



SLS™ CS218XL and CS218XL-CM User's Guide

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Dolby Laboratories, Inc.

Corporate Headquarters

Dolby Laboratories, Inc.
1275 Market Street
San Francisco, CA 94103-1410 USA
Telephone 415-558-0200
Fax 415-645-4000
www.dolby.com

European Headquarters

Dolby International AB
Apollo Building, 3E
Herikerbergweg 1-35
1101 CN Amsterdam Zuidoost
The Netherlands
Telephone 31-20-651-1800
Fax 31-20-651-1801

Technical Support

Dolby Laboratories
Portal: <http://customer.dolby.com>
Email: cinemasupport@dolby.com

Region	Support Phone Numbers
Americas	+1-415-645-4900
EMEA	+44-33-0808-7700
APAC	+86-400-692-6780
Japan	+81-3-4540-6782

LIMITED WARRANTY AND WARRANTY EXCLUSIONS:

THE LIMITED WARRANTY AND WARRANTY EXCLUSIONS MAY BE FOUND AT THE FOLLOWING URL:
<https://www.dolby.com/us/en/about/warranty-and-maintenance-policies.html>.



IMPORTANT SAFETY INSTRUCTIONS



1. **INSTALLER ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR THE INSTALLATION OF THESE PRODUCTS.**
2. Prior to installing these products, 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. 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 you do not understand the installation instructions.
4. 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 these products.
5. Use proper personal lifting techniques when working with heavy objects to avoid personal injury.
6. 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.
7. 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.
8. 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.
9. 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.
10. Prior to installation, always inspect all hardware components for wear, deformations, corrosion, and missing or damaged parts.
11. These products are intended for installation in dry indoor locations only. Premature product failure or serious personal injury could occur if these products are used outdoors or in wet indoor environments.
12. No open flame sources should be placed on or near the apparatus.
13. These products are not intended for ceiling or wall installations.
14. Only clean product with a dry or damp cloth.
15. Do not block any ventilation openings.
16. Do not expose the product to rain or moisture.
17. Hearing damage, may result from prolonged exposure to excessive sound pressure levels (SPL). The loudspeaker is easily capable of generating SPL sufficient to cause permanent hearing damage to performers, production crew, and audience members. Caution should be taken to avoid prolonged exposure to SPL in excess of 90 dB.

18. The products covered by this manual are not intended for use in high-moisture environments. Moisture can damage the product and cause corrosion of electrical contacts and metal parts. Avoid exposing the speakers to direct moisture. Keep speakers out of extended or intense direct sunlight.
19. 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. 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 companies, industrial supply catalogs, and specialized rigging distributors. Local hardware stores do not usually stock these products.
20. THESE PRODUCTS ARE NOT INTENDED FOR FLOOR-STANDING INSTALLATIONS WITH NO ANCHORAGE.
21. 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. Abuse of these products, use of these products not in accordance with SLS instructions, or use in an application for which these products have not been designed is not covered under any SLS warranty, nor is SLS liable for any loss or damage.

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Introduction

1.1 CS218XL and CS218XL-CM Overview

The SLS™ CS218XL and CS218XL-CM are high-performance subwoofers for use in cinema auditoriums. They are designed exclusively for ground stack applications to reproduce low-frequency effects channels. These subwoofers are not designed for ceiling or wall installations.



Figure 1-1 SLS CS218XL and CS218XL-CM

1.2 CS218XL and CS218XL-CM Specifications

Following are the CS218XL and CS218XL-CM general specifications:*

- Frequency response: 29 Hz to 300 Hz
- Sensitivity: 1 watt @ 1 M: 102 dB
- Nominal impedance: 4 ohms
- Continuous power rating: 1,200 watts
- Maximum continuous rated SPL at 1 meter: 133 dB
- Coverage angle: Omnidirectional
- Drivers: Two 18-inch low frequency
- Size:
 - Width: 48 inches (122 centimeters)
 - Height 30 inches (76 centimeters)
 - Depth: 25.2 inches (64 centimeters)
- Net weight: 148 pounds (67.13 kilograms)
- Shipping weight: 175 pounds (79.4 kilograms)

* SLS Audio reserves the right to make changes to existing products without notice.

1.3 Processor Settings

Following are the CS218XL and CS218XL-CM processor settings:

Crossover Section	Frequency	Slope
Highpass filter	26 Hz	12 dB octave (second order) Butterworth
Lowpass filter	80–300 Hz	24 dB octave (fourth order) Butterworth

Limiting Section	Threshold Voltage	Attack	Release	Peak Stop Voltage
See Appendix B	64 V	45 ms	720 ms	126 V

Installing the SLS CS218XL or CS218XL-CM

2.1 Installing the Subwoofers

This documentation provides instructions for installing the SLS™ CS218XL and CS218XL-CM subwoofers.



Warning: TO PREVENT INJURY, THESE PRODUCTS MUST BE SECURELY ATTACHED TO THE BUILDING FLOOR STRUCTURE IN ACCORDANCE WITH THE INSTALLATION INSTRUCTIONS. CONSULT A PROFESSIONAL MECHANICAL OR STRUCTURAL ENGINEER TO APPROVE ALL ATTACHMENTS TO THE BUILDING STRUCTURE. THESE PRODUCTS MUST BE INSTALLED BY LICENSED PROFESSIONAL INSTALLERS. IF NOT INSTALLED ON THE BUILDING STRUCTURE PROPERLY, THESE PRODUCTS COULD FALL, CAUSING PERSONAL INJURY OR DEATH. THESE PRODUCTS ARE NOT DESIGNED FOR FLYABLE INSTALLATIONS. INSPECT ALL COMPONENTS BEFORE INSTALLATION. THESE PRODUCTS ARE NOT INTENDED FOR FLOOR-STANDING INSTALLATIONS WITH NO ANCHORAGE. ALL LOCAL BUILDING AND SEISMIC CODES MUST BE ADHERED TO.

2.1.1 Tools Required

- Tools needed for installer-supplied hardware to anchor the CS218XL or CS218XL-CM to the building structure platform and each other if applicable
- #2 Phillips screwdriver for attaching speaker wire to the barrier strip

2.1.2 Installing the Subwoofer for a Ground Stack

You must use installer-supplied brackets to secure any stacked subwoofers to each other and the building structure platform to prevent movement during operation.

Note: We recommend adding rubber isolation material between the two cabinets with a durometer of ~40 Shore A.



Warning: THE SUBWOOFER MAY VIBRATE OUT OF POSITION IF NOT SECURED TO THE BUILDING FLOOR STRUCTURE OR OTHER UNITS. CONSULT A PROFESSIONAL MECHANICAL OR STRUCTURAL ENGINEER TO APPROVE ALL ATTACHMENTS TO THE BUILDING STRUCTURE. USE APPROPRIATE SIZE AND QUANTITY OF BOLTS TO SECURE HARDWARE TO THE BUILDING STRUCTURE. HARDWARE MUST BE SECURELY TIGHTENED.

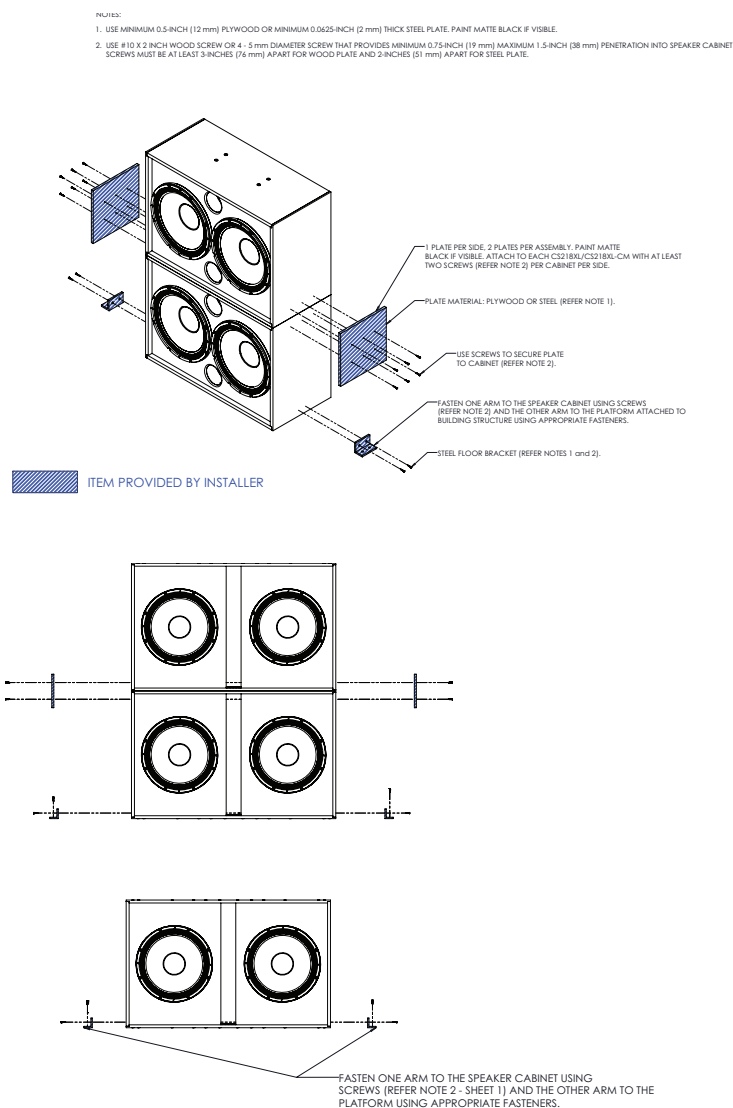


Figure 2-1 Installing a Ground Stack

2.2 Connecting Audio

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. If possible, play sound through each speaker to check for any connection issues, buzzing, rattling, or vibrations.



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

2.3 CS218XL and CS218XL-CM Dimensions

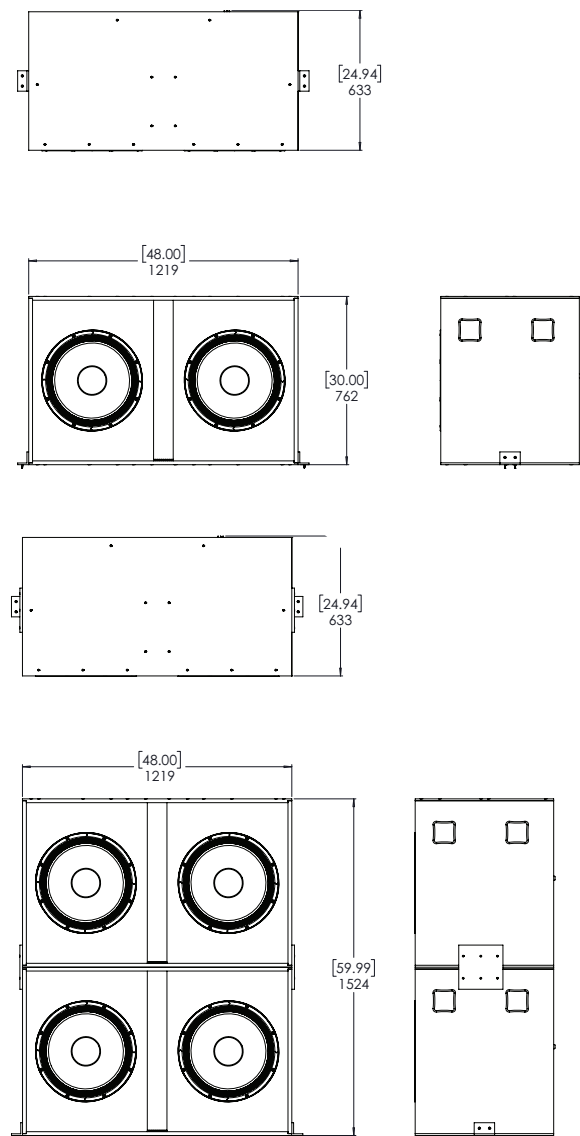


Figure 2-2 CS218XL Dimensions in [Inches] and Millimeters

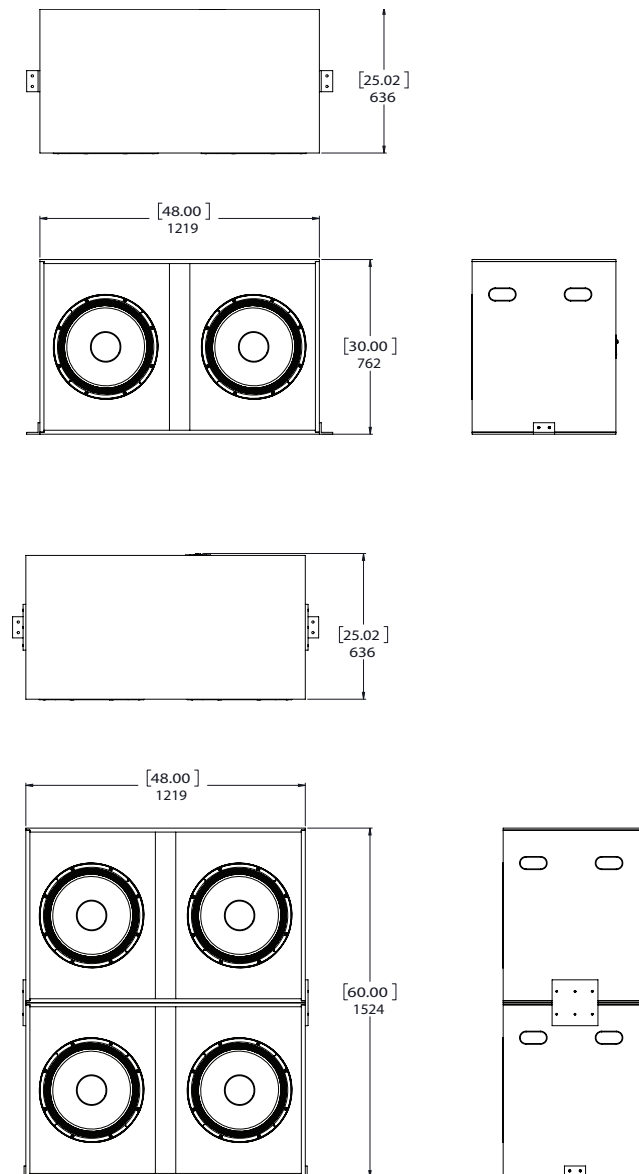


Figure 2-3 CS218XL-CM Dimensions in [Inches] and Millimeters

Environmental Compliance and Regulations

A.1 EU Environmental Regulations and Compliance

Following are the CS218XL and CS218XL-CM EU environmental regulations and compliance information.

Restriction of Hazardous Substances Directive (RoHS)

All Dolby® products comply with the requirements of the EU RoHS Directive. For the Dolby Declarations of Conformity, go to <http://www.dolby.com/us/en/about/environmental-commitment.html>

Product End-of-Life Information

This product is electronic equipment and should be disposed of in accordance with all applicable laws. Do not dispose as household waste. Do not dispose of the product in a fire. Please dispose of this product by taking it to your local electronic waste collection point or recycling center. For information regarding where to recycle electronic equipment, contact your local dealer. For additional information regarding Waste Electrical and Electronic Equipment (WEEE) and product disposal go to <http://www.dolby.com/us/en/about/environmental-commitment.html>

A.2 Russian Environmental Regulations and Compliance

Following is the CS218XL and CS218XL-CM Russian environmental compliance information.

Restriction of Hazardous Substances (RoHS) Directive

This product complies with Russian EAC RoHS requirements.



Setting System Limiters

B.1 Setting up System Limiters

This documentation explains how to set up system limiters to protect your loudspeaker and provide maximum performance when the digital signal processor (DSP), amplifier, and loudspeaker hardware are all variables. The following procedure provides a limiter setting threshold that can protect loudspeakers in a majority of use cases. However, the speaker drivers may still be vulnerable to content issues, such as sustained feedback or large, low-frequency transients below box tuning. Good system design and common sense should be the rule.

1. Obtain an audio source (to generate pink noise) and a true RMS voltage meter with a bandwidth of at least 20 kHz that can average a reading over a period of at least 10 seconds.
2. Complete the room tuning and set the amplifier gain.
To prevent future user error, consider setting the amplifiers at full gain, unless the amplifier gain setting is hardware or software protected. In such a case, you can optimize the amplifier gain to achieve the best signal-to-noise ratio.
3. After completing the room tuning and setting the amplifier gain, bypass the limiter on the DSP that you are using for protection, and leave all other DSP functions for that output engaged. For example, the highpass filter, crossovers, equalization, and so on.
4. Mute all system outputs except the output that is currently being calibrated.
5. Place the voltage meter across the amplifier +/- output terminals and turn up the pink noise source until the reading on the meter is slightly above the specified Threshold/RMS voltage rating for that speaker driver and its recommended processor settings (see [Section 1.3](#)).
6. Play the pink noise only long enough to obtain a stable RMS average voltage reading. For high-frequency drivers, this is typically five seconds, and for full range loudspeakers or subwoofers, it is typically ten seconds.
7. Set the limiter to a minimum ratio of 100:1, and then input the attack and release times recommended by the speaker manufacturer.
8. Engage the limiter, and decrease the threshold until the voltage is lowered to the specified rating, without changing the pink noise gain.
9. Repeat the above procedure for each driver and/or passive loudspeaker you are using.
10. If a predictive peak stop limiter is available on the DSP, engage it at 6 dB above the RMS setting.
11. Monitor for amplifier clipping. If clipping occurs during system use, lower the peak-stop threshold until the amplifier clips slightly. Alternatively, you can engage the self-contained limiter circuit in the amplifier (if it has such a limiter circuit).

You need to perform this procedure only once, as long as the combined amplifier-limiter does not change. However, amplifier gain changes modify the limiter action. If the amplifier gain is decreased, protection engages early, which limits driver output. If the amplifier gain is increased, protection engages only after the driver reading is above the safe RMS voltage.