

TrueTime

Model 560-5149 Power Supply, AC/DC, -48 VDC Manual

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SECTION ONE

1. FUNCTIONAL DESCRIPTION

1.1 PURPOSE OF EQUIPMENT

The TrueTime Model 560-5149 Power Supply works in conjunction with the appropriate rear Power Entry Module to provide 48 VDC power to the chassis in a redundant configuration. The Power Entry Module provides the input connector, chassis ground lug, and fuse. This Power Supply is for use with 90-264 VAC input and/or -48 VDC input.

The Power Supply provides filtering and transient protection at the input. The 48 VDC power is delivered to the backplane via OR-ing diodes from the AC input section and DC input section of each power supply, connecting to the power bus in a redundant configuration. If one power supply in the chassis fails, the other takes over. If both supplies are functioning, the highest voltage supply delivers power to the backplane.

1.1.1 PHYSICAL SPECIFICATIONS

Dimensions: 1.6" w X 4.4" h X 8.66" d (4 cm X 10 cm X 22 cm)
Weight: Approximately 2 pounds (1 kg)

1.1.2 ENVIRONMENTAL SPECIFICATIONS

Operating Temp: 0° to +50°C
Storage Temp: -40° to +85°C
Humidity: Up to 95% max., relative, non-condensing
Cooling Mode: Convection

1.1.3 POWER SPECIFICATIONS

Input Voltage: 90-264 VAC (continuous), 47-63 Hz
Input Power: See table below
Fuse: 2 Amp 3AG SLO-BLO
Output Power: 115 W maximum
Output Voltage: 56 VDC ±5%
Maximum Output Power:

INPUT	AMBIENT	AIRFLOW	OUTPUT
90-132 VAC	50°C	CONVECTION	100 W
180-264 VAC	50°C	210 CFM	88 W
180-264 VAC	50°C	120 CFM	64 W

CANNOT BE USED WITH NEGATIVE-GROUND POWER SUPPLY IN ADJACENT SLOT

1.1.4 DC POWER SPECIFICATIONS

Input Voltage: -48 VDC \pm 20% (positive-ground)
Power Capability: 150 W
Fuse 5 Amp 3AG SLO-BLO
CANNOT BE USED WITH NEGATIVE-GROUND INPUT POWER

1.1.5 FUNCTIONAL SPECIFICATIONS

1.1.5.1 INPUT POWER CONNECTOR

See Chassis manual.

1.1.5.2 TEST POINTS

48 VDC+: 48 VDC, Positive Power Supply Output
48 VDC-: 48 VDC, Negative Power Supply Output
Isolation: 10k ohm

1.1.5.3 CARD COMPATIBILITY

Location: Slot 18/19 or 20/21
Compatibility: AC/DC Power Entry Module in rear slot

1.2 CERTIFICATIONS

1.2.1 CE COMPLIANT / UR AND C-UR RECOGNIZED

The use of the 560-5149 power supply is CE compliant and UR and C-UR recognized. In addition to the condition for acceptability related to bottom containment for the unit, the following condition of acceptability is also applicable for the power supply: If the unit is operated over 140V input at up to 80 W input, forced air cooling of 120 CFM must be provided to the bottom of the unit. If the unit is operated over 140V input at up to 110 W input, 210 CFM must be provided to the bottom of the unit.

SECTION TWO

2. INSTALLATION AND OPERATION

2.1 HOT-SWAPPING

All cards, input cables and output cables are hot-swappable. It is not necessary to remove chassis power during insertion or removal. The system is designed to protect against permanent effects and minimize any temporary effects of hot-swapping.

2.2 REMOVAL AND INSTALLATION

CAUTION: Individual components on this card are sensitive to static discharge. Use proper static discharge procedures during removal and installation.

For proper operation, the Power Supply **MUST** be installed in a slot with a matching rear Power Entry Module.

To remove card, loosen the captive retaining hardware at the top and bottom of the assembly, then firmly pull on the handle (or on any connector on rear panel adapter cards) at the bottom of the card. Slide the card free of the frame. Refer to the **SETUP** section for any required switch settings or set them identically to the card being replaced. Reinstall the card in the frame by fitting it into the card guides at the top and bottom of the frame and sliding it in slowly, avoiding contact between bottom side of card and adjacent card front panel, until it mates with the connector. Seat card firmly to avoid contact bounce. Secure the retaining screws at the top and bottom of the card assembly.

2.3 SETUP

This card has no setup requirements.

2.4 FAULT INDICATION

Fault indicators may activate briefly during following hot-insertion or power-up. The following paragraphs describe operation during steady-state conditions.

2.4.1 FAULT INDICATORS

The Fault indicators activate when the associated Power Supply section ceases to provide power. The detection point is approximately 16 V lower than the chassis power voltage. This could be caused by a loss of power at the source, a disconnected Power Entry power-input cable, a blown Power Entry fuse, or a Failed Power Supply.

2.4.2 BACKPLANE FAULT OUTPUT

Each slot contains a Fault output, which can be read by the optional Fault Monitor CPU. Note that a fault in either the AC input or DC input power supply section will activate the backplane fault output. The CPU will respond to a fault by setting all Fault Status and Status Register bits high for both front and rear power supply/power entry module chassis slots. Both AC and DC failures give identical results.

SECTION THREE

3. THEORY OF OPERATION

3.1 GENERAL INFORMATION

This section contains a detailed description of the circuits in the Power Supply. These descriptions should be used in conjunction with the drawings in SECTION FOUR.

3.2 HARDWARE DESCRIPTION

The Power Supply incorporates an Input Filter, an OR-ing diode, and Fault-Detection Indicator.

3.3 DETAILED DESCRIPTION

Reference drawing 560-5149.

3.3.1 INPUT FILTER

The input filter consists of a Electro Magnetic Interference (EMI) filter. The filter reduces common and differential mode EMI conducted into and/or out of the chassis. This filter is located in the power entry module in the rear of the chassis.

3.3.2 OR-ING DIODE

Power Supply -48 VDC power is delivered to the backplane via a 10 Amp. diode. This connects the two power supplies in a redundant configuration. When the input voltage falls below the backplane voltage the diode ceases to conduct. The Power Supply is designed for use with -48 VDC power. Therefore, the fuse and OR-ing diodes are located in this 48 VDC NEGATIVE leg.

The front panel test points connect to this Power Supply output, indicating the state of the power supply rather than backplane power.

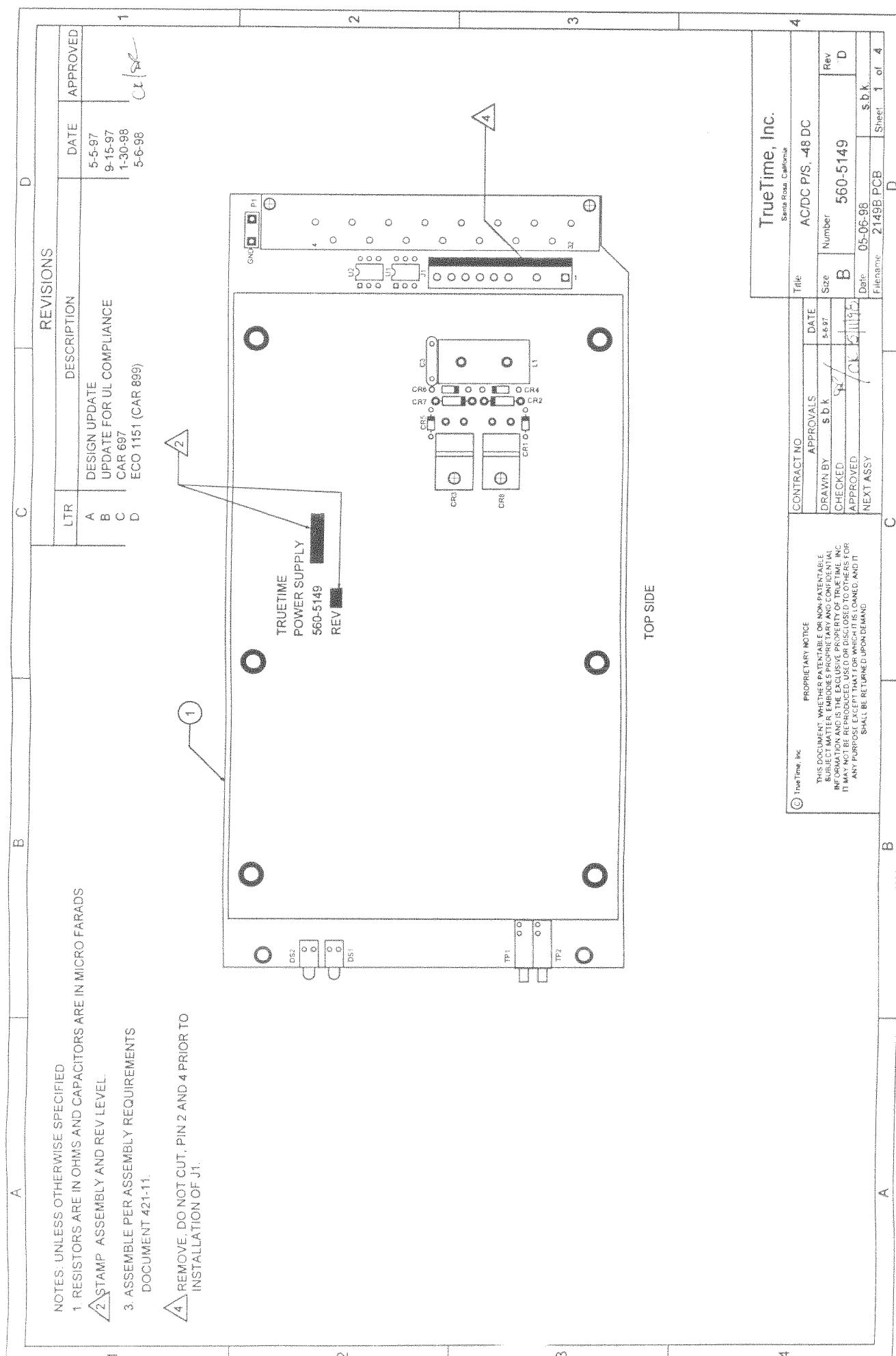
3.3.3 FAULT DETECTION / INDICATORS

The indicator is powered by the backplane 48 VDC. It receives power via current limiting resistors, a 15 V zener diode and the input to an opto-isolator. An additional diode is connected from the high side of the zener to the -48 VDC input. While the input and backplane voltages are equal, the diode pulls current away from the indicator and opto-isolator, keeping them inactive. When the input power drops to approximately 16 V lower than the backplane power, the diode can no longer pull current away, activating the indicator. The opto-isolators drive the backplane fault line, which is read by the optional Fault Monitor CPU.

SECTION FOUR

4. DETAILED DRAWINGS

4.1 560-5149 DETAILED DRAWINGS / BILL OF MATERIALS



NOTES: UNLESS OTHERWISE SPECIFIED

1. RESISTORS ARE IN OHMS AND CAPACITORS ARE IN MICRO FARADS

2. STAMP ASSEMBLY AND REV LEVEL.

3. ASSEMBLE PER ASSEMBLY REQUIREMENTS DOCUMENT 421-11.

4. REMOVE, DO NOT CUT, PIN 2 AND 4 PRIOR TO INSTALLATION OF J1.

REVISIONS		
LTR	DESCRIPTION	DATE
A	DESIGN UPDATE	5-5-97
B	UPDATE FOR UL COMPLIANCE	9-15-97
C	CAR 697	1-30-98
D	ECO 1151 (CAR 899)	5-6-98

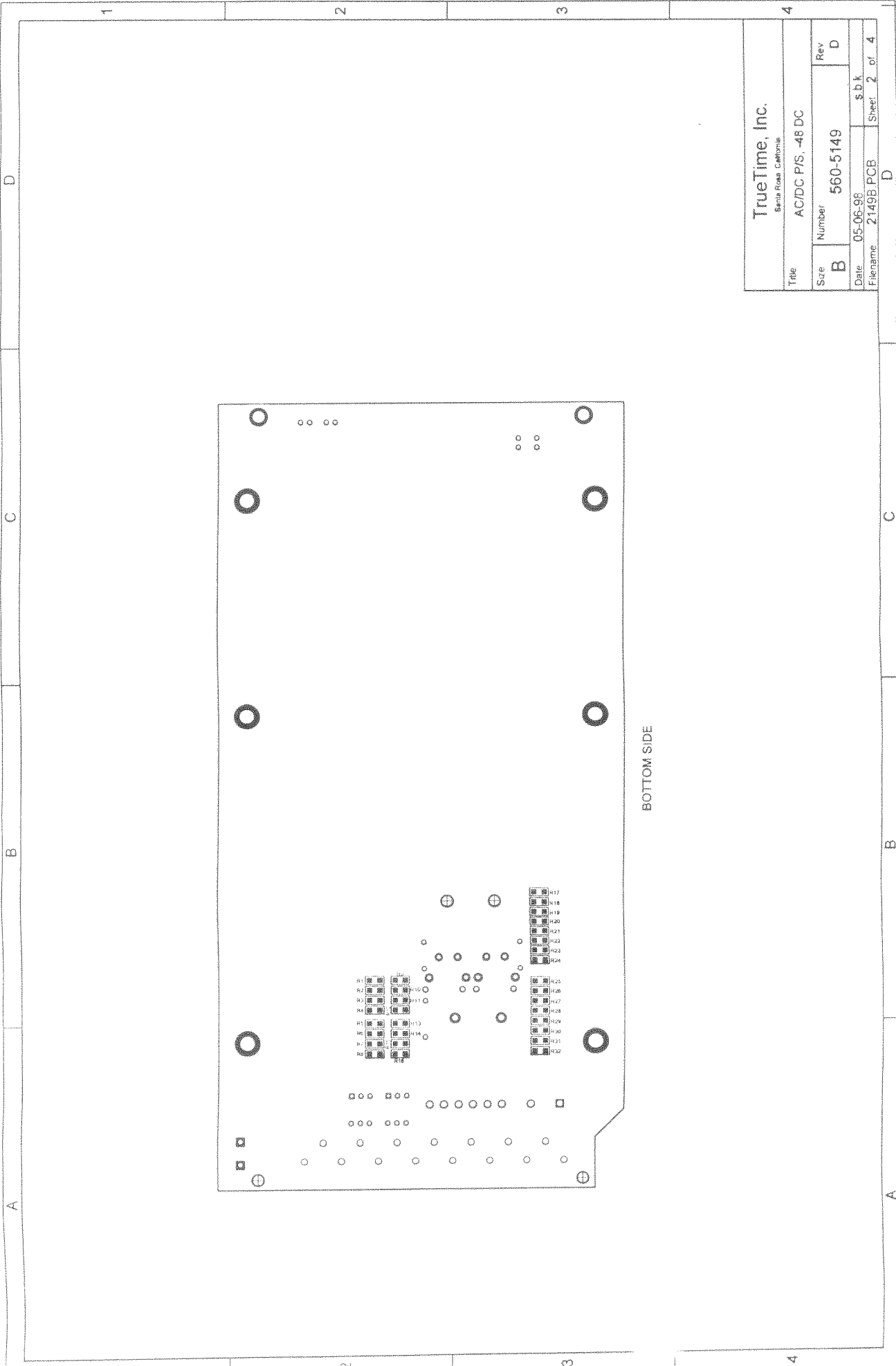
DATE	APPROVED
5-5-97	
9-15-97	
1-30-98	
5-6-98	<i>CL</i>

TOP SIDE

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CONTRACT NO.	APPROVALS	DATE
	S b k	5-5-97
DRAWN BY	CHECKED	
APPROVED		
NEXT ASSY		

TrueTime, Inc. Santa Rosa, California	
Title	AC/DC P/S, -48 DC
Size	Number
B	560-5149
Date	05-06-98
Filename	2149B.PCB
S b k	Sheet 1 of 4



TrueTime, Inc. Santa Rosa, California	
Title	AC/DC P/S, -48 DC
Size	B
Number	560-5149
Date	05-06-98
Filename	2149B.PCB
Rev	D
s.b.k.	Sheet 2 of 4

MAX * BILL OF MATERIALS * SINGLE-LEVEL EXPLOSION BY PART IDENTIFIER W/REFERENCE

PART IDENTIFIER	DESCRIPTION 1	DESCRIPTION 2	EFF DATE	EON #	QTY/ASSY	REV UOM LVL	REFERENCE DESCRIPTION
560-5149	ASSY PWR SUP AC/DC -48VDC MADE FROM 560-2149					EA	
0000-APPROVAL	PARTS LIST APPROVAL		0000		1.0000	EA	<u>CK/02 5-11-98</u>
0000-PL	PARTS LIST REV LEVEL		0000		1.0000	EA	REV D (05-08-98)
0000-PRINT	REFERENCE PRINT		0000		1.0000	EA	560-5149 REV D
0000-REV	PCB REV LEVEL HERE >>>>		0000		1.0000	EA	560-2149 REV B
0025-473	RES 47K OHM 1/4W 1206 5%	NIC NRC25R473TR	0000		32.0000	EA	R1,32
028-026-200	CAP FILM .1UF 250V	NICHICON QXJ2E104KTPT	0000		1.0000	EA	C3
045-33	INDUCTOR 33UH 5.5A	DALE IHM-2 33UH +/-10%	0000		1.0000	EA	L1
055-SA60	TRANSORB 60V	CSI SA60	0000		2.0000	EA	CR4,6
057-1N5245	DIODE,ZENER 15V 0.5W	MOTOROLA 1N5245A	0000		2.0000	EA	CR1,5
057-4002	DIODE 100V 3A RECTIFIER	1N4002	0000		2.0000	EA	CR2,7
057-MBR10100	RECTIFIER	MOTOROLA MBR10100	0000		2.0000	EA	CR3,8
058-020	LED	DIALIGHT 550-3006	0000		2.0000	EA	DS1,2
088-SRW115-2004	P/S 85-264VAC DUAL 28V/2A	IPD SRW-115-2004-28	0000		1.0000	EA	22
176-4N37	4N37 OPTICAL COUPLER	MOTOROLA #4N37	0000		2.0000	EA	U1,2
223-008	HANDLE FOR 3U X 8HP	SCHROFF 20808-062	0000		1.0000	EA	08
223-131	SCHROFF TP DUAL	SCHROFF #69004-131	0000		2.0000	EA	TP1,2
223-144	NUT M2.5	SCHROFF #21100-144	0000		3.0000	EA	09
223-181	HOLDER (PB) DIE CAST	SCHROFF 20827-072	0000		2.0000	EA	10
223-379	SCREW CAP NP M2.5 X 11	SCHROFF #21100-379	0000		2.0000	EA	11
223-464	SLEEVE, STAINLESS	SCHROFF 21100-660	0000		2.0000	EA	12
223-500	SCREW PH FH NP M2.5X10	SCHROFF #21100-500	0000		1.0000	EA	13
240-004-002	SCREW PH PH SS 4-40X1/4	SCREW PAN	0000		2.0000	EA	14
241-006-002	SCREW PH FH SS 6-32X1/4	BUY/USE ONLY 100 DEGREE	0000		2.0000	EA	25
241-006-005	SCREW PH FH SS 6-32X5/8	BUY/USE ONLY 100 DEGREE	0000		8.0000	EA	06
249-005	SCREW M2.5 X 8	SCHROFF #21100-140	0000		2.0000	EA	16
249-007	SCREW SH CH ZN M2.5X12	SCHROFF 21100-148	0000		4.0000	EA	17
251-004	NUT KEP SS 4-40	KEPNUT	0000		2.0000	EA	18
251-006	NUT KEP SS 6-32 .250 HEX	KEPNUT SMALL PATTERN	0000		2.0000	EA	20
255-006-009	SPACER 6-32X1-1/8X1/4	AMATOM 2114-632-A-7	0000		2.0000	EA	04
255-006-019	SPCR HEX NYL 6-32X1-3/16	RAF 2115-632-N	0000		2.0000	EA	26
269-006	WSHR FLT NYL 6 1/16 .3100	AROW NFW-06-062	0000		2.0000	EA	05
270-006-002A	1/4R X 1/8IN LONG NYLON	SPACER	0000		4.0000	EA	23
272-009	INSULATOR 10-220 SIL PAD	BERGQUIST 3223-07AC-55	0000		2.0000	EA	21
273-009	TERMINAL TEST POINT	COMP CORP PJ-201-25	0000		1.0000	EA	GND
282-002	ADHESIVE LOC-ITTE ASSURE	LOC TITE ASSURE 425	0000		0.2000	EA	SEE DWG NOTE 6
372-15RA	CONN 15-P DIN PWR RT ANG	HARTING 09-06-115-2921	0000		1.0000	EA	P1
401-01-01-100	HEADER 10-P LCKNG W/VOIDS	MOLEX 26-60-4100 (CUSTOM)	0000		1.0000	EA	J1
560-1220	PANEL,POWER SUPPLY AC/DC	FAB/SCREEN (DRC56000)	0000		1.0000	EA	02
560-1223	GUIDE RAIL FOR DRC P/S	FAB	0000		2.0000	EA	03
560-1224	CABLE ASSY PWR SUP (DRC)		0000		1.0000	EA	24
560-2149	PCB PWR SUP AC/DC -48VDC	FAB	0000		1.0000	EA	01
560-2177	PCB SHIELD DRC PWR SUP	SEE BOM NAV NOTES	0000		1.0000	EA	07
LA	LABOR ASSEMBLY COST HRS		0000		0	EA	
LT	LABOR TEST COST HOURS		0000		0	EA	
OSV560-5149	OUTSIDE LABOR 560-5149	PCA	0000		1.0000	EA	