SLS™ FCT-24 and RCT-24 Ceiling Tile Rigging Kits User's Guide

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⚠️ IMPORTANT SAFETY INSTRUCTIONS ⚠️

1. **INSTALLER ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR THE INSTALLATION OF THIS PRODUCT.**

2. Prior to installing this product, read and completely understand the installation instructions. You must read these instructions to prevent personal injury and property damage. Keep the installation instructions in an easily accessible location for future reference.

3. A licensed professional engineer must approve the placement and method of attachment to the building structure prior to the installation of the system.

4. Installation must be performed by qualified, licensed, and insured installers, and installed in accordance with all laws, rules, and regulations applicable to the installation site. Failure to do so could result in serious personal injury or even death. Consult an installation professional if the installation instructions are not understood.

5. Compliance with local building codes (and, where applicable, national codes) is the responsibility of the installer. Installers should consult with local regulatory authorities for specific codes and/or guidelines for the use of this product.

6. All information presented herein is based upon materials and practices common to North America and may not directly apply to other countries because of differing material dimensions, specifications, and/or local regulations. Installers in other countries should consult with appropriate engineering and regulatory authorities for specific guidelines.

7. Use proper personal lifting techniques when working with heavy objects to avoid personal injury.

8. Any supplied rigging hardware is intended only for use with the specified loudspeaker. The installer assumes all risk of loss and/or injury arising out of the use of the supplied rigging hardware with any other loudspeaker.

9. This guide is meant only for the purpose of instructing the installer in the intended use of SLS supplied rigging. All other rigging is considered part of the venue and/or installer-supplied equipment and is not addressed in this guide.

10. This guide is not a comprehensive source for rigging in general. Installer assumes all responsibility for ensuring that accepted rigging and safety practices are employed. Installer assumes all responsibility for the appropriate use of SLS supplied rigging hardware and follows at a minimum all applicable laws, rules, and regulations in force for each venue.

11. The system safety cable must be mounted to the structural steel above the suspended ceiling tile in an auditorium. Do not attach the system safety cable to any wood structure, wood roof joists, or wood frame. In all instances, the safety cable must be mounted in a way that supports a minimum of 5 times the static weight of the speaker, or greater if a higher requirement is mandated as per local laws.

12. Do not install on a structure that is prone to abnormal vibration, movement, or chance of impact. Failure to do so could result in damage to the equipment and/or damage to the mounting surface.

13. Make sure that no water pipes, natural gas lines, electrical wire, or conduit are present where the speaker is to be installed. Cutting or drilling into water pipes, natural gas lines, electrical wire, or conduit could cause serious personal injury or property damage.

14. This product is intended for installation in dry indoor locations only. Premature product failure or serious personal injury could occur if this product is used outdoors or in wet indoor environments.

15. No open flame sources should be placed on or near the apparatus.

16. Prior to suspending any system, always inspect all components (enclosures, rigging frames, pins, eyebolts, track fittings, and so on) for wear, cracks, deformations, corrosion, missing, loose, or damaged parts that could reduce the strength and safety of the system. Do not suspend the system until the proper corrective action has been taken.

17. This product is intended for installation in dry indoor locations only. Premature product failure or serious personal injury could occur if this product is used outdoors or in wet indoor environments.

18. The loudspeaker can generate considerable acoustical energy and may move during use. The system must be mounted in a way that allows sufficient clearance for this movement without risk of contact with the building structure, rigging, or other equipment. Do not tether the system to prevent movement. Installer-supplied hardware must be intended for overhead suspension and comply with ASME B30.20 and be manufactured under product traceability controls. Compliant hardware will be referenced with a working load limit (WLL) and a traceability code. The hardware must be load rated to support a minimum of five times the static weight of the system, or greater if a higher requirement is mandated per local laws. Generally, this type of hardware is available from rigging supply houses, industrial supply catalogs, and specialized rigging distributors. Local hardware stores do not usually stock these products.

19. Installed systems should be inspected at least annually or as required by local laws. The inspection shall include a visual survey of all corners and load bearing surfaces for signs of cracking, water damage, de-lamination, or any other condition that may decrease the strength of the rigging frame and speakers. The rigging hardware must be inspected for fatigue at least annually or as required by local laws. The inspection shall include a visual survey of the hardware for signs of corrosion, bending or any other condition that may decrease the strength of the hardware.

20. Prior to suspending the system, an expert, trained and experienced in suspending speaker systems should inspect all parts and components. Dolby is not responsible for the application of its products for any purpose or the misuse of this information for any purpose. Furthermore, Dolby is not responsible for the abuse of its products caused by avoiding compliance with inspection and maintenance procedures or any other abuse.

21. THIS APPARATUS IS NOT INTENDED FOR FLOOR OR WALL INSTALLATIONS.

22. No information contained in this guide is intended as a warranty on the part of SLS. Anyone using this information assumes all liability arising from its use. Product abuse, use of the product not in accordance with SLS instructions, or use in an application for which the product has not been designed is not covered under any SLS warranty, nor is SLS liable for any loss or damage.

Table of Contents

Introduction

This documentation provides step-by-step instructions for installing the SLS™ flat-mount ceiling tile rigging kit (part number FCT-24-2) and the SLS recessed-mount ceiling tile rigging kit (part number RCT-24-2). These speaker mounts are sold and shipped as pairs. These kits were developed to reduce the time and expense required when installing SLS multi-axis speakers in Dolby Atmos® cinema environments.
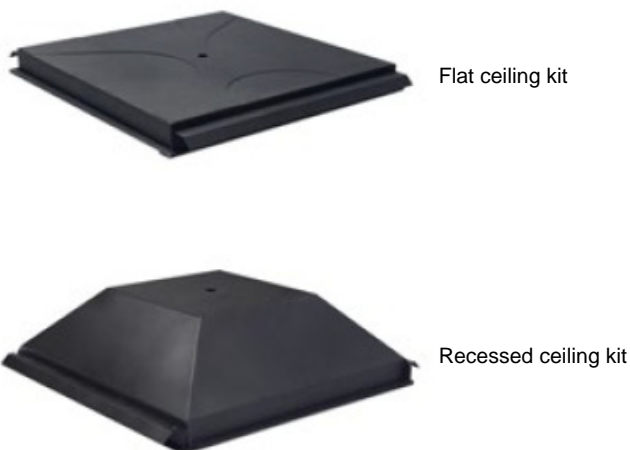
Flat ceiling kit

Recessed ceiling kit

Figure 1-1   FCT-24 and RCT-24 Ceiling Tile Mounts

The information in this user's guide refers to the FCT or RCT collectively as speaker mount or rigging kit.

THIS EQUIPMENT MUST BE INSTALLED BY LICENSED AND PROFESSIONAL INSTALLERS.

1.1   Safety Precautions

The weakest component determines the safety of the entire finished installation. Prior to connecting the SLS ceiling tile rigging kits to the venue building structure, always inspect all hardware components for deformations, corrosion, and missing or damaged parts, and compare all included SLS ceiling tile rigging kits parts to the supplied parts list. Also inspect the venue rigging points (attachment points) for wear or structural integrity, and confirm that these points are suitably load rated for the suspended tile speaker mount (including the weight of the loudspeakers that will be suspended from these mount kits).

Installers in countries outside the United States should not assume that their local regulations are equivalent to the state of California, United States regulations, or practices.

Installers should consult with local regulatory authorities for specific codes and/or guidelines.

⚠️ **Warning:** TO PREVENT INJURY, THIS APPARATUS MUST BE SECURELY ATTACHED TO THE BUILDING STRUCTURE IN ACCORDANCE WITH THE INSTALLATION INSTRUCTIONS. CONSULT A PROFESSIONAL MECHANICAL OR STRUCTURAL ENGINEER TO OBTAIN APPROVAL FOR ALL ATTACHMENTS TO THE BUILDING STRUCTURE. THIS APPARATUS MUST BE INSTALLED BY LICENSED PROFESSIONAL INSTALLERS. IF NOT ATTACHED TO THE BUILDING STRUCTURE PROPERLY, THIS APPARATUS COULD FALL AND CAUSE PERSONAL INJURY OR DEATH. SUSPENSION OF HARDWARE COMPONENTS MUST BE CALCULATED WITH A GIVEN SAFETY FACTOR TO BE WITHIN THEIR RESPECTIVE LOAD LIMITS. INSPECT ALL COMPONENTS BEFORE INSTALLATION. ALL LOCAL BUILDING AND SEISMIC CODES MUST BE ADHERED TO.

1.2   SLS Ceiling Tile Rigging Kits Supported Speaker Weights

These products are designed for use only in connection with SLS multi-axis speakers (referred to in this document as supported speakers), and have not been evaluated for performance in connection with any other products.

These are the SLS multi-axis speakers:

- MA390C
- MA460AS
- MA480AS

You can also use the SLS CS1090, but extreme angles are not reachable due to the shape of the speaker and would require the use of both YK-1090 and MMA-1090 mounts.

You assume any and all loss resulting from your use of any nonsupported speakers in connection with the products.

In addition, these guidelines pertain only to the assembly of the product with supported speakers, and illustrations are provided on how to attach the product to an attachment point. You assume any and all loss resulting from your attachment of the product to the ultimate attachment point in the venue.

1.3   Inspection and Maintenance

Suspension systems are mechanical devices by nature, and they require regular inspection and routine maintenance.

Regularly inspect the SLS ceiling tile speaker mounts for fatigue, and immediately inspect these kits after any significant seismic activity or other structural interference.

Inspections must include a visual survey of all corners and load-bearing surfaces for signs of cracking, water damage, delamination, or any other condition that may decrease the strength of the SLS ceiling tile speaker mount.

Inspect all suspension system hardware that is included with the SLS ceiling tile rigging kits for fatigue once a year (or more). Perform a visual inspection of all hardware, and check for any indication of corrosion, bending, or other conditions that would compromise the strength of the fastener. Check the eyebolts for any indications that spinouts of the enclosure might occur.

Installing the Ceiling Tile Rigging Kits

Ceiling tile speaker mounts provide a fast and easy way to install ceiling speakers in a Dolby Atmos® equipped auditorium. The flat and recessed tile speaker mounts connect to the building structure in the same way. The mount sits in a standard two-foot by two-foot ceiling tile position. If the ceiling grid is two-feet by four-feet, you can cut the ceiling tile in half to accommodate the speaker mount. The speaker mount has a neoprene gasket that rests on the metal ceiling grid to prevent rattling. Each mount has four rigging points (one at each corner). You can route a safety cable through the center hole to connect directly to the attachment point on the speaker safety cable eyebolt. This provides a secure and safe installation.

The installation of ceiling speakers in a Dolby Atmos equipped cinema requires strict adherence to proper aiming angles to cover the audience as evenly as possible. The speaker mount allows for three-axis aiming. During the installation, you set and lock in three different angles (labeled as G, D, and C) on the speaker yoke. You can set the D angle on the ground before lifting the speaker into place or you can do it after the speaker is hanging from its mount.

You can change the step-by-step sequence for installing a speaker, as described in this documentation, to accommodate installer preference or unique installation situations.

2.1 Identifying the Rigging Kit Parts

Each rigging kit includes the following parts:

1. Cap to seal the wire and safety cable runs from a plenum space above the ceiling grid. When tightened, it encapsulates the wires running through it to create the seal.
2. M20 bolt to serve as a coupler to the sealing cap. One half of the bolt threads onto the end of the hollow all-thread assembly (item 7), whereas the other half is for the threads in the sealing cap (item 1).
3. M20 bolt for tightening the entire assembly together.
4. Steel washer.
5. Neoprene washer (interchangeable with the two washers in item 6).
6. Neoprene washers: These washers fit snugly onto item 7 and hold it in place while the speaker is lifted into position. They are used in between components to prevent metal-on-metal rubbing and rattling.
7. Hollow all-thread assembly to enable the speaker wires and safety cable to pass through this hollow tube. The two tabs at the bottom of this assembly fit inside the yoke slot to prevent the part from spinning when the M20 bolt (item 3) is tightened.
8. Ceiling tile speaker mount (two-foot by two-foot sheet metal).

Figure 2-1 and Figure 2-2 show these parts.

Figure 2-1 and Figure 2-2 show the parts in the rigging kits. The SLS multi-axis speakers ship with the yoke installed, but the speaker body is not shown in the figures (for clarity).
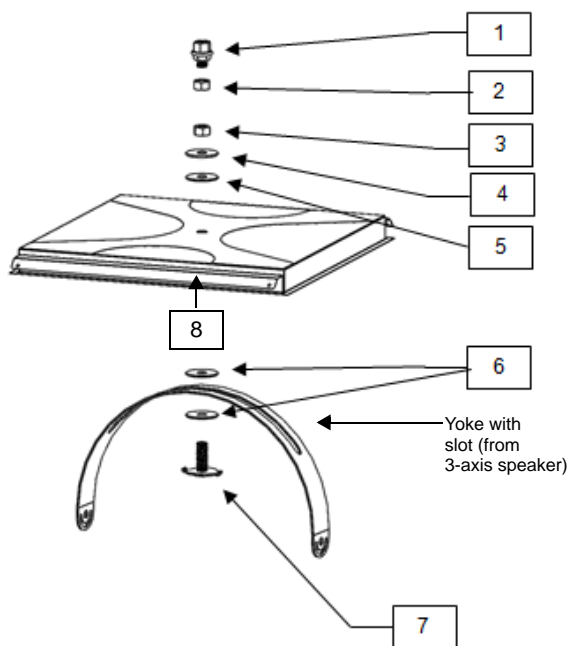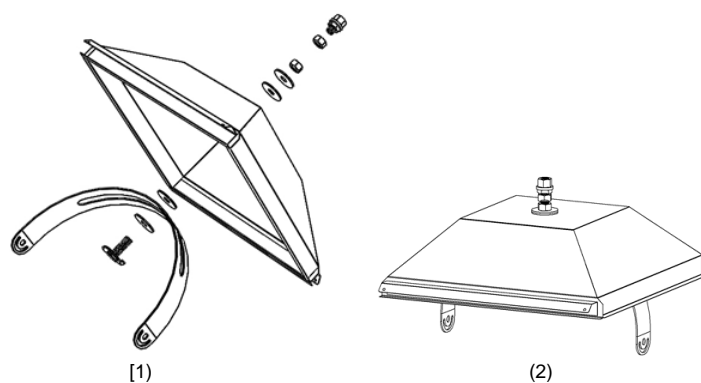

Figure 2-1   Flat-Mount Assembly

Figure 2-2   Recessed Assembly (1) and Recessed Assembly Fastened Together (2)

2.2　Understanding Angle Values

Before starting the installation, you need to understand the speaker aiming angles. The Dolby® Audio Room Design Tool (DARDT) provides this information for accurate speaker aiming. This table provides an example from DARDT.

Side	Horizontal Angle C	Vertical Angle D
LSS/RSS 1	50	-5
LSS/RSS 2	40	-5
LSS/RSS 3	20	5
LSS/RSS 4	0	10
LSS/RSS 5	0	5
LSS/RSS 6	-15	10

Figure 2-3　Aiming Angles

Stickers are shipped with SLS multi-axis speakers. These stickers provide angle information that should match the values shown in the DARDT output.

In some situations, an installer is provided with plans, renderings, or lists containing these values.

All speakers should point toward the audience and be positioned to cover the widest possible seating area. Speakers that are aimed away from the audience are incorrectly installed.

2.3　Preparing the Speakers

Refer to Figure 2-1 and Figure 2-2. To prepare the speakers:

1. Place a neoprene washer (Figure 2-1, item 6) onto the hollow all-thread bolt, and push to the bottom of the shaft.
2. Install the hollow all-thread assembly into the yoke slot (from the speaker side) with the tabs inside the slot.
3. Place the second neoprene washer (Figure 2-1, item 6) onto the hollow all-thread assembly, and push down onto the yoke so that the assembly is held loosely to the yoke.
4. Unscrew the terminal block screws to the point where you can easily attach the speaker wires. Make sure that there are no obstructions in the center of the all-thread assembly that would prevent you from pushing through the speaker wires and safety cable.
5. If you can aim the speaker and lock it into position from the ground, do this now. See the following figures and refer to the DARDT or provided plans for these two angles (labeled **Angle D** and **Angle C**).

The provided yoke attachment to the speaker pivot point is labeled **Angle D**. Use the seam in the plastic speaker enclosure as the angle indicator.
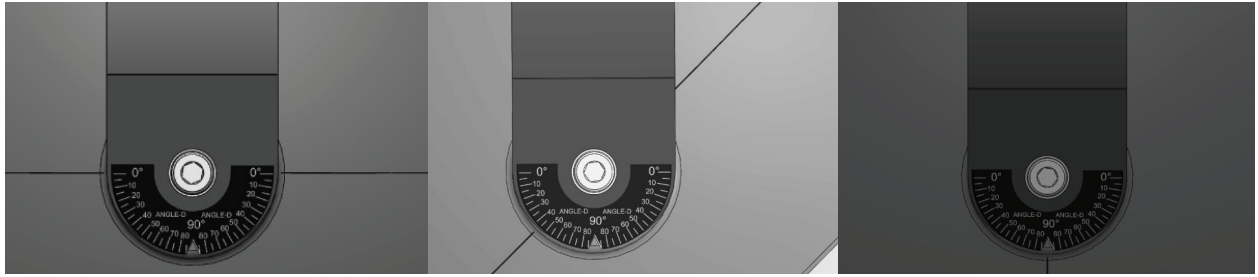

Figure 2-4   Angle D at 0, 45, and 90 Degrees Using Speaker-Body Seam as Indicator

The slot in the yoke-sliding adjustment is labeled **Angle C**. The following figure illustrates the rigging setup of a single point to building structure used with the **Angle C** yoke sticker to indicate the desired degree. Use the center of the ceiling mount suspension point as a reference to set the angle.
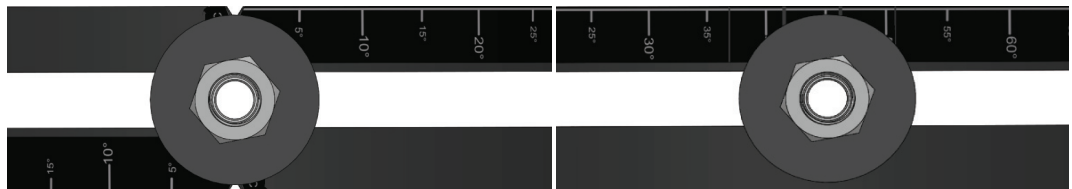

Figure 2-5   Angle C at 0 and 45 degrees (Up to 70 Degrees is Obtainable)

2.3.1   Marking the Final Aiming Angle (Angle G)

The single point attachment to the mount pivot point is labeled **Angle G.** You can adhere this provided angle sticker (contained in the packing kit) to the ceiling tile mount in the correct orientation, as marked on the sticker (the arrow pointing to screen direction). The side of the yoke is used as the angle indicator.

Figure 2-6   Angle G at 0 and 45 Degrees

It may be difficult to see this aiming sticker once the speaker is in position in the ceiling mount. This is especially true when using the recessed ceiling tile mount. You can place a piece of tape or other mark on the edge of the speaker mount frame. Aligning the speaker to the tape (or mark) can help you make this final adjustment.

2.4   Installing the Ceiling Mount

To prepare the ceiling and install the ceiling mount:

1. Remove two ceiling tiles, one for the speaker mount and one to the side, to enable access for the installation.

2. If the site uses 2 × 4 ceiling tiles, cut a 2 × 4 tile in half to create a 2 × 2 section in the grid.

3. Place the ceiling tile mount into the ceiling tile grid. Make sure you retain the correct mounting orientation. (Refer to Section 2.3.)

    The soft neoprene gasket should rest fully against the grid (where a tile would normally fit). Be sure to center the tile mount in the grid opening, so that the edges are sealed on all four sides.

4. Connect rigging cables from each corner of the mount to the building structure. Remove any slack, and be sure that all connections are secure.

5. Shake the grid to see if there are any rattles associated with the cables or building structure.

6. Thread the speaker wires and safety cable through the parts labeled 1-5 in Section 2.1, and then through the center cutout of the speaker mount. This keeps all of the parts in order as you make the attachment to the speaker. For more information regarding the safety cable, see Section 2.7.

2.5   Connecting the Speaker to the Mount

To connect the speaker to the mount:

1. Lift the speaker into position below the speaker mount.

    For a recessed tile mount installation, connect the speaker wires and safety cable to the speaker. For a flat tile mount installation, you may be able to do this after securing the speaker in the mount. (Refer to Figure 2-1 and Figure 2-2.)

    The input barrier strip accepts 16- to 12-gauge wire, with either #6 spade lugs or bare wire. Always use industry-standard practices for selecting wire gauge, based on the product power rating and cable length. Note that the barrier strip is marked with a plus (+) or red indicator to show the polarity. Per IEC standard, a positive voltage on the positive marked input results in the low-frequency drivers moving outward. Always tie down the cable to available hardware to minimize any buzzing or pullouts. We recommend running the audio wires through the M20 hollow bolt (item 7 in Figure 2-1).

Warning: TURN OFF ALL AMPLIFIERS WHEN CONNECTING THE LOUDSPEAKER WIRING.

2. Lift the speaker and push the hollow all-thread assembly through the hole in the center of the speaker mount.

3. Install the neoprene washer, and then the steel washer.

4. Thread the M20 bolt onto the all-thread assembly.

5. Loosely tighten the bolt to enable adjustable side-to-side and rotation angles.

6. Align the speaker to the angle on the sticker, or to the tape mark you made on the speaker mount frame.

7. Tighten the M20 bolt to lock the speaker in the correct orientation.

Figure 2-7   Final Positioning

8. Add the second M20 bolt to the top of the all-thread.

You only need to screw this nut on halfway. Then thread the plastic cap to seal the wire and safety cable runs from a plenum space above the ceiling grid. When tightened, it encapsulates the wires running through it to create the seal.

2.6   Connecting Audio

If not already done, connect the speaker wiring to the speaker terminal.

The input barrier strip accepts 16- to 12- gauge wire, with either #6 spade lugs or bare wire. Always use industry-standard practices for selecting wire gauge, based on the product power rating and cable length. Note that the barrier strip is marked with a plus (+) or red indicator to show the polarity. Per IEC standard, a positive voltage on the positive marked input results in the low-frequency drivers moving outward. Always tie down the cable to available hardware to minimize any buzzing or pullouts. We recommend running the audio wires through the M20 hollow bolt (item 7 in Figure 2-1).

Warning: TURN OFF ALL AMPLIFIERS WHEN CONNECTING THE LOUDSPEAKER WIRING.

2.7 Verifying the Safety Cable

After attaching the supported speakers to the building structure, you must connect a secondary safety attachment point to an independent point on the building structure. An M6 eyebolt on the speaker is provided to attach an installer-supplied safety cable. Based on the weight of the supported speaker, all installer-supplied safety rigging hardware must have a minimum 5:1 safety factor, or greater if a higher requirement is mandated by local laws. Remove all slack to avoid any shock loading of the cable Remove all slack to prevent any shock loading of the cable if the primary rigging fails. To include the FCT24 or RCT24 speaker mount inside the loop, you must run the safety cable through the hollow all-thread.

Make sure that the safety cable is secured so that it does not:

- Rattle against the speaker, speaker mount, or ceiling building structure.
- Come into contact with exposed speaker wiring or the terminal block. A metal cable could short the connection, resulting in a nonfunctional speaker.

Warning: INSTALLER-SUPPLIED RIGGING HARDWARE MUST HAVE A MINIMUM 5:1 SAFETY FACTOR BASED ON THE WEIGHT OF THE APPARATUS. YOU MUST SECURELY TIGHTEN THE HARDWARE. DO NOT SECURE THE SAFETY CABLE BACK TO THE YOKE. REMOVE ALL SLACK FROM THE CABLE. REPLACE THE CABLE IF IT HAS BEEN PULLED DUE TO A PRIMARY RIGGING FAILURE.

2.8 Finalizing the Installation

- If possible, play sound through the speaker to check for any connection issues, buzzing, rattling, or vibrations.
- Place the ceiling tiles back into position, and perform any necessary clean up.

2.9　Dimensions

Following are the top-view and side-view dimensions for the flat and recessed rigging kits.
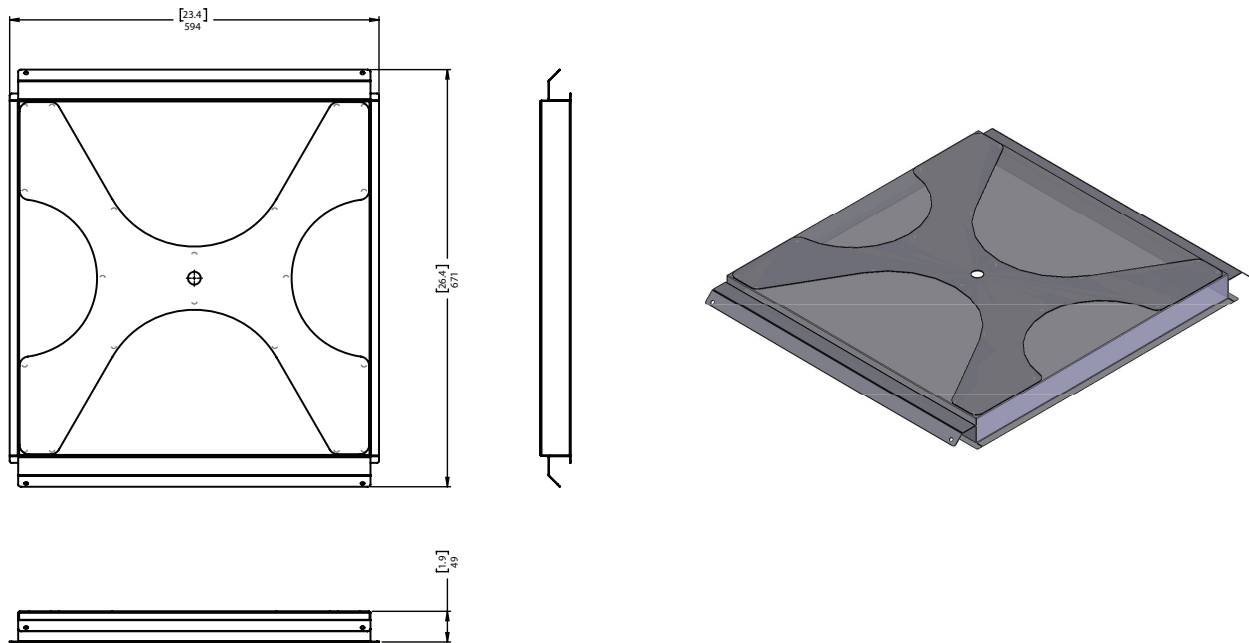

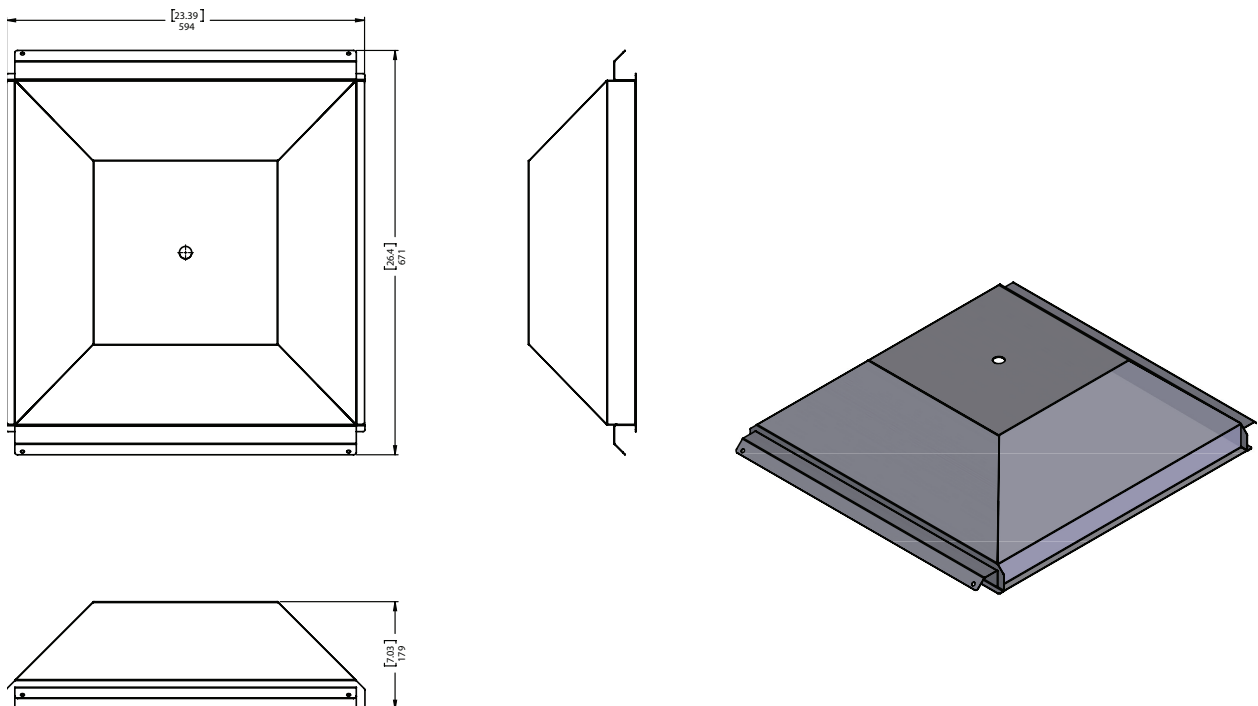**Figure 2-8**　Flat-mount Rigging Kit (FCT-24) Top and Side Views [Inches] mm

Figure 2-9　Recessed-mount Rigging Kit (RCT-24) Top and Side Views [Inches] Millimeters