INSTRUCTION MANUAL

Power Supply for Resistance Heater Evaporation **PSE-150C** SEREM

Please read this manual thoroughly to ensure safe and effective operation of this equipment.

Keep this manual in a safe place.

Please note that due to performance upgrade, the equipment described in this manual is subject to changes in dimensions and specifications without prior notice.

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Items marked [] are related to safety.

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To Safely Use This Equipment

Thank you for purchasing our product. This pump is designed exclusively for vacuum evacuation, and it may malfunction or cause accidents if operated inappropriately. Please read the manual thoroughly, and pay specific attention to inspection, maintenance and safety guidelines. Read and fully understand the description of this manual to prevent serious accidents from occurring. The copyright of this user's manual and safety guides are reserved by Technical Division of Ulvac Kiko.

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Read this section before using the PSE-150C. Follow the instructions below to safely use the device and prevent personal injuries from occurring. Please comply with them all the time.

The symbols below have the following meaning

\triangle	Danger	Incorrect handling of the equipment is very likely to result in death or serious injury to the operator.
\triangle	Warning	Incorrect handling of the equipment may result in death or serious injury to the operator.
$\boxed{\bigwedge}$	Caution	Incorrect handling of the equipment may result in light or medium injuries to the operator or damage to the equipment.

	This indicates action or practice that should be made.
	Always make connection with the earth.
\bigcirc	This indicates the action or practice that should be prohibited.
	Do not disassemble.
	Do not touch.

	F	Power Supply
	0	Primary Power Supply capacity Prepare the single-phase power supply exceeding 200V 7.5A.
	Capacity check	k In case the power capacity is not adequate, a circuit breaker may trip by over current during operation.
	0	Prepare islanding power for Primary Power Supply, and do not connect other equipment to the Power Supply.
	Islanding operati	ion In case the circuit breaker capacity is not adequate, the circuit breaker may trip by over current during operation.
		Connect D type ground.
Δ		Ground wire is green cable.
	Ground wire	In case the ground wire connection is not adequate,
Warning	connection	there is a risk of electric shock when failure or short circuit occurred.
		Avoid use of extension cable unless it is absolutely required. In case of using it out of necessity, observe the following caution.
	Ų	Use cables for 200V larger than 2.0 sq mm (close to AWG 14).
	Cable capacity check	In case cable is small, it has a risk of causing overheat, ignition or fire.
	\bigcirc	Never place any substance on the primary cable. It has a risk of electrical shock or fire.
	Prohibition	
	A	When the primary cable is inserted in wall sockets, do not touch terminals.
	Caution	It has a risk of electrical shock.

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	Prohibition	This Power Supply is not allowed to use in inflammable ambient since it is not designed for explosion-proof construction.	
		It has a risk of fire or burn due to an ignition explosion.	
Marning	Prohibition	Power Supply Cooling Fan is rotating during operation. Never place any substance inclined to be entangled near by.	
		It has a risk of being rolled up.	
		Power Supply Cooling Fan is rotating during operation. Do not touch it by hand directly.	
	Contact prohibited	It has a risk of getting hurt.	
\mathbf{N}		Power Supply unit generates heat during operation.	
Caution	Ventilation required	Room temperature rises.	

	Ins	stallation
 Install this Power Surthe following condition Horizontal place. On the floor havin Well-ventilated pl Where no expose Room temperature (44.6° to 86°F). Where not inflam Where not existing equipment corrors Where no electric exists. 		 Install this Power Supply in place where satisfying the following conditions. 1) Horizontal place. 2) On the floor having enough strength. 3) Well-ventilated place. 4) Where no exposure to sunlight. 5) Room temperature is in range of 7°C to 30°C (44.6° to 86°F). 6) Where not inflammable. 7) Where not existing substances to effect equipment corrosion such as chemical or gas. 8) Where no electrical influence such as noise exists. It may cause operation failure or decrease of durability.
	Caution to electric	When connecting the secondary circuit c able, do not insert the primary circuit cable to the receptacle.
	shock	It has a risk of electrical shock.
	O Work by plurol	When mounting or detaching this Power Supply unit to the equipment, make a team for cooperative work.
	operators	It has a risk of hurting waist
Caution		When mounting or detaching this Power Supply unit to the equipment, make a team for cooperative work.
	Work by plural	
	operators	It has a risk of hurting waist.

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Operation		
\wedge	Prohibition	Do not operate when an evaporation source is installed in the load side. It has a risk of causing Power Supply failure.
Warning	Prohibition	Maximum output is 150A. Do not operate with a load larger than 150A. It has a risk of causing Power Supply failure.

Maintenance/Repair/Disposal

Marning	Prohibition	Do not disassemble or modify. Ulvac KIKO shall not be responsible if disassembled or modified.
	Work by plural operators	Weight of Power Supply is 40kg approx.Do not mount or detach Power Supply in unreasonable posture.It has a risk of fallen down or hurting waist.
Caution	Observance of laws	Disposal of Power Supply unit is obliged to laws. Dispose Power Supply unit according to laws appropriately. Consult factory if you have any question.

Warning label

	Warning label is stuck in the following position. 1) Upside of unit (PL008)	
Caution	Label check	Consult factory if labels became hard to read or about to peel off.

1 Introduction

1-1. Suitable operator

This Power Supply shall be operated by a person having experience of operating a vacuum evaporation equipment or the person who are trained based on this instruction manual.

1-2. Perusal of Instruction Manual

Peruse this Instruction Manual thoroughly before operating this Power Supply to operate correctly.

Read "Directions for safe use" clause in particular by all means.

1-3. Keeping Instruction Manual

Keep this Instruction Manual carefully. After perusal, keep Instruction Manual on hand at all times so that operators may read again anytime.

1-4. Warranty

(1) The warranty period of this Power Supply is one year after the date of shipment from factory.

(2) Any malfunctions or defects which occur under normal usage conditions during the warranty period will be repaired free of charge.

Note, the warranty stated here is an individual warranty covering the power supply. In addition, the scope of the warranty coverage concerning repairs is limited to the repair and/or replacement of parts.

Normal usage conditions refer to the following:

- a) Ambient temperature and humidity during operation: 7 30°C, below 85% RH b) Operation in accordance with the user manual
- (3) Repair fees will incur during the warranty period for the following cases:
 - a) Malfunctions due to a natural disaster or fire.
 - b) Malfunctions caused by special atmospheric conditions, such as salt damage, inflammable gas, corrosive gas, radiation or pollution.
 - c) Malfunctions caused by usage conditions that differ from those stated in the user manual (performance specifications, maintenance and inspection, etc.).
 - d) Malfunctions caused by modifications or repairs carried out by a party other than the manufacturer, or by a service company not approved by the manufacturer.
 - e) Malfunctions caused by noise (electric disturbance).
 - f) Malfunctions that occur when not using a rated power supply.
 - g)Malfunctions that occur, when the power supply is damaged as a result of being dropped or falling, etc.
 - h) Malfunctions which are determined by the manufacturer's technical personnel to be caused by conditions that do not comply with the usage conditions for this vacuum pump.
 - i) Malfunctions due to the replacement of consumables.
- (4) Disclaimer
 - a) We shall not be liable for any malfunctions of our products caused by the customer, regardless if the malfunction does not fall within the warranty period, nor shall we be liable for any loss of opportunity for the customer's clients or for

compensation for any damages to other products, labor costs, production loss, transportation expenses and other related work.

b) We shall not be liable for any claims and patent infringements, including secondary damages, filed a claim by a third party against the customer.

1-5. Observance of laws

Disposal process of Power Supply unit is obliged to laws. Dispose Power Supply unit according to laws appropriately. Consult factory if you have any question.

1-6. Safety Control in Repair

In case requesting Ulvac to repair, please advise existence of hazardous substance for safety control of repair personnel. Please attach the filled Use Situation Check Sheet to Power Supply.

In case a use situation is unclear, your request for repair may be rejected.

2 Outline of Product

2-1.Intended Use of Products and Prohibition

This Power Supply is an evaporation Power Supply for vacuum evaporation equipment by vaporizing a material by a resistance heater method in vacuum and produces films.

Please observe the following prohibited operation to use Power Supply normally.



Do not use this Power Supply for the other purpose than the vacuum evaporation.

Do not use other cable than the dedicated cable.

Do not resale/repair/modify unless Ulvac authorized.

2-2. Safety Device and Purpose/Function

ltem	Purpose	Function
Abnormality of internal wiring circuit and function parts	Protection of Power Supply unit	Turn the power off with Power Switch type Circuit Protector. Protection of internal wiring short circuit and wiring burnout when function parts abnormal. Replacement of Power Supply unit.
SCR Over load SCR failure	Protection of Power Supply unit	Over load protection equipment operates (Overload warning). Gate blocking method: Rated current 130% (Main body alarm flashing: Output OFF) After solving cause, reset with Power Switch.
DC Power Supply failure	Protection of operation circuit	Fast response fuse for operation circuit protection blowout (output OFF) and DC Power Supply in the main body failure is considered. Replacement of Power Supply unit.
Open circuit of the evaporation source	Protection of Power Supply unit	Protector operates and stop output after 3 seconds in case no load such as evaporation source open circuit SCR output voltage is larger than10% and zero current) Voltage indication field hb Current indication field After solving cause, reset with Reset Key.
Prohibition	Never operate afte	er invalidating the above safety device.

V.02 2014.09

2-3. Product specifications

Input	AC 200V Single-phase 1.5kVA (50/60Hz)		
	Allowable voltage fluctuation range: ±10%		
Output	Max.150A		
Control method	Thyristor AC phase control method		
Control signal	External automatic control input DC0-10V/0-100% setting		
	Reception impedance 1MΩ		
Output control	Constant power operation/constant current operation/constant		
	voltage operation (Setting when shipped out: constant current)		
Output control	Load output switchover 3 positions max. * Optional		
	Output range switchover 1V/10V * Optional		
Rating	30 minutes		
Dimensions	W 480mm x D 360mm x H 149mm (W 19" x D 14" x H 6")		
	((Excluding projected portion and accessories)		
Weight	40 kg approx.		
Painted color	JIS S-5-462 baking (Munsell 5GY8/0.5)		

2-4. Single equipment specifications

Equipment name	Model/Specifications	Quantity
1) Power Switch	 200V single-phase 10A 	1 set
2) Power controller	• S-1039-030	1 set
3) Substrate	• ND-00282-1-01/02	1 set
4) Transformer (50VA)	• 180-200v/200V • 20V	1 set
5) Transformer (1.5kVA)	180-200V /10V x 2 circuits · V x 2 circuits	1 set
6) Output cable	• 38 sq mm x 2M (AWG 1 x 6.5') Terminal size: φ8/φ12	2 pcs.
7) Input cable	• 2.0 sq mm x 2M (AWG 14 x 6.5') Terminal size: φ5	1 set
8) Instruction Manual	General paper	1 сору

* According to the optional setting, the above composition may be changed.

2-5. Functional Description

2-5-1 Front Key Operation



Panel Layout Drawing

No.	ltem	Equipment name	Function
1	MAIN	Main Power Supply operation switch (Circuit protector)	Power Switch of this equipment
2	POWER ON * Note 1	Operation switch	For main switch turn ON and turn OFF: Switches operation or state of stop When lamp lighting: ON, When lamp lights out: OFF
3	CONTROL AUTO * Note 1	Operation switch * Note 2	Automatic power control signal operation: When AUTO, controlled by input signal of the external of DC 0 to 10V. When MANU, set output with Δ , ∇ switch. When lamp lighting: AUTO. When lamp lights out: MANU
4	Δ UP	Operation switch	"Rise" command for adjustment. For output adjustment in MANU. For parameter setting change.
5	▼ DOWN	Operation switch	"Down" command for adjustment (- ditto -)
6	RESET	Operation switch	For alarm reset * Shifts to operation mode setting when this switch is hold down. (Invalid when POWER ON)
Ī	MONITOR VOLT	Indicator	Output voltage indicator * Indicates adjustment value when MANU and output adjusting. Indicates when constant power operation (1) and constant voltage operation (3). Indicates "" when constant current operation (2). * Indicates the set value when parameter ENTER mode.
8	MONITOR CURRENT	Indicator	Output current indicator * Indicates adjustment value when MANU and output adjusting. Indicates when constant current operation (2). Indicates "" when constant power operation (1), constant voltage operation (3).
9	SELECT	Operation switch * Note 2	For load output switchover (load 1,2,3) * Operation is allowed when POWER OFF only

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No.	ltem	Equipment name	Function
	HIGH/LOW	Operation switch * Note 2	For output voltage range switchover (HIGH: 10V, LOW: 1V) When lamp lighting: HIGH, When lamp lights out: LOW * Operation is allowed when POWER OFF only
10	REMOTE CONTROL	Connector for remote control boxes	Connect a wireless remote controller box for external operation

* **Note 1** Malfunction prevention process is equipped for each push button. Please note that function does not operate unless button is pushed longer than 0.1 second.

* Note 2 Operation is limited for models that are not equipped optional setting function. (Please refer 2-4 operation mode setting in 2 Operation Procedure and 2-6 DIP Switch Setting for details.)

2-6. Dimensions





2-7. Electric Circuit Diagram



3 Unpacking/Installation

3-1. General Precaution

Check	4)	Install adjacent to evaporation equipment.
		installation work.
	3)	Secure space longer than 1m (3') to equipment circumference safety of
	2)	Confirm whether predetermined accessories are included.
	1)	Confirm whether delivery matched to the product required.

3-2. Style of Packing of Delivery

Power Supply Main Body packed in a cardboard box (with cables) shall be delivered. Power Supply may be built-in the evaporation equipment, according to the specifications of the equipment.

3-3. Installation Place

Warning	D Environmental check	 Install this Power Supply in place where satisfying the following conditions. 1) Horizontal place. 2) On the floor having enough strength. 3) Well-ventilated place. 4) Where no exposure to sunlight. 5) Room temperature is in range of 7°C to 30°C (44.6°to 86°F). 6) Where not inflammable. 7) Where not existing substances to effect equipment corrosion such as chemical or gas. 8) Where no electrical influence such as noise exists. It may cause operation failure or decrease of durability.
Check	Secure at lease maintenance spa	0.3m (1') apart from the wall surface after installation for safe ice.

3-4. Power Supply

		Primary Power Supply capacity
		Prepare the single-phase power supply exceeding
		200V 7.5A.
Warning	Сараситу спеск	In case the power capacity is not adequate, a circuit
		breaker may trip by overcurrent during operation.
Primary cable spec	cifications	
Single-phase 200V	cable, 2m (6.6')	long, with $\Psi 5$ solderless terminal at tip.
		Prepare islanding power for Primary Power Supply,
		and do not connect other equipment to the Power
		Supply.
	Islanding	In case the circuit breaker capacity is not adequate,
	operation	the circuit breaker may trip by overcurrent during
		operation.
		Connect D type ground.
		Ground wire is green cable.
	J	
	Ground wire	In case the ground wire connection is not adequate,
	connection	there is a risk of electric shock when failure or short
		circuit occurred.
		Avoid use of extension cable unless it is absolutely
		required. In case of using it out of necessity, observe
		the following caution.
Warning		Use cables for 200V larger than 2.0 sg mm (close to
	Cable capacity	AWG 14).
	check	,
		In case cable is small, it has a risk of causing
		overheat, ignition or fire.
		Never place any substance on the primary cable.
		It has a risk of electrical shock or fire
	Prohibition	
		When the primary cable is inserted in wall sockets,
		do not touch terminals.
	//\	
		It has a risk of electrical shock.
	(califion to	

3-5. Required Tool List

Tool name	Usage
Phillips-head screwdriver	Connection of the primary Power Supply cable
Torque wrench/socket (13 opposite side)	Evaporation Power Supply cable connection

3-6. Connection



No.	Item	Connection
1	Power Supply	Connect Power Supply between TB1 terminal R-S. (Terminal screw: M4, Clamping torque: 1.7N· m).
2	Ground	Connect the ground cable to E. (Terminal screw: M4, Clamping torque: 1.7N· m).
3	Interface	Connect to SYSTEMI/F connector.
4	Load	TB2 terminal POSITION Connect load No. 1: across C to 1 No. 1: across C to 2 No. 1: across C to 3 (Terminal screw: M8, Clamping torque: 12.0 N· m).
5	External control (instrument) input	Connect thyristor control signal wire (DC10 to 10V) across TB3 connector +/
6	Fuse (F1, F2)	Operation circuit protection fuse 3A

SYSTEM I/F connector

Pin No.	Contents
	Do not connect wiring.
1 N/C	(Although inside the Equipment Power Supply DC24V is
	output, do not use it for external).
2 ←→COM	Input and output signal common (N24)
3 → Signal output	POWER ON (MC) When ON Tr level L Close operation
$4 \rightarrow$ Signal output	OVERLOAD (ALARM) When AL Tr level H Open

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Pin No.	Contents
	operation
	POSITION NO.1 When ON Tr level L Close
$5 \rightarrow \text{Signal output}$	operation
	POSITION NO.2 When ON Tr level L Close
$\delta \rightarrow \text{Signal output}$	operation *
7 -> Signal output	POSITION NO.3 When ON Tr level L Close
$7 \rightarrow \text{Signal output}$	operation *
8 \rightarrow Signal output	POSITION LOW When ON Tr level L Close operation
	POSITION HIGH When ON Tr level L Close operation
$9 \rightarrow \text{Signal output}$	*
10~13 N/C	Do not connect wiring.
14 ← Signal output	INTER LOCK Level input, Interlock signal
15 ← Signal output	REM POWER ON/OFF Level input, Power ON
16 ← Signal output	POSITION SELECT Level input, Position switchover
17~25 N/C	Do not connect wiring.

* Operation may be limited according to optional setting.

4 Driving Operation

4-1. Contents of Danger in Operation and Safety Measures

	\bigcirc	Do not operate when an evaporation source is installed in the load side.
	Prohibition	It has a risk of causing Power Supply failure.
Warning	Prohibition	Maximum output is 150A. Do not operate with a load larger than 150A. It has a risk of causing Power Supply failure.

4-2. Operation Procedure

4-2-1 Preparation

- 1) All switches of the operation panel OFF
- 2) Connect output cable to Power Supply (output terminal) / evaporation equipment (electrode stick).

Mount the electrode cover again after connecting cable to the evaporation equipment (an electrode stick) side.

- 3) Connect input cable to Power Supply (input terminal).
- 4) Connect I/F connector to Power Supply (interface terminal).
- 5) User side Input connection.
- 6) Preparation of the membrane production operation of the evaporation equipment. (See Evaporation Equipment Instruction Manual)
- * Preparations of above 1) to 4) are unnecessary in case Power Supply is built-in evaporation equipment.

4-2-2 Basic Operation

1)	MAIN	ON		
2)	SELECT	ON (in case of switchover type, select the conducting electrode)		
3)	HIGH/LOW	Selection (in case of switchover type, select the output range)		
	HIGH (lamp lighting):	operate with 10V		
	LOW (lamp lights out): operate with 1V		
4)	AUTO/MANUAL sele	ction		
	MANUAL (lamp lights	out): Operate by front key UP / DOWN		
	AUTO (lamp lighting): Operate by external input signal (0 to 10V)			
5)	POWER	ON *		
6)	MANU: Operate at ar	bitrary output by watching the state of the evaporation source.		
	AUTO: Operate by the	external interface.		
*	During a soft start (us	ing soft start), works according to the soft start parameter.		
	Operation after the so	oft start is finished shall be the above operation.		
	Refer to 2-4 Operatio	n Mode Setting in detail.		

4-2-3 Remote Control Box (optional)

- 1) Connect to the connector for remote control.
- 2) It is possible to operate same as main body panel function.
 - * Panel operation is allowed when connected to the remote control.



4-2-4 Operation Mode Setting

- 1) Push and hold down [RESET] switch and shift to "Parameter input mode".
- Set contents referring Parameter Setting Table.
 * Setting is not allowed in POWERON mode.

Parameter Setting Table (See 4-2-7 Parameter setting operation)

No.	Item		Setting Contents	Factory default
01	SOFT START TIME (T1)	Soft start time (T1)	Soft start time (the first step) Sets the starting time of the first step of the soft start. (when soft start is not using, set to 0) Setting range: 0 to 60 SEC	0 (second)
02	SOFT START TIME (T2)	Soft start time (T2)	start time Soft start time (duration) Sets duration of output after T1. Setting range: 0 to 60 SEC	
03	SOFT START TIME (T3)	Soft start time (T3)	Soft start time (final step) Sets the starting time of the final step of the soft start. Setting range: 0 to 60 SEC	0 (second)
04	SOFT START POWER (P1)	Soft start output (P1)	Soft start power (output of the first grade and duration) Sets the output when the first step starting and duration. (When 0, soft start operation shall not be conducted.) Setting range: 0 to 100%	0(%)
05	SOFT START POWER (P3)	Soft start output (P3)	Soft start power (output of final step) Sets the output of the final step of the soft start. (Set the value more than P1) Setting range: 0 to 100%	0(%)

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No.	Item		Setting Contents	Factory default
06	RESPONSE- TIME	Control response speed	Sets time from command to when the adjustment operation (response) is finished. Setting range: 0 to 10 SEC The shorten this time shall make the control response speed faster. (Example) Adjust after checking hunting, etc.	10 (seconds)
07	SAMPLING-TI ME	Control adjustment cycle	Cycle of automatic adjustment process Setting range:1 to 10 cycles/SEC The smaller number of this cycle reduces control cycles and response speed becomes slower. (Example) Adjust after checking hunting, etc.	4 (cycles/ seconds)
08	CNTRL MODE	Automatic control mode selection	 Sets output adjustment method. 1 : Constant power control: Adjusts automatically to become setting power. 2 : Constant current control: Adjusts automatically to become setting current. 3 : Constant voltage control: Adjusts automatically to become setting voltage. * Input DC0-10V = Thyristor control (4 to 20mA) 0 to 100% Setting for either MANU/AUTO is allowed. 	2
09	AUTO POWER GAIN (Effective in AUTO operation only)	Taper adjustment (For output power adjustment)	By conducting ratio process of the taper (B(%)) to output during operation (after soft start is finished) control input (A(%), output it as adjustment command (C(%)). output it. Setting range: 0 to 100% (Example) External input 50%(A)5V x Automatic power gain (B)50% = (C)25% output External input 100%(A)10V x Automatic power gain (B)50% = (C)50% output	100(%)
10	POSITION SELECT	Load output number	Sets output switching number selected by POSITION SELECT. Setting range: 1 to 3 (Example) Because of 3 output switching "3"	3 * Note 1
11	W-LIMIT (HIGH)	Power limit value (When output range HIGH)	Inputs using maximum power value. * Effective when constant power control Setting range: 0 to 1.5KVA * When the power value exceeded the value set by this function, adjust output automatically and controls the output within the set value.	1.5 (KVA)
12	I-LIMIT (HIGH)	Current limit value (When output range HIGH)	Inputs using maximum current value. * Effective when constant power/constant current/constant voltage control. Setting range: 0 to 150A * When the current value exceeded the value set by this function, adjust output automatically and controls the output within the set value.	150(A)
13	W-SCALE (HIGH)	Setting power span (When output range HIGH)	Inputs power conversion value when output is 100%. Setting range: 0 to 1.5KVA (Example) Because Power Supply maximum power is 1500VA "1.5" KVA	1.5 (KVA)

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No.	Item		Setting Contents	Factory default
14	I-SCALE (HIGH)	Setting current span (When output range HIGH)	Inputs current conversion value when output is 100%. Setting range: 0 to 150A (Example) Because Power Supply maximum current is 150A, "150" A.	150(A)
15	W-LIMIT (LOW) * Note 2	Power limit value (When output range LOW)	Power limit value (When output range LOW) Inputs using maximum power value. * Effective when constant power control Setting range: 0 to 50VA * When the power value exceeded the value set by this function, adjust output automatically and controls the output within the set value.	
16	I-LIMIT (LOW) * Note 2	Current limit value (When output range LOW)	Current limit value (When output range LOW) Inputs using maximum current value. * Effective when constant power/constant curren / constant voltage control. * When the current value exceeded the value se by this function, adjust output automatically and controls the output within the set value	
17	W-SCALE (LOW) * Note 2	Setting power span (When output range LOW)	Inputs power conversion value when output is 100%. Setting range: 0 to 50VA (Example) Because Power Supply maximum power is 50VA "50" VA	50(VA)
18	I-SCALE (LOW) * Note 2	Setting current span (When output range LOW)	Inputs current conversion value when output is 100%. Setting range: 0 to 50A (Example) Because Power Supply maximum current is 50A "50" A.	50(A)

* Note 1: In case output position switchover function is not equipped (1 point), initial value is "1".
 In case output position switchover function is 2 points switching, initial value is "2".
 (In case the output position is as mentioned above, do not set larger value than initial value.)
 When power is turn ON, all POSITION LED shall not turn on.

Operate POWER ON after pushing THE POSITION SELECT SWITCH.

* Note 2: This shall not be allowed to set for models not having small power tap switching function. Models not having small power tap switching function shall not be changed when HIGH / LOW switches are pushed.

This can be changed by setting of DIP switch.

(See (2) DIP Switch Setting for detail.)

4-2-5 Soft Start Operation



4-2-6 DIP Switch setting



4-2-7 Parameter setting operation



4-3. Countermeasure of abnormal circumstances

4-3-1 Instantaneous power failure

All equipment returns to the state before power failure automatically.

4-3-2 Long time power failure

1) MAIN switch OFF

4-3-3 Operation when power failure returns

Please execute it from basic operation (4-2-2) again.

5 Maintenance and Repair

5-1. Danger and Safety Measure in Maintenance and Repair





Do not disassemble or modify.

Ulvac KIKO shall not be responsible if disassembled or modified.

5-2. Maintenance and Check Point

Check Point (Equipment name)	Maintenance and Check Particulars	Maintenance and Check Cycle
Main body	Cooling fan shall rotate.	As required Any time
Wiring cable	Terminals for wiring and screws are not loosen.	Before operation

5-3. Measures in trouble

Trouble	Conceivable Cause	Measures	
SCR overload signal Alarm flashing	SCR over load and SCR failure.	Eliminate the cause of overcurrent, press RESET key to reset alarm, and turn power ON.	
Signal alarm for exceeding the upper limit lights.	Parameter items (No. 11, 12, 15, 16) exceeded the upper limit for longer than 3 seconds.	Eliminate the cause of failure, press RESET key to reset alarm, and turn power ON.	
HB heater open circuit warning Alarm lights. Voltage indication field: hb Indication	When a heater line open circuit output is no load (SCR output voltage is larger than 10% and zero current), it occurred 3 seconds later and output stopped. Voltage indication field hb Current indication field	Press RESET key to reset alarm, eliminate the cause of failure, and turn power ON.	
SCR not output.	Load is not connected.	Check load.	
	Setting of parameter is not correct.	Input correct setting.	
	External input control signal (DC 0 to 10V) is not correct.	Input DC 0 to 10V.	
Control becomes unstable	Setting of parameter is not correct.	Input adequate setting.	
Burnout of protection fuses	Failure of internal DC Power Supply.	Replace Power Supply main body.	
POWER not turn ON (not lights)	SYSTEM I/F connector is not connected.	Connect I/F connector.	

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Trouble	Conceivable Cause	Measures
Value is displayed when POWER turned ON whereas "0" setting	Due to characteristic of thyristors, there is a leak current. Even output is set to "0", outputs several mA.	Not abnormal.

* Since this Power Supply conducts automatic control between parameter set value by detecting the load output in real time, normal operation cannot be performed if various setting data are incorrect.

5-4. Storage of Equipment

lf a into	If a Power Supply is to be out of service or stored for a long time, take the followings into consideration.				
1)	Storage place				
	 On the floor having enough strength. 	•	Well-ventilated place.		
	 Where no exposure to sunlight. 	•	Where not existing substances to effect equipment corrosion such as chemical or gas.		
2)	Arrangement before and during storage				
	 Detach input and output cables. 				

5-5. Consumption Parts List

Where Parts Used	Parts Name	Specifications	Material	Quantity	User Replacement
Power Supply	Fuse	3A		2	0
main body	Warning label	PL008		1	0

6 Disposal

6-1. Caution for Disposal

	0	Disposal of Power Supply unit is obliged to laws.				
Caution	Observance of laws	Dispose Power Supply unit according to laws appropriately. Consult factory if you have any question.				
Relevant regulation: Laws about processing of a waste and cleaning.						
 Process method: 1)Transportation: An industrial waste collection transportation supplier. 2) Process: Entrust to industrial waste disposal contractors. 						