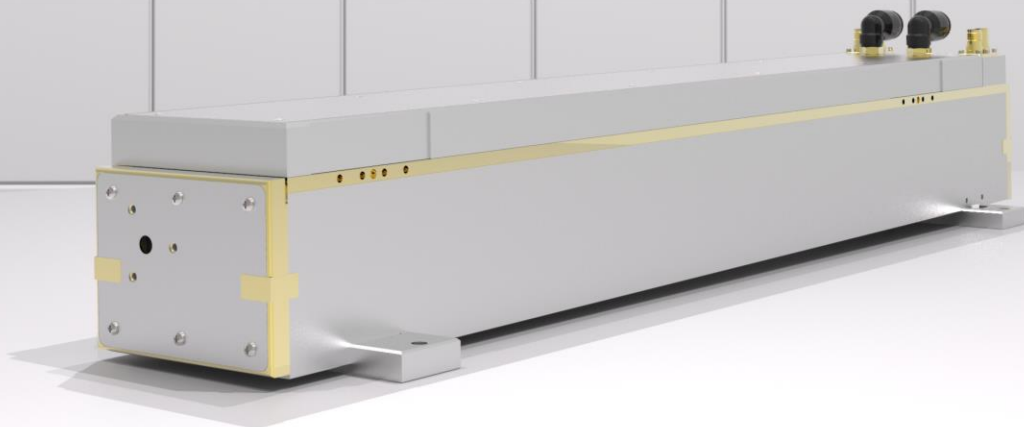


AL50 Q-Switched CO₂ Laser



Access Laser AL50Q is a compact RF-excited, INVAR-stabilized, fully sealed CO₂ waveguide laser that is Q-switched with an acoustic-optical modulator (AOM). This results in outstanding pulse characteristics with high peak powers of 2.5 kW, 200 ns pulse widths and frequencies up to 100 kHz. Our unique sealed and INVAR-stabilized design ensures highest quality and reliable laser processing with industry-leading power stability and low maintenance. The precision pulse control makes this laser exceptionally useful for high-precision applications such as selective removal of thin-film layers on display panels or electronic components, sensitive marking of security features, high-resolution micro-perforation and others. Based on your application and material specifications, we optimize the laser wavelength to 9.3 μm , 9.6 μm , 10.2 μm or 10.6 μm . Many materials such as glasses, ceramics, plastics, soft and hard tissues show high absorption at these wavelengths and as such, can be processed with high precision and minimal thermal impact using short-pulsed CO₂ lasers.

FEATURES



≤ 200 ns, 0.3 mJ, 2 kW
Short high-power pulses ensure high-precision laser processing with minimal thermal stress



Q-Switch Pulse Control
Intra-cavity AOM for pulse frequencies from Hz to 100 kHz



INVAR Stabilized Waveguide Laser Design
Consistent results with high pulse-to-pulse repeatability < 2% and high pointing accuracy < 0.1 mrad



Fully Sealed Laser Cavity
Reliable performance over many years with minimal maintenance



ACCESS LASER
Member of the TRUMPF Group



AL50 Q-Switched CO₂ Laser

SPECIFICATIONS

Laser Power

Wavelength	9.3, 9.6, 10.2 or 10.6 μm
Pulse Peak Power	1 – 2 kW
Average Power	up to 13 W
Pulse Energy	0.1 – 0.5 mJ
Pulse Rep. Frequency	0 Hz – 100 kHz
Pulse Width	< 200 ns
CW Power	40 W
CW Power Stability	$\pm 2\%$

Beam Characteristics

Beam Waist Diameter	2.8 mm
Waist Location Output Coupler	
Mode Quality	$M^2 \leq 1.2$
Full Divergence Angle	6 mrad
Polarization	$\geq 50:1$ Linear

Heat & Cooling

Heat Dissipation	≤ 750 W
Cooling Requirement	Water Cooled
Working Temperature	5 – 40 $^{\circ}\text{C}$
Min Flow Rate	3.8 LPM
Recommended Flow Rate	9.5 LPM
Max Pressure	10 bar
Required Chiller Stability	± 0.1 $^{\circ}\text{C}$
Storage Temp. Range	5 – 50 $^{\circ}\text{C}^{*1}$

DC Power Requirements

Laser RF Driver (U I)	28 V (48 V) 28 A
AOM RF Driver	12 V

Dimensions & Weight

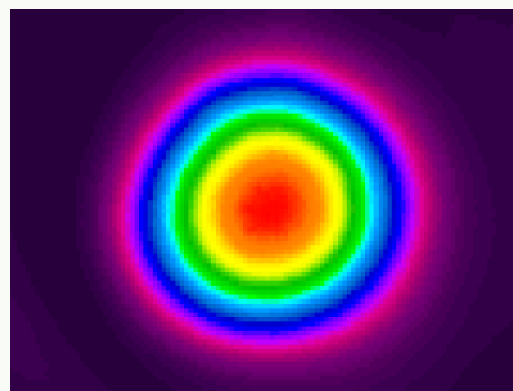
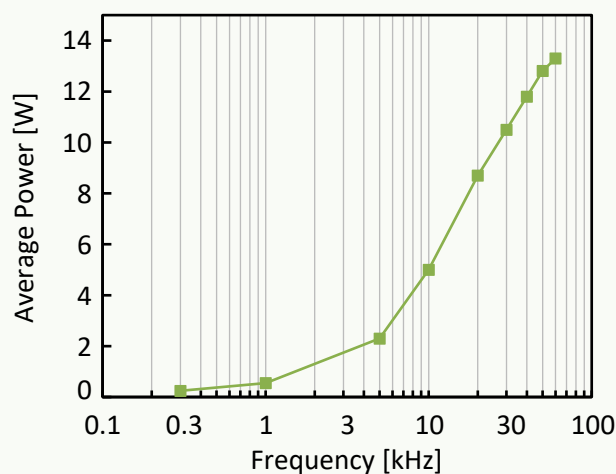
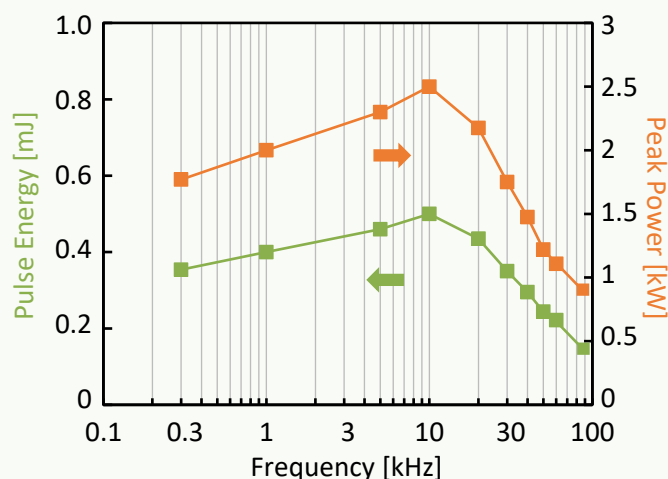
Laser Weight	15.5 kg
Dimensions L x W x H	84 x 10 x 12.5 cm
RF Driver Weight	5.2 kg

Notes

Power Stability calculated by: $\pm \frac{P_{max} - P_{min}}{P_{max} + P_{min}}$

Beam specifications measured at: $\frac{1}{e^2}$

TYPICAL PERFORMANCE



Average or pulsed power may exceed listed value. All specifications are subject to change without notice. Stability measured after 45 minute warm-up to allow laser head to reach thermal equilibrium. ^{*}Non-condensing condition.