



GE Medical Systems

Technical Publications

sm 2165121-100

Revision 1

SCPU V2 Power Unit Central Listings

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ATTENTION

LES APPAREILS À RAYONS X SONT DANGEREUX À LA FOIS POUR LE PATIENT ET POUR LE MANIPULATEUR SI LES MESURES DE PROTECTION NE SONT PAS STRICTEMENT APPLIQUEES

Bien que cet appareil soit construit selon les normes de sécurité les plus sévères, la source de rayonnement X représente un danger lorsque le manipulateur est non qualifié ou non averti. Une exposition excessive au rayonnement X entraîne des dommages à l'organisme.

Par conséquent, toutes les précautions doivent être prises pour éviter que les personnes non autorisées ou non qualifiées utilisent cet appareil créant ainsi un danger pour les autres et pour elles-mêmes.

Avant chaque manipulation, les personnes qualifiées et autorisées à se servir de cet appareil doivent se renseigner sur les mesures de protection établies par la Commission Internationale de la Protection Radiologique, Annales 26 : Recommandations de la Commission Internationale sur la Protection Radiologique et les normes nationales en vigueur.

WARNING

X-RAY EQUIPMENT IS DANGEROUS TO BOTH PATIENT AND OPERATOR UNLESS MEASURES OF PROTECTION ARE STRICTLY OBSERVED

Though this equipment is built to the highest standards of electrical and mechanical safety, the useful x-ray beam becomes a source of danger in the hands of the unauthorized or unqualified operator. Excessive exposure to x-radiation causes damage to human tissue.

Therefore, adequate precautions must be taken to prevent unauthorized or unqualified persons from operating this equipment or exposing themselves or others to its radiation.

Before operation, persons qualified and authorized to operate this equipment should be familiar with the Recommendations of the International Commission on Radiological Protection, contained in Annals Number 26 of the ICRP, and with applicable national standards.

ATENCION

LOS APARATOS DE RAYOS X SON PELIGROSOS PARA EL PACIENTE Y EL MANIPULADOR CUANDO LAS NORMAS DE PROTECCION NO ESTAN OBSERVADAS

Aunque este aparato está construido según las normas de seguridad más estrictas, la radiación X constituye un peligro al ser manipulado por personas no autorizadas o incompetentes. Una exposición excesiva a la radiación X puede causar daños al organismo.

Por consiguiente, se deberán tomar todas las precauciones necesarias para evitar que las personas incompetentes o no autorizadas utilicen este aparato, lo que sería un peligro para los demás y para sí mismas.

Antes de efectuar las manipulaciones, las personas habilitadas y competentes en el uso de este aparato, deberán informarse sobre las normas de protección fijadas por la Comisión Internacional de la Protección Radiológica, Anales No 26: Recomendaciones de la Comisión Internacional sobre la Protección Radiológica y normas nacionales.

ACHTUNG

RÖNTGENAPPARATE SIND EINE GEFAHR FÜR PATIENTEN SOWIE BEDIENUNGSPERSONAL, WENN DIE GELTENDEN SICHERHEITSVORKEHRUNGEN NICHT GENAU BEACHTET WERDEN

Dieser Apparat entspricht in seiner Bauweise strengsten elektrischen und mechanischen Sicherheitsnormen, doch in den Händen unbefugter oder unqualifizierter Personen wird er zu einer Gefahrenquelle. Übermäßige Röntgenbestrahlung ist für den menschlichen Organismus schädlich.

Deswegen sind hinreichende Vorsichtsmaßnahmen erforderlich, um zu verhindern, daß unbefugte oder unqualifizierte Personen solche Geräte bedienen oder sich selbst und andere Personen deren Bestrahlung aussetzen können.

Vor Inbetriebnahme dieses Apparats sollte sich das qualifizierte und befugte Bedienungspersonal mit den geltenden Kriterien für den gefahrlosen Strahleneinsatz durch sorgfältiges Studium des Hefts Nr. 26 der Internationalen Kommission für Strahlenschutz (ICRP) vertraut machen: Empfehlungen der Internationalen Kommission für Strahlenschutz und anderer nationaler Normenbehörden.

WARNING

- THIS SERVICE MANUAL IS AVAILABLE IN ENGLISH ONLY.
- IF A CUSTOMER'S SERVICE PROVIDER REQUIRES A LANGUAGE OTHER THAN ENGLISH, IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE TRANSLATION SERVICES.
- DO NOT ATTEMPT TO SERVICE THE EQUIPMENT UNLESS THIS SERVICE MANUAL HAS BEEN CONSULTED AND IS UNDERSTOOD.
- FAILURE TO HEED THIS WARNING MAY RESULT IN INJURY TO THE SERVICE PROVIDER, OPERATOR OR PATIENT FROM ELECTRIC SHOCK, MECHANICAL OR OTHER HAZARDS.

AVERTISSEMENT

- CE MANUEL DE MAINTENANCE N'EST DISPONIBLE QU'EN ANGLAIS.
- SI LE TECHNICIEN DU CLIENT A BESOIN DE CE MANUEL DANS UNE AUTRE LANGUE QUE L'ANGLAIS, C'EST AU CLIENT QU'IL INCOMBE DE LE FAIRE TRADUIRE.
- NE PAS TENTER D'INTERVENTION SUR LES ÉQUIPEMENTS TANT QUE LE MANUEL SERVICE N'A PAS ÉTÉ CONSULTÉ ET COMPRIS.
- LE NON-RESPECT DE CET AVERTISSEMENT PEUT ENTRAÎNER CHEZ LE TECHNICIEN, L'OPÉRATEUR OU LE PATIENT DES BLESSURES DUES À DES DANGERS ÉLECTRIQUES, MÉCANIQUES OU AUTRES.

WARNUNG

- DIESES KUNDENDIENST-HANDBUCH EXISTIERT NUR IN ENGLISCHER SPRACHE.
- FALLS EIN FREMDER KUNDENDIENST EINE ANDERE SPRACHE BENÖTIGT, IST ES AUFGABE DES KUNDEN FÜR EINE ENTSPRECHENDE ÜBERSETZUNG ZU SORGEN.
- VERSUCHEN SIE NICHT, DAS GERÄT ZU REPARIEREN, BEVOR DIESES KUNDENDIENST-HANDBUCH NICHT ZU RATE GEZOGEN UND VERSTANDEN WURDE.
- WIRD DIESE WARNUNG NICHT BEACHTET, SO KANN ES ZU VERLETZUNGEN DES KUNDENDIENSTTECHNIKERS, DES BEDIENERS ODER DES PATIENTEN DURCH ELEKTRISCHE SCHLÄGE, MECHANISCHE ODER SONSTIGE GEFAHREN KOMMEN.

AVISO

- ESTE MANUAL DE SERVICIO SÓLO EXISTE EN INGLÉS.
- SI ALGÚN PROVEEDOR DE SERVICIOS AJENO A GEMS SOLICITA UN IDIOMA QUE NO SEA EL INGLÉS, ES RESPONSABILIDAD DEL CLIENTE OFRECER UN SERVICIO DE TRADUCCIÓN.
- NO SE DEBERÁ DAR SERVICIO TÉCNICO AL EQUIPO, SIN HABER CONSULTADO Y COMPRENDIDO ESTE MANUAL DE SERVICIO.
- LA NO OBSERVANCIA DEL PRESENTE AVISO PUEDE DAR LUGAR A QUE EL PROVEEDOR DE SERVICIOS, EL OPERADOR O EL PACIENTE SUFRAN LESIONES PROVOCADAS POR CAUSAS ELÉCTRICAS, MECÁNICAS O DE OTRA NATURALEZA.

ATENÇÃO

- ESTE MANUAL DE ASSISTÊNCIA TÉCNICA SÓ SE ENCONTRA DISPONÍVEL EM INGLÊS.
- SE QUALQUER OUTRO SERVIÇO DE ASSISTÊNCIA TÉCNICA, QUE NÃO A GEMS, SOLICITAR ESTES MANUAIS NOUTRO IDIOMA, É DA RESPONSABILIDADE DO CLIENTE FORNECER OS SERVIÇOS DE TRADUÇÃO.
- NÃO TENHA TENTADO REPARAR O EQUIPAMENTO SEM TER CONSULTADO E COMPREENDIDO ESTE MANUAL DE ASSISTÊNCIA TÉCNICA.
- O NÃO CUMPRIMENTO DESTA AVISO PODE POR EM PERIGO A SEGURANÇA DO TÉCNICO, OPERADOR OU PACIENTE DEVIDO A CHOQUES ELÉTRICOS, MECÂNICOS OU OUTROS.

AVVERTENZA

- IL PRESENTE MANUALE DI MANUTENZIONE È DISPONIBILE SOLTANTO IN INGLESE.
- SE UN ADDETTO ALLA MANUTENZIONE ESTERNO ALLA GEMS RICHIEDE IL MANUALE IN UNA LINGUA DIVERSA, IL CLIENTE È TENUTO A PROVVEDERE DIRETTAMENTE ALLA TRADUZIONE.
- SI PROCEDA ALLA MANUTENZIONE DELL'APPARECCHIATURA SOLO DOPO AVER CONSULTATO IL PRESENTE MANUALE ED AVERNE COMPRESO IL CONTENUTO.
- NON TENERE CONTO DELLA PRESENTE AVVERTENZA POTREBBE FAR COMPIERE OPERAZIONI DA CUI DERIVINO LESIONI ALL'ADDETTO ALLA MANUTENZIONE, ALL'UTILIZZATORE ED AL PAZIENTE PER FOLGORAZIONE ELETTRICA, PER URTI MECCANICI OD ALTRI RISCHI.

警告

- ・ このサービスマニュアルには英語版しかありません。
- ・ GEMS以外でサービスを担当される業者が英語以外の言語を要求される場合、翻訳作業はその業者の責任で行うものとさせていただきます。
- ・ このサービスマニュアルを熟読し理解せずに、装置のサービスを行わないで下さい。
- ・ この警告に従わない場合、サービスを担当される方、操作員あるいは患者さんが、感電や機械的又はその他の危険により負傷する可能性があります。

注意：

- 本维修手册仅存有英文本。
- 非 GEMS 公司的维修员要求非英文本的维修手册时，客户需自行负责翻译。
- 未详细阅读和完全了解本手册之前，不得进行维修。
- 忽略本注意事项会对维修员，操作员或病人造成触电，机械伤害或其他伤害。

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Revision 1

SCPU V2 Central Listings

IMPORTANT! ... X–RAY PROTECTION

X–RAY equipment if not properly used may cause injury. Accordingly, the instructions herein contained should be thoroughly read and understood before you attempt to place this equipment in operation. The General Electric Company, Medical Systems Group, will be glad to assist and cooperate in placing this equipment in use.

Although this apparatus incorporates a high degree of protection against x–radiation other than the useful beam. No practical design of equipment can provide complete protection. Nor can any practical design compel the operator to take

adequate precautions to prevent the possibility of any persons carelessly, unwisely, or unknowingly exposing themselves or others to radiation.

It is important that everyone having anything to do with x–radiation be properly trained and fully acquainted with the recommendations of the National Council on Radiation Protection and Measurements as published in NCRP Reports available from NCRP Publications, 7910 Woodmont Avenue, Room 1016, Bethesda, Maryland 20814 and of the International Commission on Radiation Protection,

and take adequate steps to insure protection against injury.

All persons authorized to use the equipment must be cognizant of the danger of excessive exposure to x–radiation and the equipment is sold with the understanding that the General Electric Company, Medical Systems Group, its agents, and representatives have no responsibility for injury or damage which may result from exposure to x–radiation.

Various protective material and devices are available. It is urged that such materials or devices be used.

WARNING

**THE SCPU DOES NOT HAVE INTERNAL REMOTE TRIP CONNECTION
AND HAS NO INTERNAL CIRCUIT BREAKER.
THE REMOTE TRIP CAPABILITY AND THE CIRCUIT BREAKER ARE
CUSTOMER'S RESPONSIBILITY.**

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REVISION HISTORY

REV	DATE	TYPE OF MODIFICATION
0	10–Apr–97	SCPU V2 replacing SCPU V1 (C/R modifications). Legacy CC M3 Level.
1	03–Dec–97	S2 switch position on CPU board corrected paragraph 7–1 (Consequence of CQA 97 2563)

LIST OF EFFECTIVE PAGES

PAGE	REVISION	PAGE	REVISION	PAGE	REVISION
Title page	1				
Warning	1				
i thru x	1				
1 thru 34	1				

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CENTRAL LISTINGS

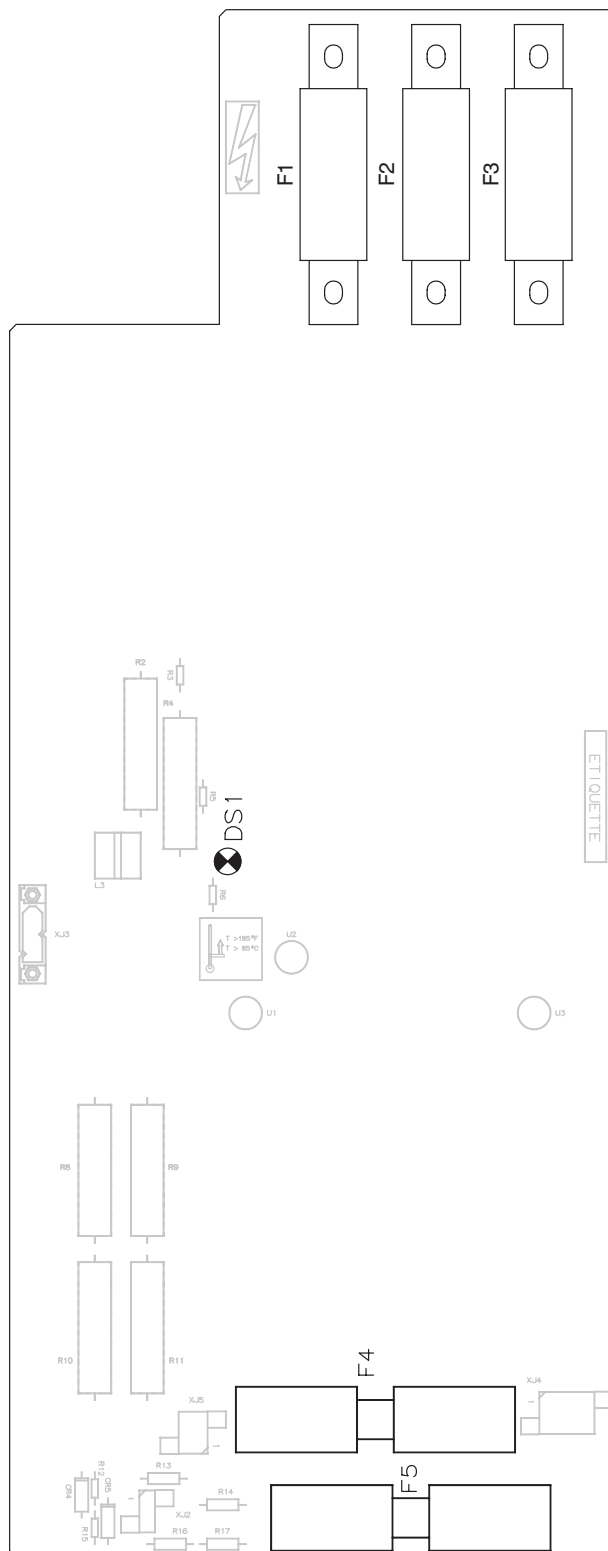
SECTION 1 INTRODUCTION

This document lists SCPU V2 components which may require access during service procedures (switches, jumpers, indicator lights, etc.). Information for each circuit board is in a self-contained section, containing the component list and a layout diagram.

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SECTION 2
SCPU A3 A1 DC FILTER BOARD

ILLUSTRATION 1
SCPU A3 A1 DC FILTER BOARD FILTER SWITCHES, JUMPERS, ETC.



2-1 Switches and Jumpers

None.

2-2 Indicators

INDICATOR	INDICATES:	LOCATION ON SCHEMATIC:
DS1	DC SUPPLIES ON	1/C6

2-3 Test Points

None.

2-4 Fuses

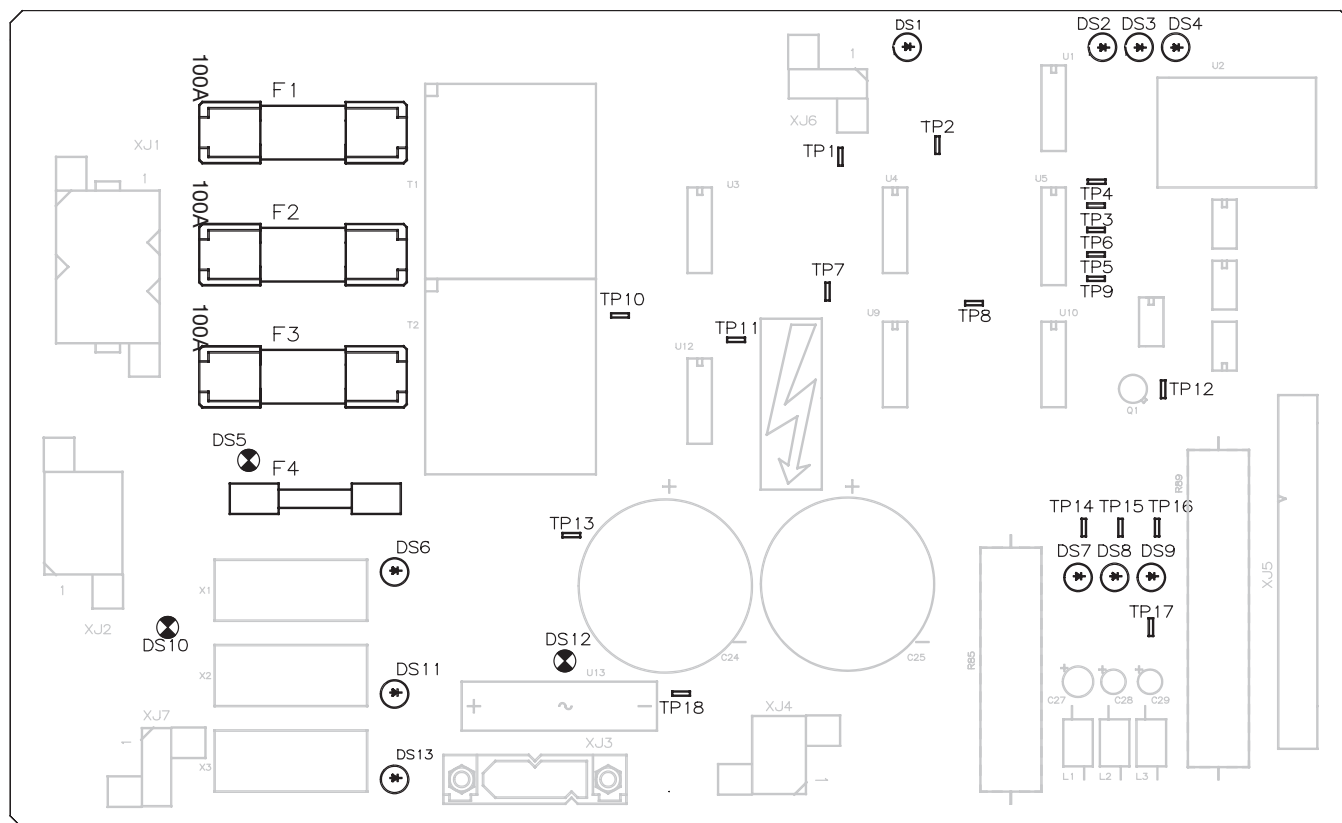
FUSE	PROTECTS:	TYPE	LOCATION ON SCHEMATIC:
F1	PHASE 1 INPUT	100 A, 600 V	1/B3
F2	PHASE 2 INPUT	100 A, 600 V	1/C3
F3	PHASE 3 INPUT	100 A, 600 V	1/C3
F4	START SUPPLY	15 AFF, 700 V	1/D8
F5	HEATER SUPPLY	3 AFF, 700 V	1/F8

2-5 Adjustments

None.

SECTION 3
SCPU A3 A2 MAIN POWER SUPPLY BOARD

ILLUSTRATION 2
SCPU A3 A2 MAIN POWER SUPPLY BOARD SWITCHES, JUMPERS, ETC.



3–1 Switches

None.

3–2 Indicators

INDICATOR	COLOR	INDICATES:	LOCATION ON SCHEMATIC:
DS1	Green	80 KW DC DROP	2/A4
DS2	Green	65 KW DC DROP	2/A3
DS3	Green	+15 VM ON	4/D2
DS4	Green	–15 VM ON	4/E1
DS5	Neon	115 V AC ON	1/G3
DS6	Yellow	_SYST_ON ON	1/G2
DS7	Green	+5 VS ON	4/F3
DS8	Green	+15 VS ON	4/G2
DS9	Green	–15 VS ON	4/G1
DS10	Neon	220_240 AC ON	1/G3
DS11	Yellow	_GEN_ON ON	1/H1
DS12	Neon	LV_SUPPLY ON	4/E4
DS13	Yellow	_PUMP_ON ON	1/G1

3-3 Testpoints

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
		RANGE	
TP1	+15 V M		4/E2
TP2	+5 VM		4/D2
TP3	E < 30 V : 0 V	0 – 15 V	3/E1
TP4	– 15 VM		4/E2
TP5	DC MEAS BUS 1	0 – 5 V	3/C2
TP6	400 < E < 750 V : 15 V	0 – 10 V	3/G4
TP7	0 VM		4/D2
TP8	DC MEASUREMENT; 1 V/100 V	1 V/100 V	2/D2
TP9	DC MEAS BUS 0	0 – 5 V	3/C3
TP10	PHASE MEASUREMENT; 1 V/88 V	1 V/88 V	1/C4
TP11	–PH ON	0 – 5 V	1/A3
TP12	+10 V M		4/C2
TP13	+ LV SUPPLY		4/E4
TP14	+5 V S		4/G3
TP15	+15 V S		4/G3
TP16	– 15 VS		4/G1
TP17	0 V		4/G2
TP18	– LV SUPPLY		4/E3

3-4 Adjustments

None.

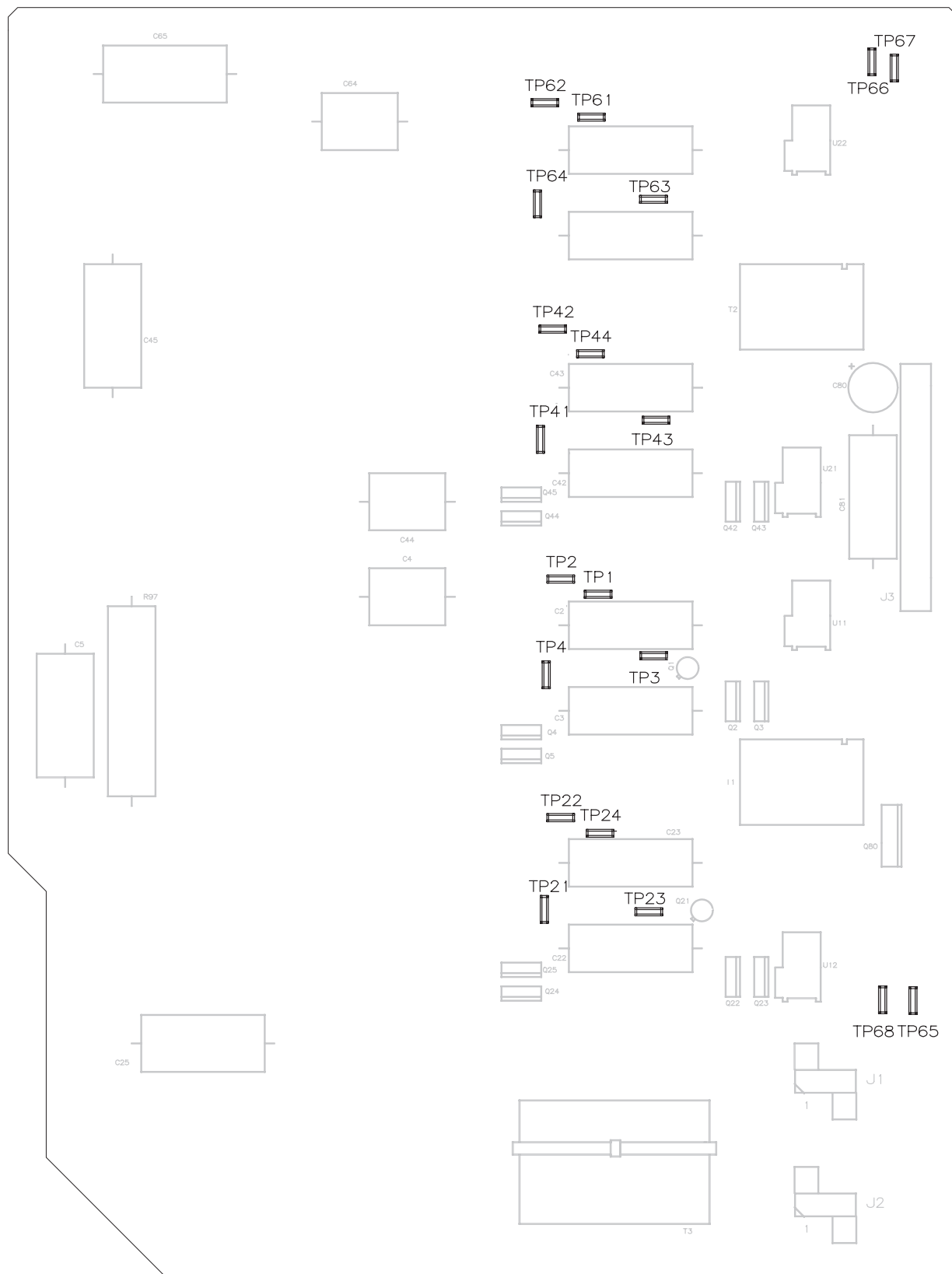
3-5 Fuses

FUSE	PROTECTS:	TYPE	LOCATION ON SCHEMATIC:
F1	PHASE 3 INPUT	3AT, 500 V	1/G4
F2	PHASE 2 INPUT	3AT, 500 V	1/G3
F3	PHASE 1 INPUT	3AT, 500 V	1/G3
F4	115 V_S	3.2AT, 250 V	1/G2

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SECTION 4
SCPU A3 A3 INVERTER BOARD

ILLUSTRATION 3
SCPU A3 A3 INVERTER BOARD SWITCHES, JUMPERS, ETC.



REV 1

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4-1 Switches

None.

4-2 Indicators

None.

4-3 Testpoints

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL	RANGE	
TP1	+18 V – T11		1/A2
TP2	GATE – T11		1/A2
TP3	EMITTER – T11	–18 V, +18 V	1/A3
TP4	–18 V – T11		1/A1
TP21	+18 V – T12		1/A4
TP22	GATE – T12	–18 V, +18 V	1/A3
TP23	EMITTER – T12		1/A3
TP24	–18 V – T12		1/A3
TP41	+18 V – T21		2/A4
TP42	GATE – T21	–18 V, +18 V	2/A4
TP43	EMITTER – T21		2/A3
TP44	–18 V – T21		2/A3
TP61	+18 V – T22		2/A2
TP62	GATE – T22	–18 V, +18 V	2/A2
TP63	EMITTER – T22		2/A2
TP64	–18 V – T22		2/A1
TP65	FPS – T1 – CMD	0 V, 24 V	1/F3
TP66	0 V		1/F2
TP67	FPS – T2 – CMD	0 V, 24 V	2/F3
TP68	0 V		2/F2

4-4 Fuses

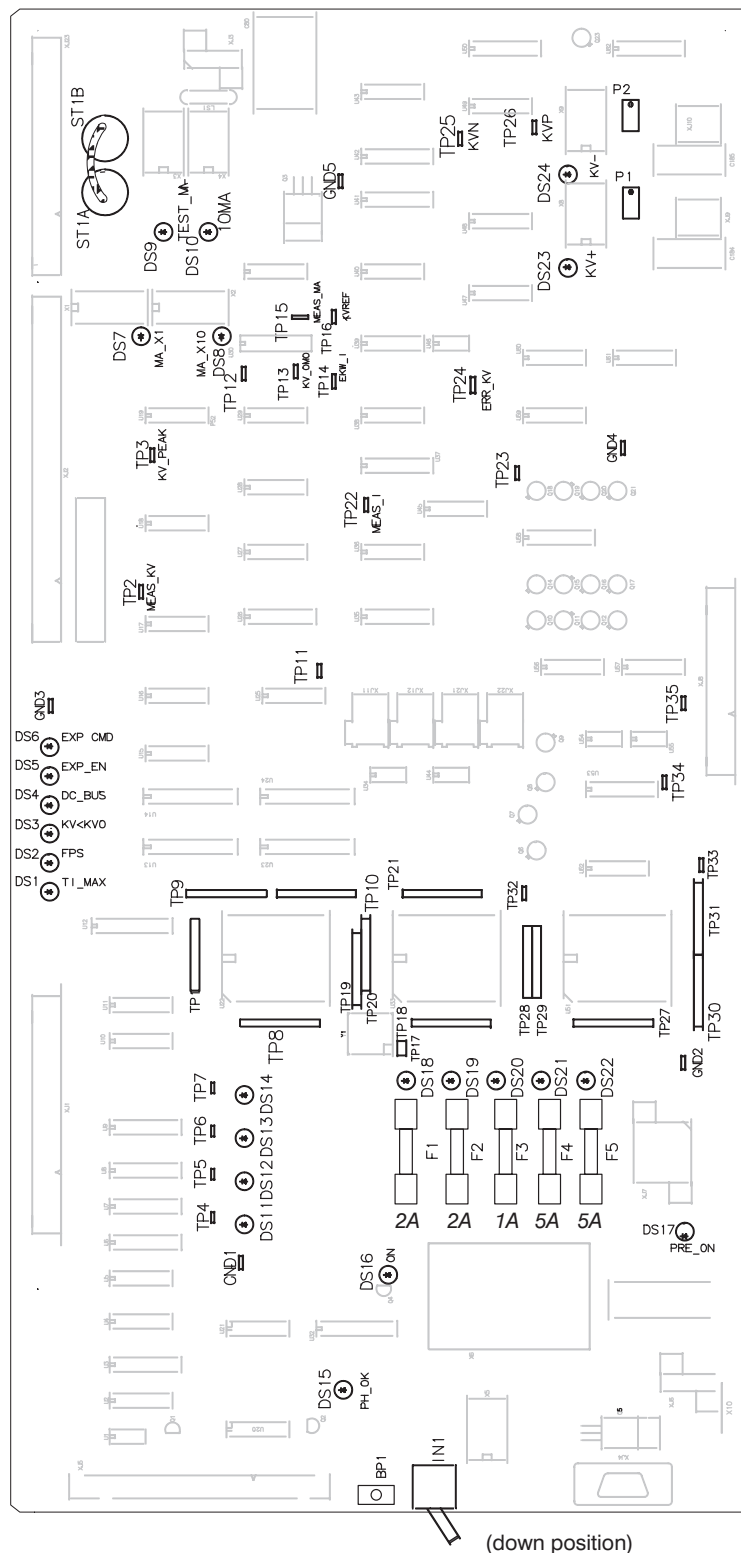
None.

4-5 Adjustments

None.

SECTION 5
SCPU A4 A1 COMMAND 1 BOARD

ILLUSTRATION 4
SCPU A4 A1 COMMAND 1 BOARD SWITCHES AND JUMPERS, ETC.



5-1 Switches and jumpers

SWITCH OR JUMPER	FUNCTION	LOCATION ON SCHEMATIC:
BP1	DC – DROP – RESET	9/B2
ST1B–ST1A	The strap may be replaced by a miliammeter to allow direct measurement of the tube current	8/D3
IN1	Inhibit DC BUS is OFF normal position is ON (down)	9/D8

5-2 Indicators

INDICATOR	COLOR	INDICATES:	LOCATION ON SCHEMATIC:
DS1	Red	EXP TIME MAX	12/A4
DS2	Red	FPS FAULT	12/A3
DS3	Red	kV < kV0	12/A3
DS4	Red	DC BUS FAULT	12/A4
DS5	Green	EXPOSURE ENABLE ON	10/F2
DS6	Green	EXPOSURE COMMAND ON	10/F1
DS7	Yellow	mA X 1 ON	8/E1
DS8	Yellow	mA X 10 ON	8/F1
DS9	Yellow	TEST mA ON	8/D4
DS10	Yellow	10 mA SOURCE SELECT ON	8/G4
DS11	Green	+15 VS ON	17/B3
DS12	Green	–15 VS ON	17/B2
DS13	Green	+5 VS ON	17/B4
DS14	Green	+24 VS ON	17/B1
DS15	Green	_PH OK ON	16/B4
DS16	Green	LV ON ON	15/E2
DS17	Green	LV PRE ON ON	15/D2
DS18	Green	+24 V OLEO ON	17/H4
DS19	Green	+15 V BF ON	17/D3
DS20	Green	–15 V BF ON	17/D2
DS21	Green	+5 V BF ON	17/D4
DS22	Green	+24 V BF ON	17/D22
DS23	Yellow	Test KV+	1/E4
DS24	Yellow	Test KV–	1/E2

5–3 Testpoints

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL	RANGE	
TP2	MEAS kV	1 V/16 kV	1/B4
TP3	kV_PEAK	1 V/16 kV	3/D2
TP4	+15 V S		17/B3
TP5	–15 V S		17/B3
TP6	+5 V S		17/B4
TP7	+24 V S		17/B2
TP11	VIMP2	1 V/1 kV	5/D3
TP12	V IMP	1 V/1 kV	5/B4
TP13	KV Demand	1 V/16 kV	7/B4
TP14	EkV _IMP	1 V/1 kV	5/H3
TP15	mA_MEAS	RANGE	8/A3
TP16	KVREF	1 V/16 kV	7/F4
TP22	MEAS_I	1 V/100 A	6/D4
TP23	VIMP1	1 V/1 kV	5/D4
TP24	ERROR kV	1 V/4 kV	1/B3
TP32	EkV LIN 1	1 V/2 kV	4/G3
TP33	EkV LIN 2	1 V/2 kV	4/G2
TP34	kV CONV 2	1 V/2 kV	4/G3
TP35	kV CONV 1	1 V/2 kV	4/G2

5–4 Fuses

FUSE	PROTECTS:	TYPE	LOCATION ON SCHEMATIC:
F1	+24 V OLEO	2 AT 250 V	17/H4
F2	+15 VS	2 AT 250 V	17/C3
F3	–15 VS	1 AT 250 V	17/C3
F4	+5 VS	5 AT 250 V	17/C4
F5	+24 VS	5 AT 250 V	17/C2

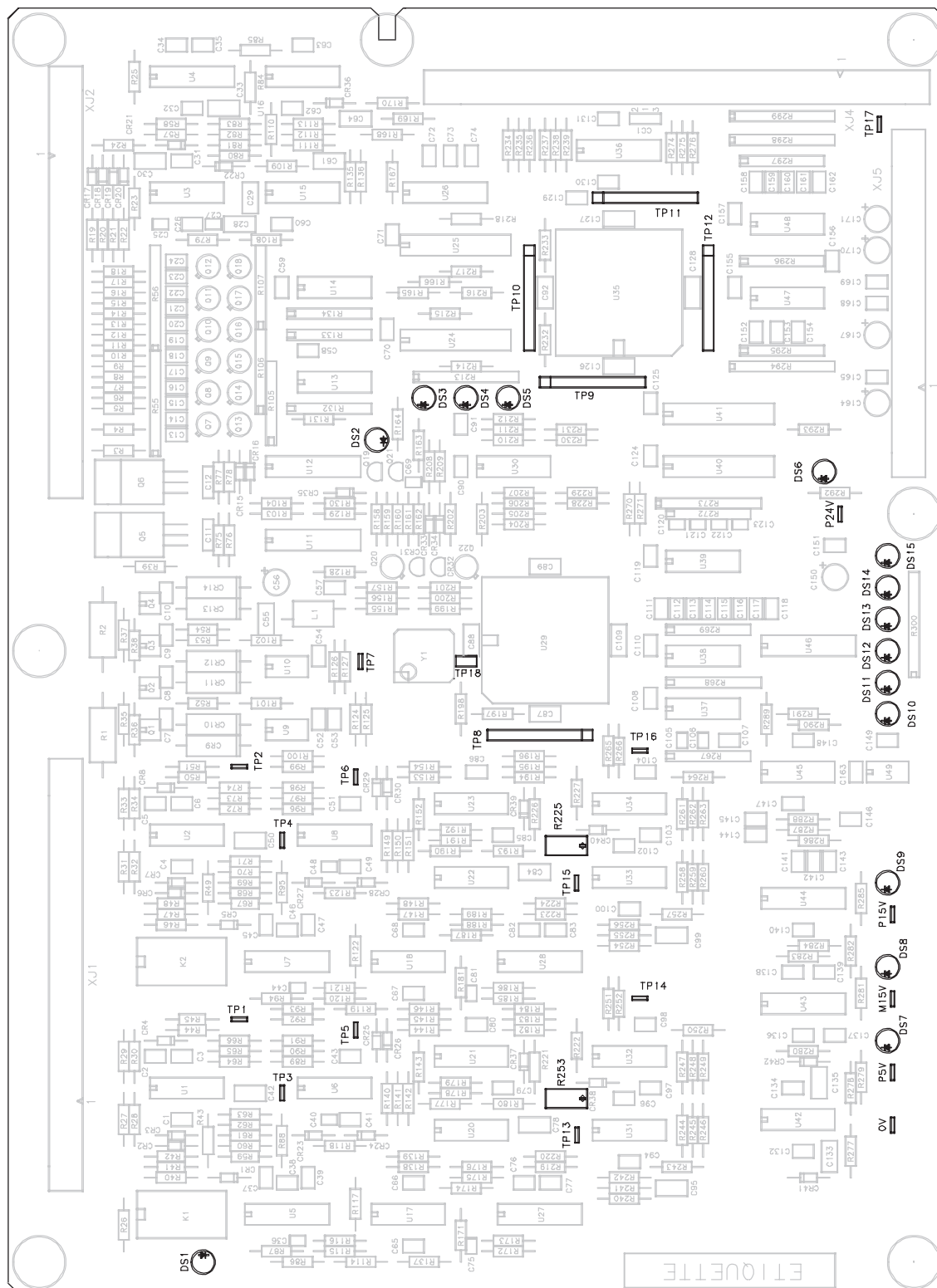
5–5 Adjustments

ADJUSTMENT	FUNCTION	LOCATION ON SCHEMATIC:
P1	Adjust kV positive waveform	1/F3
P2	Adjust kV negative waveform	1/F2

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SECTION 6
SCPU A4 A2 COMMAND 2 BOARD

ILLUSTRATION 5
SCPU A4 A2 COMMAND 2 BOARD SWITCHES, JUMPERS, ETC.



6–1 Switches and Jumpers

None.

6–2 Indicators

INDICATOR	COLOR	INDICATES	LOCATION ON SCHEMATIC
DS1	Yellow	XL_DIAG_ON	7/E9
DS2	Green	LOW VOLTAGE ENABLE	14/D7
DS3	Red	START OVERLOAD	2/E9
DS4	Yellow	CURRENT START ON	2/F9
DS5	Yellow	LOW SPEED RELAY	2/B4
DS6	Green	+24 V ON	14/F4
DS7	Green	+5 V ON	14/B10
DS8	Green	–15 V ON	14/B9
DS9	Green	+15 V ON	14/C9
DS10	Yellow	XS PRESENT	12/B3
DS11	Red	XS OVERLOAD	12/C3
DS12	Red	XS HEATER FAULT	12/C3
DS13	Red	XL HEATER FAULT	12/E3
DS14	Red	XI OVERLOAD	12/E3
DS15	Yellow	XL PRESENT	12/D3

6–3 Testpoints

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC
		RANGE	
0 V	0 V		14/B8
M15V	–15 V		14/B9
P5V	+5 V		14/A9
P15V	+15 V		14/C9
P24V	+24 V		14/E3
TP1	$\sqrt{(\text{SET_HEATER_XL}) - (\text{MEAS_I_XL})^2}$		6/C8
TP2	$\sqrt{(\text{SET_HEATER_XS}) - (\text{MEAS_I_XS})^2}$		10/C8
TP3	XL CURRENT	0.706 V/1 A (Pr'y) 0.318 V/1 A (Sec'y.)	6/D4
TP4	XS CURRENT	0.706 V/1 A (Pr'y) 0.318 V/1 A (Sec'y.)	10/D4
TP5	(XL CURRENT) ²	1 V/10 A (Sec'y.)	6/C7
TP6	(XS CURRENT) ²	1 V/10 A (Sec'y.)	10/C7
TP7	0 V		14/B7
TP8	Not used		
TP9	Not used		
TP10	Not used		
TP11	Not used		
TP12	Not used		
TP13	SET HEATER XL	1 V/1 A	6/B4
TP14	OVERLOAD XL	0–5 V	6/B9
TP15	SET HEATER XS	10 V/10 A	10/B4
TP16	OVERLOAD XS	0–5 V	10/B10
TP17	0 V		14/B7
TP18			12/A6

6–4 Fuses

None.

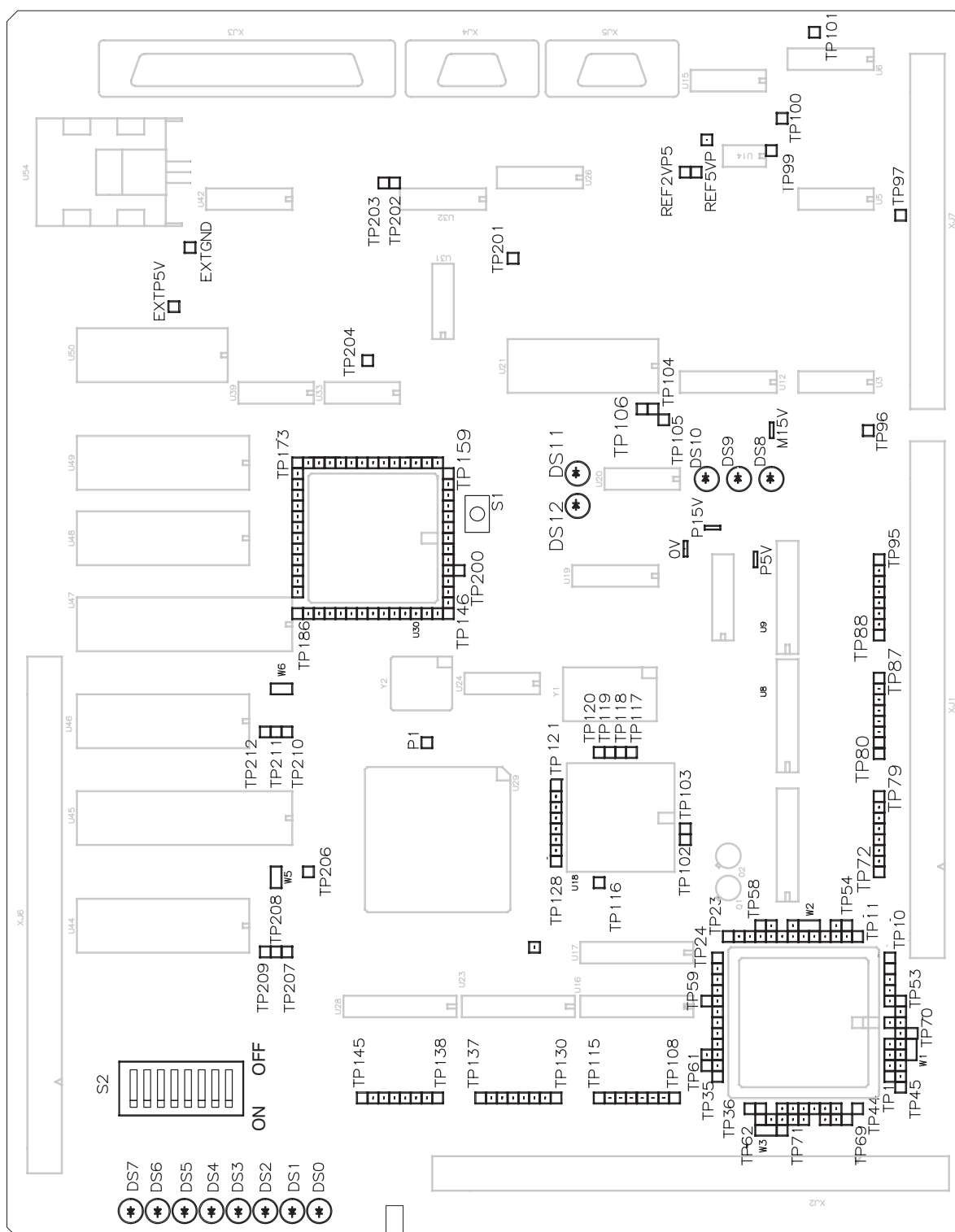
6–5 Adjustments

ADJUSTMENT	FUNCTION	LOCATION ON SCHEMATIC
R253	XL Multiplier offset adjustment	6/D6
R225	XS Multiplier offset adjustment	10/D6

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ILLUSTRATION 6

SCPU A4 A3 CPU BOARD SWITCHES, JUMPERS, ETC.



7–1 Switches and Jumpers

SWITCH OR JUMPER	FUNCTION	LOCATION ON SCHEMATIC
S1	RESET PUSH-BUTTON	10/G3
S2/1	 TEST SELECT SWITCHES. NORMALLY ALL ON SET AS REQUIRED FOR DIAGNOSTICS	2/E2
S2/2		2/E2
S2/3		2/E2
S2/4		2/E2
S2/5		2/E2
S2/6		2/E2
S2/7		2/E2
S2/8		2/E2

7–2 Indicators

INDICATOR	COLOR	INDICATES:	LOCATION ON SCHEMATIC:
DS0	Red	 IN DIAGNOSTIC MODE, THESE LEDS DISPLAY EITHER 80 (NORMAL) OR THE PRD ERROR CODE IN APPLICATION MODE, THESE LEDS FLASH (IN TURN) CONTINUOUSLY	2/A2
DS1	Red		2/A1
DS2	Red		2/B2
DS3	Red		2/B1
DS4	Red		2/B2
DS5	Red		2/B1
DS6	Red		2/B2
DS7	Red		2/B1
DS8		–15 V ON	14/C3
DS9		+15 V ON	14/C3
DS10		+5 V ON	14/C2
DS11	Red	CPU HALT	2/B3
DS12	Red	CPU RESET	2/B4

7–3 Testpoints

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL		
P1	_CS_SRAM		9/G2
P2	+10V		8/E2
P5V	+5 V		14/D2
M15V	–15 V		14/D3
P15V	+15 V		14/D4
0V	0 V		14/C4
EXTP5V	+5 V EXT		1/A1
EXTGND	EXT GROUND		1/A1
REF2VP5	2.5 V		8/B2
REF5VP	5 V		8/B3
TP1	spare		6/C4
TP2	VALID_DIAG		6/F4
TP3	A1		6/F4
TP4	spare		6/C4
TP5	_WRITE		6/G3
TP6	_VALID_T_MAX		6/G3
TP7	CMD_DIAG3		6/G3
TP8	_ACK_RESTART		6/G3
TP9	_POW_ON_CMD		6/G3
TP10	_RESET_KV_PEAK		6/G3
TP11	SPARE_2		6/G3
TP12	D1		6/G2
TP13	D3		6/G2
TP14	D4		6/G2
TP15	D6		6/G2
TP16	D7		6/H2
TP17	D2		6/H2
TP18	D8		6/H2
TP19	mA X 1)		6/G1
TP20	TEST_kV+		6/G1
TP21	+5 V		6/H2
TP22	COM_SEL_HEAT		6/H2
TP23	T2_SEL_HEAT		6/H2
TP24	T2_SEL_START		6/G1

7.3 Testpoints (continued)

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL		
TP25	spare		6/C2
TP26	TEST_KV–		6/G1
TP27	A2		6/G1
TP28	A3		6/F1
TP29	A5		6/F1
TP30	A\$		6/F1
TP31	ACCEL		6/F1
TP32	RUN_ROTOR		6/F1
TP33	BRAKE		6/F1
TP34	CMD_DIAG 0		6/F1
TP35	spare		6/B2
TP36	_RESET_SAFETY		6/E2
TP37	spare		6/B2
TP38	SPARE		6/B3
TP39	_RESET		6/E3
TP40	_PWRUP		6/E3
TP41	spaRE		6/E3
TP42	spare		6/B3
TP43	XS		6/F4
TP44	BOOST		6/F4
TP45	R_HEAT_XS		6/E3
TP46	COMMON_R_HEAT_XS		6/E3
TP47	+5 V		6/E3
TP48	_GE_TUBE		6/F4
TP49	SPARE_1		6/F4
TP50	OUT_EN		6/G4
TP51	COMMON_OUT_EN		6/G4
TP52	0 V		6/E3
TP53	CMD_DIAG2		6/E3
TP54	10 mA_SCE_SEL		6/G4
TP55	D0		6/G3
TP56	D5		6/G3
TP57	mA_X1		6/H3
TP58	TEST_mA		
TP59	HV_SWITCH_CTRL		6/H2
TP60	HI_SPEED		6/G1

7.3 Testpoints (continued)

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL		
TP61	HI_IMP_CMD		6/F1
TP62	CMD_DIAG 1		6/F1
TP63	spare		6/F1
TP66	FREE2 (spare)		6/E3
TP67	spare		6/E3
TP68	FREE3 (spare)		6/E3
TP69	FREE1 (spare)		6/F4
TP70	_PRE_HEAT		6/F4
TP71	_CS_OUTPUT		6/E3
TP72	Restarting Safety		3/G2
TP73	kV < kV0		3/H2
TP74	kV Max		3/H2
TP75	Regulation out		3/H2
TP76	mA Max		3/H2
TP77	FPS Fault		3/H1
TP78	Safety		3/H1
TP79	DC BUS Measure 0		3/H1
TP80	DC Bus Measure 1		5/H4
TP81	DC Bus Fault		5/H4
TP82	On Enable		5/H4
TP83	kV >75 kV		5/H3
TP84	Power On		5/H3
TP85	Status mA		5/H3
TP86	Status Test mA		5/H3
TP87	Status mA		5/H3
TP88	Exposure Time Max		5/H2
TP89	Status Test kV –		5/H2
TP90	kv OK D		5/H2
TP91	Status Test kV +		5/H2
TP92	kV Drop		5/H2
TP93	kV Drop Cathode		5/H1
TP94	kV Drop anode		5/H1
TP95	Main Drop		5/H1
TP96	mA FREQ		7/C4
TP97	HEATER XL		7/D2
TP98	HEATER XS		7/D1
TP99	mA MEAS		7/D4
TP100	kV MEAS		7/D3

7.3 Testpoints (continued)

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL		
TP101	REF 8 VP26		8/A1
TP102	_IACK_MFP		9/C2
TP103	_CS_MFP		9/C3
TP104	kV REF A		8/F2
TP105	SET HEATER A XL		8/F2
TP106	SET HEATER A XS		8/F1
TP107	RESERV A		8/F2
TP108	Max Inverter Current		3/H4
TP109	spare 1 CMD1		3/H4
TP110	spare 2 CMD2		3/H3
TP111	XS Present		3/H3
TP112	XL Present		3/H3
TP113	XL Heater Fault		3/H3
TP114	XS Heater Fault		3/H3
TP115	Start DRI V OK		3/H3
TP116	IRQ MFP		9/C3
TP117	TIMER FAST		9/B3
TP118	TIMER 10 ms		9/B3
TP119	TIMER 1 ms		9/B3
TP120	RT CLK		9/B3
TP121	EXP EN		9/B2
TP122	BUSY		9/B2
TP123	EXPOSURE COMMAND		9/B2
TP124	EXPOSURE 75		9/B2
TP125	CUR START ON		9/B2
TP126	RESTARTING SAFETY		9/B2
TP127	SAFETY		9/B2
TP128	EXP CMND		9/B2
TP129	0 V		14/C3
TP130	LS RTN		4/G4
TP131	Current Start On		4/G4
TP132	Start OVL		4/G4
TP133	Stat Start T2		4/G3
TP134	24 V OK		4/G3
TP135	HV Switch Motor Off		4/G3
TP136	Heater Current Ok		4/G3
TP137	Thermal safety		4/G3
TP138	Stat Heater T2		4/G2

7.3 Testpoints (continued)

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL		
TP139	XS Overload		4/G2
TP140	T1 Position		4/G2
TP141	XL Overload		4/G2
TP142	T2 Position		4/G2
TP143	LV Enable		4/G2
TP144	HV Switch Index		4/G1
TP145	Continuity		4/G1
TP146	CS PGM		10/B2
TP147	A10		10/B3
TP148	CS EEPROM		10/C4
TP149	CS EPROM		10/C4
TP150	spare		10/D4
TP151	CK TIMER 2		10/D4
TP152	Reset Pushbutton		10/D2
TP153	MAIN DROP		10/D2
TP154	Reset Pushbutton		10/D2
TP155	WD RESET		10/D2
TP156	INHIB WD		10/D2
TP157	END TIME OUT		10/D2
TP158	PU RESET		10/D2
TP159	NMI (Non Maskable Interrupt)		10/D2
TP160	PWR UP		10/D2
TP161	START NM		10/D2
TP162	RESET PWRUP		10/D2
TP163	spare		10/C2
TP164	SAFETY		10/D3
TP165	CS2		10/D3
TP166	mA FREQ		10/D2
TP167	kV > 75%		10/D3
TP168	EXPOSUE COMMAND		10/D2
TP169	EXPOSURE 75		10/D2
TP170	EXPOSURE ON		10/D2
TP171	CUT OFF SOFT		10/D2
TP172	EXP CMND		10/D2
TP173	HV ON TEST		10/D2
TP174	mAs CUT OFF		10/D2
TP175	INHIB kV75		10/D2
TP176	DEVALID SAFETY		10/C2

7.3 Testpoints (continued)

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL		
TP177	TIMER CUT OFF		10/D2
TP178	CPT mAs		10/C2
TP179	A12		10/C2
TP180	A13		10/B2
TP181	A14		10/B2
TP182	A15		10/B2
TP183	A16		10/B2
TP184	CS STAT LEDS		10/B2
TP185	CS INPUT		10/B2
TP186	CS MUX		10/B2
TP187	CS OUTPUT		10/B2
TP188	CS DAC		10/B2
TP189	CS ADC		10/B2
TP190	LDAC		10/B2
TP191	UDS		10/D3
TP192	CLK 16M		10/D3
TP193	WRITE		10/D3
TP194	CS DATA SAVE		10/B2
TP195	LDS		10/D3
TP196	LWE		10/B2
TP197	UWE		10/B2
TP198	LOE		10/B2
TP199	UOE		10/B2
TP200	CLK 4M		10/D4
TP201	spare		1/H3
TP202	spare		1/D3
TP203	spare		1/D3
TP204	RAD PULSE		1/E2
TP205	Valid Data Buffers		13/H4
TP206	BERR		12/F2
TP207	spare		11/D4
TP208	UWE		11/D4
TP209	spare		11/D4
TP210	spare		11/D2
TP211	LWE		11/D2
TP212	spare		11/D2

REV 1

sm 2165121–100

7–4 Fuses

None.

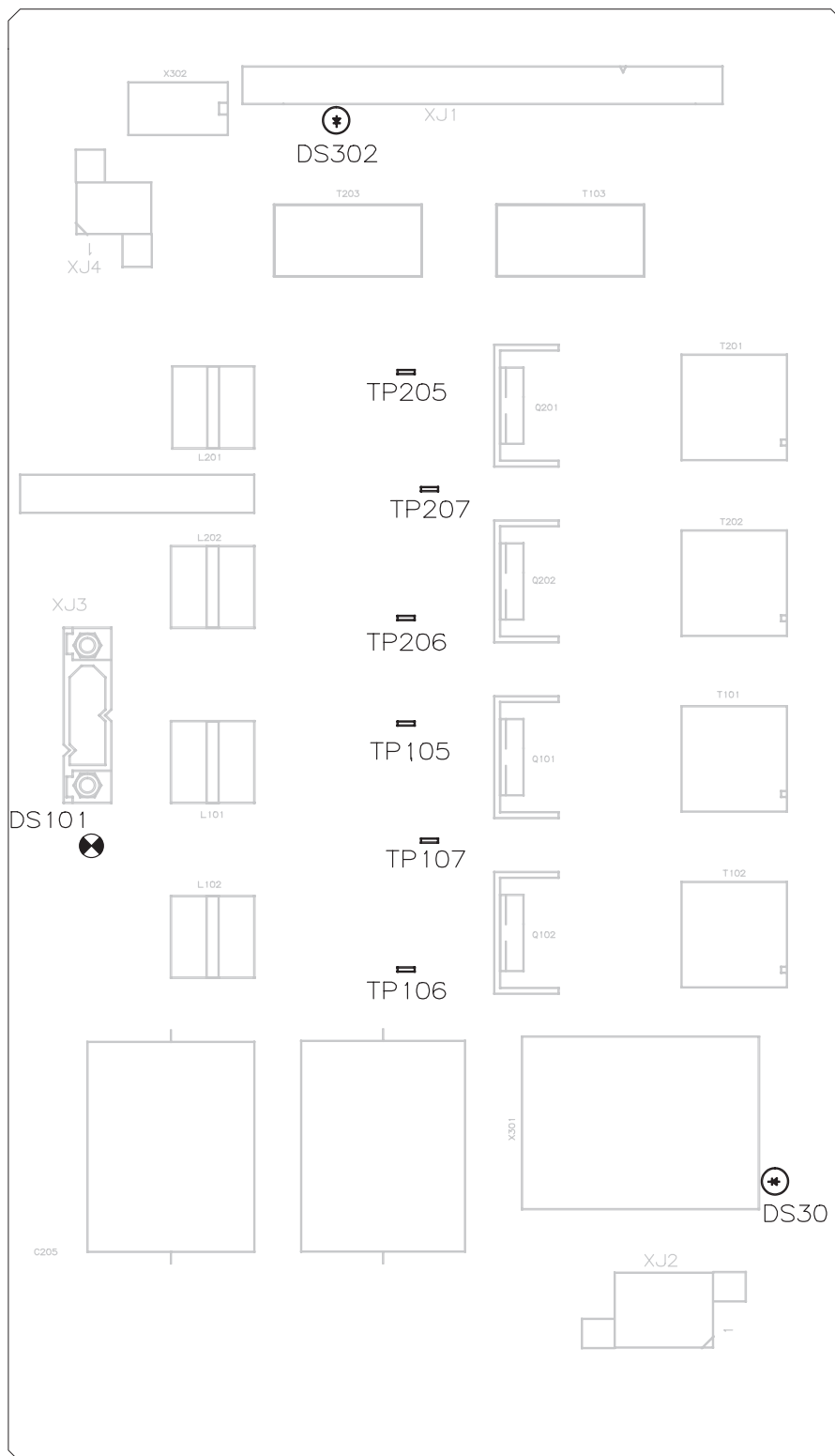
7–5 Adjustments

None.

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SECTION 8
SCPU A5 A1 HEATER BOARD

ILLUSTRATION 7
SCPU A5 A1 HEATER BOARD SWITCHES AND JUMPERS, ETC.



8–1 Switches and Jumpers

None.

8–2 Indicators

INDICATOR	COLOR	INDICATES:	LOCATION ON SCHEMATIC:
DS101	neon	DC SUPPLY	1/B2
DS301	Yellow	T2_HEATER_SEL	3/D3
DS302	Yellow	HV_SWITCH_CTRL	3/D4

8–3 Testpoints

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL	RANGE	
TP105	+DC Supply (XL)	400 V to 762 V	1/E4
TP106	–DC Supply (XL)	400 V to 762 V	1/E2
TP107	Q101 Emitter		1/E3
TP205	+DC Supply (XS)	400 V to 762 V	2/D4
TP206	–DC Supply (XS)	400 V to 762 V	2/D2
TP207	Q201 Emitter		2/D3

8–4 Fuses

None.

8–5 Adjustments

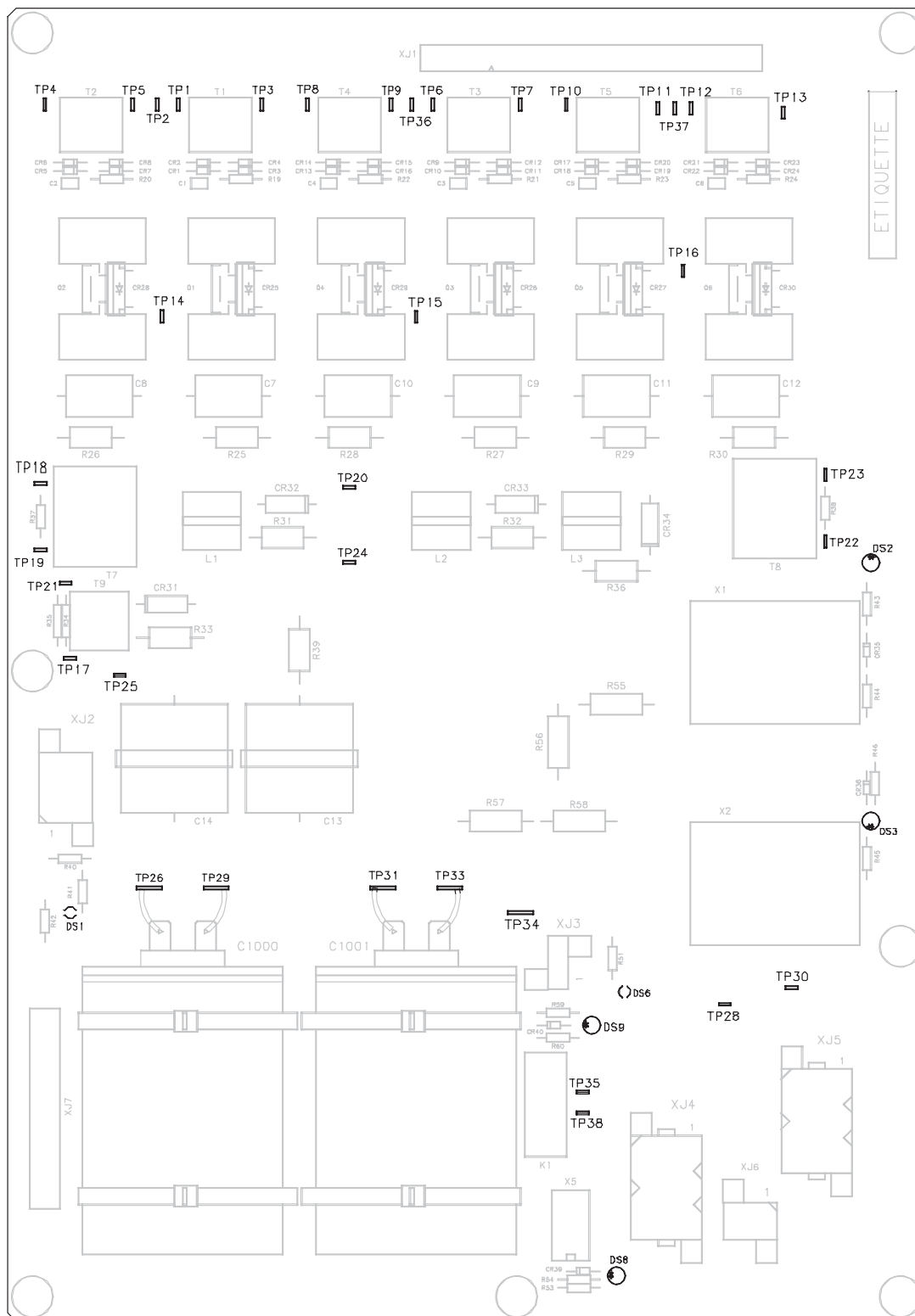
None.

SECTION 9

SCPU A5 A2 ROTOR CONTROLLER BOARD

ILLUSTRATION 8

SCPU A5 A2 ROTOR CONTROLLER BOARD SWITCHES AND JUMPERS, ETC.



9-1 Switches and Jumpers

None.

9-2 Indicators

INDICATOR	COLOR	INDICATES:	LOCATION ON SCHEMATIC:
DS1	neon	DC SUPPLY	1/E2
DS2	Yellow	_LS_RELAY_ON	3/E4
DS3	Yellow	TUBE 2_ROTATOR_SEL	3/E7
DS6	neon	115 V AC	3/B7
DS8	Yellow	THERMAL SAFETY SWITCH TUBE 2	3/F9
DS9	Yellow	FAN TUBE 2	3/C8

9-3 Testpoints

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL	RANGE	
TP1	DRIV_T1_ON	0-15 V	1/C3
TP2	DRIV_T1_OFF	0-15 V	1/B3
TP3	COMMON_DRIV_1_2	0-15 V	1/C3
TP4	DRIV_T2_ON	0-15 V	1/D3
TP5	DRIV_T2_OFF	0-15 V	1/D3
TP6	DRIV_T3_ON	0-15 V	2/C3
TP7	DRIV_T3_OFF	0-15 V	2/C3
TP8	DRIV_T4_ON	0-15 V	2/D3
TP9	DRIV_T4_OFF	0-15 V	2/D3
TP10	DRIV_T5_ON	0-15 V	2/C7
TP11	DRIV_T5_OFF	0-15 V	2/C7
TP12	DRIV_T6_ON	0-15 V	2/D7
TP13	DRIV_T6_OFF	0-15 V	2/E7
TP14	PHASE_1		1/D5
TP15	PHASE_2		1/D7
TP16	PHASE_3		1/D9
TP17	START_CUR_MON_A	1 V/20 A	1/F5
TP18	PHASE 1_CUR B	1 V/30 A	1/D7

9.3 Testpoints (continued)

TESTPOINT	MEASUREMENT		LOCATION ON SCHEMATIC:
	SIGNAL	RANGE	
TP19	PHASE 1_CUR A	1 V/30 A	1/D6
TP20	–DC_SUPPLY	400 V–762 V	1/F7
TP21	START_CUR_MON_B	1 V/20 A	1/F5
TP22	PHASE 3_CUR B	1 V/30 A	1/D9
TP23	PHASE 3_CUR A	1 V/30 A	1/D8
TP24	+DC_SUPPLY	400 V–762 V	1/B2
TP25	–DC_SUPPLY	400 V–762 V	1/F2
TP26	CONNECTION OF PHASE SHIFT CAPACITOR IN MAIN PHASE OF TUBE STATOR		3/D5
TP29	”		3/D6
TP28	FAN	115 V ac	3/D9
TP30	FAN	115 V ac	3/D9
TP31	CONNECTION OF PHASE SHIFT CAPACITOR IN AUXILIARY PHASE OF TUBE STATOR		3/D5
TP33	”		3/D6
TP34	STATOR_COMMON		3/A9
TP35	FAN T2		3/B9
TP38	FAN T1		
TP36	COMMON_DRIV_3_4	0 V – 15 V	2/B3
TP37	COMMON_DRIV_5_6	0 V – 15 V	2/B7
TP38	OIL_PUMP_A/T1	115 V/T1	3/B7

9–4 Fuses

None.

9–5 Adjustments

None.

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