Multi-Range DC Power Supply

PSW Series

Service MANUAL

GW INSTEK PART NO. 82SW-80400S01

ISO-9001 CERTIFIED MANUFACTURER

GW INSTEK

The information in this manual was correct at the time of printing. However, Good Will continues to improve products and reserves the rights to change specification, equipment, and maintenance procedures at any time without notice.

Good Will Instrument Co., Ltd.
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SAFETY INSTRUCTIONS

This chapter contains important safety instructions that you must follow during operation and storage. Read the following before any operation to insure your safety and to keep the instrument in the best possible condition.

Safety Symbols

These safety symbols may appear in this manual or on the instrument.

 WARNING	Warning: Identifies conditions or practices that could result in injury or loss of life.
 CAUTION	Caution: Identifies conditions or practices that could result in damage to the instrument or to other objects.
	DANGER High Voltage
	Attention: Refer to the Manual
	Protective Conductor Terminal
	Earth (ground) Terminal
	Do not dispose electronic equipment as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased.

Safety Guidelines

General guidelines


CAUTION

- Do not place any heavy object on the PSW.
- Avoid severe impact or rough handling that leads to damaging the PSW.
- Do not discharge static electricity to the PSW.
- Use only mating connectors, not bare wires, for the terminals.
- Do not block the cooling fan opening.
- Do not disassemble the PSW unless you are qualified.

(Measurement categories) EN 61010-1:2010 and EN 61010-2-030 specify the measurement categories and their requirements as follows. The PSW falls under category II.

- Measurement category IV is for measurement performed at the source of low-voltage installation.
- Measurement category III is for measurement performed in the building installation.
- Measurement category II is for measurement performed on the circuits directly connected to the low voltage installation.
- 0 is for measurements performed on circuits not directly connected to Mains.

Power Supply


WARNING

- AC Input voltage range: 85VAC~265VAC
- Frequency: 47Hz~63Hz
- To avoid electrical shock connect the protective grounding conductor of the AC power cord to an earth ground.

Cleaning the PSW

- Disconnect the power cord before cleaning.
- Use a soft cloth dampened in a solution of mild detergent and water. Do not spray any liquid.
- Do not use chemicals containing harsh material such as benzene, toluene, xylene, and acetone.

Operation Environment

- Location: Indoor, no direct sunlight, dust free, almost non-conductive pollution (Note below)
- Relative Humidity: 20%~ 85%
- Altitude: < 2000m
- Temperature: 0°C to 50°C

(Pollution Degree) EN 61010-1:2010 and EN 61010-2-030 specify the pollution degrees and their requirements as follows. The PSW falls under degree 2.

Pollution refers to “addition of foreign matter, solid, liquid, or gaseous (ionized gases), that may produce a reduction of dielectric strength or surface resistivity”.

- Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.
- Pollution degree 2: Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation can be expected.

- Pollution degree 3: Conductive pollution occurs, or dry, non-conductive pollution occurs which becomes conductive due to the expected condensation. In such conditions, while the equipment is normally protected against exposure to direct sunlight, precipitation, and strong draughts, neither temperature nor humidity is controlled.

Storage environment

- Location: Indoor
- Temperature: -25°C to 70°C
- Relative Humidity: <90%

Disposal

Do not dispose this instrument as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased. Please make sure discarded electrical waste is properly recycled to reduce environmental impact.

Power cord for the United Kingdom

When using the instrument in the United Kingdom, make sure the power cord meets the following safety instructions.

NOTE: This lead / appliance must only be wired by competent persons

⚠ WARNING: THIS APPLIANCE MUST BE EARTHED

IMPORTANT: The wires in this lead are coloured in accordance with the following code:

Green/ Yellow:	Earth
Blue:	Neutral
Brown:	Live (Phase)

As the colours of the wires in mains leads may not correspond with the colour markings identified in your plug/appliance, proceed as follows:
The wire which is coloured Green & Yellow must be connected to the Earth terminal marked with the letter E or by the earth symbol ⏚ or coloured Green or Green & Yellow.
The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Blue or Black.
The wire which is coloured Brown must be connected to the terminal marked with the letter L or P or coloured Brown or Red.
If in doubt, consult the instructions provided with the equipment or contact the supplier.
This cable/appliance should be protected by a suitably rated and approved HBC mains fuse: refer to the rating information on the equipment and/or user instructions for details. As a guide, a cable of 0.75mm2 should be protected by a 3A or 5A fuse. Larger conductors would normally require 13A types, depending on the connection method used.
Any exposed wiring from a cable, plug or connection that is engaged in a live socket is extremely hazardous. If a cable or plug is deemed hazardous, turn off the mains power and remove the cable, any fuses and fuse assemblies. All hazardous wiring must be immediately destroyed and replaced in accordance to the above standard.

Declaration of Conformity

GOOD WILL INSTRUMENT CO., LTD.
No. 7-1, Jhongsing Rd, Tucheng Dist., New Taipei City 236, Taiwan

GOOD WILL INSTRUMENT (SUZHOU) CO., LTD.
No. 69 Lushan Road, Suzhou New District Jiangsu, China.
declare that the below mentioned product
Type of Product: Multi-Range DC Power Supply
Model Number: PSW 30-36, PSW 80-13.5, PSW 160-7.2, PSW 30-72,
PSW 80-27, PSW 160-14.4, PSW 30-108, PSW 80-40.5, PSW 160-21.6, PSW 250-4.5, PSW 800-1.44, PSW 250-9, PSW 800-2.88, PSW 250-13.5, PSW 800-4.32
are herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Law of Member States relating to Electromagnetic Compatibility (2004/108/EC) and Low Voltage Directive (2006/95/EC).
For the evaluation regarding the Electromagnetic Compatibility and Low Voltage Directive, the following standards were applied:

◎ **EMC**	
EN 61326-1: EN 61326-2-1:	Electrical equipment for measurement, control and laboratory use –– EMC requirements (2013)
Conducted & Radiated Emission EN 55011: 2009+A1:2010	Electrostatic Discharge EN 61000-4-2: 2009
Current Harmonics EN 61000-3-2: 2006+A1: 2009+A2: 2009	Radiated Immunity EN 61000-4-3: 2006+A1:2008+A2:2010
Voltage Fluctuations EN 61000-3-3: 2008	Electrical Fast Transients IEC 61000-4-4: 2012
----------	Surge Immunity EN 61000-4-5: 2006
----------	Conducted Susceptibility EN 61000-4-6: 2009
----------	Power Frequency Magnetic Field EN 61000-4-8: 2010
----------	Voltage Dip/ Interruption EN 61000-4-11: 2004

Low Voltage Equipment Directive 2006/95/EC	
Safety Requirements	EN 61010-1: 2010 EN 61010-2-030: 2010

HOW TO USE THIS MANUAL

If you are not sure what type of service operation you should choose, read the *Service Operation List* section and find the chapter which suits your needs. The *Summary of Each Chapter* section gives you an overview of this service manual's contents.

To find a place in the manual which deals with a specific keyword, refer to the *Index* chapter at the end of this service manual.

Service Operation List

See the following list, decide which operation you might need, and jump to the introduced chapter.

I want to…	Go to…	Page
Verify	The *Verification* chapter. We recommend you to verify all listed items at once.	Page 40
Calibrate the power supply	The *Calibration and Adjustment* chapter.	Page 59
Disassemble the unit	The *Disassembly* chapter.	Page 76
Replace a mechanical component	The *Disassembly, Parts list* chapter.	Page, 76, 99

Summary of Chapters

This document consists of the following chapters.

Safety Instructions (page 5)	Describes the important safety instructions that should be followed before, during, and after operating the power supply.
How to Use This Manual (page 10)	Provides the summary of each chapter in this service manual and shows where to read for various service operations.
PSW series Overview (page 12)	Helps service engineers become familiar with the power supply. The panel overview and specifications contain all the performance data and functionalities. The Operation theory shows how the power supply is internally structured. • Front and Rear panel • Features • Specifications • Operation theory • Block Diagram
Verification (page 40)	Describes how to verify the power supply's major functionalities, covering the following items: Constant Voltage Tests • Voltage Programming and Measurement Accuracy • CV Load Regulation • CV Line Regulation • CV Ripple and Noise • Transient Recovery Time Constant Current Tests • Current Programming and Measurement Accuracy • CC Load Regulation • CC Line Regulation
Calibration and Adjustment (page 59)	Use the calibration section to calibrate/adjust the PSW after the verification chapter.
Mechanical Parts List (page 76)	Shows the diagrams and replacement parts list for the mechanical components used in the power supply.

PSW SERIES OVERVIEW

The Overview chapter helps you become familiar with the power supply. The front and rear panel diagrams introduce the panel keys and ports. The specifications section lists technical details of the power supply series.

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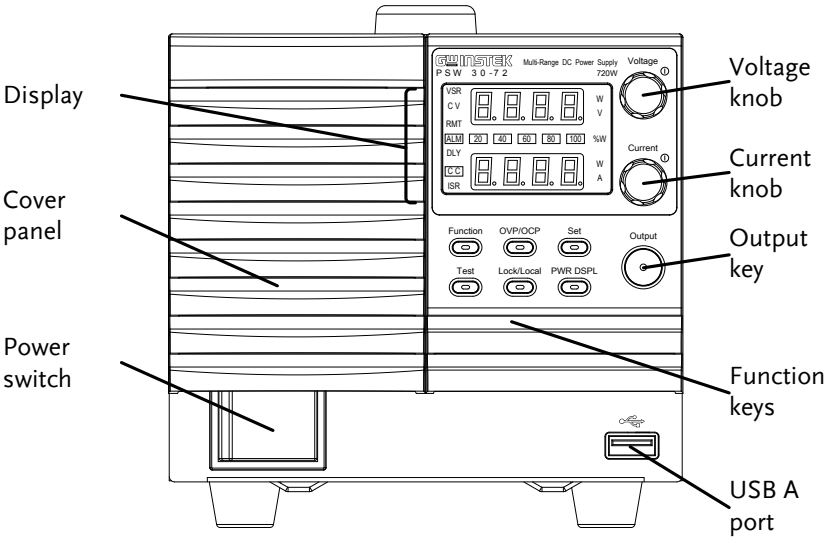
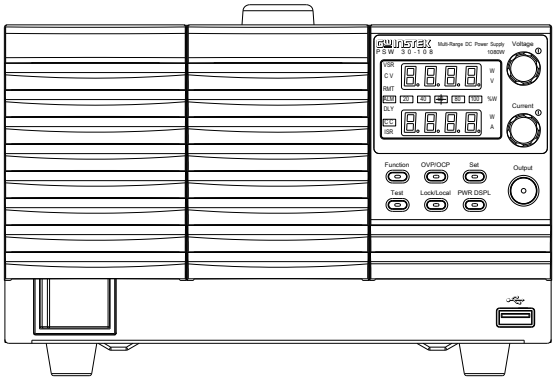
Front Panel

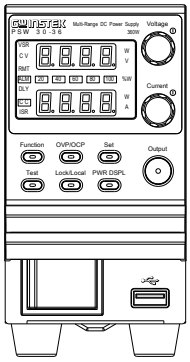
720W: PSW 30-72, 80-27, 160-14.4, 250-9, 800-2.88



1080W: PSW 30-108, 80-40.5, 160-21.6, 250-13.5, 800-4.32



360W: PSW 30-36, 80-13.5, 160-7.2, 250-4.5, 800-1.44



Function Keys

The Function keys along with the Output key will light up when a key is active.

Function

The Function key is used to configure the power supply.

OVP/OCP

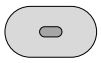
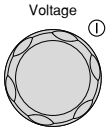
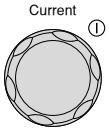
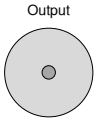
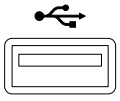
Set the over current or over voltage protection levels.

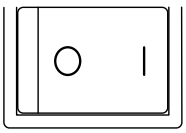
Set

Sets the current and voltage limits.

Test

Used to run customized scripts for testing.

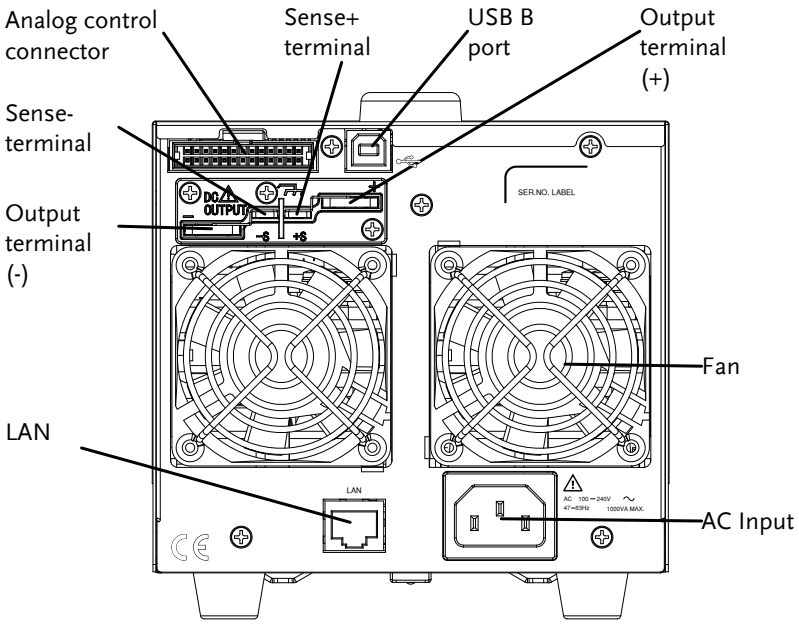
	Lock/Local 	Locks or unlocks the panel keys to prevent accidentally changing panel settings.
	PWR DSPL 	Toggles the display from viewing V/A → V/W or A/W*. *Press the Voltage knob for V/W, press the Current knob for A/W.
Display Indicators	VSR	Voltage Slew Rate
	C V	Constant Voltage Mode
	RMT	Remote Control Mode
	ALM	Alarm on
	DLY	Delay Output
	C C	Constant Current Mode
	ISR	Current Slew Rate
	20 40 60 80 100 % W	Power bar Indicates the current power output as a percentage.
Voltage Knob	Voltage 	Sets the voltage.
Current Knob	Current 	Sets the current.
Output	Output 	Press to turn on the output. The Output key will light up when the output is active.
USB		USB A port for data transfer, loading test scripts etc.

Power Switch 

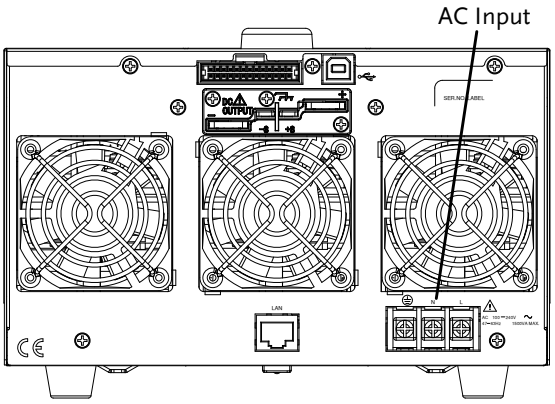
Used to turn the power on/off.

Rear Panel

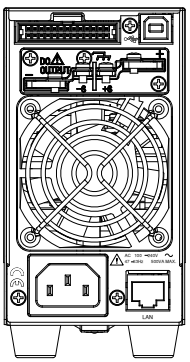
720W: PSW 30-72, 80-27, 160-14.4



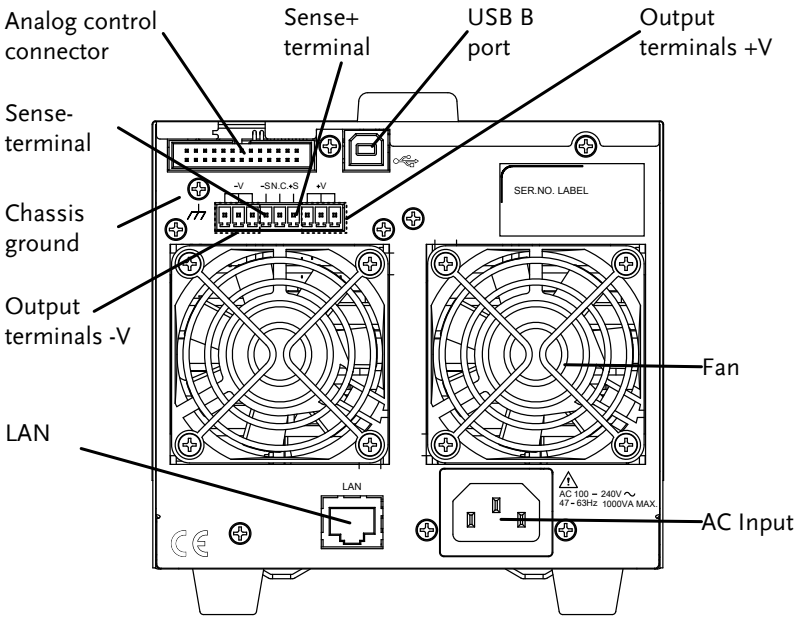
1080W: PSW 30-108, 80-40.5, 160-21.6



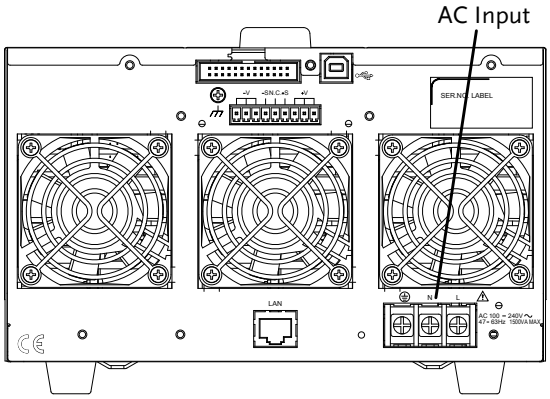
360W: PSW 30-36, 80-13.5, 160-7.2



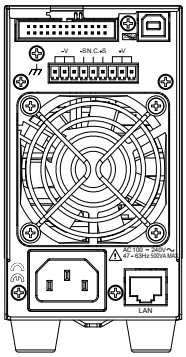
720W: PSW 250-9, 800-2.88



1080W: PSW 250-13.5, 800-4.32



360W: PSW 250-4.5, 800-1.44



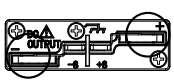
Analog Control Connector

Standard 26 pin MIL connector (OMRON XG4 IDC plug).

The analog control connector is used to monitor current and voltage output, machine status (OVP, OCP, OTP etc.), and for analog control of the current and voltage output.

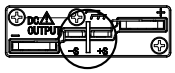
Use an OMRON XG5 IDC socket as the mating socket.

Output Terminals



Positive (+) and negative (-) output terminals.

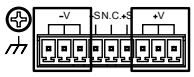
Chassis ground



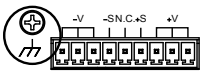
Sense (-) and Sense (+) terminals.

Output Terminals (250, 800 volt models)

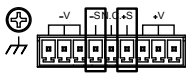
The 250 and 800 volt models use a 9 pin connector and a plug for the output and sense terminal connections. The plug is a MC420-38109Z plug by DECA SwitchLab Inc. This plug is also available separately (GW part number 39BT-50900401).



Positive (V+) and negative (V-) output terminals (3 of each).

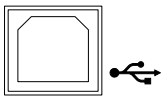


Chassis ground



Sense (-S) and Sense (+S) terminals.

USB B port

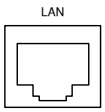


The USB B port is used for remote control.

Fans

Temperature controlled fans

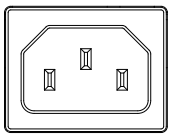
Ethernet Port



The ethernet port is used for remote control and digital monitoring from a PC.

Line Voltage Input

(Type I/TypeII)



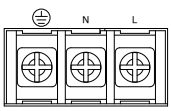
Type I: PSW 30-36/80-13.5/160-7.2/250-4.5, 800-1.44

Type II: PSW 30-72/80-27/160-14.4/250-9, 800-2.88

- Voltage Input: 100~240 VAC
- Line frequency: 50Hz/60 Hz (Automatically switchable)

Line Voltage Input

(Type III)



Type III:
PSW
30-108/80-40.5/160-21.6/250-13.5/800-4.32

- Voltage Input: 100~240 VAC
- Line frequency: 50Hz/60 Hz (Automatically switchable)

PSW Default Settings

The following default settings are the factory configuration settings for the power supply (Function settings/Test settings).

The F-88 configuration setting allows the PSW to be reset back to the factory default settings.

Initial Settings	Default Setting
Output	Off
LOCK	0 (Disabled)
Voltage	0V
Current	0A
OVP	Maximum
OCP	Maximum

Normal Function Settings	Setting	Default Setting
Output ON delay time	F-01	0.00s
Output OFF delay time	F-02	0.00s
V-I mode slew rate select	F-03	0 = CV high speed priority
Rising voltage slew rate	F-04	60.00V/s (PSW 30-XX) 160.0V/s (PSW 80-XX) 320.0V/s (PSW 160-XX) 500.0V/s (PSW 250-XX) 1600V/s (PSW 800-XX)
Falling voltage slew rate	F-05	60.00V/s (PSW 30-XX) 160.0V/s (PSW 80-XX) 320.0V/s (PSW 160-XX) 500.0V/s (PSW 250-XX) 1600V/s (PSW 800-XX)
Rising current slew rate	F-06	72.00A/s (PSW 30-36) 144.0A/s (PSW 30-72) 216.0A/s (PSW 30-108) 27.00A/s (PSW 80-13.5) 54.00A/s (PSW 80-27) 81.00A/s (PSW 80-40.5) 14.40A/s (PSW 160-7.2) 28.80A/s (PSW 160-14.4) 43.20A/s (PSW 160-21.6) 9.000A/s (PSW 250-4.5) 18.00A/s (PSW 250-9) 27.00A/s (PSW 250-13.5) 2.880A/s (PSW 800-1.44) 5.760A/s (PSW 800-2.88) 8.640A/s (PSW 800-4.32)

Falling current slew rate	F-07	72.00A/s (PSW 30-36) 144.0A/s (PSW 30-72) 216.0A/s (PSW 30-108) 27.00A/s (PSW 80-13.5) 54.00A/s (PSW 80-27) 81.00A/s (PSW 80-40.5) 14.40A/s (PSW 160-7.2) 28.80A/s (PSW 160-14.4) 43.20A/s (PSW 160-21.6) 9.000A/s (PSW 250-4.5) 18.00A/s (PSW 250-9) 27.00A/s (PSW 250-13.5) 2.880A/s (PSW 800-1.44) 5.760A/s (PSW 800-2.88) 8.640A/s (PSW 800-4.32)
Internal resistance setting	F-08	0.000Ω
Bleeder circuit control	F-09	1 = ON
Buzzer ON/OFF control	F-10	1 = ON
Measurement Average Setting	F-17	0 = Low
Lock Mode	F-19	0 = Panel lock: allow output off
USB/GPIB setting		
Rear Panel USB Mode	F-22	2 = USB CDC
GPIB address	F-23	8
LAN setting		
LAN	F-36	1 = Enable
DHCP	F-37	1 = Enable
Sockets active	F-57	1 = Enable
Web Server active	F-59	1 = Enable
Web password active	F-60	1 = Enable
Web setting password	F-61	0000
Power On Configuration		
CV Control	F-90	0= Panel control (local)
CC Control	F-91	0= Panel control (local)
Power-ON Output	F-92	0 = OFF at startup
Master/Slave	F-93	0 = Master/Local
External Out Logic	F-94	0= High ON
Power Switch trip	F-95	0 = Enable

Error Messages & Messages

The following error messages or messages may appear on the PSW screen during operation.

Error Messages	Description
Err 001	USB Mass Storage is not present
Err 002	No (such)file in USB mass storage
Err 003	Empty memory location
Err 004	File access error
⚠ Note	For error messages other than Err 001 to Err 004, please contact your distributor for service repair.
Messages	**Description**
MSG 001	External control of output. Output off (F-94=0, High=on)
MSG 002	External control of output. Output off (F-94=1, Low=on)
MSG 003	F-93 is not zero. Unable to calibrate.
LOCK F-19	F-19 is zero. Unable to turn the output on.

LED Display Format

Use the following table to read the LED display messages.

0	1	2	3	4	5	6	7	8	9	A	B	C	D
													
E	F	G	H	I	J	K	L	M	N	O	P	Q	R
													
S	T	U	V	W	X	Y	Z	(	)	+	-	,	
													

PSW Specifications

The specifications apply when the PSW is powered on for at least 30 minutes.

PSW 360W

PSW 30-36, 80-13.5, 160-7.2, 250-4.5, 800-1.44

Model	Unit	PSW 30-36	PSW 80-13.5	PSW 160-7.2	PSW 250-4.5	PSW 800-1.44
Rated Output Voltage	V	30	80	160	250	800
Rated Output Current	A	36	13.5	7.2	4.5	1.44
Rated Output Power	W	360	360	360	360	360
Power Ratio	--	3	3	3.2	3.125	3.2
Constant Voltage Mode						
Line Regulation (*1)	mV	18	43	83	128	403
Load Regulation (*2)	mV	20	45	85	130	405
Ripple and Noise (*3)						
p-p (*4)	mV	60	60	60	80	150
r.m.s (*5)	mV	7	7	12	15	30
Temperature coefficient	ppm/°C	100ppm/°C of rated output voltage, after a 30 minute warm-up.				
Remote sense compensation voltage (single wire)	V	0.6	0.6	0.6	1	1
Rise Time (*6)						
Rated Load	ms	50	50	100	100	150
No Load	ms	50	50	100	100	150
Fall Time (*7)						
Rated Load	ms	50	50	100	150	300
No Load	ms	500	500	1000	1200	2000
Transient response time (*8)	ms	1	1	2	2	2
Constant Current Mode						
Line regulation (*1)	mA	41	18.5	12.2	9.5	6.44
Load regulation (*9)	mA	41	18.5	12.2	9.5	6.44
Ripple and noise						
r.m.s (*5)	mA	72	27	15	10	5
Temperature coefficient	ppm/°C	200ppm/°C of rated output current, after a 30 minute warm-up.				
Protection Function						
Over voltage protection (OVP)						
Setting range	V	3-33	8-88	16-176	20-275	20-880
Setting accuracy		± (2% of rated output voltage)				
Over current protection (OCP)						
Setting range	A	3.6-39.6	1.35-14.85	0.72-7.92	0.45-4.95	0.144-1.584
Setting accuracy		± (2% of rated output current)				
Over temperature protection (OTP)						
Operation		Turn the output off.				
Low AC input protection (AC-FAIL)						
Operation		Turn the output off.				

Power limit (POWER LIMIT)						
Operation		Over power limit.				
Value (fixed)		Approx. 105% of rated output power				
Analog Programming and Monitoring						
External voltage control output voltage		Accuracy and linearity: ±0.5% of rated output voltage.				
External voltage control output current		Accuracy and linearity: ±1% of rated output current.				
External resistor control output voltage		Accuracy and linearity: ±1.5% of rated output voltage.				
External resistor control output current		Accuracy and linearity: ±1.5% of rated output current.				
Output voltage monitor						
Accuracy	%	±1	±1	±1	±2	±2
Output current monitor						
Accuracy	%	±1	±1	±1	±2	±2
Shutdown control		Turns the output or power off with a LOW (0V to 0.5V) or short-circuit.				
Output on/off control		Possible logic selections: Turn the output on using a LOW (0V to 0.5V) or short-circuit, turn the output off using a HIGH (4.5V to 5V) or open-circuit. Turn the output on using a HIGH (4.5V to 5V) or open-circuit, turn the output off using a LOW (0V to 0.5V) or short-circuit.				
CV/CC/ALM/PWR ON/OUT ON indicator		Photocoupler open collector output; Maximum voltage 30V, maximum sink current 8mA.				
Front Panel						
Display, 4 digits						
Voltage accuracy 0.1% +	mV	20	20	100	200	400
Current accuracy 0.1% +	mA	40	20	5	5	2
Indications		GREEN LED's: CV, CC, VSR, ISR, DLY, RMT, 20, 40, 60, 80, 100, %W, W, V, A				
		RED LED's: ALM				
Buttons		Function, OVP/OCP, Set, Test, Lock/Local, PWR DSPL, Output				
Knobs		Voltage, Current				
USB port		Type A USB connector				
Programming and Measurement (USB, LAN, GPIB)						
Output voltage programming accuracy 0.1% +	mV	10	10	100	200	400
Output current programming accuracy 0.1% +	mA	30	10	5	5	2
Output voltage programming resolution	mV	1	2	3	5	14
Output current programming resolution	mA	1	1	1	1	1
Output voltage measurement accuracy 0.1% +	mV	10	10	100	200	400
Output current measurement accuracy 0.1% +	mA	30	10	5	5	2

Output voltage measurement resolution	mV	1	2	3	5	14
Output current measurement resolution	mA	1	1	1	1	1
Series and Parallel Capability						
Parallel number	Units	3	3	3	3	3
Series Number	Units	2	2	2	None	None
Input Characteristics						
Nominal input rating		100Vac to 240Vac, 50Hz to 60Hz, single phase				
Input voltage range		85Vac ~ 265Vac				
Input voltage range		47Hz ~ 63Hz				
Maximum input current						
100Vac	A	5				
200Vac	A	2.5				
Inrush current		Less than 25A.				
Maximum input power	VA	500				
Power factor						
100Vac		0.99				
200Vac		0.97				
Efficiency						
100Vac	%	77	78	79	79	80
200Vac	%	79	80	81	81	82
Hold-up time		20ms or greater				
Interface Capabilities						
USB		TypeA: Host, TypeB: Slave, Speed: 1.1/2.0, USB Class: CDC(Communications Device Class)				
LAN		MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask				
GPIB		Optional: GUG-001 (GPIB to USB Adapter)				
Environmental Conditions						
Operating temperature		0°C to 50°C				
Storage temperature		-25°C to 70°C				
Operating humidity		20% to 85% RH; No condensation				
Storage humidity		90% RH or less; No condensation				
Altitude		Maximum 2000m				
General Specifications						
Weight (main unit only)	kg	Approx. 3kg				
Dimensions (WxHxD)	mm	71×124×350				
Cooling		Forced air cooling by internal fan.				
EMC		Complies with the European EMC directive 2004/108/EC for Class A test and measurement products.				
Safety		Complies with the European Low Voltage Directive 2006/95/EC and carries the CE-marking.				
Withstand voltage		Between input and chassis: No abnormalities at 1500 Vac for 1 minute.				
		Between input and output: No abnormalities at 3000 Vac for 1 minute.				
		Between output and chassis: No abnormalities at 500 Vdc for 1 minute for 30V, 80V, 160V models. No abnormalities at 1500 Vdc for 1 minute for 250V, 800V models.				
Insulation resistance		Between input and chassis: 500 Vdc, 100MΩ or more				
		Between input and output: 500 Vdc, 100MΩ or more				

	Between output and chassis: 500 Vdc, 100MΩ or more for 30V, 80V, 160V and 250V models. 1000Vdc, 100MΩ or more for 800V models.

*1: At 85 ~ 132Vac or 170 ~ 265Vac, constant load.
*2: From No-load to Full-load, constant input voltage. Measured at the sensing point in Remote Sense.
*3: Measure with JEITA RC-9131B (1:1) probe
*4: Measurement frequency bandwidth is 10Hz to 20MHz.
*5: Measurement frequency bandwidth is 5Hz to 1MHz.
*6: From 10% to 90% of rated output voltage, with rated resistive load.
*7: From 90% to 10% of rated output voltage, with rated resistive load.
*8: Time for output voltage to recover within 0.1% + 10mV of its rated output for a load change from 50 to 100% of its rated output current.
*9: For load voltage change, equal to the unit voltage rating, constant input voltage.

PSW 720W

PSW 30-72, 80-27, 160-14.4, 250-9, 800-2.88

Model	Unit	PSW 30-72	PSW 80-27	PSW 160-14.4	PSW 250-9	PSW 800-2.88
Rated Output Voltage	V	30	80	160	250	800
Rated Output Current	A	72	27	14.4	9	2.88
Rated Output Power	W	720	720	720	720	720
Power Ratio	--	3	3	3.2	3.125	3.2
Constant Voltage Mode						
Line Regulation (*1)	mV	18	43	83	128	403
Load Regulation (*2)	mV	20	45	85	130	405
Ripple and Noise (*3)						
p-p (*4)	mV	80	80	80	100	200
r.m.s (*5)	mV	11	11	15	15	30
Temperature coefficient	ppm/°C	100ppm/°C of rated output voltage, after a 30 minute warm-up.				
Remote sense compensation voltage (single wire)	V	0.6	0.6	0.6	1	1
Rise Time (*6)						
Rated Load	ms	50	50	100	100	150
No Load	ms	50	50	100	100	150
Fall Time (*7)						
Rated Load	ms	50	50	100	150	300
No Load	ms	500	500	1000	1200	2000
Transient response time (*8)	ms	1	1	2	2	2
Constant Current Mode						
Line regulation (*1)	mA	77	32	19.4	14	7.88
Load regulation (*9)	mA	77	32	19.4	14	7.88
Ripple and noise						
r.m.s (*5)	mA	144	54	30	20	10
Temperature coefficient	ppm/°C	200ppm/°C of rated output current, after a 30 minute warm-up.				
Protection Function						
Over voltage protection (OVP)						
Setting range	V	3-33	8-88	16-176	20-275	20-880
Setting accuracy		± (2% of rated output voltage)				
Over current protection (OCP)						
Setting range	A	5-79.2	2.7-29.7	1.44-15.84	0.9-9.9	0.288-3.168
Setting accuracy		± (2% of rated output current)				
Over temperature protection (OTP)						
Operation		Turn the output off.				
Low AC input protection (AC-FAIL)						
Operation		Turn the output off.				
Power limit (POWER LIMIT)						
Operation		Over power limit.				

Value (fixed)		Approx. 105% of rated output power				
Analog Programming and Monitoring						
External voltage control output voltage		Accuracy and linearity: ±0.5% of rated output voltage.				
External voltage control output current		Accuracy and linearity: ±1% of rated output current.				
External resistor control output voltage		Accuracy and linearity: ±1.5% of rated output voltage.				
External resistor control output current		Accuracy and linearity: ±1.5% of rated output current.				
Output voltage monitor						
Accuracy	%	±1	±1	±1	±2	±2
Output current monitor						
Accuracy	%	±1	±1	±1	±2	±2
Shutdown control		Turns the output or power off with a LOW (0V to 0.5V) or short-circuit.				
Output on/off control		Possible logic selections: Turn the output on using a LOW (0V to 0.5V) or short-circuit, turn the output off using a HIGH (4.5V to 5V) or open-circuit. Turn the output on using a HIGH (4.5V to 5V) or open-circuit, turn the output off using a LOW (0V to 0.5V) or short-circuit.				
CV/CC/ALM/PWR ON/OUT ON indicator		Photocoupler open collector output; Maximum voltage 30V, maximum sink current 8mA.				
Front Panel						
Display, 4 digits						
Voltage accuracy 0.1% +	mV	20	20	100	200	400
Current accuracy 0.1% +	mA	70	40	30	10	4
Indications		GREEN LED's: CV, CC, VSR, ISR, DLY, RMT, 20, 40, 60, 80, 100, %W, W, V, A				
		RED LED's: ALM				
Buttons		Function, OVP/OCP, Set, Test, Lock/Local, PWR DSPL, Output				
Knobs		Voltage, Current				
USB port		Type A USB connector				
Programming and Measurement (USB, LAN, GPIB)						
Output voltage programming accuracy 0.1% +	mV	10	10	100	200	400
Output current programming accuracy 0.1% +	mA	60	30	15	10	4
Output voltage programming resolution	mV	1	2	3	5	14
Output current programming resolution	mA	2	2	2	1	1
Output voltage measurement accuracy 0.1% +	mV	10	10	100	200	400
Output current measurement accuracy 0.1% +	mA	60	30	15	10	4
Output voltage measurement resolution	mV	1	2	3	5	14
Output current measurement resolution	mA	2	2	2	1	1

Series and Parallel Capability						
Parallel number	Units	3	3	3	3	3
Series Number	Units	2	2	2	None	None
Input Characteristics						
Nominal input rating		100Vac to 240Vac, 50Hz to 60Hz, single phase				
Input voltage range		85Vac ~ 265Vac				
Input voltage range		47Hz ~ 63Hz				
Maximum input current						
100Vac	A	10				
200Vac	A	5				
Inrush current		Less than 50A.				
Maximum input power	VA	1000				
Power factor						
100Vac		0.99				
200Vac		0.97				
Efficiency						
100Vac	%	77	78	79	79	80
200Vac	%	79	80	81	81	82
Hold-up time		20ms or greater				
Interface Capabilities						
USB		Type A: Host, Type B: Slave, Speed: 1.1/2.0, USB Class: CDC(Communications Device Class)				
LAN		MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask				
GPIB		Optional: GUG-001 (GPIB to USB Adapter)				
Environmental Conditions						
Operating temperature		0°C to 50°C				
Storage temperature		-25°C to 70°C				
Operating humidity		20% to 85% RH; No condensation				
Storage humidity		90% RH or less; No condensation				
Altitude		Maximum 2000m				
General Specifications						
Weight (main unit only)	kg	Approx. 5.3kg				
Dimensions (WxHxD)	mm	142×124×350				
Cooling		Forced air cooling by internal fan.				
EMC		Complies with the European EMC directive 2004/108/EC for Class A test and measurement products.				
Safety		Complies with the European Low Voltage Directive 2006/95/EC and carries the CE-marking.				
Withstand voltage		Between input and chassis: No abnormalities at 1500 Vac for 1 minute.				
		Between input and output: No abnormalities at 3000 Vac for 1 minute.				
		Between output and chassis: No abnormalities at 500 Vdc for 1 minute for 30V, 80V, 160V models. No abnormalities at 1500 Vdc for 1 minute for 250V, 800V models.				
Insulation resistance		Between input and chassis: 500 Vdc, 100MΩ or more				
		Between input and output: 500 Vdc, 100MΩ or more				
		Between output and chassis: 500 Vdc, 100MΩ or more for 30V, 80V, 160V and 250V models. 1000Vdc, 100MΩ or more for 800V models.				

*1: At 85 ~ 132Vac or 170 ~ 265Vac, constant load.
*2: From No-load to Full-load, constant input voltage. Measured at the sensing point in Remote Sense.

*3: Measure with JEITA RC-9131B (1:1) probe
*4: Measurement frequency bandwidth is 10Hz to 20MHz.
*5: Measurement frequency bandwidth is 5Hz to 1MHz.
*6: From 10% to 90% of rated output voltage, with rated resistive load.
*7: From 90% to 10% of rated output voltage, with rated resistive load.
*8: Time for output voltage to recover within 0.1% + 10mV of its rated output for a load change from 50 to 100% of its rated output current.
*9: For load voltage change, equal to the unit voltage rating, constant input voltage.

PSW 1080W

PSW 30-108, 80-40.5, 160-21.6, 250-13.5, 800-4.32

Model	Unit	PSW 30-108	PSW 80-40.5	PSW 160-21.6	PSW 250-13.5	PSW 800-4.32
Rated Output Voltage	V	30	80	160	250	800
Rated Output Current	A	108	40.5	21.6	13.5	4.32
Rated Output Power	W	1080	1080	1080	1080	1080
Power Ratio	--	3	3	3.2	3.125	3.2
Constant Voltage Mode						
Line Regulation (*1)	mV	18	43	83	128	403
Load Regulation (*2)	mV	20	45	85	130	405
Ripple and Noise (*3)						
p-p (*4)	mV	100	100	100	120	200
r.m.s (*5)	mV	14	14	20	15	30
Temperature coefficient	ppm/°C	100ppm/°C of rated output voltage, after a 30 minute warm-up.				
Remote sense compensation voltage (single wire)	V	0.6	0.6	0.6	1	1
Rise Time (*6)						
Rated Load	ms	50	50	100	100	150
No Load	ms	50	50	100	100	150
Fall Time (*7)						
Rated Load	ms	50	50	100	150	300
No Load	ms	500	500	1000	1200	2000
Transient response time (*8)	ms	1	1	2	2	2
Constant Current Mode						
Line regulation (*1)	mA	113	45.5	26.6	18.5	9.32
Load regulation (*9)	mA	113	45.5	26.6	18.5	9.32
Ripple and noise						
r.m.s (*5)	mA	216	81	45	30	15
Temperature coefficient	ppm/°C	200ppm/°C of rated output current, after a 30 minute warm-up.				
Protection Function						
Over voltage protection (OVP)						
Setting range	V	3-33	8-88	16-176	20-275	20-880
Setting accuracy		± (2% of rated output voltage)				
Over current protection (OCP)						
Setting range	A	5-118.8	4.05-44.55	2.16-23.76	1.35-14.85	0.432-4.752
Setting accuracy		± (2% of rated output current)				
Over temperature protection (OTP)						
Operation		Turn the output off.				
Low AC input protection (AC-FAIL)						
Operation		Turn the output off.				
Power limit (POWER LIMIT)						
Operation		Over power limit.				
Value (fixed)		Approx. 105% of rated output power				

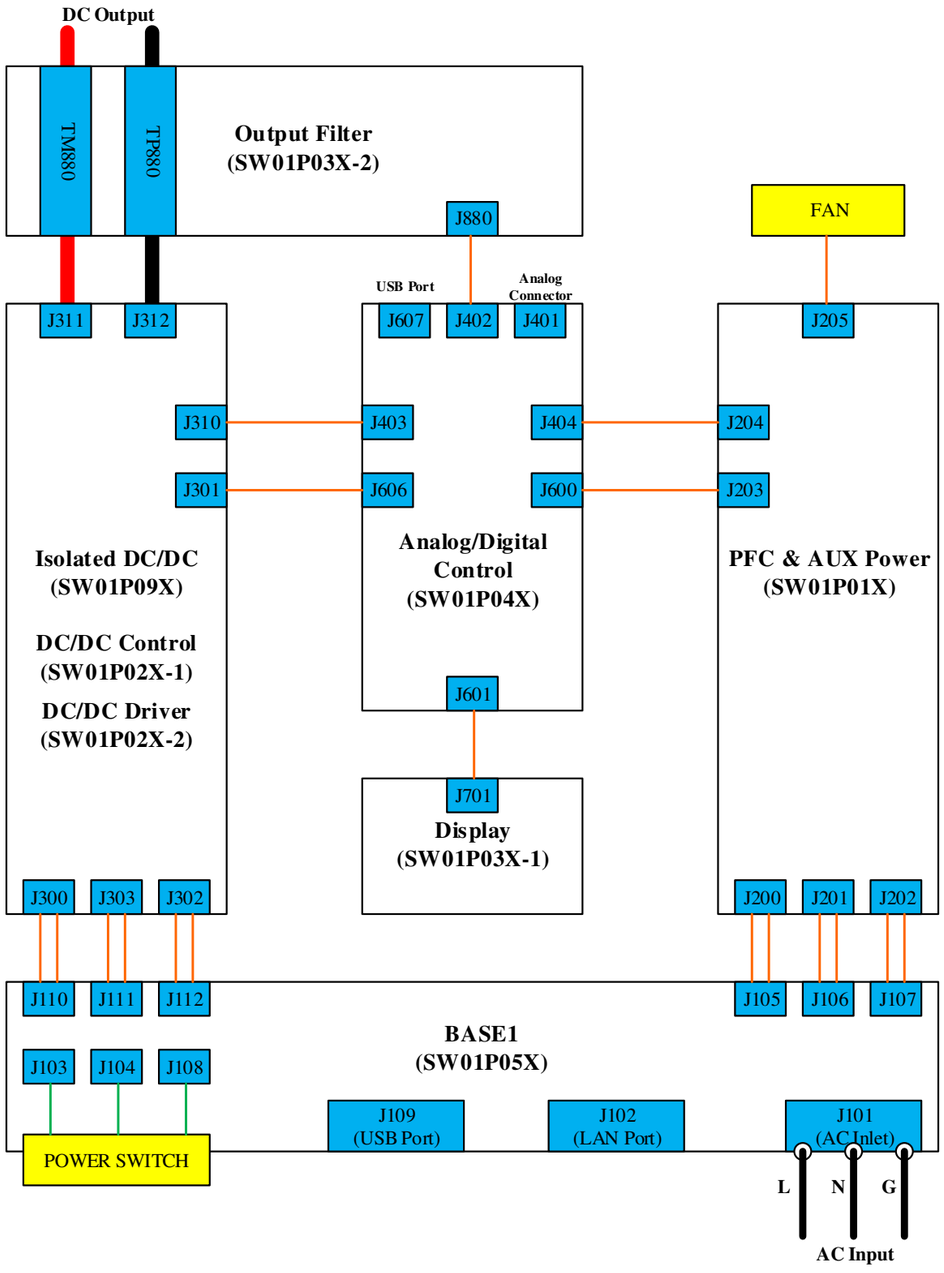
Analog Programming and Monitoring						
External voltage control output voltage		Accuracy and linearity: ±0.5% of rated output voltage.				
External voltage control output current		Accuracy and linearity: ±1% of rated output current.				
External resistor control output voltage		Accuracy and linearity: ±1.5% of rated output voltage.				
External resistor control output current		Accuracy and linearity: ±1.5% of rated output current.				
Output voltage monitor						
Accuracy	%	±1	±1	±1	±2	±2
Output current monitor						
Accuracy	%	±1	±1	±1	±2	±2
Shutdown control		Turns the output or power off with a LOW (0V to 0.5V) or short-circuit.				
Output on/off control		Possible logic selections: Turn the output on using a LOW (0V to 0.5V) or short-circuit, turn the output off using a HIGH (4.5V to 5V) or open-circuit. Turn the output on using a HIGH (4.5V to 5V) or open-circuit, turn the output off using a LOW (0V to 0.5V) or short-circuit.				
CV/CC/ALM/PWR ON/OUT ON indicator		Photo coupler open collector output; Maximum voltage 30V, maximum sink current 8mA.				
Front Panel						
Display, 4 digits						
Voltage accuracy 0.1% +	mV	20	20	100	200	400
Current accuracy 0.1% +	mA	100	50	30	20	6
Indications		GREEN LED's: CV, CC, VSR, ISR, DLY, RMT, 20, 40, 60, 80, 100, %W, W, V, A				
		RED LED's: ALM				
Buttons		Function, OVP/OCP, Set, Test, Lock/Local, PWR DSPL, Output				
Knobs		Voltage, Current				
USB port		Type A USB connector				
Programming and Measurement (USB, LAN, GPIB)						
Output voltage programming accuracy 0.1% +	mV	10	10	100	200	400
Output current programming accuracy 0.1% +	mA	100	40	20	15	6
Output voltage programming resolution	mV	1	2	3	5	14
Output current programming resolution	mA	3	3	3	1	1
Output voltage measurement accuracy 0.1% +	mV	10	10	100	200	400
Output current measurement accuracy 0.1% +	mA	100	40	20	15	6
Output voltage measurement resolution	mV	1	2	3	5	14

Output current measurement resolution	mA	3	3	3	1	1
Series and Parallel Capability						
Parallel number	Units	3	3	3	3	3
Series Number	Units	2	2	2	None	None
Input Characteristics						
Nominal input rating		100Vac to 240Vac, 50Hz to 60Hz, single phase				
Input voltage range		85Vac ~ 265Vac				
Input voltage range		47Hz ~ 63Hz				
Maximum input current						
100Vac	A	15				
200Vac	A	7.5				
Inrush current		Less than 75A.				
Maximum input power	VA	1500				
Power factor						
100Vac		0.99				
200Vac		0.97				
Efficiency						
100Vac	%	77	78	79	79	80
200Vac	%	79	80	81	81	82
Hold-up time		20ms or greater				
Interface Capabilities						
USB		TypeA: Host, TypeB: Slave, Speed: 1.1/2.0, USB Class: CDC(Communications Device Class)				
LAN		MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask				
GPIB		Optional: GUG-001 (GPIB to USB Adapter)				
Environmental Conditions						
Operating temperature		0°C to 50°C				
Storage temperature		-25°C to 70°C				
Operating humidity		20% to 85% RH; No condensation				
Storage humidity		90% RH or less; No condensation				
Altitude		Maximum 2000m				
General Specifications						
Weight (main unit only)	kg	Approx. 7.5kg				
Dimensions (WxHxD)	mm	214×124×350				
Cooling		Forced air cooling by internal fan.				
EMC		Complies with the European EMC directive 2004/108/EC for Class A test and measurement products.				
Safety		Complies with the European Low Voltage Directive 2006/95/EC and carries the CE-marking.				
Withstand voltage		Between input and chassis: No abnormalities at 1500 Vac for 1 minute.				
		Between input and output: No abnormalities at 3000 Vac for 1 minute.				
		Between output and chassis: No abnormalities at 500 Vdc for 1 minute for 30V, 80V, 160V models. No abnormalities at 1500 Vdc for 1 minute for 250V, 800V models.				
Insulation resistance		Between input and chassis: 500 Vdc, 100MΩ or more				
		Between input and output: 500 Vdc, 100MΩ or more				
		Between output and chassis: 500 Vdc, 100MΩ or more for 30V, 80V, 160V and 250V models. 1000Vdc, 100MΩ or more for 800V models.				

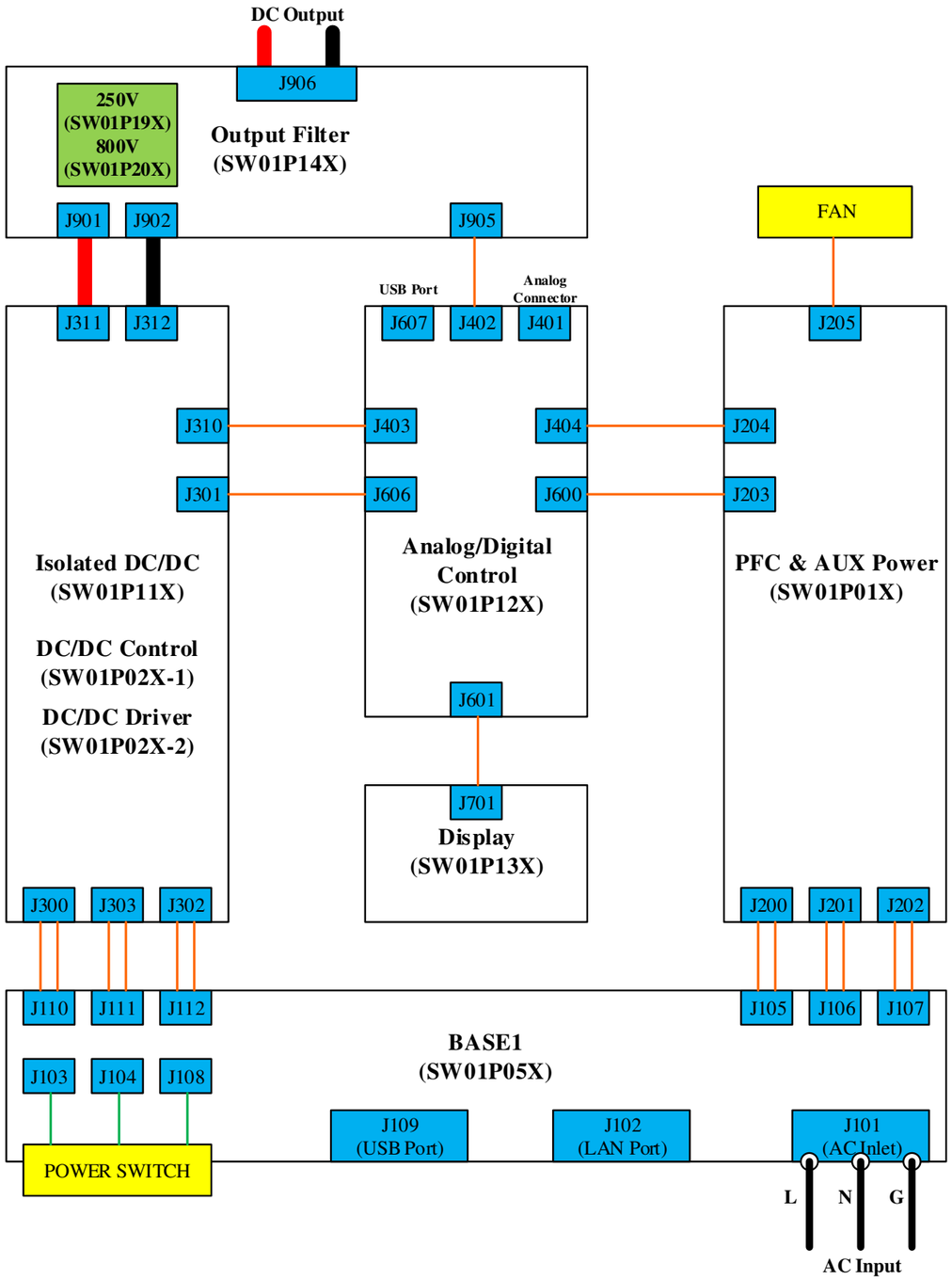
*1: At 85 ~ 132Vac or 170 ~ 265Vac, constant load.
*2: From No-load to Full-load, constant input voltage. Measured at the sensing point in Remote Sense.
*3: Measure with JEITA RC-9131B (1:1) probe
*4: Measurement frequency bandwidth is 10Hz to 20MHz.
*5: Measurement frequency bandwidth is 5Hz to 1MHz.
*6: From 10% to 90% of rated output voltage, with rated resistive load.
*7: From 90% to 10% of rated output voltage, with rated resistive load.
*8: Time for output voltage to recover within 0.1% + 10mV of its rated output for a load change from 50 to 100% of its rated output current.
*9: For load voltage change, equal to the unit voltage rating, constant input voltage.

Block Diagram

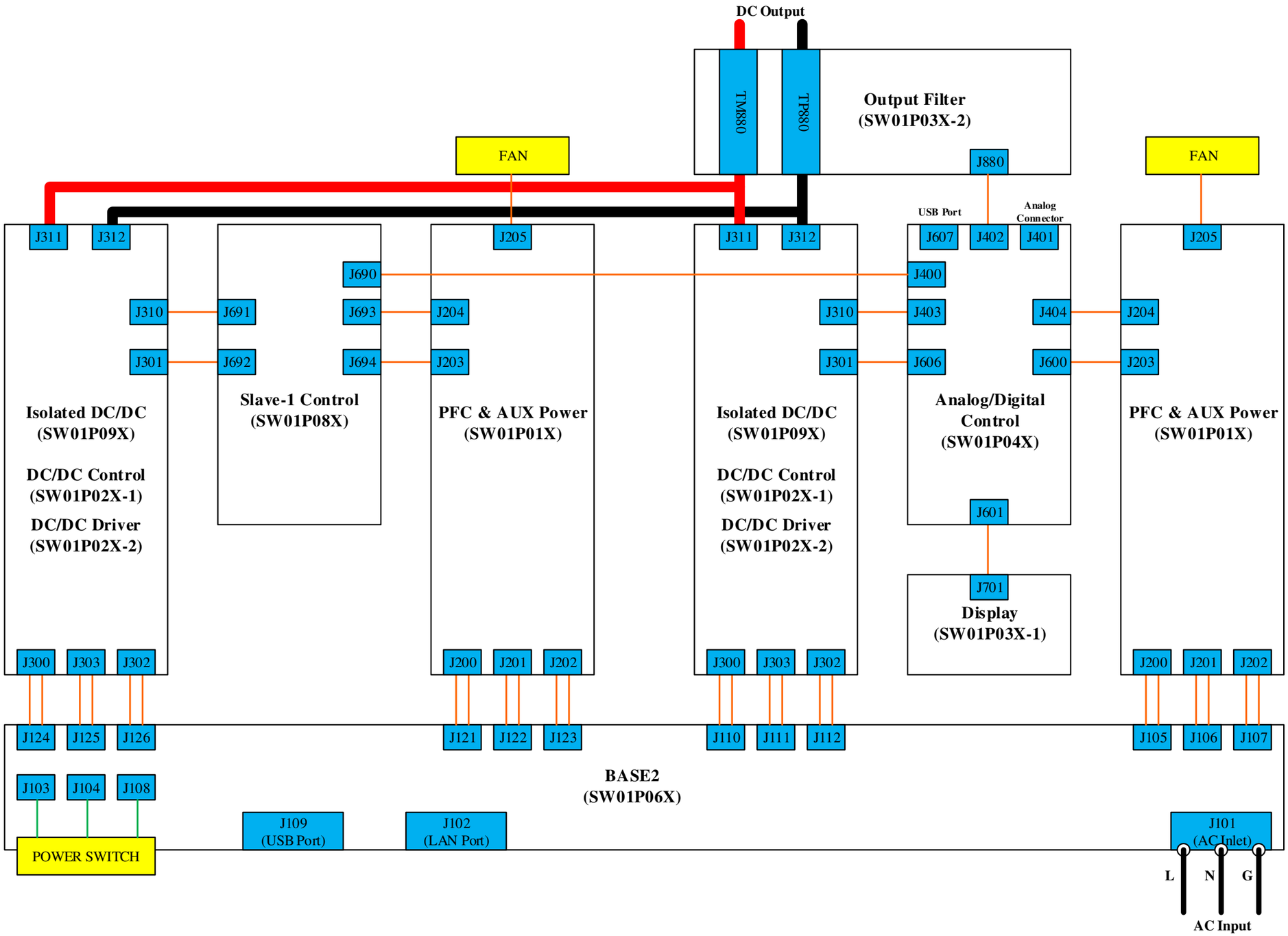
360W models (Type I) PSW 30-36, 80-13.5, 160-7.2



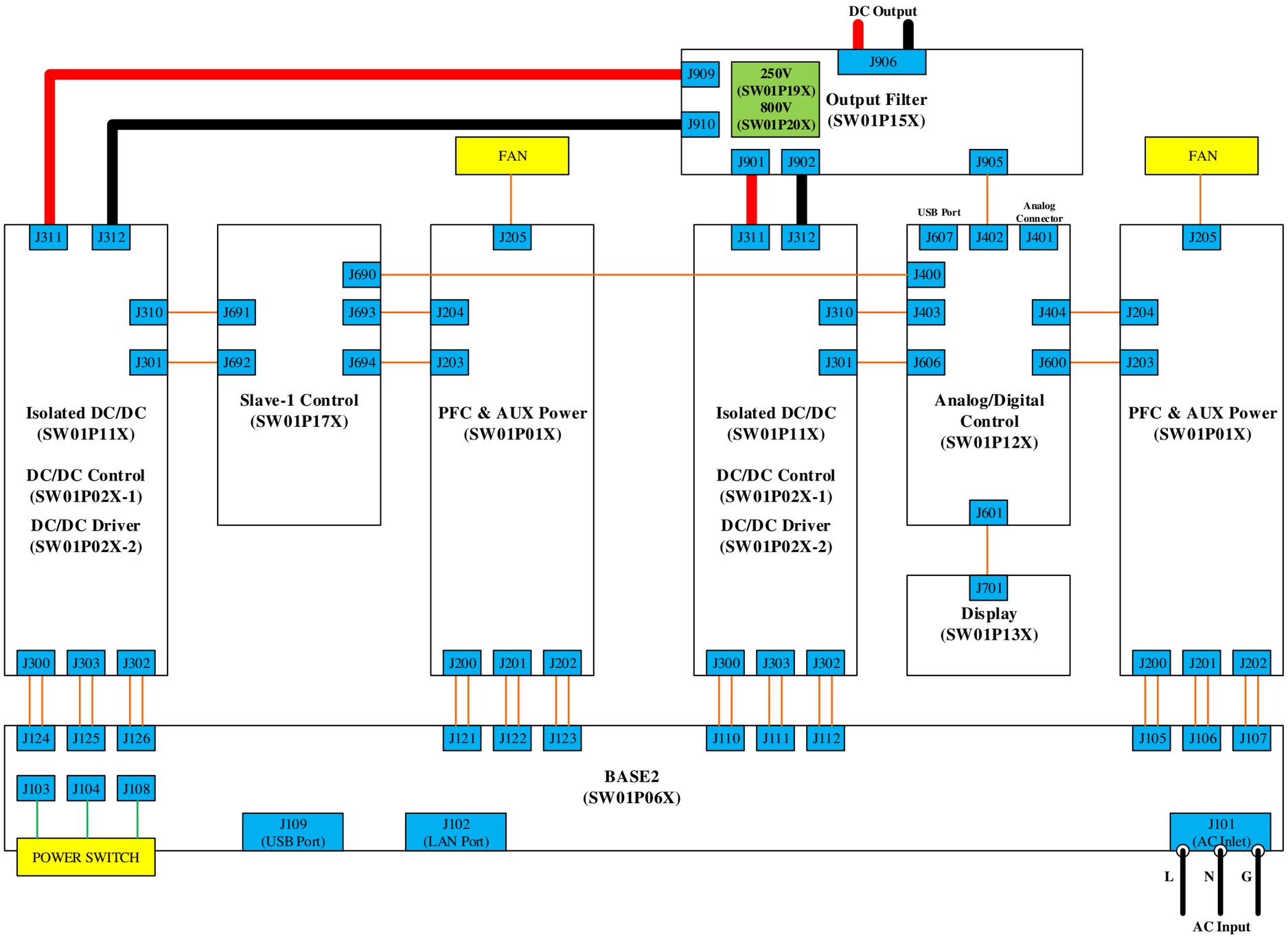
360W models (Type I) PSW 250-4.5, 800-1.4



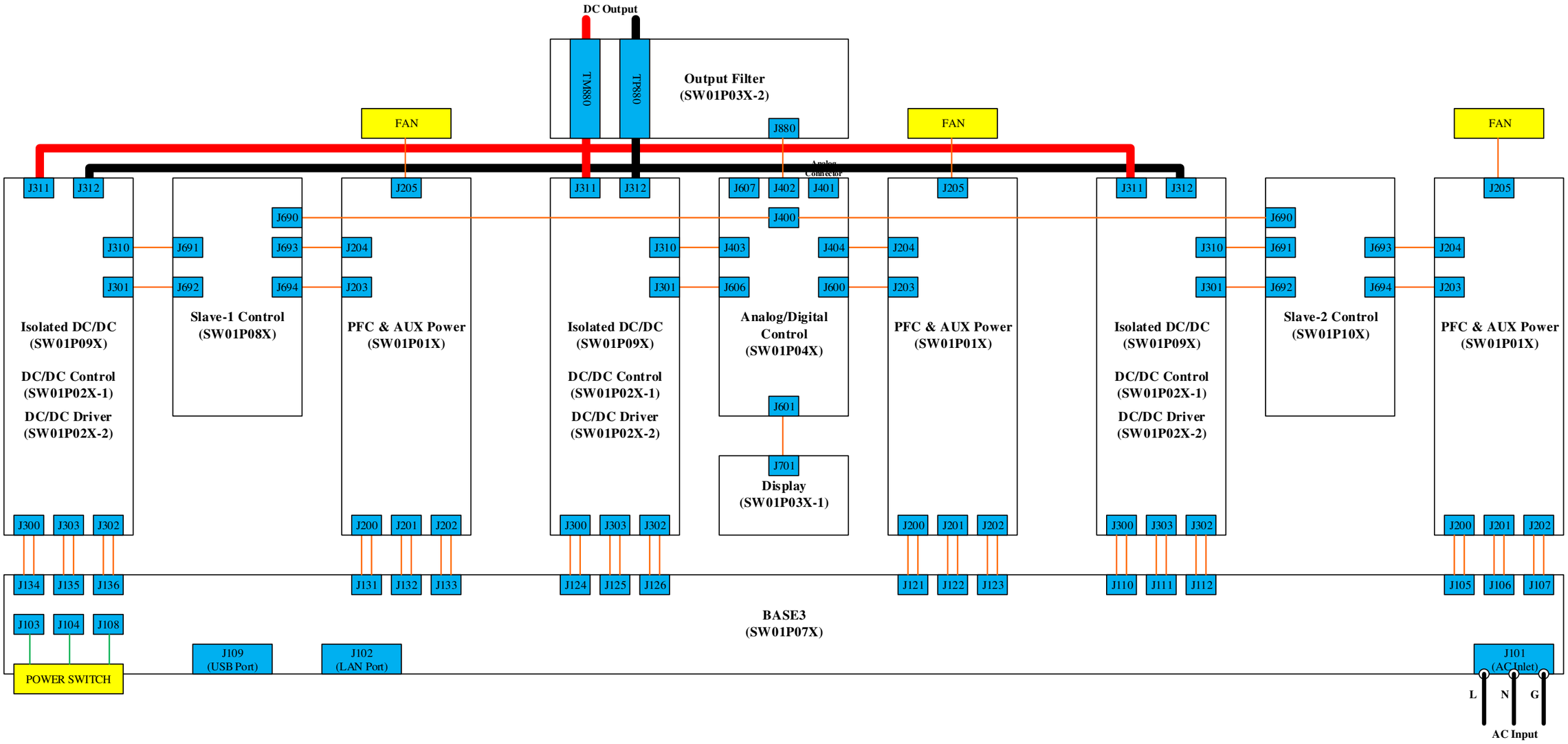
720W models (Type II) PSW 30-72, 80-27, 160-14.4



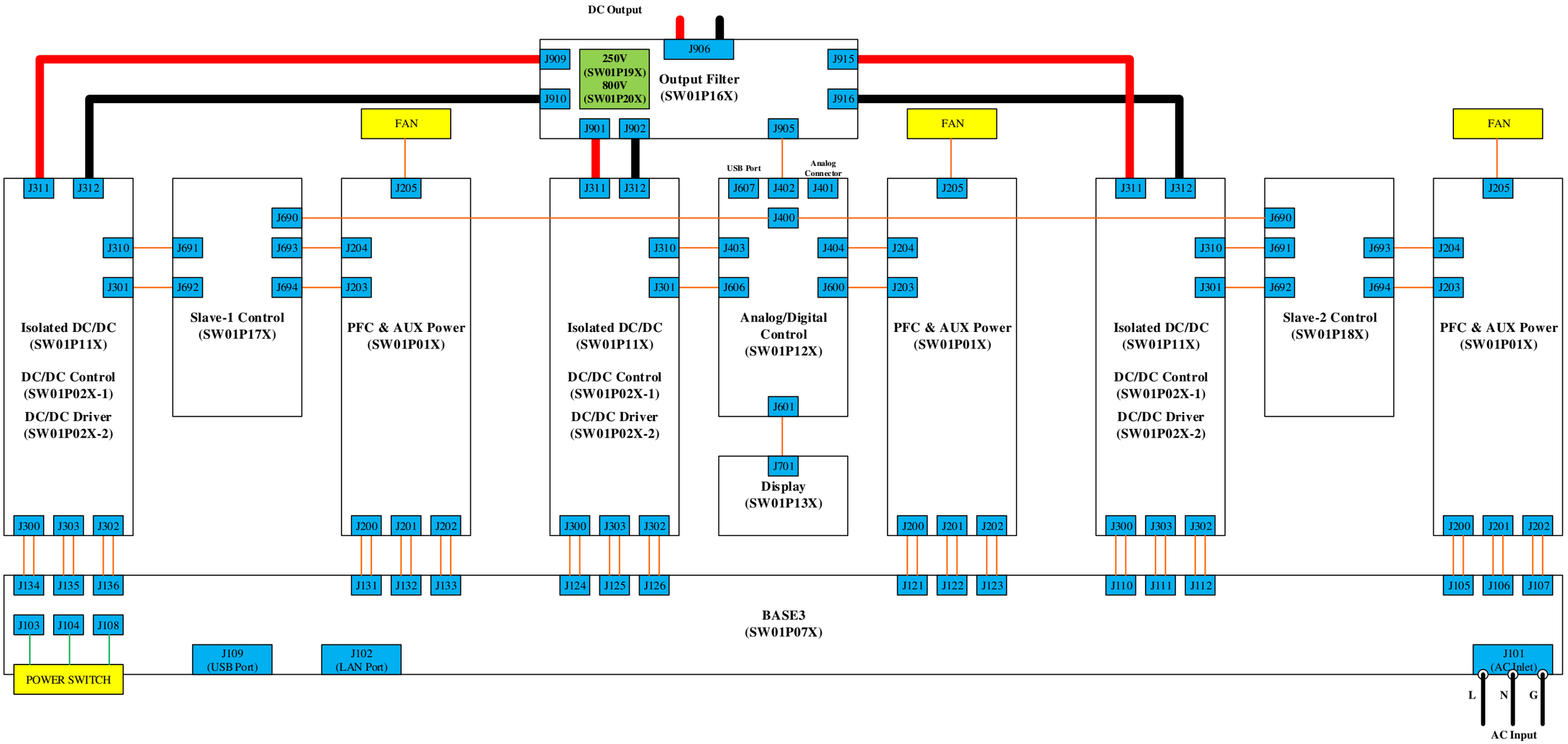
720W models (Type II) PSW 250-9, 800-2.88



1080W models (Type III) PSW 30-108, 80-40.5, 160-21.6



1080W models (Type III) PSW 250-13.5, 800-4.32



VERIFICATION

The Verification chapter describes how to make sure the power supply is operating properly by verifying its major functionalities. The verification is intended for a full performance inspection before shipping the power supply to the end user, after major component replacements, or a firmware upgrade.

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Preparing for Verification

Note ⚠	In order to ensure performance accuracy, we recommend you to verify all items listed in this chapter at once.
When to verify the specification	• When using the power supply in a new environment • After replacing one of the major internal modules, such as front panel or power supply PCB • When you need to make sure that the power supply is malfunctioning or not
Verification Environment	• Location: Indoor, no direct sunlight, dust free • Relative Humidity: < 80% • Temperature: +18~+28°C • Warm-up time: ≥ 30 minutes
When the verification fails…	• Calibrate the instrument when a corresponding calibration item exists. • For other items, send the power supply back to the factory for repair.

List of Equipment for Verification

Here is the list of all equipment used in the service operations.

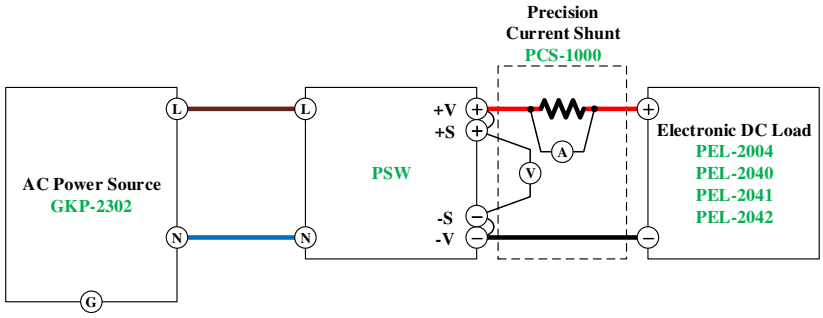
Type	Specifications	Recommended Model
Digital Voltmeter	• Resolution: 1 uV @ 1V • Readout: 6 1/2 digits	• GW Instek GDM-8261A • PCS-1000 or equivalent
Precision Current Shunt	• 3A (0.1Ω) 0.01%, TC=3ppm/℃ • 30A (0.01Ω) 0.01%, TC=10ppm/℃ • 300A (0.001Ω) 0.02%, TC=10ppm/℃	• GW Instek PCS-1000 or equivalent
Oscilloscope	• Sensitivity: 1 mV • Bandwidth Limit: 20 MHz • Probe: 1:1 with JEITA RC-9131B	• GW Instek GDS-2302A or equivalent
AC Power Source	• Adjustable to highest rated input voltage range. • Power: 3000 VA	• GW Instek GKP-2302 or equivalent
Electronic Load	• 80V, 280A minimum, with transient capability and a slew rate of 2.8A/us or better.	• GW Instek PEL-2004 mainframe, with 4 - PEL-2040 modules
	• 500V, 40A minimum, with transient capability and a slew rate of 0.4A/us or better	• GW Instek PEL-2004 mainframe, with 4 - PEL-2041 modules
	• 850V, 40A minimum, with transient capability and a slew rate of 0.4A/us or betterCurrent Load Effect	• GW Instek PEL-2004 mainframe, with 4 - PEL-2042 modules
True RMS AC Voltmter	• True RMS • Bandwidth: 20 MHz • Sensitivity: 100 uV	• NF M2170 or equivalent

Constant Voltage Tests

Voltage Programming and Measurement Accuracy

Connection

Fig. 1



Background

This test verifies that the voltage programming and measurement functions are within specifications.

Procedure

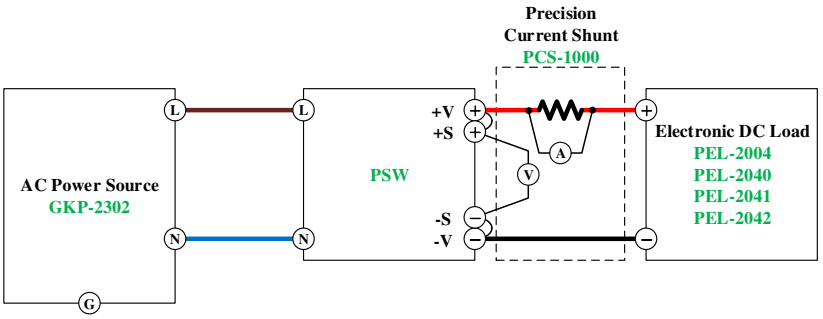
1. Turn off the power supply and connect a DVM of PCS-1000 directly across the +S and -S terminals as shown in the connection fig. 1. Do not turn on electronic load.
2. Turn on the power supply and program the output voltage to zero and the output current to its maximum programmable value (Imax) with the load off. The CV annunciator should be on and the output current reading should be approximately zero.
3. Record the output voltage readings on the digital voltmeter (DVM) and the voltage measured over the interface. The readings should be within the limits specified in the test record form for the appropriate model under Voltage Programming and Measurement, Minimum Voltage Vout.
4. Program the output voltage to its full-scale rating.
5. Record the output voltage readings on the DVM and the voltage measured over the interface. The readings should be within the limits specified in the test record form for the appropriate model under Voltage Programming and Measurement, Rated Voltage Vout.

Verifying Voltage Programming and Measurement Accuracy is complete

CV Load Regulation

Connection

Fig.2



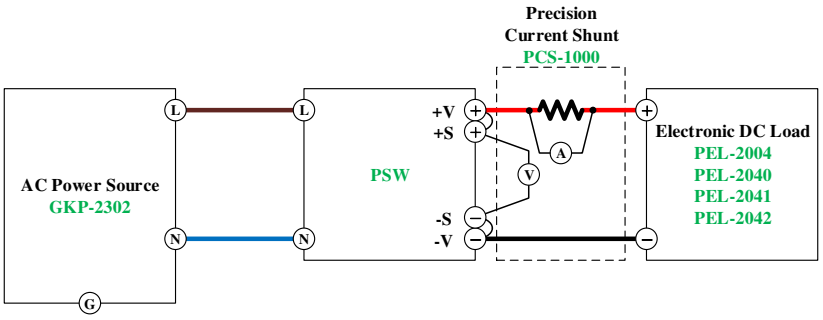
Background	This test measures the change in output voltage resulting from a change in output current from full load to no load.
Procedure	1. Turn off the power supply and connect a DVM of PCS-1000 and an electronic load as shown in the connection fig. 2. 2. Turn on the power supply and program the output current to its maximum programmable value (Imax) and the output voltage to its full scale value. 3. Set the electronic load for the output's full-scale current. The CV annunciator on the front panel must be on. If it is not, adjust the load so that the output current drops slightly. 4. Record the output voltage reading from the DVM. 5. Open the load and record the voltage reading from the DVM again. The difference between the DVM readings in steps 4 and 5 is the load effect, which should not exceed the value listed in the test record form for the appropriate model under CV Load Regulation.

Verifying CV Load Regulation is complete

CV Line Regulation

Connection

Fig. 3



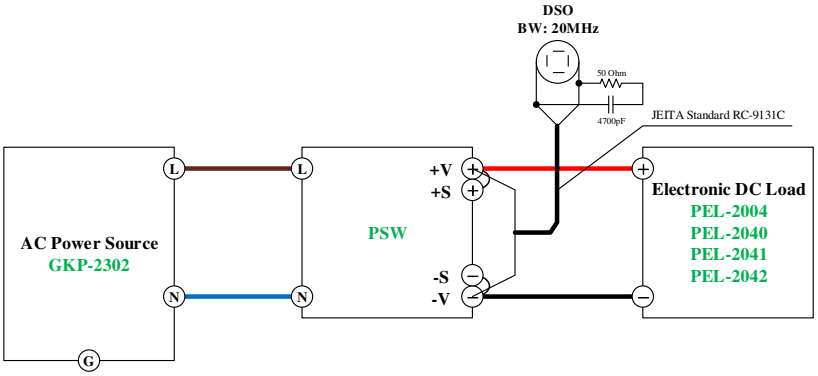
Background	This test measures the change in output voltage that results from a change in AC line voltage from the minimum to maximum value within the line voltage specifications.
Procedure	1. Turn off the power supply and connect the ac power source. 2. Connect a DVM of PCS-1000and an electronic load as shown in the connection fig. 3. Set the variable ac voltage to nominal line voltage. 3. Turn on the power supply and program the output current to its maximum programmable value (Imax) and the output voltage to its full-scale value. 4. Set the electronic load for the output's full-scale current. The CV annunciator on the front panel must be on. If it is not, adjust the load so that the output current drops slightly. 5. Adjust the ac power source to the low-line voltage (85 VAC for 100/120 nominal line; 170 VAC for 200/240 nominal line). 6. Record the output voltage reading from the DVM. 7. Adjust the ac power source to the high-line voltage (132 VAC for 100/120 nominal line; 265 VAC for 200/240 nominal line). 8. Record the output voltage reading on the DVM. The difference between the DVM reading in steps 5 and 7 is the source effect, which should not exceed the value listed in the test record form for the appropriate model under CV Line Regulation.

Verifying CV Line Regulation is complete

CV Ripple and Noise

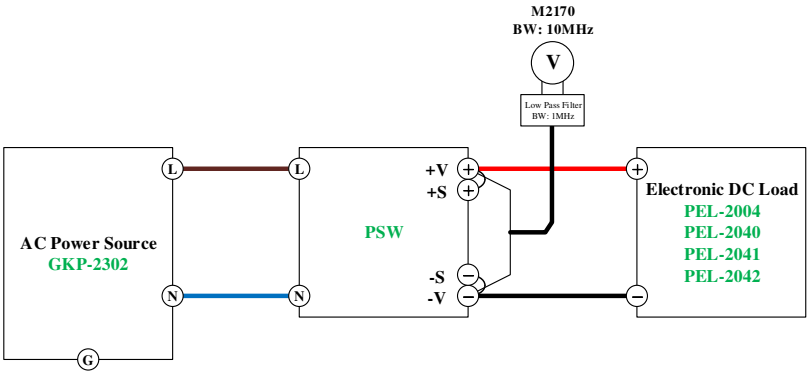
Connection

Fig. 4



Connection

Fig. 5



Background

Measure with JEITA RC-9131B (1:1) probe on the DC output voltage. Measurement frequency bandwidth is 10Hz to 20MHz for peak to peak. Measurement frequency bandwidth is 5Hz to 1MHz for rms.

Procedure

1. Turn off the power supply and connect the electronic load (or load resistor), probe, and an oscilloscope (ac coupled) to the output as shown in the connection fig. 4.
2. Set the oscilloscope's bandwidth limit on 20 MHz, and set the sampling mode.
3. Program the power supply to program the output current to its maximum programmable value (Imax) and the output voltage to its full-scale value and enable the output. Let the oscilloscope run for a few seconds to generate enough measurement points. The result should not exceed the peak-to-peak limits in the test record.
4. Disconnect the oscilloscope and connect an ac rms voltmeter in its place as shown in the connection fig. 5. The result should not exceed the rms limits in the test record form for the appropriate model under CV Ripple and Noise - rms.

Verifying CV Ripple and Noise is complete

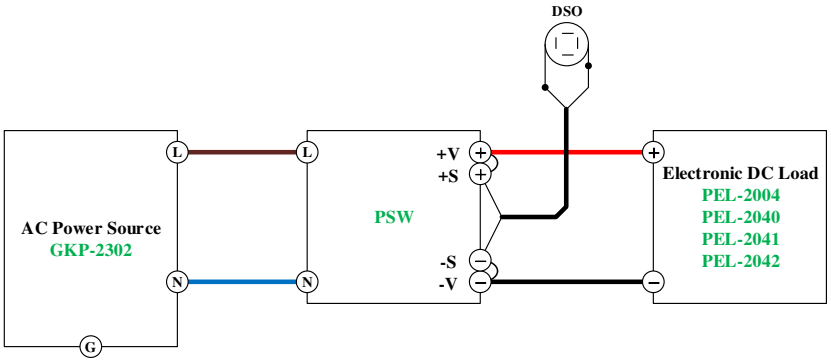
Transient Recovery Time

Background

This measures the time for the output voltage to recover to within the specified value following a 50% to 100% change in the load current.

Connection

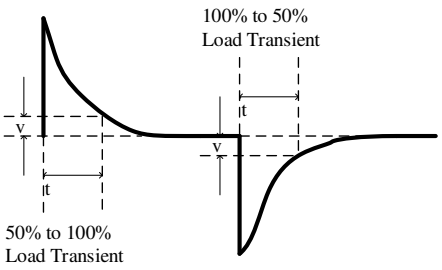
Fig. 6



Procedure

1. Turn off the power supply and connect the output as in the connection fig. 6 with the oscilloscope across the +S and –S terminals.
2. Turn on the power supply and program the output current to its maximum programmable value (Imax) and the output voltage to its full-scale value.
3. Set the electronic load to operate in constant current mode. Program its load current to 50% of the power supply's full scale current value.
4. Set the electronic load's transient generator frequency to 100 Hz and its duty cycle to 50%.
5. Program the load's transient current level to 100% of the power supply's full-scale current value. Turn the transient generator on.
6. Adjust the oscilloscope for a waveform similar to that shown in the following fig 7.

Fig. 7



7. The output voltage should return to within the specified voltage in the specified time following the 50% to 100% load change. Check transients by triggering on the positive and negative slope. Record the voltage at time "t" in the performance test record form under Transient Response.

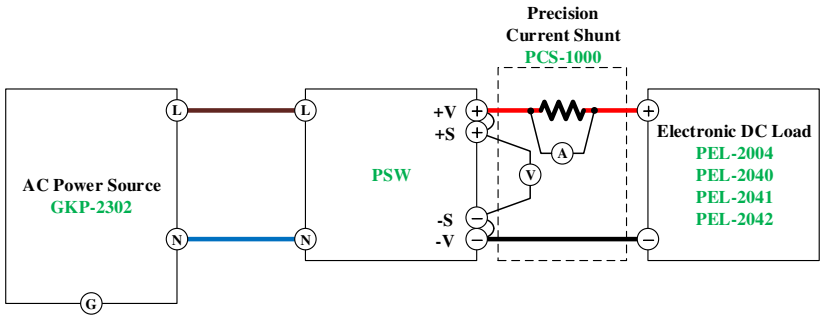
Verifying Transient Recovery Time Regulation is complete

Constant Current Tests

Current Programming and Measurement Accuracy

Connection

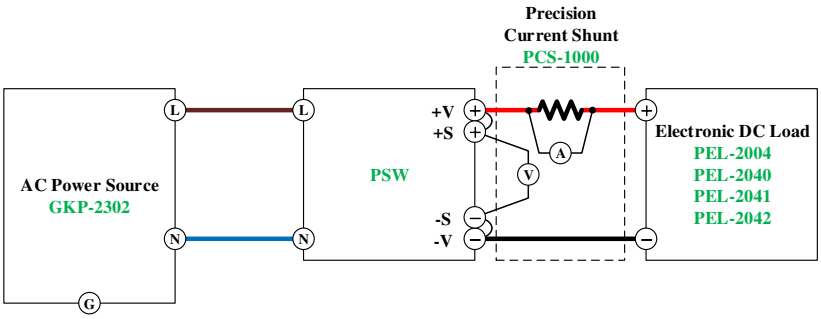
Fig. 8



Background	This test verifies that the current programming and measurement functions are within specifications.
Procedure	1. Turn off the power supply and connect the current shunt directly across the output as shown in the connection fig. 8. 2. Turn on the power supply and program the output voltage to its full-scale value and the output current to zero. The CC annunciator should be on and the output voltage reading should be approximately zero. 3. Record the output current readings on precision current shunt (PCS-1000) and the current measured over the interface. The readings should be within the limits specified in the test record form for the appropriate model under Current Programming and Measurement, Minimum Current Iout. 4. Program the output current to its full-scale rating. 5. Record the output current readings on the precision current shunt (PCS-1000) and the voltage measured over the interface. The readings should be within the limits specified in the test record form for the appropriate model under Current Programming and Measurement, Rated Current Iout.

Verifying Current Programming and Measurement Accuracy is complete

CC Load Regulation

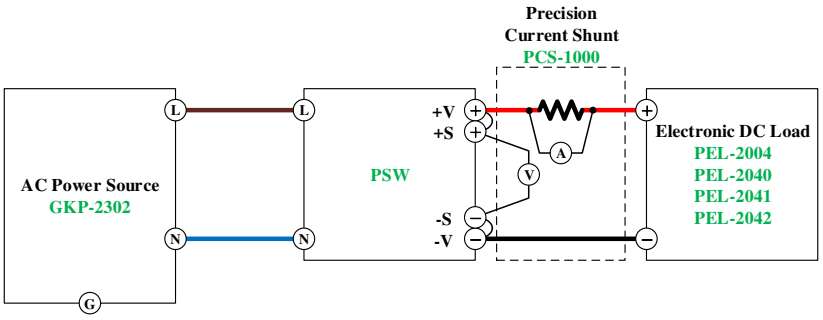
Connection Fig. 9	
Background	This test measures the change in output current resulting from a change in output voltage from full scale to short circuit.
Procedure	1. Turn off the power supply and connect the precision current shunt and electronic load as shown in the connection fig. 9. 2. Turn on the power supply and program the output current to its maximum programmable value (Imax) and the output voltage to its full-scale value. 3. With the electronic load in CV mode, set it for the output's full scale voltage. The CC annunciator on the front panel must be on. If it is not, adjust the load so that the voltage drops slightly. 4. Record the output current reading from the PCS-1000. 5. Short the electronic load. Record this value (Iout). The difference in the current readings in steps 3 and 4 is the load effect, which should not exceed the value listed in the test record form for the appropriate model under CC Load Regulation.

Verifying CC Load Regulation is complete

CC Line Regulation

Connection

Fig. 10



Background	This test measures the change in output current that results from a change in AC line voltage from the minimum to maximum value within the line voltage specifications.
Procedure	1. Turn off the power supply and connect the ac power source.. 2. Connect the current shunt and electronic load as shown in the connection fig. 10. Set the variable ac voltage to nominal line voltage. 3. Turn on the power supply and program the output current to its full-scale value and the output voltage to its maximum programmable value (Vmax). 4. With the electronic load in CV mode, set it for the output's full scale voltage. The CC annunciator on the front panel must be on. If it is not, adjust the load so that the voltage drops slightly. 5. Adjust the ac power source to the low-line voltage (85 VAC for 100/120 nominal line; 170 VAC for 200/240 nominal line). 6. Record the output current reading from the PCS-1000. 7. Adjust the ac power source to the high-line voltage (132 VAC for 100/120 nominal line; 265 VAC for 200/240 nominal line). 8. Record the output current reading on the PCS-1000. The difference between the PCS-1000 reading in steps 5 and 7 is the source effect, which should not exceed the value listed in the test record form for the appropriate model under CC Line Regulation.

Verifying CC Line Regulation is complete

Verification Test Record Form

Print out these pages and record the results. Keep it with the power supply.

30V

Model ☐ PSW30-36 ☐ PSW 30-72 ☐ PSW 30-108

Serial number _____

Date Year_____ Month_____ Date_____

Verified by Name_____

Company/Contact_____

Environment Temperature_____°C Humidity_____%

Constant Voltage Test	Model	Min. Specs.	Results	Max. Specs.
Voltage Programming and Measurement				
Minimum Voltage V_{out}	All	- 10 mV		+ 10 mV
Measurement Accuracy	All	Vout - 10 mV		Vout + 10 mV
Rated Voltage Vout	All	29.960 V		30.040 V
Measurement Accuracy	All	Vout - 40 mV		Vout + 40 mV
CV Line Regulation	All	- 18 mV		+ 18 mV
CV Load Regulation	All	- 20 mV		+ 20 mV
CV Ripple and Noise				
peak-to-peak	30-36	N/A		60 mV
	30-72	N/A		80 mV
	30-108	N/A		100 mV
rms	30-36	N/A		7 mV
	30-72	N/A		11 mV
	30-108	N/A		14 mV
Transient Response Time				
Voltage @ 1ms	All	- 40 mV		+ 40 mV
Constant Current Test	Model	Min. Specs.	Results	Max. Specs.
Current Programming and Measurement				
Minimum Current Iout	30-36	- 30 mA		+ 30 mA
	30-72	- 60 mA		+ 60 mA
	30-108	- 100 mA		+ 100 mA
Measurement Accuracy	30-36	Iout - 30 mA		Iout + 30 mA
	30-72	Iout - 60 mA		Iout + 60 mA

	30-108	Iout - 100 mA		Iout + 100 mA
Rated Current Iout	30-36	35.934 A		36.066 A
	30-72	71.898 A		72.102 A
	30-108	107.862 A		108.138 A
Measurement Accuracy	30-36	Iout - 66 mA		Iout + 66 mA
	30-72	Iout - 102 mA		Iout + 102 mA
	30-108	Iout - 138 mA		Iout + 138 mA
CC Line Regulation	30-36	- 41 mA		+ 41 mA
	30-72	- 77 mA		+ 77 mA
	30-108	- 108 mA		+ 108 mA
CC Load Regulation	30-36	- 41 mA		+ 41 mA
	30-72	- 77 mA		+ 77 mA
	30-108	- 108 mA		+ 108 mA

80V

Model ☐ PSW 80-13.5 ☐ PSW 80-27 ☐ PSW 80-40.5

Serial number _____

Date Year_____ Month_____ Date_____

Verified by Name_____

Company/Contact_____

Environment Temperature_____°C Humidity_____%

Constant Voltage Test	Model	Min. Specs.	Results	Max. Specs.
Voltage Programming and Measurement				
Minimum Voltage V_{out}	All	- 10 mV		+ 10 mV
Measurement Accuracy	All	Vout - 10 mV		Vout + 10 mV
Rated Voltage Vout	All	79.910 V		80.090 V
Measurement Accuracy	All	Vout - 90 mV		Vout + 90 mV
CV Line Regulation	All	- 43 mV		+ 43 mV
CV Load Regulation	All	- 45 mV		+ 45 mV
CV Ripple and Noise				
peak-to-peak	80-13	N/A		60 mV
	80-27	N/A		80 mV
	80-40	N/A		100 mV
rms	80-13	N/A		7 mV
	80-27	N/A		11 mV
	80-40	N/A		14 mV

Transient Response Time				
Voltage @ 1ms	All	- 90 mV		+ 90 mV
Constant Current Test	Model	Min. Specs.	Results	Max. Specs.
Current Programming and Measurement				
Minimum Current Iout	80-13	- 10 mA		+ 10 mA
	80-27	- 30 mA		+ 30 mA
	80-40	- 40 mA		+ 40 mA
Measurement Accuracy	80-13	Iout - 10 mA		Iout + 10 mA
	80-27	Iout - 30 mA		Iout + 30 mA
	80-40	Iout - 40 mA		Iout + 40 mA
Rated Current Iout	80-13	13.476 A		13.524 A
	80-27	26.943 A		27.057 A
	80-40	40.419 A		40.581 A
Measurement Accuracy	80-13	Iout - 24 mA		Iout + 24 mA
	80-27	Iout - 57 mA		Iout + 57 mA
	80-40	Iout - 81 mA		Iout + 81 mA
CC Line Regulation	80-13	- 18.5 mA		+ 18.5 mA
	80-27	- 32 mA		+ 32 mA
	80-40	- 45.5 mA		+ 45.5 mA
CC Load Regulation	80-13	- 18.5 mA		+ 18.5 mA
	80-27	- 32 mA		+ 32 mA
	80-40	- 45.5 mA		+ 45.5 mA

160V

Model ☐ PSW 160-7.2 ☐ PSW 160-14.4 ☐ PSW 160-21.6

Serial number _____

Date Year_____ Month_____ Date_____

Verified by Name_____

Company/Contact_____

Environment Temperature_____°C Humidity_____%

Constant Voltage Test	Model	Min. Specs.	Results	Max. Specs.
Voltage Programming and Measurement				
Minimum Voltage V_{out}	All	- 100 mV		+ 100 mV
Measurement Accuracy	All	Vout - 100 mV		Vout + 100 mV
Rated Voltage Vout	All	159.74 V		160.26 V
Measurement Accuracy	All	Vout - 260 mV		Vout + 260 mV

CV Line Regulation	All	- 83 mV		+ 83 mV
CV Load Regulation	All	- 85 mV		+ 85 mV
CV Ripple and Noise				
peak-to-peak	160-7.2	N/A		60 mV
	160-14.4	N/A		80 mV
	160-21.6	N/A		100 mV
rms	160-7.2	N/A		12 mV
	160-14.4	N/A		15 mV
	160-21.6	N/A		20 mV
Transient Response Time				
Voltage @ 1ms	All	- 170 mV		+ 170 mV
Constant Current Test	Model	Min. Specs.	Results	Max. Specs.
Current Programming and Measurement				
Minimum Current Iout	160-7.2	- 5 mA		+ 5 mA
	160-14.4	- 15 mA		+ 15 mA
	160-21.6	- 20 mA		+ 20 mA
Measurement Accuracy	160-7.2	Iout - 5 mA		Iout + 5 mA
	160-14.4	Iout - 15 mA		Iout + 15 mA
	160-21.6	Iout - 20 mA		Iout + 20 mA
Rated Current Iout	160-7.2	7.1878 A		7.2122 A
	160-14.4	14.370 A		14.430 A
	160-21.6	21.558 A		21.642 A
Measurement Accuracy	160-7.2	Iout - 12.2 mA		Iout + 12.2 mA
	160-14.4	Iout - 30 mA		Iout + 30 mA
	160-21.6	Iout - 42 mA		Iout + 42 mA
CC Line Regulation	160-7.2	- 12.2 mA		+ 12.2 mA
	160-14.4	- 19.4 mA		+ 19.4 mA
	160-21.6	- 26.6 mA		+ 26.6 mA
CC Load Regulation	160-7.2	- 12.2 mA		+ 12.2 mA
	160-14.4	- 19.4 mA		+ 19.4 mA
	160-21.6	- 26.6 mA		+ 26.6 mA

250V

Model ☐ PSW 250-4.5 ☐ PSW 250-9 ☐ PSW 250-13.5

Serial number _____

Date Year_____ Month_____ Date_____

Verified by Name_____

Company/Contact_____

Environment Temperature_____°C Humidity_____%

Constant Voltage Test	Model	Min. Specs.	Results	Max. Specs.
Voltage Programming and Measurement				
Minimum Voltage V_{out}	All	- 200 mV		+ 200 mV
Measurement Accuracy	All	Vout - 200 mV		Vout + 200 mV
Rated Voltage Vout	All	249.55 V		250.45 V
Measurement Accuracy	All	Vout - 450 mV		Vout + 450 mV
CV Line Regulation	All	- 128 mV		+ 128 mV
CV Load Regulation	All	- 130 mV		+ 130 mV
CV Ripple and Noise				
peak-to-peak	250-4	N/A		80 mV
	250-9	N/A		100 mV
	250-13	N/A		120 mV
rms	250-4	N/A		15 mV
	250-9	N/A		15 mV
	250-13	N/A		15 mV
Transient Response Time				
Voltage @ 1ms	All	- 260 mV		+ 260 mV
Constant Current Test	Model	Min. Specs.	Results	Max. Specs.
Current Programming and Measurement				
Minimum Current Iout	250-4	- 5 mA		+ 5 mA
	250-9	- 10 mA		+ 10 mA
	250-13	- 15 mA		+ 15 mA
Measurement Accuracy	250-4	Iout - 5 mA		Iout + 5 mA
	250-9	Iout - 10 mA		Iout + 10 mA
	250-13	Iout - 15 mA		Iout + 15 mA
Rated Current Iout	250-4	4.4905 A		4.5095 A
	250-9	8.9810 A		9.0190 A
	250-13	13.471 A		13.529 A
Measurement Accuracy	250-4	Iout - 9.5 mA		Iout + 9.5 mA
	250-9	Iout - 19 mA		Iout + 19 mA
	250-13	Iout - 29 mA		Iout + 29 mA
CC Line Regulation	250-4	- 9.5 mA		+ 9.5 mA
	250-9	- 14 mA		+ 14 mA
	250-13	- 18.5 mA		+ 18.5 mA
CC Load Regulation	250-4	- 9.5 mA		+ 9.5 mA
	250-9	- 14 mA		+ 14 mA
	250-13	- 18.5 mA		+ 18.5 mA

800V

Model ☐ PSW 800-1.44 ☐ PSW 800-2.88 ☐ PSW 800-4.32

Serial number _____

Date Year_____ Month_____ Date_____

Verified by Name_____

Company/Contact_____

Environment Temperature_____°C Humidity_____%

Constant Voltage Test	Model	Min. Specs.	Results	Max. Specs.
Voltage Programming and Measurement				
Minimum Voltage V_{out}	All	- 400 mV		+ 400 mV
Measurement Accuracy	All	Vout - 400 mV		Vout + 400 mV
Rated Voltage Vout	All	798.8 V		201.2 V
Measurement Accuracy	All	Vout - 1.2 V		Vout + 1.2 V
CV Line Regulation	All	- 403 mV		+ 403 mV
CV Load Regulation	All	- 405 mV		+ 405 mV
CV Ripple and Noise				
peak-to-peak	800-1	N/A		150 mV
	800-2	N/A		200 mV
	800-4	N/A		200 mV
rms	800-1	N/A		30 mV
	800-2	N/A		30 mV
	800-4	N/A		30 mV
Transient Response Time				
Voltage @ 1ms	All	- 260 mV		+ 260 mV
Constant Current Test	Model	Min. Specs.	Results	Max. Specs.
Current Programming and Measurement				
Minimum Current Iout	800-1	- 2 mA		+ 2 mA
	800-2	- 4 mA		+ 4 mA
	800-4	- 6 mA		+ 6 mA
Measurement Accuracy	800-1	Iout - 2 mA		Iout + 2 mA
	800-2	Iout - 4 mA		Iout + 4 mA
	800-4	Iout - 6 mA		Iout + 6 mA
Rated Current Iout	800-1	1.4365 A		1.4435 A
	800-2	2.8731 A		2.8869 A
	800-4	4.3096 A		4.3304 A

Measurement Accuracy	800-1	Iout - 3.5 mA		Iout + 3.5 mA
	800-2	Iout - 6.9 mA		Iout + 6.9 mA
	800-4	Iout - 10.4 mA		Iout + 10.4 mA
CC Line Regulation	800-1	- 6.44 mA		+ 6.44 mA
	800-2	- 7.88 mA		+ 7.88 mA
	800-4	- 9.32 mA		+ 9.32 mA
CC Load Regulation	800-1	- 6.44 mA		+ 6.44 mA
	800-2	- 7.88 mA		+ 7.88 mA
	800-4	- 9.32 mA		+ 9.32 mA

CALIBRATION AND ADJUSTMENT

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List of Equipment for Calibration

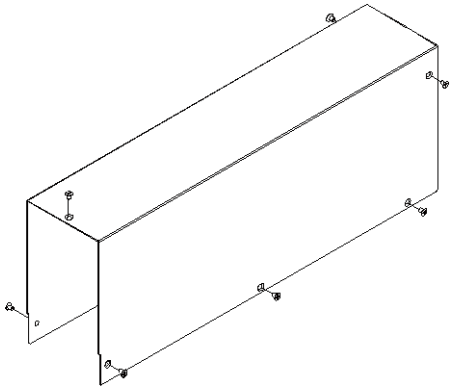
Here is the list of all equipment used in the calibration operations.

Type	Specifications	Recommended Model
Precision Current Shunt	• 3A (0.1Ω) 0.01%, TC=3ppm/℃ • 30A (0.01Ω) 0.01%, TC=10ppm/℃ • 300A (0.001Ω) 0.02%, TC=10ppm/℃	• GW Instek PCS-1000 or equivalent
Electronic Load	• 80V, 280A minimum, with transient capability and a slew rate of 2.8A/us or better.	• GW Instek PEL-2004 mainframe, with 4 - PEL-2040 modules
	• 500V, 40A minimum, with transient capability and a slew rate of 0.4A/us or better	• GW Instek PEL-2004 mainframe, with 4 - PEL-2041 modules
	• 850V, 40A minimum, with transient capability and a slew rate of 0.4A/us or better Current Load Effect	• GW Instek PEL-2004 mainframe, with 4 - PEL-2042 modules
DC Source	• Voltage resolution: 1mV • Accuracy: 10mV	• GW Instek GPD-2303S or equivalent

Analog Interface Calibration

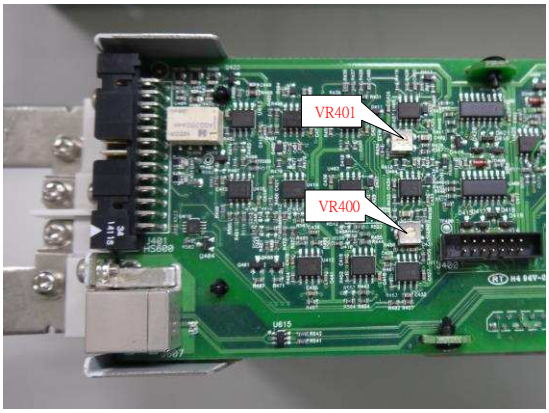
Remove the Top Cover

Before executing this calibration, please remove the top cover from the device. There are 9 screws to unscrew from both sides and top as shown in the photos below.



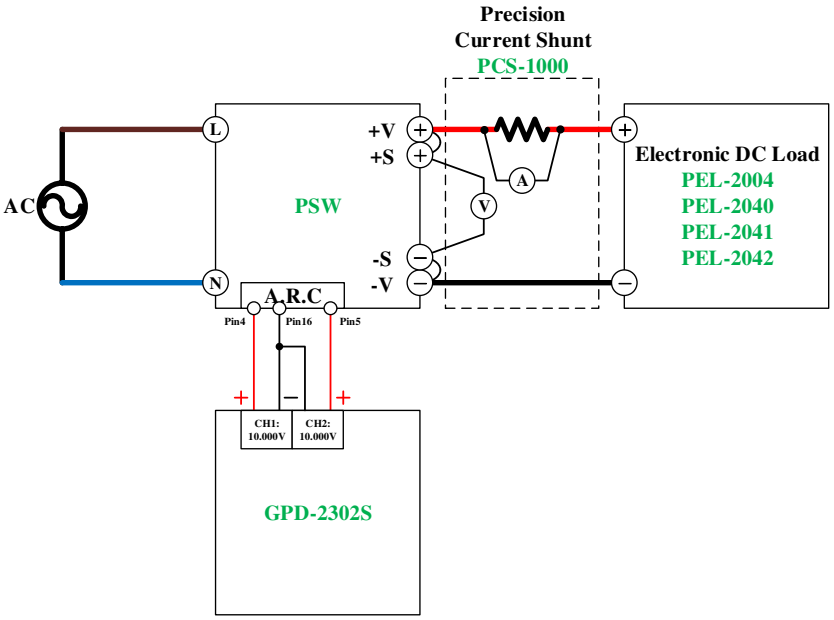
The location of adjustment points

The location of adjustment point VR400 and VR401 are shown in the photo below.



Connection of the device

Please refer to the connection diagram below to connect the required device



NOTE

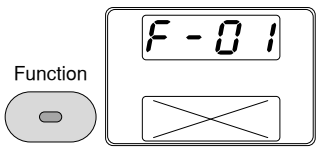
Before connecting to the external DC power supply (GPD-2302S), be sure to conform with a voltmeter whether if the output on CH1or CH2 is 10.000V± 0.001V respectively.

Calibration procedure

Procedure

1. Turn on the PSW. Press the Function key. The Function key will light up.

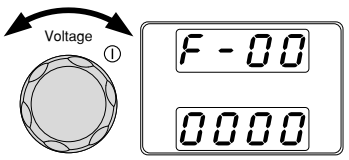
   The display will show F-01 on the top.



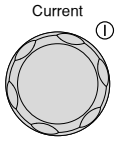
NOTE

"X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

2. Rotate the voltage knob to change the F setting until F-00 is shown.

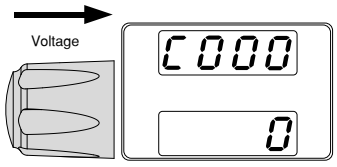


3. Use the current knob to enter the password corresponding to the model being calibrated. The password for each model is listed below.



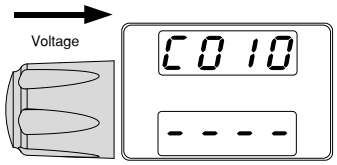
PSW 30-36	3036	PSW 30-72	3072	PSW 30-108	3010
PSW 80-13.5	8013	PSW 80-27	8027	PSW 80-40.5	8040
PSW 160-7.2	1607	PSW 160-14.4	1614	PSW 160-21.6	1621
PSW 250-4.5	2545	PSW 250-9	2509	PSW 250-13.5	2515
PSW 800-1.44	8014	PSW 800-2.88	8028	PSW 800-4.32	8043

4. Press the voltage knob to enter the analog interface calibration. C000 will be displayed when successful.



5. Turn on the external Power supply (GPD-2302), Set the output on CH1/CH2 to 10.000V± 0.001V.

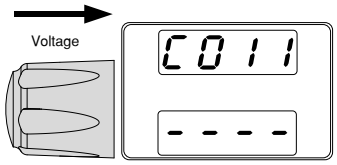
6. Press the voltage knob to prepare to execute the external output voltage calibration (C010).



NOTE

Be sure that the load on the electric load is turned off.

7. Press the voltage knob (C011 is displayed). At this time the output on the PSW turns on, the output and CV indicators are lit.



NOTE

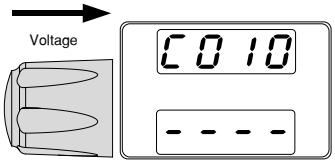
Check if the reading on the PCS-1000's voltmeter is within the specified voltage range. If not, adjust VR401. (please refer to the photo on page 61)

Adjustment range for each model at adjustment point VR401.

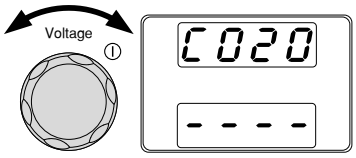
Model	Min.	Max.
PSW 30-36	29.994	30.006
PSW 80-13.5	79.984	80.016
PSW 160-7.2	159.968	160.032
PSW 250-4.5	249.950	250.050
PSW 800-1.44	799.840	800.160
PSW 30-72	29.994	30.006
PSW 80-27	79.984	80.016
PSW 160-14.4	159.968	160.032
PSW 250-9	249.950	250.050

PSW 800-2.88	799.840	800.160
PSW 30-108	29.994	30.006
PSW 80-40.5	79.984	80.016
PSW 160-21.6	159.968	160.032
PSW 250-13.5	249.950	250.050
PSW 800-4.32	799.840	800.160

8. Press the voltage knob to return external voltage calibration (C010).

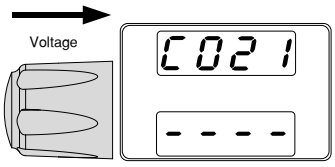


9. Rotate the voltage knob to prepare to execute the external output current calibration (C020).



NOTE Make sure that the Load key and the Short key on the electronic load are turned on.

10. Press the voltage knob (C021 is displayed). At this time the output on the PSW is turned on, the output and CC indicators are lit.

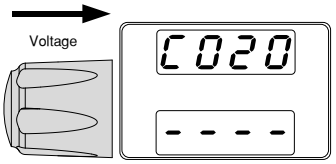


NOTE Check if the reading on the PCS-1000's current meter is within the specified current range. If not, adjust VR400. (please refer to the photo on page 61)

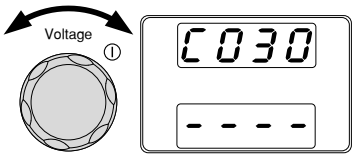
Adjustment range for each model at adjustment point VR400.

Model	Min.	Max.
PSW 30-36	35.9928	36.0072
PSW 80-13.5	13.4973	13.5027
PSW 160-7.2	7.1986	7.2014
PSW 250-4.5	4.4991	4.5009
PSW 800-1.44	1.4397	1.4403
PSW 30-72	71.9856	72.0144
PSW 80-27	26.9946	27.0054
PSW 160-14.4	14.3971	14.4029
PSW 250-9	8.9982	9.0018
PSW 800-2.88	2.8794	2.8806
PSW 30-108	107.9784	108.0216
PSW 80-40.5	40.4919	40.5081
PSW 160-21.6	21.5957	21.6043
PSW 250-13.5	13.4973	13.5027
PSW 800-4.32	4.3191	4.3209

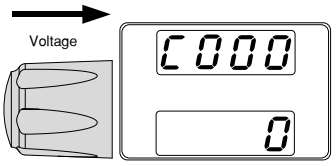
11. Press the voltage knob to return to the external current calibration (C020).



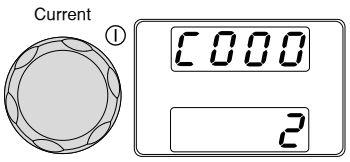
12. Rotate the voltage knob to exit the external current calibration display (C030 is displayed).



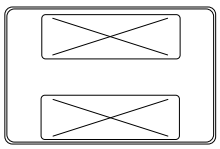
13. Press the voltage knob to return main calibration display.



14. Rotate the current knob to go to the "exit calibration" mode (C000: 2).



15. Press the voltage knob to exit the calibration mode



NOTE "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

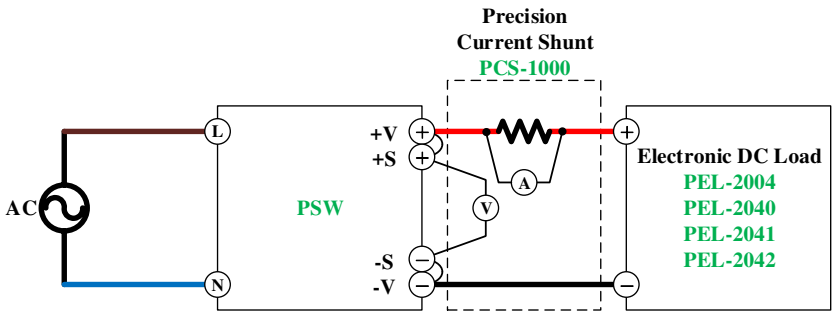
16. Power off the PSW and then reinstall the top cover back on the unit to finish analog interface calibration.

Analog Interface Calibration is complete

Constant Voltage Calibration

Connection of the device

Please refer to the connection diagram below to connect the required device

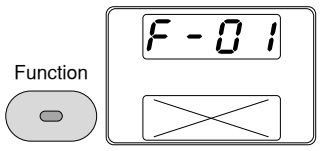


Calibration procedure

Step

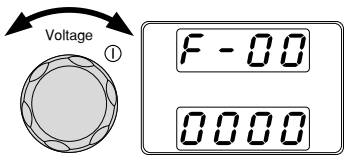
1. Turn on the PSW. Press the Function key. The Function key will light up.

   The display will show F-01 on the top.

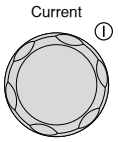


NOTE "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

2. Rotate the voltage knob to change the F setting until F-00 is shown.

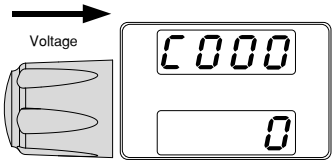


3. Use the current knob to enter the password corresponding to the model being calibrated. The password for each model is listed below.

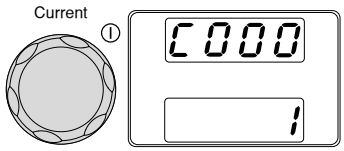


PSW 30-36	3036	PSW 30-72	3072	PSW 30-108	3010
PSW 80-13.5	8013	PSW 80-27	8027	PSW 80-40.5	8040
PSW 160-7.2	1607	PSW 160-14.4	1614	PSW 160-21.6	1621
PSW 250-4.5	2545	PSW 250-9	2509	PSW 250-13.5	2515
PSW 800-1.44	8014	PSW 800-2.88	8028	PSW 800-4.32	8043

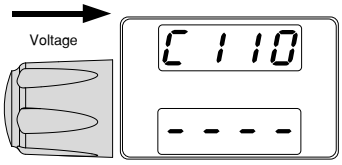
4. Press the voltage knob to enter the analog interface calibration. C000 will be displayed when the calibration is successful.



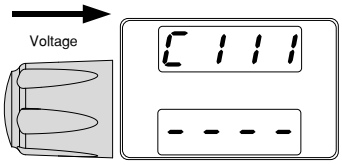
5. Use the current knob to enter "constant voltage" calibration mode. To enter the calibration mode, rotate the current knob until 1 is shown on the bottom display (C000:1).



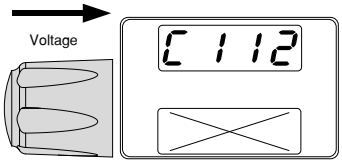
6. Press the voltage knob to enter voltage calibration (C110).



7. Press the voltage knob to enter the output voltage offset calibration (C111).

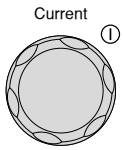


8. Press the voltage knob to set the offset voltage value (C112).

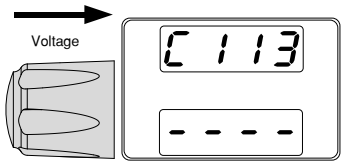


NOTE "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

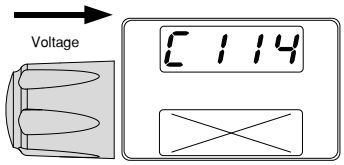
9. Rotate the current knob to set the offset value on the PSW display to be the same as the reading on the PCS-1000's voltmeter.



10. Press the voltage knob to enter the output voltage middle calibration (C113).

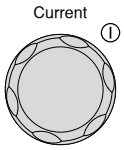


11. Press the voltage knob to set the middle voltage value.

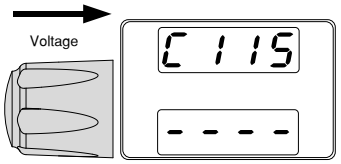


NOTE "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

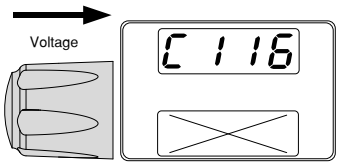
12. Rotate the current knob to set the middle voltage value on the PSW display to be the same as the reading on the PCS-1000's voltmeter.



13. Press the voltage knob to enter the output voltage full scale calibration (C115).

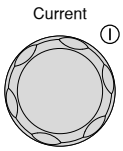


14. Press the voltage knob to set the full scale voltage value (C116).

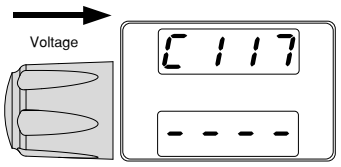


NOTE "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

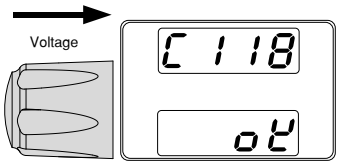
15. Rotate the current knob to set the full scale voltage value on the PSW display to be the same as the reading on the PCS-1000's voltmeter.



16. Press the voltage knob to enter the OVP calibration (C117).

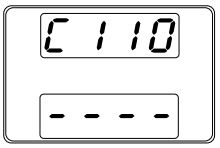


17. Press the Voltage knob to start the automatic OVP calibration (C118). OK will be shown when the calibration is successful.

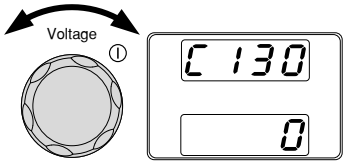


NOTE At this time the output turns on and the CV indicator is lit.

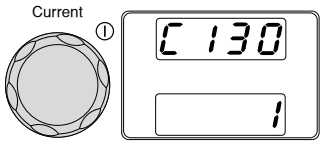
18. You will be automatically returned to C110 after the automatic OVP calibration.



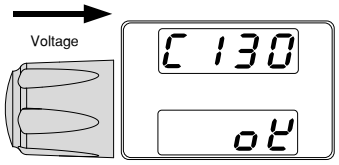
19. Rotate the voltage knob to go to the save mode (C130).



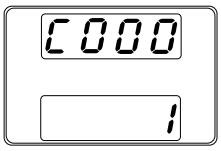
20. Rotate the current knob until 1 is shown on the bottom display (C130:1).



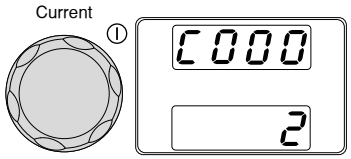
21. Press the voltage knob to save calibration the results. OK will be shown when the calibration value is saved.



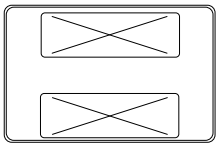
22. You will be automatically returned to C000 after saving is finished.



23. Rotate the current knob to go to the "exit calibration" mode (C000: 2).



24. Press the voltage knob to exit the calibration mode



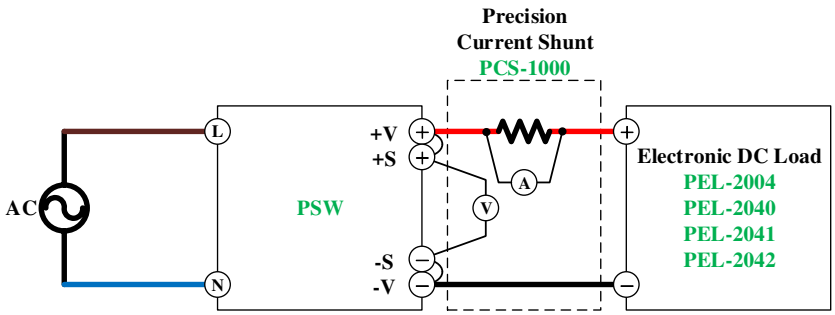
Note "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

Constant Voltage Calibration is complete

Constant Current Calibration

Connection of the device

Please refer to the connect diagram below to connect the required device

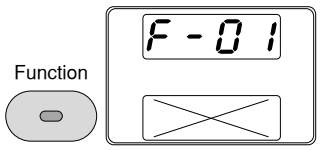


Calibration procedure

Procedure

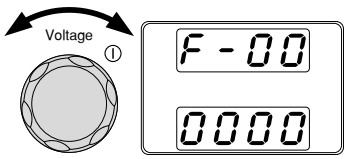
1. Turn on the PSW. Press the Function key. The Function key will light up.

   The display will show F-01 on the top.

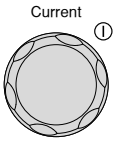


NOTE "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

2. Rotate the voltage knob to change the F setting until F-00 is shown.

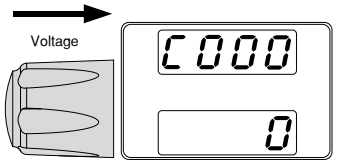


3. Use the current knob to enter the password corresponding to the model being calibrated. The password for each model is listed below.

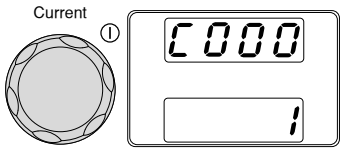


PSW 30-36	3036	PSW 30-72	3072	PSW 30-108	3010
PSW 80-13.5	8013	PSW 80-27	8027	PSW 80-40.5	8040
PSW 160-7.2	1607	PSW 160-14.4	1614	PSW 160-21.6	1621
PSW 250-4.5	2545	PSW 250-9	2509	PSW 250-13.5	2515
PSW 800-1.44	8014	PSW 800-2.88	8028	PSW 800-4.32	8043

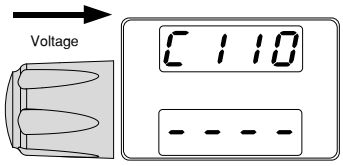
4. Press the voltage knob to enter the analog interface calibration. C000 will be displayed when the calibration is successful.



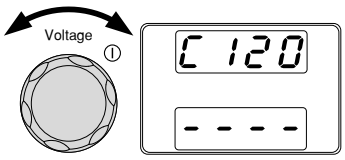
5. Use the current knob to enter "constant voltage" calibration mode. To enter the calibration mode, rotate the current knob until 1 is shown on the bottom display (C000:1).



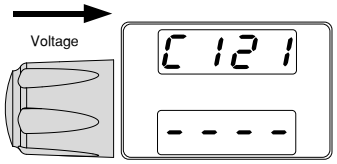
6. Press the voltage knob to enter voltage calibration (C110).



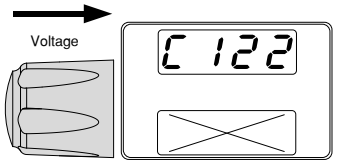
7. Rotate the voltage knob to go to the current calibration (C120).



8. Press the voltage knob to enter the output current offset calibration (C121).

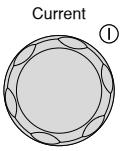


9. Press the voltage knob to set the offset value.

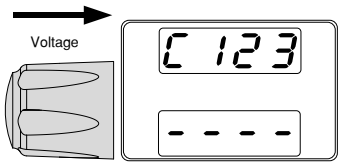


NOTE "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

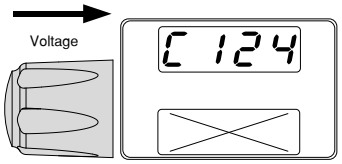
10. Rotate the current knob to set the offset value on the PSW display to be the same as the reading on the PCS-1000's current meter.



11. Press the voltage knob to enter the output current Half-scale calibration.

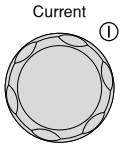


12. Press the voltage knob to set the Half-scale current value.

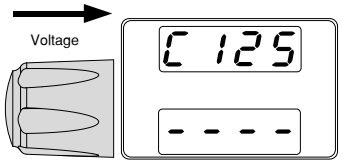


NOTE "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

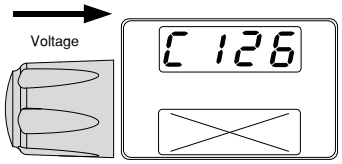
13. Rotate the current knob to set the Half-scale current value on the PSW display to be the same as the reading on the PCS-1000's current meter.



14. Press the voltage knob to enter the output current full scale calibration (C125).

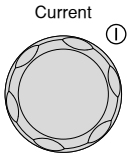


15. Press the voltage knob to set the full scale value (C126).

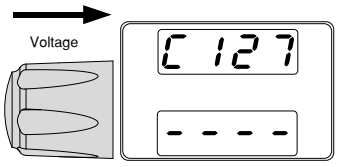


NOTE "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

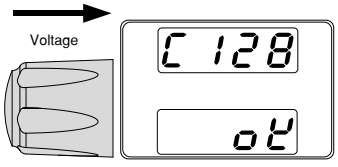
16. Rotate the current knob to set the full scale value on the PSW display to be the same as the reading on the PCS-1000's current meter.



17. Press the voltage knob to enter OCP calibration (C127).



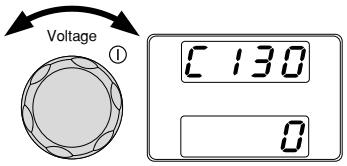
18. Press the voltage knob to start the automatic OCP calibration (C128). OK will be shown when the calibration is successful.



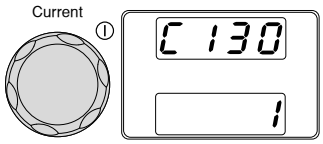
NOTE At this time the output turns on and the CC indicator is lit.

19. You will automatically be returned to C120 after the automatic OCP calibration.

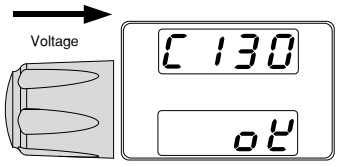
20. Rotate the voltage knob to go to the save mode (C130).



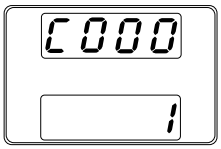
21. Rotate the current knob until 1 is shown on the bottom display (C130:1).



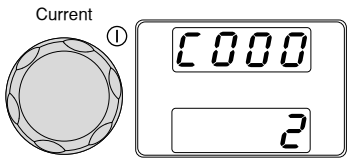
22. Press the voltage knob to save calibration the results. OK will be shown when the calibration value is saved.



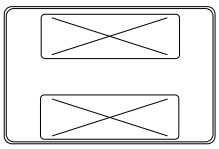
23. You will be automatically returned to C000 after saving is finished.



24. Rotate the current knob to go to the "exit calibration" mode (C000: 2).



25. Press the voltage knob to exit the calibration mode



NOTE "X" mark on the above diagram means that the value on the screen isn't fixed. It depends on the actual value.

Constant Current Calibration is complete

Glossary of all the calibration modes

Display in voltage	Display in Current	Description
F000	0000	Enter Calibration mode
C000	0	Adjustment
C010	----	
C011	----	
C020	----	
C021	----	
C110	----	Enter the Voltage calibration mode
C111		Standby calibration offset Voltage value
C112		Calibration offset Voltage value
C113		Standby calibration Half-scale Voltage value
C114		Calibration Half-scale Voltage value
C115		Standby calibration Full-scale Voltage value
C116		Calibration Full-scale Voltage value
C117		Standby OVP calibration
C118		OVP calibration
C120		Enter the Current calibration mode
C121		Standby calibration offset current value
C122		Calibration offset current value
C123		Standby calibration Half-scale current value
C124		calibration Half-scale current value
C125		Standby calibration Full-scale current value
C126		calibration Full-scale current value
C127		Standby OCP calibration

C128	OCP calibration
C130	Exit calibration mode

DISASSEMBLING THE POWER SUPPLY

The Disassembly chapter shows how to remove the major units, PCBs, panels, and outer casing, from the power supply. The procedures described in this chapter are intended for parts replacement and board adjustment. The Mechanical Parts List show more details about the mechanical structures of the power supply and thus can be used as a reference.

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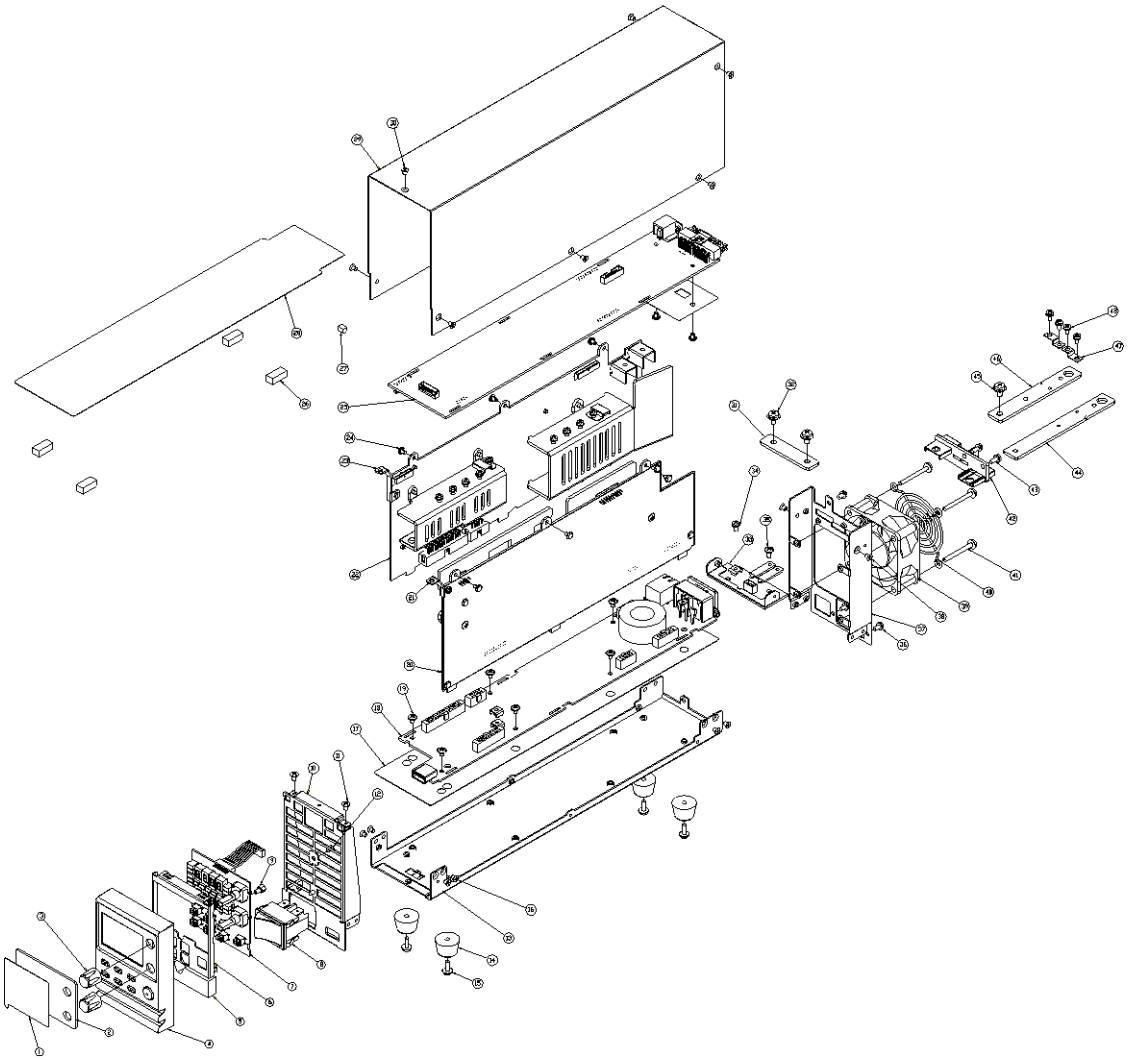
360W models (Type I) PSW 30-36, 80-13.5, 160-7.2

Explosion Diagram



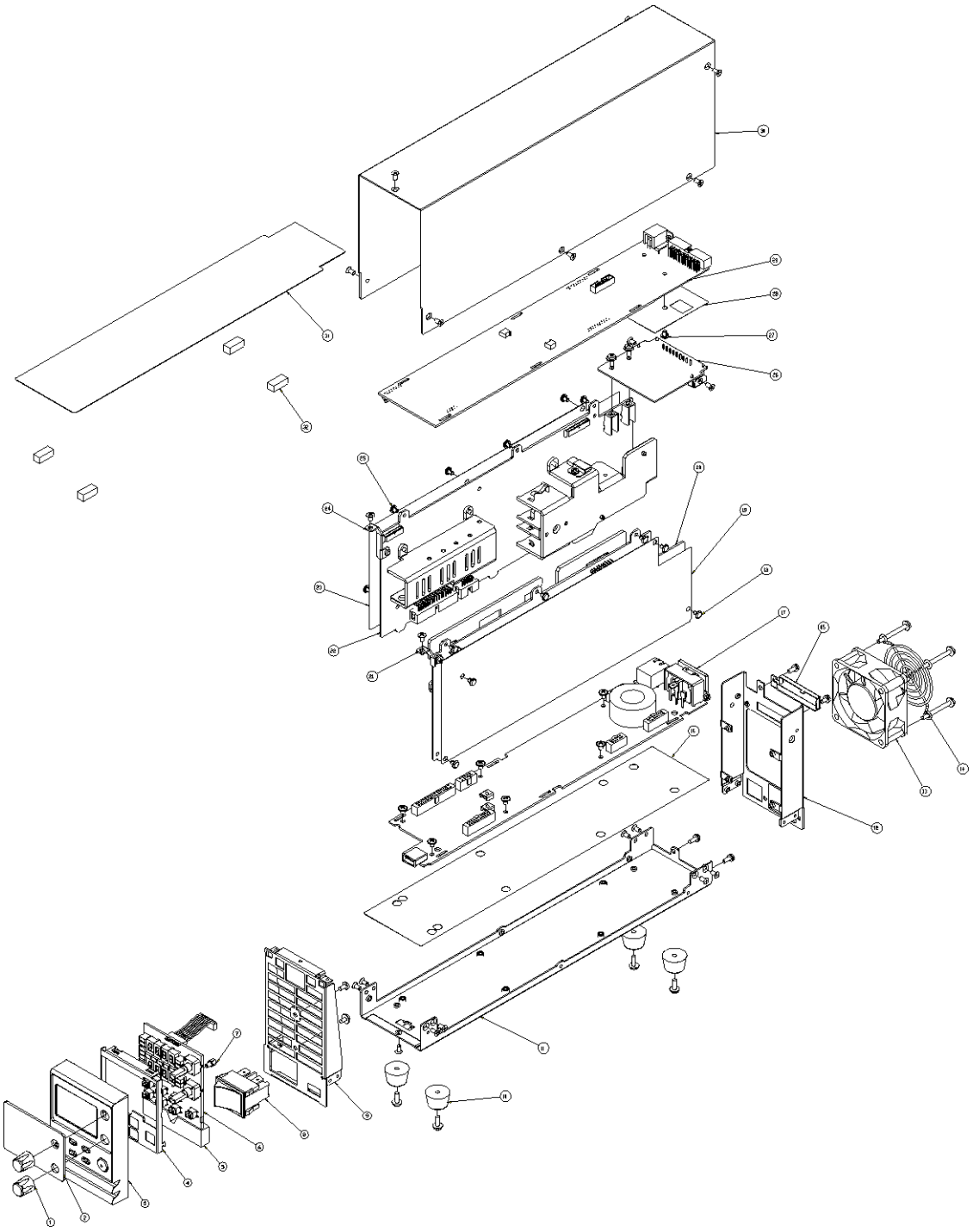
Mechanical Parts List

Item	Part No.	Description	QTY
1	5812-21330201	STATIC FILM FOR PSW LCD FILTER, PET, 49.5*43.8mm	1
2	51SW-30360101	NP PSW 30-36 MODEL, LENS, RoHS	1
3	5005130G0101	KNOB PSW ENCODE KNOB, 13@, GRAY, RoHS	2
4	1042-SWLV0101	PSW-LV FP+LENS+BUTTON ASS'Y, RoHS	1
5	57RG-30B00101	SPONGE PSW FP FILTER ,65.8*16*9T, BLACK, RoHS	1
6	62SW-080FP201	CA PSW FP KEYPAD HP, RoHS	1
7	35SW-01P030B1	PCB SW01P03A, 2, FR4 (contains 2 pieces), PSW DISPLAY + FILTER	1

8	3203-01200501	ROCKER AJ8R2013ZCF, DC12V, DPST, ON-OFF	1
9	66CN-04650001	PILLAR HEXAGON, M3*4.6+5m/m, N, RoHS	1
10	62SW-360FP101	CA PSW-LV-M1 FRONT PLATE, RoHS	1
11	599B-03006NS1	IMS 3*6	2
12	594B-W3006NS1	Pan headed bolt with washer and split washer 3*6	2
13	62SW-360L01A1	CA PSW-LV-M1 BOTTOM COVER, RoHS	1
14	57FC-10B01001	RUBBER FOOT GL-4L, 19.7@*12.6T, BLACK, RoHS	4
15	594B-W3010NS1	Pan headed bolt with washer and split washer 3*10	4
16	59BB-03005NS1	FMS 3*5(110 degrees)	5
17	57IL-28F08801	INSULATED PAD PSW-LV-M1 LO MYLAR, RoHS	1
18	35SW-01P050B1	PCB SW01P05B, 2, FR4(contains 2 pieces), PSW BASE-1, RoHS	1
19	591B-T3004NS1	Mushroom bolt 3*4	6
20	35SW-01P010B1	PCB SW01P01B,2,FR4,PSW AC-DC &FPC&AUX, RoHS	1
21	62SW-080HP401	CA PSW PFC PCB HP, 20.4mm, RoHS	1
22	35SW-01P090B1	PCB SW01P09A, 2, FR4, PSW DC-DC POWER, RoHS	1
23	62SW-080HP301	CA PSW DC/DC PCB HP, 35.7mm, RoHS	1
24	5320-00403001	SNAP RIVER SR-3S PIN GOOD, RoHS	6
25	35SW-01P040E1	PCB SW01P04E, 4, FR4(contains 2 pieces), PSW MASTER, RoHS	1
26	57RB-30B08801	RUBBER PSW 16*6*7T, RoHS	4
27	57RB-30B09001	RUBBER PSW, RoHS	1
28	57IL-28F091A1	INSULATED PAD PSW-LV-M1 TOP COVER MYLAR, RoHS	1
29	62SW-360UP1B1	CA PSW-LV-M1 TOP COVER, RoHS	1
30	59BB-03006NS1	FMS 3*6(110 degrees)	9
31	62SW-080CP701	CA PSW-LV-M1 CU7 CONDUCT PLATE, 55.1*13.3*2.5T	1
32	594B-W4010NS1	Pan headed bolt with washer and split washer 4*10	2
33	35SW-01P030B1	PCB SW01P03A,2,FR4(contains 2 pieces), PSW DISPLAY + FILTER	1
34	592B-W3008NS1	Button bolt 3*8	1
35	594B-W3008NS1	Pan headed bolt with washer and split washer 3*8	1
36	592B-W3008NS1	Button bolt 3*8	2
37	62SW-360RP101	CA PSW-LV-M1 REAR PLATE, RoHS	1
38	59BB-03005NS1	FMS 3*5(110degrees)	2
39	3812-35101001	FAN 2410SB04WB50B00+70mm(XH2.5) 12V 60*60*25, HS	1
40	62SW-080SP101	CA PSW FAN METAL NET FOR 60*60mm, RoHS	1
41	594B-W3032NS1	Pan headed bolt with washer and split washer 3*32	4
42	57IL-20G00101	INSULATED SEAT PSW, PBT, RoHS	1
43	592B-W3008NS1	Button bolt 3*8	3
44	62SW-080CP101	CA PSW CU1 CONDUCT PLATE, 112.9*15*2.5T, RoHS	1
45	594B-W4010NS1	Pan headed bolt with washer and split washer 4*10	1
46	62SW-080CP201	CA PSW CU2 CONDUCT PLATE, 92.9*15*2.5T, RoHS	1
47	62SW-080CP801	CA PSW CU8 CONDUCT PLATE, 17.7*6.9*0.5T, RoHS	2
48	592B-W3006NS1	Button bolt 3*6	4

360W models (Type I) PSW 250-4.5, 800-1.44

Explosion Diagram

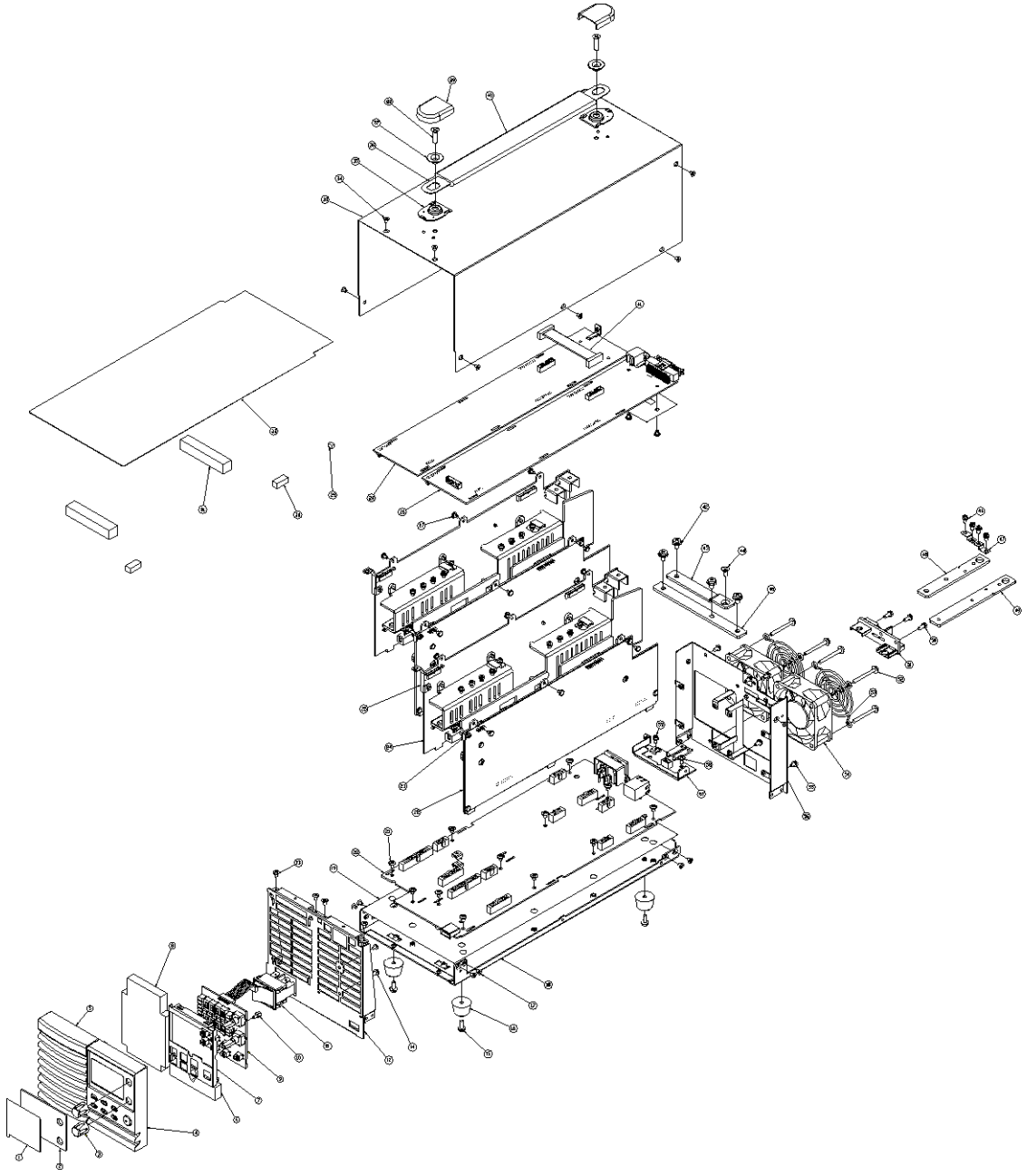


Mechanical Parts List

Item	Part No.	Description	QTY
1	5005-130G0101	KNOB PSW ENCODE KNOB, 13@, GRAY, RoHS	2
2	51SW-25040101	NP PSW 250-4.5 MODEL, LENS, RoHS	1
3	1042-SWLV01B1	PSW-LV FP+LENS+BUTTON ASS'Y, RoHS	1
4	62SW-080FP201	CA PSW FP KEYPAD HP, RoHS	1
5	57RG-30B00101	SPONGE PSW FP FILTER, 65.8*16*9T, BLACK, RoHS	1
6	13SW-HVM1130	PCB ASS'Y SW01P130, PSW-HV-360W/720W (DISPLAY)	1
7	66CN-04650001	PILLAR HEXAGON, M3*4.6+5m/m, N, RoHS	1
8	3203-01200501	ROCKER AJ8R2013ZCF, DC12V, DPST, ON-OFF	1
9	62SW-360FP1A1	CA PSW-LV-M1 FRONT PLATE, RoHS	1
10	57FC-10B01001	RUBBER FOOT GL-4L, 19.7@*12.6T, BLACK, RoHS	4
11	62SW-360LO1A1	CA PSW-LV-M1 BOTTOM COVER, RoHS	1
12	62SW-360RP201	CA PSW-HV-M1 REAR PLATE, RoHS	1
13	3812-35101001	FAN 2410SB04WB50B00+70mm(XH2.5) 12V 60*60*25, HS	1
14	62SW-080SP101	CA PSW FAN METAL NET FOR 60*60mm, RoHS	1
15	62SW-080SC201	CA PSW-LV RP TERMINAL PROTECT COVER, RoHS	1
16	57IL-28F08801	INSULATED PAD PSW-LV-M1 LO MYLAR, RoHS	1
17	13SW-80M1050	PCB ASS'Y SW01P050 ,PSW-LV-360 (BASE-1)	1
18	5320-00403001	SNAP RIVET SR-3S PINGOOD, RoHS	8
19	57IL-28F09501	INSULATED PAD PSW-PFC-PCB-MYLAR, RoHS	1
20	13SW-SW01010	PCB ASS'Y SW01P010 ,PSW-SER (AC-DC+PFC+AUX)	1
21	62SW-080HP401	CA PSW PFC PCB HP, 20.4mm, RoHS	1
22	13SW-HV25110	PCB ASS'Y SW01P110, PSW-250V-MASTER (DC-DC POWER)	1
23	57IL-28F15001	MYLAR PSW-HV DC/DC PCB, 283*101*0.254T, RoHS	1
24	62SW-080HP301	CA PSW DC/DC PCB HP ,35.7mm, RoHS	1
25	5320-00403001	SNAP RIVET SR-3S PINGOOD, RoHS	6
26	13SW-HV25140	PCB ASS'Y SW01P140 PSW-250V-360W (OUTPUT FILTER-1)	1
27	5320-00403001	SNAP RIVET SR-3S PINGOOD, RoHS	2
28	57IL-28F15101	MYLAR PSW-HV AG PCB, 63*61*0.254T, RoHS	1
29	13SW-2HM1120	PCB ASS'Y SW01P120 ,PSW-250V-360W (ANALOG CTRL)	1
30	62SW-360UP1C1	CA PSW-LV-M1 TOP COVER, RoHS	1
31	57IL-28F091A1	INSULATED PAD PSW-LV-M1 TOP COVER MYLAR, RoHS	1
32	57RB-30B08801	RUBBER PSW 16*6*7T, RoHS	4

720W models (Type II) PSW 30-72, 80-27, 160-14.4

Explosion Diagram



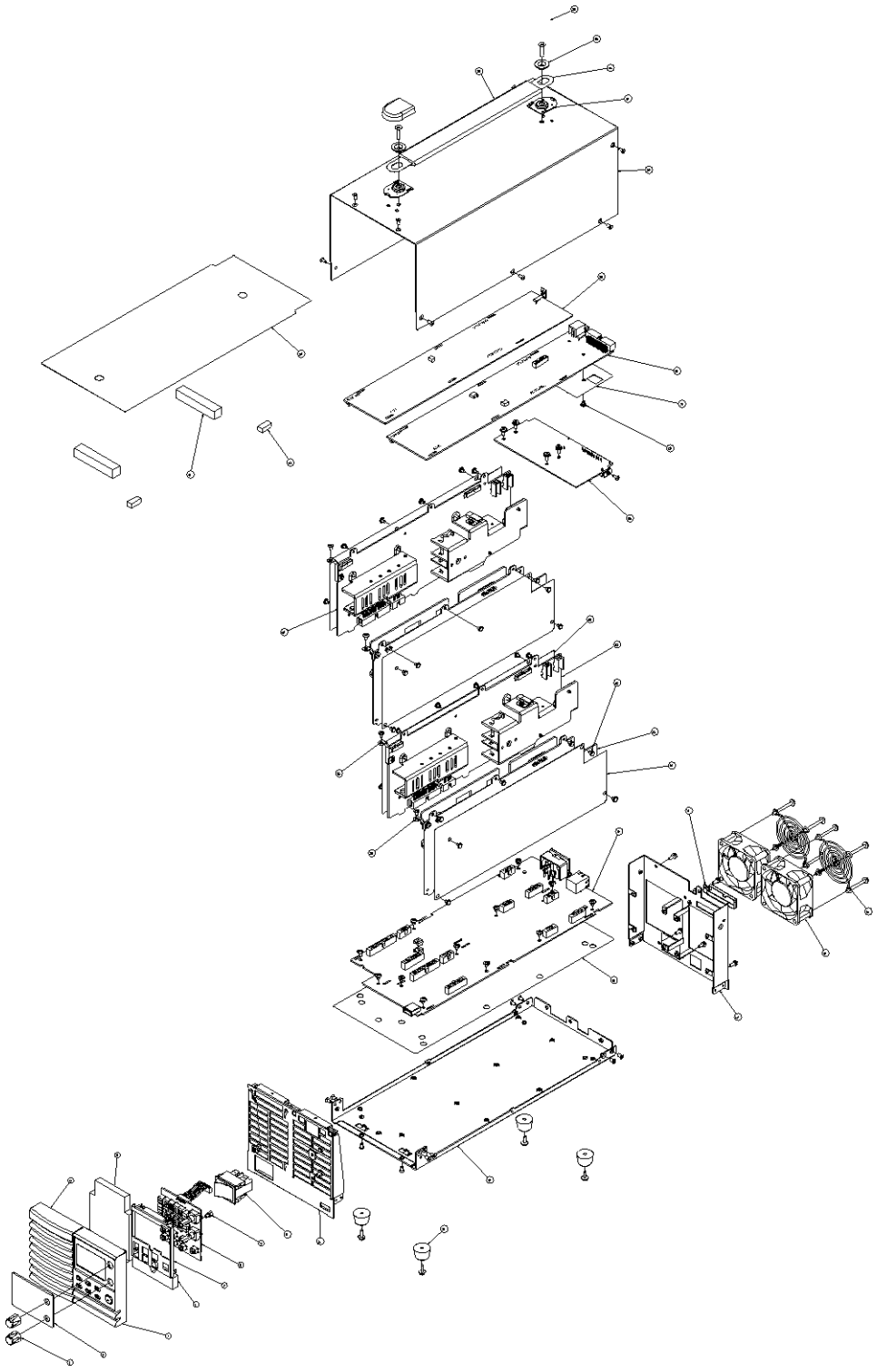
Mechanical Parts List

Item	Part No.	Description	QTY
1	5812-21330201	STATIC FILM FOR PSW LCD FILTER, PET, 49.5*43.8mm	1
2	51SW-30720101	NP PSW 30-72 MODEL, LENS, RoHS	1
3	5005130G0101	KNOB PSW ENCODE KNOB, 13@, GRAY, RoHS	2
4	1042-SWLV0101	PSW-LV FP+LENS+BUTTON ASS'Y, RoHS	1
5	63FP-AG107601	PC PSW (SLAVE) FRONT FRAME, ABS, GRAY, RoHS	1
6	57RG-30B00101	SPONGE PSW FP FILTER, 65.8*16*9T, BLACK, RoHS	1
7	62SW-080FP201	CA PSW FP KEYPAD HP, RoHS	1
8	57RG-30B00201	SPONGE PSW FP FILTER, 64.8*94*9T, BLACK, RoHS	1
9	35SW-01P030B1	PCB SW01P03A, 2, FR4(contains 2 pieces), PSW DISPLAY + FILTER	1
10	66CN-04650001	PILLAR HEXAGON, M3*4.6+5m/m, N, RoHS	1
11	3203-01200501	ROCKER AJ8R2013ZCF, DC12V, DPST, ON-OFF	1
12	62SW-720FP1A1	CA PSW-LV-M2 FRONT PLATE, RoHS	1
13	599B-03006NS1	IMS 3*6	4
14	594B-W3006NS1	Pan headed bolt with washer and split washer 3*6	2
15	594B-W3010NS1	Pan headed bolt with washer and split washer 3*10	4
16	57FC-10B01001	RUBBER FOOT GL-4L, 19.7@*12.6T, BLACK, RoHS	4
17	59BB-03005NS1	FMS 3*5(110 degrees)	8
18	62SW-720LO1A1	CA PSW-LV-M2 BOTTOM COVER, RoHS	1
19	57IL-28F08901	INSULATED PAD PSW-LV-M2 LO MYLAR, RoHS	1
20	35SW-01P060B1	PCB SW01P06B, 2, FR4,PSW BASE-2, RoHS	1
21	591B-T3004NS1	Mushroom bolt 3*4	12
22	35SW-01P010B1	PCB SW01P01B, 2, FR4, PSW AC-DC &FPC&AUX, RoHS	1
23	62SW-080HP401	CA PSW PFC PCB HP, 20.4mm, RoHS	1
24	35SW-01P090B1	PCB SW01P09A ,2 ,FR4 ,PSW DC-DC POWER ,RoHS	1
25	62SW-080HP301	CA PSW DC/DC PCB HP, 35.7mm, RoHS	1
26	35SW-01P040E1	PCB SW01P04E, 4, FR4(contains 2 pieces), PSW MASTER, RoHS	1
27	5320-00403001	SNAP RIVER SR-3S PIN GOOD, RoHS	12
28	35SW-01P080A1	PCB SW01P08A, 2, FR4 (contains 2 pieces), PSW SLAVE-1, RoHS	1
29	57RB-30B09001	RUBBER PSW, RoHS	1
30	57RB-30B08801	RUBBER PSW 16*6*7T, RoHS	2
31	57RB-30B08901	RUBBER PSW 63*12*12T, RoHS	2
32	57IL-28F092A1	INSULATED PAD PSW-LV-M2 TOP COVER MYLAR, RoHS	1
33	62SW-720UP1B1	CA PSW-LV-M2 TOP COVER, RoHS	1
34	59BB-03006NS1	FMS 3*6(110 degrees)	10
35	62DS-300HP401	CA GDS-3000 BELT HOLDER PLATE, RoHS	2
36	62DS-300HP3A1	CA GDS-3000 BELT STEEL, RoHS	2
37	612P-044170N1	WASHER 4.4@*17@, BELT WASHER, RoHS	2
38	593B-04012NS1	FMS 4*12	2
39	63CH-AG1001A1	PC GDS-3000 BELT FASTEN, PC, GRAY, RoHS	2
40	550G-20927701	BELT GDS-3000, 209*27*7T, GRAY, RoHS	1
41	40WC-D1401001	FLAT CABLE GW9907014-1, 14P, 70mm	1
42	594B-W4010NS1	Pan headed bolt with washer and split washer 4*10	5

43	62SW-080CP501	CA PSW-LV-M2 CU5 CONDUCT PLATE, 88.3*13.3*2.5T	1
44	593B-04010NS1	FMS 4*10	1
45	62SW-080CP601	CA PSW-LV-M2 CU6 CONDUCT PLATE, 126.1*13.3*2.5T	1
46	592B-W3006NS1	Button bolt 3*6	4
47	62SW-080CP801	CA PSW CU8 CONDUCT PLATE, 17.7*6.9*0.5T, RoHS	2
48	62SW-080CP201	CA PSW CU2 CONDUCT PLATE, 92.9*15*2.5T, RoHS	1
49	62SW-080CP101	CA PSW CU1 CONDUCT PLATE,112.9*15*2.5T,RoHS	1
50	592B-W3008NS1	Button bolt 3*8	3
51	57IL-20G00101	INSULATED SEAT PSW, PBT, RoHS	1
52	594B-W3032NS1	Pan headed bolt with washer and split washer 3*32	8
53	62SW-080SP101	CA PSW FAN METAL NET FOR 60*60mm, RoHS	2
54	3812-35101001	FAN 2410SB04WB50B00+70mm(XH2.5) 12V 60*60*25, HS	2
55	592B-W3008NS1	Button bolt 3*8	3
56	62SW-720RP101	CA PSW-LV-M2 REAR PLATE, RoHS	1
57	35SW-01P030B1	PCB SW01P03A, 2, FR4(Contains 2 pieces), PSW DISPLAY + FILTER	1
58	594B-W3008NS1	Pan headed bolt with washer and split washer 3*8	1
59	592B-W3006NS1	Button bolt 3*6	1

720W models (Type II) PSW 250-9, 800-2.88

Explosion Diagram

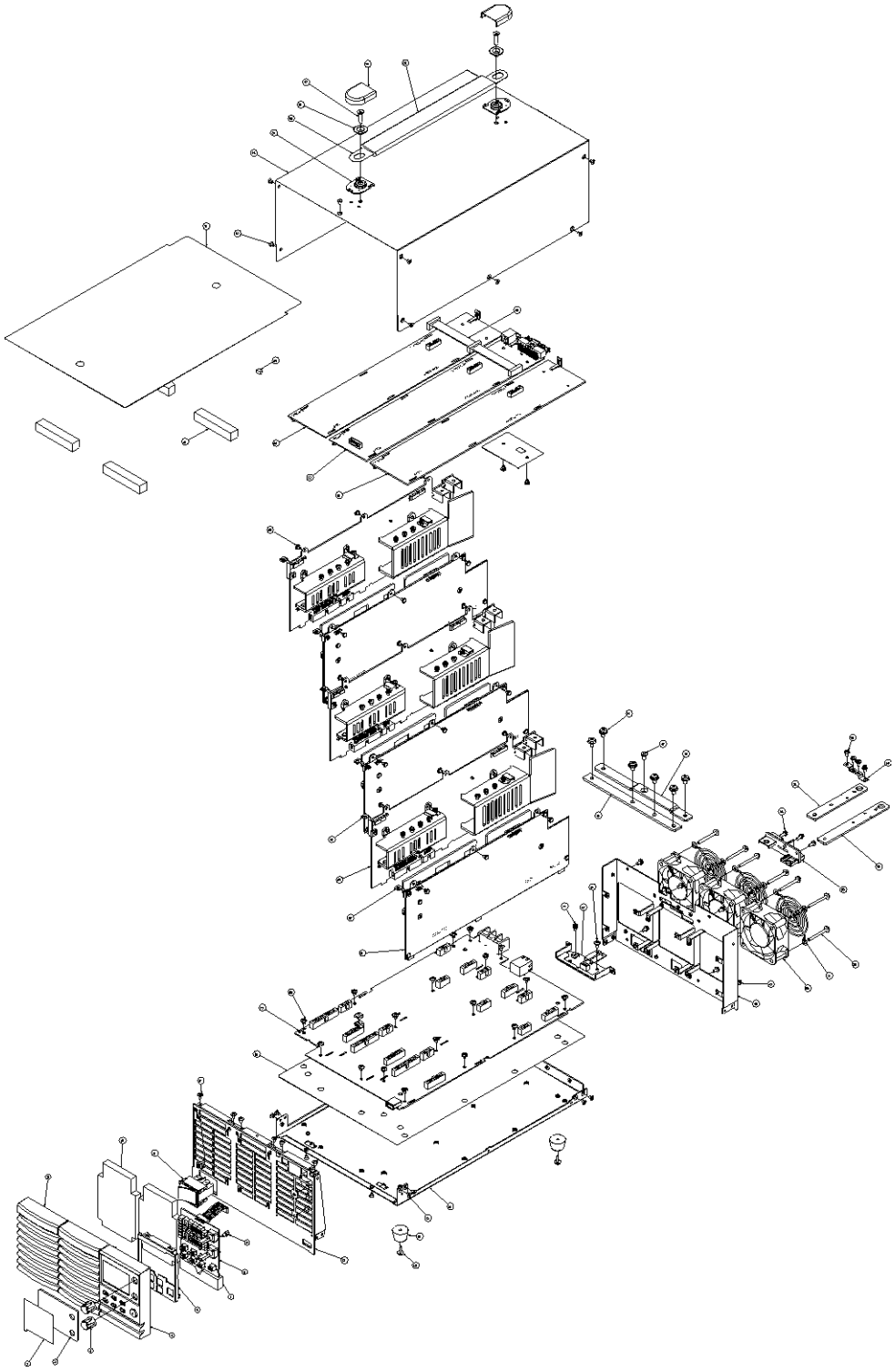


Mechanical Parts List

Item	Part No.	Description	QTY
1	5005-130G0101	KNOB PSW ENCODE KNOB, 13@, GRAY, RoHS	2
2	51SW-25090101	NP PSW 250-9 MODEL, LENS, RoHS	1
3	63FP-AG107601	PC PSW (SLAVE) FRONT FRAME, ABS, GRAY, RoHS	1
4	1042-SWLV01B1	PSW-LV FP+LENS+BUTTON ASS'Y, RoHS	1
5	57RG-30B00201	SPONGE PSW FP FILTER, 64.8*94*9T, BLACK, RoHS	1
6	57RG-30B00101	SPONGE PSW FP FILTER, 65.8*16*9T, BLACK, RoHS	1
7	62SW-080FP201	CA PSW FP KEYPAD HP, RoHS	1
8	13SW-HVM1130	PCB ASS'Y SW01P130, PSW-HV-360W/720W (DISPLAY)	1
9	66CN-04650001	PILLAR HEXAGON, M3*4.6+5m/m, N, RoHS	1
10	3203-01200501	ROCKER AJ8R2013ZCF, DC12V, DPST, ON-OFF	1
11	62SW-720FP1A1	CA PSW-LV-M2 FRONT PLATE, RoHS	1
12	57FC-10B01001	RUBBER FOOT GL-4L, 19.7@*12.6T, BLACK, RoHS	4
13	62SW-720LO1A1	CA PSW-LV-M2 BOTTOM COVER, RoHS	1
14	62SW-720RP201	CA PSW-HV-M2 REAR PLATE, RoHS	1
15	3812-35101001	FAN 2410SB04WB50B00+70mm(XH2.5) 12V 60*60*25, HS	1
16	62SW-080SP101	CA PSW FAN METAL NET FOR 60*60mm, RoHS	1
17	62SW-080SC201	CA PSW-LV RP TERMINAL PROTECT COVER, RoHS	1
18	57IL-28F08901	INSULATED PAD PSW-LV-M2 LO MYLAR, RoHS	1
19	13SW-80M2060	PCB ASS'Y SW01P060, PSW-LV-720 (BASE-2)	1
20	57IL-28F09501	INSULATED PAD PSW-PFC-PCB-MYLAR, RoHS	2
21	13SW-SW01010	PCB ASS'Y SW01P010, PSW-SER (AC-DC+PFC+AUX)	1
22	5320-00403001	SNAP RIVET SR-3S PINGOOD, RoHS	8
23	13SW-HV25110	PCB ASS'Y SW01P110, PSW-250V-MASTER (DC-DC POWER)	1
24	57IL-28F15001	MYLAR PSW-HV DC/DC PCB, 283*101*0.254T, RoHS	2
25	62SW-080HP401	CA PSW PFC PCB HP, 20.4mm, RoHS	2
26	62SW-080HP301	CA PSW DC/DC PCB HP, 35.7mm, RoHS	2
27	13SW-HV25111	PCB ASS'Y SW01P110,PSW-250V-SLAVE (DC-DC POWER)	1
28	13SW-HV25150	PCB ASS'Y SW01P150 PSW-250V-720W(OUTPUT FILTER-2)	1
29	5320-00403001	SNAP RIVET SR-3S PINGOOD, RoHS	2
30	57IL-28F15101	MYLAR PSW-HV AG PCB, 63*61*0.254T, RoHS	1
31	13SW-2HM2120	PCB ASS'Y SW01P120, PSW-250V-720W (ANALOG CTRL)	1
32	13SW-HVXX170	PCB ASS'Y SW01P170, PSW-HV (SLAVE-1)	1
33	62SW-720UP1C1	CA PSW-LV-M2 TOP COVER, RoHS	1
34	62DS-300HP401	CA GDS-3000 BELT HOLDER PLATE, RoHS	2
35	62DS-300HP3A1	CA GDS-3000 BELT STEEL, RoHS	1
36	612P-044170N1	WASHER 4.4@*17@, BELT WASHER, RoHS	2
37	63CH-AG1001A1	PC GDS-3000 BELT FASTEN, PC, GRAY, RoHS	2
38	550G-20927701	PC GDS-3000 BELT FASTEN, PC, GRAY, RoHS	1
39	57IL-28F092A1	INSULATED PAD PSW-LV-M2 TOP COVER MYLAR, RoHS	1
40	57RB-30B08801	RUBBER PSW 16*6*7T, RoHS	2
41	57RB-30B08901	RUBBER PSW 63*12*12T, RoHS	2

1080W models (Type III) PSW 30-108, 80-40.5, 160-21.6

Explosion Diagram



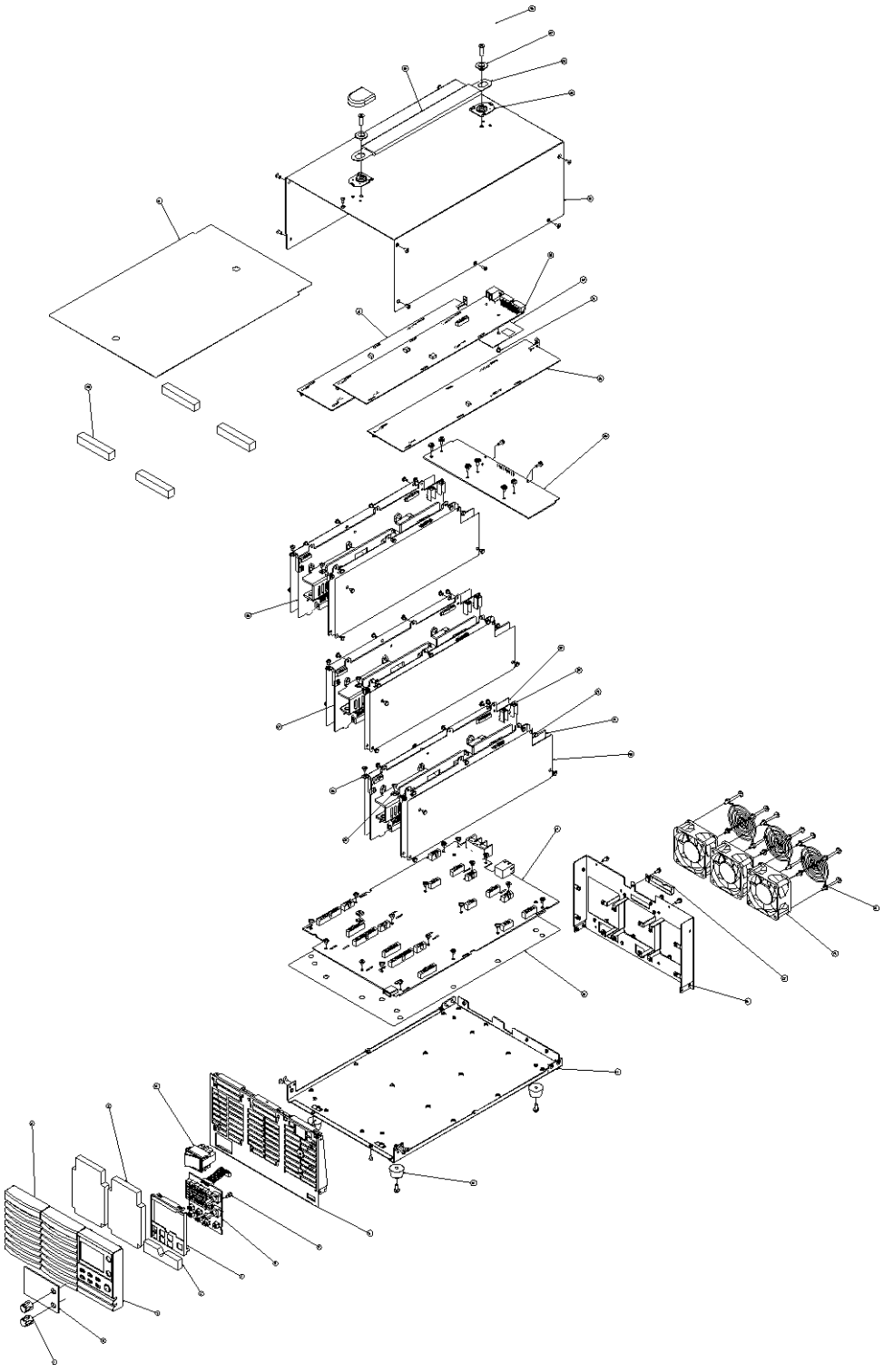
Mechanical Parts List

Item	Part No.	Description	QTY
1	5812-21330201	STATIC FILM FOR PSW LCD FILTER, PET, 49.5*43.8mm	1
2	51SW-301H0101	NP PSW 30-108 MODEL, LENS, RoHS	1
3	5005130G0101	KNOB PSW ENCODE KNOB, 13@, GRAY, RoHS	2
4	1042-SWLV0101	PSW-LV FP+LENS+BUTTON ASS'Y, RoHS	1
5	63FP-AG107601	PC PSW (SLAVE) FRONT FRAME, ABS, GRAY, RoHS	1
6	62SW-080FP201	CA PSW FP KEYPAD HP, RoHS	1
7	57RG-30B00101	SPONGE PSW FP FILTER, 65.8*16*9T, BLACK, RoHS	1
8	35SW-01P030B1	PCB SW01P03A, 2, FR4(contains 2 pieces), PSW DISPLAY + FILTER	1
9	66CN-04650001	PILLAR HEXAGON, M3*4.6+5m/m, N, RoHS	1
10	57RG-30B00201	SPONGE PSW FP FILTER, 64.8*94*9T, BLACK, RoHS	1
11	3203-01200501	ROCKER AJ8R2013ZCF, DC12V, DPST, ON-OFF	1
12	62SW-080FP1A1	CA PSW-LV-M3 FRONT PLATE, RoHS	1
13	594B-W3010NS1	Pan headed bolt with washer and split washer 3*10	4
14	57FC-10B01001	RUBBER FOOT GL-4L, 19.7@*12.6T, BLACK, RoHS	4
15	59BB-03005NS1	FMS 3*5(110 degrees)	8
16	62SW-080LO1A1	CA PSW-LV-M3 BOTTOM COVER, RoHS	1
17	599B-03006NS1	IMS 3*6	6
18	57IL-28F09001	INSULATED PAD PSW-LV-M3 LO MYLAR ,RoHS	1
19	35SW-01P070B1	PCB SW01P07B, 2, FR4, PSW BASE-3, RoHS	1
20	591B-T3004NS1	Mushroom bolt 3*4	18
21	35SW-01P010B1	PCB SW01P01B, 2, FR4, PSW AC-DC &FPC&AUX, RoHS	1
22	62SW-080HP401	CA PSW PFC PCB HP, 20.4mm, RoHS	1
23	35SW-01P090B1	PCB SW01P09A, 2, FR4, PSW DC-DC POWER, RoHS	1
24	62SW-080HP301	CA PSW DC/DC PCB HP, 35.7mm, RoHS	1
25	5320-00403001	SNAP RIVER SR-3S PIN GOOD, RoHS	
26	35SW-01P100A1	PCB SW01P10A, 2, FR4 (contains 2 pieces), PSW SLAVE-2, RoHS	1
27	35SW-01P040E1	PCB SW01P04E, 4, FR4(contains 2 pieces), PSW MASTER, RoHS	1
28	35SW-01P080A1	PCB SW01P08A, 2,FR4 (contains 2 pieces), PSW SLAVE-1, RoHS	1
29	57RB-30B09001	RUBBER PSW, RoHS	1
30	57RB-30B08901	RUBBER PSW 63*12*12T, RoHS	2
31	57IL-28F093A1	INSULATED PAD PSW-LV-M3 TOP COVER MYLAR, RoHS	1
32	59BB-03006NS1	FMS 3*6(110 degrees)	11
33	62SW-080UP1C1	CA PSW-LV-M3 TOP COVER, RoHS	1
34	62DS-300HP401	CA GDS-3000 BELT HOLDER PLATE, RoHS	2
35	62DS-300HP3A1	CA GDS-3000 BELT STEEL, RoHS	2
36	612P-044170N1	WASHER 4.4@*17@, BELT WASHER, RoHS	2
37	593B-04012NS1	FMS 4*12.	2
38	63CH-AG1001A1	PC GDS-3000 BELT FASTEN, PC, GRAY, RoHS	2
39	550G-20927701	BELT GDS-3000, 209*27*7T, GRAY, RoHS	1
40	40WC-D1401101	FLAT CABLE GW9907014-2, 14P, 70+70mm	1
41	594B-W4010NS1	Pan headed bolt with washer and split washer 4*10	6

42	593B-04010NS1	FMS 4*10	1
43	62SW-080CP301	CA PSW-LV-M3 CU3 CONDUCT PLATE, 159.3*13.3*2.5T	1
44	62SW-080CP401	CA PSW-LV-M3 CU4 CONDUCT PLATE, 159.3*13.3*2.5T	1
45	592B-W3006NS1	Button bolt 3*6	1
46	594B-W3008NS1	Pan headed bolt with washer and split washer 3*8	1
47	35SW-01P030B1	PCB SW01P03A, 2, FR4(contains 2 pieces), PSW DISPLAY + FILTER	1
48	62SW-080RP101	CA PSW-LV-M3 REAR PLATE, RoHS	1
49	594B-W3008NS1	Pan headed bolt with washer and split washer 3*8	3
50	3812-35101001	FAN 2410SB04WB50B00+70mm(XH2.5) 12V 60*60*25, HS	2
51	62SW-080SP101	CA PSW FAN METAL NET FOR 60*60mm, RoHS	2
52	594B-W3032NS1	Pan headed bolt with washer and split washer 3*32	12
53	57IL-20G00101	INSULATED SEAT PSW, PBT, RoHS	1
54	62SW-080CP101	CA PSW CU1 CONDUCT PLATE, 112.9*15*2.5T, RoHS	1
55	592B-W3008NS1	Button bolt 3*8	3
56	62SW-080CP201	CA PSW CU2 CONDUCT PLATE ,92.9*15*2.5T, RoHS	1
57	592B-W3006NS1	Button bolt 3*6	4
58	62SW-080CP801	CA PSW CU8 CONDUCT PLATE, 17.7*6.9*0.5T, RoHS	2

1080W models (Type III) PSW 250-13.5, 800-4.32

Explosion Diagram



Mechanical Parts List

Item	Part No.	Description	QTY
1	5005-130G0101	KNOB PSW ENCODE KNOB, 13@, GRAY, RoHS	2
2	51SW-25130101	NP PSW 250-13.5 MODEL, LENS, RoHS	1
3	63FP-AG107601	PC PSW (SLAVE) FRONT FRAME, ABS, GRAY, RoHS	1
4	1042-SWLV01B1	PSW-LV FP+LENS+BUTTON ASS'Y, RoHS	1
5	57RG-30B00201	SPONGE PSW FP FILTER, 64.8*94*9T, BLACK, RoHS	1
6	57RG-30B00101	SPONGE PSW FP FILTER, 65.8*16*9T,BLACK, RoHS	1
7	62SW-080FP201	CA PSW FP KEYPAD HP, RoHS	1
8	13SW-HVM1130	PCB ASS'Y SW01P130, PSW-HV-360W/720W (DISPLAY)	1
9	66CN-04650001	PILLAR HEXAGON, M3*4.6+5m/m, N, RoHS	1
10	3203-01200501	ROCKER AJ8R2013ZCF, DC12V, DPST, ON-OFF	1
11	62SW-080FP1A1	CA PSW-LV-M3 FRONT PLATE, RoHS	1
12	57FC-10B01001	RUBBER FOOT GL-4L, 19.7@*12.6T, BLACK, RoHS	4
13	62SW-080LO1A1	CA PSW-LV-M3 BOTTOM COVER, RoHS	1
14	62SW-080RP201	CA PSW-HV-M3 REAR PLATE, RoHS	1
15	3812-35101001	FAN 2410SB04WB50B00+70mm(XH2.5) 12V 60*60*25, HS	1
16	62SW-080SP101	CA PSW FAN METAL NET FOR 60*60mm, RoHS	1
17	62SW-080SC201	CA PSW-LV RP TERMINAL PROTECT COVER, RoHS	1
18	57IL-28F09001	INSULATED PAD PSW-LV-M3 LO MYLAR, RoHS	1
19	13SW-80M3070	PCB ASS'Y SW01P070, PSW-LV-1080 (BASE-3)	1
20	57IL-28F09501	INSULATED PAD PSW-PFC-PCB-MYLAR, RoHS	3
21	13SW-SW01010	PCB ASS'Y SW01P010, PSW-SER (AC-DC+PFC+AUX)	1
22	5320-00403001	SNAP RIVET SR-3S PINGOOD, RoHS	12
23	13SW-HV25111	PCB ASS'Y SW01P110,PSW-250V-SLAVE (DC-DC POWER)	1
24	57IL-28F15001	MYLAR PSW-HV DC/DC PCB ,283*101*0.254T ,RoHS	3
25	62SW-080HP401	CA PSW PFC PCB HP ,20.4mm ,RoHS	2
26	62SW-080HP301	CA PSW DC/DC PCB HP ,35.7mm ,RoHS	2

27	13SW-HV25110	PCB ASS'Y SW01P110, PSW-250V-MASTER (DC-DC POWER)	1
28	13SW-HV25111	PCB ASS'Y SW01P110,PSW-250V-SLAVE (DC-DC POWER)	1
29	13SW-HV25160	PCB ASS'Y SW01P160 PSW-250V-1080W(OUTPUT FILTER-3)	1
30	13SW-HVXX180	PCB ASS'Y SW01P180, PSW-HV (SLAVE-2)	1
31	5320-00403001	SNAP RIVET SR-3S PINGOOD, RoHS	2
32	57IL-28F15101	MYLAR PSW-HV AG PCB, 63*61*0.254T, RoHS	1
33	13SW-2HM3120	PCB ASS'Y SW01P120, PSW-250V-1080W (ANALOG CTRL)	1
34	62SW-080UP1D1	CA PSW-LV-M3 TOP COVER, RoHS	1
35	62DS-300HP401	CA GDS-3000 BELT HOLDER PLATE, RoHS	2
36	62DS-300HP3A1	CA GDS-3000 BELT STEEL, RoHS	1
37	612P-044170N1	WASHER 4.4@*17@, BELT WASHER, RoHS	2
38	63CH-AG1001A1	PC GDS-3000 BELT FASTEN, PC, GRAY, RoHS	2
39	550G-20927701	PC GDS-3000 BELT FASTEN, PC, GRAY, RoHS	1
40	13SW-HVXX170	PCB ASS'Y SW01P170 ,PSW-HV (SLAVE-1)	1
41	57IL-28F093A1	INSULATED PAD PSW-LV-M3 TOP COVER MYLAR, RoHS	1
42	57RB-30B08901	RUBBER PSW 63*12*12T, RoHS	4

PCB & CIRCUIT DIAGRAM

This chapter shows the PCB layout and circuit diagrams used in the PSW series. For the list of PCB parts , see the *Parts List* chapter, page 99.

Main PCB Layout for Models of 30V, 80, 160V 93
Main PCB Layout for Models of 250V, 800V 94
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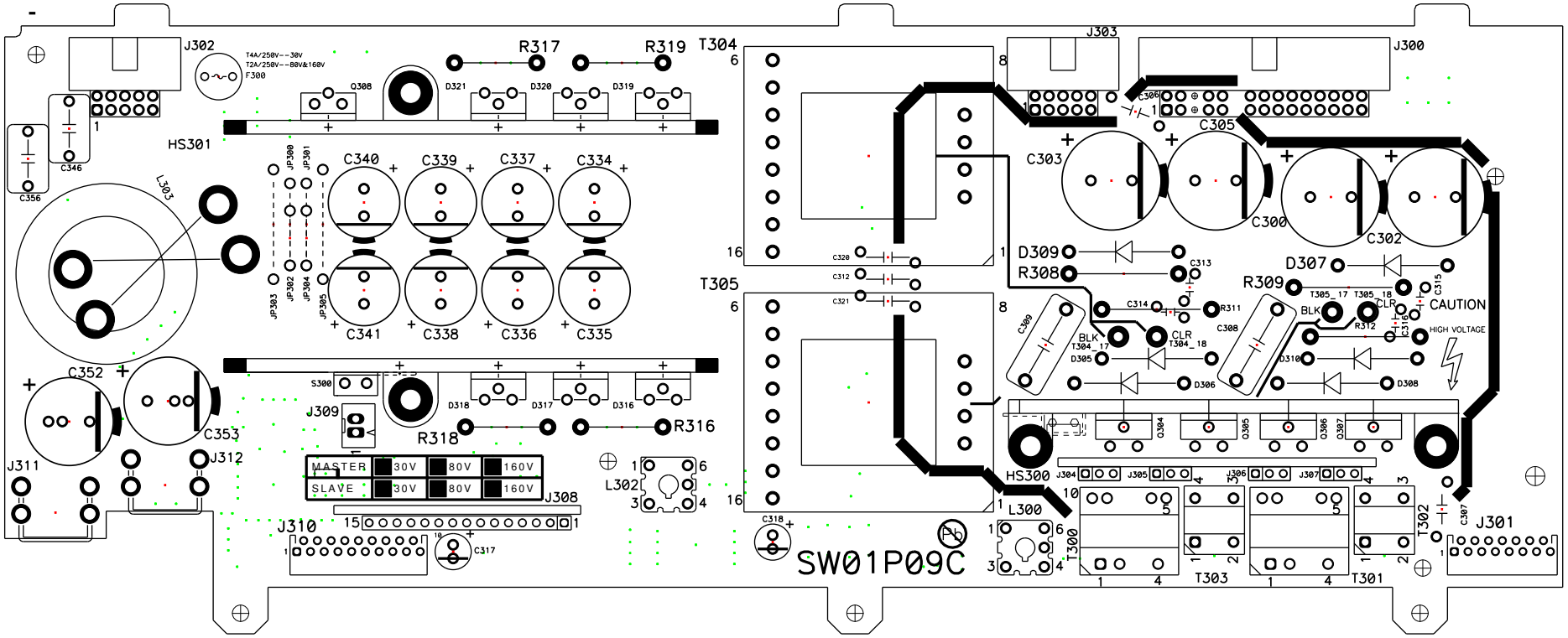
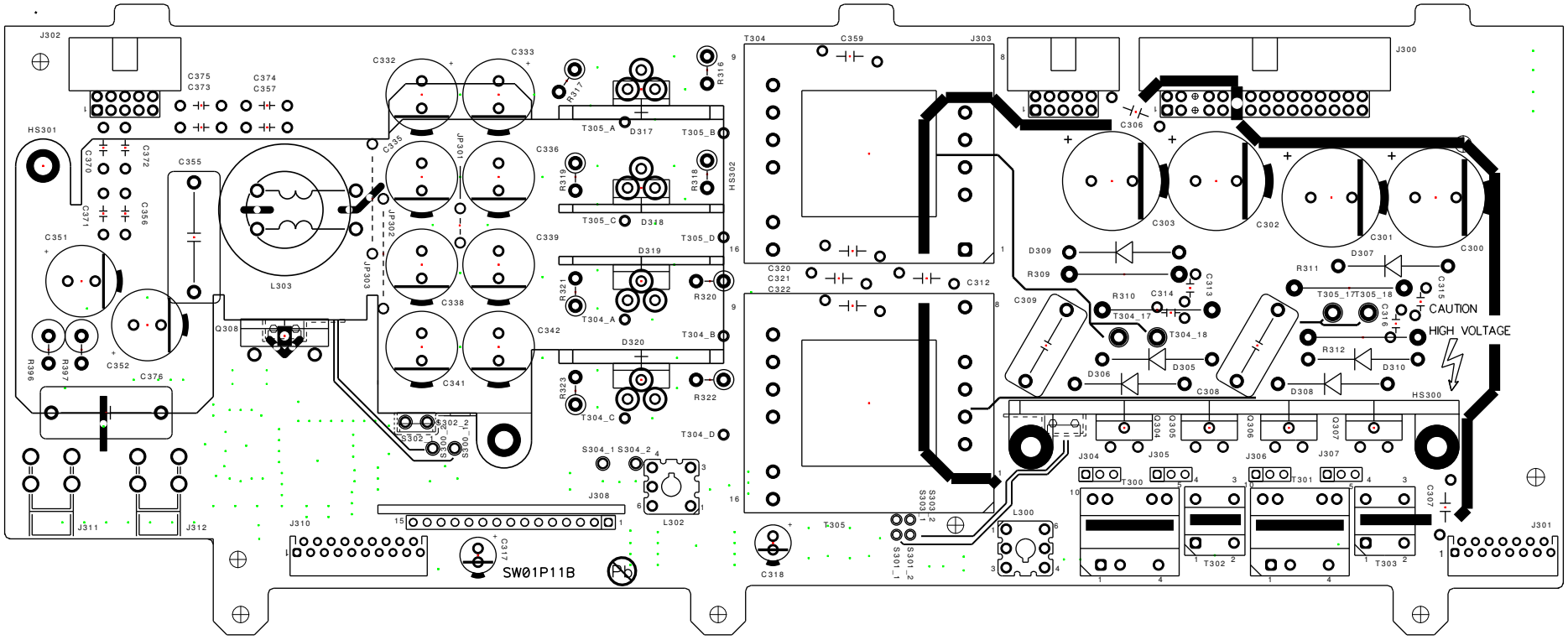
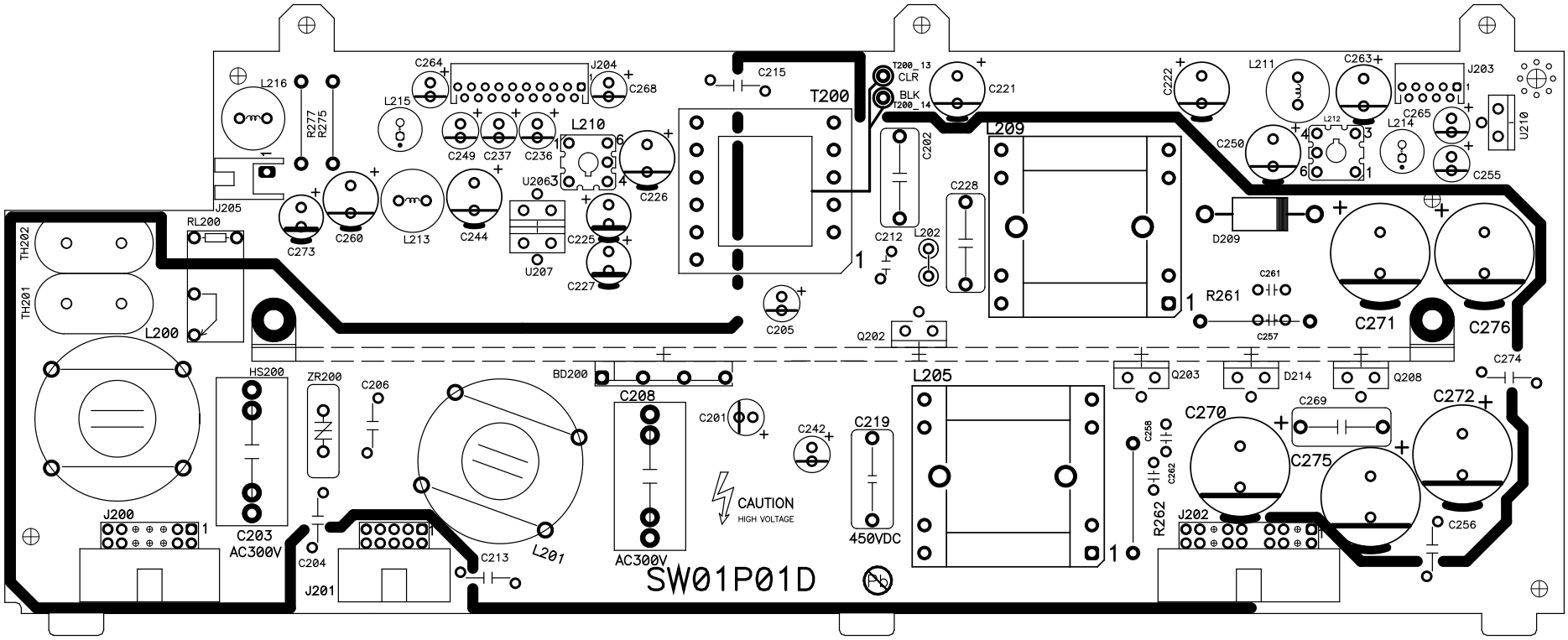
Main PCB Layout for Models of 30V, 80, 160V



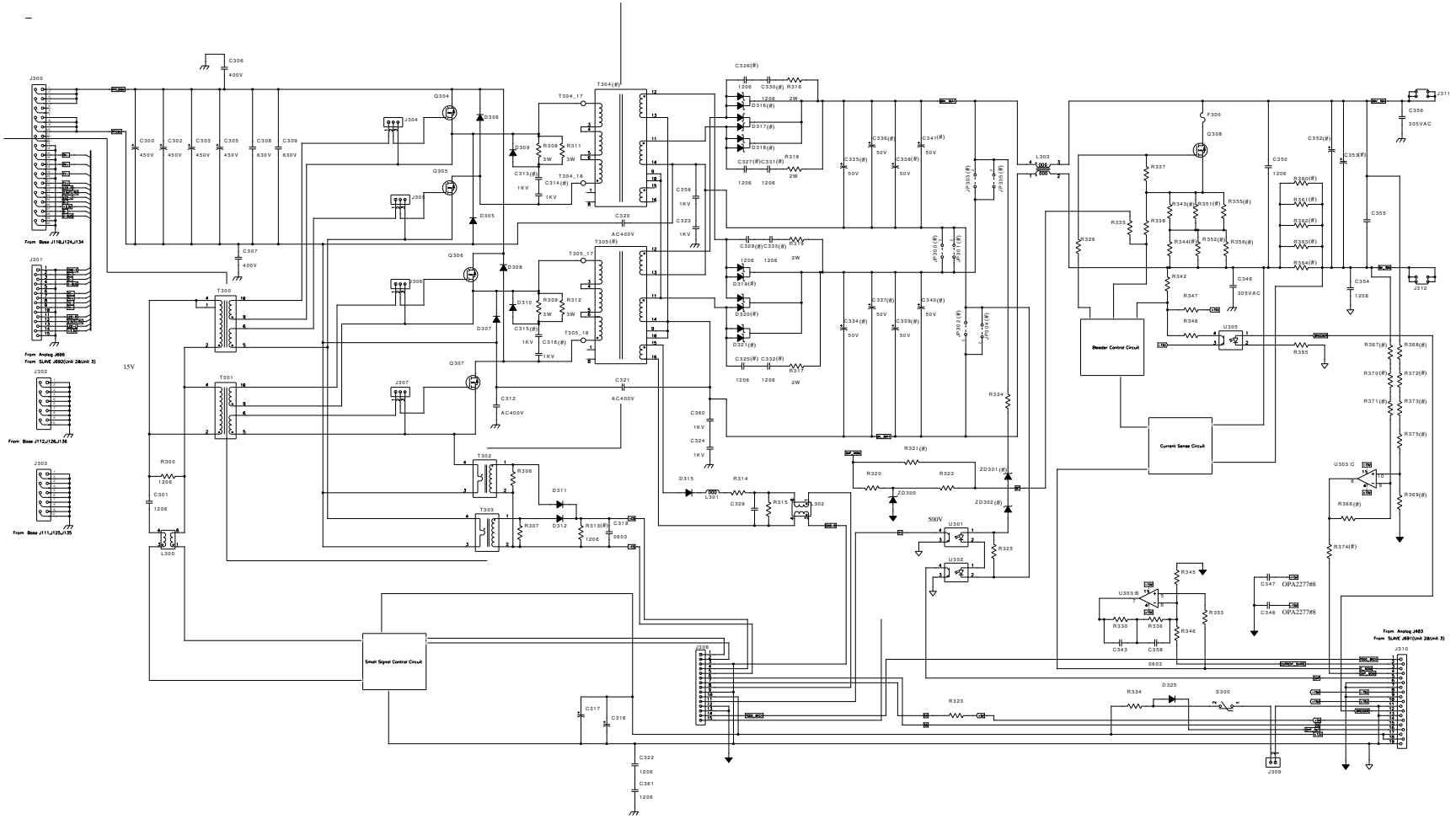
Main PCB Layout for Models of 250V, 800V



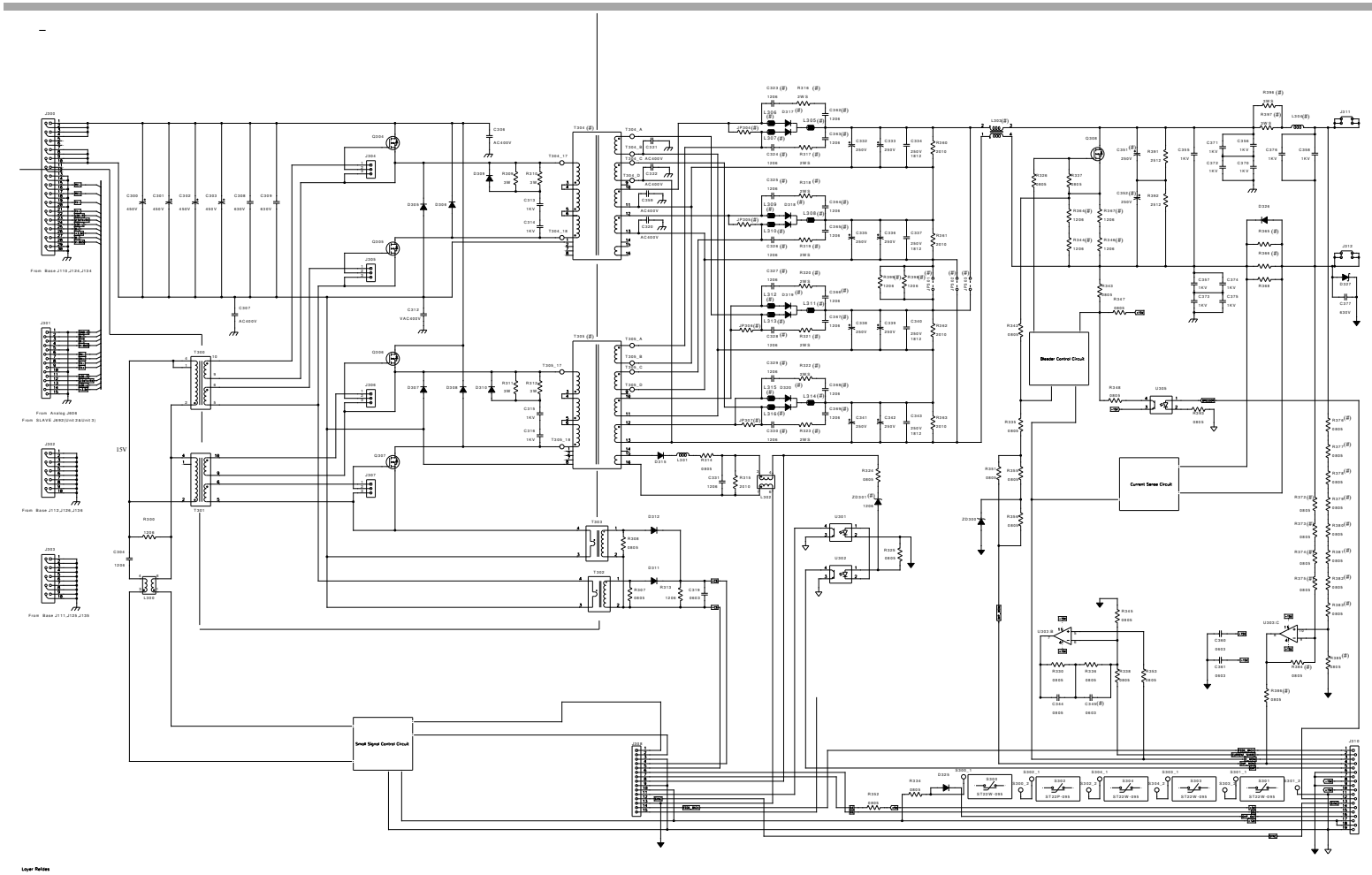
PFC & AUX power PCB Layout



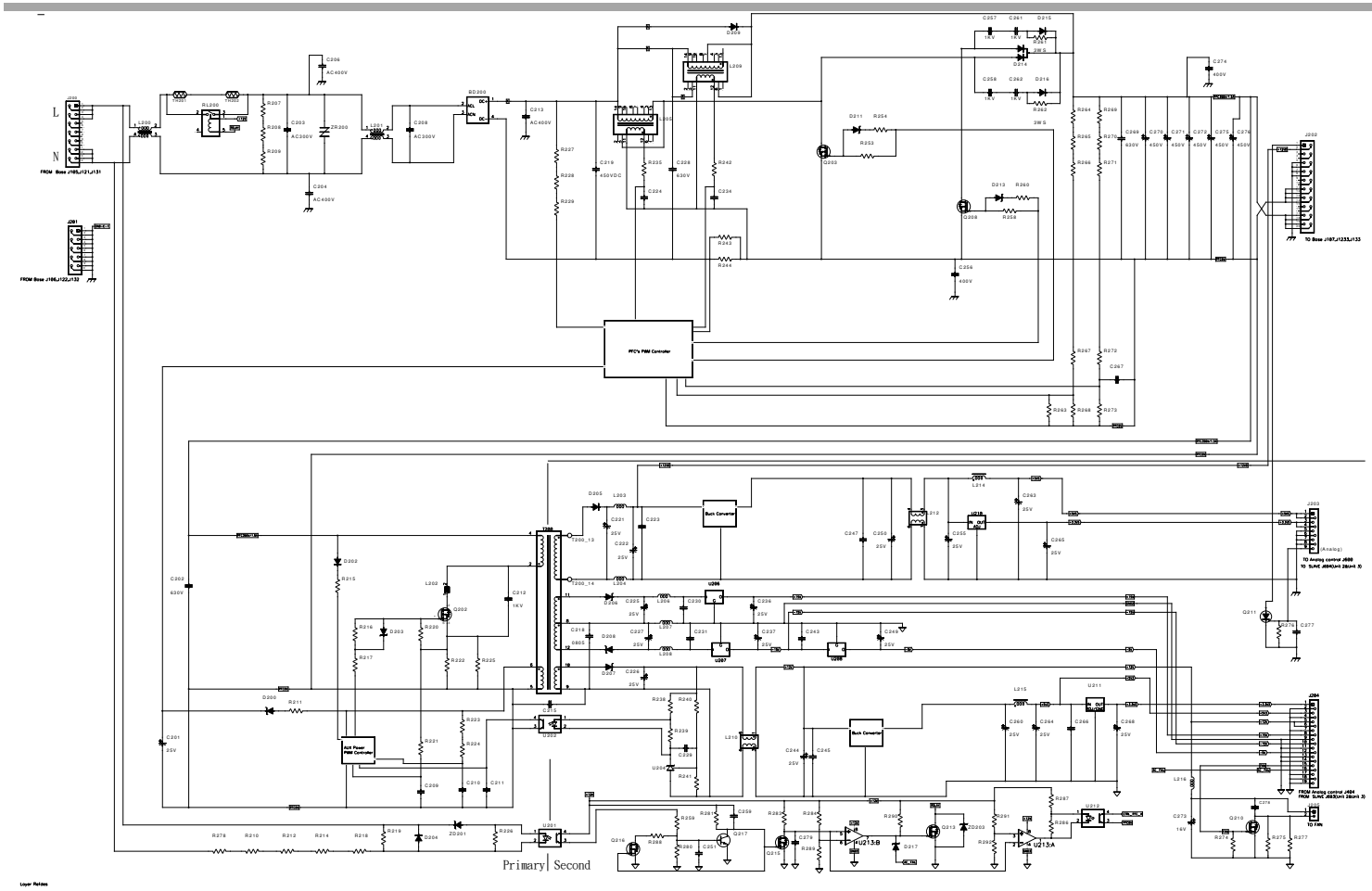
Circuit Diagram for Models of 30V, 80, 160V



Circuit Diagram for Models of 250V, 800V



PFC & AUX Power Circuit Diagram



PARTS LIST

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Electrical Parts List

SW01P01X

Ref. Des.	Model	Part Number	Description
BD200	All	2504-XB60H011	BRIDGE D10XB60H, 10A, 600V ,RoHS
C201	All	2254-25107M21	CSE2 25V, 100uM, 105'C 6.3*11, EKY-250ETD101MF11D
C202	All	2271-6A104K01	CSD 630V, 0.1uK, 18*13.5 ,P=15, END630P10K000
C203	All	2291-3D105K01	CSK AC300V, 1uK, P=22.5, X1, CKX105K300S, RoHS
C204	All	2201-4X222M31	CSC AC400V, 2200pM ,P=9.5, Y1, JD222MY5UY1, RoHS
C205	All	2254-25107M21	CSE2 25V, 100uM, 105'C 6.3*11, EKY-250ETD101MF11D
C206	All	2201-4X222M31	CSC AC400V, 2200pM ,P=9.5, Y1, JD222MY5UY1, RoHS
C208	All	2291-3D105K01	CSK AC300V, 1uK, P=22.5, X1, CKX105K300S, RoHS
C212	All	2201-1K221K11	CSC 1KV, 220pK ,P=5.0, DEBB33A221KC1B, MURATA
C219	All	2271-4B105K11	CSD 450V, 1uK, 18.3*18.5 P=15, MDST22W105K2A6.3
C221	All	2254-25337M11	CSE2 25V 330uM 105'C 10*12.5, EKY-250ETD331MJC5S
C222	All	2254-25337M11	CSE2 25V 330uM 105'C 10*12.5, EKY-250ETD331MJC5S
C225	All	2254-25227M21	CSE2 25V, 220uM,105'C 8*11.5, EKY-250ETD221MHB51
C226	All	2254-25337M11	CSE2 25V 330uM 105'C 10*12.5, EKY-250ETD331MJC5S
C227	All	2254-25227M21	CSE2 25V, 220uM,105'C 8*11.5, EKY-250ETD221MHB51
C228	All	2271-6A104K01	CSD 630V, 0.1uK, 18*13.5 ,P=15, END630P10K000
C236	All	2254-25107M21	CSE2 25V, 100uM, 105'C 6.3*11, EKY-250ETD101MF11D
C237	All	2254-25107M21	CSE2 25V, 100uM, 105'C 6.3*11, EKY-250ETD101MF11D
C242	All	2254-25107M21	CSE2 25V, 100uM, 105'C 6.3*11, EKY-250ETD101MF11D
C244	All	2254-25337M11	CSE2 25V 330uM 105'C 10*12.5, EKY-250ETD331MJC5S
C249	All	2254-25107M21	CSE2 25V ,100uM ,105'C 6.3*11 ,EKY-250ETD101MF11D
C250	All	2254-25337M11	CSE2 25V 330uM 105'C 10*12.5 ,EKY-250ETD331MJC5S
C255	All	2254-25107M21	CSE2 25V ,100uM ,105'C 6.3*11 ,EKY-250ETD101MF11D
C256	All	2201-4X102M11	CSC AC400V ,1000PM ,7@ ,P=9.5 ,Y1 ,Y5U ,RoHS
C257	All	2201-1K681K01	CSC 1KV ,680pK ,P=5.0 ,DEBB33A681KA2B ,MURATA
C258	All	2201-1K681K01	CSC 1KV ,680pK ,P=5.0 ,DEBB33A681KA2B ,MURATA
C260	All	2254-25337M11	CSE2 25V 330uM 105'C 10*12.5 ,EKY-250ETD331MJC5S
C261	All	2201-1K681K01	CSC 1KV ,680pK ,P=5.0 ,DEBB33A681KA2B ,MURATA
C262	All	2201-1K681K01	CSC 1KV ,680pK ,P=5.0 ,DEBB33A681KA2B ,MURATA
C263	All	2254-25337M11	CSE2 25V 330uM 105'C 10*12.5 ,EKY-250ETD331MJC5S
C264	All	2254-25107M21	CSE2 25V ,100uM ,105'C 6.3*11 ,EKY-250ETD101MF11D
C265	All	2254-25107M21	CSE2 25V ,100uM ,105'C 6.3*11 ,EKY-250ETD101MF11D
C268	All	2254-25107M21	CSE2 25V ,100uM ,105'C 6.3*11 ,EKY-250ETD101MF11D
C269	All	2271-6A104K01	CSD 630V ,0.1uK ,18*13.5 ,P=15 ,END630P10K000
C270	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25, EKXG451ELL680MM251
C271	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25, EKXG451ELL680MM251
C272	All	2251-4B686M01	CSE2 450V, 68uM 105'C 18@*25,EKXG451ELL680MM251
C273	All	2251-16477M21	CSE2 16V 470uM 105'C 8*11.5 EKZH160ELL471MHB5D
C274	All	2201-4X102M11	CSC AC400V, 1000PM, 7@, P=9.5, Y1, Y5U, RoHS
C275	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25, EKXG451ELL680MM251
C276	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25, EKXG451ELL680MM251
D200	All	2501-ES1D0201	DIODE ES1D, 200V, 1A, SMD, PANJIT, RoHS
D201	All	2501-ES1D0201	DIODE ES1D, 200V, 1A, SMD, PANJIT, RoHS

D202	All	2501-F10JA201	DIODE RGF10JA, SMD DO-214AC, ZOWIE, RoHS
D203	All	2512-S1040201	SCHOTTKY BARRIER DIODE SS1040FL, SMD, RoHS
D205	All	2501-GF30D201	DIODE UGF30D, 3A, 200V, SMD, RoHS
D206	All	2501-ES1D0201	DIODE ES1D, 200V, 1A, SMD, PANJIT, RoHS
D207	All	2501-ES1D0201	DIODE ES1D, 200V, 1A, SMD, PANJIT, RoHS
D208	All	2501-ES1D0201	DIODE ES1D, 200V, 1A, SMD, PANJIT, RoHS
D209	All	2501-N5406101	DIODE 1N5406 ,600V ,3A ,DO-201AD, PANJIT, RoHS
D210	All	2512-34000201	SCHOTTKY BARRIER DIODE SX34, 40V, 3A, SMD,RoHS
D211	All	2512-S1040201	SCHOTTKY BARRIER DIODE SS1040FL,SMD, RoHS
D212	All	2512-34000201	SCHOTTKY BARRIER DIODE SX34,40V, 3A, SMD, RoHS
D213	All	2512-S1040201	SCHOTTKY BARRIER DIODE SS1040FL, SMD, RoHS
D214	All	2501-1606F301	DIODE UF1606FCT, 16A, 600V, PANJIT, RoHS
D215	All	2501-F10JA201	DIODE RGF10JA, SMD DO-214AC ,ZOWIE, RoHS
D216	All	2501-F10JA201	DIODE RGF10JA, SMD DO-214AC ,ZOWIE, RoHS
D217	All	2512-S1040201	SCHOTTKY BARRIER DIODE SS1040FL, SMD, RoHS
Q202	All	2661-35300101	FET 2SK3530-01MR, TO-220F, FUJI, RoHS
Q203	All	266A-15A50D01	MOSFET TK15A50D(Q)(STA4, Q, M)(STA4, X, M), TOSHIBA
Q208	All	266A-15A50D01	MOSFET TK15A50D(Q)(STA4, Q, M)(STA4, X, M), TOSHIBA
Q210	All	266A-1N03LTT1	FET MGSF1N03LT1G, SMD, ON, RoHS
Q211	All	2680-08MT1GT1	SCR MCR08MT1G, SMD, ON, RoHS
R261	All	2076B27B1J431	RO 3W, 270RJ, P=20 ,MOF3WS270RJMG, RoHS
R262	All	2076B27B1J431	RO 3W, 270RJ, P=20 ,MOF3WS270RJMG, RoHS
RL200	All	3311-12100101	RELAY JQ1AP-12V-F,DC12V,10A,SPST,RoHS
TH201	All	2505-11010011	THR CPTC PPL19100MA1B7YKB, 100RM, 19@, RoHS
TH202	All	2505-11010011	THR CPTC PPL19100MA1B7YKB, 100RM, 19@, RoHS
U206	All	2733-7815FA01	IC NJM7815FA, JRC, RoHS
U207	All	2733-7915FA01	IC NJM7915FA, JRC, RoHS
U210	All	2785-108433C1	IC AIC1084-33CT, AIC, RoHS
ZR200	All	2506-47114001	VARISTOR TVR14471KSY, 470V, 14@, RoHS

SW01P09X_30V, 80V, 160V

Ref. Des.	Model	Part Number	Description
C300	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25 ,EKXG451ELL680MM251
C302	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25 ,EKXG451ELL680MM251
C303	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25 ,EKXG451ELL680MM251
C305	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25 ,EKXG451ELL680MM251
C306	All	2201-4X102M11	CSC AC400V, 1000PM, 7@, P=9.5, Y1, Y5U, RoHS
C307	All	2201-4X102M11	CSC AC400V, 1000PM , 7@ , P=9.5, Y1, Y5U, RoHS
C308	All	2271-6A104K01	CSD 630V, 0.1uK, 18*13.5, P=15, END630P10K000
C309	All	2271-6A104K01	CSD 630V, 0.1uK, 18*13.5, P=15, END630P10K000
C312	All	2201-4X222M31	CSC AC400V, 2200pM, P=9.5, Y1, JD222MY5UY1, RoHS
C313	30V,80V	2201-1K471K01	CSC 1KV, 470pK, P=5.0, DESD33A471KA2B, MURATA
C313	160V	2201-1K221K11	CSC 1KV, 220pK, P=5.0, DEBB33A221KC1B, MURATA
C314	30V,80V	2201-1K471K01	CSC 1KV, 470pK, P=5.0, DESD33A471KA2B, MURATA
C314	160V	2201-1K221K11	CSC 1KV, 220pK, P=5.0, DEBB33A221KC1B, MURATA

C315	30V,80V	2201-1K471K01	CSC 1KV, 470pK, P=5.0, DESD33A471KA2B, MURATA
C315	160V	2201-1K221K11	CSC 1KV, 220pK, P=5.0, DEBB33A221KC1B, MURATA
C316	30V,80V	2201-1K471K01	CSC 1KV, 470pK, P=5.0, DESD33A471KA2B, MURATA
C316	160V	2201-1K221K11	CSC 1KV, 220pK, P=5.0, DEBB33A221KC1B, MURATA
C317	All	2254-25107M21	CSE2 25V, 100uM, 105'C 6.3*11, EKY-250ETD101MF11D
C318	All	2254-25107M21	CSE2 25V, 100uM, 105'C 6.3*11, EKY-250ETD101MF11D
C320	All	2201-4X471K11	CSC AC400V, 470PK, 9.5@, Y1, Y5P, JD471K2GBE9LS
C321	All	2201-4X471K11	CSC AC400V, 470PK, 9.5@, Y1, Y5P, JD471K2GBE9LS
C334	All	2251-50477M21	CSE2 50V 470uM 105'C 12.5*20, EKY-500ELL471MK20S
C334	160V	2251-1A157M01	CSE2 100V 150uM 105'C 12.5*20, EKY-101ELL151MK20S
C335	All	2251-50477M21	CSE2 50V 470uM 105'C 12.5*20, EKY-500ELL471MK20S
C335	160V	2251-1A157M01	CSE2 100V 150uM 105'C 12.5*20, EKY-101ELL151MK20S
C336	All	2251-50477M21	CSE2 50V 470uM 105'C 12.5*20, EKY-500ELL471MK20S
C336	160V	2251-1A157M01	CSE2 100V 150uM 105'C 12.5*20, EKY-101ELL151MK20S
C337	All	2251-50477M21	CSE2 50V 470uM 105'C 12.5*20, EKY-500ELL471MK20S
C337	160V	2251-1A157M01	CSE2 100V 150uM 105'C 12.5*20, EKY-101ELL151MK20S
C338	All	2251-50477M21	CSE2 50V 470uM 105'C 12.5*20, EKY-500ELL471MK20S
C338	160V	2251-1A157M01	CSE2 100V 150uM 105'C 12.5*20, EKY-101ELL151MK20S
C339	All	2251-50477M21	CSE2 50V 470uM 105'C 12.5*20 ,EKY-500ELL471MK20S
C339	160V	2251-1A157M01	CSE2 100V 150uM 105'C 12.5*20 ,EKY-101ELL151MK20S
C340	All	2251-50477M21	CSE2 50V 470uM 105'C 12.5*20, EKY-500ELL471MK20S
C340	160V	2251-1A157M01	CSE2 100V 150uM 105'C 12.5*20, EKY-101ELL151MK20S
C341	All	2251-50477M21	CSE2 50V 470uM 105'C 12.5*20, EKY-500ELL471MK20S
C341	160V	2251-1A157M01	CSE2 100V 150uM 105'C 12.5*20, EKY-101ELL151MK20S
C346	All	2291-3D473M01	CSK 305VAC, 0.047uJ, EMI, B32921C3473M000, EPCOS
C352	30V	2251-50477M21	CSE2 50V 470uM 105'C 12.5*20, EKY-500ELL471MK20S
C352	80V	2251-1A227M41	CSE2 100V 220uM 105'C 16@*20 EKY-101ELL221ML20S
C352	160V	2251-2B107M01	CSE2 250V 100uM 105'C 16@*20 EKXJ251ELL101ML20S
C353	30V	2251-50477M21	CSE2 50V 470uM 105'C 12.5*20, EKY-500ELL471MK20S
C353	80V	2251-1A227M41	CSE2 100V 220uM 105'C 16@*20 EKY-101ELL221ML20S
C353	160V	2251-2B107M01	CSE2 250V 100uM 105'C 16@*20 EKXJ251ELL101ML20S
C356	All	2291-3D473M01	CSK 305VAC, 0.047uJ, EMI, B32921C3473M000, EPCOS
D305	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D306	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D307	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D308	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D309	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D310	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D316	30V	2512-30100301	SCHOTTKY DIODE MBR30100FCT, 100V, 30A, PANJIT
D316	80V	2512-20150301	SCHOTTKY DIODE MBR20150FCT, 150V, 20A, PANJIT
D316	160V	2501-20010301	ULTRAFAST DIODE RF2001T3D, 300V, 20A, ROHM
D317	30V	2512-30100301	SCHOTTKY DIODE MBR30100FCT, 100V, 30A, PANJIT
D318	30V	2512-30100301	SCHOTTKY DIODE MBR30100FCT, 100V, 30A, PANJIT
D318	80V	2512-20150301	SCHOTTKY DIODE MBR20150FCT, 150V, 20A, PANJIT
D318	160V	2501-20010301	ULTRAFAST DIODE RF2001T3D, 300V, 20A, ROHM
D319	30V	2512-30100301	SCHOTTKY DIODE MBR30100FCT, 100V, 30A, PANJIT
D319	80V	2512-20150301	SCHOTTKY DIODE MBR20150FCT, 150V, 20A, PANJIT
D319	160V	2501-20010301	ULTRAFAST DIODE RF2001T3D, 300V, 20A, ROHM
D320	30V	2512-30100301	SCHOTTKY DIODE MBR30100FCT, 100V, 30A, PANJIT
D321	30V	2512-30100301	SCHOTTKY DIODE MBR30100FCT, 100V, 30A, PANJIT

D321	80V	2512-20150301	SCHOTTKY DIODE MBR20150FCT, 150V, 20A, PANJIT
D321	160V	2501-20010301	ULTRAFAST DIODE RF2001T3D, 300V, 20A, ROHM
F300	30V	37FF-77A44021	FUSE F 8.35@*7.7 ,4A 250V MEF RoHS
F300	80V, 160V	37FF-77A42021	FUSE F 8.35@*7.7 ,2A 250V MEF RoHS
Q304	All	266A-15A50D01	MOSFET TK15A50D(Q)(STA4, Q, M)(STA4, X, M), TOSHIBA
Q305	All	266A-15A50D01	MOSFET TK15A50D(Q)(STA4, Q, M)(STA4, X, M), TOSHIBA
Q306	All	266A-15A50D01	MOSFET TK15A50D(Q)(STA4, Q, M)(STA4, X, M), TOSHIBA
Q307	All	266A-15A50D01	MOSFET TK15A50D(Q)(STA4,Q,M)(STA4,X,M) ,TOSHIBA
Q308	All	2665-64000001	FET IRF640NPbF, IR, RoHS
R308	All	2076B27B1J431	RO 3W, 270RJ, P=20, MOF3WS270RJMG,RoHS
R309	All	2076B27B1J431	RO 3W, 270RJ, P=20, MOF3WS270RJMG,RoHS
R311	All	2076B27B1J431	RO 3W, 270RJ, P=20, MOF3WS270RJMG,RoHS
R312	All	2076B27B1J431	RO 3W, 270RJ, P=20, MOF3WS270RJMG,RoHS
R316	All	2075B33B0J421	RO 2W, 33RJ, P=15, MOF2WS33RJMG, RoHS
R317	All	2075B33B0J421	RO 2W, 33RJ, P=15, MOF2WS33RJMG, RoHS
R318	All	2075B33B0J421	RO 2W, 33RJ, P=15, MOF2WS33RJMG, RoHS
R319	All	2075B33B0J421	RO 2W, 33RJ, P=15, MOF2WS33RJMG, RoHS

SW01P11X_250V, 800V

Ref. Des.	Model	Part Number	Description
C300	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25 ,EKXG451ELL680MM251
C301	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25 ,EKXG451ELL680MM251
C302	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25 ,EKXG451ELL680MM251
C303	All	2251-4B686M01	CSE2 450V,68uM 105'C 18@*25 ,EKXG451ELL680MM251
C306	All	2201-4X102M11	CSC AC400V, 1000PM, 7@, P=9.5, Y1, Y5U, RoHS
C307	All	2201-4X102M11	CSC AC400V, 1000PM ,7@, P=9.5, Y1, Y5U, RoHS
C308	All	2271-6A104K01	CSD 630V, 0.1uK, 18*13.5, P=15, END630P10K000
C309	All	2271-6A104K01	CSD 630V, 0.1uK, 18*13.5, P=15, END630P10K000
C312	All	2201-4X102M11	CSC AC400V, 1000PM, 7@, P=9.5, Y1, Y5U, RoHS
C313	All	2201-1K471K01	CSC 1KV, 470pK, P=5.0, DESD33A471KA2B, MURATA
C314	All	2201-1K471K01	CSC 1KV, 470pK, P=5.0, DESD33A471KA2B, MURATA
C315	All	2201-1K471K01	CSC 1KV, 470pK, P=5.0, DESD33A471KA2B, MURATA
C316	All	2201-1K471K01	CSC 1KV, 470pK, P=5.0, DESD33A471KA2B, MURATA
C317	All	2254-25107M21	CSE2 25V, 100uM, 105'C 6.3*11, EKY-250ETD101MF11D
C318	All	2254-25107M21	CSE2 25V, 100uM, 105'C 6.3*11, EKY-250ETD101MF11D
C320	All	2201-4X102M11	CSC AC400V, 1000PM ,7@, P=9.5, Y1, Y5U, RoHS
C321	All	2201-4X102M11	CSC AC400V, 1000PM ,7@, P=9.5, Y1, Y5U, RoHS
C322	All	2201-4X102M11	CSC AC400V, 1000PM ,7@, P=9.5, Y1, Y5U, RoHS
C332	All	2251-2B826M01	CSE2 250V, 82uM 105'C 12.5*25 EKXJ251ELL820MK25S
C333	All	2251-2B826M01	CSE2 250V, 82uM 105'C 12.5*25 EKXJ251ELL820MK25S
C335	All	2251-2B826M01	CSE2 250V, 82uM 105'C 12.5*25 EKXJ251ELL820MK25S
C336	All	2251-2B826M01	CSE2 250V, 82uM 105'C 12.5*25 EKXJ251ELL820MK25S
C338	All	2251-2B826M01	CSE2 250V, 82uM 105'C 12.5*25 EKXJ251ELL820MK25S
C339	All	2251-2B826M01	CSE2 250V, 82uM 105'C 12.5*25 EKXJ251ELL820MK25S

C341	All	2251-2B826M01	CSE2 250V, 82uM 105'C 12.5*25 EKXJ251ELL820MK25S
C342	All	2251-2B826M01	CSE2 250V, 82uM 105'C 12.5*25 EKXJ251ELL820MK25S
C351	250V	2251-2B826M01	CSE2 250V, 82uM 105'C 12.5*25 EKXJ251ELL820MK25S
C351	800V	2251-4B186M01	CSE2 450V, 18uM 105'C 12.5*20 EKXJ451ELL180MK20S
C352	250V	2251-2B826M01	CSE2 250V, 82uM 105'C 12.5*25 EKXJ251ELL820MK25S
C352	800V	2251-4B186M01	CSE2 450V, 18uM 105'C 12.5*20 EKXJ451ELL180MK20S
C355	All	22M1-1K104J01	CMPP 1KV, 0.1uJ, FLS4461000VDC104J1A1 SHINYEI
C356	All	2201-1K103Z11	CSC 1KV, 0.01uZ, 13@, DEBE33A103ZA3B, RoHS
C357	All	2201-1K103Z11	CSC 1KV, 0.01uZ, 13@, DEBE33A103ZA3B, RoHS
C359	All	2201-4X102M11	CSC AC400V, 1000PM, 7@, P=9.5, Y1, Y5U, RoHS
C370	All	2201-1K103Z11	CSC 1KV, 0.01uZ, 13@, DEBE33A103ZA3B, RoHS
C371	All	2201-1K103Z11	CSC 1KV, 0.01uZ, 13@, DEBE33A103ZA3B, RoHS
C372	All	2201-1K103Z11	CSC 1KV, 0.01uZ, 13@, DEBE33A103ZA3B, RoHS
C373	All	2201-1K103Z11	CSC 1KV, 0.01uZ, 13@, DEBE33A103ZA3B, RoHS
C374	All	2201-1K103Z11	CSC 1KV, 0.01uZ, 13@, DEBE33A103ZA3B, RoHS
C375	All	2201-1K103Z11	CSC 1KV, 0.01uZ, 13@, DEBE33A103ZA3B, RoHS
C376	All	22M1-1K104J01	CMPP 1KV, 0.1uJ, FLS4461000VDC104J1A1 SHINYEI
D305	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D306	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D307	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D308	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D309	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D310	All	2501-ER206101	DIODE ER206, 600V, 2A, DO-15, PANJIT, RoHS
D317	250V	2501-12T60301	RECTIFIERS DIODE LXA12T600C, 600V, 12A, PI
D317	800V	2501-08T60301	RECTIFIERS DIODE LXA08T600C, 600V, 8A, PI
D318	250V	2501-12T60301	RECTIFIERS DIODE LXA12T600C, 600V, 12A, PI
D318	800V	2501-08T60301	RECTIFIERS DIODE LXA08T600C, 600V, 8A, PI
D319	250V	2501-12T60301	RECTIFIERS DIODE LXA12T600C, 600V, 12A, PI
D319	800V	2501-08T60301	RECTIFIERS DIODE LXA08T600C, 600V, 8A, PI
D320	250V	2501-12T60301	RECTIFIERS DIODE LXA12T600C, 600V, 12A, PI
D320	800V	2501-08T60301	RECTIFILTERS DIODE LXA08T600C, 600V, 8A, PI
Q304	All	266A-15A50D01	MOSFET TK15A50D(Q)(STA4, Q, M)(STA4, X, M), TOSHIBA
Q305	All	266A-15A50D01	MOSFET TK15A50D(Q)(STA4, Q, M)(STA4, X, M), TOSHIBA
Q306	All	266A-15A50D01	MOSFET TK15A50D(Q)(STA4, Q, M)(STA4, X, M), TOSHIBA
Q307	All	266A-15A50D01	MOSFET TK15A50D(Q)(STA4, Q, M)(STA4, X, M), TOSHIBA
Q308	All	2661-38780001	MOSFET 2SK3878, 900V, 9A, TOSHIBA, RoHS
R309	All	2076L33B2J431	RO 3WS, 3.3kJ 200ppm P=20 RSF3WS3.3KJMK
R310	All	2076L33B2J431	RO 3WS, 3.3kJ 200ppm P=20 RSF3WS3.3KJMK
R311	All	2076L33B2J431	RO 3WS, 3.3kJ 200ppm P=20 RSF3WS3.3KJMK
R312	All	2076L33B2J431	RO 3WS, 3.3kJ 200ppm P=20 RSF3WS3.3KJMK
R316	250V	2075L22B1J311	RO 2W, 220RJ, RSF2WS220RJFKK, RoHS
R316	800V	2075B47B1J311	RO 2W, 470RJ, VERT, MO-2W-470-FKK, RoHS
R317	250V	2075L22B1J311	RO 2W, 220RJ, RSF2WS220RJFKK, RoHS
R317	800V	2075B47B1J311	RO 2W, 470RJ, VERT, MO-2W-470-FKK, RoHS
R318	250V	2075L22B1J311	RO 2W, 220RJ, RSF2WS220RJFKK, RoHS
R318	800V	2075B47B1J311	RO 2W, 470RJ, VERT, MO-2W-470-FKK, RoHS

R319	250V	2075L22B1J311	RO 2W, 220RJ, RSF2WS220RJFKK, RoHS
R319	800V	2075B47B1J311	RO 2W, 470RJ, VERT, MO-2W-470-FKK, RoHS
R320	250V	2075L22B1J311	RO 2W, 220RJ, RSF2WS220RJFKK, RoHS
R320	800V	2075B47B1J311	RO 2W, 470RJ, VERT, MO-2W-470-FKK, RoHS
R321	250V	2075L22B1J311	RO 2W, 220RJ, RSF2WS220RJFKK, RoHS
R321	800V	2075B47B1J311	RO 2W, 470RJ, VERT, MO-2W-470-FKK, RoHS
R322	250V	2075L22B1J311	RO 2W, 220RJ, RSF2WS220RJFKK, RoHS
R322	800V	2075B47B1J311	RO 2W, 470RJ, VERT, MO-2W-470-FKK, RoHS
R323	250V	2075L22B1J311	RO 2W, 220RJ, RSF2WS220RJFKK, RoHS
R323	800V	2075B47B1J311	RO 2W, 470RJ, VERT, MO-2W-470-FKK, RoHS
R396	250V	2026H22BCJ311	RW 3W, 0.22RJ, 400ppm ,VERT ,KNP3WSR22JFKK, RoHS
R396	800V	2026H22BDJ311	RW 3W, 2.2RJ, 400ppm , VERT, KNP3WS2R2JFKK, RoHS
R397	250V	2026H22BCJ311	RW 3W, 0.22RJ, 400ppm , VERT, KNP3WSR22JFKK, RoHS
R397	800V	2026H22BDJ311	RW 3W, 2.2RJ, 400ppm , VERT, KNP3WS2R2JFKK, RoHS