

Adjustment Procedure							
PPT & PPS SERIES			Doc. No.		Page	Page1 of 7	
Item	Description	Published Spec.	Condition	Adj Point	Adj Spec.	PQC Spec.	Remark

Test Equipment :

1. GDM-8145 & GDM-8055 2. Scope & DSO 3. PEL-300 or Pure Resistive Load
4. Insulation Meter & Hi-Pot Tester 5. GPIB Computer Test

1	Workman-ship	Refer to various Workmanship Standard					
2	Insulation Test	≥ DC 500V 20M	CH 1 / CH 2 / CH 3 OUT+ and OUT- to GND respectively	CHECK	≥ DC 500V 20M	≥ DC 500V 20M	Unplug
		≥ DC 500V 30M	AC Cord to GND	CHECK	≥ DC 500V 30M	≥ DC 500V 30M	Unplug
3	Hi-Pot Test	1.2kV 4mA 1 MIN	CH 1 / CH 2 / CH 3 OUT+ / OUT- to GND and short	CHECK	1.2kV 4mA 1 MIN	1.2kV 4mA 1 MIN	Safety Caution

Preparation

- H Working Voltage :
- 1) J402 Pin 3 and Pin 4 to U401 case _____ $\pm (15V \pm 0.75V)$
 - 2) J402 Pin 6 to U401 case _____ $\pm (5V \pm 0.25V)$
J102 and J105 leads _____ $\pm (5V \pm 0.25V)$
 - 3) J103 Pin 1 to Pin 3 _____ $\pm (5.7V \pm 0.75V)$
 - 4) J508 (J608) Pin 16 and Pin 20 to U501 (U601) case _____ $\pm (15V \pm 0.75V)$
 - 5) J508 (J608) Pin 1 and Pin 2 to U503 (U603) case _____ $\pm (5V \pm 0.25V)$

PS. No need to apply item 4) & 5) to PSS-1860/PPS-3635/PPS-6020.

4	Power ON Self-Test	No [ERR] displayed	Power ON, the panel displays Self-Test Result	CHECK	No [ERR] displayed	No [ERR] displayed	
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- H Note
- 1) No PQC / QA personnel should proceed the following adjustment modes
 - 2) Do not include the following adjustment modes to PQC / QA Inspection Specifications
 - 3) There are two adjusting modes(A. Continuous adjusting mode, B. Individual adjusting mode) available for selection.
A. Continuous adjusting mode: for Product adjustment in the very beginning
B. Individual Adjusting mode: for Product repair or input error occur in half way through adjustment in Serial Mode or finished goods inspection
 - 4) Before adjustment, please erase the memory data by pressing the key shown as below:
[SHIFT][1][2][3][4][←]

Select the Output CH (1, 2, 3) to be adjusted, after the adjustment of CH1 is completed, then adjust CH2. CH3 can be adjusted individually. (PPS-SERIES only has one output).

		Key In	"A" Meter Display
A	Enter individual adjusting Mode.	[SHIFT] [I↓] [X] [X] [X] [X] [←]	[CL00]
	↑ _____	[X] [X] [X] [X] [X] → vary with different model.	
NG return to step A ↓ OK			
B	Ready to enter V OFFSET	[←]	[CL10]
	V OFFSET adjust		[CL00]
	Set DMM to 2V range to test the output value. Key in DMM reading value.	[0] [.] [X] [X] [←]	[CL11]
	This adjustment step completed	PS: When the reading value of DMM is at 0.525V, then key in [0] [.] [5] [3] [←]	
↑ _____			
NG return to step A ↓ OK			
C	Go to V FULL SCALE		[CL11]
	Use DMM to measure the output value, adjust VR501/601/VR401 according to Table 1.	X [←]	[CL2F]

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Table 1 : Adjustment Values

(Tolerance : $\pm 5mV$)

Model	PPS-1860	PPS-3635	PPS-6020	PPT-1830	PPT-3615	PS-2520	PS-2521
VR501	19.00V	37.00V	61.00V	19.00V	37.00V	37.00V	21.00V
VR601	19.00V	37.00V	61.00V	19.00V	37.00V	37.00V	21.00V
VR401				7.00V	7.00V	7.00V	7.00V

<p>↑ _____</p> <p>NG return to step A ↓ OK</p> <p>D</p> <div> Set DMM to 2A range and connect to Output terminal Enter CURRENT OFFSET adjustment Key in DMM reading value Complete the adjustment </div>		<p>Key In</p> <p>[←] [0] [.] [X] [X] [X] [←]</p> <p>PS: When the reading value of DMM is at 15.5mA, then key in [0] [.] [0] [1] [6] [←]</p>	<p>Meter "A" DISPLAY</p> <p>[CL20] [CL2F]</p>
<p>↑ _____</p> <p>NG return to step A ↓ OK</p> <p>E</p> <div> Set DMM to 20A range and connect to Output terminal Enter CURRENT FULL SCALE adjustment Key in DMM reading value Complete the adjustment </div>		<p>[←] [X] [.] [X] [X] [X] [←]</p> <p>PS: When the reading value of DMM is at 1.512A, then key in [1] [.] [5] [1] [2] [←]</p>	<p>[CL21] [CL2F]</p>
<p>↑ _____</p> <p>NG return to step A ↓ OK</p> <p>F</p> <div> Set the Output terminal to OPEN Go to OVP Auto Adjust Complete the adjustment </div>		<p>[←]</p>	<p>[CL30] [CL31]</p>
<p>PS : 1. The above adjustment steps can be applied to CH1, CH2 and CH 3, but the adjustment for CH2 can not be proceeded until the adjustment for CH1 is completed.</p> <p>2. The following steps are not valid for CH1 & CH3</p>			
<p>↑ _____</p> <p>NG return to step A ↓ OK</p> <p>G</p> <div> Set DMM to 2A range and connect to Output terminal Go to PARA CURRENT OFFSET adjustment Key in DMM reading value Complete the adjustment </div>		<p>[←] [0] [.] [X] [X] [X] [←]</p> <p>PS: When the reading value of DMM is at 15.5mA, then key in [0] [.] [0] [1] [6] [←]</p>	<p>[CL40] [CL2F]</p>
<p>↑ _____</p> <p>NG return to step A ↓ OK</p> <p>H</p> <div> Set DMM to 20A range and connect to Output terminal Enter CURRENT PARA FULL Scale adjustment Key in DMM reading value Complete the adjustment </div>		<p>[←] [X] [.] [X] [X] [X] [←]</p> <p>PS: When the reading value of DMM is at 3.512A, then key in [3] [.] [5] [1] [2] [←]</p>	<p>[CL41] [CL2F]</p>

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PS: If key-in in error, then go back to the first step of the continuous adjusting mode, or enter the Individual adjusting Mode according to the adjustment steps below:

		<u>Key-In</u>	<u>Meter "A" Display</u>
	Individual adjusting mode	[SHIFT] [I↑] [X] [X] [X] [X] [←]	[CL00]
1)	V OFFSET Adjust	[1] [←]	[CL10]
	Key in DMM Voltage reading value	[0] [.] [X] [X] [←]	
2)	V Full Scale Adjustment	[1] [V↑] [←]	[CL11]
	Key in DMM Voltage reading value	Adjust VR401 (VR501/VR601)	
	Connect output terminal to DMM 2A Range		
3)	CURRENT OFFSET Adjust	[2] [←]	[CL20]
	Key in DMM Current reading value	[0] [.] [X] [X] [X] [←]	
	Connect output terminal to DMM 20A Range		
4)	CURRENT Full Scale Adjust	[2] [V↑] [←]	[CL21]
	Key in DMM Current reading value	[X] [.] [X] [X] [X] [←]	
	Output Terminal OPEN		
5)	OVP OFFSET Adjust	[3] [←]	[CL30]
	Output Terminal OPEN		
6)	OVP FULL Scale Adjust	[3] [V↑] [←]	[CL31]
	Connect output terminal to DMM 2A Range		
7)	PARA CURRENT OFFSET Adjust	[4] [←]	[CL40]
	Key in DMM Current reading value	[0] [.] [X] [X] [X] [←]	
	Connect output terminal connect to DMM 20A Range		
8)	PARA CURRENT Full Scale Adjust	[4] [V↑] [←]	[CL41]
	Key in DMM Current reading value	[X] [.] [X] [X] [X] [←]	

PS. Only PPT-SERIES & PS-2520/2521 need to be adjusted by step 7) & 8).

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The common items of the adjusting mode listed as below:

★ When proceed adjusting procedure, first enter the adjusting mode by key-in :

[↑] [X] [X] [X] [X] [←]

▲
vary with different model.

- ★ When the Display shows CL10, adjust Voltage OFFSET
- ★ When the Display shows CL11, adjust Voltage Full Scale
- ★ When the Display shows CL20, adjust Current OFFSET
- ★ When the Display shows CL21, adjust Current Full Scale
- ★ When the Display shows CL30, adjust OVP OFFSET
- ★ When the Display shows CL31, adjust OVP Full Scale
- ★ When the Display shows CL40, adjust PARA Current OFFSET
- ★ When the Display shows CL41, adjust PARA Current Full Scale

5	OVER-SHOOT Checking	No OVER-SHOOT	1. Voltage SET → 3V 2. Current SET → MAX 3. Power ON/OFF Test	CHECK	No OVER-SHOOT	No OVER-SHOOT	10% Line Voltage 50 / 60 Hz Test from CH1~CH3
6	[V SET] & Accuracy check	± 0.05% + 25mV (± 0.05% + 50mV when Rated Voltage > 36V)	1. Set any voltage value for CH1, CH2 & CH3. 2. Confirm the setting value and the error value between DMM reading value and Display value.	CHECK	± 0.05% +15Mv (± 0.05% + 30mV when Rated Voltage >36V)	± 0.05% + 20mV (± 0.05% + 40mV when Rated Voltage >36V)	Output Terminal should be loaded when testing
	PARA [V SET] Accuracy check		1. Set rated voltage for CH1 & CH2. 2. Press [SHIFT][PARA] to confirm the setting value and the error value between DMM reading value and Display value.				Add load to output terminal when test PPT-series & PS-2520.
7	[I SET] & Accuracy Function Check	± 0.2% + 10mA	1. Set Max and Min Current 2. Confirm the setting value and the error value between DMM reading value and Display value.	CHECK	± 0.2% + 5mA	± 0.2% + 8mA	Output Terminal should be loaded when testing
	PARA [I SET] Accuracy check	± 0.2% + 20mA	1. Set rated current for CH1 & CH2. 2. Press [SHIFT][PARA] to confirm the setting value and the error value between DMM reading value and Display value.				Add load to output terminal when test PPT-series & PS-2520.

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8	[V STEP] [V ↑][V ↓] Function Check	Range: 10mV ~ 2V Resolution: 10mV	1. Check the Voltage range 2. When pressing[V ↑ ↓] once, the output voltage will increase (decrease) one step. 3. Repress [V ↑ ↓], the output will increase (decrease) continuously.		CHECK	Range: 10mV ~ 2V Resolution: 10mV	Range: 10mV ~ 2V Resolution: 10mV	Test from CH1~CH3
	Rated value >36V	Range: 20mV ~ 2V Resolution: 20mV				Range: 20mV ~ 2V Resolution: 20mV		
9	[I STEP] [I ↑][I ↓] Function Check	Range : 1mA ~ 0.2A Resolution : 1mA	1. Confirm the setting Current range 2. When pressing [I ↑ ↓] once, the output will increase (decrease) one step. 3. Repress[I ↑ ↓] button, the output will increase (decrease) continuously.		CHECK	Range : 1mA ~ 0.2A Resolution : 2mA	Range : 1mA ~ 0.2A Resolution : 2mA	Test from CH1~CH3
	Rated value >3.5V	Range : 2mA ~ 0.2A Resolution : 2mA				Range : 2mA ~ 0.2A Resolution : 2mA		
10	[OVP] Function Check	Range : 0~20.0V Resolution : 10mV Accuracy : ± 2% + 0.6V	1. Press [OVP] to set OVP value: XX.XX 2. Set OUTPUT on. 3. Input voltage YY.YY until display shows [Err]. 4. Check the error value between the voltage setting YY.YY and OVP setting XX.XX .		CHECK	Range : Shown as below. Resolution : 10mV Accuracy : ± 2% + 0.6V	Range : Shown as below. Resolution : 10mV Accuracy : ± 2% + 0.6V	Set Output off, press [SHIFT] [OVP RST] to return to normal state
	PARA [OVP] Function Check	1. Set rated current for CH1 & CH2. 2. Press [SHIFT][PARA]. 3. Press [OVP] to set OVP value: XX.XX. 4. Set OUTPUT on. 5. Input voltage YY.YY until display shows [Err]. 5. Check the error value between the voltage setting YY.YY and OVP setting XX.XX .						For PPT-series and ps-2520/2521 only.
	MODEL	PPS-1860	PPS-3635	PPS-6020	PPT-1830	PPT-3635	PS-2520	PS-2521
	OVP RANGE	20.0V	38.5V	63.5V	20.0V	38.5V	38.5V	22.5V
11	[DELAY] Function Check	1. Press [DELAY] once to0 display [X] [Y] — (X is for minute from 0 to255. Y is for second from 0 to 59.) 2. Press [X] [.] [Y] [.] again to complete the setting.						
12	[OCP] Function Check	1. Set the OCP LED on and Output LED on 2. SHORT the Output Terminals → display Err-12 3. Press [OCP] off, let the Output back to normal						

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13	[STO] Function Check	1. Store the setting [Volts] [Current] [Output ON / OFF] [OCP ON / Off] [DLY Time] 2. Press [SHIFT] on, then press [STO], now the memory LED should be OFF 3. Key in another group of numbers (0~99) to set the memory location, then press [←] to complete storage. 4. Data can be stored in any MEMORY location according to steps 1 to 3.					
14	[RECALL] Function Check: Direct RECALL data from certain MEMORY location	Press [SHIFT] [RCL] [value 0~99] [←], the data stored in this memory location is recalled immediately.					
	Set RECALL STEP and AUTO Range	1. Press [SHIFT] [RCL] [value 0~99] [•] [Value 0~99] [←]. 2. The setting of above step has completed the Memory location “A” → “B” RECALL STEP and AUTO Range. PS : A ≤ B					
15	[RCL ↑] [RCL ↓] Function Check	1. Pre-store data to 2~3 memory locations (similar to item 13) 2. Press [RCL ↑] once to add figure 1 to the MEMORY display and output will be changed following by the change of stored data. 3. Press [RECL ↓] once to subtract figure 1 from the MEMORY display, output will be changed following by the change of stored data.					
16	[AUTO] Function Check	1. Pre-store data to 2~3 memory locations (similar to item 13) 2. Set AUTO range (similar to item 13, point 2) 3. Press [AUTO] on, the data output and other operation is controlled by the MEMORY, but the output terminal is controlled by the [OUTPUT ON / OFF] key, the other keys are invalid under the AUTO mode. 4. Under AUTO Mode, if power off or [AUTO] off abruptly, the next power on will start from the last MEMORY location before power off or [AUTO] off. 5. Under AUTO Mode, when the output is off, there is no loading to the output terminal, but the MEMORY location still keeps working.					
17	[SERIES / INDEP] Function Check	Press [SHIFT] [SERIES] to control both CH1 and CH2 simultaneously. Now the output value on CH1 or CH2 output terminal whatever will be the same as the total value of CH1 and CH2. PS: Set 5V output for CH1 and 3V output for CH2, press [SHIFT] [SERIES], the output value now on both CH1 and CH2 is 8V.					For PPT-series and ps-2520/2521 only.
18	[PARA / INDEP] Function Check	Press [SHIFT] [PARA], to control both CH 1 and CH 2 simultaneously. Now the output value on CH1 or CH2 output terminal whatever will be the same as the total value of CH1 and CH2. PS: Set 1A output for CH1 and 2A output for CH2, press [SHIFT] [PARA], the output value now on both CH1 and CH2 is 3A.					For PPT-series and ps-2520/2521 only.
19	SERIES Voltage Error Conf.	≤0.1%+50mV	1. Set rating value for CH1 & CH2. 2. Then, press [SHIFT] [SERIES] to observe the difference between CH1 and CH2.	Check	≤0.1%+35mV	≤0.1%+50mV	For PPT-series and ps-2520/2521 only.
20	Voltage Load Variation Conf.	Front panel: ≤6mV Rear Panel: ≤3mV	1. Set rating voltage /current for CH3. 2. Add a rating current load to the output terminal. 3. Compare the load before and after.	Check	Front panel: ≤6mV Rear Panel: ≤3mV	Front panel: ≤6mV Rear Panel: ≤3mV	
21	PARA AMPS ERR Conf.						
23							
24							

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19	Constant Voltage Checking	Front Panel $\leq 6mV$ Rear Panel $\leq 3mV$	<ol style="list-style-type: none"> Set the output to rated voltage and set the output current to Maximum. Add load to max. rated current output terminal Compare the voltage different before and after applying the load 		Check	Front Panel $\leq 6mV$ Rear Panel $\leq 3mV$	Front Panel $\leq 6mV$ Rear Panel $\leq 3mV$	AC Power 10% Test
20	Source Effect Checking	Front and Rear Panel $\leq 3mV$	<ol style="list-style-type: none"> Same as item 19, point 1 & 2 Vary AC Source $\pm 10\%$ Check the output voltage variation 		Check	Front and Rear Panel $\leq 3mV$	Front and Rear Panel $\leq 3mV$	

21	RIPPLE & NOISE Checking	RIPPLE : 1mVrms 2.8mVp-p NOISE : 2mVrms 5.6Vp-p	<ol style="list-style-type: none"> Set the output to rated voltage and Max. current Add Max. Rated Current load Check RIPPLE as affected by line voltage (50/60 Hz) and NOISE other than line frequency (50/60 Hz) Check RIPPLE and NOISE before and after each relay switching stage 		Check	RIPPLE : 1mVrms 2.8mVp-p NOISE : 2mVrms 5.6Vp-p	RIPPLE : 1mVrms 2.8mVp-p NOISE : 2mVrms 5.6Vp-p	AC Power 10% Test
22	Constant Current Variation Checking	Rated Current $> 3.5A : \leq 6mA$ Rated Current $< 3.5A : \leq 3mA$	<ol style="list-style-type: none"> Set the output to rated voltage and Max. current Add load to output terminal, connect to DMM in SERIES at 20A range. Check the output current and adjust the load to Min. Compare the variation of the current readings 		Check	Rated Current $> 3.5A : \leq 6mA$ Rated Current $< 3.5A : \leq 3mA$	Rated Current $> 3.5A : \leq 6mA$ Rated Current $< 3.5A : \leq 3mA$	

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23	RESPONSE TIME Checking Voltage Rising and Falling Time (10%~90%)	Rising Time : ≤ 100mS Falling Time : ≤ 100mS (10% load)	1. Set output voltage to 0V, then change the output voltage to rated voltage. Use DSO to measure the output terminal, check the output voltage rising time from 10% ~ 90%. (No load and full load) 2. Set the output voltage to rated voltage, then change the output voltage to 0V. Use DSO to measure the output terminal, check the output voltage falling time from 90% ~ 10%. (Full load and 10% load)	Check	Rising Time : ≤ 100mS Falling Time : ≤ 100mS (10% load)	Rising Time : ≤ 100mS Falling Time : ≤ 100mS (10% load)	
24	Recovery Time Checking	≤ 100 S	1. Set the output to rated voltage and Max. Current. 2. Connect the output terminal with a full load (with ON/OFF switch). Use DSO the measure the output terminal. When switching the load ON / OFF, check the Voltage Recovery Time.	Check	≤ 100 S	≤ 100 S	

Product	PPT-1830
Rated Voltage Value	18.00V
Rated Current Value	3.000A
Max. Voltage Value	19.00V
Max. Current Value	3.100A
OVP Value	20.00V

ERROR CODE

LIST :

CODE	Signal Name
0	NO ERROR
-1	CPU TEST ERROR
-2	RAM TEST ERROR
-3	ROM TEST ERROR
-4	EEPROM TEST ERROR
-5	DAC / ADC TEST ERROR
-12	OVER CURRENT PROTECT ERROR
-13	OVER VOLTAGE PROTECT ERROR
-16	VOLTAGE TOO LARGE
-17	CURRENT TOO LARGE
-18	VOLTAGE TOO SMALL
-19	CURRENT TOO SMALL
-64	TIMER SETTING ERROR

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-65	OVP SETTING ERROR
-66	ADDRESS SETTING ERROR
-67	VOLTAGE SETTING ERROR
-68	CURRENT SETTING ERROR
-69	RECALL SETTING ERROR
-70	STORE ERROR
-71	STEP ERROR
-89	STEP VOLTAGE OR CURRENT SETTING ERROR
-91	CALIBRATION CURRENT FULL SCALE ERROR
-92	CALIBRATION VOLTAGE FULL SCALE ERROR
-93	CALIBRATION OVP FULL SCALE ERROR
-94	CALIBRATION OVP OFFSET ERROR
-96	CALIBRATION CURRENT OFFSET ERROR
-98	CALIBRATION VOLTAGE OFFSET ERROR
-99	CALIBRATION ERROR
-100	COMMAND ERROR
-108	PARAMETER NOT ALLOWED (TOO MANY PARAMETERS)
-109	MISSING PARAMETER (TOO FEW PARAMETER)
-121	INVALID CHARACTER IN NUMBER
-124	TOO MANY DIGITS (GREATER THEN 255 CHARACTERS)
-200	EXECUTION ERROR (GENERIC)
-222	DATA OUT OF RANGE
-240	HARDWARE ERROR
-310	SYSTEM ERROR
-313	CALIBRATION MEMORY LOST
-330	SELF-TEST FAILED
-350	TOO MANY ERRORS