AHC443

High Efficiency Full-Range Coaxial Horn



Overview

The AHC443 is a tri-amplified 2-way, high sensitivity, arrayable coaxial horn loudspeaker that provides a precise 45° x 30° pattern with control to below 400 Hz, low frequency extension to 70 Hz, and extremely high output with modest amplifier power. Its unique **Compression Head**™ horn architecture provides exceptional low frequency loading to its four 10 inch low frequency compression drivers, while four **Oculus**™ phase plugs extend the 10s' high frequency response to smoothly mesh with two coaxial ring-radiator high frequency compression drivers. The AHC443's unique 30° compact trapezoidal shape allows it to be deployed with its trapezoidal profile vertically oriented (45°H x 30°V) for stand-alone use, in distributed systems, or in vertical arrays; or with its trapezoidal profile horizontally oriented (30°H x 45°V) for use in horizontal tight-packed arrays.

Sound, innovative acoustical design combined with Fulcrum Acoustic's **TQ**™ processing leads to exceptional clarity and precise transient response, even at very high sound pressure levels. The required digital signal processing can be provided by one of many supported platforms.

The AHC443 is particularly effective in acoustically challenging spaces where broadband pattern control is necessary, and in applications requiring high acoustic output and high fidelity. Its **Compression Head**™ horn architecture provides easy access to the drivers, so the AHC443 can be conveniently serviced while flown. Its clean aesthetic and relatively compact size complements many architectural styles, which facilitates acceptance by interior designers and architects. This makes it the perfect choice for houses of worship, sports facilities, theaters, night clubs, theme parks, and more.

Performance Specifications[1]

Operating Mode

2-way Tri-amplified w/ DSP

Operating Range [2]

68 Hz to 20 kHz

Nominal Beamwidth

45° x 30°

Transducers

LF: (4) 10.0 inch neodymium magnet, dual 3.5 inch voice coil cone drivers
HF: (2) 4.0 inch /2.5 inch voice coil coaxial ring-radiator compression drivers

Power Handling @ Nominal Impedance [3]

LF: 2x 113 V / 1600 W @ 8 Ω
HF: 49 V (600 W @ 4 Ω)

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

LF: 109 dB @ 2.00 V
HF: 117dB @ 2.00 V

Nominal Maximum SPL (peak / continuous)

LF: 150 dB / 144 dB
HF: 151 dB / 145 dB

Equalized Sensitivity @ Input Voltage [5]

108 dB @ 2.00 V

Equalized Maximum SPL (peak / continuous) [6]

150 dB / 144 dB

Recommended Power Amplifiers

LF: 2x 1600 W to 3200 W @ 8 Ω
HF: 400 W to 800 W @ 4 Ω

Physical Specifications

Connections

(2) Neutrik NL4 Speakon

Speakon #1	*Speakon #2*
Pin 1+/-: LF A	Pin 1+/-: HF
Pin 2+/-: LF B	Pin 2+/-: NC

WR Version: (1) 8 position terminal strip

Mounting / Suspension Points

(16) M10 x 1.5 eye bolt angle points, (2) M12 x 1.75 yoke points

Dimensions / Weight

See pages 6 & 7

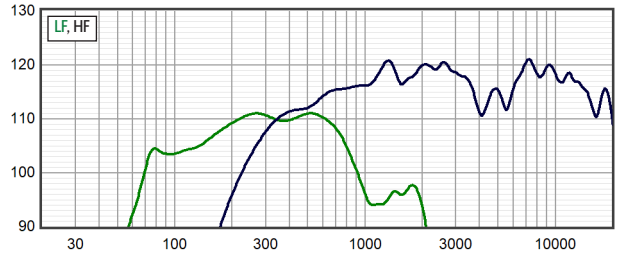
Finish

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

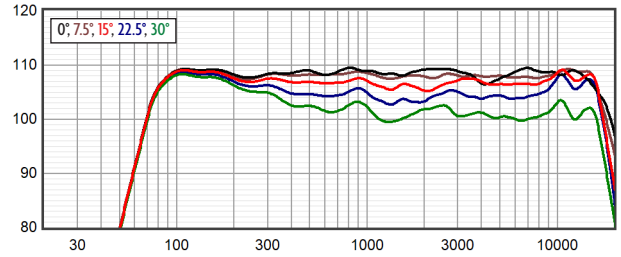
Options

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

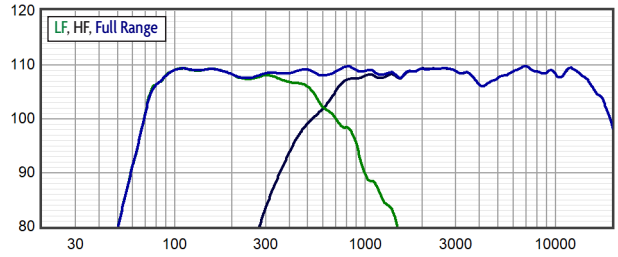
Axial Sensitivity (dB SPL, 2.00 V @ 1 m)[7, 8]



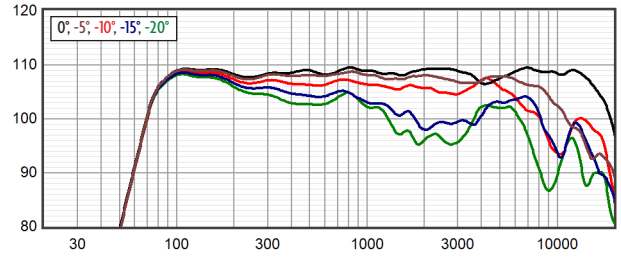
Horizontal Off Axis Response[7, 11]



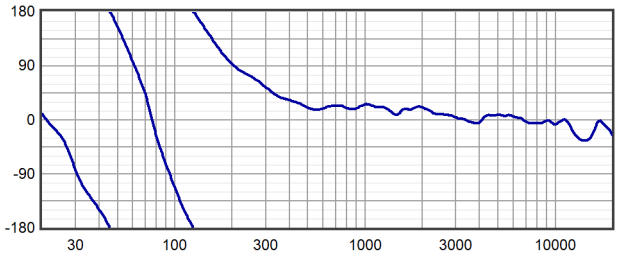
Axial Processed Response (dB)[7, 9]



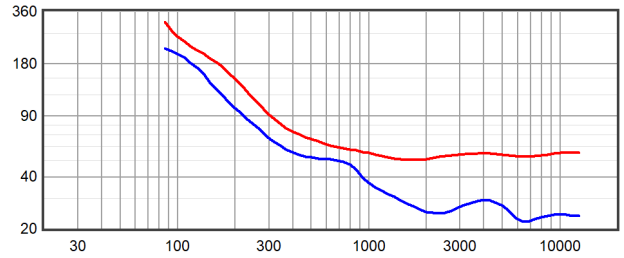
Vertical Off Axis Response[7, 11]



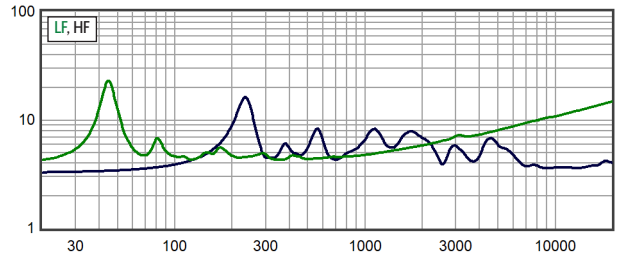
Axial Processed Phase Response (degrees)[7, 10]



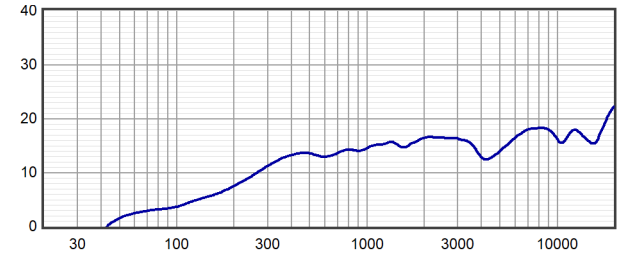
Beamwidth[7, 12]



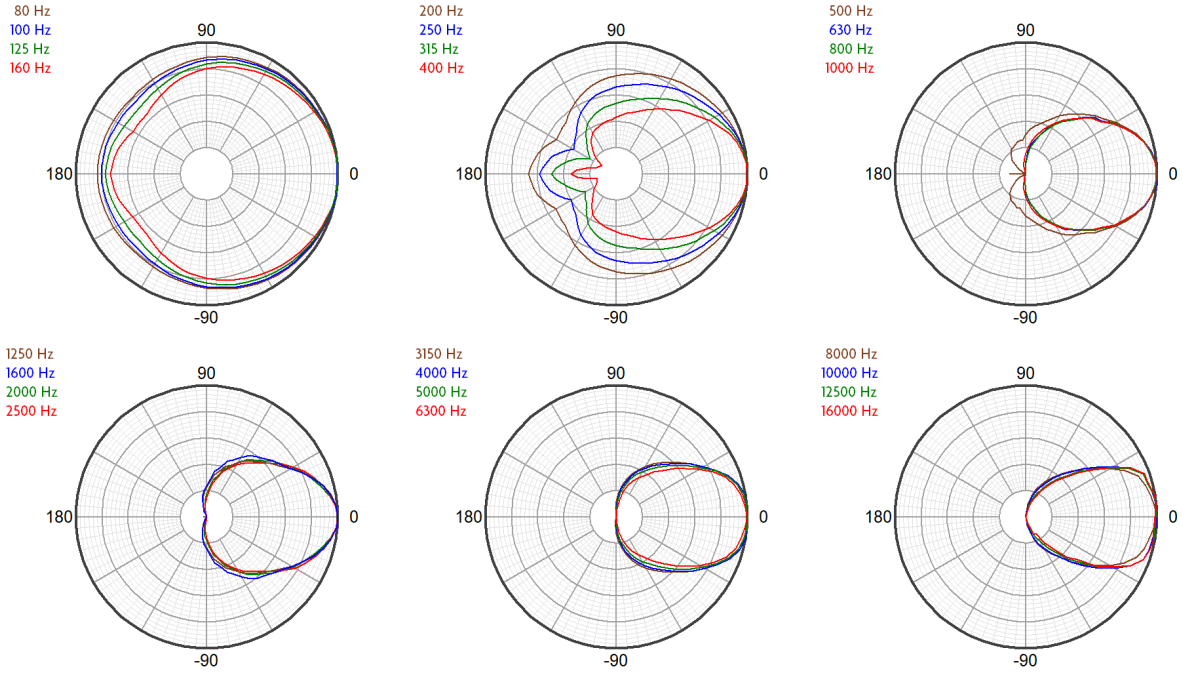
Impedance (ohms)



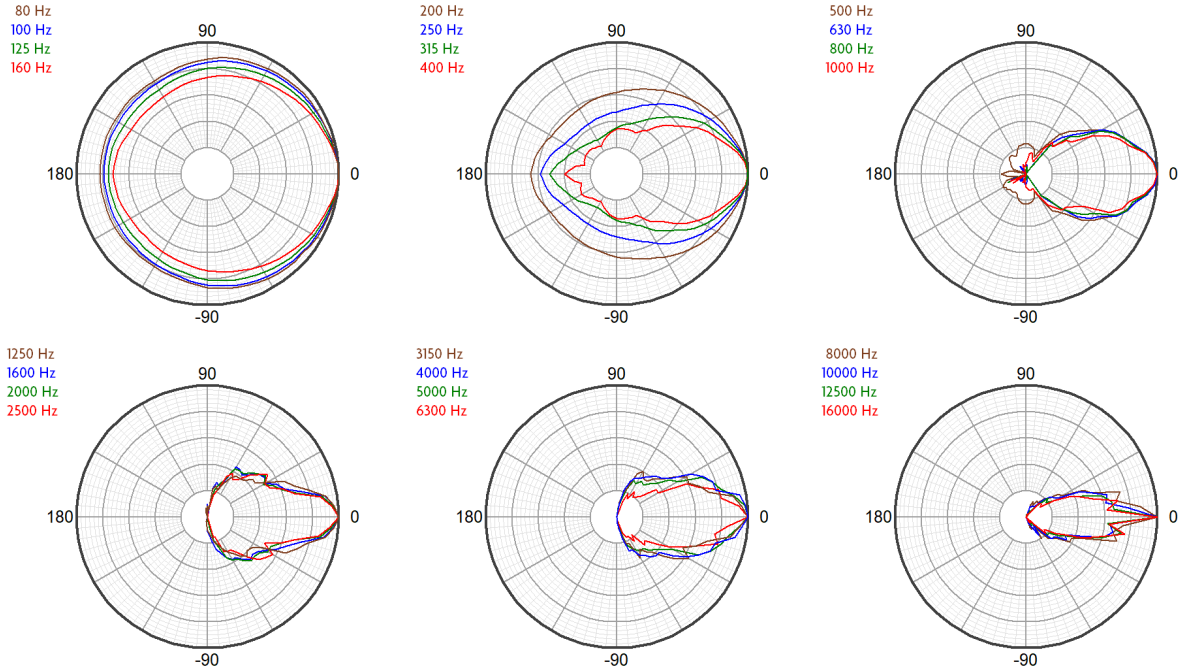
Directivity Index (dB)[13]



Horizontal Polar Response (30 dB Scale, 6 dB per Major Division)



Vertical Polar Response (30 dB Scale, 6 dB per Major Division)



Technologies

The four **low frequency drivers** in the AHC443 each employ dual 3.5-inch voice coils in a high-energy neodymium magnet structure. This configuration provides exceptional thermal power handling, resulting in a combined 3200 watts of long-term power handling, as well as providing the prodigious motor strength necessary to drive the AHC443's low-frequency horn to its full potential.

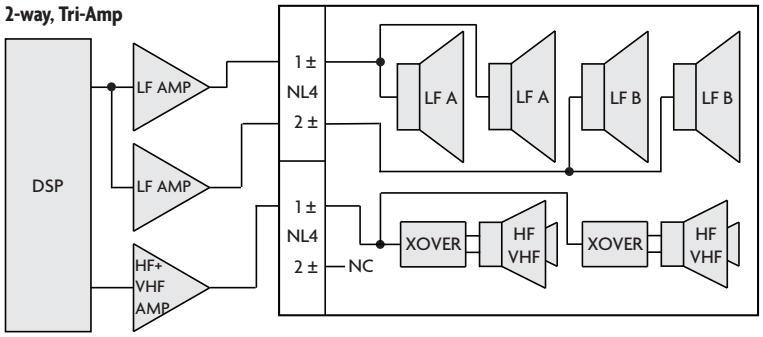
The **compression drivers** employ two coaxially positioned ring radiator diaphragms with 4.0 inch and 2.5 inch voice coils respectively. A patented acoustical filter combines the output of both diaphragms without the interference associated with other coaxial compression driver designs. This combination results in exceptionally high output capability, while TQ™ processing ensures the crisp, clean transient response expected of all Fulcrum Acoustic loudspeakers.

The AHC443's **Compression Head**™ horn architecture couples a trapezoidal enclosure housing a pattern-control horn bell and rear-facing 10 inch drivers with a "compression head" – a removable acoustical labyrinth resembling the cylinder head of an engine. The compression head accurately positions two **Oculus**™ phase plugs in front of the 10 inch cones, and delivers their output coherently to the entry of the horn bell, by way of an integral folded horn throat.

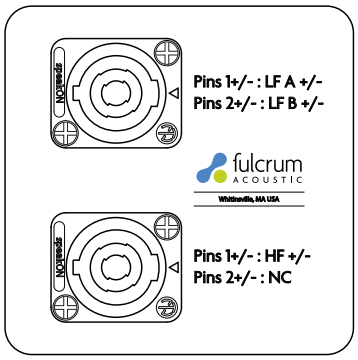
The **Oculus**™**phase plug** employs two radially asymmetrical slots, precisely shaped and positioned to gather the pressure from the 10 inch driver's hemispherical compression chamber and deliver it in planar phase to a rectangular horn throat.

Connection Diagram

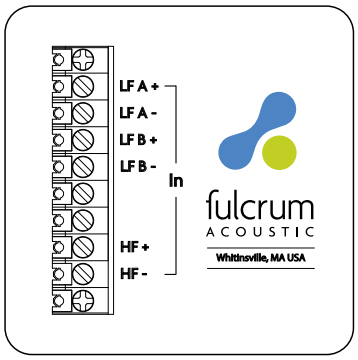
2-way, Tri-Amp



Input Connections



Standard NL4 SpeakON Input



Optional Terminal Strip / WR 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.*

[10] **Axial Processed Phase Response** *The axial phase response with recommended signal processing applied, and latency removed.*

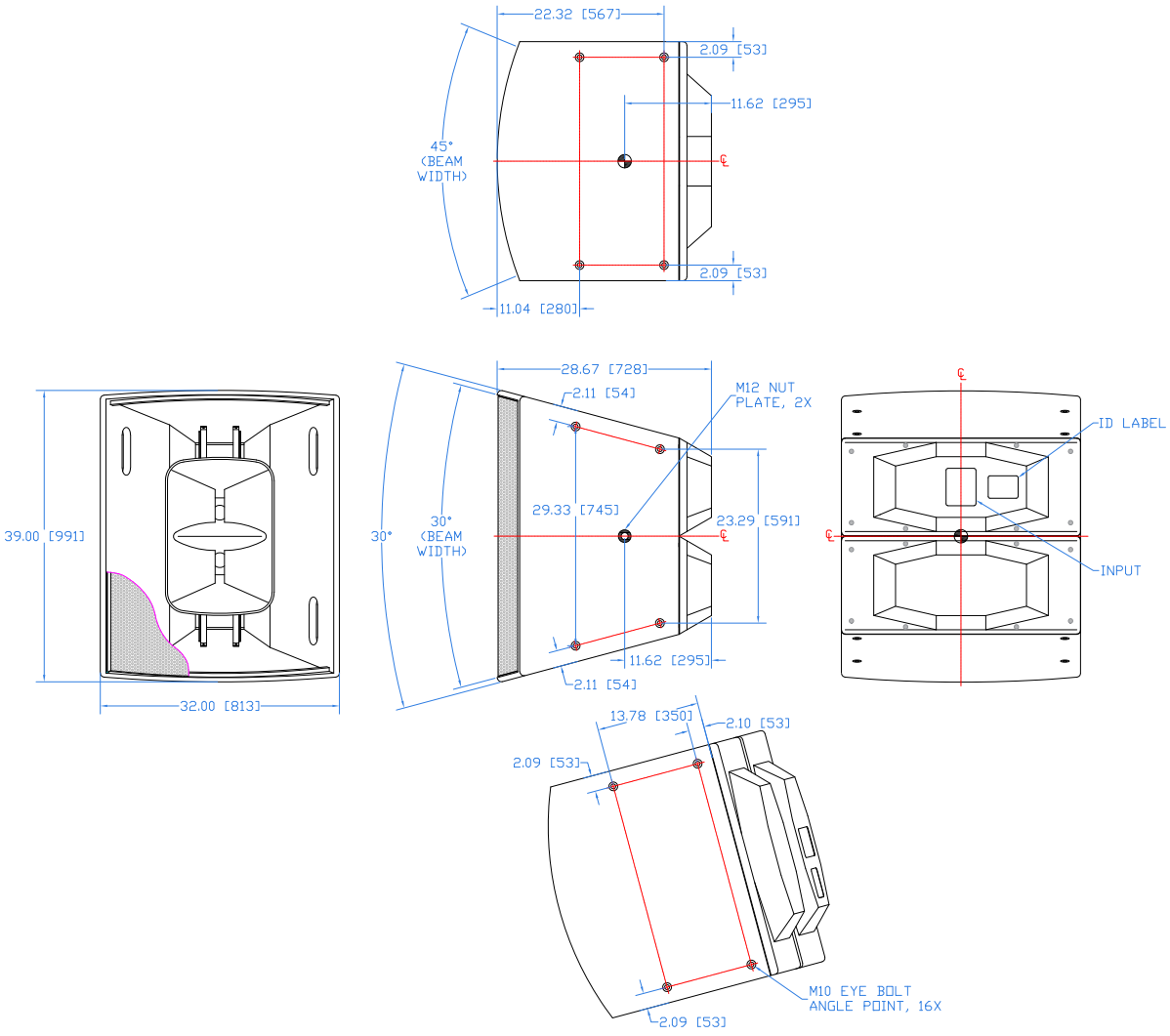
[11] **Horizontal / Vertical Off Axis Responses** *The magnitude response at various angles off axis, with recommended signal proceessing applied.*

[12] **Beamwidth** *The angle between the -6 dB points in a loudspeaker's polar response.*

[13] **Directivity Index (D_i)** *The ratio of the on-axis sound pressure squared to the spherical average of the sound pressure squared at a particular frequency expressed in dB. To convert the directivity index to directivity factor (Q) use the formula* $10^{Di/10}$.

Notes:
1. Net Weight = Approx. 186 lb / 84.4 kg
2. Symbol ◎ = M10x1.5 eye bolt angle point
3. Symbol ◎ = M12x1.75 nut plate
4. Symbol ⊕ = CoG
5. Symbol ● = Compression Head attachment point; do not use for suspension

REVISIONS		
REV	DESCRIPTION	APPR / DATE
1	NEW ISSUE	RAF 4/18/22
2	ADD COMPRESSION HEAD ATTACHMENT POINTS	RAF 7/14/22
3	UPDATE NOTES, MOVE INPUT HEAD	RAF 1/2/25

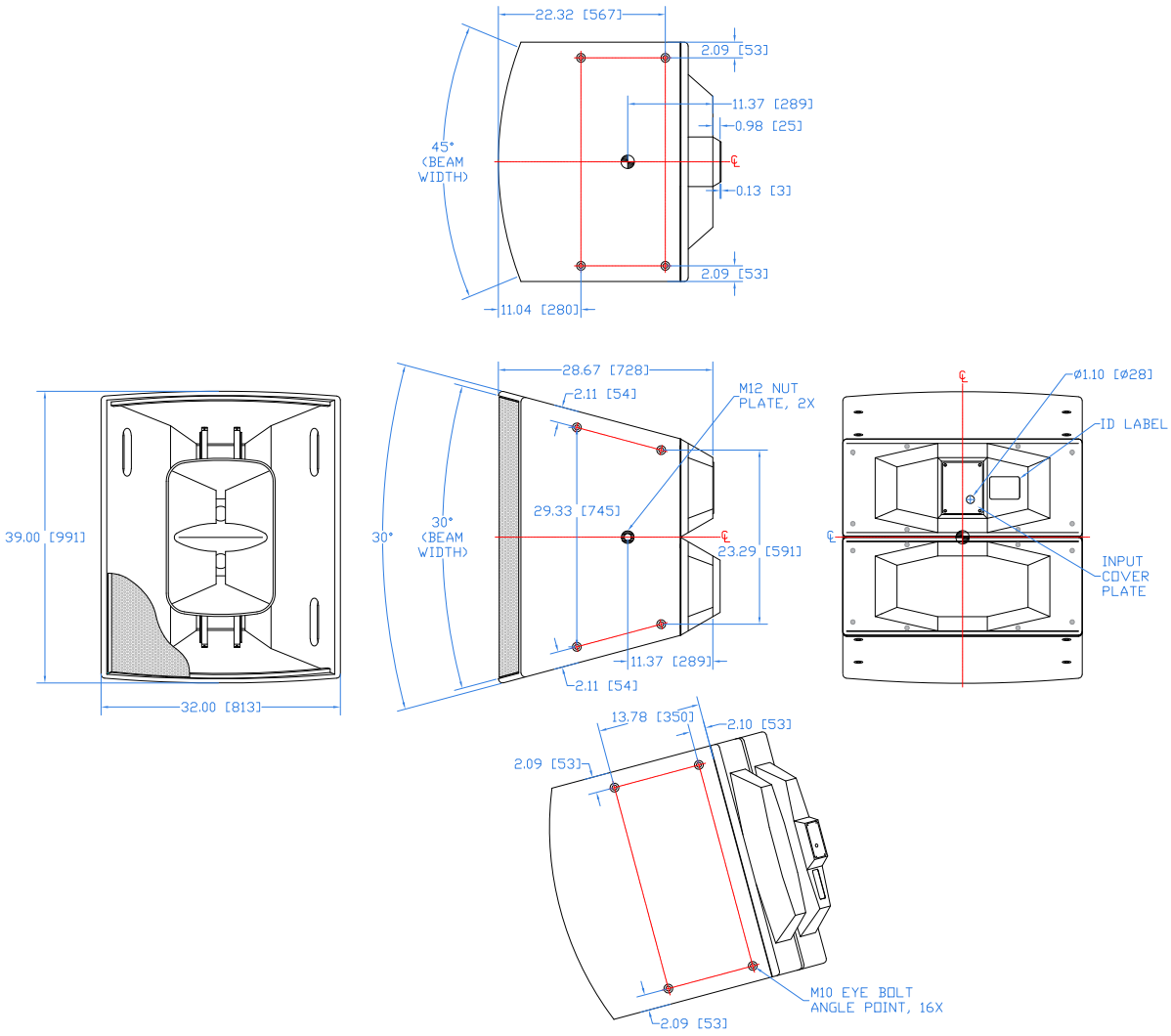


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		CHECKED: DEW 4/18/22	
		DES ENG:	A SHEET 1 OF 1 SCALE: 1:20
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Notes:
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3. Symbol ◉ = M12x1.75 nut plate
4. Symbol ⊕ = CoG
5. Symbol ● = Compression Head attachment point; do not use for suspension.
6. Enclosure construction:
   Fiberglass Reinforced Polyurethane

REVISIONS		
REV	DESCRIPTION	APPR / DATE
1	NEW ISSUE	RAF 4/18/22
2	ADD COMPRESSION HEAD ATTACHMENT POINTS	RAF 7/14/22
3	UPDATE WEIGHT, INPUT COVER PLATE	RAF 1/2/25



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