



# 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](http://fulcrum-acoustic.com/dsp.html) for details.

### Performance Specifications<sup>1</sup>

#### Operating Mode

Single-amplified w/ DSP

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

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 Impedance<sup>3</sup>

89 V / 500 W @ 16 Ω

#### Nominal Sensitivity @ Input Voltage<sup>4</sup> (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 Voltage<sup>5</sup>

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 SPL<sup>6</sup> (peak / continuous)

One Module: 128 dB / 122 dB

Four Modules: 140 dB / 134 dB

Six Modules: 143 dB / 137 dB

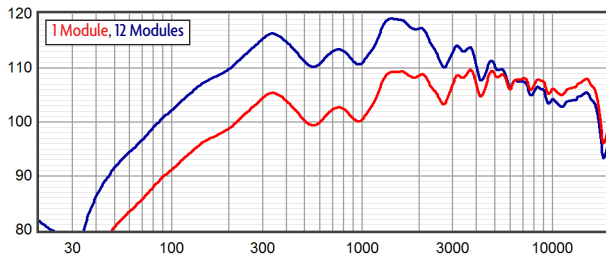
Eight Modules: 146 dB / 140 dB

Twelve Modules: 150 dB / 144 dB

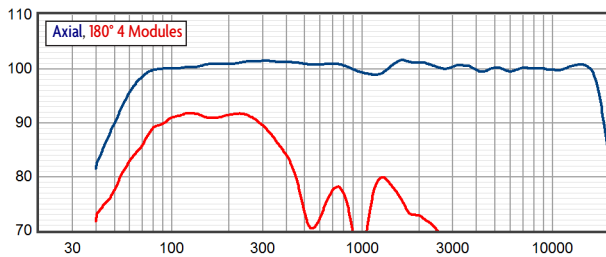
#### Recommended Power Amplifier

500 W to 1000 W @ 16 Ω

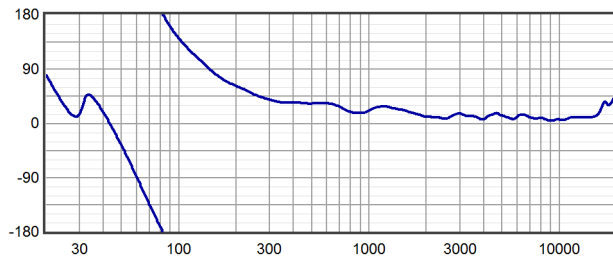
Axial Sensitivity (dB SPL, 4.0 V @ 1 m)<sup>7,8</sup>



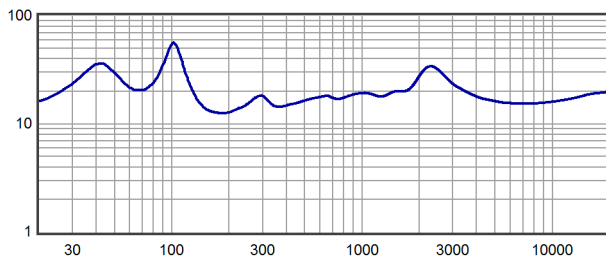
Axial Processed Response (dB)<sup>7,9</sup>



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



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

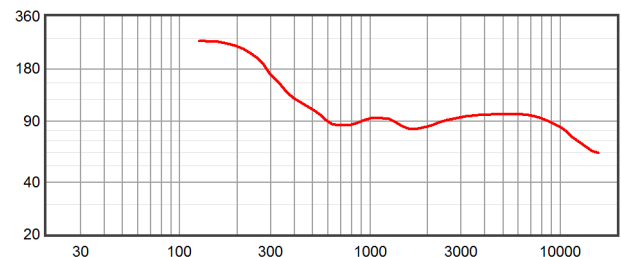
Black painted enclosure w/ matte black grille

### Accessories

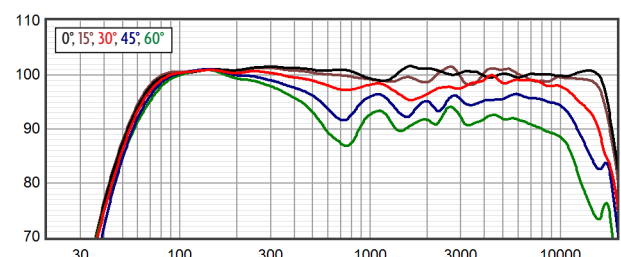
Fly bar kit (1x Polar Focus® OFA-FL283-Kestrel array frame plus 1x Polar Focus® PY1-EN750-1550 pan-less single pick point accessory), Pull-up bar kit, Extended rear link bar

Polar Focus offers a wide variety of accessories that may be used with the array frame. These accessories must be purchased from Polar Focus. Please see <http://linearrayframes.com/> for options.

Horizontal Beamwidth<sup>7,12</sup>

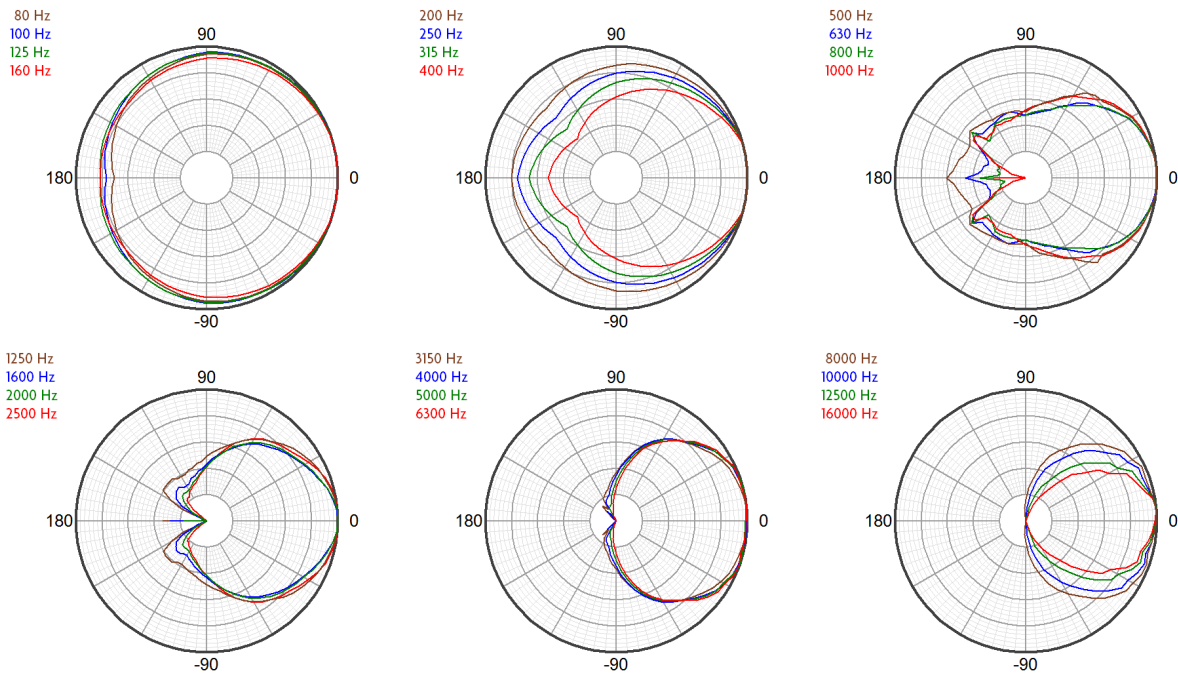


Horizontal Off Axis Response<sup>7,11</sup>

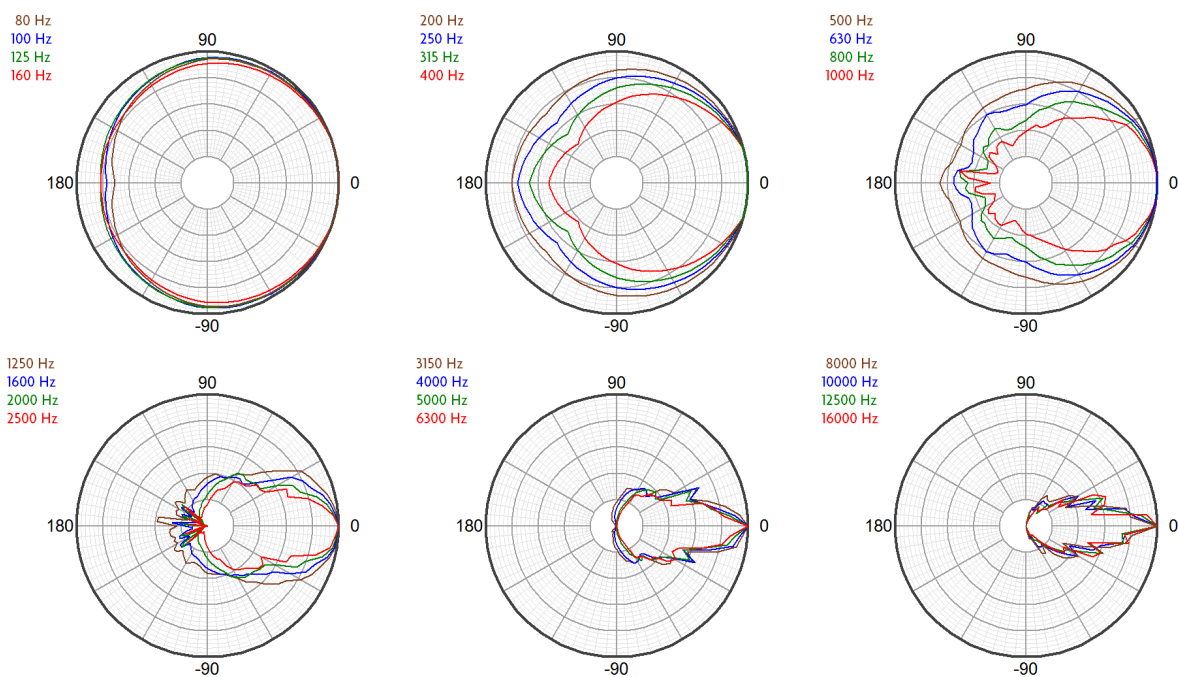




Horizontal Polar Response (30 dB Scale, 6 dB per Major Division)



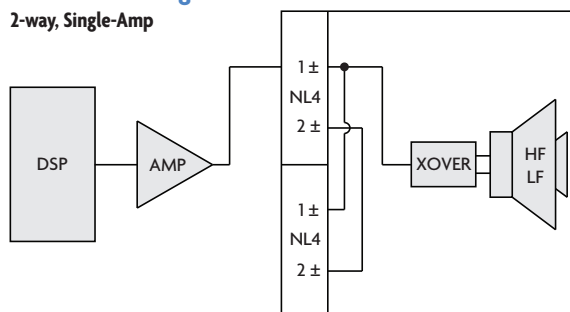
Vertical Polar Response (30 dB Scale, 6 dB per Major Division)





### 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](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.

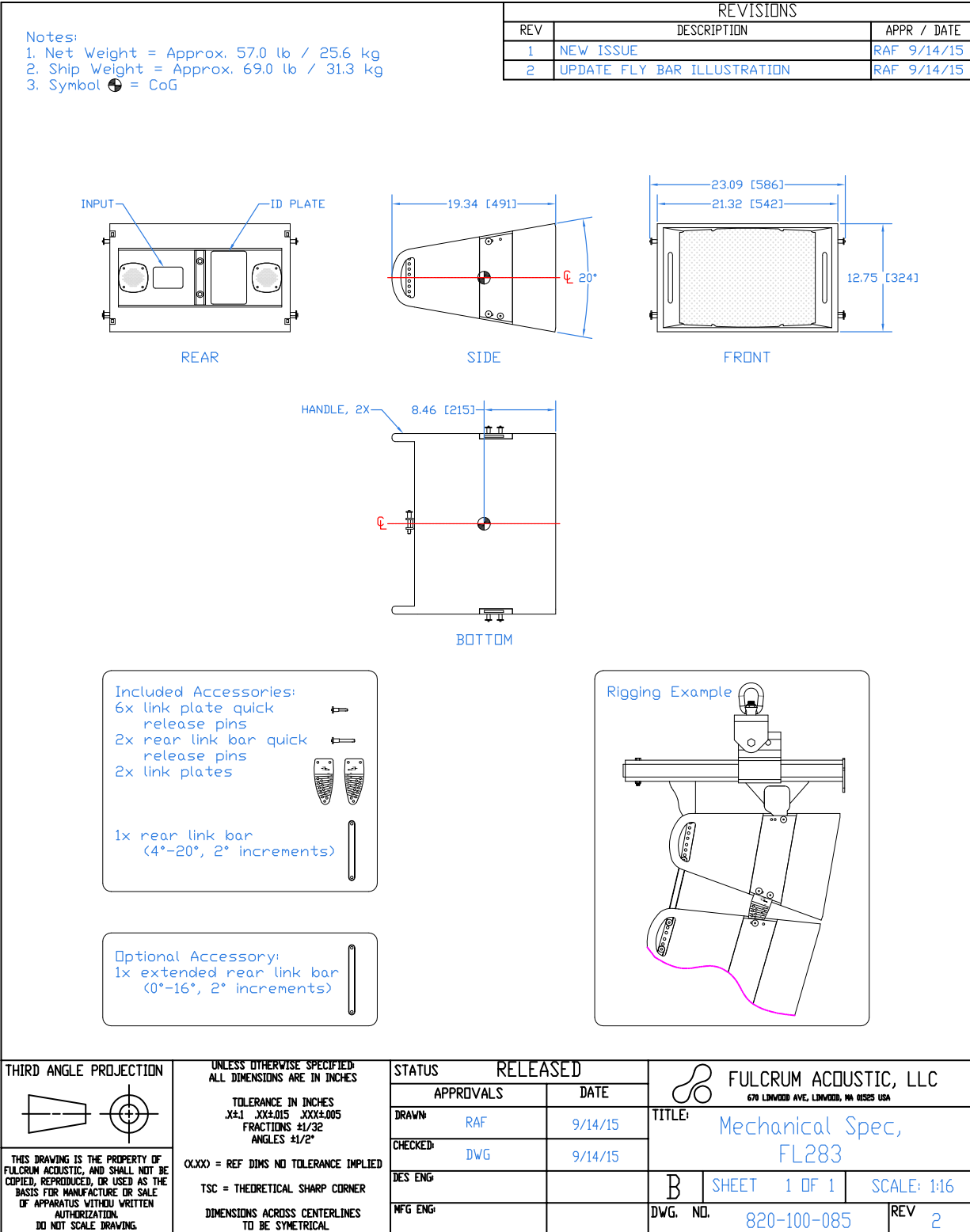
<sup>11</sup> **Horizontal / Vertical Off Axis Responses** The magnitude response at various angles off axis, with recommended signal processing applied.

<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.

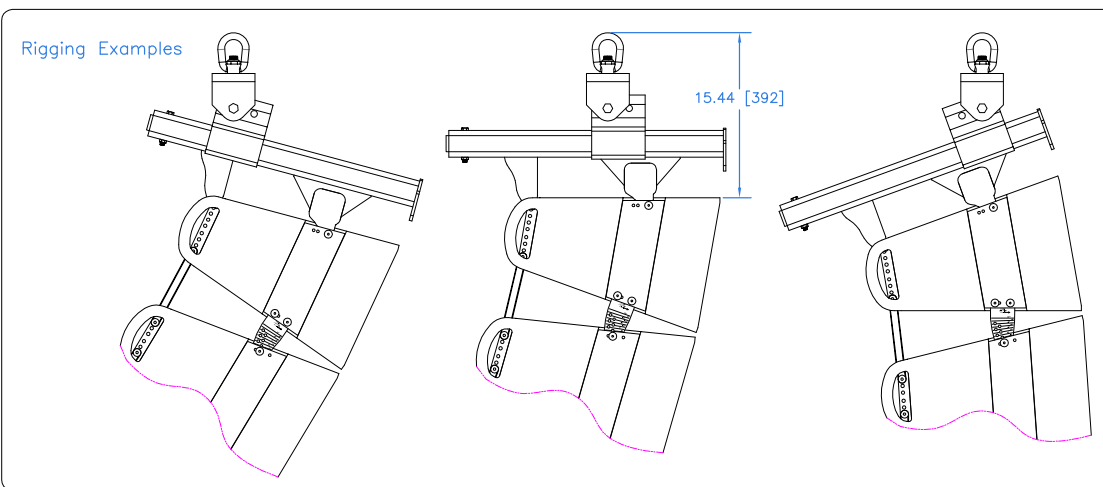
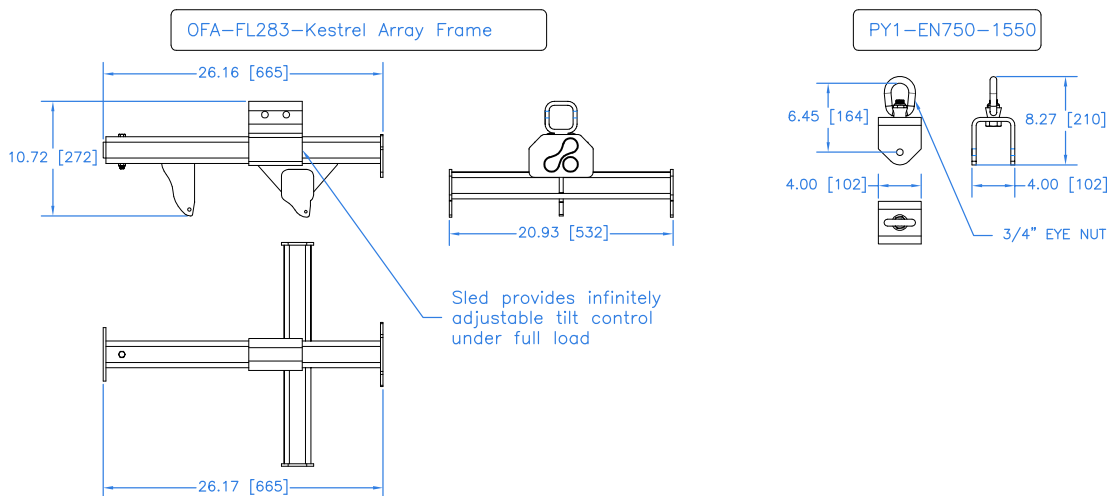


optional accessory

Notes:

1. Kit includes 1x Polar Focus OFA-FL283-Kestrel Array Frame and 1x Polar Focus PY1-EN750-1550 Pan-less Single Pick Point Accessory
2. OFA-FL283-Kestrel Net Weight = ~40.0 lb / 18.1 kg
3. OFA-FL283-Kestrel Ship Weight = ~49.0 lb / 22.2 kg
4. PY1-EN750-1550 Net Weight = ~5.5 / 2.5 kg
5. PY1-EN750-1550 Ship Weight = ~6.0 lb / 2.7 kg
6. Polar Focus offers a wide variety of accessories that may be used with the array frame. These accessories must be purchased from Polar Focus. Please see <http://linearrayframes.com/> for options.

REVISIONS		
REV	DESCRIPTION	APPR / DATE
1	NEW ISSUE	RAF 9/16/15
2	UPDATE TO POLAR FOCUS FRAME	RAF 9/14/15



<p>THIRD ANGLE PROJECTION</p>	<p>UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES</p> <p>TOLERANCE IN INCHES .XX1 .XX2-0.015 .XXX3-0.005 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 01825 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>9/16/15</p> <p>9/16/15</p>	
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		<p>DWG. NO. 045-300-001</p>	<p>REV 2</p>	

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