US221-4

Dual 21 inch Direct-Radiating Subwoofer



Overview

The US221-4 is a dual 21 inch, ultra-compact, direct radiating subwoofer that is designed to provide gut churning impact and solid musicality – not just infrasonic effects. Its 6 inch voice coils, unusually rigid cones, and innovative low-turbulence ports permit an optimal tuning to be achieved in an enclosure that is smaller than most dual 18 inch subwoofers.

For overhead suspension, sixteen M10 suspension points allow either horizontal or vertical orientation. For ground stacking, the supplied vibration isolators may be threaded into any four M10 mounting points to prevent spurious vibrations and "walking". When stacking enclosures, the vibration isolators nest in recesses surrounding the mounting points in the cabinet below. The input is mounted on a chamfer at the rear of the enclosure, allowing cable access without requiring additional space between the enclosure and a wall or stage.

The US221-4 is perfectly suited for highly dynamic live performance venues and nightclubs, A/V screening rooms, and low frequency effects in theme parks. And, its small size allows it to be used under stages, built into small cavities, and surprisingly, in many situations where a double 18 inch subwoofer would normally be too large.

Performance Specifications[1]

Operating Mode

Single or dual amplified w/ DSP*

** See page 3 for connection diagrams*

Operating Range [2]

27 Hz to 152 Hz

Nominal Beamwidth

Spherical within operating range

Transducers

LF: (2) 21.0" woofers, 6.0" voice coil; neodymium magnet

Power Handling @ Nominal Impedance [3]

126 V / 4000 W @ 4 Ω (2x 2000 W @ 8 Ω)

Nominal Sensitivity @ Input Voltage [4] (half / whole space)

104 dB / 98 dB @ 2.00 V

Nominal Maximum Continuous SPL (half / whole space)

146 dB / 140 dB peak
140 dB / 134 dB continuous

Equalized Sensitivity @ Input Voltage [5] (half / whole space)

101 dB / 95 dB @ 2.00 V

Equalized Maximum SPL [6] (half / whole space)

143 dB / 137 dB peak
137 dB / 131 dB continuous

Recommended Power Amplifier

4000 W to 6000 W @ 4 Ω

Physical Specifications

Connections

(2) Neutrik NL4 Speakon
Pin 1+/-: LF 1
Pin 2+/-: LF 2

Mounting / Suspension Points

(16) M10 x 1.5 eye bolt angle points

Dimensions / Weight

See pages 5 & 6

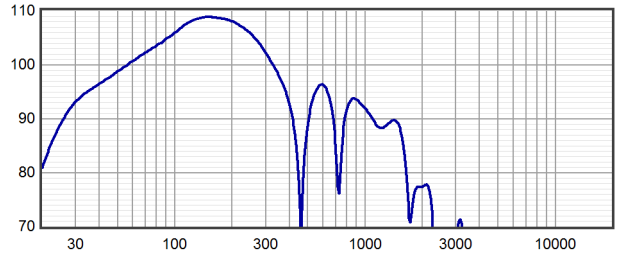
Finish

Black painted enclosure w/ matte black grille, or
White painted enclosure w/ matte white grille

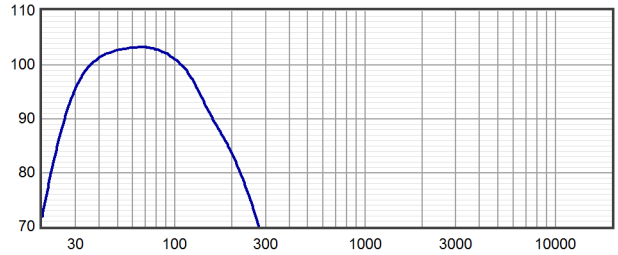
Options

Terminal strip input, Custom color finish,
Weather-resistant (WR) enclosure & hardware

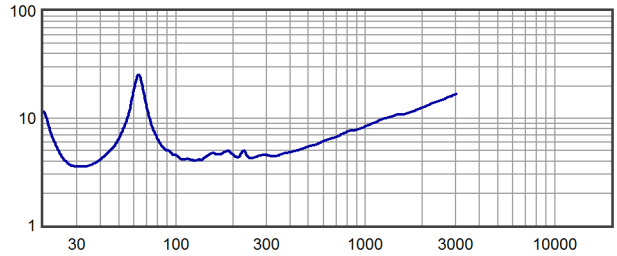
Axial Sensitivity (dB SPL, 2.00 V @ 1 m, half space) [7, 8]



Axial Processed Response (dB, half space) [7, 9]



Impedance (ohms)



Variant

Also available is the US221-2, which has two 4 ohm woofers instead of two 8 ohm woofers. The US221-2 version can be powered by amplifiers with less voltage swing.

Technologies

The 21 inch woofers in the US221-4 have 6 inch voice coils, unusually strong cones, and a dual-spider suspension that allows 60 mm peak-to-peak excursion capability. This allows the pair of woofers to handle 4000 watts of long term power, and provides the motor strength required to operate effectively in such a small enclosure.

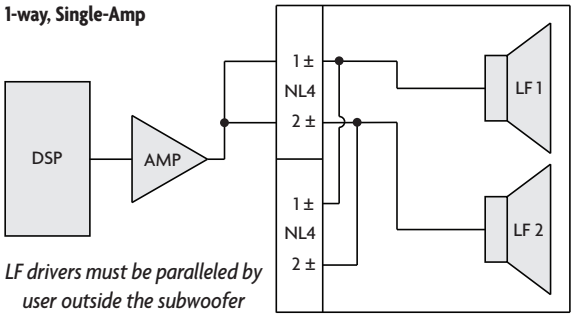
The enclosure shell is constructed of 18 mm Baltic birch plywood, while the ports are constructed of curved plywood. The port design makes use of all available frontal area, minimizes turbulence, and smoothly guides the air flow around the woofers' 20 kg magnet structures.

The specially-selected vibration isolators are much more effective than conventional loudspeaker feet. They are constructed of high-compliance neoprene for a high coefficient of friction, with a special shape that allows up to 8 mm of lateral displacement.

The net result is a subwoofer that provides low frequencies with a very authoritative character in a package that is less than half the size and weight of most competitive products.

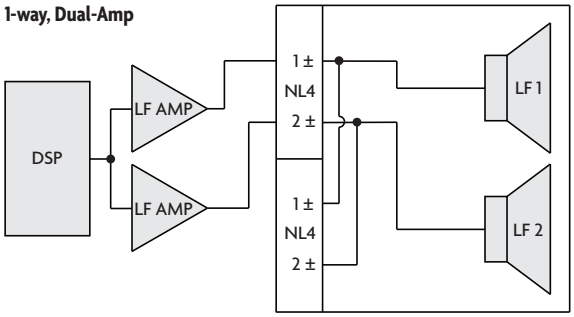
Connection Diagram

1-way, Single-Amp



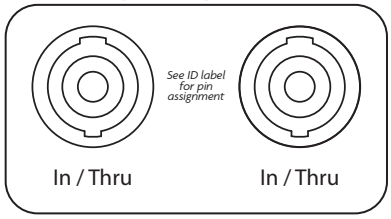
LF drivers must be paralleled by user outside the subwoofer

1-way, Dual-Amp



Connections

Neutrik NL4 Speakon Input



Mechanical Specification Drawings

2D and 3D DWG dimensional drawings are available for download at www.fulcrum-acoustic.com/resources

Notes

[1] **Performance Specifications** *All acoustic specifications rounded to nearest whole number. External DSP with Fulcrum Acoustic-provided settings is required to achieve the specified performance.*

[2] **Operating Range** *The frequency range within which the processed response is within 10 dB of the average.*

[3] **Power Handling** *Based on the AES power handling of the transducers.*

[4] **Nominal Sensitivity** *The 1-meter-referenced SPL produced by a 1 watt band limited pink noise signal, with no processing applied.*

[5] **Equalized Sensitivity** *The 1-meter-referenced SPL produced when an EIA-426-B signal is applied to an equalized loudspeaker system, at a level which produces a total power of 1 watt, in sum, to the loudspeaker subsections.*

[6] **Equalized Maximum SPL** *The 1-meter-referenced SPL produced when an EIA-426-B signal is applied to an equalized loudspeaker system, at a level which drives at least one subsection to its rated power.*

[7] **Resolution** *All response graphs are subjected to 1/6 octave cepstral smoothing with a gaussian weighting function.*

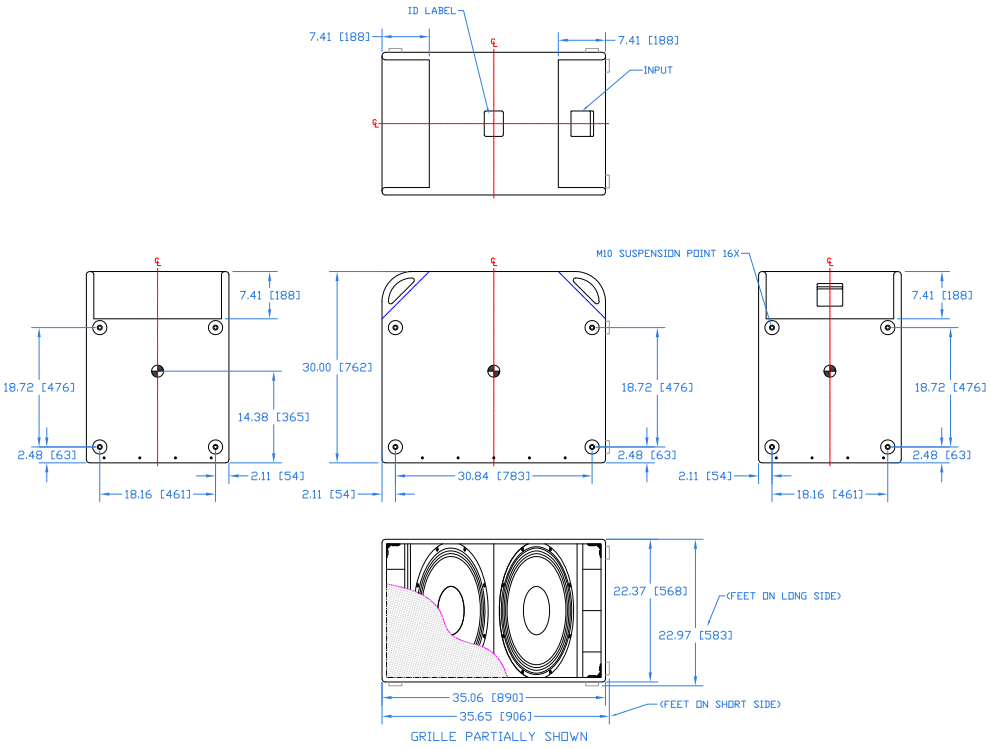
[8] **Axial Sensitivity** *The SPL plotted against frequency for a 1 watt swept sine wave, referenced to 1 m with no signal processing.*

[9] **Axial Processed Response** *The axial magnitude response with recommended signal processing applied.*

Notes:
1. Net Weight = Approx. 177.0 lb / 80.3 kg
2. Symbol ⊙ = M10 x 1.5 eye bolt angle point in 0.188 [4.76] deep foot recess
3. Symbol ◔ = CoG
4. Four vibration isolation feet thread into suspension points on either short or long side (shown on both)

REVISIONS

REV	DESCRIPTION	APPR / DATE
3	ROTATED VIEW 90 DEG	RAF 9/22/09
4	REMOVE FRONT HANDLES	RAF 8/31/11
5	ADD SHIPPING WEIGHT	RAF 8/31/11
6	UPDATE FOOT DRAWING	RAF 1/25/16
7	MOVE INPUT TO PANEL CENTER	RAF 11/21/19
8	UPDATE NOTES, FOOT HEIGHT	RAF 2/10/26



THIRD ANGLE PROJECTION

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ALL DIMENSIONS ARE IN INCHES

TOLERANCE IN INCHES
.X±.1 .XX±.015 .XXX±.005
FRACTIONS ±1/32
ANGLES ±1/2°

(X.XX) = REF DIMS NO TOLERANCE IMPLIED

TSC = THEORETICAL SHARP CORNER

DIMENSIONS ACROSS CENTERLINES TO BE SYMETRICAL

STATUS	RELEASED	
APPROVALS		DATE
DRAWN:	DWG	8/22/09
CHECKED:	RAF	9/22/09
DES ENG:		
MFG ENG:		

FULCRUM ACOUSTIC, LLC
1 MAIN STREET, WHITINSVILLE, MA 01588 USA

TITLE: Mechanical Spec, US221

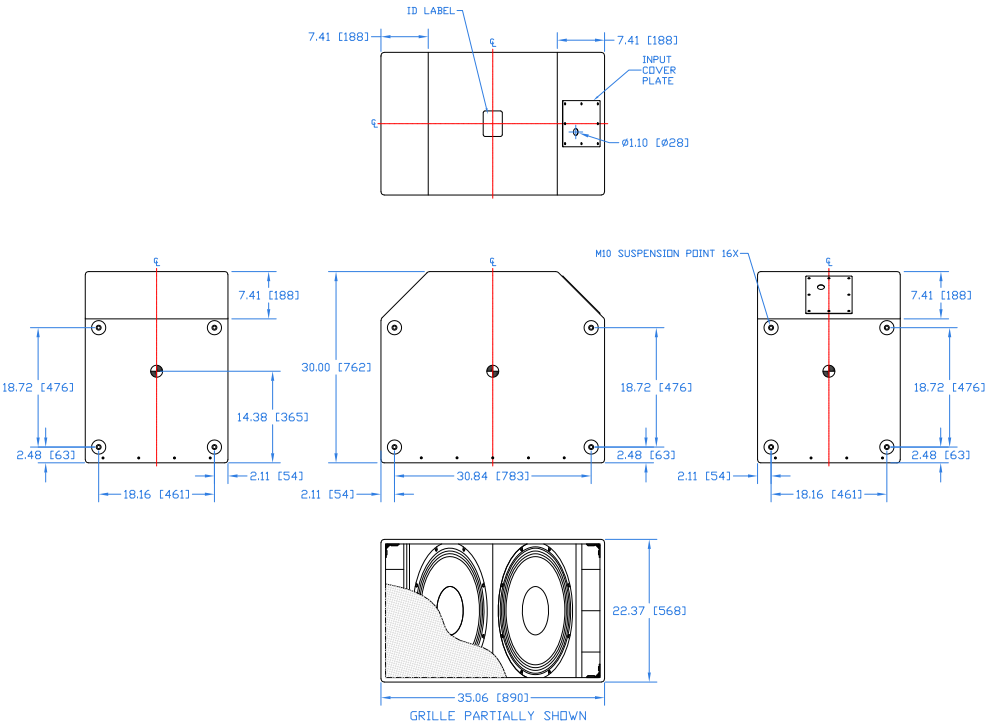
A | SHEET 1 OF 1 | SCALE: 1:24

DWG. NO. 820-100-023 | REV 8

Drawing is reduced. Do not scale.

Notes:
1. Net Weight <= Approx. 177.0 lb / 80.3 kg
2. Symbol ⊙ = M10 x 1.5 eye bolt angle point in 0.188 [4.76] deep foot recess
3. Symbol ◔ = CoG

REVISIONS		
REV	DESCRIPTION	APPR / DATE
1	RELEASED TO PRODUCTION	RAF 9/22/09
2	UPDATE FOOT DRAWING	RAF 1/25/16
3	UPDATE WEIGHT & DIMS FOR FRP	DEW 6/22/18
4	PURGE HANDLES, ADD INPUT COVER PLATE	RAF 11/22/19
5	UPDATE NOTES & INPUT COVER PLATE, REMOVE FEET	RAF 2/10/26



THIRD ANGLE PROJECTION	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES TOLERANCE IN INCHES .X±.1 .XX±.015 .XXX±.005 FRACTIONS ±1/32 ANGLES ±1/2° (X.XX) = REF DIMS NO TOLERANCE IMPLIED TSC = THEORETICAL SHARP CORNER DIMENSIONS ACROSS CENTERLINES TO BE SYMETRICAL	STATUS RELEASED	FULCRUM ACOUSTIC, LLC 1 MAIN STREET, WHITINSVILLE, MA 01588 USA
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