

# Laser Mechanisms

## Product Specification

Specification Part Number:  
Product Description:  
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SPC-00-0000  
Articulated Arm Delivery System

Revision: 21092000

### **1.0 General Description**

- 1.1 **Intended Use:** The Articulated Arm Delivery System is used in conjunction with various types of CO<sub>2</sub>, Yag, and other wavelength Laser Systems as a means of delivering the laser energy from the laser launch to the process point.
- 1.2 **Functional Appearance:** A seven joint articulated arm for the delivery of laser energy. Attachment to the laser is accomplished with a laser mount plate and various coupling devices, and process end is attached to the hand piece by the use of an adapter at the end of the arm. Arm color to match customer specification.

### **2.0 Functional Characteristics**

#### **2.1 Physical Dimensions and Requirements**

- 2.1.1 All dimensions to match drawings per customer specifications
- 2.1.2 All parts degreased and cleaned prior to assembly
- 2.1.3 All arm loads are balanced vertical to arm post
- 2.1.4 Mirror options per customer specification

#### **2.2 Shipping and Customer Specifications**

- 2.2.1 Transmission Specifications
  - 2.2.1.1 CO<sub>2</sub> Transmission 10.6-11.1  $\mu\text{m}$   $\geq 92\%$
  - 2.2.1.2 Yag Transmission  $\geq \text{XX}\%$
  - 2.2.1.3 Other wavelengths available upon request
  - 2.2.1.4 Aim Beam Transmission .590-.650  $\mu\text{m}$   $\geq 80\%$
  - 2.2.1.5 All with random polarization
  - 2.2.1.6 Power to 250 Watts without cooling
  - 2.2.1.7 Up to 1000 W/cm<sup>2</sup>
- 2.2.2 Runout Specifications
  - 2.2.2.1 Total Positional Runout  $\leq \text{Ø}1.0 \text{ mm}$
  - 2.2.2.2 NOR Positional Runout  $\leq \text{Ø}0.5 \text{ mm}$   
(Normal Operating Range (NOR) is when vertical tube is  $\pm 45^\circ$  from normal hanging position)
  - 2.2.2.3 Angular Runout  $\leq 1.0 \text{ mrad}$
- 2.2.3 All weights shipped separately
- 2.2.4 No preferred operational direction
- 2.2.5 Units tested over entire operational sphere per customer specifications
- 2.2.6 Test reports and certification supplied with each unit
- 2.2.7 Uses sealed bearings to prevent contamination and for arm to be pressurized
- 2.2.8 No cosmetic defects acceptable

### **3.0 Reliability**

- 3.1 **Failure Rate:** System designed to achieve five year Mean Time Between Failure (MTBF)
- 3.2 **Call Rate:** Expected to be greater than that indicated by MTBF due to spurious calls and delivery interactions
- 3.3 **Arm Test:** Alignment repeatable after one million continuous cycles through normal arm motions

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### **4.0 Environmental Specifications**

#### **4.1 Operational**

- 4.1.1 Maximum operating altitude: 10,000 ft.
- 4.1.2 Operating temperature: 10°C to 25°C
- 4.1.3 Humidity: 0-90% Relative Humidity (RH)
- 4.1.4 Electric isolation to ground: R=5-10 Mega ohm, Class CF

#### **4.2 Non-Operational**

- 4.2.1 Maximum Altitude: 30,000 ft.
- 4.2.2 Temperature: 0°C to 55°C
- 4.2.3 Humidity: 90% @ 55°C non-condensing
- 4.2.4 Shock: Rolling shock simulating arm installed on a system rolling over door jams, and other common obstructions

### **5.0 Warranty**

- 5.1 System is under a one year limited warranty from date of shipment

### **6.0 Service Adjustments and Installation**

- 6.1 **Beam Alignment:** All beam alignment procedures are performed at the factory. No adjustments should be necessary upon installation
- 6.2 Mirrors are retained for easy removal for inspection
- 6.3 Mirrors are replaceable without subsequent realignment requirements
- 6.4 Laser must enter arm base perpendicular and parallel to axis of rotation of arm base