

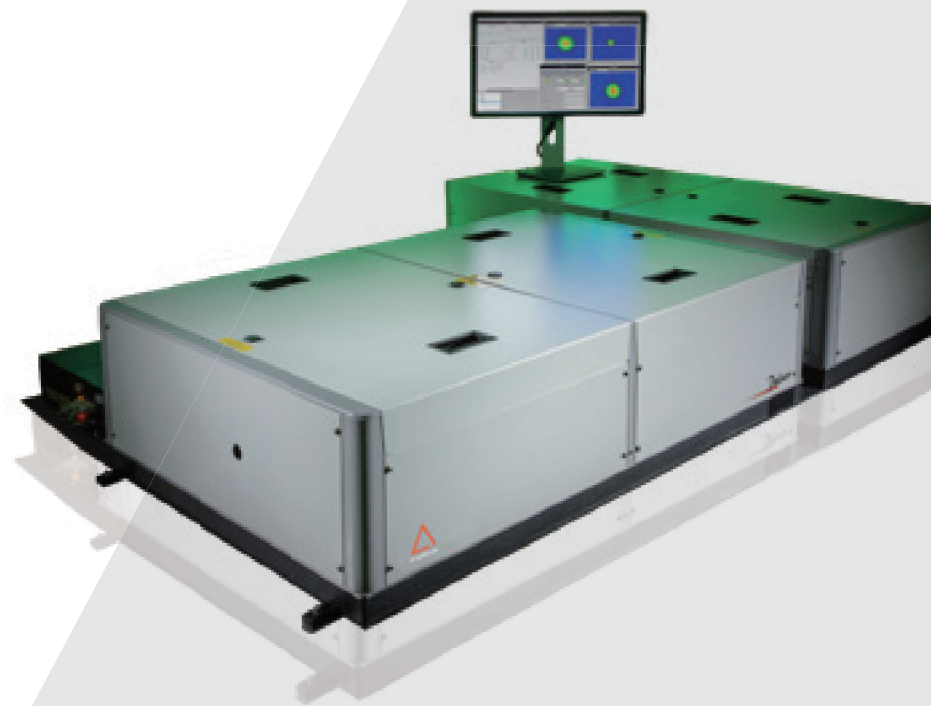
# ARCO

## 高エネルギー・チタンサファイア レーザーアンプ

### チタンサファイア技術の最高峰

Arcoは、最も要求の多いアプリケーションのための理想的な光源として設計された超高強度フェムト秒レーザーアンプです。クラス最高の出力パラメータを、堅牢で信頼性の高く、使い易い構成で提供します。

モジュール式で柔軟性に優れた超高速チタンサファイア・レーザーで、市販品で最も多彩な出力パラメータをカバーしています。



### Applications

#### Science:

- > 高調波発生
- > アト物理
- > 分光
- > ファイラメンテーション
- > レーザー航跡場加速
- > テラヘルツ
- > プラズマ研究
- > 電子生成 & 加速

### Key Features

- > 繰り返し周波数：10 Hz, 100 Hz, 1 kHz, 10 kHz
- > パルスエネルギー：1 mJ to 1.1 J
- > 自社製ポンプレーザー
- > 堅牢で多様性に優れた構成
- > 最大ピークパワー：55 TW
- > クラス最高性能
- > 最小パルス幅：20 fs
- > デュアル繰返し周波数のハイブリッドシステム

# Specifications

## ARCO W 10 kHz amplifiers

Repetition Rate <sup>1</sup>	10 kHz		
Energy Per Pulse <sup>2,3</sup>	0,8 mJ @ 10 kHz	1,8 mJ @ 10 kHz	3 mJ @ 10 kHz
Pulse Width (fwhm) <sup>4</sup>	< 100 fs or < 35 fs or < 20 fs		
Central Wavelength (nm) <sup>5</sup>	800 ± 10		
Average Power (W)	8	18	30
Pump Lasers	Mesa	Mesa Duo	Mesa & Mesa Duo
Pulse To Pulse Energy Stability (RMS) <sup>6</sup>	1 %	1 %	0,7 %
Power Stability (RMS) <sup>7</sup>	1 %		
Nanosecond Contrast <sup>8</sup>	< 5.10 <sup>-4</sup>		
Picosecond Contrast <sup>9</sup>	< 10 <sup>-6</sup> @ 300 - 50 ps & < 10 <sup>-6</sup> @ 50 - 10 ps & < 10 <sup>-5</sup> @ 1 ps		
Beam Quality M <sup>2</sup>	< 1.3		
Pointing Stability	< 10 µrad RMS		
Polarization	Linear horizontal		
Warm-up Time	< 1 hour		

## Options

- Carrier envelope phase (CEP)
- Down to 17 fs pulse durations
- External synchronization
- User friendly laser control software

## Accessories

- Energy attenuator
- Active beam pointing control
- Palitra OPA (230 nm - 17 µm)
- SHG, THG, FHG harmonic generators

<sup>1</sup> Please contact factory for specifications at other repetition rates

<sup>2</sup> 0.6 mJ / 1.6 mJ / 2.8 mJ @ 10 kHz for pulse duration < 25 fs

<sup>3</sup> Please contact factory for specifications at other energy level

<sup>4</sup> Factory set, must be specified when ordered and will be optimized prior to shipment

<sup>5</sup> 790 nm +/- 10 nm for 100 fs pulse duration. Other central wavelengths, please contact factory

<sup>6</sup> Over 2000 pulses

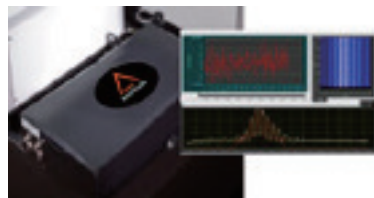
<sup>7</sup> Over 8 hours under stable environmental conditions

<sup>8</sup> Pre-pulse, regenerative amplifier replicas

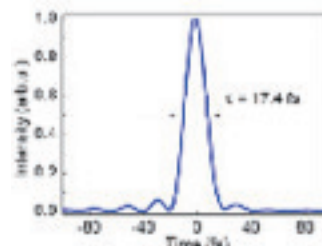
<sup>9</sup> Measured with third order cross-correlator (SEQUOIA)



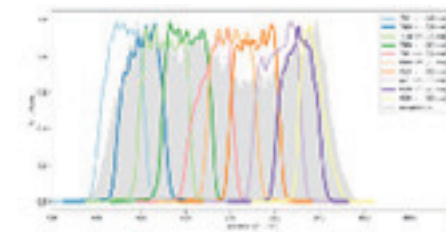
Mesa DPSS Nd:YAG pump laser



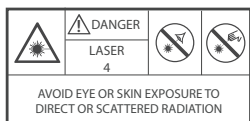
BIRD for CEP stabilization and measurement



< 18 fs pulse duration



For < 20 fs duration tunability over 100 nm with Mazzler



AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION

# Specifications

## ARCO C (100 Hz) & ARCO M (1 kHz)

Repetition Rate <sup>1</sup>	100 Hz for Arco C   1 kHz for Arco M		
Energy Per Pulse <sup>2</sup>	6 mJ @ 100 Hz   5 mJ @ 1 kHz	12 mJ @ 100 Hz   10 mJ @ 1 kHz	25 mJ @ 100 Hz   20 mJ @ 1 kHz
Pulse Width (fwhm) <sup>3</sup>	< 100 fs or < 35 fs or < 20 fs		
Central Wavelength (nm) <sup>4</sup>	800 ± 10		
Average Power (W)	5	10	20
Pump Lasers	Terra	Terra Duo	2 Terra Duo
Pulse To Pulse Energy Stability (RMS) <sup>5</sup>	0,7 %	0,7 %	0,5 %
Power Stability (RMS) <sup>6</sup>	1 %		
Nanosecond Contrast <sup>7</sup>	< 5.10 <sup>-4</sup>		
Picosecond Contrast <sup>8</sup>	< 5 · 10 <sup>-7</sup> @ 300 - 50 ps & < 10 <sup>-6</sup> @ 50 - 10 ps & < 10 <sup>-5</sup> @ 1 ps		
Beam Quality M <sup>2</sup>	< 1.3		
Pointing Stability	< 10 µrad RMS		
Polarization	Linear horizontal		
Warm-up Time	< 1 hour		

## Options

- Carrier envelope phase (CEP)
- Down to 17 fs pulse durations
- External synchronization
- User friendly laser control software

## Accessories

- Energy attenuator
- Active beam pointing control
- Palitra OPA (230 nm - 17 µm)
- SHG, THG, FHG harmonic generators

<sup>1</sup> Please contact factory for specifications at other repetition rates

<sup>2</sup> 5 mJ / 9 mJ / 20 mJ @ 100 Hz or 4 mJ / 9 mJ / 16 mJ @ 1 kHz for pulse duration < 25 fs

<sup>3</sup> 790 nm +/- 10 nm for 100 fs pulse duration. Other central wavelengths, please contact factory

<sup>4</sup> Factory-set, must be specified when ordered and will be optimized prior to shipment

<sup>5</sup> Over 2000 pulses

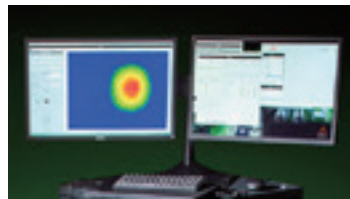
<sup>6</sup> Over 8 hours under stable environmental conditions

<sup>7</sup> Pre-pulse, regenerative amplifier replicas

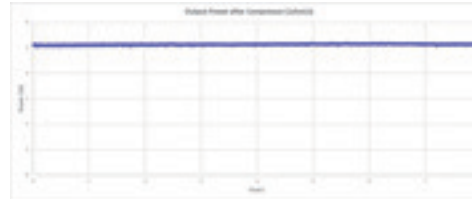
<sup>8</sup> Measured with third order cross-correlator (SEQUOIA)



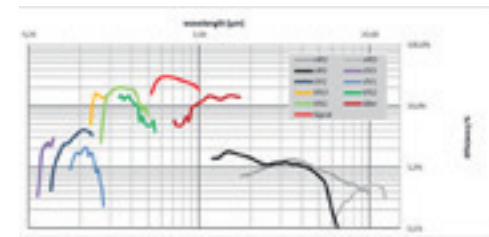
Terra DPSS Nd:YLF pump laser



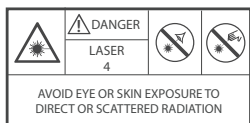
User friendly laser control software



High power stability



Palitra OPA tunability



# Specifications

## ARCO X 10 Hz high energy amplifiers

Repetition Rate <sup>1</sup>	10 Hz			
Energy Per Pulse <sup>2</sup>	25 mJ	100 mJ	500 mJ	1,1 J
Pulse Width (fwhm) <sup>3</sup>	< 100 fs or < 35 fs or < 20 fs			
Central Wavelength (nm) <sup>4</sup>	800 ± 10			
Peak Power (max)	1,25 TW	5 TW	25 TW	55 TW
Pump Lasers	Inlite II	Minilite II & Surelite III	Inlite II & Powerlite 2,5 J	Inlite II & Powerlite 2,5 J
Pulse To Pulse Energy Stability (RMS) <sup>5</sup>	< 1,5 %	< 1,5 %	< 1,5 %	< 1 %
Power Stability (RMS) <sup>6</sup>	2 % over 8 hours			
Nanosecond Contrast <sup>7</sup>	< 5.10 <sup>-4</sup>			
Picosecond Contrast <sup>8</sup>	< 5 10 <sup>-7</sup> @ 300 - 50 ps & < 10 <sup>-6</sup> @ 50 - 10 ps & < 10 <sup>-5</sup> @ 1 ps			
Beam Quality M <sup>2</sup>	< 1.5			
Pointing Stability <sup>9</sup>	< 10 µrad RMS			
Polarization	Linear horizontal			
Warm-up Time	< 1 hour			

## Options

- Vacuum compatible compressor
- Down to 20 fs pulse durations
- External synchronization
- User friendly laser control software

## Accessories

- Energy attenuator
- Active beam pointing control
- Palitra OPA (230 nm - 17 µm)
- Isolation of experimental reflected beam

<sup>1</sup> Please contact factory for specifications at other repetition rates

<sup>2</sup> Please contact factory for specifications at other energy level

<sup>3</sup> Factory-set, must be specified when ordered and will be optimized prior to shipment. Please contact factory for specifications at other pulse duration

<sup>4</sup> 790 nm +/- 10 nm for 100 fs pulse duration. Other central wavelengths, please contact factory

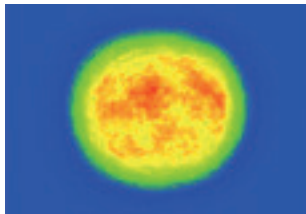
<sup>5</sup> Over 2000 consecutive pulses

<sup>6</sup> Over 8 hours under stable environmental conditions

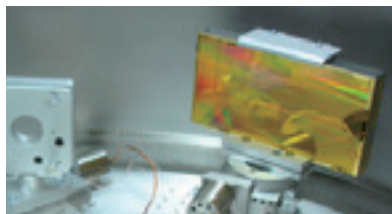
<sup>7</sup> Pre-pulse, regenerative amplifier replicas

<sup>8</sup> Measured with third order cross-correlator (SEQUOIA)

<sup>9</sup> Over 2000 consecutive pulses



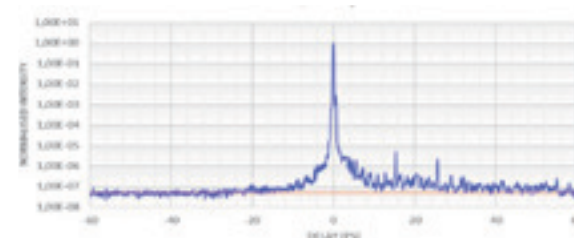
High quality beam profile (500 mJ)



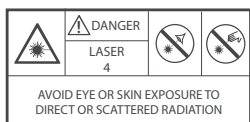
Vacuum compressor for high energy



Genpulse: safety and timing control unit



High picosecond contrast



AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION

# Specifications

## ARCO Hybrid Dual 1 kHz and 10 Hz amplifier

Repetition Rate <sup>1</sup>	10 Hz & 1 kHz		
Energy Per Pulse <sup>2</sup>	4 mJ @ 1 kHz & 25 mJ @ 10 Hz	4 mJ @ 1 kHz & 100 mJ @ 10 Hz	4 mJ @ 1 kHz & 500 mJ @ 10 Hz
Pulse Width (fwhm) <sup>3</sup>	< 100 fs or < 35 fs		
Central Wavelength (nm) <sup>4</sup>	800 ± 10		
Peak Power (max)	0,7 TW	2,8 TW	14 TW
Pump Lasers	Terra & Inlite II	Terra & Surelite III	Terra & Inlite + Powerlite 2,5 J
Energy Stability (RMS) <sup>5</sup>	0,7 % @ 1 kHz & 1,2 % @ 10 Hz	0,7 % @ 1 kHz & 1,5 % @ 10 Hz	0,7 % @ 1 kHz & 1,5 % @ 10 Hz
Power Stability (RMS) <sup>6</sup>	2 % over 8 hours		
Nanosecond Contrast <sup>7</sup>	< 5.10 <sup>-4</sup> @ 1 kHz & < 1.10 <sup>-6</sup> @ 10 Hz		
Picosecond Contrast <sup>8</sup>	< 5 10 <sup>-7</sup> @ 300 - 50 ps & < 10 <sup>-6</sup> @ 50 - 10 ps		
Beam Quality M <sup>2</sup>	< 1,3	< 1,5	< 1,5
Pointing Stability <sup>9</sup>	< 10 μrad RMS		
Polarization	Linear horizontal		
Warm-up Time	< 1 hour		

## Options

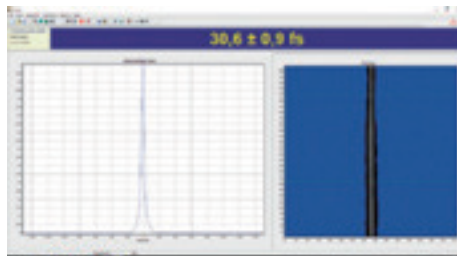
- Two independent compressed beams
- Down to 20 fs pulse durations
- Simultaneous 1 kHz & 10 Hz output
- User friendly laser control software

## Accessories

- Energy attenuator
- Active beam pointing control
- Vacuum compatible compressor
- Palitra OPA (230 nm - 17 μm)

<sup>1</sup> 1 kHz - 10 Hz when 10 Hz output is activated. Please contact factory for specifications at other repetition rates  
<sup>2</sup> Please contact factory for specifications at other energy level  
<sup>3</sup> Factory-set, must be specified when ordered and will be optimized prior to shipment  
<sup>4</sup> 790 nm +/- 10 nm for 100 fs pulse duration. Other central wavelengths, please contact factory

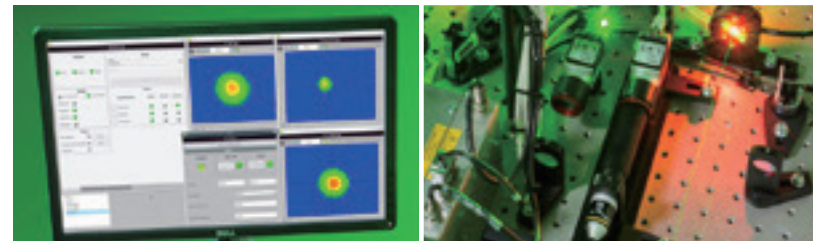
<sup>5</sup> Over 2000 pulses  
<sup>6</sup> Over 8 hours under stable environmental conditions  
<sup>7</sup> Pre-pulse, regenerative amplifier replicas  
<sup>8</sup> Measured with third order cross-correlator (SEQUOIA)  
<sup>9</sup> Over 2000 consecutive pulses



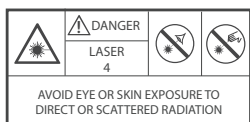
Pulse duration < 35 fs



Vacuum compressor for high energy

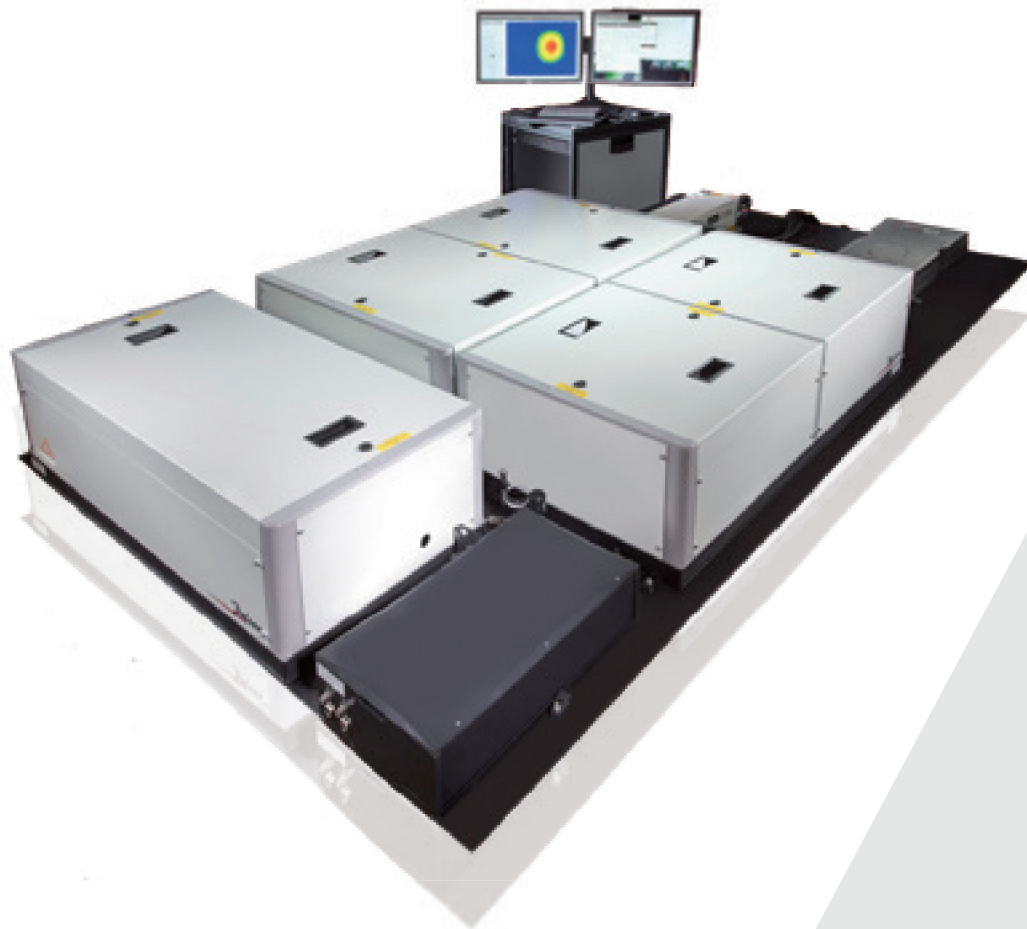


Laser control software with beam profile monitoring for each amplifier and pump



# ARCO

Arco amplifiers offer outstanding performance:  
best-in-class output parameters packaged in robust,  
reliable and user friendly configurations.



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