



# AH443

## High Efficiency Full-Range Coaxial Horn

tq<sup>install</sup>  
SERIES™



### Overview

The AH443 is a bi-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 extends the 10s' high frequency response to smoothly mesh with two 4 inch diaphragm high frequency compression drivers. The AH443'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 AH443 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 AH443 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<sup>1</sup>

#### Operating Mode

Bi-amplified w/ DSP

#### Operating Range<sup>2</sup>

67 Hz to 17 kHz

#### Nominal Beamwidth

45° x 30°

#### Transducers

LF: 4x 10.0" ceramic magnet cone driver, 3.0" voice coil

HF: 2x 4.0" titanium diaphragm, neodymium magnet compression driver

#### Power Handling @ Nominal Impedance<sup>3</sup>

LF: 75 V (1400 W @ 4 Ω)

HF: 40 V (400 W @ 4 Ω)

#### Nominal Sensitivity @ Input Voltage<sup>4</sup> (whole space)

LF: 110 dB @ 2.00 V

HF: 114 dB @ 2.00 V

#### Nominal Maximum SPL (peak / continuous)

LF: 147 dB / 141 dB

HF: 146 dB / 140 dB

#### Equalized Sensitivity @ Input Voltage<sup>5</sup>

110 dB @ 2.00 V

#### Equalized Maximum SPL (peak / continuous)<sup>6</sup>

148 dB / 142 dB

#### Recommended Power Amplifiers

LF: 1400 W to 2800 W @ 4 Ω

HF: 400 W to 800 W @ 4 Ω

### Physical Specifications

#### Connections

(2) Neutrik NL4 Speakon

Pin 1+/-: LF

Pin 2+/-: HF

#### Mounting / Suspension Points

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

#### Finish

Black painted enclosure w/ matte black grille, or

White painted enclosure w/ matte white grille

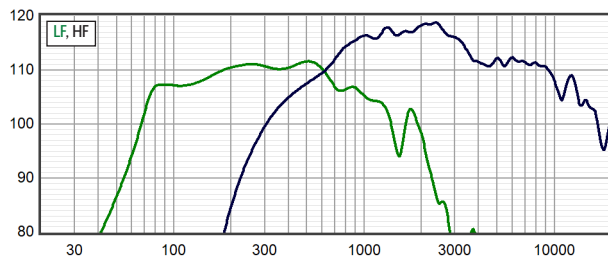
#### Options

Terminal strip input, Custom color finish,

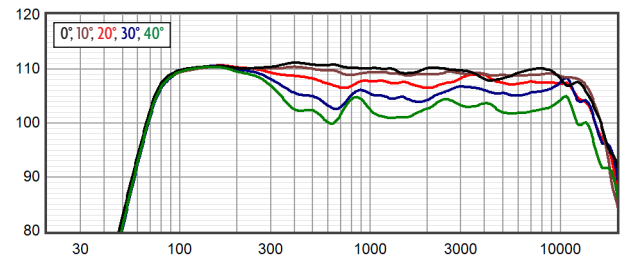
Weather-resistant (WR) enclosure



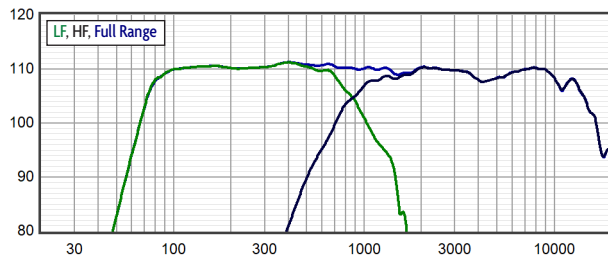
Axial Sensitivity (dB SPL, 2.00 V @ 1 m)<sup>7,8</sup>



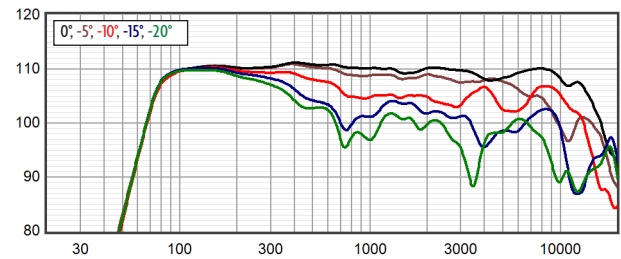
Horizontal Off Axis Response<sup>7,11</sup>



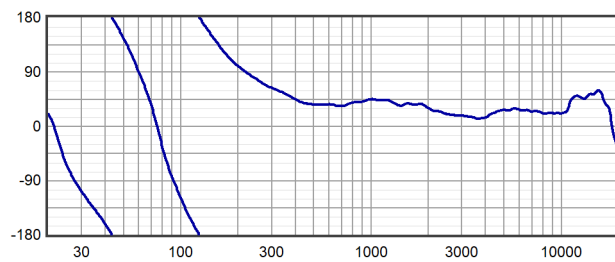
Axial Processed Response (dB)<sup>7,9</sup>



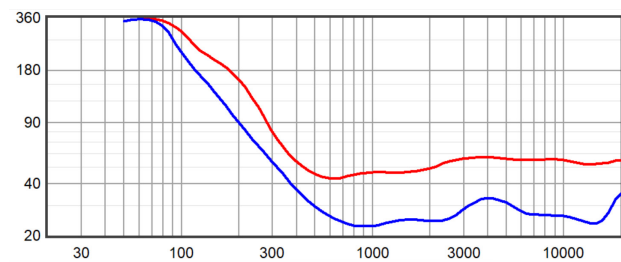
Vertical Off Axis Response<sup>7,11</sup>



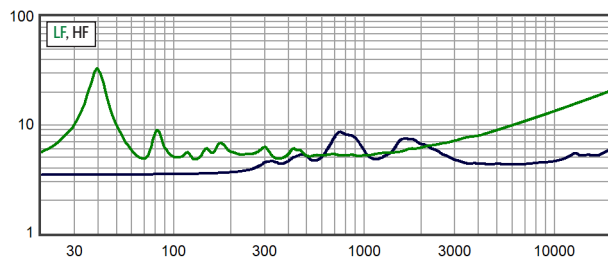
Axial Processed Phase Response (degrees)<sup>7,10</sup>



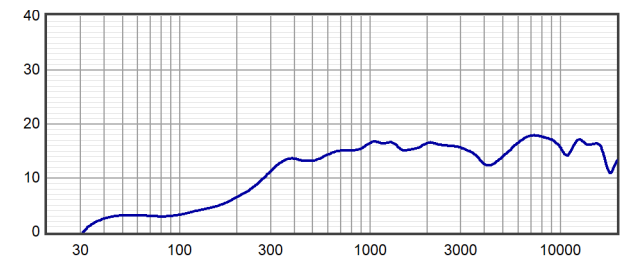
Beamwidth<sup>7,12</sup>



Impedance (ohms)



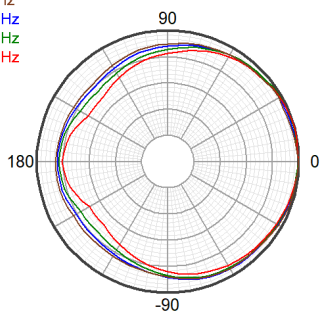
Directivity Index (dB)<sup>13</sup>



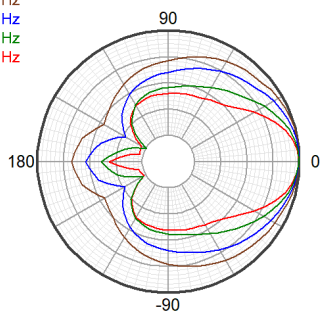


Horizontal Polar Response (30 dB Scale, 6 dB per Major Division)

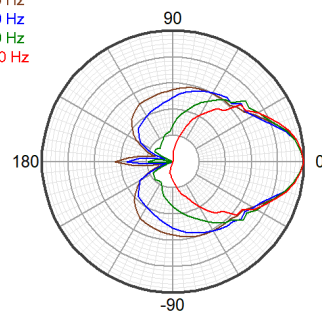
80 Hz  
100 Hz  
125 Hz  
160 Hz



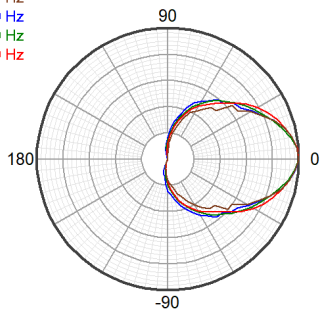
200 Hz  
250 Hz  
315 Hz  
400 Hz



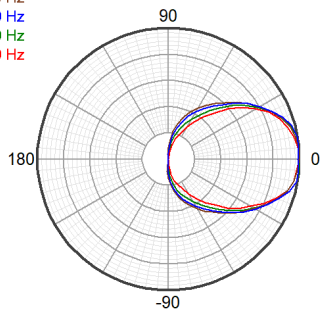
500 Hz  
630 Hz  
800 Hz  
1000 Hz



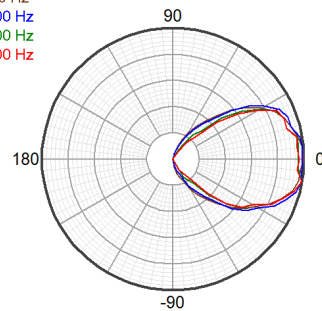
1250 Hz  
1600 Hz  
2000 Hz  
2500 Hz



3150 Hz  
4000 Hz  
5000 Hz  
6300 Hz

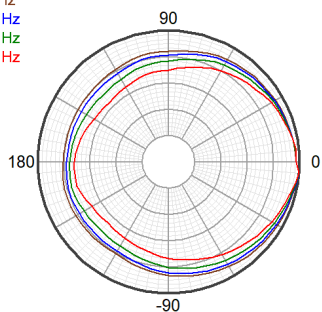


8000 Hz  
10000 Hz  
12500 Hz  
16000 Hz

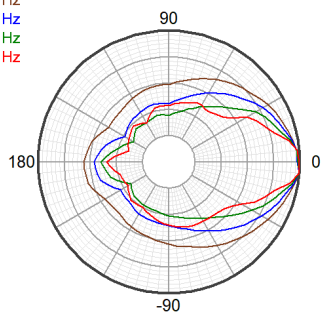


Vertical Polar Response (30 dB Scale, 6 dB per Major Division)

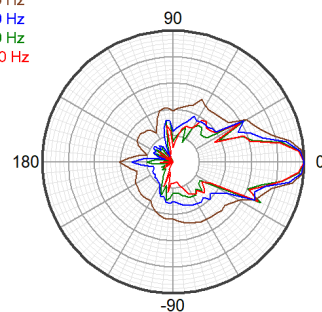
80 Hz  
100 Hz  
125 Hz  
160 Hz



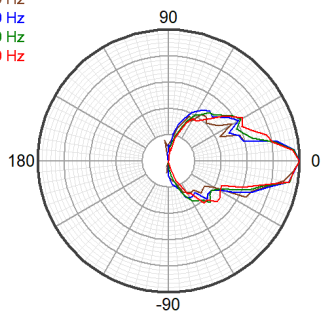
200 Hz  
250 Hz  
315 Hz  
400 Hz



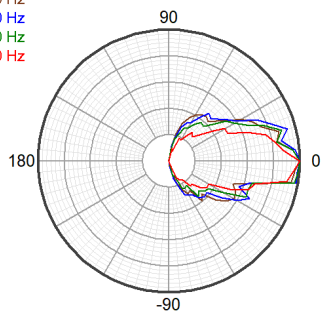
500 Hz  
630 Hz  
800 Hz  
1000 Hz



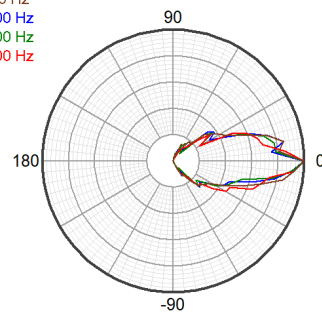
1250 Hz  
1600 Hz  
2000 Hz  
2500 Hz



3150 Hz  
4000 Hz  
5000 Hz  
6300 Hz



8000 Hz  
10000 Hz  
12500 Hz  
16000 Hz





### Technologies

The AH44p3'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.

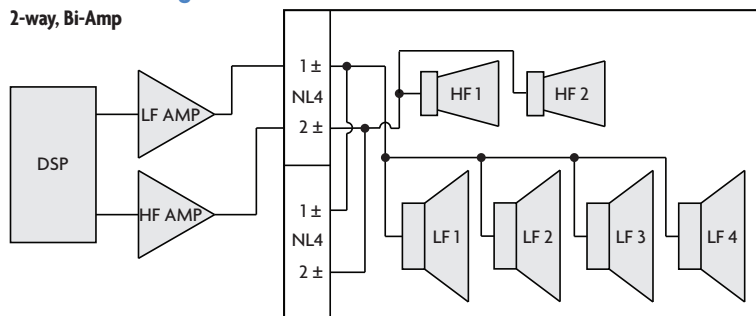
This unique arrangement allows a horn with an effective length of 1.1 m (44 in) to be housed within an enclosure with a depth of only 0.7 m (27.7 in). Further, it allows the low frequency drivers and horn throat to fit completely within the vertical envelope of the horn bell; which

in turn allows the angled top and bottom walls of the enclosure to double as the vertical walls of the low frequency horn. In tight packed arrays, the walls of adjacent AH horns are perfectly parallel and separated by just two thicknesses of birch plywood, providing the most ideal array geometry possible.

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. The rectangular output of the phase plug is only 6.3 cm (2.5 in) wide, which allows the sound waves to pass through the compression head's two 90 degree bends without any loss of sound power.

### Connection Diagram

2-way, Bi-Amp



### Mechanical Specification Drawings

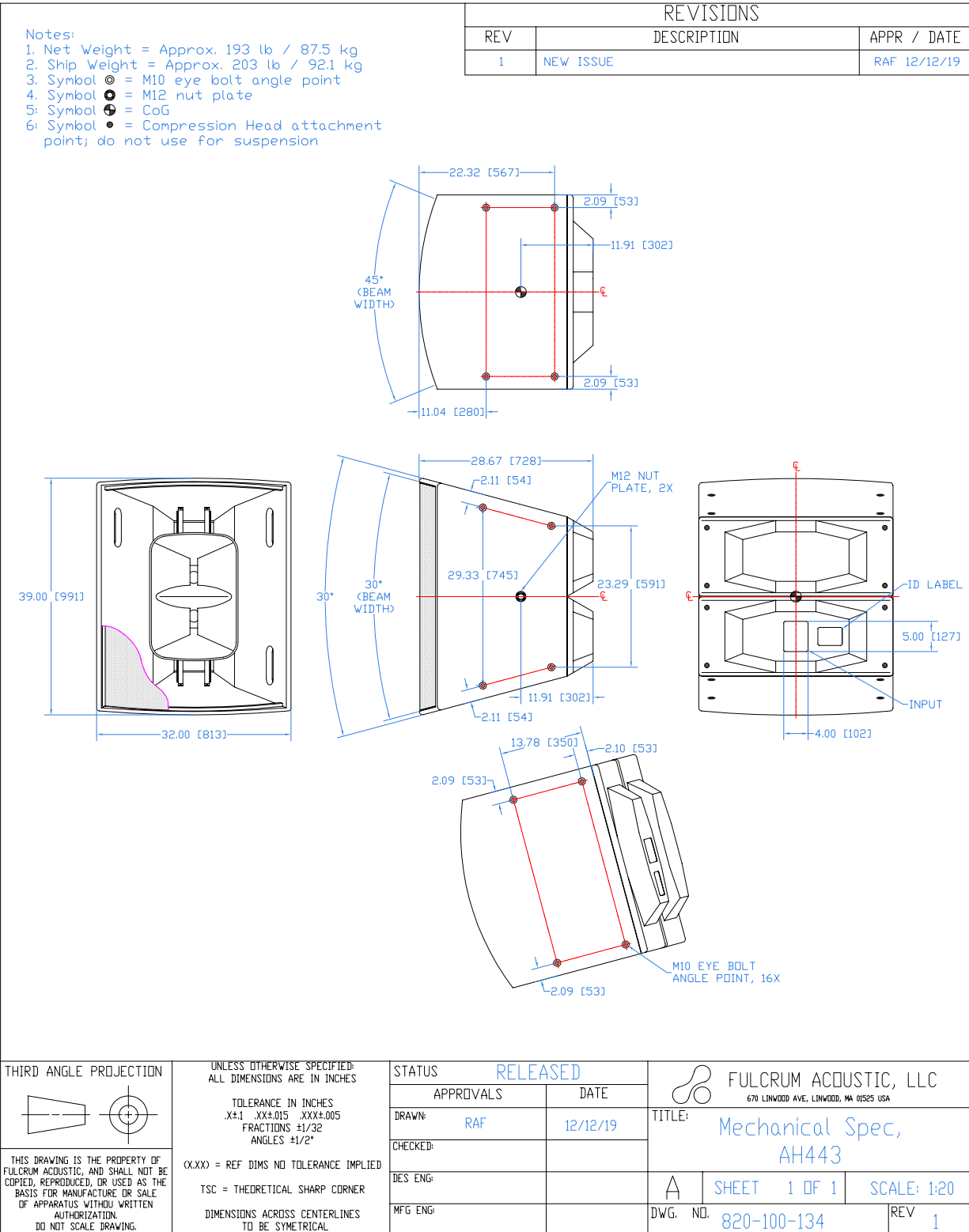
2D and 3D DXF dimensional drawings are available for download at [www.fulcrum-acoustic.com/support](http://www.fulcrum-acoustic.com/support).

### Notes

- <sup>1</sup> **Performance Specifications** All acoustic specifications rounded to nearest whole number. External DSP with Fulcrum Acoustic-provided settings is required to achieve the specified performance.
- <sup>2</sup> **Operating Range** The frequency range within which the processed response is within 10 dB of the average.
- <sup>3</sup> **Power Handling** Based on the AES power handling of the transducers.
- <sup>4</sup> **Nominal Sensitivity** The 1-meter-referenced SPL produced by a 1 watt band limited pink noise signal, with no processing applied.
- <sup>5</sup> **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.
- <sup>6</sup> **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.
- <sup>7</sup> **Resolution** All response graphs are subjected to 1/6 octave cepstral smoothing with a gaussian weighting function.
- <sup>8</sup> **Axial Sensitivity** The SPL plotted against frequency for a 1 watt swept sine wave, referenced to 1 m with no signal processing.
- <sup>9</sup> **Axial Processed Response** The axial magnitude response with recommended signal processing applied.
- <sup>10</sup> **Axial Processed Phase Response** The axial phase response with recommended signal processing applied, and latency removed.
- <sup>11</sup> **Horizontal / Vertical Off Axis Responses** The magnitude response at various angles off axis, with recommended signal processing applied.
- <sup>12</sup> **Beamwidth** The angle between the -6 dB points in a loudspeaker's polar response.
- <sup>13</sup> **Directivity Index (Di)** 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  $10^{Di/10}$ .



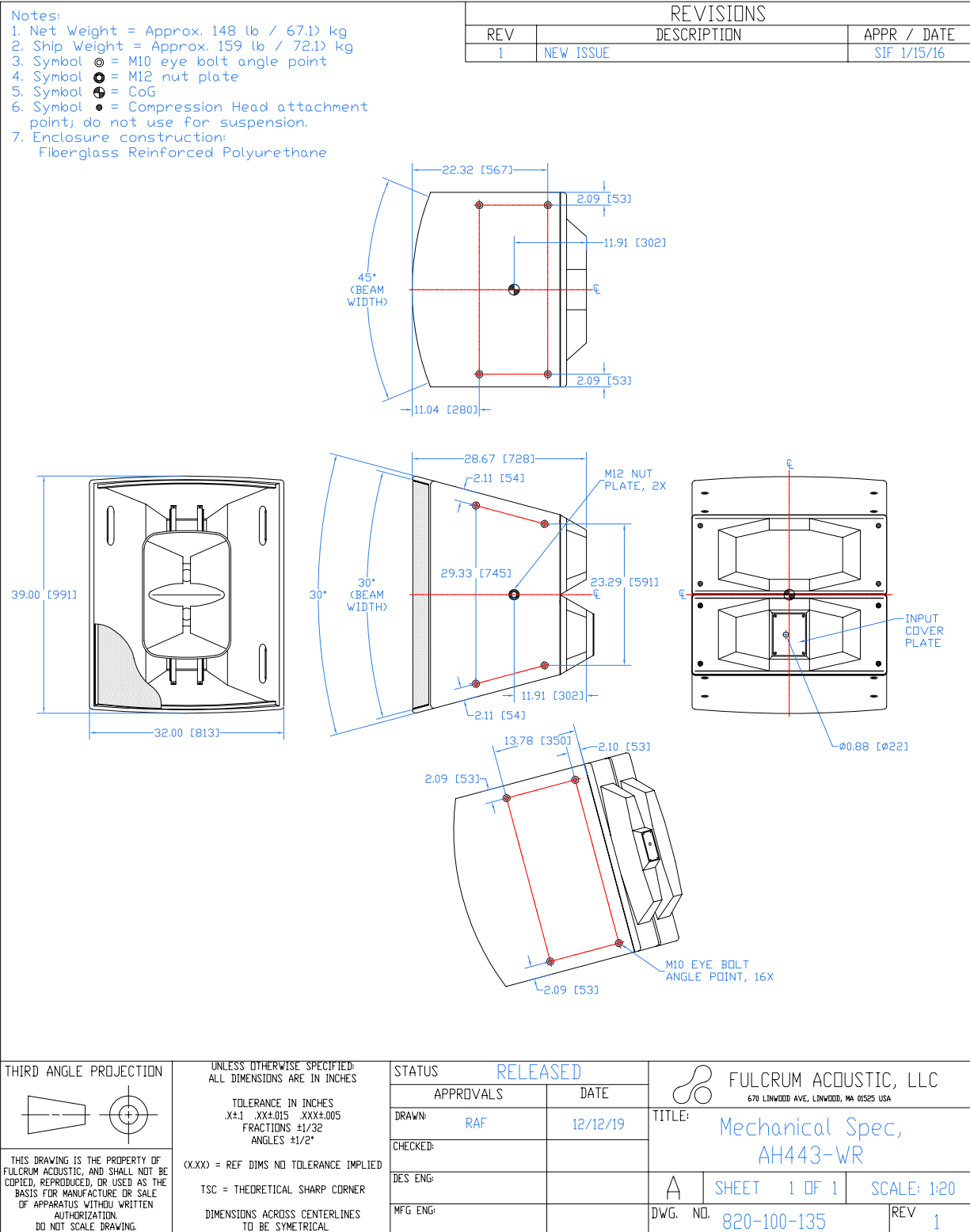
product specification



Drawing is reduced. Do not scale.



product specification, weather-resistant (WR) version



Drawing is reduced. Do not scale.