

REVISIONS


DCN	LTR	DESCRIPTION	DATE	CHANGED	CHECKED	APPROVED
	A	RELEASED FOR PRODUCTION	941216			S.REDMAN
1439	B	REVISED PER ECN	950531			S.REDMAN
4358	C	REVISED PER DCN	030528			TMA
5538	D	REVISED PER DCN	100428	PJ	RT	RThompson

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TOLERANCES	LEAD APPROVAL			DATE			FINAL APPROVAL			DATE	
	T. AYRES			941220			C.SMITH			941222	
DECIMAL .XX = N/A .XXX = N/A	TITLE INSTALLATION AND OPERATION MANUAL MODEL 591A										
ANGULAR X = N/A	SCALE N / A	SIZE A	FSCM 61651	SHEET 1 OF 13	DRAWING NUMBER	4030				REV. D	

DWG#: 4030
REV: D
FILE#: 4030D.doc
DATE: 100428
DCN#: 5538

**INSTALLATION AND OPERATING MANUAL
FOR
MODEL 591A

CW ARC LAMP POWER MODULE**

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**Approval: _____
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**_____
Robert Thompson, Product Engineer**

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MODEL 591A

SPECIAL PRECAUTIONS

CAUTION

- Read this manual carefully before attempting to install or operate the model 591A.
- This unit contains no user serviceable parts. Manufacturer's warranty is void if field serviced.
- Proper installation is necessary to limit access to lethal voltages.

MODEL 591A

Spezielle Vorsichtsmaßnahmen

Achtung







- Lesen Sie bitte dieses Handbuch genau, bevor Sie das Modell 591A anschließen oder in Betrieb nehmen.
- Reparaturen dürfen nur von autorisiertem Servicepersonal vorgenommen werden. Bei unbefugtem Öffnen des Gerätes erlischt die Herstellergarantie.
- **Achtung: Teile können Hochspannung führen !!**
Eine einwandfreie Installation ist notwendig um das unbeabsichtigte Berühren von tödlichen Hochspannungen unmöglich zu machen.

LABELS

Abbreviations:

A	amperes
AC	alternating current
°C	degrees Celsius
CW	Continuous wave
Hz	hertz
IEC	International Electrotechnical Commission
KHz	kilohertz
kW	kilowatts
(L)	line conductor, single phase system
mA	milliamp
mm	millimeter
mV	millivolt
(N)	neutral conductor, single phase system
V	volts
VAC	alternating voltage
VDC	direct voltage
W/°C	watts per degree Celsius
Z	impedance
Ω	ohms

Symbols:

	Protective Earth (ground) Terminal
	Local signal reference
	Alternating Current
	Earth (ground)
	Direct Current
	Dangerous Voltage

SECTION 1

INTRODUCTION

1.0 INTRODUCTION

The Model 591A is a highly efficient buck converter designed to deliver 3kW of continuous power into CW short arc lamps.

Referring to the block diagram in Figure 1, 230 VAC is filtered and rectified to achieve an open circuit output of approximately 300VDC when the lamp is not conducting. With an appropriate lamp igniter module (such as the Model 592 or 592A), the lamp is struck and begins to pass current. Current is sensed by the power module and controlled based upon the opto-isolated current demand.

User feedback is provided by on-board LED's for LAMP ON (green) and POWER ON (yellow). Opto-isolated versions of these same status lines are available as well. An enable for actual lamp current can be configured as active high or low. The Model 593 control module is designed to interface with the power module. Please refer to the following sections on installation and operation of the Model 591A for further details.

SECTION 2

INSTALLATION PROCEDURE

2.0 INSTALLATION

AC mains power is connected at P12 (N) and P13 (L) as identified in Figure 2. Earth ground must be connected to chassis at the location identified by the ground symbol. The AC terminals are not intended for field wiring. As noted on the label, input voltage is 230VAC nominal and 50 to 60 Hz.* EN60601-1 requires that both line and neutral be fused. Therefore, a 30A fuse and fuse block must be installed in series with both high and low sides of the mains. Recommended part numbers necessary to retain safe operating conditions are:

Fuse: KLK 30 (Littelfuse) 30A, 600VAC, Fast Acting-2 min. (max) at 200%
Holder: L60030M-1C (Littelfuse)

Figure 3 illustrates the control circuit interface for both enable/disable and current demand. The Model 591A CW power module is designed for lamp operation with output currents from 3-30 amperes. Current demand is achieved by controlling the current through the forward diode of the IL300 linear optocoupler (U8). Each 591A module is calibrated to provide 3A of lamp current with 2mA of forward diode current and 30A of lamp current with 11mA of forward diode current. Operation within this range is linear with a 1mA change in forward diode current producing a 3A change in lamp current. Forward diode current through the IL300 linear optocoupler can be sensed by monitoring the voltage drop across R20 and dividing this value by 100Ω. Jumpers at P7 are connected as shown to configure the input from P6 as an enable or a disable command. The current sense circuitry is accessed via P5 and connects to a high impedance meter which reads approximately 17mV per ampere of lamp current. The opto-isolated remote status as shown in Figure 2 is available at P2 and P4.

The lamp connection is made at P8 (positive) and P9 (negative). Because the lamp driver is not transformer isolated both positive and negative lamp contacts are at AC mains potential relative to earth ground.

A lamp igniter interface is provided at P10 and P11 for either the Model 592 or Model 592A. Specific information regarding the interface of the 592 or 592A to the 591A module can be found in the operators manual for these igniter modules. If the 591A is not being used in conjunction with either of these igniter modules, no connection to P10 or P11 is required.

Since the power module is electrically connected to AC mains, proper air clearance must be maintained according to EN60601-1. Clearances to any low voltage secondary circuit must exceed 5mm in air.

Proper air flow must be maintained to prevent thermal shutdown. Two fans delivering 52 liters per second (110 cubic feet per minute) each are recommended with airflow as shown on the product data sheet. A plenum which directs the air flow will help in extending the life of the product.

*To operate from a 115VAC single-phase service, first ensure the unit is disconnected from any external power source and the input storage capacitors are fully discharged, then install a jumper (18 AWG buss wire) at JU1 location.

SECTION 3

OPERATING INSTRUCTIONS

3.0 OPERATING INSTRUCTIONS

Beginning with ENABLE off, apply 230VAC to the power module. Verify proper fan operation and set the current demand for a minimum output current of three amperes. At this time only the POWER ON LED should be illuminated. Set ENABLE on and ignite the lamp. The LAMP ON LED should now illuminate and current levels can be monitored at P5.

CAUTION: BOTH PINS ON P5 ARE AT AC MAINS POTENTIAL RELATIVE TO EARTH GROUND.

The power module is rated at 3kW. For a 100V lamp this implies 30A maximum. For higher voltage lamps the current must be reduced proportionally.

CAUTION: LAMP CONNECTIONS ARE AT AC MAINS POTENTIAL RELATIVE TO EARTH GROUND

Ambient operating temperatures must be limited to between 0°C and 70°C for safe operation. Output power of 3kW is guaranteed up to 50°C and derated 50W/°C up to the limit of 2kW at 70°C.

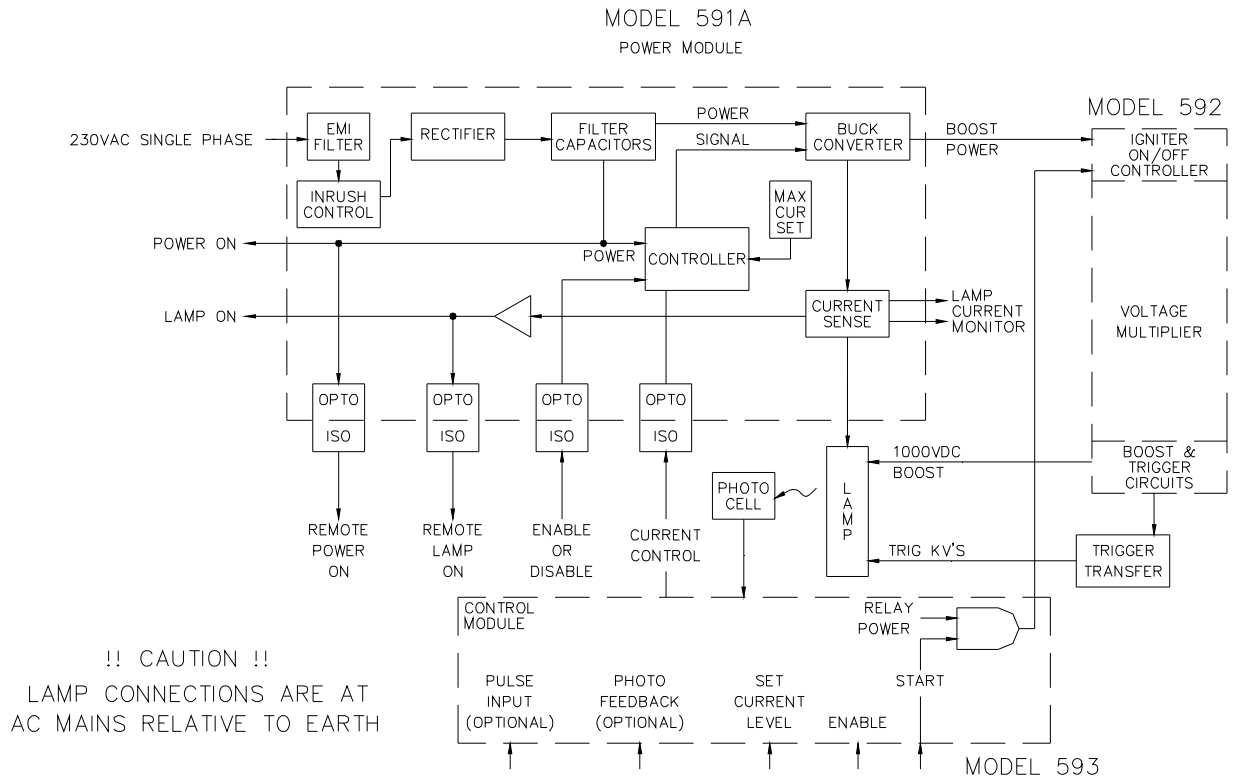


FIGURE 1
BLOCK DIAGRAM

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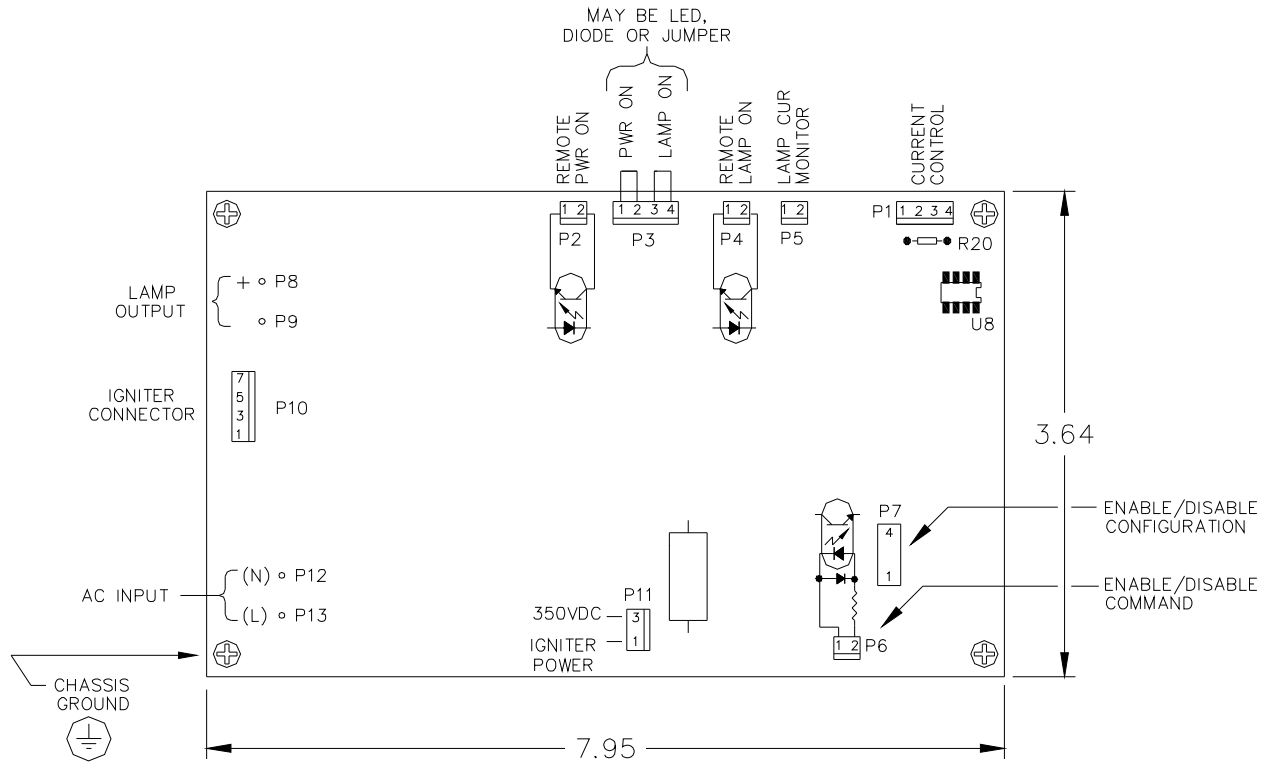


FIGURE 2
 POWER MODULE CONNECTIONS

4030DFIGS.DWG

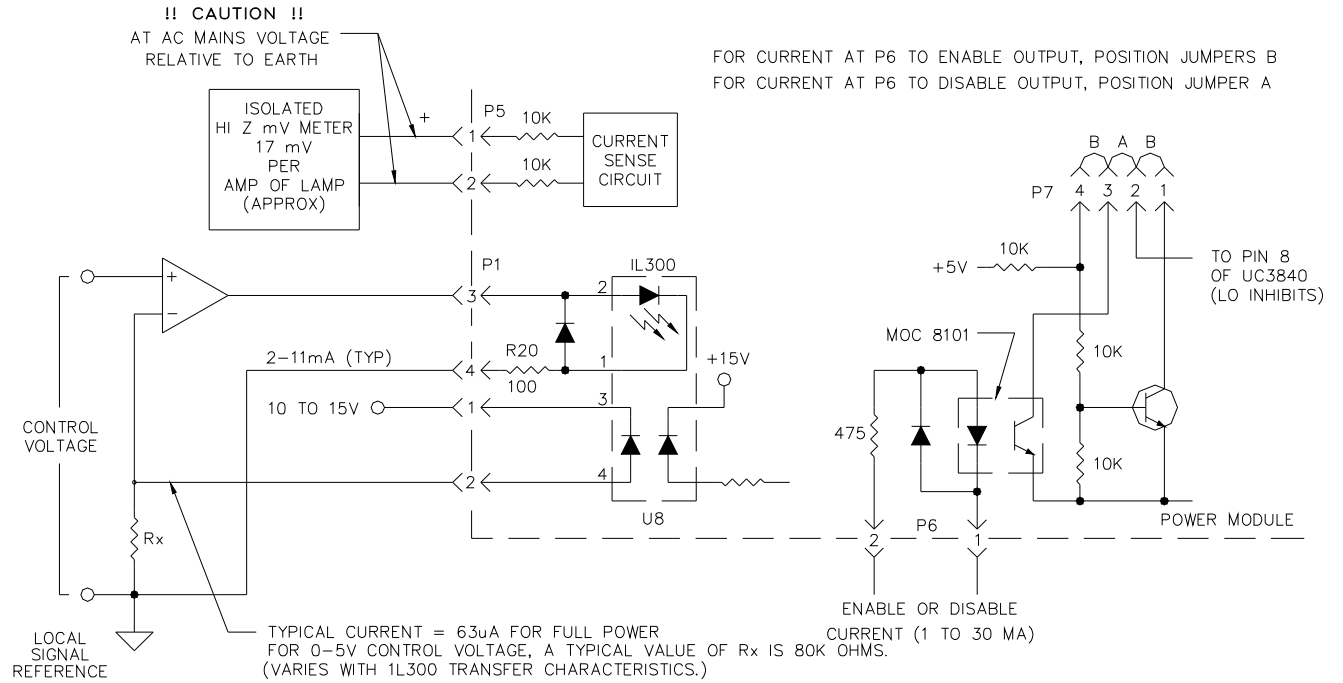


FIGURE 3
 CURRENT CONTROL & MONITOR

4030DFIGS.DWG