

## Technical Information

### Frequency range

80 Hz to 16 kHz (with active equalization)

### FreeSpace® Model 32 versions

#### Active equalization

- > 70 V, 32 Watt
- > 100 V, 32 Watt

#### Passive equalization

- > 4 Ω, 32 Watt, no transformer

### Sensitivity<sup>1</sup>

89 dB-SPL, 1 W, 1 m (speech)  
87 dB-SPL, 1 W, 1 m (music)

### Maximum acoustic output<sup>2</sup>

104 dB-SPL average (speech)  
102 dB-SPL average (music)

### Beamwidth (-6dB point)

132° conical (average, 1-4 kHz)

### Long-term power handling<sup>3</sup>

32 W continuous

## Dimensions

Flange diameter: 7.72" (19.6 cm)  
Hole diameter: 7.19" (18.2 cm)  
Depth: 8" (20.3 cm)

## Weight

3.7 lb (1.68 kg) speaker only  
5.7 lb (2.6 kg) including mounting hard ware (70 V and 100 V version)  
3.0 lb (1.3 kg) speaker only  
5.1 lb (2.3 kg) including mounting hard ware (4 Ω version)

## Mounting hardware

Ceiling pan: 11" W x 11.75" D (28 cm (W) x 30 cm (D))  
Pan rail: 1.15" W x 23.75" D (2.93 cm (W) x 60.3 cm (D))

## General Description

The BOSE® FreeSpace® Model 32 loudspeaker is a 32 Watt loudspeaker designed for flush-mount ceiling installations in commercial spaces with ceiling heights up to 30' (9 m).

It offers the following features:

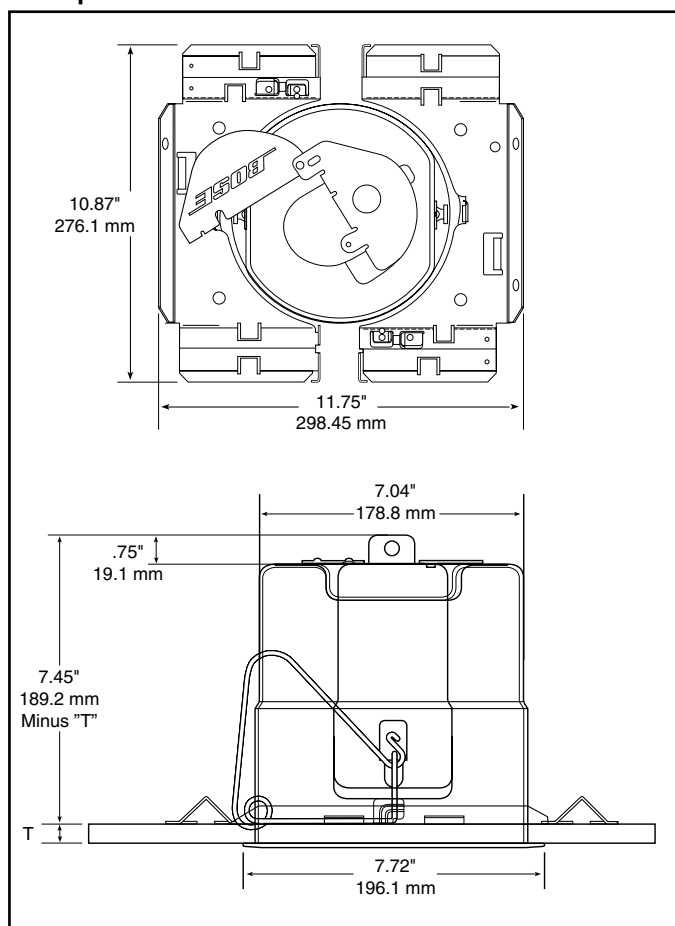
- > A 4.5" (11.4 cm) BOSE® HVC (Helical Voice Coil) driver with active equalisation, providing reliable high quality sound in a compact enclosure
- > A multi-tap line transformer that provides easy to change tap settings for 1 W, 2 W, 4 W, 8 W, 16 W, and 32 W
- > Mounting hardware that permits fast and easy installation in any kind of ceiling
- > Complies with U.L. 2043 for use in air handling spaces
- > Simple contemporary design will blend with any decor and can be painted to match any interior

1 Full bandwidth pink noise is applied to the FreeSpace® system controller and amplified to a level at the speaker terminals corresponding to 1 Watt as referenced to the nominal impedance. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

2 Full bandwidth pink noise is applied to the FreeSpace® system controller and amplified to a level at the speaker terminals corresponding to the long-term rated power handling of the speaker. The average sound pressure level (dB-SPL) is measured at 1 meter from the speaker in an anechoic environment.

3 Full bandwidth noise, meeting the International Electrotechnical Commission Standard #268-5 is applied to the FreeSpace® system controller and amplified to a level at the speaker terminals corresponding to the power handling of the speaker. The speaker must show no visible damage or measurable loss of performance after 100 hours of continuous testing.

## FreeSpace® Model 32 DIMENSIONS



## Installation

The "quick install" mounting hardware consists of two 5.5" (13.9) x 11" (27.9 cm) formed sheet metal plates which are assembled on two formed metal channels 23.75" (60.3 cm) long. The channels transfer the weight of the pan and loudspeaker out to the tile support grid. The pan halves, when placed for loudspeaker installation on the channels and forms a central clearance hole equal to the recommended mounting hole for the loudspeaker. The mounting technique requires the use of a metal ceiling pan which can be used in all forms of drop tile ceiling construction up to 2" (5 cm) thick, and can be installed behind existing ceilings through the installation hole. Each pan half provides for the attachment of a spring retention mechanism which actually lifts the loudspeaker into place and holds it firmly against the ceiling surface. A deliberate and separate action is required to remove the unit from the bracket after withdrawing it from the ceiling.

Assuming the mounting hole has been cut in a suspended ceiling panel, and a stripped signal wire is present, installation can be completed in less than three minutes with the use of one screwdriver. Pliers and additional time may be required for installation of North American-style strain relief bushings, connection to flexible conduit, and for installation of the pan in ceilings of plaster or of hidden spline tile construction.

## Loudspeaker Configuration

The 100 Volt version can be part of a distributed sound system when used in conjunction with the FreeSpace® controller and a comparable amplifier. The 4 Ω model is intended to be a budget loudspeaker requiring neither tap capability, line amplifier, nor equalizer. Any modest amplifier or receiver can be used to drive this loudspeaker. It utilizes a mid-band RLC filter to equalise driver output.

## Engineers' and Architects' Specifications

The loudspeaker shall be a 32 Watt ported loudspeaker system utilising one 4.5" (11.4 cm) full-range driver for installation in a manner where the grille surface is nominally flush with the ceiling surface and the enclosed volume protrudes within the ceiling space.

The 100 V version shall be designed for use with a proprietary active equalization device. Versions intended for use with line amplifiers shall also contain multiple tap impedance matching transformers.

The design shall minimise the use of organic materials in the product and the mounting mechanism such that the product shall meet the requirements of U.L. 2043. All exposed cosmetic surfaces shall be paintable and the acoustically transparent grille component shall be formed of expanded metal mesh. A dust and paint shield shall be supplied with every unit to protect the transducer prior to grille installation.

The loudspeaker's maximum acoustic output shall be 104 dB-SPL from 80 Hz - 16 kHz, with measurements referenced to a fullbandwidth pink noise input at 1 meter at the loudspeaker's rated power.

The input connection shall consist of a barrier strip screw-type terminal. Its power handling capability shall be 1 W, 2 W, 4 W, 8 W, 16 W, or 32 W continuous power when referenced to IEC noise for 100 hours. The nominal coverage angle shall be 132° conical. The loudspeaker shall be the BOSE® FreeSpace® Model 32 flush-mount loudspeaker.

## U.L. Certification

All versions of the FreeSpace® 32 loudspeaker comply with U.L. requirements for the following uses:

- > Vandal resistant (with grille in place)
- > Suitable for general purpose use (U.L. category UEAY); the U.L. control number is 3N89, the U.L. file number is S5591
- > Suitable for installation using Class 1, Class 2, or Class 3 wiring methods in accordance with NFPA 70, *National Electric Code*, 2008, Article 640. Suitable for use in air handling (plenum) spaces. UL-2043, *Fire Test and Visible Smoke Release for Discrete Products and their Accessories Installed in Air Handling Spaces*. NFPA 70, *National Electric Code*, 2008, Article 300-22 (c). NFPA 90-A, 2009, *Installation of Air Conditioning and Ventilation Systems*, Paragraph 4.3.11.2.6.5.