



# Legend Elite Cryo PA

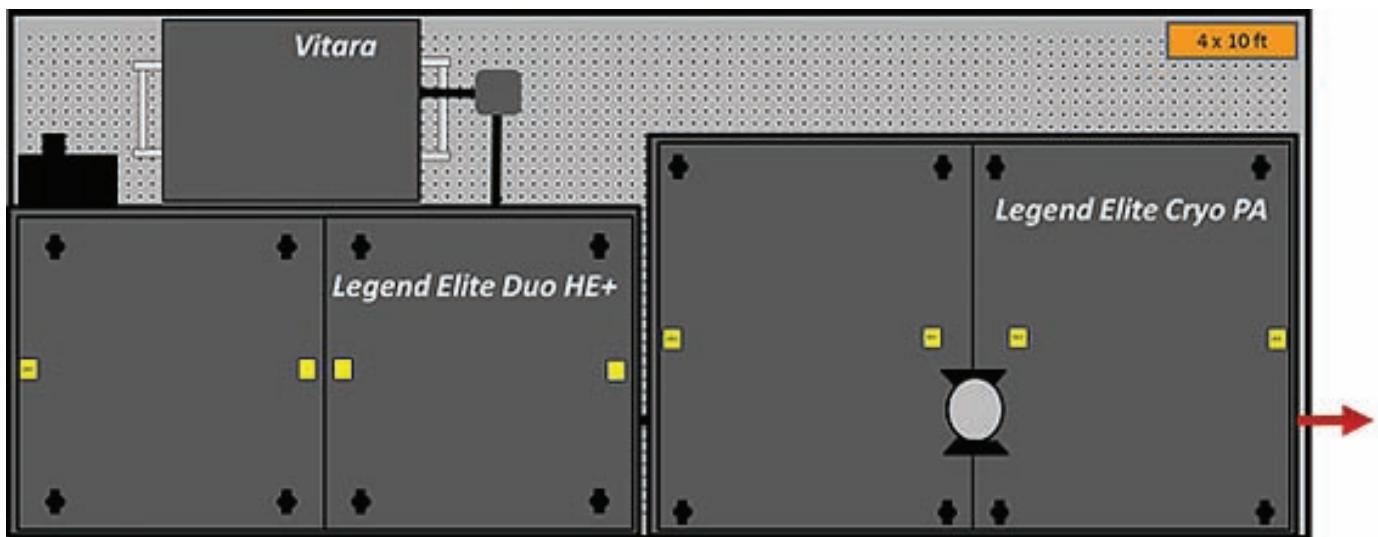
Cryogenically-Cooled, Ti:Sapphire Power Amplifier



## Features

- Closed-loop, cryogenically-cooled Ti:Sapphire technology
- High pulse energy to >20 mJ
- Pulse duration options to <30 fs
- Integrated Evolution pump laser for pulse-to-pulse stability better than 0.75% rms
- Multiple interlocks for vacuum, temperature and safety provide stable system operation and user protection
- Compact, high-efficiency, remotely-controlled optical compressor for ease of use
- Electronics ready for complete computer control

Typical layout of Legend-Elite Cryo PA system on a 120 x 300 cm (4 x 10 ft.) optical table



Superior Reliability & Performance

# Legend™ Elite Cryo PA

## Cryogenically-Cooled, Ti:Sapphire Power Amplifier

### System Specifications

|  |  |
|--|--|
| Center Wavelength (nm)(nominal)            | 800                                      |
| Repetition-Rate Options <sup>1</sup> (kHz) | 1, 5, or 10                              |
| Pulse Duration <sup>2</sup> (fs)(FWHM)     | <30 (USX model), <40 (USP model)         |
| Energy-per-Pulse <sup>3</sup> (mJ)         | Options to >20                           |
| Contrast Ratio <sup>4</sup> (ns)           | >1000:1 pre-pulse; >100:1 post-pulse     |
| Contrast Ratio (ASE)                       | >106:1                                   |
| Power Stability <sup>5</sup> (rms)(8 hrs.) | <0.75                                    |
| Energy Stability (60,000 pulses)(% rms)    | <1                                       |
| Spatial Mode                               | TEM <sub>00</sub> , M <sup>2</sup> <1.45 |
| Polarization                               | Horizontal                               |
| Pump Laser <sup>6</sup>                    | Evolution-30, Evolution-HE               |

<sup>1</sup> Repetition rate must be specified when ordered and will be optimized prior to shipment.

<sup>2</sup> When seeded by Coherent Vitara. A Gaussian pulse shape de-convolution factor (0.7) is used to determine the pulse width from an autocorrelator signal measured by a Coherent SSA (Single-Shot Autocorrelator). For other seed lasers, please contact factory.

<sup>3</sup> Pulse energy is dependent on pre-amplifier performance and number of pump lasers used (contact factory for details).

<sup>4</sup> Contrast ratio is defined as the ratio between the peak intensity of the output pulse to the peak intensity of any other pulse that occurs greater than 1 ns before or after the output pulse. Nanosecond contrast can be improved to >1,000,000:1 pre with <15% energy loss with optional pulse slice.

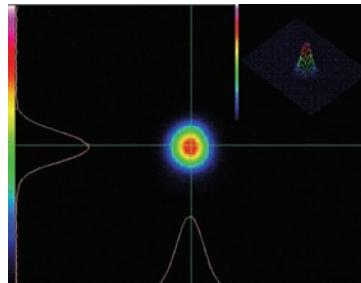
<sup>5</sup> Under stable environmental conditions.

<sup>6</sup> Model and number of pump lasers used dependent on Cryo PA output energy (contact factory for details).

### Legend Elite Cryo PA Beam Quality

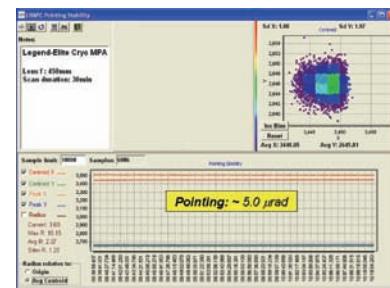
Output compressed beam profile, at focus.

TEM<sub>00</sub> mode,  
Ellipticity = 1.05



### Legend Elite Cryo PA Beam Pointing Stability

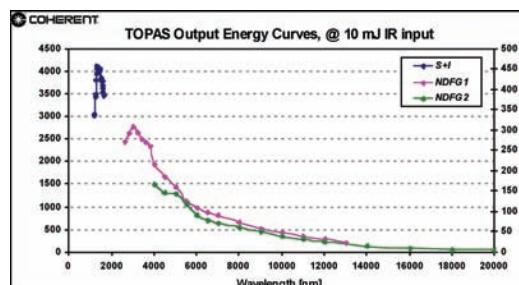
Over 30 minutes:  
<5 μrad



### TOPAS-HE (pumped by Legend-Elite Cryo PA @ 10 mJ, 1 kHz)

S+I – Signal + Idler

NDFG – Non-collinear Difference  
Frequency Generator



Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice.

Coherent's scientific and industrial lasers are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by the Center for Devices and Radiological Health on all systems ordered for shipment after August 2, 1976.

Coherent offers a limited warranty for all Legend Elite Cryo PA systems. For full details of this warranty coverage, please refer to the Service section at [www.Coherent.com](http://www.Coherent.com) or contact your local Sales or Service Representative.



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