

INSTRUCTION MANUAL

Power Supply for Resistance Heater Evaporation

PSE-150C (100V,80A)

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.

Contents

Items marked [] are related to safety.

1 Introduction	1
1-1. Suitable operator	1
1-2. Perusal of Instruction Manual	1
1-3. Keeping Instruction Manual	1
1-4. Warranty	1
1-5. Observance of laws	2
1-6. Safety Control in Repair	2
2 Outline of Product	3
2-1. Intended Use of Products and Prohibition	3
2-2. Safety Device and Purpose/Function	3
2-3. Product specifications	4
2-4. Single equipment specifications	4
2-5. Functional Description	5
2-5-1 Front Key Operation	5
2-6. Dimensions	7
2-7. Electric Circuit Diagram	8
3 Unpacking/Installation	9
3-1. General Precaution	9
3-2. Style of Packing of Delivery	9
3-3. Installation Place	9
3-4. Power Supply	10
3-5. Required Tool List	11
3-6. Connection	11
4 Driving Operation	13
4-1. Contents of Danger in Operation and Safety Measures	13
4-2. Operation Procedure	13
4-2-1 Preparation	13
4-2-2 Basic Operation	13
4-2-3 Remote Control Box (optional)	14
4-2-4 Operation Mode Setting	14
4-2-5 Soft Start Operation	16
4-2-6 DIP Switch setting	17
4-2-7 Parameter setting operation	18
4-3. Countermeasure of abnormal circumstances	18

4-3-1 Instantaneous power failure	1 8
4-3-2 Long time power failure	1 8
4-3-3 Operation when power failure returns.....	1 8
5 Maintenance and Repair.....	1 9
5-1. Danger and Safety Measure in Maintenance and Repair	1 9
5-2. Maintenance and Check Point.....	1 9
5-3. Measures in trouble	1 9
5-4. Storage of Equipment.....	2 0
5-5. Consumption Parts List.....	2 0
6 Disposal.....	2 1
6-1. Caution for Disposal	2 1
7. Ulvac KIKO Address List.....	2 2




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.

No part of this document, in whole or part may be reproduced without permission of Ulvac Kiko Inc.








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







	Danger	Incorrect handling of the equipment is very likely to result in death or serious injury to the operator.
	Warning	Incorrect handling of the equipment may result in death or serious injury to the operator.
	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.
	This indicates the action or practice that should be prohibited.
	Do not disassemble.
	Do not touch.







Power Supply

 Warning	 Capacity check	<p>Primary Power Supply capacity Prepare the single-phase power supply exceeding 100V 8.0A.</p> <p>In case the power capacity is not adequate, a circuit breaker may trip by over current during operation.</p>
	 Islanding operation	<p>Prepare islanding power for Primary Power Supply, and do not connect other equipment to the Power Supply.</p> <p>In case the circuit breaker capacity is not adequate, the circuit breaker may trip by over current during operation.</p>
	 Ground wire connection	<p>Connect D type ground.</p> <p>Ground wire is green cable.</p> <p>In case the ground wire connection is not adequate, there is a risk of electric shock when failure or short circuit occurred.</p>
	 Cable capacity check	<p>Avoid use of extension cable unless it is absolutely required. In case of using it out of necessity, observe the following caution.</p> <p>Use cables for 100V larger than 2.0 sq mm (close to AWG 14).</p> <p>In case cable is small, it has a risk of causing overheat, ignition or fire.</p>
	 Prohibition	<p>Never place any substance on the primary cable.</p> <p>It has a risk of electrical shock or fire.</p>
	 Caution	<p>When the primary cable is inserted in wall sockets, do not touch terminals.</p> <p>It has a risk of electrical shock.</p>




Environment

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






Installation

 Warning	 Environmental check	<p>Install this Power Supply in place where satisfying the following conditions.</p> <ol style="list-style-type: none"> 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. <p>It may cause operation failure or decrease of durability.</p>
	 Caution to electric shock	<p>When connecting the secondary circuit cable, do not insert the primary circuit cable to the receptacle.</p> <p>It has a risk of electrical shock.</p>
 Caution	 Work by plural operators	<p>When mounting or detaching this Power Supply unit to the equipment, make a team for cooperative work.</p> <p>It has a risk of hurting waist.</p>
	 Work by plural operators	<p>When mounting or detaching this Power Supply unit to the equipment, make a team for cooperative work.</p> <p>It has a risk of hurting waist.</p>



Operation

 Warning	 Prohibition	<p>Do not operate when an evaporation source is installed in the load side.</p> <p>It has a risk of causing Power Supply failure.</p>
	 Prohibition	<p>Maximum output is 80A.</p> <p>Do not operate with a load larger than 80A.</p> <p>It has a risk of causing Power Supply failure.</p>

Maintenance/Repair/Disposal

 Warning	 Prohibition	<p>Do not disassemble or modify.</p> <p>Ulvac KIKO shall not be responsible if disassembled or modified.</p>
	 Work by plural operators	<p>Weight of Power Supply is 24kg approx.</p> <p>Do not mount or detach Power Supply in unreasonable posture.</p> <p>It has a risk of fallen down or hurting waist.</p>
 Caution	 Observance of laws	<p>Disposal of Power Supply unit is obliged to laws.</p> <p>Dispose Power Supply unit according to laws appropriately.</p> <p>Consult factory if you have any question.</p>

Warning label

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

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.




Prohibition

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

Item	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 than 10% and zero current) Voltage indication field __ hb Current indication field ____ After solving cause, reset with Reset Key.
 Prohibition		
Never operate after invalidating the above safety device.		

2-3. Product specifications

Input	AC 100V Single-phase 0.8kVA (50/60Hz) Allowable voltage fluctuation range: $\pm 10\%$
Output	Max.80A
Control method	Thyristor AC phase control method
Control signal	External automatic control input DC0-10V/0-100% setting Reception impedance 1M Ω
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
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	24 kg approx.
Painted color	JIS S-5-462 baking (Munsell 5GY8/0.5)

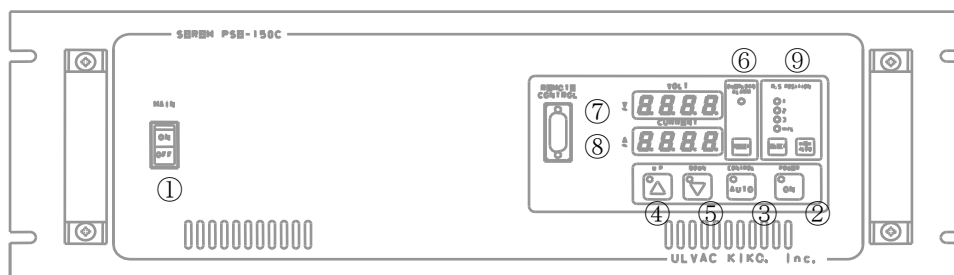
2-4. Single equipment specifications

Equipment name	Model/Specifications	Quantity
1) Power Switch	▪ 100V single-phase 10A	1 set
2) Power controller	▪ S-1039-030	1 set
3) Substrate	▪ ND-00282-1-01/02	1 set
4) Transformer (1.5kVA)	▪ 90-100V /10V	1 set
5) Output cable	▪ 38 sq mm x 2M (AWG 1 x 6.5') Terminal size: $\phi 8/\phi 8$	2 pcs.
6) Input cable	▪ 2.0 sq mm x 4M (AWG 14 x 6.5') 3P plug with ground	1 set
7) Instruction Manual	▪ General paper	1 copy

* 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.	Item	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)
⑦	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

No.	Item	Equipment name	Function
	HIGH/LOW	Operation switch	Do not work (HIGH: fixed) [H/L] LED is always lit.
⑩	REMOTE CONTROL	Connector for remote control boxes	Connect a wireless remote controller box for external operation

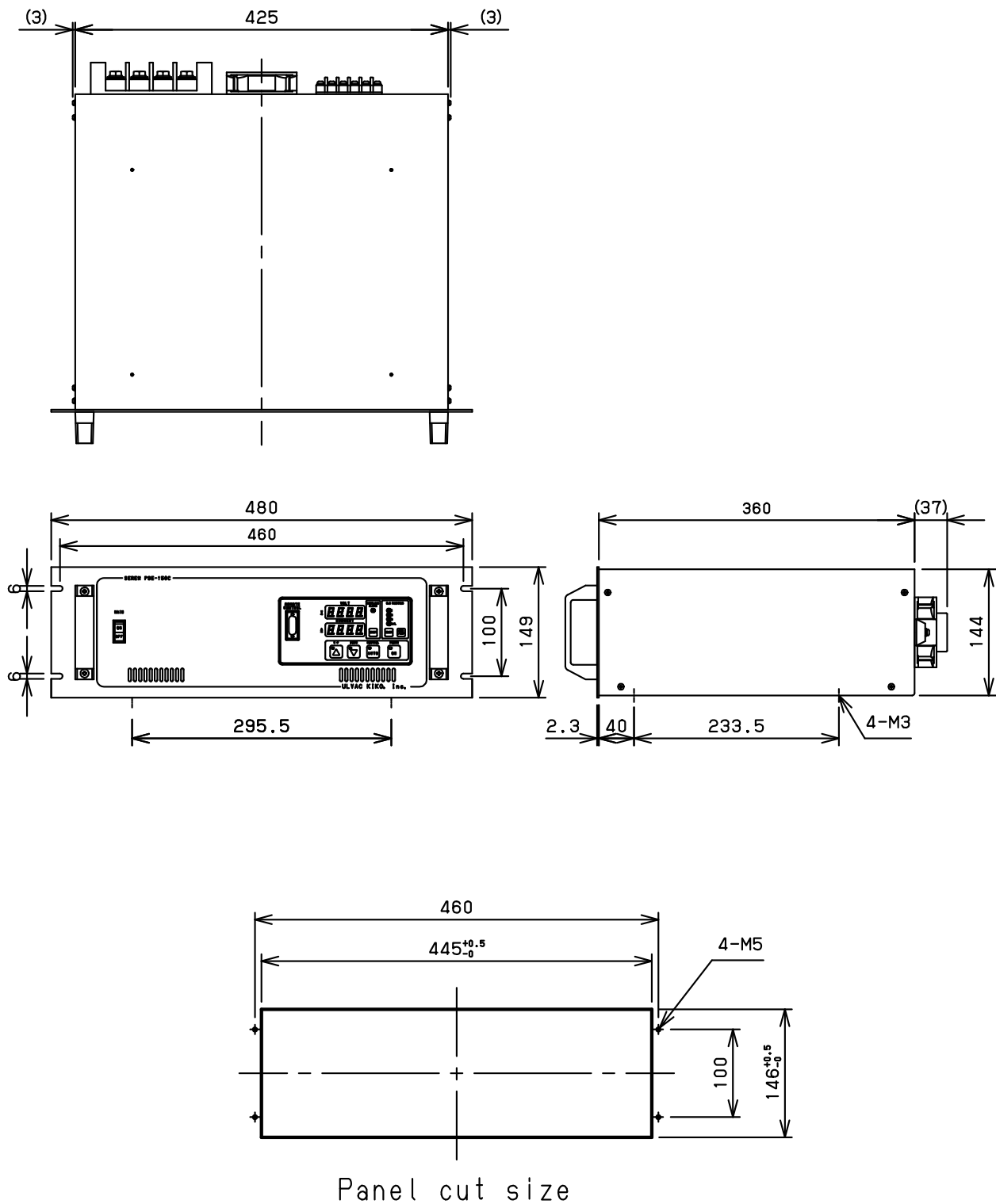
* **Note 1** Malfunction prevention process is equipped for each push button.

Please note that function does not operate unless button is pushed longer than 0.1 second.

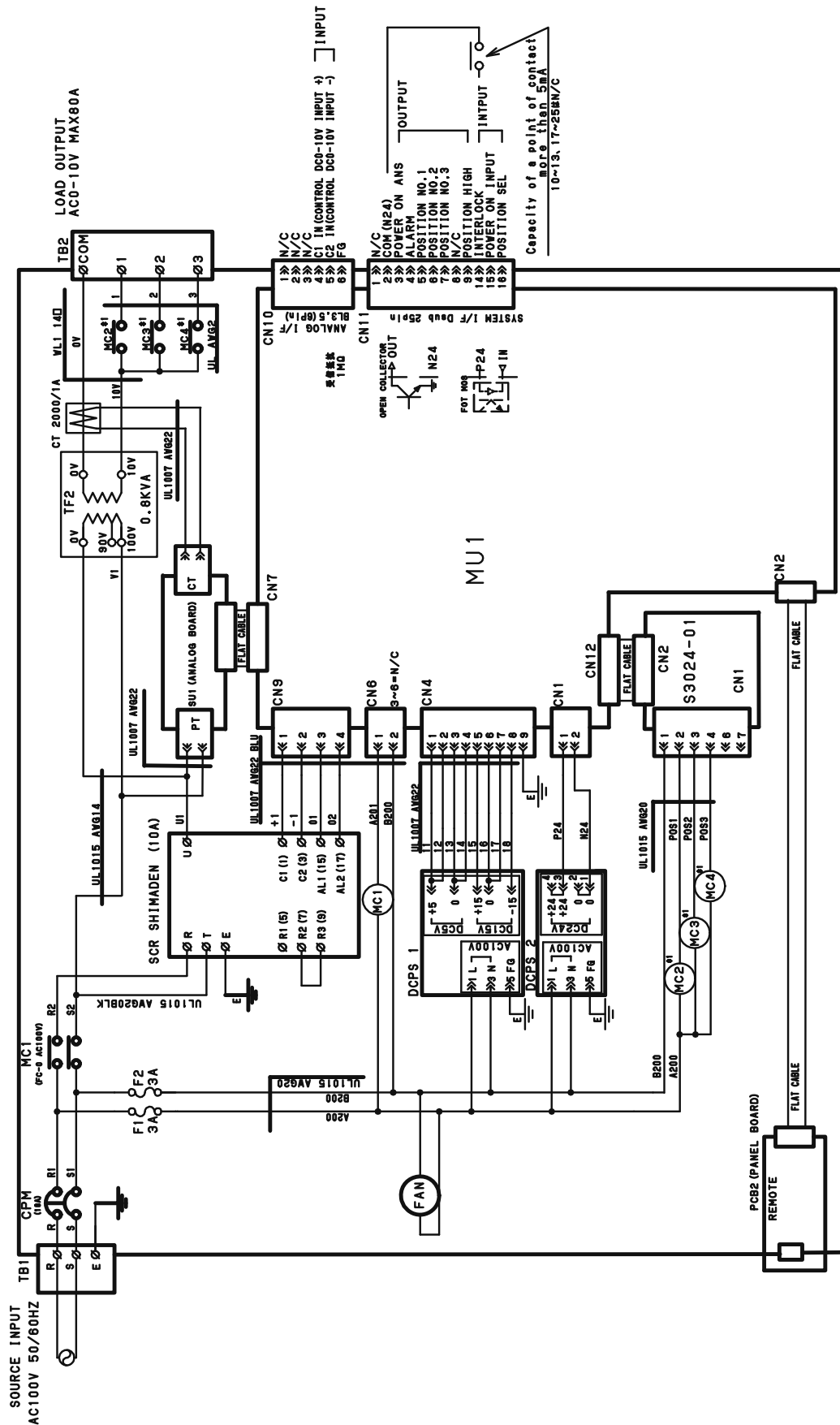
* **Note 2** Operation is limited for models that are not equipped optional setting function.

(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

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

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



**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°F 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 least 0.3m (1') apart from the wall surface after installation for safe maintenance space.

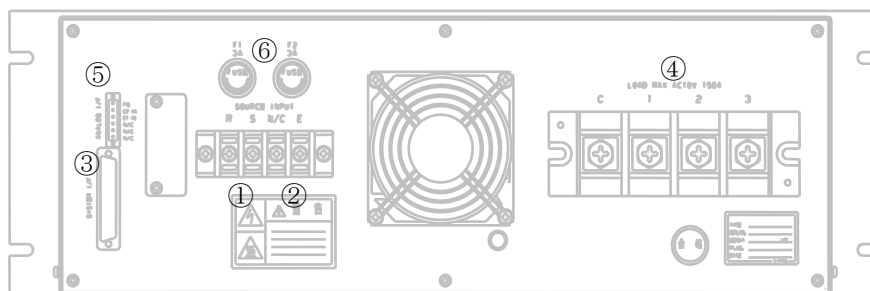
3-4. Power Supply

 Warning	 Capacity check	<p>Primary Power Supply capacity</p> <p>Prepare the single-phase power supply exceeding 100V 8.0A.</p> <p>In case the power capacity is not adequate, a circuit breaker may trip by overcurrent during operation.</p>
<p>Primary cable specifications</p> <p>Single-phase 100V cable, 4m (6.6') long, with 3P plug with ground.</p>		
 Warning	 Islanding operation	<p>Prepare islanding power for Primary Power Supply , and do not connect other equipment to the Power Supply.</p> <p>In case the circuit breaker capacity is not adequate, the circuit breaker may trip by overcurrent during operation.</p>
	 Ground wire connection	<p>Connect D type ground.</p> <p>Ground wire is green cable.</p> <p>In case the ground wire connection is not adequate, there is a risk of electric shock when failure or short circuit occurred.</p>
	 Cable capacity check	<p>Avoid use of extension cable unless it is absolutely required. In case of using it out of necessity, observe the following caution.</p> <p>Use cables for 100V larger than 2.0 sq mm (close to AWG 14).</p> <p>In case cable is small, it has a risk of causing overheat, ignition or fire.</p>
	 Prohibition	<p>Never place any substance on the primary cable.</p> <p>It has a risk of electrical shock or fire.</p>
	 Caution to electric shock	<p>When the primary cable is inserted in wall sockets, do not touch terminals.</p> <p>It has a risk of electrical shock.</p>

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 SYSTEM I/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
1 N/C	Do not connect wiring. (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 → Signal output	OVERLOAD (ALARM) When AL Tr level H Open operation

Pin No.	Contents
5 → Signal output	POSITION NO.1 When ON Tr level L Close operation
6 → Signal output	POSITION NO.2 When ON Tr level L Close operation *
7 → Signal output	POSITION NO.3 When ON Tr level L Close operation *
8 → Signal output	POSITION LOW When ON Tr level L Close operation
9 → Signal output	POSITION HIGH When ON Tr level L Close operation *
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.

* Interface connector, we have short 2-14 pin factory.

Please wire to the external control circuit as necessary.

4 Driving Operation

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

 Warning	 Prohibition	<p>Do not operate when an evaporation source is installed in the load side.</p> <p>It has a risk of causing Power Supply failure.</p>
	 Prohibition	<p>Maximum output is 80A.</p> <p>Do not operate with a load larger than 80A.</p> <p>It has a risk of causing Power Supply failure.</p>

4-2. Operation Procedure

4-2-1 Preparation

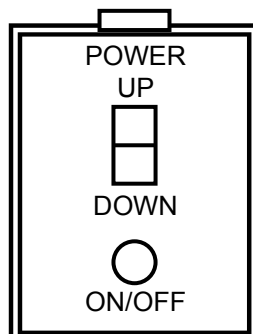
- 1) All switches of the operation panel OFF
 - 2) Connect output cable to Power Supply (output terminal) / evaporation equipment (electrode stick).
Mount the electrode cover again after connecting cable to the evaporation equipment (an electrode stick) side.
 - 3) Connect input cable to Power Supply (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 | ON(lamp lighting) |
| 4) AUTO/MANUAL selection | |
| | 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 arbitrary output by watching the state of the evaporation source. |
| AUTO: | Operate by the external interface. |
| * During a soft start (using soft start), works according to the soft start parameter.
Operation after the soft start is finished shall be the above operation.
Refer to 2-4 Operation 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".
- 2) 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)	Soft start time (duration) Sets duration of output after T1. Setting range: 0 to 60 SEC	0 (second)
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(%)
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)

No.	Item		Setting Contents	Factory default
07	SAMPLING-TIME	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	Power limit value (When output range HIGH)	Inputs using maximum power value. * Effective when constant power control Setting range: 0 to 0.8KVA * When the power value exceeded the value set by this function, adjust output automatically and controls the output within the set value.	0.8 (KVA)
12	I-LIMIT	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 80A * When the current value exceeded the value set by this function, adjust output automatically and controls the output within the set value.	80(A)
13	W-SCALE	Setting power span (When output range HIGH)	Inputs power conversion value when output is 100%. Setting range: 0 to 0.8KVA (Example) Because Power Supply maximum power is 800VA --- "0.8" KVA	0.8 (KVA)
14	I-SCALE	Setting current span (When output range HIGH)	Inputs current conversion value when output is 100%. Setting range: 0 to 80A (Example) Because Power Supply maximum current is 80A, --- "80" A.	80(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.

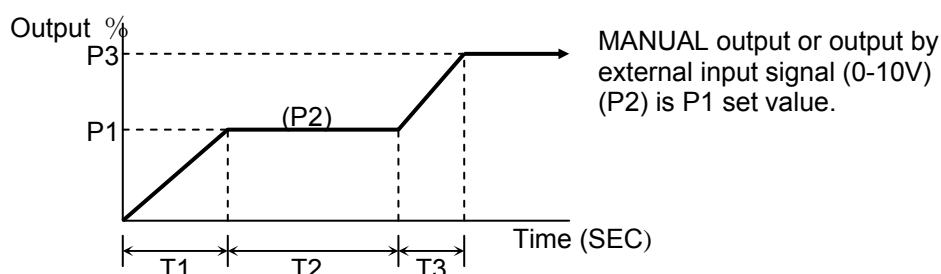
Models not having small power tap switching function shall not be changed when HIGH / LOW switches are pushed.

This can be changed by setting of DIP switch.

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

4-2-5 Soft Start Operation

1) Conduct setting of all items, i.e. T1, T2, T3, P1, P3.



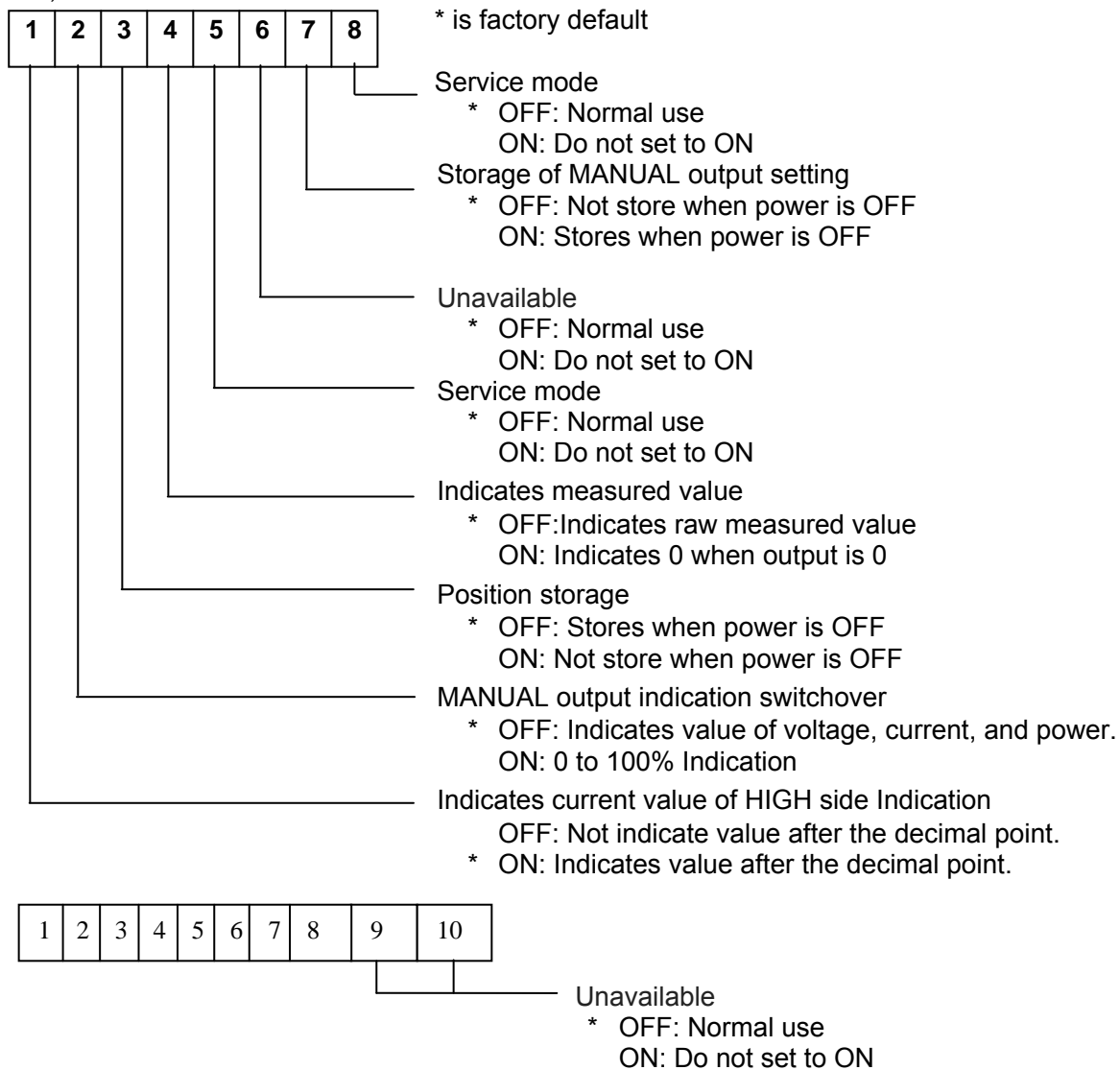
2) Precaution

- 2)-1 $P3 \geq P1$ Set in condition of (P3 output shall be larger than P1 output).
 $P3 < P1$ In case (P3 output is smaller than P1 output) condition, the soft start operation shall not be performed.
 T2, T3 is allowed to set to 0 setting (0 sec).
 (Set P3 (set value larger than P1) even when T2, T3 are set to 0)
- 2)-2 In case $T1 = 0$ or $P1 = 0$, the soft start operation shall not be performed.
 (when the soft start is not used, set either to 0)
- 2)-3 In AUTO mode after T3 is finished, controls an external input signal (0-10V).
- 2)-4 In MANUAL mode after T3 is finished, continues set value of P3 or runs by UP/DOWN operation of front key.

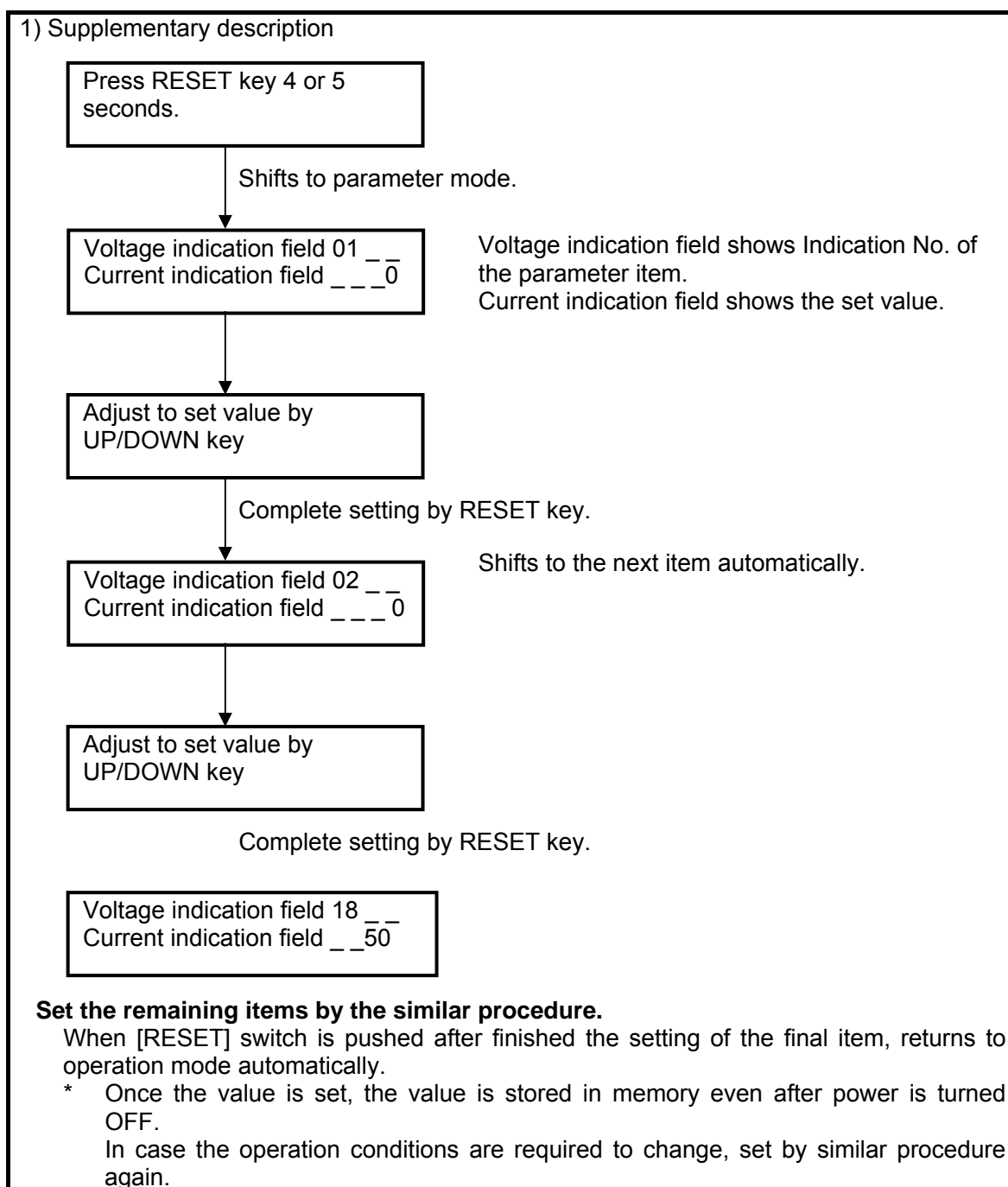
4-2-6 DIP Switch setting

1) By switchover DIP Switch on CPU substrate, display indication and operation mode can be changed.

DIP, SW



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

 Warning	 Prohibition	<p>Do not disassemble or modify.</p> <p>Ulvac KIKO shall not be responsible if disassembled or modified.</p>
---	---	--

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.

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



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 main body	Fuse	3A	---	2	○
	Warning label	PL008	---	1	○

6 Disposal

6-1. Caution for Disposal

 <p>Caution</p>	 <p>Observance of laws</p>	<p>Disposal of Power Supply unit is obliged to laws.</p> <p>Dispose Power Supply unit according to laws appropriately. Consult factory if you have any question.</p>
<p>Relevant regulation: Laws about processing of a waste and cleaning.</p>		
<p>Process method:</p> <ol style="list-style-type: none"> 1) Transportation: An industrial waste collection transportation supplier. 2) Process: Entrust to industrial waste disposal contractors. 		