

DIODE-PUMPED Nd:YLF LASERS



Darwin-Duo Series 527 nm



Based on Quantronix's proven Darwin laser series, the Darwin-Duo is a dual oscillator/single head, high repetition rate, diode-pumped Nd:YLF laser. The Darwin-Duo offers the ultimate in flexibility for PIV and other dual output applications.

The combination of two independent oscillators allows complete control of pulse separation and pulse energy. Both oscillators in the Darwin-Duo are identical in optical design giving temporally and spatially matched pulses for the highest degree of cross-correlation possible. Each oscillator can be independently triggered via TTL inputs. As an option, a compact, external combination box can be directly attached to the laser to make access to the beam combination optics easier and safer for the rest of the laser system.

The Darwin-Duo uses our patented* intracavity frequency doubling to achieve high energy 527 nm outputs without resorting to the tight focusing (which can result in optical damage) necessary for extra-cavity doubling. Our patented* pumping chamber design increases the overall efficiency allowing for high pulse energy, excellent beam quality and long component lifetimes from a compact diode-pumped package.

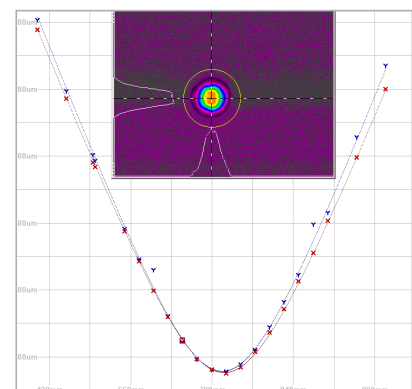
FEATURES AND BENEFITS

- > 60 mJ total energy @ 1 kHz
- > 100 W average power @ 3 kHz
- Ideal for Particle Image Velocimetry
- Independent external trigger for each oscillator
- External and internal triggering
- Built-in optics for beam combination
- Industrially proven 24/7 operation
- Flexible time delay and energy adjustment

SPECIFICATIONS ¹	527-100-M	527-80-M	527-60-M	527-40-M
Wavelength (nm)	527	527	527	527
Average Power @ 3 kHz (W)	100	80	60	40
Energy per Oscillator @ 0.1-1 kHz (mJ)	30	25	20	15
Total Pulse Energy @ 0.1-1 kHz (mJ)	60	50	40	30
Pulse Repetition Rate (kHz) ²	0.1-10	0.1-10	0.1-10	0.1-10
Pulse-to-Pulse Stability (% RMS)	<0.5	<0.5	<0.5	<0.5
Pulse Width (ns)	<210	<230	<250	<270
Beam Pointing Stability (μrad)	<25	<25	<25	<25
Beam Diameter (mm) ^{3,4}	3.0	3.0	3.0	3.0
Beam Divergence (mrad) ⁴	8	8	8	8
Beam Quality (M ²)	<25	<25	<25	<25
Polarization ⁵	Circular			

1. Performance at 1 kHz unless otherwise noted
2. Single shot to 0.1 kHz available with external trigger
3. Typical measurement (±10%)
4. Measured at 13.5% level at output window
5. Cross-polarization available as option

All specifications subject to change without notice.



Darwin-Duo's smooth output profile makes it the ideal choice for PIV applications

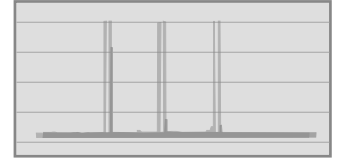
*US Patents #4,637,026; #6,075,803; #6,151,341

**Pump-diodes are warranted for 10,000 hours or 2 years, whichever comes first

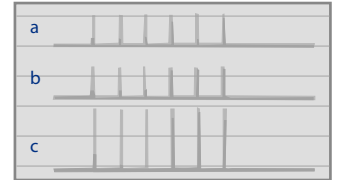
MECHANICAL & UTILITIES REQUIREMENTS

LASER	Size (LxWxH)	31.96 x 10.00 x 5.69 in (81.2 x 25.4 x 14.5 cm)
	Weight	70 lbs (31.5 kg)
CONTROL UNIT / CHILLER	Size (LxWxH)	Control unit: 20.02 x 19.00 x 8.7 in (50.9 x 48.3 x 22.1 cm) Chiller: 27.57 x 19.02 x 19.38 in (70.0 x 48.3 x 49.2 cm)
	Weight	Control unit: 60 lbs (27 kg) / Chiller: 144 lbs (65 kg)
CONTROL INTERFACE	User Interface	Full Featured Front Panel Control
	Serial Interface	RS - 232, Ethernet
	Rear Control Interface	External beam enable, External trigger, Analog current control, Analog RF attenuation control, Digital alert output
	Control Software	MS Windows-based <i>Laser Commander™</i>
CONNECTIONS, CONSUMPTION, SETUP	Electrical Service	Control unit: Single phase, 208-240 VAC, 50/60 Hz Operating Current: 10 A, Maximum Current: 20 A Chiller: Single-phase, 230 VAC ± 10%, 20 A, 50/60 Hz Operating Current: 12 A, Maximum Current: 20 A
	Cooling	Air-Water; Water-Water cooling option available
	Operating Temperature Range	15 - 35°C
	Storage Temperature Range	-20°C - 50°C
	Relative Humidity	8 - 80%, non-condensing
	Length of Umbilical	12.0 ft (3.65 m); longer available upon request

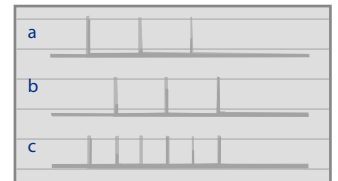
Darwin-Duo ADVANTAGES



Generation of pulse pairs.
Flexible time delay adjustment.



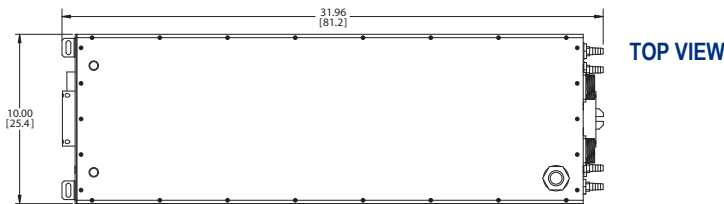
Two laser output synchronized to double the pulse energy and peak power,
a) one laser output,
b) a second laser output, and
c) combined output.



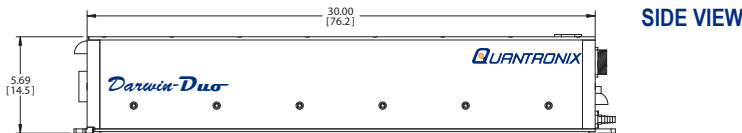
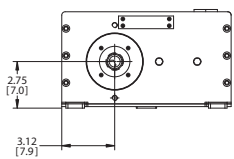
Two laser output combined with an adjustable delay to double the pulse repetition rate,
a) one laser output,
b) a second laser output with delay, and
c) combined laser output.

LAYOUT

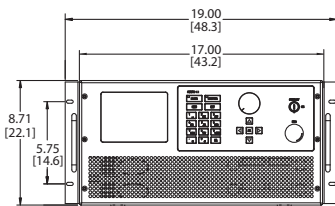
All dimensions are in Inches [cm]



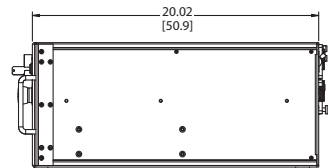
FRONT VIEW



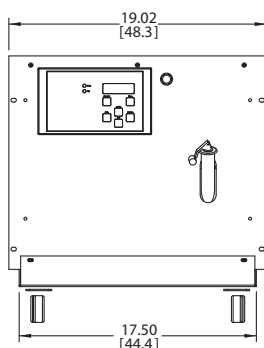
FRONT VIEW (CONTROL UNIT)



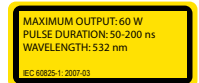
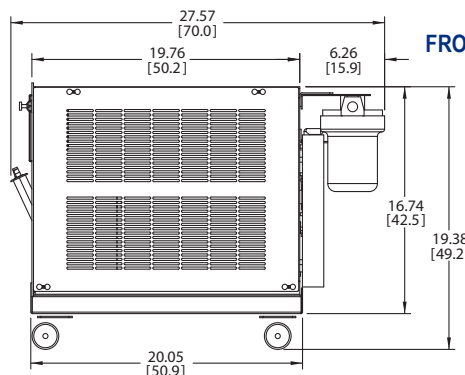
SIDE VIEW



SIDE VIEW (CHILLER)



FRONT VIEW



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