

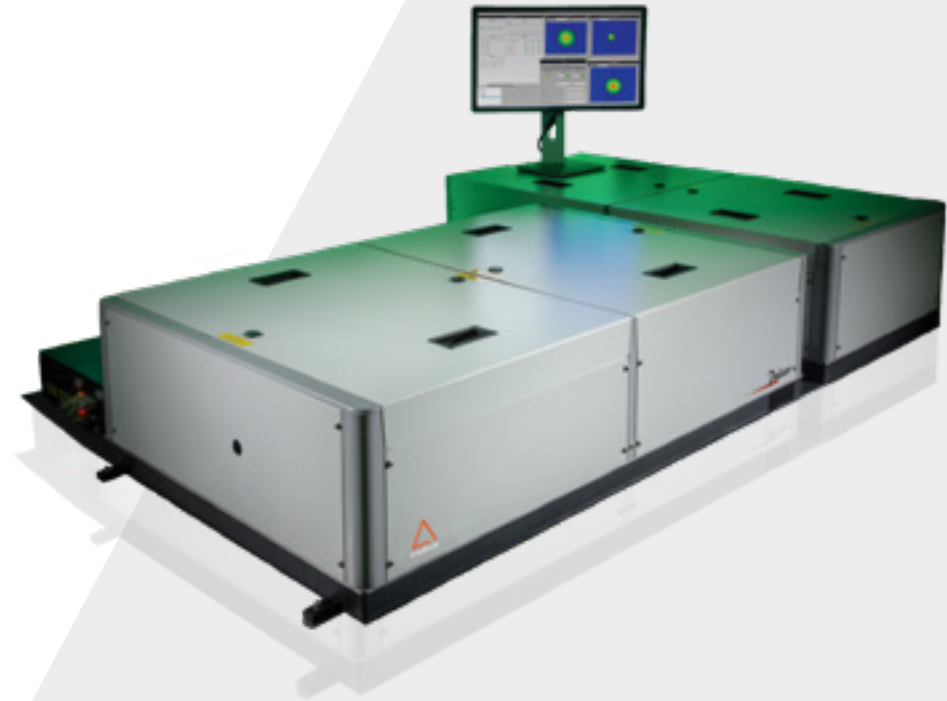
ARCO

High energy Ti:Sapphire amplifiers

The best of the Ti:Sapphire technology

Arco - the class of ultra-intense fs laser systems designed as the ideal light source for the most demanding applications. Arco amplifiers offer outstanding performance: best-in-class output parameters packaged in robust, reliable and user friendly configurations.

Arco ultrafast Ti:Sapphire lasers are built on a modular and versatile architecture and cover most exhaustive output parameter range on the ultrafast laser market.



Applications

Science:

- > High harmonic generation
- > Attophysics
- > Spectroscopy
- > Filamentation
- > Laser wakefield acceleration
- > Terahertz
- > Plasma study
- > Electron generation & acceleration

Key Features

- > 10 Hz, 100 Hz, 1 kHz, 10 kHz repetition rates
- > Pulse energy from 1 mJ to 1.1 J
- > Amplitude-made pump lasers
- > Most versatile and robust architecture
- > Peak power up to 55 TW
- > Highest performance in class
- > Pulse duration down to 20 fs
- > Hybrid systems with dual repetition rate

Specifications

ARCO W 10 kHz amplifiers

Repetition Rate ¹	10 kHz		
Energy Per Pulse ^{2,3}	0,8 mJ @ 10 kHz	1,8 mJ @ 10 kHz	3 mJ @ 10 kHz
Pulse Width (fwhm) ⁴	< 100 fs or < 35 fs or < 20 fs		
Central Wavelength (nm) ⁵	800 ± 10		
Average Power (W)	8	18	30
Pump Lasers	Mesa	Mesa Duo	Mesa & Mesa Duo
Pulse To Pulse Energy Stability (RMS) ⁶	1 %	1 %	0,7 %
Power Stability (RMS) ⁷	1 %		
Nanosecond Contrast ⁸	< 5.10 ⁻⁴		
Picosecond Contrast ⁹	< 10 ⁻⁶ @ 300 - 50 ps & < 10 ⁻⁶ @ 50 - 10 ps & < 10 ⁻⁵ @ 1 ps		
Beam Quality M ²	< 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

¹ Please contact factory for specifications at other repetition rates

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

³ Please contact factory for specifications at other energy level

⁴ Factory set, must be specified when ordered and will be optimized prior to shipment

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

⁶ Over 2000 pulses

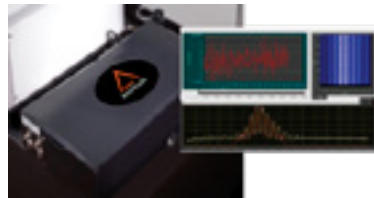
⁷ Over 8 hours under stable environmental conditions

⁸ Pre-pulse, regenerative amplifier replicas

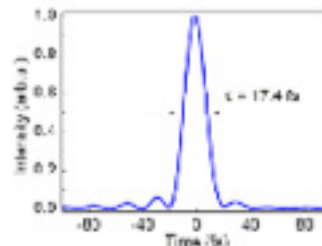
⁹ Measured with third order cross-correlator (SEQUOIA)



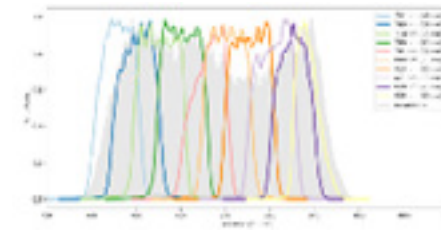
Mesa DPSS Nd:YAG pump laser



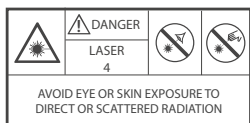
BIRD for CEP stabilization and measurement



< 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 ¹	100 Hz for Arco C 1 kHz for Arco M		
Energy Per Pulse ²	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) ³	< 100 fs or < 35 fs or < 20 fs		
Central Wavelength (nm) ⁴	800 ± 10		
Average Power (W)	5	10	20
Pump Lasers	Terra	Terra Duo	2 Terra Duo
Pulse To Pulse Energy Stability (RMS) ⁵	0,7 %	0,7 %	0,5 %
Power Stability (RMS) ⁶	1 %		
Nanosecond Contrast ⁷	< 5 · 10 ⁻⁴		
Picosecond Contrast ⁸	< 5 · 10 ⁻⁷ @ 300 - 50 ps & < 10 ⁻⁶ @ 50 - 10 ps & < 10 ⁻⁵ @ 1 ps		
Beam Quality M ²	< 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

¹ Please contact factory for specifications at other repetition rates

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

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

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

⁵ Over 2000 pulses

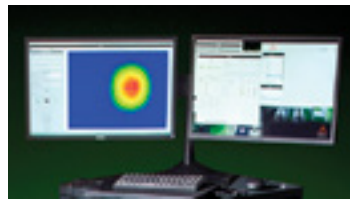
⁶ Over 8 hours under stable environmental conditions

⁷ Pre-pulse, regenerative amplifier replicas

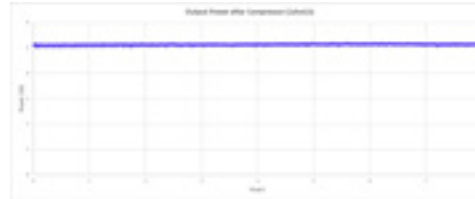
⁸ Measured with third order cross-correlator (SEQUOIA)



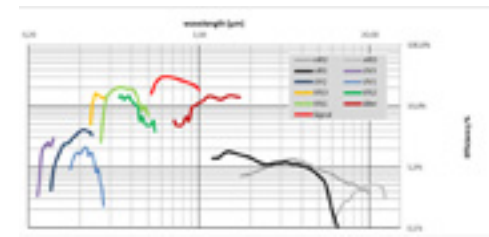
Terra DPSS Nd:YLF pump laser



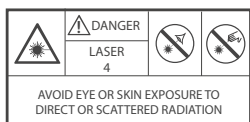
User friendly laser control software



High power stability



Palitra OPA tunability



Specifications

ARCO X 10 Hz high energy amplifiers

Repetition Rate ¹	10 Hz			
Energy Per Pulse ²	25 mJ	100 mJ	500 mJ	1,1 J
Pulse Width (fwhm) ³	< 100 fs or < 35 fs or < 20 fs			
Central Wavelength (nm) ⁴	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) ⁵	< 1,5 %	< 1,5 %	< 1,5 %	< 1 %
Power Stability (RMS) ⁶	2 % over 8 hours			
Nanosecond Contrast ⁷	< 5.10 ⁻⁴			
Picosecond Contrast ⁸	< 5 10 ⁻⁷ @ 300 - 50 ps & < 10 ⁻⁶ @ 50 - 10 ps & < 10 ⁻⁵ @ 1 ps			
Beam Quality M ²	< 1.5			
Pointing Stability ⁹	< 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

¹ Please contact factory for specifications at other repetition rates

² Please contact factory for specifications at other energy level

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

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

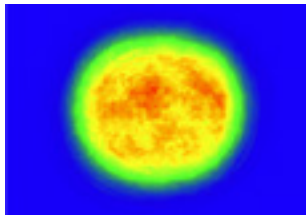
⁵ Over 2000 consecutive pulses

⁶ Over 8 hours under stable environmental conditions

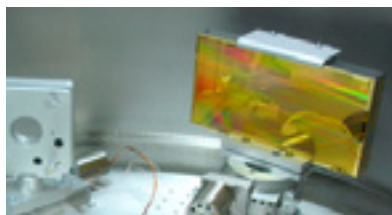
⁷ Pre-pulse, regenerative amplifier replicas

⁸ Measured with third order cross-correlator (SEQUOIA)

⁹ Over 2000 consecutive pulses



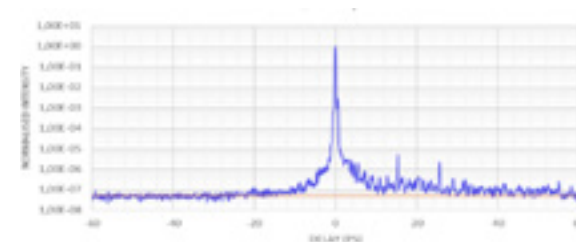
High quality beam profile (500 mJ)



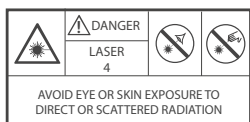
Vacuum compressor for high energy



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 ¹	10 Hz & 1 kHz		
Energy Per Pulse ²	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) ³	< 100 fs or < 35 fs		
Central Wavelength (nm) ⁴	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) ⁵	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) ⁶	2 % over 8 hours		
Nanosecond Contrast ⁷	< 5.10 ⁻⁴ @ 1 kHz & < 1.10 ⁻⁶ @ 10 Hz		
Picosecond Contrast ⁸	< 5 10 ⁻⁷ @ 300 - 50 ps & < 10 ⁻⁶ @ 50 - 10 ps		
Beam Quality M ²	< 1,3	< 1,5	< 1,5
Pointing Stability ⁹	< 10 µrad RMS		
Polarization	Linear horizontal		
Warm-up Time	< 1 hour		

Options

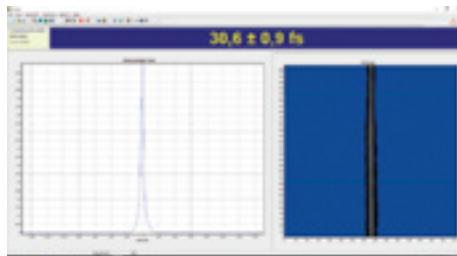
- Two independent compressed beams
- Down to 20 fs pulse durations
- Simultaneous 1 kHz & 10 Hz output
- User friendly laser control software

Accessories

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

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

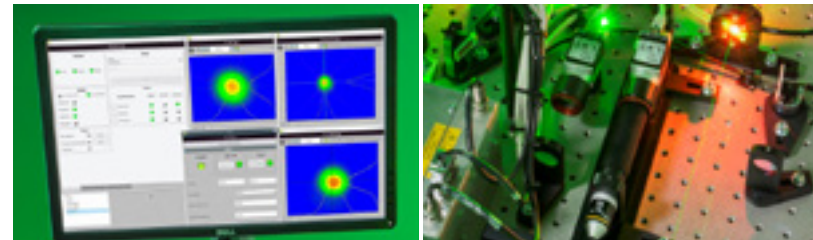
⁵ Over 2000 pulses
⁶ Over 8 hours under stable environmental conditions
⁷ Pre-pulse, regenerative amplifier replicas
⁸ Measured with third order cross-correlator (SEQUOIA)
⁹ Over 2000 consecutive pulses



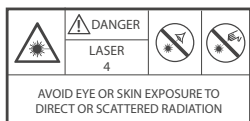
Pulse duration < 35 fs



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.

