FH1565

Full Range Coaxial Horn

tq install™ SERIES

Overview

The FH1565 is a 2-way, high sensitivity, coaxial horn loudspeaker that provides a precise 60° x 45° pattern with control to below 400 Hz, low frequency extension to 54 Hz, and extremely high output using a single amplifier channel. Its 3.5 inch voice coil, 15 inch woofer combines interactively with a 4 inch diaphragm high frequency compression driver to produce precise pattern control through the crossover range. The FH1565's 35° compact trapezoidal shape allows it to be deployed with its trapezoidal profile vertically oriented (60° H x 45° V) for stand-alone use, in distributed systems, or in vertical arrays; or with its trapezoidal profile horizontally oriented (45° H x 60° V) for use in horizontal 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 FH1565 is particularly effective in acoustically challenging spaces where broadband pattern control is necessary, and in applications requiring high acoustic output and high fidelity. 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
Single-amplified w/ DSP

Operating Range [2]
54 Hz to 20 kHz

Nominal Beamwidth
60° x 45°

Transducers
LF: 15.0" neodymium magnet cone driver, 3.5" voice coil
HF: 4.0" titanium diaphragm, neodymium magnet compression driver

Power Handling @ Nominal Impedance [3]
80 V / 800 W @ 8 Ω

Nominal Sensitivity @ Input Voltage [4] (whole space)
108 dB @ 2.83 V

Nominal Maximum SPL (peak / continuous)
143 dB / 137 dB

Equalized Sensitivity @ Input Voltage [5]
103 dB @ 2.83 V

Equalized Maximum SPL [6] (peak / continuous)
138 dB / 132 dB

Recommended Power Amplifier
800 W to 1600 W @ 8 Ω

Physical Specifications

Connections
(2) Neutrik NL4 Speakon
Pin 1+/-: Full Range
Pin 2+/-: NC

Mounting / Suspension Points
(12) M10 x 1.5 eye bolt angle points, (1) M10 x 1.5 pull back point, (2) M12 x 1.75 yoke points

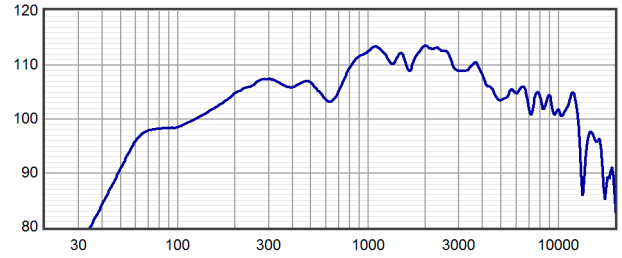
Dimensions / Weight
See page 5

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

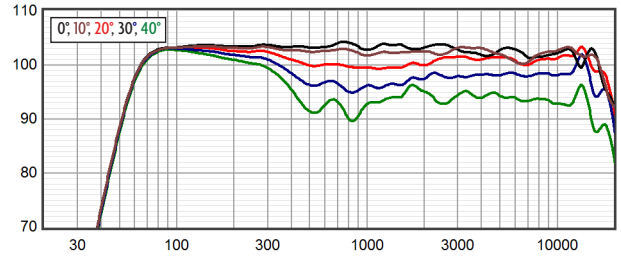
Options

YK-FH15 Ceiling Mount Yoke Bracket, Terminal strip input, Custom color finish, Weather-resistant (WR) enclosure & hardware

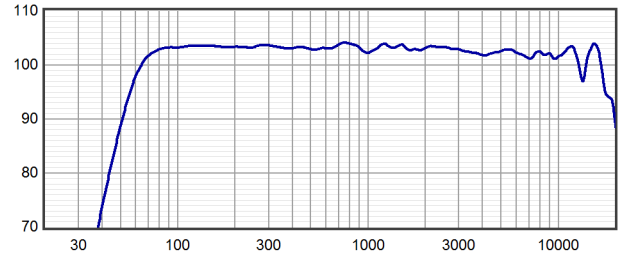
Axial Sensitivity (dB SPL, 2.83 V @ 1 m) [7, 8]



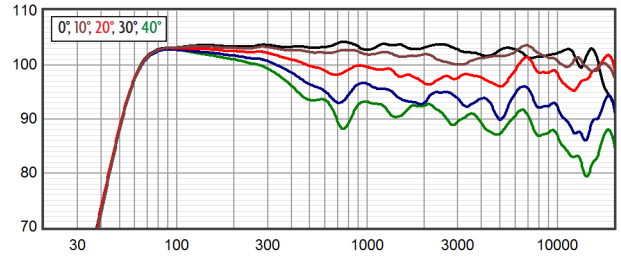
Horizontal Off Axis Response [7, 11]



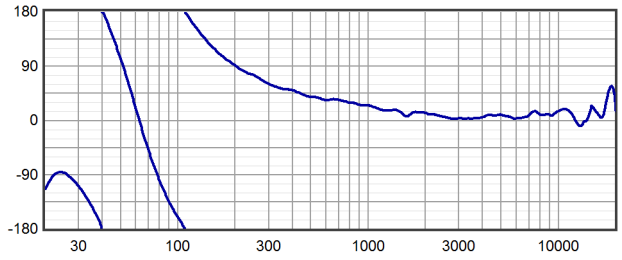
Axial Processed Response (dB) [7, 9]



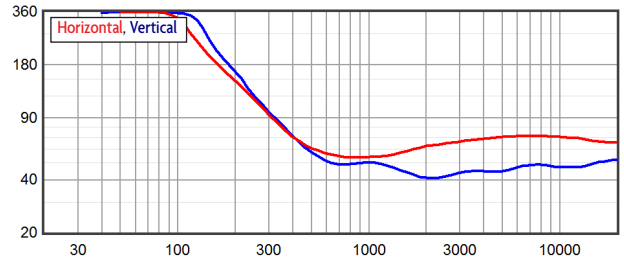
Vertical Off Axis Response [7, 11]



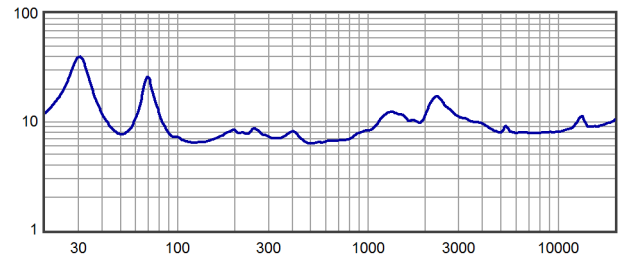
Axial Processed Phase Response (degrees) [7, 10]



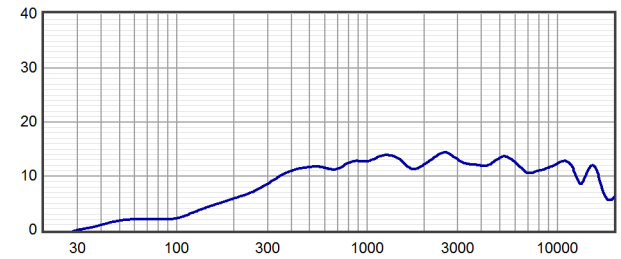
Beamwidth [7, 12]



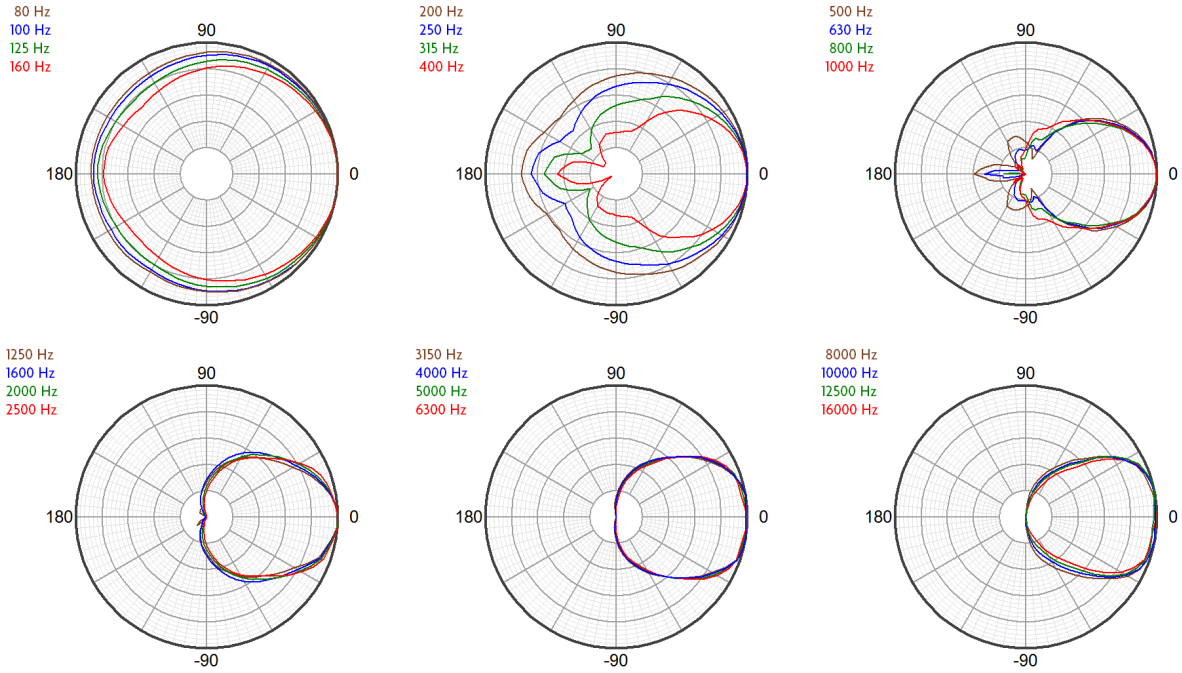
Impedance (ohms)



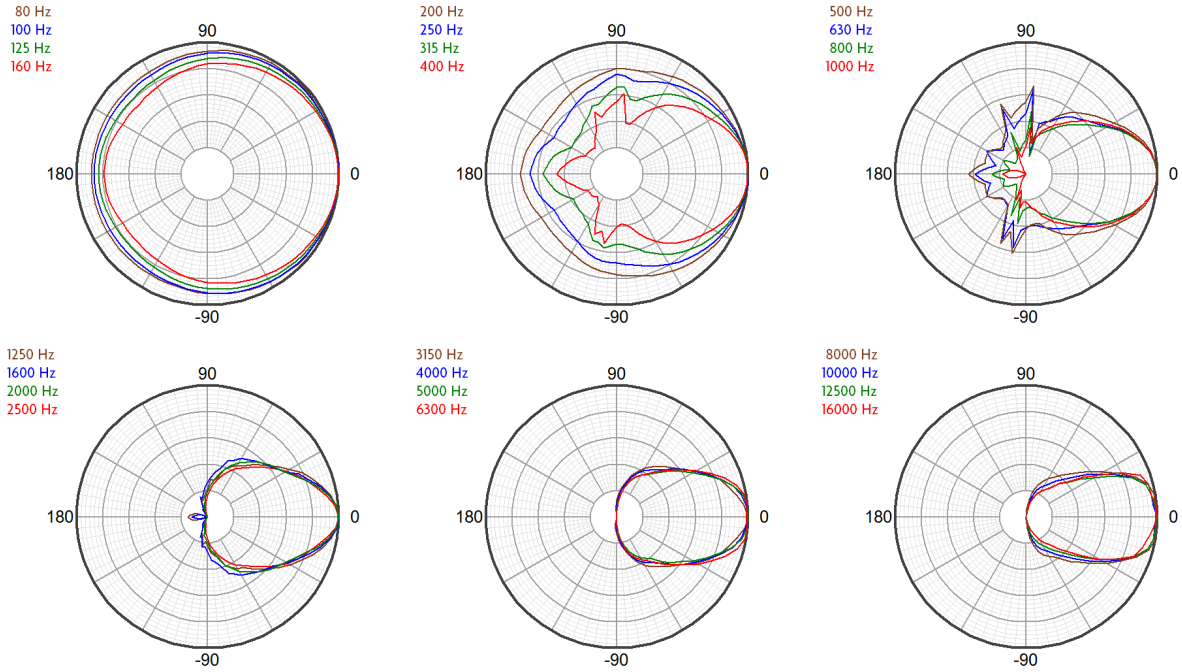
Directivity Index (dB) [13]



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



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



Technologies

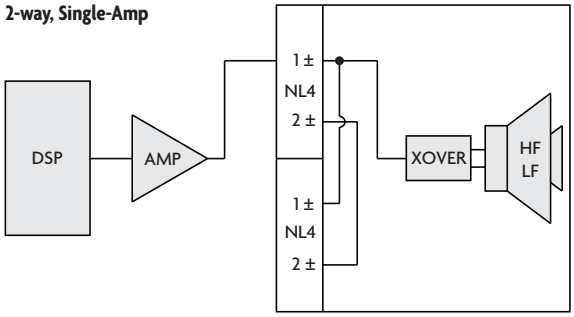
The large mouth of the FH1565's low frequency horn combined with a coaxially mounted high frequency horn extends the 60° x 45° pattern to below 400 Hz and produces a symmetrical, well behaved coverage pattern.

The proprietary horns employed in the FH Series represent a modern digital-signal-processing-aware update to the traditional horn-in-horn coaxial loudspeaker concept. 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. In fact, the horns used in the FH series were designed from the ground up to take advantage of the unique capabilities of TQ™.

The high frequency horn in the FH1565 employs a 4 inch diaphragm compression driver. The driver's large diaphragm area permits the compression driver to operate at frequencies too low for smaller compression drivers to handle. This allows the high frequency horn to smooth the polar response of the low frequency section in the frequency range where the high frequency horn would otherwise cause shadowing. It also allows the compression driver to produce extreme sound pressure levels with an effortless sonic character.

Connection Diagram

2-way, Single-Amp



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.*

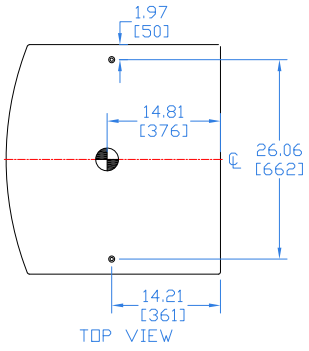
[11] **Horizontal / Vertical Off Axis Responses** *The magnitude response at various angles off axis, with recommended signal proceessing applied.*

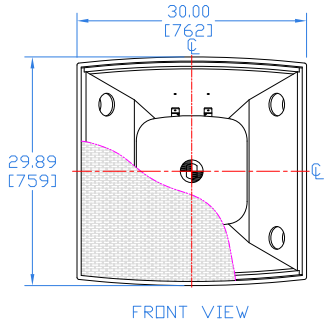
[12] **Beamwidth** *The angle between the -6 dB points in a loudspeaker's polar response.*

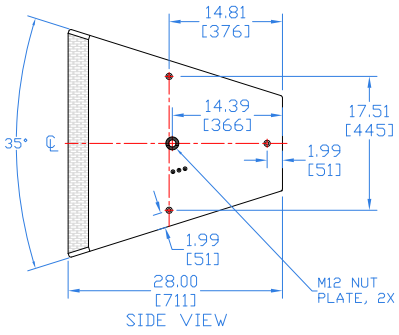
[13] **Directivity Index (D_i)** *The ratio of the on-axis sound pressure squared to the spherical average of the sound pressure squared at a particular frequency expressed in dB. To convert the directivity index to directivity factor (Q) use the formula* $10^{D_i/10}$.

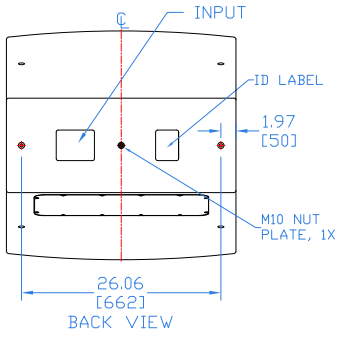
Notes:
1. Net Weight = Approx. 107.0 lb / 48.5 kg
2. Ship Weight = Approx. 118.0 lb / 53.5 kg
3. Symbol ⊙ = M10 eye bolt angle point
4. Symbol • = M10 nut plate
5. Symbol ◎ = M12 nut plate
6. Symbol ◐ = CoG
7. Symbol ••• = Index plate mounting points for optional yoke bracket

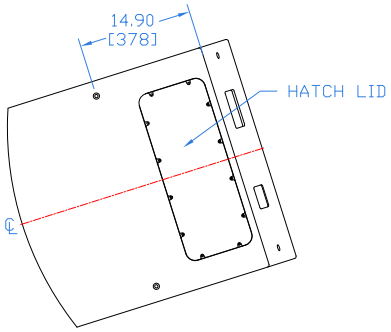
REVISIONS		
REV	DESCRIPTION	APPR / DATE
1	NEW ISSUE	DEW 2/22/18
2	ADD BRACKET INDEX PLATE POINTS	RAF 4/20/21











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 670 LINWOOD AVE, LINWOOD, MA 01525 USA
		APPROVALS / DATE	
		DRAWN: DEW 2/22/18	TITLE: Mechanical Spec, FH15 Series
		CHECKED: RAF 4/17/18	
		DES ENG:	A SHEET 1 OF 1 SCALE: 1:20
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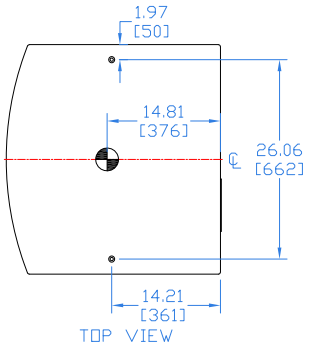
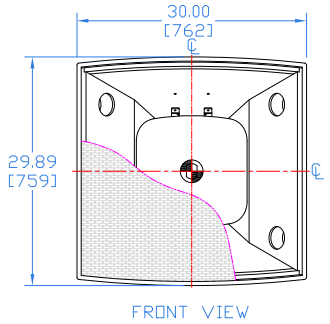
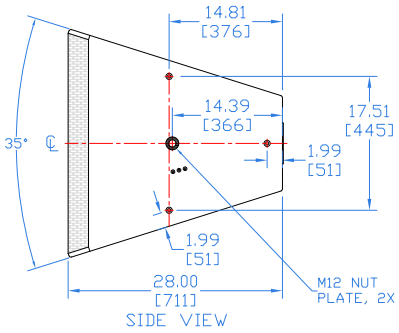
Drawing is reduced. Do not scale.

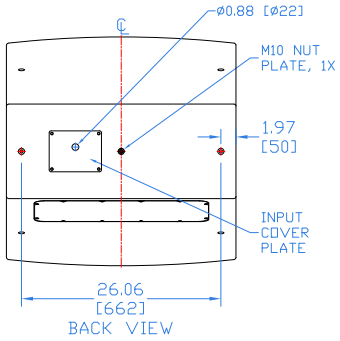
Notes:
1. Net Weight = Approx. 100.0 lb / 45.4 kg
2. Ship Weight = Approx. 111 lb / 50.3 kg
3. Symbol ⚬ = M10 eye bolt angle point
4. Symbol • = M10 nut plate
5. Symbol ◎ = M12 nut plate
6. Symbol ◓ = CoG
7. Symbol ••• = Index plate mounting points for optional yoke bracket
8. Enclosure construction: Fiberglass Reinforced Polyurethane

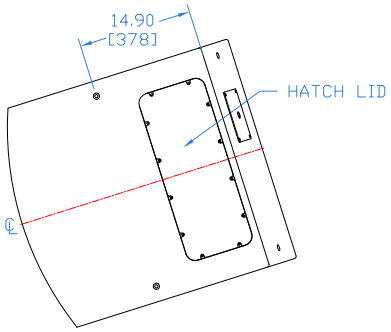
REVISIONS		
REV	DESCRIPTION	APPR / DATE
1	NEW ISSUE	DEW 4/12/18
2	ADD ENCLOSURE CONSTRUCTION TO NOTES	RAF 7/18/18
3	ADD BRACKET INDEX PLATE POINTS	RAF 4/21/20











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 670 LINWOOD AVE, LINWOOD, MA 01525 USA
		APPROVALS / DATE	TITLE: Mechanical Spec, FH15 Series - WR
		DRAWN: DEW 4/12/18	
		CHECKED: RAF 4/17/18	
		DES ENG:	A SHEET 1 OF 1 SCALE: 1:20
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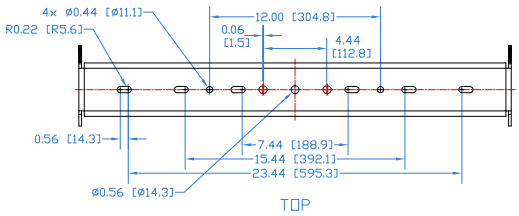
Drawing is reduced. Do not scale.

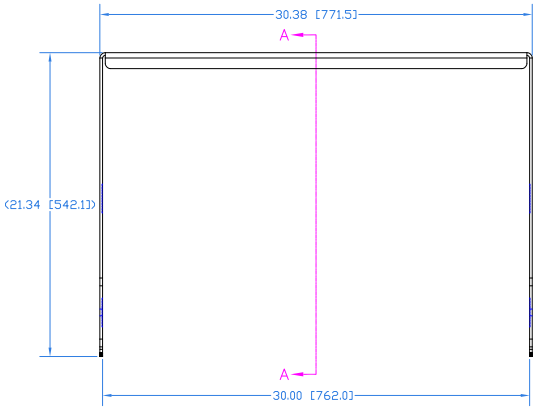
NOTES:
1. FITS: FH15xx Series, CS118, CS121
2. NET WEIGHT: 17.0 lb / 7.7 kg
3. MATERIAL: 7 GA ASTM A36 STEEL
4. INCLUDES HARDWARE KIT
5. USE FOR OVERHEAD CEILING MOUNT ONLY

REVISIONS

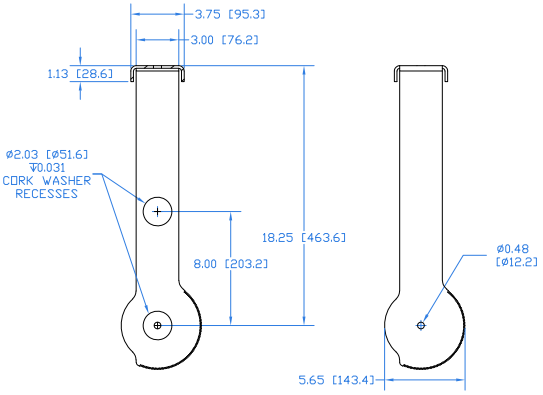
REV	DESCRIPTION	APPR / DATE
1	NEW ISSUE	RAF 4/21/20
2	ADD CS SUBS TO NOTE 1	RAF 5/6/20
3	ADD BRACKET MATERIAL TO NOTES	RAF 8/5/21
4	UPDATED MOUNTING HOLE SPACING	RAF 3/4/22
5	ADD "CEILING MOUNT" TO DESCRIPTIONS	RAF 4/4/23



TOP

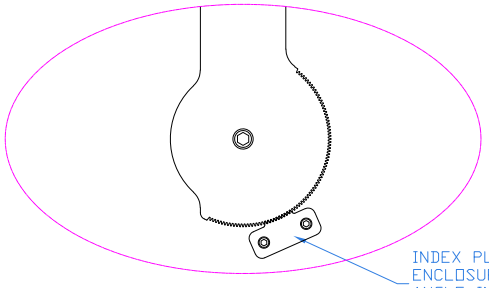


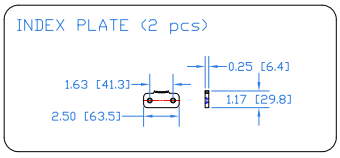
FRONT



SECTION A-A

RIGHT SIDE


INDEX PLATE BOLTS TO ENCLOSURE TO FIX TILT ANGLE IN 2° INCREMENTS (SHOWN 2X SCALE)



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	
APPROVALS		DATE
DRAWN:	RAF	4/21/20
CHECKED:	DEW	4/21/20
DES ENG:		
MFG ENG:		

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

TITLE: Mech Spec, YK-FH15 Ceiling Mount Yoke Bracket

A | SHEET 1 OF 1 | SCALE: 1:12

DWG. NO. 820-300-025 | REV 5

Drawing is reduced. Do not scale.