



FA28ac

Self-Powered Dual 8 inch Coaxial Loudspeaker

*fa*PORTABLE.



Overview

The FA28ac is a portable, self-powered 3-way coaxial loudspeaker that is well suited for a variety of sound reinforcement applications. Its neodymium coaxial transducer and 90° x 60° horn provide broad coverage that is beneficial in both stage monitor and mains operation, and its dedicated neodymium low frequency transducer provides additional low frequency directivity and mid bass impact. Its multi-faceted, enclosure includes a pole mount socket, 40° and 50° rear angles for stage monitor use, and M10 threaded accessory plates for use with optional suspension hardware such as the FA28 Yoke Bracket. The compact enclosure is vertically-oriented, but if a horizontal orientation is desired, it can be easily obtained by exchanging the pole socket with one of the M10 accessory plates and rotating the coaxial transducer to provide appropriate coverage angles. When rotated, the FA28ac's low profile also makes it very useful as a high output front fill system when placed on the edge of a stage apron.

Sound, innovative acoustical design combined with on-board **TQ™**, Level 1 processing provides exceptional clarity and stability, and precise transient response even at high sound pressure levels. Four back panel selectable presets optimize the response for either mains or floor monitor use, with or without a subwoofer. A full complement of input filters and delay, as well as signal levels and amplifier status, may be accessed via Ethernet, using **Armonia Pro Audio Suite™** control software. In addition, a pre-output EQ stage is available for programming custom presets. These presets may be saved and later recalled using the back panel Preset Select button or software.

The FA28ac's transducers are powered by two 570 watt amplifier channels, designed and manufactured in Italy by Powersoft. Powersoft amplifiers incorporate state-of-the-art Class-D technology to produce extremely high efficiency, low noise, and low intermodulation distortion in compact and lightweight packages.

The FA28ac's versatility, high performance, and aesthetic appeal make it a compelling choice for A/V rental companies, live performance venues, corporate A/V, nightclub PA, theatrical productions, and more.

Performance Specifications¹

Operating Mode

Self-Powered, w/ On-Board DSP

Operating Range²

49 Hz to 20 kHz

Nominal Beamwidth (rotatable)

90° x 60°

Transducers

LF: 8.0" ceramic magnet woofer, 2.0" voice coil
HF/LF: Coaxial 1.7" titanium diaphragm compression driver;
8.0" woofer, 2.0" voice coil; single neodymium magnet

Power Handling @ Nominal Impedance³

LF: 63 V / 250 W @ 16 Ω

HF: 63 V / 250 W @ 16 Ω

Nominal Sensitivity @ Input Voltage⁴ (whole space)

LF: 94 dB @ 4.00 V

HF: 103 dB @ 4.00 V

Nominal Maximum SPL (peak / continuous)

LF: 124 dB / 118 dB

HF: 133 dB / 127 dB

Equalized Sensitivity @ Input Voltage⁵

Full Range: 94 dB @ 4.00 V

80 Hz HPF: 96 dB @ 4.00 V

Equalized Maximum SPL⁶ (peak / continuous)

Full Range: 127 dB / 121 dB

80 Hz HPF: 129 dB / 123 dB

Physical Specifications

Mounting / Suspension Points

(1) 35 mm / 1.38 inch pole socket

(1) M10 nut plate

(3) M10 accessory plates*

*M10 thread is sealed. Use bolts with 15-20 mm shank length.

Dimensions / Weight

See page 6

Finish

Black painted enclosure w/ matte black grille

Options

FA28 Padded Bag w/ Logo

FA28 Vertical Yoke Bracket (see page 7)

FA28 Horizontal Yoke Bracket (see page 8)

SPI Speaker Pole

Mounts to subwoofers with M20-threaded connector plate.

Height-adjustable between 905 mm / 35.6 in and 1450 mm / 57.1 in



Audio Input

Connectors

Analog In: Female XLR
Analog Out: Male XLR
AES3 In: Female XLR
Ethernet / AESOP: 2x 8P8C (RJ45)

Analog Input Wiring

Pin 1: Chassis
Pin 2: Signal +
Pin 3: Signal -

Input Impedance

10 k Ω balanced to ground

Input Sensitivity

1.5 Vrms / 6.0 dBu

Maximum Input Voltage

6.3 Vrms / 18.2 dBu

Controls

Preset Select: 1 thru 4, press and hold 3 sec to access 5 thru 8
Input Select: Analog, AES3 A, AES3 B, AES3 A+B
Input EQ: In / Out
Input Volume: Full clockwise = nominal gain

LED Indicators

Ready, signal, temp, limit, protect, selected preset,
selected input, input EQ in

Digital Signal Processing

DSP Encoding

24 bit / 48 kHz

DSP Latency

Analog Input: 3.52 ms

Input Processing (software accessible)

Three layers raised cosine parametric or graphic EQ
Filter Types: Peaking, asymmetrical, low and high shelf, low and high pass
Delay: 2 seconds
Gain
Polarity
Mute

Pre-Output Processing (software accessible)

Sixteen bands parametric EQ
Filter Types: Peaking, low and high shelf, low and high pass, band pass, band stop, all pass
Delay: 2 seconds
Gain
Mute

Amplifier

Type

Two-channel Class D

Output Power

EIAJ test, 1 kHz, 1% THD: 2x 570 W @ 16 Ω
Maximum Output Voltage: 2x 129 V peak

Frequency Response

10 Hz to 25 kHz, ± 3 dB, for 1 W @ 8 Ω

S/N Ratio

> 112 dBA, 20 Hz to 20 kHz

Crosstalk Separation

> 70 dB @ 1 kHz

Slew Rate

50 V / microsecond @ 8 Ω , input filter bypassed

Damping Factor

> 500 @ 100 Hz

Distortion

THD+N: < 0.05% from 0.1 W to full power (typically < 0.01%)
SMPTE IMD: < 0.05% from 0.1 W to full power (typically < 0.01%)
DIM100 IMD: < 0.02% from 0.1 W to full power (typically < 0.005%)

Efficiency

> 80% (typical)

Cooling

Temperature-controlled variable speed internal fan

Maximum Operating Ambient Temperature

40° C

Protection Systems

Over-temp power limiting, thermal shutdown, short-circuit,
overload output protection

AC Mains

Connections

Mains In: Neutrik powerCON NAC3MPA
Mains Out: Neutrik powerCON NAC3MPB

Mains Voltage

100 to 240 V~, 50/60 Hz

Current Draw (1/8 max output power)

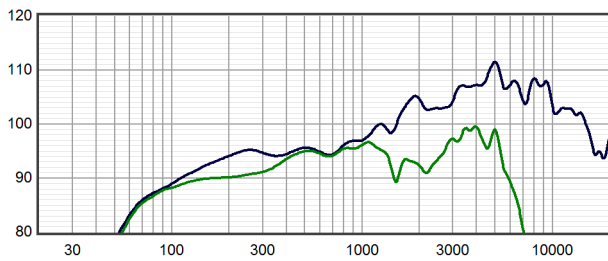
5.5 to 2.9 A

Thermal Emission (1/8 power @ 4 Ω)

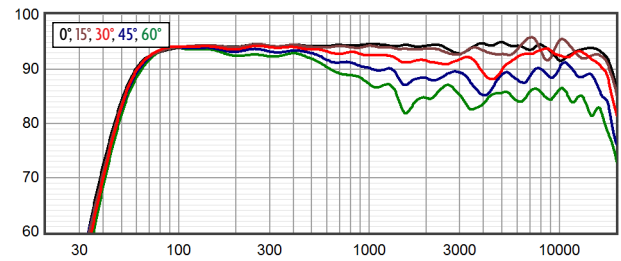
282 BTU/h 71 kcal/h



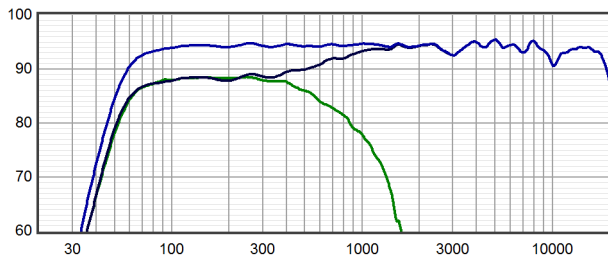
Axial Sensitivity (dB SPL, 4.00 V @ 1 m)^{7,8}



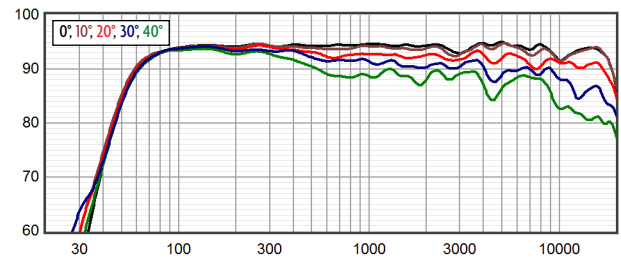
Horizontal Off Axis Response^{7,11}



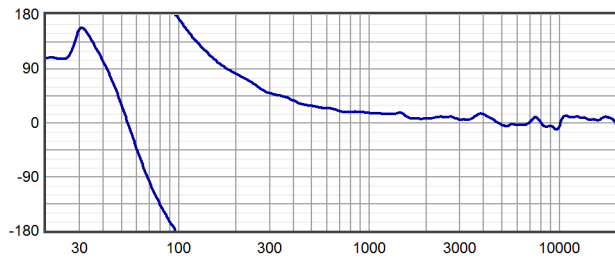
Axial Processed Response (dB)^{7,9}



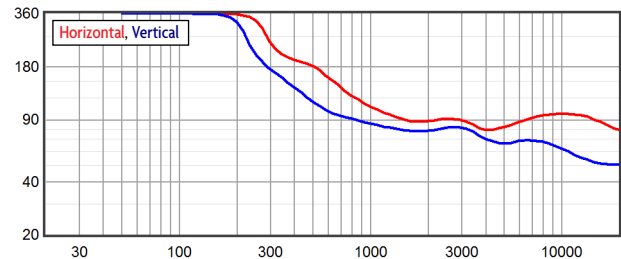
Vertical Off Axis Response^{7,11}



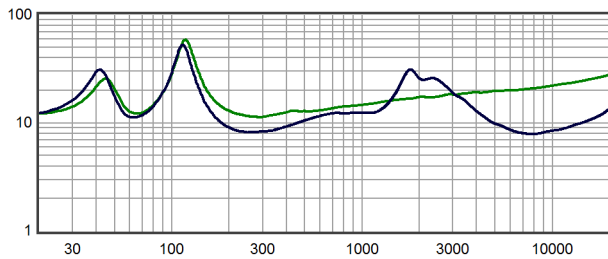
Axial Processed Phase Response (degrees)^{7,10}



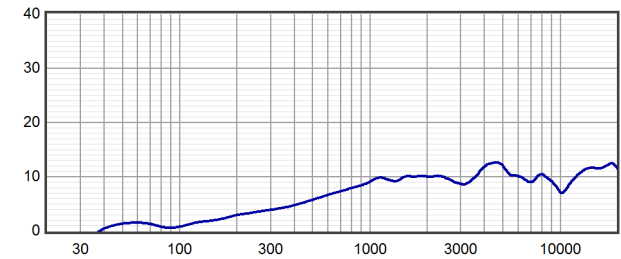
Beamwidth^{7,12}



Impedance (ohms)

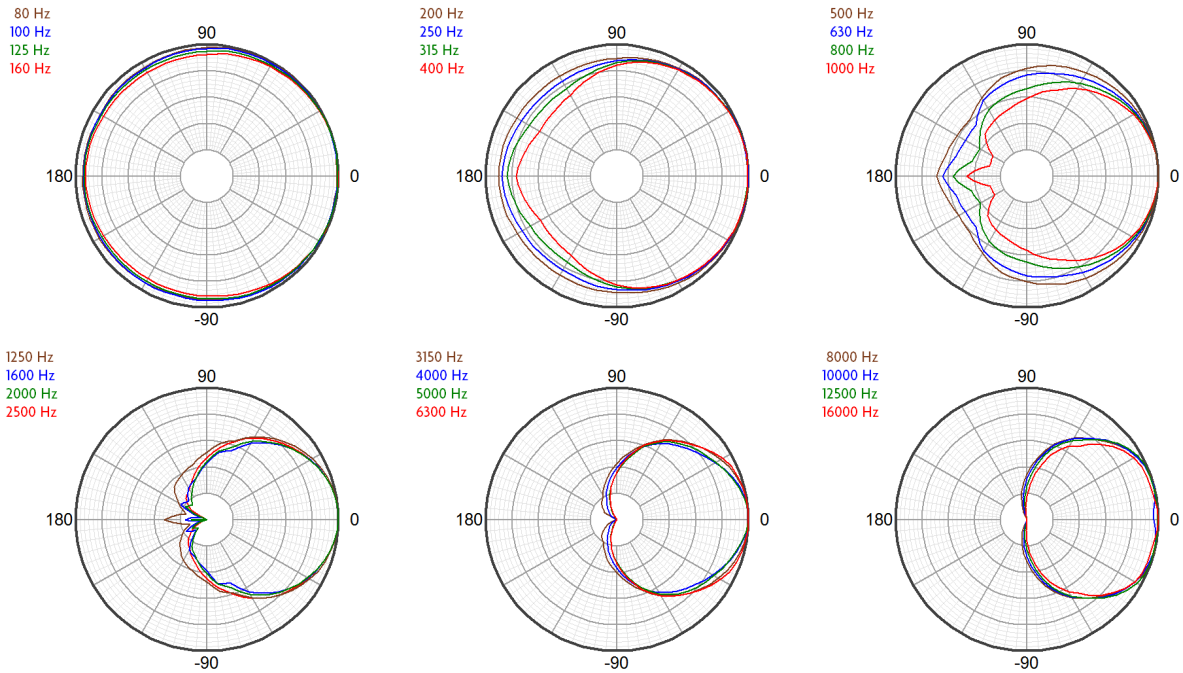


Directivity Index (dB)¹³

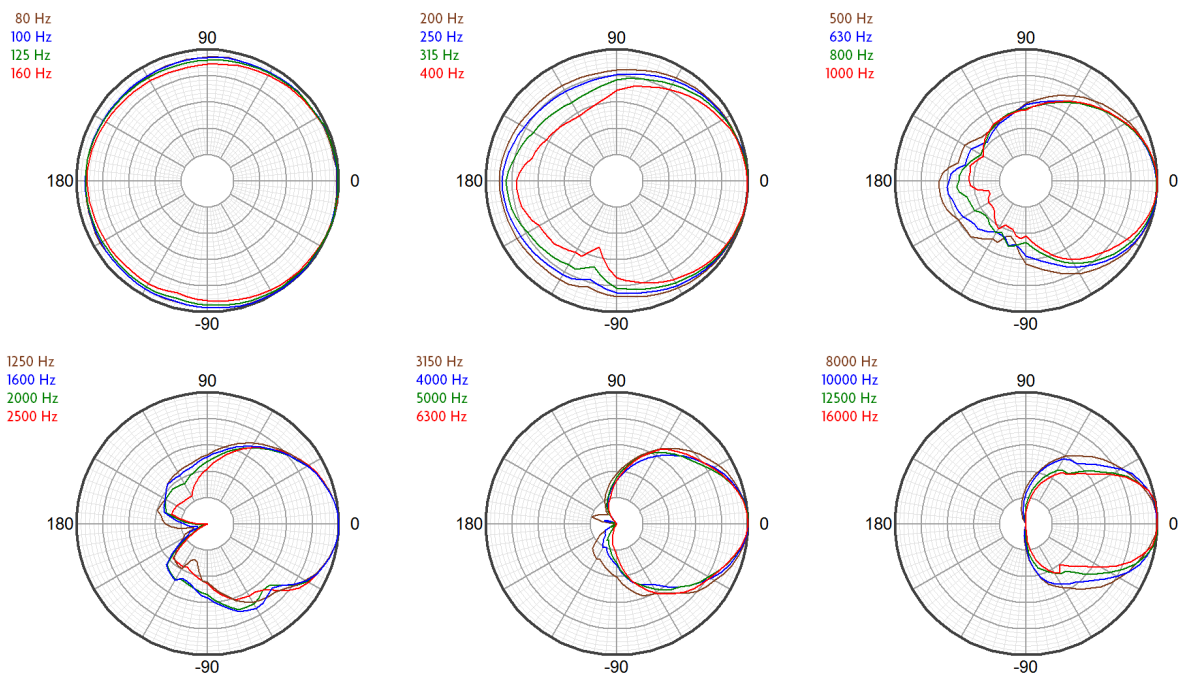




Horizontal Polar Response (30 dB Scale, 6 dB per Major Division)



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





product specification

Technologies

The proprietary horn employed in the FA28ac represents a modern digital-signal-processing-aware update to the traditional horn-loaded coaxial loudspeaker concept. The well-known benefits of the coaxial approach have been realized without the familiar shortcomings of historical designs. Fulcrum Acoustic's **Temporal Equalization™ (TQ™)** digital signal processing techniques eliminate midrange colorations and high frequency harshness while producing a smooth, seamless coverage pattern through the crossover range.

The coaxial transducer in the FA28ac includes a 1.75 inch (44 mm) diaphragm compression driver that operates to a relatively low frequency. This allows the high frequency horn to smooth the polar response of the low frequency section in the frequency range where the horn would otherwise cause shadowing. The coaxial woofer's large radiating surface works in conjunction with the HF horn to improve directional control at the bottom of the horn's operating range, increasing directional control beyond what can be accomplished by the horn alone.

The two low frequency devices both operate down to the lowest frequencies, resulting in mutual coupling that provides unusually high efficiency and impact in the critical 80 Hz to 500 Hz range.

Mechanical Specification Drawings

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

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.

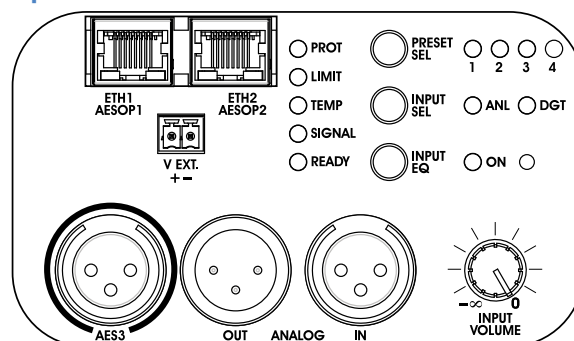
¹⁰ **Axial Processed Phase Response** The axial phase response with recommended signal processing applied, and latency removed.

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

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

¹³ **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 $10^{Di/10}$.

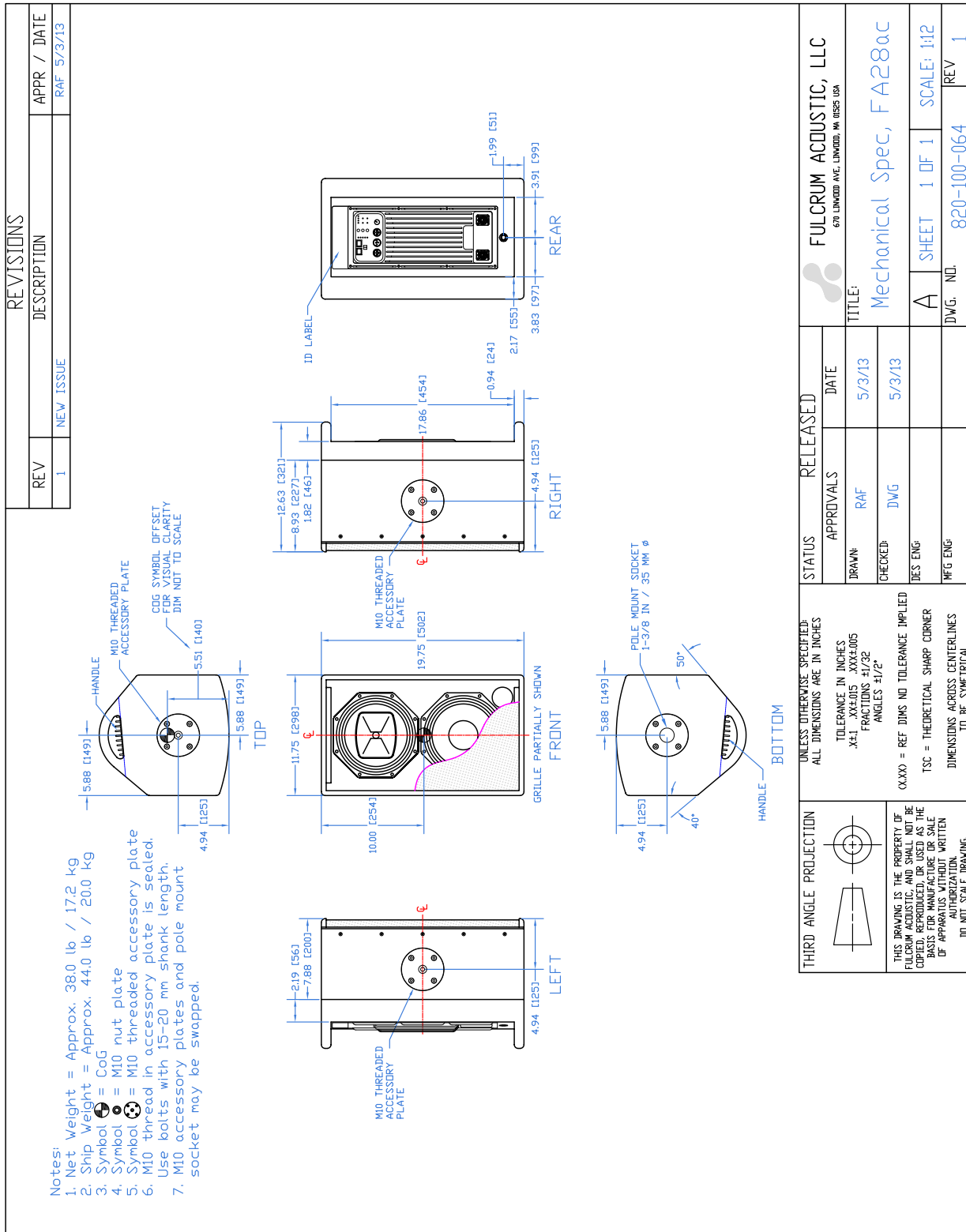
Input Panel



FA28ac Presets

Preset 1	Full Range
Preset 2	With Subwoofer
Preset 3	Stage Monitor
Preset 4	Stage Monitor With Subwoofer

Presets 5-8 user-programmable in **Armonia Pro Audio Suite™** control software. Press and hold rear panel Preset Select button 3 seconds to access these presets.



Drawing is reduced. Do not scale.



optional accessory

NOTES::

- FITS: FA28, FA28ac
- WEIGHT: 6.0 lb / 2.7 kg
- INCLUDES TWO M10 THREADED KNOBS AND TWO QUICK RELEASE PINS
- SYMBOL \otimes = $\varnothing 0.51$ [$\varnothing 12.9$] HOLE FOR USE WITH USER-SUPPLIED THREADED ROD OR TRUSS CLAMP

MAY BE COLLAPSED FOR TRANSPORT

REVISIONS		
REV	DESCRIPTION	APPR / DATE
1	NEW ISSUE	RAF 4/18/14

POLE MOUNT ADAPTER POINTS
4x 0.40 [$\varnothing 10.2$]

FRICTION WASHER, RUBBERIZED CORK

INSTALLATION:

- REMOVE ONE QUICK RELEASE PIN, SWING ARM OUT
- SCREW OTHER ARM INTO M10 ACCESSORY PLATE
- SWING FIRST ARM DOWN, SCREW INTO SECOND M10 ACCESSORY PLATE
- INSERT QUICK RELEASE PIN REMOVED IN STEP ONE
- TILT LOUDSPEAKER TO DESIRED ANGLE AND TIGHTEN BOTH KNOBS

THIRD ANGLE PROJECTION

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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 SYMMETRICAL

STATUS: RELEASED

APPROVALS	DATE
DRAWN: RAF	4/18/14
CHECKED: DWG	4/18/14
DES ENG:	
MFG ENG:	

FULCRUM ACOUSTIC, LLC
670 LINWOOD AVE, LINWOOD, MA 01525 USA

TITLE: Mechanical Spec, FA28 Vert. Yoke Bracket

A SHEET 1 OF 1 SCALE: 1:12

DWG. NO. 820-300-019 REV 1

Drawing is reduced. Do not scale.



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		APPROVALS	DATE		<p>TITLE: Mechanical Spec, FA28 Horz. Yoke Bracket</p>
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		CHECKED: DWG	4/18/14		
		DES ENG:			DWG. NO. 820-300-022
	MFG ENG:				

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