



FL283

Dual 8 inch Subcardioid Line Array Module



Overview

The FL283 is a subcardioid line array module intended for permanent installation in a wide range of venues. It includes dual 8 inch horn-loaded woofers and three 1.4 inch compression drivers in a compact enclosure. The enclosure is shaped to accommodate up to 20 degrees of splay between adjacent enclosures, allowing for more sharply curved arrays than comparable line arrays. Each FL283 module is configured for full-range passive operation at 16 ohms, allowing up to eight units to be driven from a single power amplifier channel. Up to twelve modules may be suspended with a 10:1 design factor.

The FL283 incorporates Fulcrum's patent-pending *Passive Cardioid Technology™* to overcome one of the major challenges of most line arrays: excessive rear LF radiation. Unlike active cardioid loudspeakers, Fulcrum's passive cardioid technology does not require an additional amplifier channel or additional enclosure volume to achieve its impressive low frequency directional control.

The subcardioid behavior is produced by a meticulously conceived acoustical circuit which balances the horn loading of the low frequency drivers, the enclosure depth and volume, and specially constructed rear-mounted ports which include a calibrated resistive element. By opting for a subcardioid pattern as opposed to a pure, hyper or super cardioid pattern, the rear rejection increases when the modules are deployed as a curved line array.

Fulcrum Acoustic's **TQ™** processing is an integral part of the FL283 design. Sound, innovative acoustical design combined with state of the art digital 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. Note that FL Series loudspeakers must use Level 1 processing. Please see fulcrum-acoustic.com/dsp.html for details.

Performance Specifications¹

Operating Mode

Single-amplified w/ DSP

Operating Range²

54 Hz to 18.6 kHz

Nominal Beamwidth

Horizontal: 90°

Vertical: Array dependent; 20° maximum splay

Transducers

LF: 2x 8.0" ceramic magnetic cone driver, 2.0" voice coil

HF: 3x 1.4" titanium diaphragm, neodymium magnet compression driver

Power Handling @ Nominal Impedance³

89 V / 500 W @ 16 Ω

Nominal Sensitivity @ Input Voltage⁴ (whole space)

One Module: 106 dB @ 4.00 V

Four Modules: 106 dB @ 4.00 V

Six Modules: 108 dB @ 4.00 V

Eight Modules: 111 dB @ 4.00 V

Twelve Modules: 113 dB @ 4.00 V

Nominal Maximum Continuous SPL (peak / continuous)

One Module: 139 dB / 133 dB

Four Modules: 145 dB / 139 dB

Six Modules: 148 dB / 142 dB

Eight Modules: 152 dB / 146 dB

Twelve Modules: 157 dB / 151 dB

Equalized Sensitivity @ Input Voltage⁵

One Module: 95 dB @ 4.00 V

Four Modules: 101 dB @ 4.00 V

Six Modules: 102 dB @ 4.00 V

Eight Modules: 105 dB @ 4.00 V

Twelve Modules: 106 dB @ 4.00 V

Equalized Maximum SPL⁶ (peak / continuous)

One Module: 128 dB / 122 dB

Four Modules: 140 dB / 134 dB

Six Modules: 143 dB / 137 dB

Eight Modules: 146 dB / 140 dB

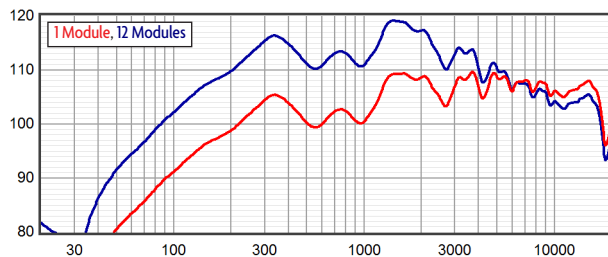
Twelve Modules: 150 dB / 144 dB

Recommended Power Amplifier

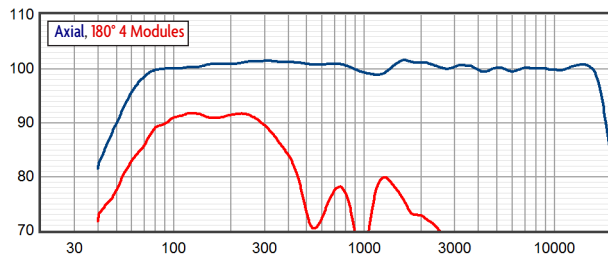
500 W to 1000 W @ 16 Ω



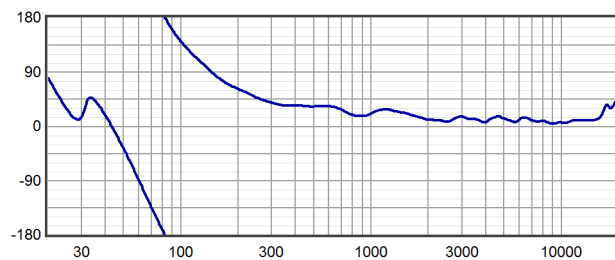
Axial Sensitivity (dB SPL, 4.0 V @ 1 m)^{7,8}



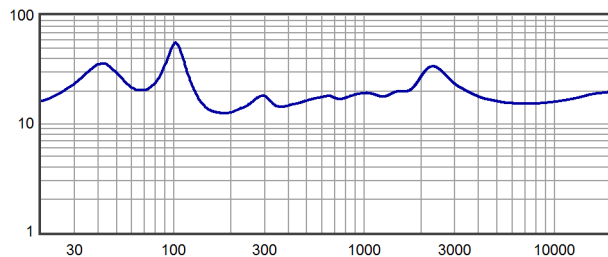
Axial Processed Response (dB)^{7,9}



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



Impedance (ohms)



Physical Specifications

Connections

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

Rigging System

Material: High grade steel & aluminum w/ anti-corrosion coating
Vertical Splay: 4° to 20° in 2° increments; 0° and 2° splays with optional extended rear link bar
Design factor: 12 loudspeakers @ 10:1

Dimensions / Weight

See page 5

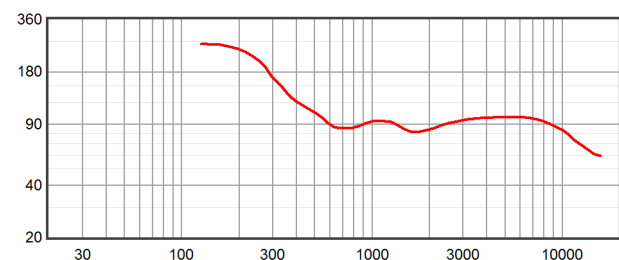
Finish

Black painted enclosure w/ matte black grille

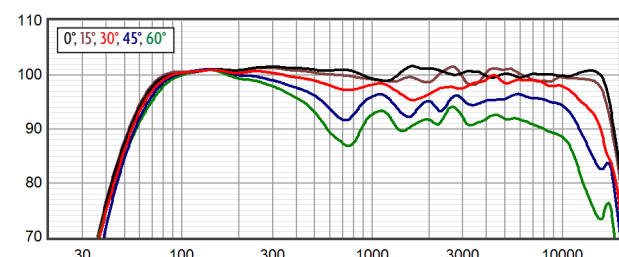
Accessories

Fly bar kit, Pull-up bar kit, Extended rear link bar

Horizontal Beamwidth^{7,12}

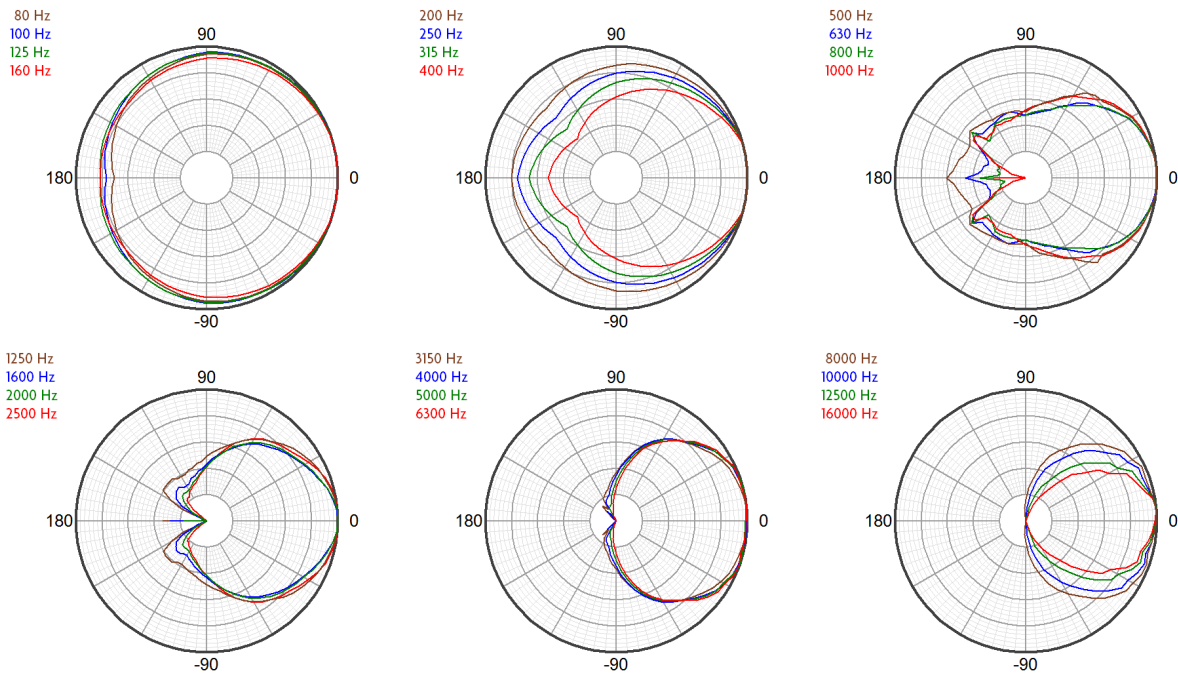


Horizontal Off Axis Response^{7,11}

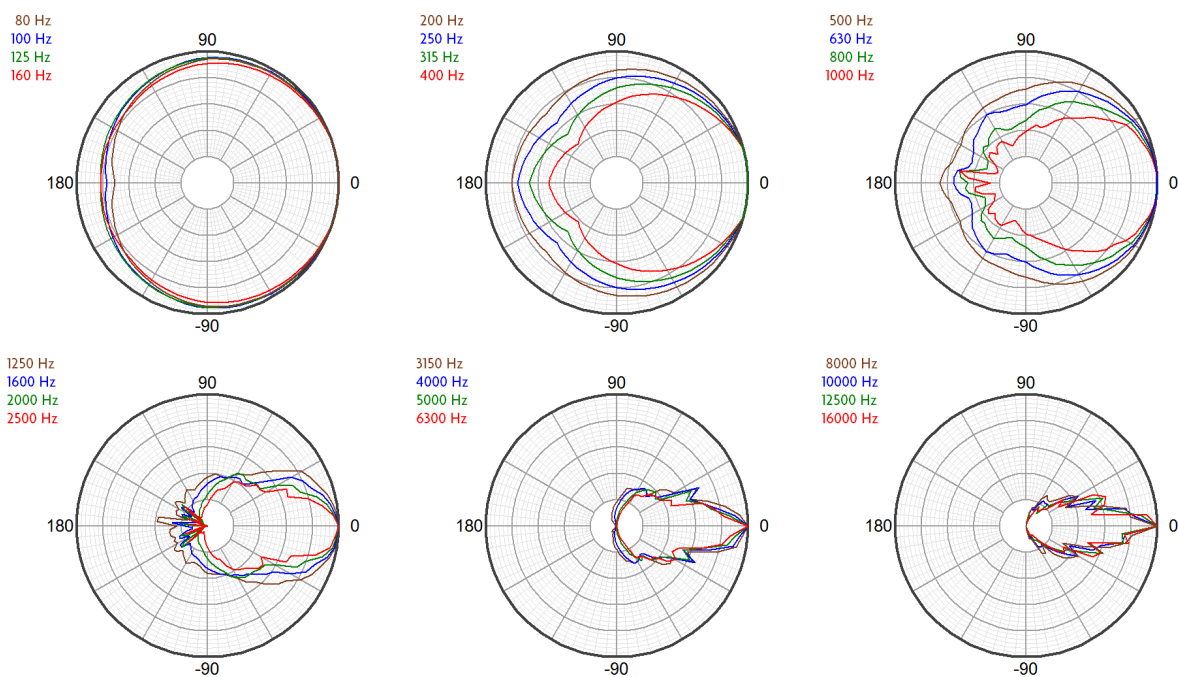




Horizontal Polar Response (30 dB Scale, 6 dB per Major Division)



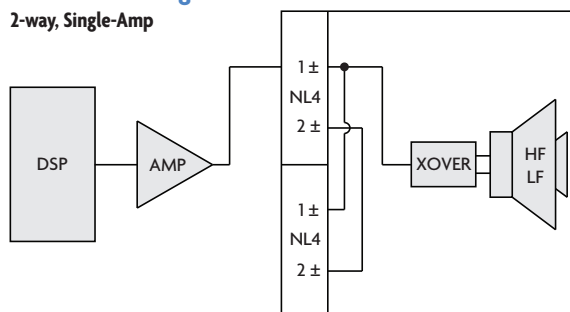
Vertical Polar Response (30 dB Scale, 6 dB per Major Division)





Connection Diagram

2-way, Single-Amp



Mechanical Specification Drawings

2D and 3D DWG 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 $10^{Di/10}$.

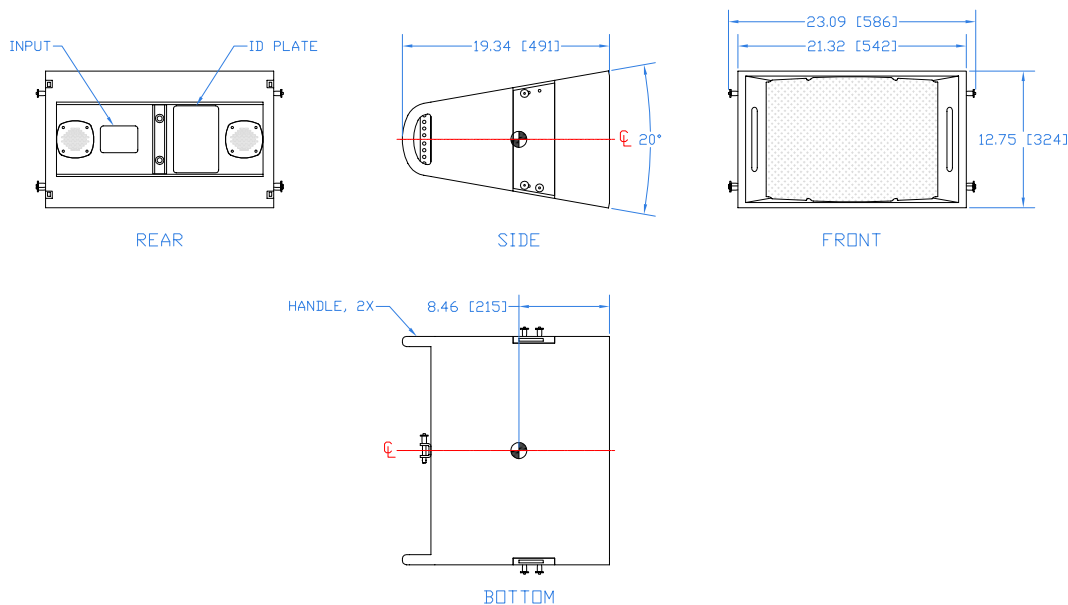


product specification

Notes:

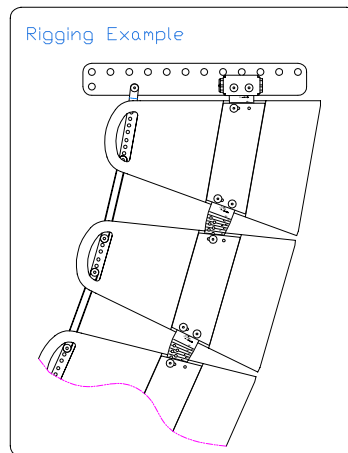
1. Net Weight = Approx. 57.0 lb / 25.6 kg
2. Ship Weight = Approx. 69.0 lb / 31.3 kg
3. Symbol = CoG

REVISIONS		
REV	DESCRIPTION	APPR / DATE
1	NEW ISSUE	RAF 9/14/15
2	UPDATE FLY BAR ILLUSTRATION	RAF 11/16/16
3	REVERT TO REV 1	RAF 9/18/18



- Included Accessories:
- 6x link plate quick release pins
 - 2x rear link bar quick release pins
 - 2x link plates
 - 1x rear link bar (4°-20°, 2° increments)

- Optional Accessory:
- 1x extended rear link bar (0°-16°, 2° increments)



<p>THIRD ANGLE PROJECTION</p>	<p>UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES</p> <p>TOLERANCE IN INCHES .XX±.015 .XXX±.005 FRACTIONS ±1/32 ANGLES ±1/2°</p> <p>(X.XX) = REF DIMS NO TOLERANCE IMPLIED</p> <p>TSC = THEORETICAL SHARP CORNER</p> <p>DIMENSIONS ACROSS CENTERLINES TO BE SYMMETRICAL</p>	<p>STATUS RELEASED</p>		<p>FULCRUM ACOUSTIC, LLC 670 LINWOOD AVE, LINWOOD, MA 01525 USA</p>
		<p>APPROVALS</p> <p>DRAWN: RAF</p> <p>CHECKED: DWG</p> <p>DES ENG:</p> <p>MFG ENG:</p>	<p>DATE</p> <p>9/14/15</p> <p>9/14/15</p>	
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Drawing is reduced. Do not scale.



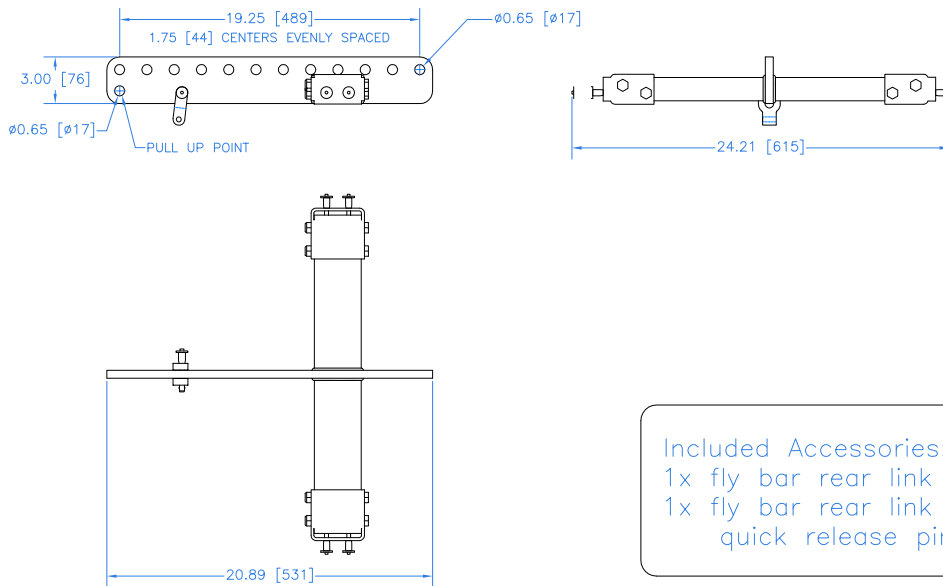
optional accessory

Notes:

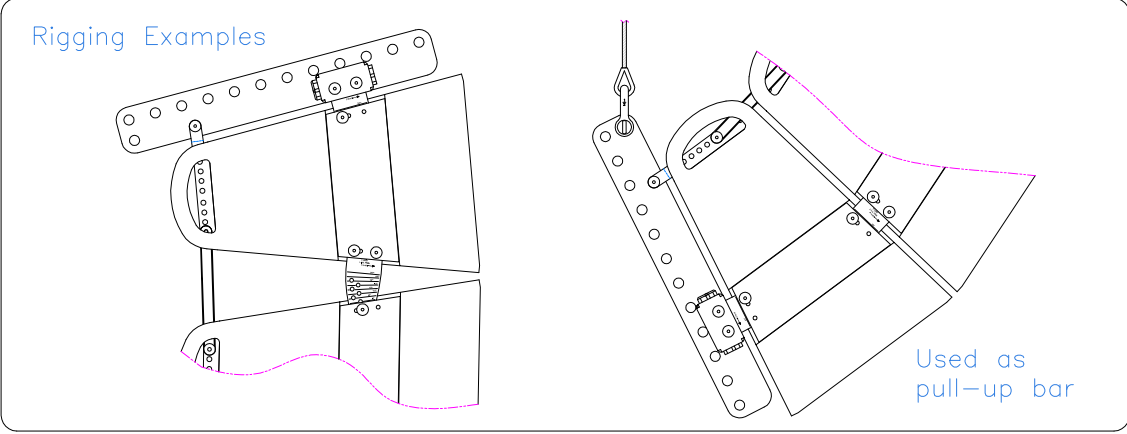
- 1. Net Weight = Approx. 20.0 lb / 9.1 kg
- 2. Ship Weight = Approx. 25.0 lb / 11.3 kg

REVISIONS

REV	DESCRIPTION	APPR / DATE
1	NEW ISSUE	RAF 9/16/15
2	UPDATE TO POLAR FOCUS FRAME	RAF 11/16/16
3	REVERT TO REV 1	RAF 9/18/18



Included Accessories:
 1x fly bar rear link
 1x fly bar rear link
 quick release pin



THIRD ANGLE PROJECTION

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

(XXX) = REF DIMS NO TOLERANCE IMPLIED

TSC = THEORETICAL SHARP CORNER

DIMENSIONS ACROSS CENTERLINES TO BE SYMMETRICAL

STATUS	RELEASED	
APPROVALS	DATE	
DRAWN: RAF	9/16/15	
CHECKED: DWG	9/16/15	
DES ENG:		
MFG ENG:		

FULCRUM ACOUSTIC, LLC
 670 LINWOOD AVE, LINWOOD, MA 01825 USA

TITLE: Mechanical Spec, FL283 Fly Bar

A SHEET 1 OF 1 SCALE: 1:8

DWG. NO. 045-300-001 REV 3

Drawing is reduced. Do not scale.