

TM-8076300509

PS-9010
12 TO 28 VDC
CONVERTER

OPERATION
AND
INSTALLATION MANUAL



SUNAIR

3101 SW Third Avenue, Ft. Lauderdale, FL 33315-3389

WARRANTY POLICY

GROUND AND MARINE PRODUCTS

Sunair Electronics warrants equipment manufactured by it to be free from defects in material or workmanship, under normal use for the lesser of one (1) year from the date of installation or 15 months from date of shipment by Sunair.

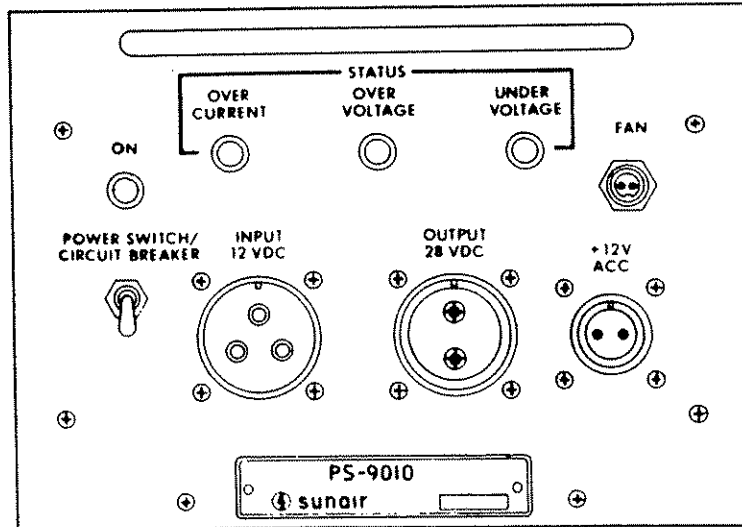
Sunair will repair or replace, at its option, any defective equipment or component of the equipment returned to it at its factory, transportation prepaid, within such warranty period. No reimbursement will be made for non-factory repair charges.

This warranty is void if equipment is modified or repaired without authorization, subject to misuse, abuse, accident, water damage or other neglect, or has its serial number defaced or removed.

THIS WARRANTY IS ESPECIALLY IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The obligation and responsibility of Sunair shall be limited to that expressly provided herein and Sunair shall not be liable for consequential or other damage or expense whatsoever therefore or by any reason thereof.

Sunair reserves the right to make changes in design or additions to or improvements in its equipment without obligation to install such additions or improvements in equipment theretofore manufactured.





PS-9010

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CONVERTER**

**OPERATION
AND
INSTALLATION MANUAL**

FIRST EDITION DECEMBER, 1991

PRODUCT SERVICE:

In case of difficulty please contact the Sunair Product Service Department, between the hours of 8:00 AM and 5:00 PM Eastern Time or write to:

Product Service Dept.
Sunair Electronics, Inc.
3101 SW Third Avenue
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Telephone: (954) 525-1505

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TRAINING:

Sunair offers training programs of varying lengths covering operation, service, and maintenance of all Sunair manufactured equipment. For details please contact the Product Service Department.

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TABLE of ABBREVIATIONS

ADDR	Address	LT	Light
AGC	Automatic Gain Control	LVL	Level
ALC	Automatic Level Control	MAN	Manual
AM	Amplitude Modulation	M CH	Manual Channel
AME	Amplitude Modulation Equivalent	MED	Medium
AMP/AMPL	Amplifier	MHz	Megahertz
ARQ	Automatic Request	MIC	Microphone
AUD	Audio	MIL-STD	Military Standard
AUTO	Automatic	MNL	Manual
AUX	Auxiliary	ms	Millisecond
BAUD	A variable unit of data transmission speed (bits per second)	MTTR	Mean Time To Repair
BELL U.S.	Telephone standards	MTR	Meter
BFO	Beat Frequency Oscillator	NAR	Narrow
BiTE	Built In Test Equipment	O.D.	Olive Drab
BRD	Board	PA	Power Amplifier
CH /CHAN /CHL/CHN	Channel	PC	Printed Circuit
CLR	Clear	PEP	Peak Envelope Power
CMOS	Complementary Metal Oxide Semiconductor	PLL	Phase-Locked Loop
CPLR	Coupler	P/N	Part Number
CPU	Computer	PNL	Panel
CW	Carrier Wave	POSTSL	Post-Selector
dB	Decibel	PRESEL	Pre-Selector
dBm	Decibels referred to 1 milliwatt across 600 ohms	PTT	Push-To-Talk
DSBSC	Double Sideband Suppressed Carrier	PWR	Power
DSP	Display	RCV/RX	Receive
DUART	Dual Asynchronous Receive/Transmit	REFL	Reflected
EEPROM	Electrically Erasable and Programmable Read Only Memory	REV	Revision
EPROM	Electrically Programmable Read Only Memory	RF	Radio Frequency
EM	Electromagnetic Radiation Interference	RFI	Radio Frequency Interference
ENTR	Enter	RFL	Reflected
FAX	Facsimile	RMT	Remote
FEC	Forward Error Correction	RS232	Computer control, hardwired up to 50 feet maximum
FREQ	Frequency	RS422	Computer control, hardwired up to 4000 feet maximum
FSK	Frequency Shift Keying	RS485	Computer control, hardwired for multiple users
FWD	Forward	RTTY	Radio Teletype
GRP	Group	SEL	Select
HF	High Frequency	SLO	Slow
Hz	Hertz	S MTR	Signal Strength Meter
IC	Integrated Circuit	SPKR	Speaker
IF	Intermediate Frequency	SPLX	Simplex
I/O	Input/Output	SRAM	Static Random Access Memory
IONCAP	Ionospheric Communications Analysis and Prediction	SSB	Single Sideband
KHz	Kilohertz	TCXO	Temperature Controlled Crystal Oscillator
kW	Kilowatt	TGC	Transmit Gain Control
iSB	Independent Sideband	THD	Total Harmonic Distortion
LCD	Liquid Crystal Display	TTL	Transistor Transistor Logic
LCL	Local	TX/XM	Transmit
LED	Light Emitting Diode	USB	Upper Sideband
LK	Link	UTC	Universal Time
LO	Local Oscillator	VCO	Voltage Controlled Oscillator
LP LPX	Lincompex	VHF	Very High Frequency
LRL	Lowest Repairable Unit	VRMS	Volts Root Mean Square
LSB	Lower Sideband	VSWR	Voltage Standing Wave Ratio
		W	Watt
		WPM	Words Per Minute

* Asterisk indicates function selected

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SECTION I

GENERAL INFORMATION

1.1 DESCRIPTION

The PS-9010 is a reliable, heavy duty 12 to 28 VDC converter intended as a highly efficient primary equipment power source. Although housed in a relatively small package, the PS-9010 is completely modularized and easily maintained. The unit employs highly advanced power handling technology, and is completely protected for overcurrent or overvoltage conditions. Designed to accommodate harsh military environments, the PS-9010 is an ideal approach to fitting 28 VDC electronic equipment to 12 VDC vehicular or emergency power sources.

1.2 TECHNICAL SPECIFICATIONS

1.2.1 GENERAL

Dimensions: 5.5" High X 9.0" Wide X 9.65" Deep, including handle.
(14 cm H X 23 cm W X 25 cm D.)

Weight: 12 Lbs (5.45 kg).

Construction: Modular, Plug-in Assemblies.

Input Protection: DC Circuit Breaker.

Output Protection: Electronic Over Current, Over Voltage and Under Voltage Detectors.

On/Off Control: Front Panel Switch / Circuit Breaker.

Remote On/Off: 12 VDC or Ground, Internally Programmable, Switch Current : 100 ma Max.

Fault isolated to module level. Failure indicators located on Front Panel for:

- (a) Under Voltage,
- (b) Over Voltage,
- (c) Over Current.

1.2.2 ENVIRONMENTAL

Temperature: -30 C to +50 C.

Humidity: 100% at 50 C.

Shock: MIL-STD-810D, Method 516.3.

Vibration: MIL-STD-810D, Method 514.6.

1.2.3 ELECTRICAL

Input Voltage: 11.0 VDC to 15.0 VDC (Operation permitted to 10.5 VDC at reduced output power).

Input Current: 35 Amperes at 13.6 VDC Input / 14 Amperes out.

Input Current (RT-9000): At 13.6 VDC : (a) CW, 125 Watts : 35 Amperes (b) CW, 65 Watts : 23 Amperes.

Output Voltage: 28 VDC (13.6 VDC input).

Output Voltage Regulation: -7% +3%.

Output Voltage Hum and Noise: Less then 250 MV PPK at rated output.

Output Current: 15 Amperes maximum (13.6 VDC input).

Duty Cycle: Continuous at 13.6 VDC input.

Efficiency: 80% minimum.

1.3 EQUIPMENT SUPPLIED

The following is a list of equipment, with appropriate Sunair part numbers, supplied with the PS-9010.

<u>SUPPLIED EQUIPMENT</u>	<u>SUNAIR PART NUMBER</u>
12 to 28 VDC Converter, PS-9010	8076310091
Manual	8076300509
Mating Connector Kit	8076300495

SECTION II

INSTALLATION

2.1 GENERAL

Section II contains all necessary instructions for unpacking, inspection, and, if required, reshipment of the equipment or parts. Information regarding location and mounting considerations, power requirements, ground system hookups, and cabling considerations is also provided.

2.2 UNPACKING AND INSPECTION

As soon as you have received your unit(s), unpack and inspect all components and accessories. Check the packing list to be sure you have received all items ordered, and that all items necessary for operation have been ordered.

NOTE: Be sure to retain the carton(s) and associated packing materials should it be necessary to reship the equipment.

Do not accept a shipment when there are visible signs of damage to the cartons until a complete inspection is made. If there is a shortage of items or any evidence of damage, insist on a notation to that effect on the shipping papers before signing the receipt from the carrier. If concealed damage is discovered after the shipment has been accepted, notify the carrier immediately in writing and await his inspection before making any disposition of the shipment. A full report of the damage should also be forwarded to Sunair's Product Services Department. Please be sure to include the following information for prompt service:

- a) ORDER NUMBER.
- b) MODEL AND SERIAL NUMBER.
- c) NAME OF TRANSPORTATION AGENCY.
- d) APPLICABLE DATES.

Upon receipt of this information, Sunair will make arrangements for repair or replacement.

2.3 RETURN OF EQUIPMENT TO FACTORY

The shipping carton for the PS-9010 has been designed to protect the equipment during shipment. The container and its associated packing materials should be used to reship the equipment.

When necessary to return equipment to Sunair for warranty or non-warranty repair, an authorization number is required. This number can be obtained from our Product Services Department: TELEPHONE: (954) 525-1505, FACSIMILE: (954) 765-1322.

If the original shipping carton is not available, be sure to carefully pack each unit separately, using suitable cushioning material where necessary. Very special attention should be given to providing enough packing material around connectors and other protrusions from the unit. Rigid cardboard should be placed at the corners of the equipment to protect against denting. **DO NOT USE DUNNAGE (e.g., STYROFOAM PEANUTS) FOR PACKING PROTECTION;** it may allow the unit to shift while being shipped, and, therefore, become damaged.

When returning subassemblies or components for repair or replacement, be sure to pack each separately, using suitable cushioning material.

Shipment to be made PREPAID consigned to:

Sunair Electronics, Inc.
 Product Services Department
 3101 SW Third Avenue
 Fort Lauderdale, Florida 33315-3389
 U.S.A.

Plainly mark with indelible ink all mailing documents as follows:

US Goods Returned For Repair
 Value For Customs - \$(Amount)

Mark ALL SIDES of the package:

FRAGILE - ELECTRONIC EQUIPMENT!

NOTE:

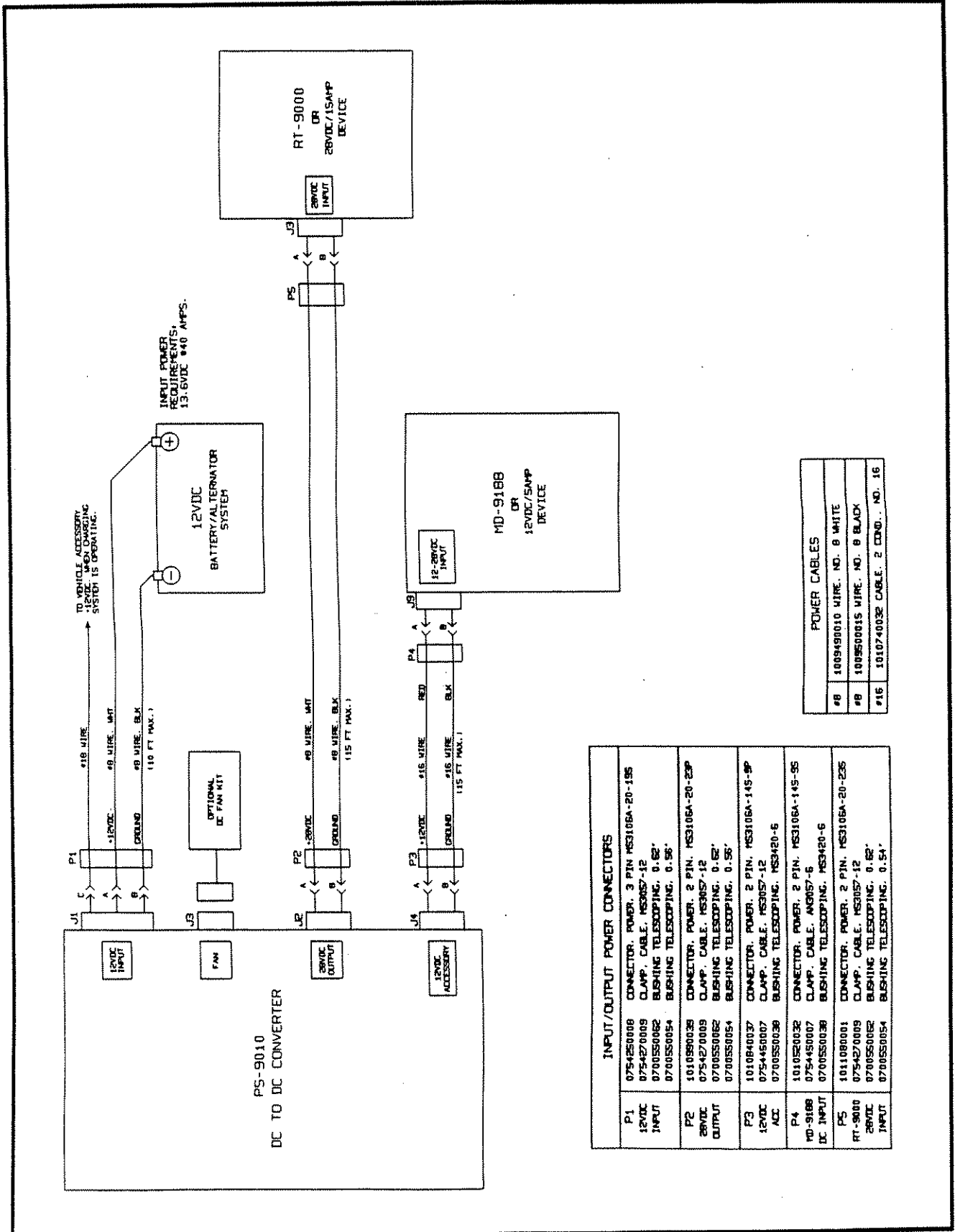
Before shipping, carefully inspect the package to be sure it is marked properly and is securely wrapped.

2.4 GENERAL INSTALLATION AND MOUNTING INFORMATION

Carefully plan Transceiver / Peripherals / PS-9010 and Battery / Alternator system locations. Figure 2.4.1 shows optimum maximum distances for power cables. Figures 2.4.2 and 2.4.3 show the overall dimensions and outline mounting details of the unit.

2.5 ELECTRICAL CONNECTIONS

TO ADD	CONNECT	NOTE
DC Power Input	+12 VDC source to J1 on front panel.	See Figure 2.4.1.
+28 VDC Output	J2 on front panel to J3 on rear panel of RT-9000.	See Figure 2.4.1 and consult RT-9000 manual (Figure 2.4.1.1).
+12 VDC Accessory	J4 on front panel to +12 VDC input connector on appropriate accessory.	See Figure 2.4.1 and consult appropriate accessory manual.
+28 VDC Fan (optional)	J3 on front panel to optional 28 VDC fan.	See Figure 2.4.1.



INPUT/OUTPUT POWER CONNECTORS	
P1	CONNECTOR, POWER, 3 PIN, MS3106A-20-155
12VDC INPUT	CLAMP, CABLE, MS3057-12
	BUSHING TELESCOPING, 0.62"
	BUSHING TELESCOPING, 0.56"
P2	CONNECTOR, POWER, 2 PIN, MS3106A-20-23P
28VDC OUTPUT	CLAMP, CABLE, MS3057-12
	BUSHING TELESCOPING, 0.62"
	BUSHING TELESCOPING, 0.56"
P3	CONNECTOR, POWER, 2 PIN, MS3106A-14S-9P
12VDC ACC	CLAMP, CABLE, MS3057-12
	BUSHING TELESCOPING, MS3420-6
P4	CONNECTOR, POWER, 2 PIN, MS3106A-14S-9S
MD-9188 DC INPUT	CLAMP, CABLE, MS3057-6
	BUSHING TELESCOPING, MS3420-6
P5	CONNECTOR, POWER, 2 PIN, MS3106A-20-23S
RT-9000 28VDC INPUT	CLAMP, CABLE, MS3057-12
	BUSHING TELESCOPING, 0.62"
	BUSHING TELESCOPING, 0.54"

Figure 2.4.1 Interconnect Block Diagram.

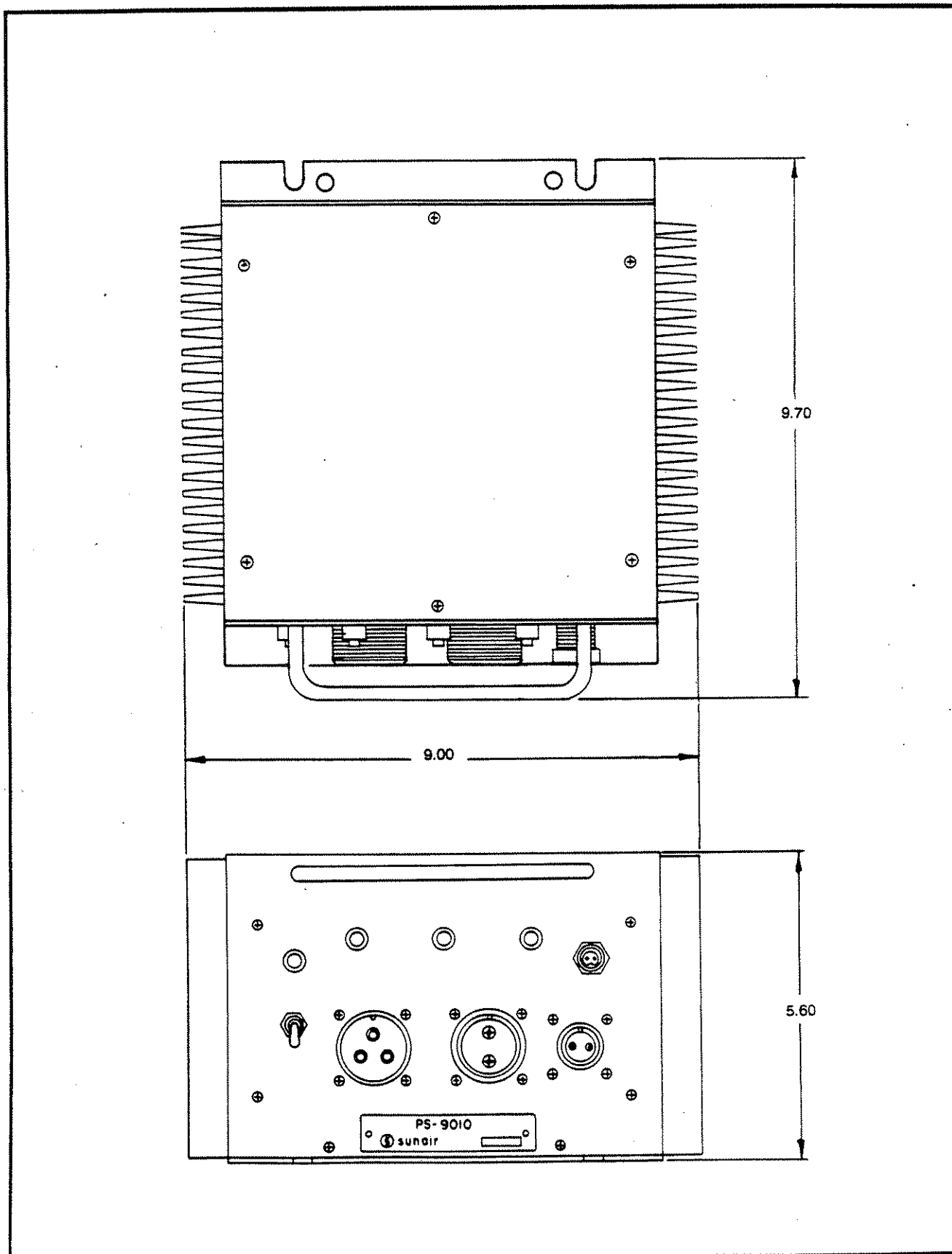


Figure 2.4.2 Outline Mounting Details, PS-9010.

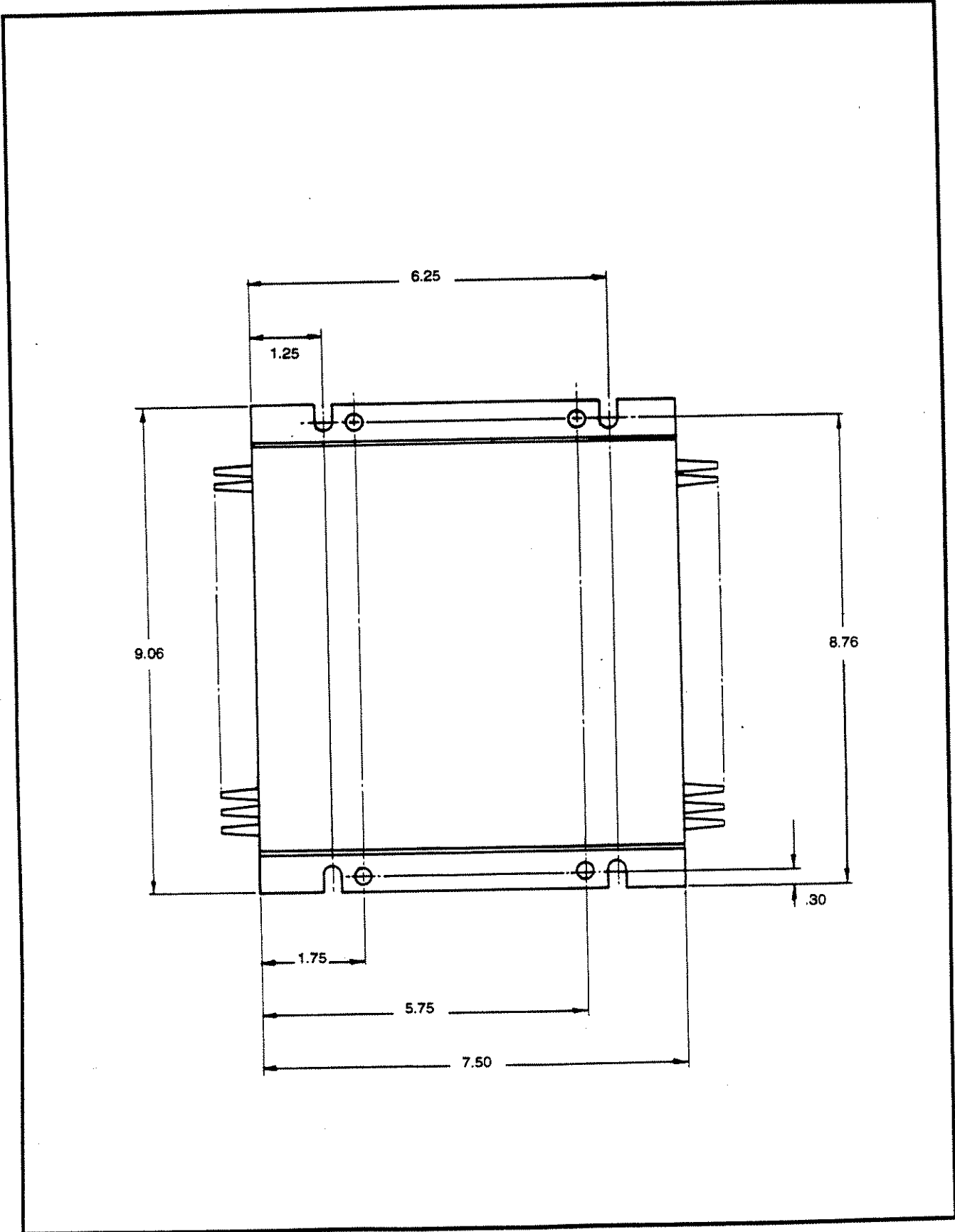


Figure 2.4.3 Outline Mounting Details, PS-9010.

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SECTION III

OPERATION

3.1 GENERAL

This section provides the operator with the location and use of the PS-9010 front panel control and indicators.

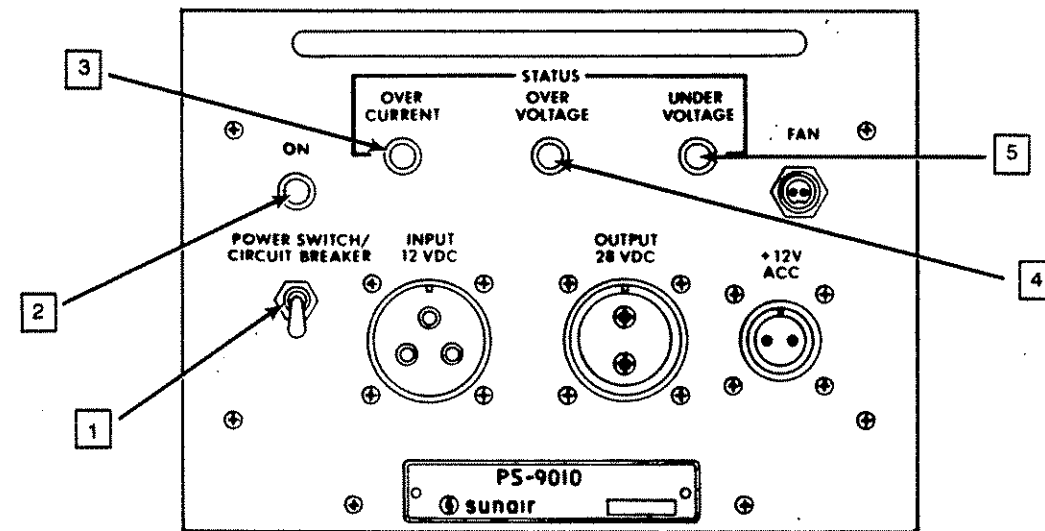


Figure 3.1.1 Front Panel Control and Indicators.

1 POWER SWITCH / CIRCUIT BREAKER

When this switch is in the UP position the converter is 'ON'. The DOWN position is 'OFF'.

2 ON (Lamp)

Green lamp - indicates that the converter is 'ON'.

3 OVER CURRENT (Lamp)

Red lamp - indicates over current condition in output voltage.

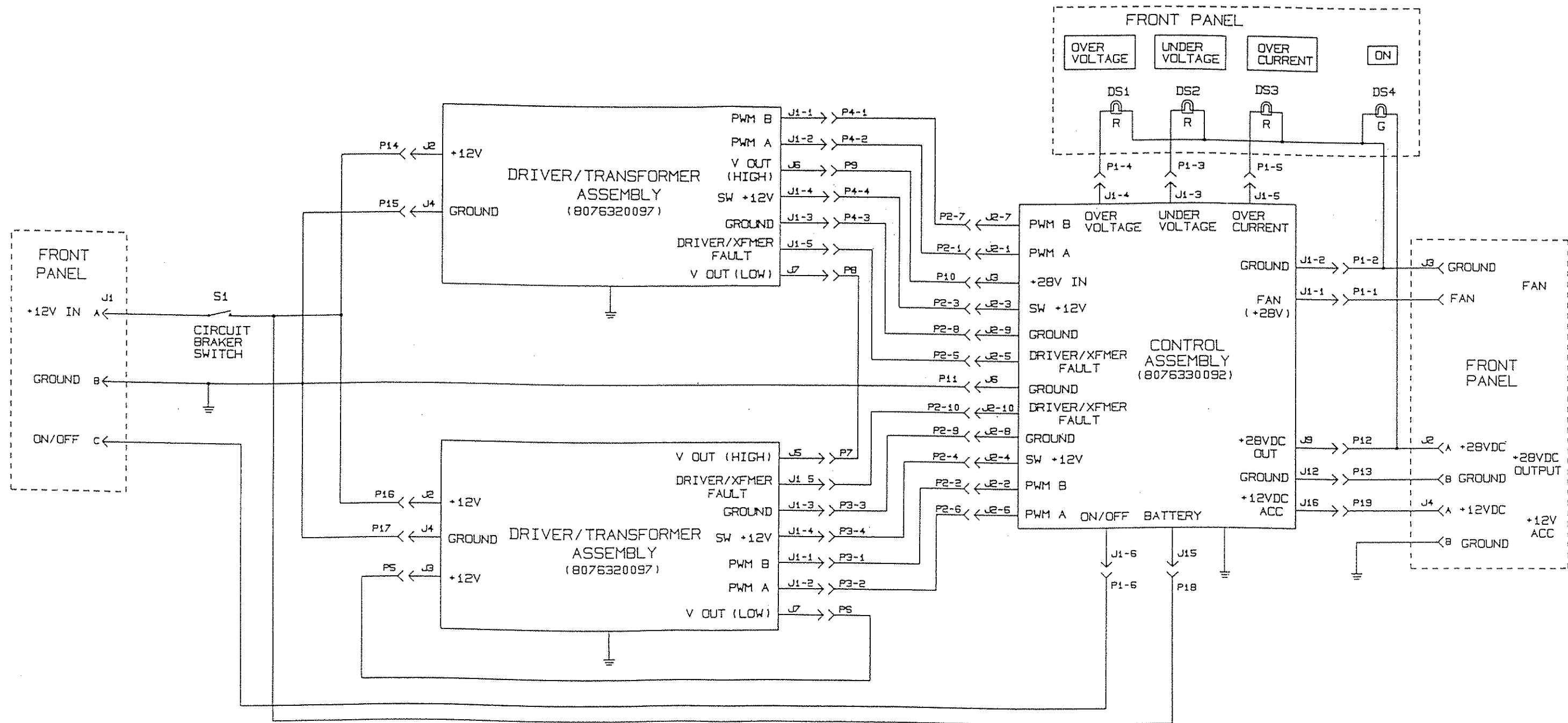
4 OVER VOLTAGE (Lamp)

Red lamp - indicates greater than 32 VDC output.

5 UNDER VOLTAGE (Lamp)

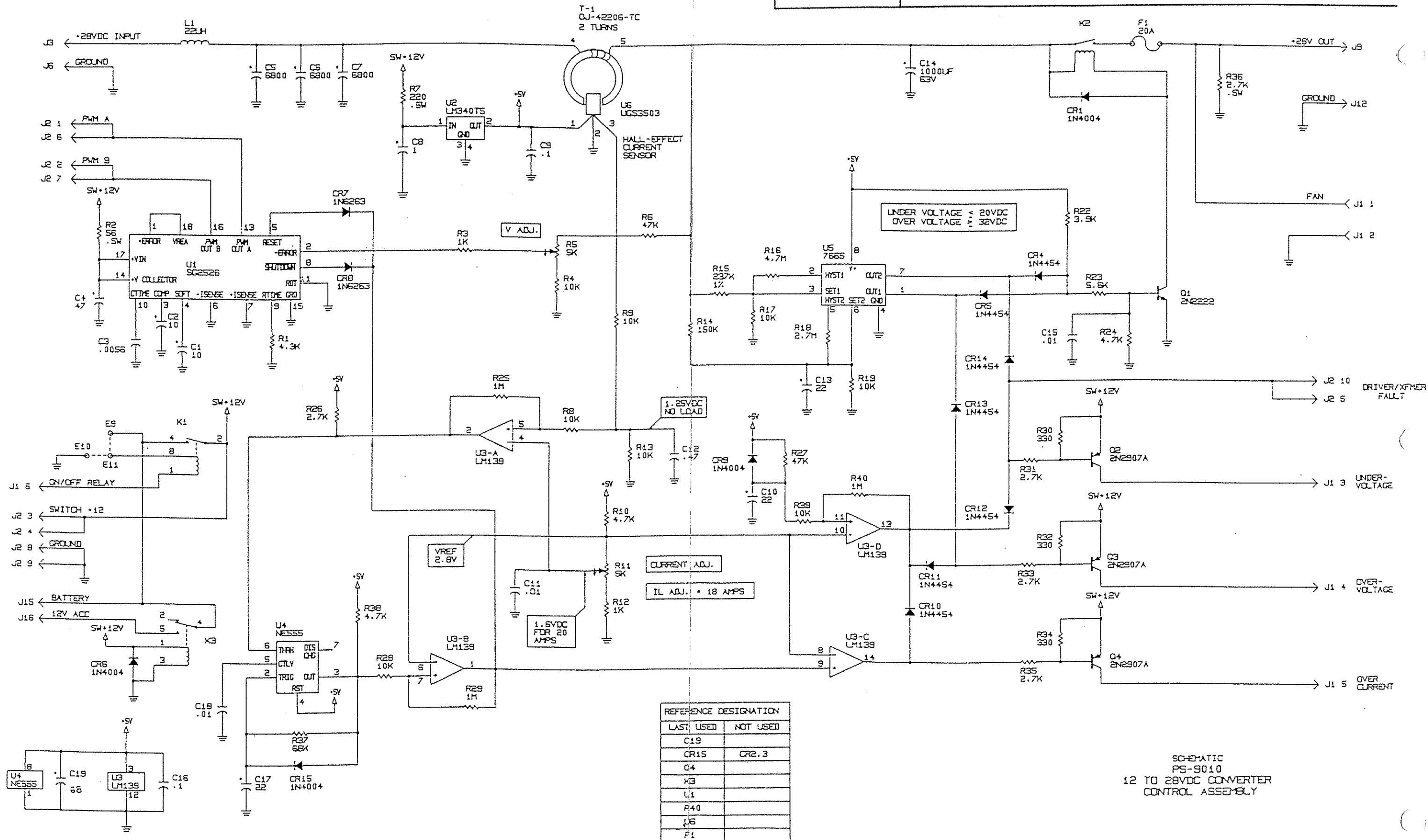
Red lamp - indicates less than 20 VDC output.

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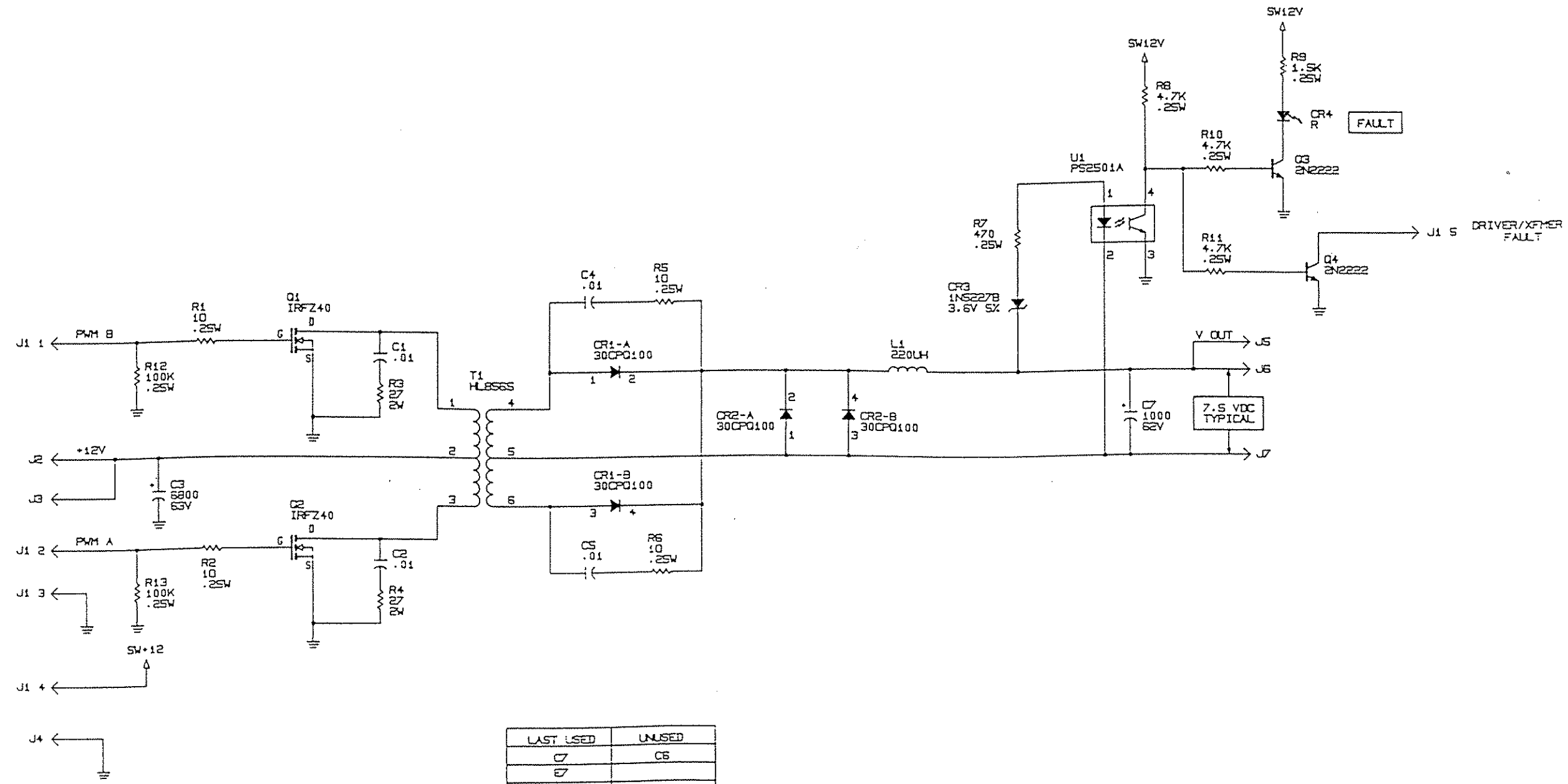
SCHEMATIC
PS-9010
12 TO 28VDC CONVERTER
CHASSIS INTERCONNECT

SUNAIR PS-9010



REFERENCE DESIGNATION	
LAST USED	NOT USED
C19	
CR15	CR2,3
Q4	
K3	
L1	
R40	
U6	
F1	

SCHMATIC
PS-9010
12 TO 28VDC CONVERTER
CONTROL ASSEMBLY



LAST USED	UNUSED
C7	C6
Q3	
L1	
R8	
T1	
U1	
CR4	

SCHEMATIC
PS-9010
12 TO 28VDC CONVERTER
DRIVER/TRANSFORMER ASSY.

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