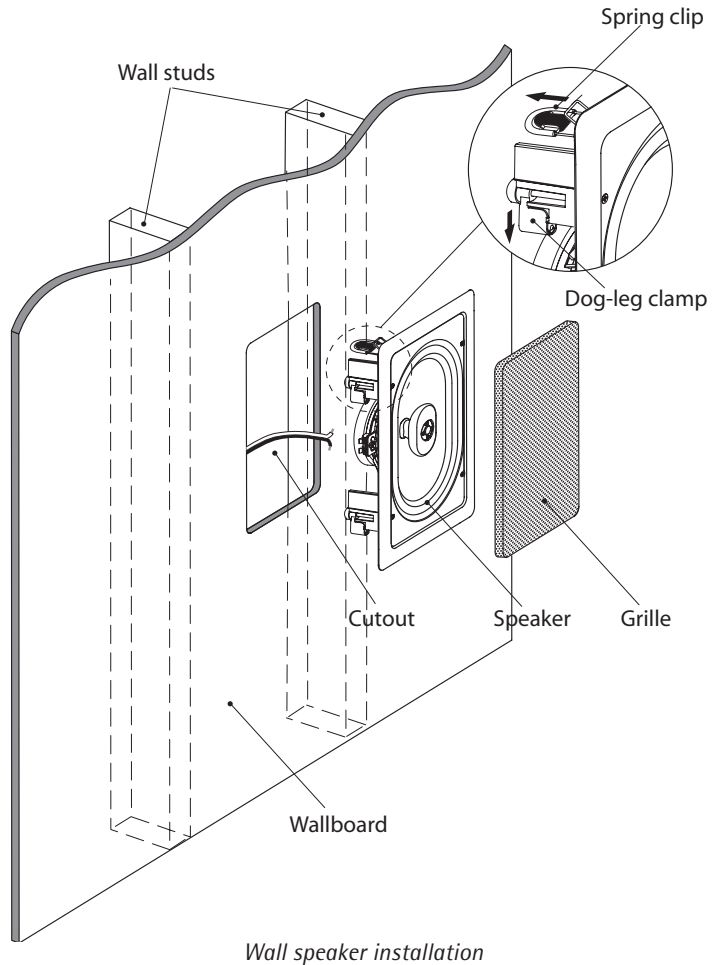
Note: The spring clip spacers are set at the factory for a wall thickness of 5/8 inch (1.6 cm). For a 1/2 inch (1.3 cm) wall, turn the spacers over so the thicker side faces the wall. Remove the spacers from the clips for a 3/4 inch (1.9 cm) wall, or when using rough-in brackets.

1. If you haven't already removed the grille for painting, gently pull it off along with the scrim cloth.
2. On the back of the speaker, flip the spring clips so they point straight back. Also make sure the dog-leg clamps are swiveled inward.
3. Make sure there is no obstruction around the edge of the cutout to keep the spring clips from flipping forward.
4. Center the back of the speaker in the cutout and push it straight in until the spring clips flip forward. Push only on the frame, not on the drivers.

Note: If the cutout is too large, one or both spring clips might not flip forward. Make sure both clips grab the wallboard before you release the speaker.

5. Level the speaker. Turn the clamp screws clockwise until the clamps are drawn up snugly, securing the speaker. Tighten the screws equally but don't overtighten them.

6. Insert the scrim cloth into the grille and press it into place on the speaker, using even pressure around the edge.



Connecting the Amplified Keypad or Amplifier

1. Make sure the keypad or amplifier is turned off.
2. Strip 1 to 2 inches (2.5 to 5 cm) off the end of each cable's outer jacket. Then strip just enough insulation off each wire to allow inserting the wires fully into the keypad's or amplifier's speaker terminals.
3. Twist the wire strands together so there are no strands separated from the bundle.
4. Connect the wires to the speaker terminals, being sure to observe proper polarity.
5. Check to make sure there are no stray strands of wire outside the terminals. If there are, remove the wire, twist the strands together, and reconnect the wire to the terminal.

Taking Care of Your Speakers

Your speakers are made of durable materials that need very little care. All we recommend is an occasional dusting with a soft cloth or light vacuuming with a dust brush attachment. If you vacuum the speakers, leave the grilles in place to avoid damaging the drivers. Do not use any harsh detergents, chemical solvents, or abrasive materials on your speakers.



SPECIFICATIONS



Model: **RC61**

Loudspeaker type: Round 2-way in-ceiling

Woofer: 6.5" (16.5 cm) polypropylene cone

Tweeter: 1/2" (13 mm) polyetherimide dome

Frequency response: 76 Hz – 20kHz ± 3 dB

Frequency range: 58 Hz – 20kHz $-6/+3$ dB

Sensitivity: 90 dB SPL 2.83 V @ 1 m

Nominal impedance: 8 ohms

Recommended amplifier power: 3–20 watts RMS

Cable connector: Spring terminal block

Overall diameter: 9.8" (24.9 cm)

Cutout diameter: 8.38" (21.3 cm)

Mounting depth: 2.8" (7.1 cm)

Weight: 2.7 lb (1.2 kg)

Finish: White (paintable)



Model: **RC61S**

Loudspeaker type: Round 2-way single-point stereo in-ceiling

Woofer: 6.5" (16.5 cm) polypropylene cone, dual voice coil

Tweeters: (2) 1/2" (13 mm) polyetherimide domes

Frequency response: 70 Hz – 20kHz ± 3 dB

Frequency range: 53 Hz – 20kHz $-6/+3$ dB

Sensitivity: 93 dB SPL 2.83 V @ 1 m

Nominal impedance: 8 ohms per channel

Recommended amplifier power: 3–20 watts RMS

Cable connectors: (2) Spring terminal blocks

Overall diameter: 9.8" (24.9 cm)

Cutout diameter: 8.38" (21.3 cm)

Mounting depth: 2.8" (7.1 cm)

Weight: 2.7 lb (1.2 kg)

Finish: White (paintable)



Model: **RC81**

Loudspeaker type: Round 2-way in-ceiling

Woofer: 8" (20.3 cm) polypropylene cone

Tweeter: 1/2" (13 mm) polyetherimide dome

Frequency response: 71 Hz – 20kHz ± 3 dB

Frequency range: 53 Hz – 20kHz $-6/+3$ dB

Sensitivity: 92 dB SPL 2.83 V @ 1 m

Nominal impedance: 8 ohms

Recommended amplifier power: 3–20 watts RMS

Cable connector: Spring terminal block

Overall diameter: 11.3" (28.7 cm)

Cutout diameter: 9.88" (25.1 cm)

Mounting depth: 3.4" (8.6 cm)

Weight: 3.2 lb (1.5 kg)

Finish: White (paintable)



Model: **RW691**

Loudspeaker type: Rectangular 2-way in-wall

Woofer: 6" x 9" (15.2 x 22.9 cm)
polypropylene cone

Tweeter: 1/2" (13 mm) polyetherimide dome

Frequency response: 64 Hz – 20kHz ± 3 dB

Frequency range: 46 Hz – 20kHz $-6/+3$ dB

Sensitivity: 90 dB SPL 2.83 V @ 1 m

Nominal impedance: 8 ohms

Recommended amplifier power: 3–20 watts RMS

Cable connector: Spring terminal block

Overall dimensions: 8.2" W x 12.2" H
(20.8 x 31.0 cm)

Cutout dimensions: 6.75" W x 10.75" H (17.1 x 27.3 cm)

Mounting depth: 3.6" (9.1 cm)

Weight: 3.6 lb (1.6 kg)

Finish: White (paintable)

Warranty

Russound Ratio Loudspeakers have a five-year warranty against defects in materials and workmanship. During the warranty period, Russound will replace any defective part and correct any defect in workmanship without charge for either parts or labor.

Russound may replace returned speakers with a product of equal value and performance. In such cases, some modifications to the mounting may be necessary and are not Russound's responsibility.

For this warranty to apply, the speaker must be installed and used according to its written instructions. If repairs are necessary, they must be performed by Russound. The speaker must be returned to Russound at the owner's expense and with prior written permission. Proof of purchase must accompany all claims. Accidental damage and shipping damage are not considered defects, nor is damage resulting from abuse or from servicing performed by an agency or person not specifically authorized in writing by Russound.

This warranty does not cover:

- Damage caused by abuse, accident, misuse, negligence, or improper operation or installation.
- Products that have been altered or modified.
- Any product whose identifying number or serial number has been altered, defaced, or removed.
- Normal wear and maintenance.

Damage to or destruction of components due to application of excessive power voids the warranty on those parts. In these cases, repairs will be made on the basis of the retail value of the parts and labor. To return for repairs, the speaker must be shipped to Russound at the owner's expense, along with a note explaining the nature of service required. Be sure to pack the speaker in a corrugated container with at least 3 inches of resilient material to protect the speaker from damage in transit.

Before returning a speaker for repair, call Russound at 603.659.5170 for a Return Authorization number. Write the RA number on the shipping label and ship to: Russound, ATTN: Service, 5 Forbes Road, Newmarket NH 03857.

Russound sells products only through authorized Dealers and Distributors to ensure that customers obtain proper support and service. Any Russound product purchased from an unauthorized dealer or source, including retailers, mail order sellers and online sellers will not be honored or serviced under existing Russound warranty policy. Any sale of products by an unauthorized source or other manner not authorized by Russound shall void the warranty on the applicable product.



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Models

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