

# YAG DRIVE™

## 6KW AND 10KW ARC LAMP POWER SUPPLY FOR CW Nd:YAG LASERS

The YAG-Drive™ Power Supply is available in two power ranges, 6KW or 10KW. This switchmode supply has a built-in BOOST circuit and optional IGNITER (Series injection trigger) for CW Nd:YAG laser systems. The YAG-DRIVE power supply is designed to drive CW arc lamps used in product development, lab applications or for the OEM system manufacture with custom requirements.

These CW YAG laser power supplies from A.L.E. offer exceptional performance in 1/2 the size and 1/4 the weight of other power supply technology. The supplies are both lightweight, less than 60 lbs. and occupy only 7" of 19" rack space. These supplies offer CW operation up to 6KW and 10KW for CW Nd:YAG lasers in a compact design, much smaller than first generation power supplies.

YAG-DRIVE is a combination of power supply and laser system controller. The unit combines the boost circuit and series injection trigger together with the main DC supply circuitry. In addition, the unit provides complete system control. Auto start, and retry (with limit counter) are standard logic features. Safety controls include lamp failure sense, and interlock control. Feedback of optical output to stabilize laser output over the life of the arc lamp is available.

With the connection of 3 phase AC input and the arc lamp to the output, the laser system is ready to operate using front panel controls. If automatic or remote operations is required, YAG-DRIVE provides for full control and monitoring via the rear panel control connector. This combined power supply and controller makes system design and operation easier and faster than adopting standard power supplies.

### APPLICATIONS:

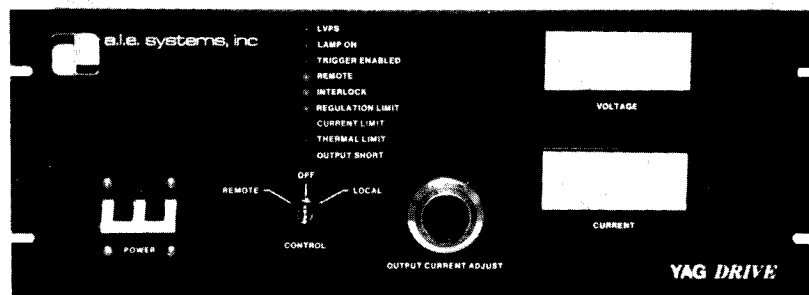
- CW YAG Laser power supply to drive CW arc lamps
- CW YAG Lasers that require up to 10KW input such as lasers using series arc lamps
- Igniter option allows user supplied remote IGNITER to be located at the laser head
- Used in CW YAG Lasers for medical applications as well as welding, cutting, heat treating, marking, and processes for semiconductor and hybrid circuits
- YAG-DRIVE can provide full system control which is useful in the R & D, lab or prototype development stages
- May be used to power other arc lamps and loads

### FEATURES:

- Small size, 7" high rack mount
- Full system control provided
- Light in weight, 55 lbs.
- Integral boost circuit and igniter circuitry
- Two power ranges available, 6 or 10KW, others on request
- High efficiency and improved Power Factor
- Full front panel control and/or remote interface control

### BENEFITS:

- Easy to handle because of its small size and lightweight design
- Attractive to the end user because of simplicity of operation
- Operates as a laser controller managing power regulation, feedback from optical power monitor, automatic start circuits and safety interlocks
- Pure output power due to switch mode design that offers greater control, less ripple and low stored energy
- Fast response of output power when programmed up or down and fully protected from short circuits
- Easy to service because of modular, lightweight design



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## MODEL DEFINITIONS:

### Model

YD-6	6KW Arc Lamp Power Supply, 215 VDC & 40A Maximum
YD-10	10KW Arc Lamp Power Supply, 215 VDC & 50A Maximum (See Notes 1 and 2)

## DESIGN OVERVIEW

A.L.E.'s buck regulator design offers low ripple output and fast response times of programmed output changes as controlled by remote programming or feedback from optical sensors. The remote interface allows complete system control by remote programming, optional modulation of the output and status monitoring.

OEM versions of this product are available. A.L.E. Systems offers application specific design modifications to meet the interface and system integration requirements of the laser system designer and manufacturer. Controls and features can be set up in a number of ways, from "block box" concept to the fully instrumented unit for quantity requirements. Packaging is available from sub system modules to a full system approach.

## REMOTE CONTROL INTERFACE

The remote operation of the YAG-DRIVE power supply may be easily achieved by using the remote connector on the rear panel in conjunction with the LOCAL/OFF/REMOTE key switch on the front panel.

Signals available at the rear panel are:

### SIGNAL NAME

CURRENT METER OUTPUT  
REMOTE ENABLED  
INTERLOCK OPEN  
CURRENT LIMIT  
REGULATION LIMIT  
LAMP ON  
TRIGGER ENABLED  
TEMP LIMIT  
OPTICAL POWER FEED BACK, or  
OUTPUT CURRENT CONTROL  
+ 15V DC  
GND

## YD-6 & YD-10 ARC LAMP POWER SUPPLIES

### GENERAL SPECIFICATIONS:

#### INPUT POWER

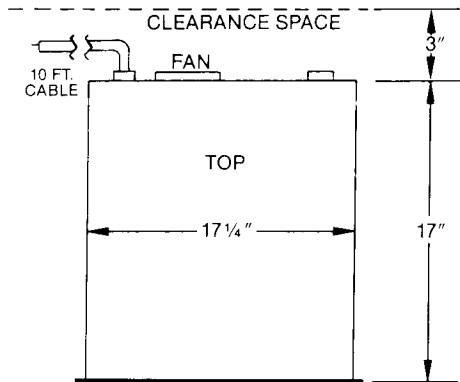
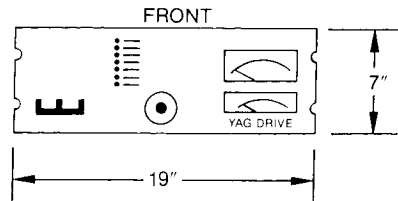
Volts AC: 1 $\phi$ :	190 to 240 (4KW max.) (See Note 1)
3 $\phi$ :	190 to 240
Frequency:	48 to 63 HZ
Power Factor:	$\geq 0.9$

### PHYSICAL SPECIFICATIONS:

	YD-6	YD-10
<b>SIZE:</b>	H=7", W=19", D=17"	H=7", W=19", D=17"
<b>WEIGHT:</b>	50 lb.	55 lb.
<b>COOLING:</b>	Air, Fan Included	Air, Fan Included
<b>OPERATING RANGE:</b>	-25° to 40°C	-25° to 40°C
<b>OUTPUT:</b>	YD-6	YD-10
<b>POWER (Max Rating)</b>	6KW	10KW
<b>CURRENT (Max DC)</b>	40A	50A
<b>VOLTAGE (Max DC)</b>	200V 215V	200V 215V (See Note 2)
<b>RIPPLE (less than)</b>	0.1% RMS	0.1% RMS
<b>REGULATION (better than)</b>	$\pm 0.2\%$ peak	$\pm 0.2\%$ peak
<b>IGNITER (optional)</b>	25KV	25KV (See Note 3)
<b>BOOST (VDC)</b>	1200 $\pm$ 5% VDC	1200 $\pm$ 5% VDC
<b>EFFICIENCY</b>	93%	93%
<b>MODULATION (better than)</b>	75% up to 1 KHZ	75% up to 1 KHZ

- NOTES:**
1. 4 kW output max. with 1 $\phi$  input.
  2. 200VDC max. output with 208 3 $\phi$  input.  
215VDC max. output with 220 3 $\phi$  input.
  3. For other igniter voltages, consult factory.

## YD-6 & YD-10 19" WIDE RACK CONFIGURATION



### CONTROLS:

YD-6 & YD-10

### REAR PANEL:

Remote Connector Interface for remote

### FRONT PANEL:

Meters Current & Voltage  
 Current Adj. 10 turn pot  
 Input Power Control Circuit breaker  
 (lockable key switch) Remote-Off-Local

### STATUS LAMPS:

LAMP ON: CURRENT ON  
 LVPS ON: INTERNAL POWER SUPPLY ON (used to power logic)

TRIGGER ENABLED: Boost and igniter are attempting to ignite the lamp

REMOTE ENABLED: Remote is enabled via key switch control on front panel

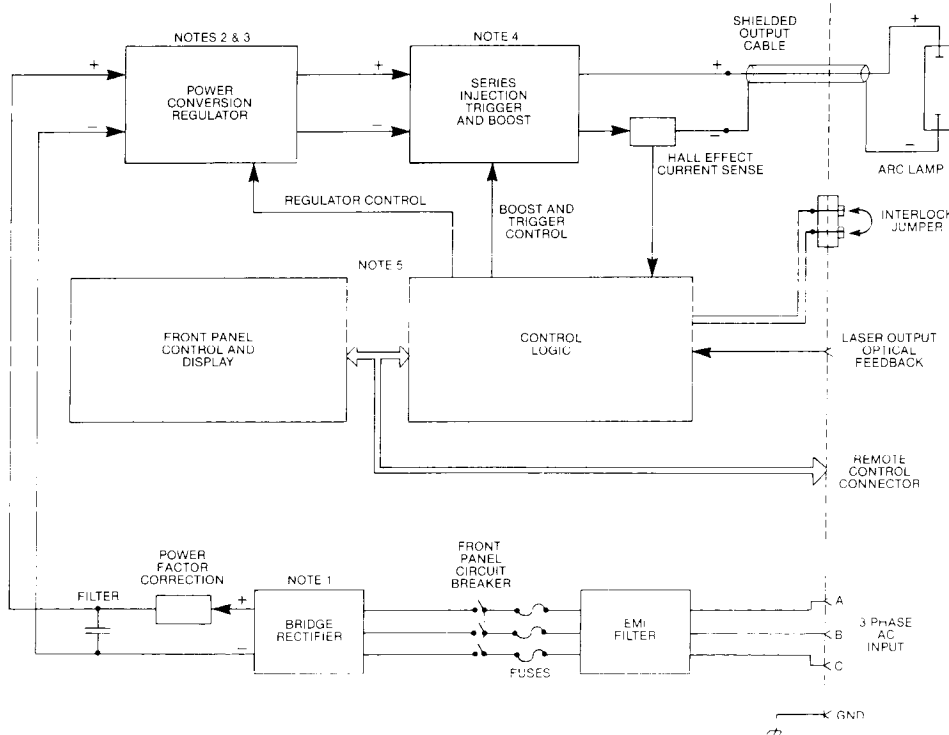
INTERLOCK OPEN: Ready to operate when off

REGULATION LIMIT: ON when limit is reached, unit operates out of regulation

CURRENT LIMIT: ON when limit is reached

TEMPERATURE LIMIT: ON when limit is reached, unit will turn off

## YD BLOCK DIAGRAM



### NOTES:

- Input Section:** Fuses, line filters, rectifiers, and DC filters.
- Power Conversion Regulator:** Main switch and drivers, LCR snubber for turn on and turn off, and protective diodes.
- Output Section:** 4-section L-C filter, and output diode.
- Trigger/Boost Section:** Boost voltage power supply, series injection transformer and injection circuitry.
- Logic Section:** Control board, output current feedback, PWM circuits, protective circuits, status circuits, front panel controls and remote interface.

## CONFIGURATION GUIDE

MODEL SPECIFICATION: **YD - 6 - T**

### 1. YAG-DRIVE

CW Arc Lamp  
Power Supply

### 2. OUTPUT POWER

check one

- 6KW Max.  
 10KW Max.

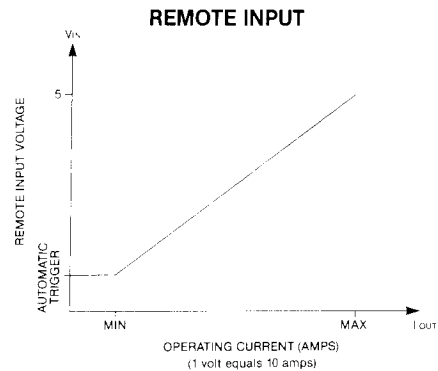
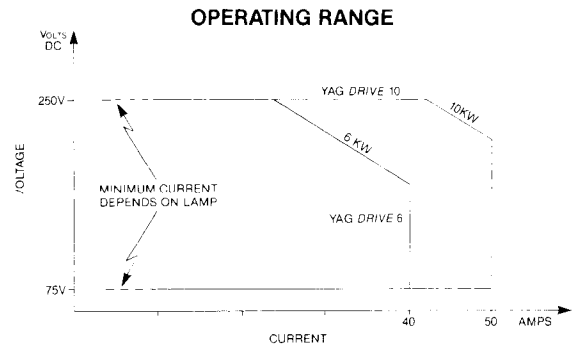
### 3. IGNITER OPTION

check one

- T, Internal Series Injection Trigger  
 N, No Trigger (use an external trigger)

## HOW TO ORDER

The A.L.E. YAG-DRIVE power supply may be ordered directly from an A.L.E. factory sales representative or company representative. The YD-6 and YD-10 may be ordered in single units or multiple units, deliverable over a 12 month period. Quantity orders are subject to quantity discounts. To place an order, use the configuration chart at the left and send or call in your order. Price and delivery quotations are available on request.



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