SANPAW 300PW

(Model: ID-3000PW-U1E)

Operating Manual

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Please ensure the operating manual is delivered to the final operator of the welding equipment.

For safe and proper use, please read the operating manual thoroughly before using the welding equipment

Thank you for purchasing the SANPAW 300PW high-performance plasma welding power supply.

Before using the welding power supply, please read the operating manual carefully and use the welding power supply correctly. For all other components that would comprise a plasma welding system, such as the welding torch, gas pressure regulator, cooling water unit and other components, other than the welding power supply, refer to the operating manual for each component.

- For the purpose of safety, it is recommended that this welding equipment be installed, maintained, inspected, and repaired by appropriately qualified personnel or personnel who are very familiar with welding equipment.
- For the purpose of safety, it is recommended that this welding equipment be operated by personnel who has demonstrated substantial knowledge and skills to understand all safety precautions and instructions in the operating manual and who has demonstrated the ability to handle welding equipment safely.
- After reading the operating manual, please store it carefully in a location where it can be easily accessed
 and referred to by related personnel when necessary.
- Please call your local distributor, business office, or service agent if you have any questions.
- Follow all applicable laws and regulations regarding this installation and use of, for your location.

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1. SAFETY PRECAUTIONS

Please read this operating manual thoroughly before utilizing the equipment. Wherever welding equipment is used, safety is always our concern.

PROTECT yourself and others.

1.1. SAFETY REGULATIONS AND REQUIREMENTS

Throughout this manual, notes, cautions, danger, attention and warnings are used to highlight important information. These highlights are categorized as follows:

1.2. NOTES, CAUTIONS AND WARNING ANNOTATIONS



An operation, procedure, or background information which requires additional emphasis or is helpful in efficient operation of the system.

CAUTION



A procedure which, if not properly followed, may cause damage to the equipment.

WARNING



A procedure which, if not properly followed, may cause injury to the operator or others in the operation of the equipment.

DANGER



Procedures, which if not properly followed, may lead to serious injury or death.

1.3. SAFETY RECOMMENDATIONS

CAUTION



For the purpose of safety, it is recommended that this welding equipment be installed, maintained, inspected, and repaired by appropriable qualified person or persons who are well familiarized with welding equipment.

CAUTION



As for safety training, it is recommended to avail yourselves of various seminars and qualifying examinations for welding engineers and welding technicians sponsored by the American Welding Society, the headquarters or branch offices of welding societies or associations concerned.

CAUTION



For the purpose of safety, it is recommended that this welding equipment should be operated by persons who have sufficient knowledge and skill to understand all safety precautions and instructions in the Operating Manual and to be able handle the equipment safely.

CAUTION



After reading this Operating Manual, please store it carefully in a location with a guarantee that it is made accessible for all personnel associated with the equipment.

NOTE



Please call your local distributors, business offices, or service agents if you have any questions

1.4. WELDING SYMBOLS

1.4.1. SAFETY SYMBOL LEGEND

SYMBOL	SOURCE OF	HAZARD	HOW TO AVOID
	HAZARD		
	Welding Electrode	Electric Shock	Don't weld on painted parts. Remove the surface coating before you begin welding. Keep your face away from the welding plume.
7	Wiring	Electric Shock	Protect welding cables from sparks, hot metal, open flames, sharp edges, oil, and grease. Do not use cables with frayed, cracked or bare spots in the insulation. Learn all you can about safety. Your employer must provide safety training.
	Welding Arc	Arc Rays	Required protection varies with time of exposure, distance from source, and shielding used. Follow recommended procedures in AWS F2.1
JA My	Engine Fuel	Fire	Develop adequate procedures, and use proper equipment to do the job safely. When required obtain a Hot-Work Permit (See NFPA 51B). If relocation is not possible, protect combustibles with fire resistant covers
	Welding Fumes and Gases	Fumes and Gases	Keep your head out of the fumes. Do not breathe the fumes. Use enough ventilation or exhaust at the arc, or both, to keep fumes and gases from your breathing zone and general area
	Welding Electrode and Wiring	Electric Shock	Read all instructions, labels, and installation manuals before installing, operating, or servicing the equipment. Train all personnel involved in welding operations to observe safe electrical work practices according to OSHA 1910.332. Do not touch live electrical parts.

SYMBOL	SOURCE OF HAZARD	HAZARD	HOW TO AVOID
Cr Ni	Chromium and Nickel Fumes	Welding Fumes	Do not breathe fumes and gases. Keep your head out of the fumes. Use enough ventilation or exhaust at the arc or both to keep fumes and gases from your breathing zone and general area
	Hazard Distances	Ultraviolet Radiation	Maintain proper distances from the Arc Ray. Review the "Safety and Health Fact Sheet No. 26" from the AWS for recommendations.
为	Falling Objects	Falling Objects	Be certain that material being welded or cut is secured from falling. Do not permit loose objects near the edge of overhead structures
Ŀ	Confined Space	Fire, Exposure to Hazardous Air Contaminants	Determine if special training or a permit is required to enter the space. Open all covers and secure them from closing. Test atmosphere for: (1) suitable oxygen content (2) combustibles or reactives (3) toxics
	Sparks, Radiation, Hot Metal, Slag, Heat	Electrical, Thermal	Wear a helmet with filter lens and cover plate that complies with ANSI Z87.1 for protection from radiant energy, flying sparks, and spatter. According to ANSI Z49.1 and OSHA 29 CFR 1910.252, "Helmets and hand shields shall protect the face, forehead, neck, and ears PPE
	Hot Metal, Slag, Arc Rays, Hot Work Piece	Thermal	Use approved helmets or hand shields that provide protection for the face, neck, and ears, and wear a head covering. Wear approved safety goggles or safety glasses with side shields, even under your helmet. Wear dry, hole-free insulating gloves.

SYMBOL	SOURCE OF HAZARD	HAZARD	HOW TO AVOID
47	Optical Radiation and Arc Heat	Thermal	Establish a written policy documenting general safety requirements for the wearing of contact lenses. Conduct an eye hazard evaluation in the workplace
	Cuts, Scrapes, Heat, Flames, Molten Metal, Wet Gloves, Insulation Failure	Mechanical, Thermal, Electrical	Gloves should be: Dry and moisture resistant. In good condition, no holes or tears. Flame resistant. Electrically and thermally insulated to suit the process.
	Coating of Steel	Fumes and Gases	Obtain the Material Safety Data Sheets (MSDSs) for all materials used. Read and understand the specification for coating type and coating weights. Find out what hazardous materials are present or might be given off by the coating when it is exposed to the arc of high temperatures
	Reactive Force from Tools, Tool Jammed or Coming Loose	Mechanical	Wear proper head, eye and hand protection. Use face shields, safety glasses, and goggles as appropriate. Inspect tools before use. Never use a tool that is in poor or faulty condition. Keep all tools in good condition.
	Engine-Driven Generators, power source Equipment	Health Hazard	Reduce the intensity of the source. Shield the source where practical. Use engineering control methods, such as room acoustics, to control noise.
	Place Body Between Welding Electrode and Work Cables	Electric & Magnetic Fields	Do not place your body between the welding electrode and work cables. Route cables on the same side of your body. Route the welding cables close together. Secure them together with tape or cable ties.

SYMBOL	SOURCE OF	HAZARD	HOW TO AVOID
	HAZARD		
	Any Coatings on Base Metal, Weld Process	Fumes and Gases	Keep your head out of the fumes. Do not breathe the fumes. Use enough ventilation or exhaust at the arc, or both, to keep fumes and gases from your breathing zone and general area
*	Welding & Cutting	Toxic Fumes, Electric Shock	Be alert, aware, and focused on the job and the work area; notice any changing conditions. Wear and use only the correct, approved equipment for the specific job; be sure it is properly installed and used
	Welding or its Allied Processes	Pneumatic, Electrical, Gases, Liquid	Employers must develop a written lockout/tagout program and procedure. Employees must be trained in these procedures, as well as the purpose and methods of lockout/tagout.

1.5. SAFETY PRECAUTIONS

ATTENTION



FOR PROPER USE, PLEASE READ THIS OPERATING MANUAL THOROUGHLY PRIOR TO UTILIZING THE WELDING MACHINE.

The safety precautions described in this Operating Manual will give you the information necessary for you to handle and operate the equipment safely and prevent any hazard or damage to you or others.

Although this welding equipment is designed and manufactured taking into account all possible scenarios, be sure to observe the safety precautions in this Operating Manual when operating this welding equipment. Not doing so may cause harm to the operator or others, resulting in death or serious injury.

Improper use of the equipment may cause various levels of damage. In this Operating Manual, such damages are classified into two ranks by combination of attention attracting symbols and signal for the purpose of warning indications. These attention attracting symbols and signal terms have the same meanings as those for warning labels on the equipment.

CAUTION



PROCEDURES, IF NOT PROPERLY
FOLLOWED, MAY CAUSE A RISK TO
OPERATORS RESULTING IN MEDIUM OR
SLIGHT INJURY AND/ OR DAMAGE

Serious or light injury includes loss of sight, (high temperature and/or low temperature) burns, electric shock, bone fracture, and poisoning which may lead to hospitalization or long-term hospital stay for treatment. Further, medium and slight injuries include burns, and electric shock, which do not require hospitalization or long-term visit to hospital stays for treatment. Damage to objects denotes widespread damage to property or equipment.

DANGER



PROCEDURES NOT PROPERLY FOLLOWED, MAY LEAD TO DEATH OR SERIOUS INJURY.

1.6. SAFE OPERATION OF THE WELDER AND PERSONAL PROTECTION

1.6.1. IMPORTANT SAFETY PRECAUTIONS

To prevent serious injury to the operator or others, be sure to observe the following:

CAUTION



Never allow any unqualified person to enter the surrounding area of this welding equipment or the welding area inadvertently. **CAUTION**



DANGER



Those who use heart pacemakers should not enter the surrounding area of this welding equipment while in operation or the welding area without permission of your doctor.

Welding equipment during energizing produces a magnetic field in the surrounding area which adversely affects the operation of such pacemakers

CAUTION



DANGER



Although this welding equipment is designed and manufactured taking into account safety adequately, be sure to observe the safety precautions in this Operating Manual when operating this welding equipment.

Not doing so may cause fatal injury to the operator or others, resulting in death or serious injury. **CAUTION**



For the purpose of safety, it is recommended that this welding equipment should be installed, maintained, inspected, and repaired by appropriately qualified personnel or persons who are well familiarized with welding equipment

CAUTION



<u>^!\</u>

Perform any work of power source on the input side, select any location, handle and store and pipe high pieces pressure gases, store work welded, and treat wastes legislations accordance with regulations, and/or and your company's standard.

CAUTION



For the purpose of safety, it is recommended that this welding equipment should be operated by persons who have sufficient knowledge and skill to understand all safety precautions and instructions in the Operating Manual and to operate the equipment safely.

CAUTION



Do not use this welding equipment for applications other than welding.

1.6.2. ELECTRIC SHOCK

To prevent electric shock, be sure to observe the following precaution:

DANGER



Touching any parts that are electrically "live" or "hot" may cause fatal electric shock or burns.

CAUTION



Have a qualified electrician connect the Welding Power Supply. Check the enclosure, base metal and jig that they are electrically connected in ordnance with local regulations. (Electrical Facilities Technical Standards)

CAUTION



Before installing, maintaining, or inspecting this welding equipment, leave the equipment off for over 5 minutes after turning off power supply at the distribution panel switch.

CAUTION



Capacitors built into the unit may be electrically charged even after the power has been switched off.

CAUTION



Before performing any work, make sure that no charging voltage is applied to such parts.

DANGER



Do not use cables which have insufficient capacity, are damaged, or any conductor is exposed.

Tighten cable connections securely and insulate properly.

CAUTION



Tighten cable connections securely and insure that they insulated properly.

CAUTION



Do not operate the welding equipment with its cover or enclosure loose or removed.

DANGER



CAUTION Do not wear damaged, torn or wet gloves. Always wear dry insulated



gloves.

CAUTION



Use a lifeline harness when performing work at any high elevations.

CAUTION



Carry out maintenance and inspection periodically and perform it after the repair of any and all damaged parts.

DANGER



Turn off both the Mains ON/OFF switch on equipment and the distribution panel switch when not in use.

1.6.3. CALIFORNIA PROPOSITION 65 WARNINGS

WARNING



This product produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

WARNING



This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm.

For more information refer to www.P65Warnings.ca.gov.

1.6.4. GASES AND FUMES

To protect you and others from fumes and gases produced during the welding processes, use safeguards.

CAUTION



DANGER



Inhalation of gases and fumes produced during the welding processes can be dangerous and hazardous to your health.

Welding in confined spaces may cause oxygen deficiency, resulting in suffocation. **CAUTION**



When welding in confined spaces, ensure that the welding area is adequately ventilated, wear a respirator, and perform the welding work under supervision.

CAUTION



DANGER



Never perform the welding work in the vicinity of degreasing, washing, and spraying operations. Doing so may cause harmful gases. **CAUTION**



When welding a coated steel plate, ensure that the welding area is adequately ventilated or wear a respirator. Welding coated steel plates may produce harmful fumes or gases.

DANGER



<u>CAUTION</u>



DANGER



To prevent gas poisoning or suffocation, use local ventilating facilities set forth in legislations or Regulations (Industrial Safety and Health Law and Ordinance on Prevention of Hazards Due to Dusts and/or Fumes) or wear a respirator.

1.6.5. FIRE AND EXPLOSIONS

To prevent fire, explosion, or rupture, be sure to observe the following precautions.

CAUTION

Spatter or hot base metals produced during and immediately after the welding processes may cause fire.

DANGER



Do not weld in the vicinity of flammable gases.



CAUTION



Keep hot base metals immediately after the welding processes away from combustibles.

CAUTION



Poor connections of cables or defective contacts in any current path on the base metal such as a steel frame may cause overheating due to conducting current and may resulting in a fire.

CAUTION



When welding ceilings, floors or walls, remove combustibles hidden adjacent to them.



CAUTION



Tighten cable connections securely and insulate them.

DANGER



Explosion can be caused by the welding arc produced on containers that may have held combustibles such as gasoline.

CAUTION



Connect work lead so that it is positioned as close to the part welded as possible.

CAUTION

Rupture can be caused by welding enclosed tanks or pipes.



Do not weld a gas pipe that may have held any gas or an enclosed tank or pipe

CAUTION



Keep combustibles away from scattered welding spatter. Cover combustibles that cannot be removed with incombustible shields.

DANGER



CAUTION Have a fire extinguisher handy in the vicinity of the welding area in preparation for emergency.

1.6.6. ARC WELDING RAYS, NOISE AND SPATTER OR SLAG

To protect you and others from arc rays, scattered spatter or slag, and loud noise produced during the welding processes, use safeguards.

CAUTION

Arc rays can cause your eyes irritation and burn your skin.

CAUTION



To protect your eyes from spatter or slag, wear goggles.



CAUTION



Wear safeguards including gauntlet type of welding safety gloves, long-sleeved clothing, leggings and spats, and leather aprons, etc.

CAUTION



Scattered welding spatter or slag will damage your eyes and cause burns.

CAUTION



Prevent gas cylinders from being exposed to welding arc and spatter generated from the welding torch.





Loud noise can cause hearing loss.



CAUTION

To protect others' eyes from arc rays, place protective booths, screens, or shields around the work area.

CAUTION



To perform or monitor welding work, wear an eye protector with filter lenses providing sufficient scale number, or a welding face shield

CAUTION



Never touch the gas cylinder with the electrode.

CAUTION



In case when noise levels exceed safe levels, wear protective earplugs and/or earmuffs.

1.6.7. GAS CYLINDERS

To prevent the turnover of gas cylinder or the rupture of gas flow regulator, be sure to observe the following precautions

CAUTION



Turnover, tipping or falling gas cylinder may cause injury to the operator or others. Cylinders should properly secured.

CAUTION



Read and follow all warnings, safety precautions, and instructions in the Operating Manual which is supplied with the gas flow regulator prior to use.

CAUTION



If gas cylinder containing a gas at high pressure is handled improperly, high pressure gas may flow out, causing injury to the operator or others.

CAUTION



gas cylinder Fix the on special-purpose holder or rack.

CAUTION



Gas cylinder shall not be exposed to

CAUTION



Handle the gas cylinder according to legislations or regulations and your company's standards.

DANGER



high temperature.

CAUTION

DANGER

Use a gas flow regulator of the proper size and is suited for the shielding gas type being used.

CAUTION



Keep your face away from the gas cylinder outlet when opening the gas cylinder valve.

CAUTION

Be sure to attach a protective cap to the gas cylinder outlet when not in use.

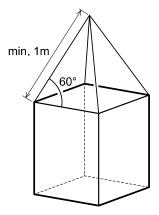


Prevent the gas cylinder from being exposed to welding arc generated from the welding torch.

1.7. PRECAUTIONS ON TRANSPORTATION

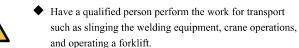
In order to prevent damage and accidents when transporting the power supply, be sure to observe the following precautions.

X Carefully observe the rules in the following diagram when slinging the welding equipment.





CAUTION



- Do not transport the welding equipment directly with a forklift or by other means.
- Before transport, check the weight of the welding power supply and select a wire rope that is appropriate for that weight.
- Use eye bolts for transport and check that the eye bolts have been tightened before transport.
- During transport, do not directly sling the welding power supply with rope. Otherwise the enclosure may deform, causing a breakdown.



- Remove all of the wiring and accessories before transport.
- Do not put objects on the top of the welding power supply or allow people to get on top of it.



The product and the required symbols displayed on its packaging indicate that the product must not be disposed of in the same manner as regular household garbage. In order to recycle waste electrical and electronic equipment, it is the responsibility of the user to dispose of the waste equipment by delivering it to a designated collection point. When disposing of waste equipment, sorting it and having it collected and recycled is beneficial for protecting natural resources and leads to the establishment of methods of recycling that protect human health and the environment. For details on waste equipment collection points for recycling, inquire with the recycling facilities for your region or the distributor where the product was purchased.

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1.8. REFERENCE PUBLICATIONS

Refer to the following standards or their latest revisions for more information:

- 1. OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, obtainable from the Superintendent of Documents, U.S. Government Printing Office, 732 N. Capital St NW, Washington, D.C. 20402
- 2. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING, updated 2010, obtainable from the American Welding Society, 8669 NW 36th Street, Miami, FL 33166-6672
- 3. NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
- ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION, obtainable from American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036
- ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY-TOE FOOTWEAR, obtainable from the American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10018
- 6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES, obtainable from American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10018
- AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES, obtainable from American Welding Society, 8669 NW 36th Street, Miami, FL 33166-6672
- 8. NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING, CUTTING AND ALLIED PROCESSES, obtainable from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169
- 9. NFPA Standard 70, NATIONAL ELECTRICAL CODE, obtainable from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169
- NFPA Standard 51B, CUTTING AND WELDING PROCESSES, obtainable from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169
- 11. CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, obtainable from the Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA, 20151
- 12. CSA Standard W117.2, CODE FOR SAFETY IN WELDING AND CUTTING, obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3
- 13. NWSA booklet, WELDING SAFETY BIBLIOGRAPHY obtainable from the National Welding Supply Association, 1900 Arch Street, Philadelphia, PA 19103
- 14. American Welding Society Standard AWSF4.1, RECOMMENDED SAFE PRACTICES FOR THE PREPARATION FOR WELDING AND CUTTING OF CONTAINERS AND PIPING THAT HAVE HELD HAZARDOUS SUBSTANCES, obtainable from the American Welding Society, 8669 NW 36th Street, Miami, FL 33166-6672
- 15. ANSI Standard Z88.2, PRACTICE FOR RESPIRATORY PROTECTION, obtainable from American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10018

2. SPECIFICATIONS

2.1. POWER SUPPLY SPECIFICATIONS

Parameters		SANPAW 300PW				
Model		ID-3000PW-U1E				
Description		Plasma weldir	g			
Rated Output		300A @ 37.0V	7, 60% Du	ty cy	cle	
		Input Power		60%	60% Duty 100% Du	
	Output Current @ Output Voltage	208-240V, 480	V, 3 φ	300	A @ 37.0V	232A @ 34.3V
Main	w Output voltage	208-240V, 1 ¢		190	A @ 32.6V	147A @ 30.9V
	Open Circuit Voltage (OCV)		58V+/-5% at AC208V in 67V+/-5% at AC240/480		put	
	Output Range	DC 5 to 300 A	,			
	Rated Output	25A @ 45.0V,	100% Du	ty cy	ele	
	0.4.40	Input Power		100	% Duty	
Pilot	Output Current @ Output Voltage	208-240V, 480 208-240V, 1 ¢		25 <i>A</i>	A @ 45.0V	
	Open Circuit Voltage (OCV)	126V+/-5% at 145V+/-5% at		-		
	Output Range	DC 3 to 25 A				
	1 0	Three-Phase		Single-Phase		
		Voltage (V)	Current	(A)	Voltage (V)	Current (A)
Input Vol	tage /Current at Rated Output	208	51.4		208	62.5
		240	44.6		240	54.1
		480	22.3		-	-
Main Out	tput Amperes (Amps)	300		190		
Main Out	put Volts (Volts)	37.0			32.6	
Pilot Outp	put Amperes (Amps)	25		25		
Pilot Outp	put Volts (Volts)	45.0		45.0		
KVA		18.5			13.0	
KW		13.9 8.3			8.3	
Input						
Input V	/oltage	208-240 /480 VAC 3-phase, 208-240 VAC single-phase				
Line Frequency		50/60 Hz				
Line Vo	olts Compensation	+/-10%				
Input Breaker Rated Breaking Current		2.5kA				
Cooling Method		Forced Air Cooling				
Weight		130 lbs. (59 kg)				
External Dimensions [W x H x L]		15.75 x 25.59 x 23.63 in. (400 x 650 x 600 mm)				

SanRex continuously strives to produce the best product possible and therefore reserves the right to change, improve or revise the specifications or design of this or any product without prior notice. Such updates or changes do not entitle the buyer of equipment previously sold or shipped to the corresponding changes, updates, improvements or replacement of such items.

The values specified in the previous table are optimal values, your values may differ. Individual equipment may differ from the above specifications due to in part, but not exclusively, to any one or more of the following; variations or changes in manufactured components, installation location and conditions and local power grid supply conditions.

2.2. INSTALLATION ENVIRONMENT

Operating Temperature	-10°C to 40°C (14~104°F)
Storage Temperature	-25°C to 55°C (-13 ~ 131°F)
Relative Humidity	90% RH or less at 20°C or less (68°F) 85% RH or less at over 20°C to 40°C (104°F)
Dust	The air should not contain excessive levels of dust, oxidizing or corrosive gases, or corrosive substances

3. INSTALLATION

3.1. PREPARATION PRIOR TO INSTALLATION

3.1.1. CHECKING THE ACCESSORIES

First check the accessories.	
☐ DIN connector (male) x 1	

☐ Operating Manual (this manual) x 1

3.1.2. POWER-SUPPLY SYSTEM

Before using the welding power supply, please prepare the following required power-supply system.

System Capacity	16 kVA or higher	22 kVA or higher	22 kVA or higher
Input Voltage	208/240 VAC	208/240 VAC 480 VAC	
Phases	Single-phase	3-phase	
Frequency	50/60 Hz		
Fuse Capacity	80 A	70 A	30 A

X Install a distribution panel (with built-in fuse) for each welding power supply unit.

3.1.3. REFERENCE CABLE SIZE

Please prepare cables thicker than the sizes listed below to connect to the welding power supply.

Input Cable	8 mm ² or larger	$(AWG 8 = 8.36 \text{ mm}^2)$
Ground Conductor	8 mm ² or larger	$(AWG 8 = 8.36 \text{ mm}^2)$
Output Cable	50 mm ² or larger	$(AWG 1/0 = 53.5 \text{ mm}^2)$

^{*} To prevent unusual decreases in the input power supply voltage and to ensure stable welding, use a power-supply system capacity and cable size that are as large as possible.

X Input cable clamp is adjustable to cable diameter from 3/4"(19.0mm) to 1-1/8"(28.6mm). №

3.2. INSTALLATION

Install the welding power supply in structurally sound location such as concrete floor or sturdy base.

Do not use or install this welding power supply in any of the following locations:

- A location exposed to wind or rain
- A steamy or humid location
- A location subjected to abnormal vibration or shock
- A location exposed to harmful corrosive gases
- A location with an altitude that exceeds 3,281Ft (1000 meters)
- A location where ambient temperature exceeds 40°C (104°F)
- A location with oil vapor
- A particularly dusty location
- A location where the ambient temperature falls below -10°C (14°F)
- * Care should be taken to ensure that the welding arc zone is not directly exposed to wind. Prepare a windshield if necessary.

CAUTION

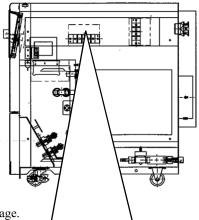


- Always turn off the distribution panel switch prior to making electrical connections.
- The forced air cooling method of the welding power supply intakes air from the rear of the equipment and expels it out the side, so a distance of 8 inches (20 cm) or more must be maintained between the equipment and any wall or other obstruction.
- If installing two or more welding power supply units side by side, separate them by a distance of 1 foot (30 cm) or more.
- When performing continuous welding, do not directly touch the exhaust vent on the side of the welding power supply as hot air is expelled from it. Do not place any combustibles near the exhaust vent.
- To prevent malfunction and damage due to noise received from other welding power supplies, equipment that generate HF or lighting surges, ensure that the equipment is properly grounded utilizing its ground terminal.

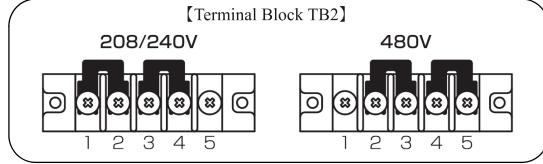
3.3. WIRING CONNECTION OF SWITCHING INPUT VOLTAGE

MARNING

- ☆ Risk of electric shock could result in serious injury or death.
- ☆ This welding power supply to be installed, and serviced by qualified personnel only.
- ☆ Be sure to turn off the line disconnect switch before performing work.
- ☆ Use a "Lock-Out/Tag-Out" procedure until installation is complete.
- ☆ Be sure to connect the earth wire.
- ☆ Always wire the input cable before wiring the distribution panel.
- ① Remove the cover on the right side.



② Configure the jumper bars to match the input voltage.



MARNING

☆ Be sure to reattach the covers before you turn on the power. Touching any parts that are electrically "live" or "hot" may cause electric shock, burns or death.

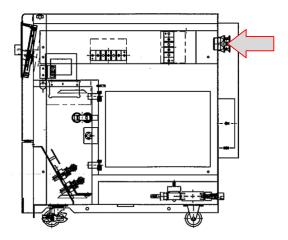
3.4. WIRING THE INPUT CABLE

WARNING

- ☆ Risk of electric shock could result in serious injury or death.
- ☆ This welding power supply to be installed, and serviced by qualified personnel only.
- ☆ Be sure to turn off the line disconnect switch before performing work.
- ☆ Use a "Lock-Out/Tag-Out" procedure until installation is complete.
- ☆ Be sure to connect the earth wire.
- ☆ Always wire the input cable before wiring the distribution panel.

ACAUTION

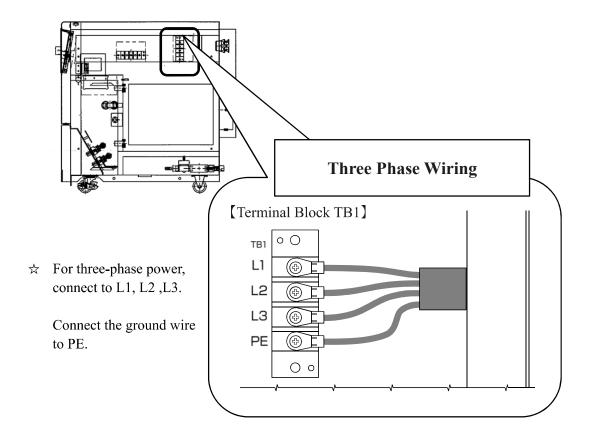
- ☆ Securely fix the power cable in place utilizing the cable clamp located at the back of the device.
- ① Remove the cover on the right side.
- 2 Unscrew the clamp screw and insert the input cable.

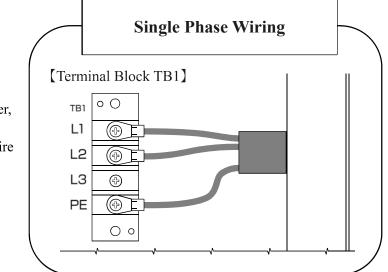


3 Connect three (for three phase power) or two (for single phase power) input wires and the ground wire to internal terminal block TB1.

Do not connect an input (BLACK or WHITE or RED) conductor to the ground terminal (PE).

Do not connect the ground (GREEN) conductor to an input line terminal.





 ☆ For single-phase power, connect to L1 and L2.
 Connect the ground wire to PE.



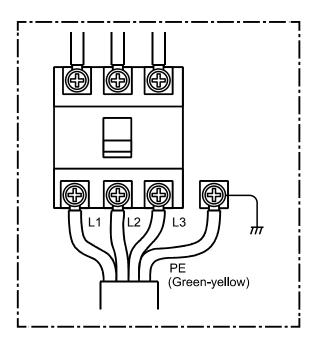
- ☆ Be sure to reattach the cover after wiring to the terminal block. Touching any parts that are electrically "live" or "hot" may cause electric shock, burns or death.
- 4 Tighten the screw to secure the cable.
- (5) Check that the cable does not move.

3.5. WIRING TO THE POWER DISTRIBUTION PANEL

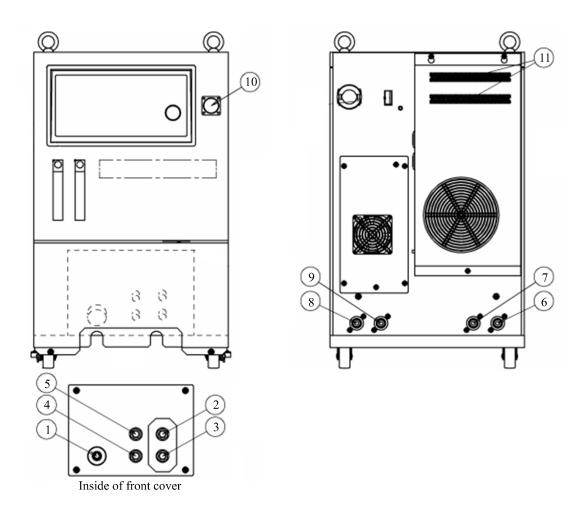
MARNING

- ☆ Risk of electric shock could result in serious injury or death.
- ☆ This welding power supply to be installed, and serviced by qualified personnel only.
- ☆ Be sure to turn off the line disconnect switch before performing work.
- ☆ Use a "Lock-Out/Tag-Out" procedure until installation is complete.
- ☆ Be sure to connect the earth wire.
- ☆ Always wire the input cable before wiring the distribution panel.

Connect the red wire, black wire, and white wire of the input cable that is connected to the welding power supply to the no-fuse breaker on the distribution panel or the distribution panel switch (built-in fuse). Always ground the green/yellow wire.



3.6. CONNECTING THE ACCESSORIES



1	Output Base Metal Terminal (+) DINSE style			
2	Coolant Water Return (RED + Terminal) (From Torch)	9/16-18UNF RH MALE		
3	Coolant Water Supply (GREEN — Terminal) (To Torch)	9/16-18UNF RH MALE		
4	Pilot Gas Output (BLACK Terminal)	9/16-18UNF RH MALE		
⑤	Shield Gas Output (YELLOW Terminal)	9/16-18UNF RH MALE		
6	Pilot Gas Input	5/18-18 UNF RH FEMALE		
7	Shield Gas Input	5/18-18 UNF RH FEMALE		
8	Coolant Water Supply (From cooler equipment)	5/18-18 UNF LH FEMALE		
9	Coolant Water Return (To cooler equipment)	5/18-18 UNF LH FEMALE		
10	Connector for Remote Controller	14-pin, MS3102A20-27S		
11)	External Input/Output Signal Terminal Block	Screw Terminal (M4); 14 position×2		

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3.6.1. WIRING OF REMOTE CONTROLLER OUTLET

Connect the wiring for the torch-side receptacle according to the following table.

Connector type on this welding power supply: MS3102A20-27S

TERMINAL	FUNCTION		DIRECTION	REMARKS
A	Main Start	Signal	Input	<u> </u>
В	Main Start will energiz	Signal (closure between pin A and pin B ze output)	Input	
С	External Peak	5k ohm (maximum) connection to $5k\Omega$ remote control potentiometer. (+10V, 2mA max)	Output	
D	(welding) Current	Zero ohm (minimum) connection to $5k\Omega$ remote control potentiometer. (GND)	_	
Е	Setting Signal	Wiper arm connection to $5k\Omega$ remote control potentiometer. $(0\sim10V)$ (*1) (*2)	Input	
F	Scaled Out	put Main Current Signal: Ifb = 100A/1V	Output	Max 5mA
G	Chassis Gro	ound	_	
Н	Scaled Out	put Main Voltage Signal: Vfb = 10V/1V	Output	Max 5mA
I	Control Cir	cuit Common (F & H)	Output	
J	NC		_	
K	Pilot Start S	Signal	Input	——————————————————————————————————————
L	Pilot Start S energize ou	Signal (closure between pin K and pin L will atput)	Input	
M	OK to Mov	re Current Detect Signal	Output	DC 0.1A / 30V
N	OK to Mov	e Current Detect Signal	Output	or less

- (*1) Enabling the output current setting utilizing an external current command value is valid when the Change REMOTE Mode button on the front control panel is ON.
- (*2) If using a foot remote, the Change REMOTE Mode button on the front control panel must be set to ON.



☆ Wire the signal lines of terminal symbol C, D, E, F, H, I separately from power lines such as input cable and output cable (base material cable, torch cable).

3.6.2. CONNECTION TO EXTERNAL OUTPUT SIGNAL TERMINAL BLOCK

The connection to external input output terminal block, please follow the list below. For details of functions, see section "5.1. FUNCTION FOR AUTOMATION".

Terminal block specification: Screw Terminal (M4); 14 position×2

TERMINAL	FUNCTION	INPUT OUTPUT	REMARKS	
1	Main Start Signal	Input	——————————————————————————————————————	
2	Main Start Signal (*3) (closure between terminal 1 and 2 will energize outpu	Input		
3	Pilot Start Signal		Input	
4	Pilot Start Signal (*3) (closure between terminal 3 and 4 will energize output	Input		
5	Gas Check Signal		Input	
6	Gas Check Signal (*3) (closure between terminal 3 and 4 will energize output	Input		
7	Emergency Stop Signal	Input		
8	Emergency Stop Signal (*3) (welding output is disabled when the contact is "Open operating mode is enabled when the contact is "Closed	Input		
9		bit0	Input	
10	User Saved File Selection Signal bit2	bit1	Input	
11		bit2	Input	
12		bit3	Input	
13	User Saved File Selection Signal (*3) (Selected closure between terminals 9, 10, 11, 12 to te 13 will retrieve a previously saved file) * Refer to section 5.1. FUNCTION FOR AUTOMA		_	
14	NC	_	_	
15	OK to Move Current Detect Signal	Output	DC 0.1A / 30V	
16	OK to Move Current Detect Signal	Output	or less	
17	Pilot Current Detect Signal	Output	DC 0.1A / 30V	
18	Pilot Current Detect Signal	Output	or less	
19	Error Signal	Output	DC 0.1A / 30V	
20	Ziro Zigiini	Output	or less	
21 22	Pulse Synchronization Signal * Refer to section 5.1. FUNCTION FOR AUTOMA	Output	Max 30VDC Max 50mA	

23	External Peak	5k ohm (maximum) connection to $5k\Omega$ remote control potentiometer. (+10V, 2mA max)	Output	
24	(welding) Current	Wiper arm connection to $5k\Omega$ remote control potentiometer. (0~10V) (*1) (*2)	Input	
25	Setting Signal	Zero ohm (minimum) connection to $5k\Omega$ remote control potentiometer. (GND) (*4)	_	
26	Scaled Output Main Voltage Signal: Vfb = 10V/1V		Output	Max 5mA
27	Scaled Output Main Current Signal Ifb = 100A/1V		Output	Max 5mA
28	Control Circuit Common (for pins 26 & 27) (*4)		Output	

- (*1) Enabling the output current setting utilizing an external current command value is valid when the Change REMOTE Mode button on the front control panel is ON.
- (*2) If using a foot remote, the Change REMOTE Mode button on the front control panel must be set to ON.
- (*3) Terminal 2, 4, 6, 8, 13 are common internally to the welding power supply.
- (*4) Terminal 25, 28 are common internally to the welding power supply.

NOTE



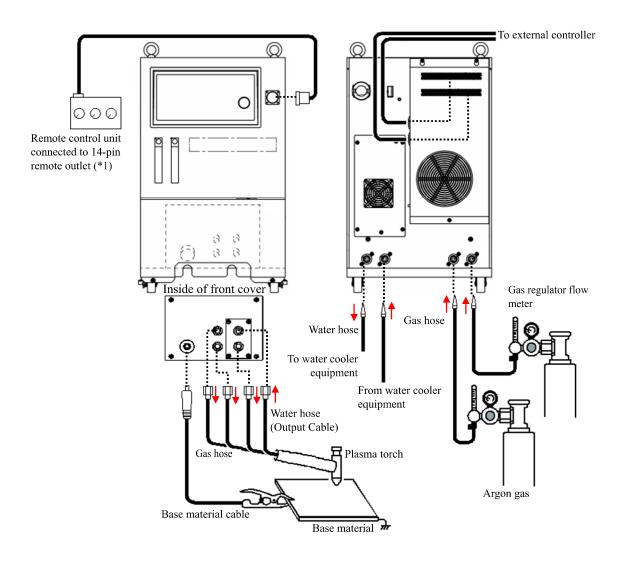
Common signals of the External Input / Output Signal Terminal Block and the Remote Controller Outlet are connected to each other inside the welding power supply. (As shown below)

SIGNAL NAME		EXTERNAL INPUT/OUTPUT TERMINAL BLOCK		REMOTE CONTROLLER OUTLET
Main Start Signal		1	\Leftrightarrow	A
Main Start Signal (common)		2	\Leftrightarrow	В
Pilot Start Signal		3	\Leftrightarrow	K
Pilot Start Signal (common)		4	\Leftrightarrow	L
OK to Move Current Detect Signal		15	\Leftrightarrow	M
OK to Move Current Detect Signal		16	\Leftrightarrow	N
External Peak	+10V Output	23	\Leftrightarrow	С
(welding) Current	0-10V Input	24	\Leftrightarrow	E
Setting Signal	GND	25	\Leftrightarrow	D
Scaled Output Main Voltage Signal		26	\Leftrightarrow	Н
Scaled Output Main Current Signal		27	\Leftrightarrow	F
Control Circuit Common (for pins 26 & 27, H & F)		28	\Leftrightarrow	I



☆ Wire the signal lines of terminal numbers 23 to 28 separately from power lines such as input cable and output cable (base material cable, torch cable).

3.6.3. OUTPUT CABLE, GAS, COOLING WATER UNIT CONNECTIONS



(*1) When using a foot remote, connect the foot remote switch into the 14-pin connector on the front panel. (See section "3.6.1. WIRING OF REMOTE CONTROLLER OUTLET")

At the same time, enable the 14-pin connector by turning ON the Change REMOTE Mode button. (See section "4.1. USER INTERFACE OVERVIEW AND OPERATION")

• GAS CONNECTION:

Prepare two argon gas cylinders. One cylinder dedicated for pilot gas and the second for the shield gas. Attach a regulator (without flow meters) to each of the argon gas cylinder and connect the regulator to the gas inlets on the welding power supply with gas hoses. Ensure that the gas pressure is 35~40 psi during use.

• COOLING WATER CONNECTION:

Connect the cooling water unit to the water inlet and water outlet with a water hose. Ensure that the water pressure is 100 psi or less during use. Also ensure that the water temperature is 70°C (158°F) or less during use.



Various plasma welding torches can be utilized with the 300PW. It is the responsibility of the user to determine the proper water pressure setting for the torch being utilized and to adjust the water pressure appropriately. Failure to adjust the water pressure properly will result in a failure of the welding torch and/or the power source.

• TORCH CONNECTION:

- Connect the Coolant Water Return metal fitting (RED + output metal fitting) of the plasma welding torch to the Coolant Water Return (RED + terminal) of the welding power supply (right top of the front panel).
- Connect the Coolant Water Supply metal fitting (GREEN output fitting) of the torch for plasma welding
 to the Coolant Water Supply (GREEN terminal) of the welding power supply (right bottom of the front
 panel).
- Connect the welding object (base material) and the output base material terminal (+) (left side of the front panel).
- Connect the pilot gas metal fitting of the plasma welding torch to the pilot gas output, BLACK Terminal, of the welding power supply (center bottom of the front panel).
- Connect the shield gas fitting of the plasma welding torch to the shielding gas output, YELLOW terminal, of the welding power supply (center top of the front panel).

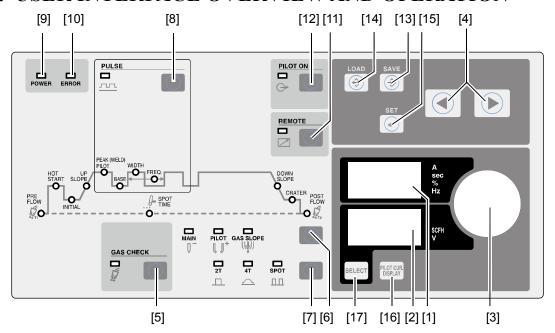


- ☆ Turn off the power switch before wiring the output side.
- ☆ Securely tighten all connectors so there are no loose connections and ensure there are no water or gas leaks. Be sure to reattach the front cover before turning on the power.

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4. OPERATION PROCEDURES

4.1. USER INTERFACE OVERVIEW AND OPERATION



[1] Parameter Display

Displays the set value for adjustable parameters. Also displays the output current value being supplied during welding. While displaying the welding current, the unit led is off.

Pressing the PILOT CUR. DISPLAY button, [16], will display the output current value of pilot current.

[2] Voltage Display

With each press of the button [17], the detected values displayed changes in the following order:

"Main Voltage Output" → "External File Selection Number" → "Pilot Gas Flow Output" → "Main Voltage Output".

The actual values displayed will change depending on the configuration.

When internal parameter P40 is set to "OFF", the "External File Selection Number" display will be bypassed in the above sequence.

When internal parameter P37 is set to "OFF", the "Pilot Gas Flow Output" display will be bypassed in the above sequence.

[3] Encoder

Turn to change the value of the parameters.

Pushing the Encoder button functions the same as the right arrow of the [4].

[4] Change Parameter Buttons

Pressing either of these two buttons changes the selection of welding parameters.

The parameters that can be selected differ according to the welding process and waveform mode setting. (See section "4.3. WELDING PROCESSES")

[5] GAS CHECK Button

Pressing this button will energize the gas solenoid and start the shield gas and pilot gas flow.

If the gas solenoid is left on continuously for 2 minutes, it will automatically be turned off.

While energized, welding cannot be performed.

[6] Change Parameter Select Button

Pressing this button changes the parameter selection of MAIN, PILOT and GAS SLOPE.

The parameter changes in the following order:

```
"MAIN" \rightarrow "PILOT" \rightarrow "GAS SLOPE" \rightarrow "MAIN"
```

With each press of the button.

The actual sequence of parameter selection will change depending on the configuration.

A selectable parameter varies according to the setting of internal parameter P37.

When internal parameter P37 is set to "off", the "GAS SLOPE" selection will be bypassed in the above sequence.

NOTE: DO NOT SET INTERNAL PARAMATER P37 TO "ON" UNLESS THE OPTIONAL MASS FLOW CONTROLLER IS INSTALLED INTO THE 300PW.

[7] Change Crater Mode Button

Pressing this button changes the welding sequence (2T, 4T, SPOT).

The sequence changes in order:

"2T"
$$\rightarrow$$
 "4T" \rightarrow "SPOT" \rightarrow "2T"

With each press of the button. It becomes the repeat operation at "4T" by turning internal parameter P21 setting on. (See section "4.3. WELDING PROCESSES")

[8] Change Pulse Setting Button

Pressing this button changes the pulse setting (PULSE ON, PULSE OFF).

[9] Control Power Source Display LED

This LED indicates that the welding power supply is in stand-by mode.

[10] Abnormal Operation Display LED

This LED illuminates when an abnormal operation or condition is detected or an emergency stop has been received.

Error codes are displayed at the upper 7-segment section of display [1].

[11] Change REMOTE Mode Button

Pressing this button to illuminate the LED will enable welding current output operation from the remote control.

[12] PILOT ON/OFF Button

Pressing this button will enable/disable the operation of the pilot output. Same operation as pilot start signal.

[13] SAVE Button

This button is used to save the state of the configured welding process, welding sequence, and parameters. (See section "5.2 SAVE/LOAD FUNCTIONS")

[14] LOAD Button

This button is used to load the state of the saved welding process, welding sequence, and parameters. This button is used to load the state of a previously saved welding process, welding sequence, and parameters. (See section "5.2. SAVE/LOAD FUNCTIONS")

[15] SET Button

SET button is used as the selection button during the SAVE, LOAD and setting internal parameter modes. In addition, SET button is also used to clear the error code and return to the standby state when an abnormal condition is detected. (See section "8.1. ERROR CODE LIST"WELDING PROCESSES)

Press and hold this button to switch to the internal parameter setup mode.

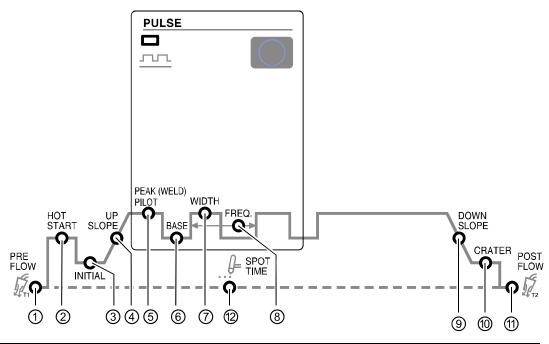
[16] PILOT CUR. DISPLAY Button

Pressing this button will display the pilot current output value on the 7-segment Parameter Display.

[17] Lower Section Digital Parameter Display Switch Button

This button enables to switch the indication of Voltage Display (Lower section 7seg LED) contents. Refer to [2].

4.2. WELDING PARAMETER DESCRIPTIONS



	DANIEL DICDLAVALAME	FUNCTION			
	PANEL DISPLAY NAME	MAIN	PILOT	GAS SLOPE	
1	PREFLOW	Pre-Flow Time of Shield Gas		_	
2	HOT START	Main Hot Current		Main Ignition Gas Flow	
3	INITIAL	Initial Welding Current	_	Initial Welding Gas Flow	
4	UP SLOPE	Time of Up Slope	_	_	
6	PEAK (WELD) PILOT	Peak Current with Pulse / Welding Current without Pulse	Pilot Current	Peak Welding Gas Flow (Pilot Gas Flow)	
6	BASE	Base Current Ratio Base current equals \$\begin{align*} \Base \Bas	-	_	
7	WIDTH	Ration of Pulse Peak Current Time (%)	_		
8	FREQ.	Pulse Frequency	_	_	
9	DOWN SLOPE	Time of Down Slope	_	_	

	DANIEL DICDLAY NAME	FUNCTION			
	PANEL DISPLAY NAME	MAIN	PILOT	GAS SLOPE	
10	CRATER.	Crater Current	_	Crater Welding Gas Flow	
11)	POST FLOW	Post-Flow Time of Shield Gas	_	_	
12	SPOT TIME	Spot Current Time	_	_	

The configurable range and initial value of each parameter is shown in the following table.

	PARAMETER NAME		MIN.	MAX.	INITIAL VALUE	UNIT
	PREFLOW		0.0	25.0	0.3	sec
	HOT START CUR.	Ih	0	70	0	A
	INITIAL CUR.	Ii	5	300	50	A
	UP SLOPE	Tup	0.0	25.0	0.1	sec
	PEAK CUR.	Ip /Iw	5	300	120	A
MAIN	BASE CUR. (*1)	Ib	1	100	50	%
	WIDTH	d2	5	95	50	%
	FREQ. (*2)	f2	0.5	500	250	Hz
	DOWN SLOPE	Tdw	0.0	25.0	0.6	sec
	CRATER CUR.	Ic	5	300	30	A
	POST FLOW	Tpos	0.0	60.0	2.0	sec
	SPOT TIME	Tsp	0.1	25.0	2.0	sec
PILOT	PILOT CUR.	Ipl	3	25	10	A
	Main Ignition Gas Flow (*3)	Fmh	0.0	5.0	0.0	SCFH
GAS SLOPE	Initial Welding Gas Flow (*3)	Fi	0.5	5.0	3.0	SCFH
UAS SLUPE	Peak Welding Gas Flow (*3) (*4)	Fp	0.5	5.0	4.0	SCFH
	Crater Welding Gas Flow (*3)	Fc	0.5	5.0	3.0	SCFH
INTERNAL PARAMETER	Pilot Ignition Gas Flow [P36]	Fplh	0.0	5.0	0.0	SCFH

^(*1) Base Current is set by ration (%) to peak (welding) current setting value. When Base Current calculation value is lower than minimum current (5A), it fixes to minimum current.

(*2) Pulse frequency and middle pulse frequency unit depend on settings of frequency shown below.

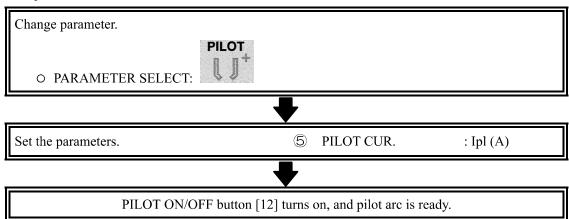
SETTING RANGE	UNIT
0.5 to 1.0	0.1Hz
1 to 500	1Hz

- (*3) These values are only valid when the optional mass flow controller is installed.
- (*4) Pilot Gas Flow will be the same setting value as Peak Welding Gas Flow.

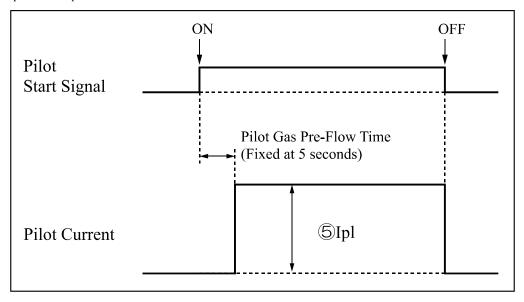
4.3. WELDING PROCESSES

4.3.1. PILOT OUTPUT

• Operation elements



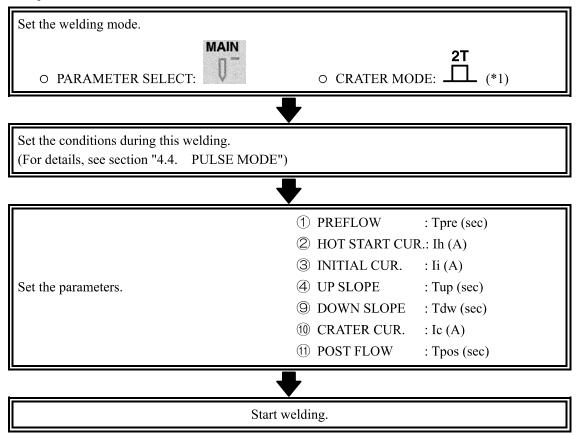
• Operation sequence



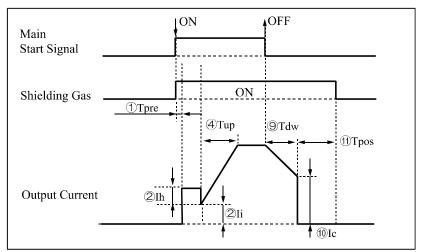
4.3.2. MAIN OUTPUT

4.3.2.1. 2T MODE (WITH SLOPE)

• Operation elements



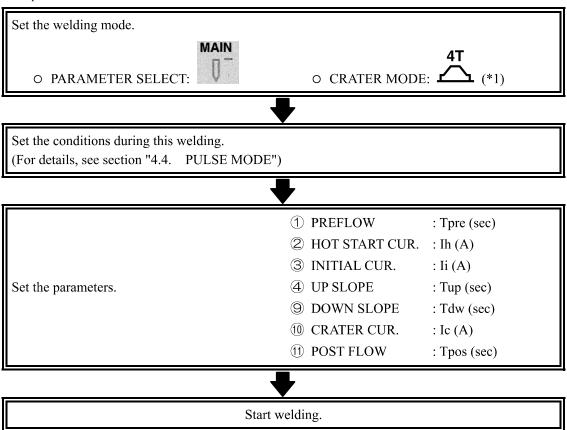
Operation sequence



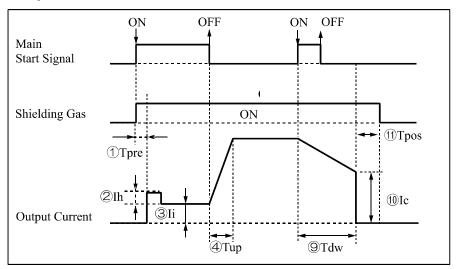
(*1) In 2T mode, SLOPE can be enabled or disabled by setting internal parameter P19.

4.3.2.2. 4T MODE (WHEN P20: 4T MODE SETTING IS ON)

• Operation elements



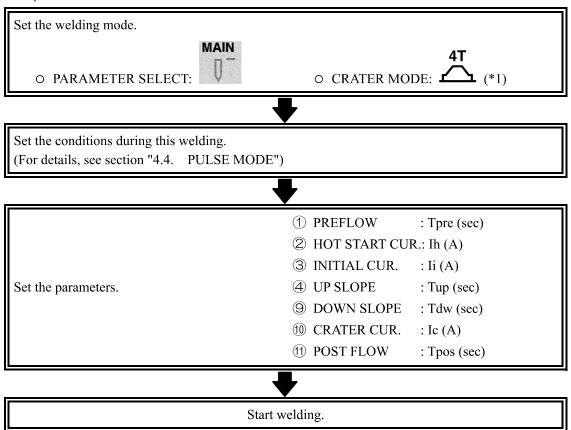
• Operation sequence



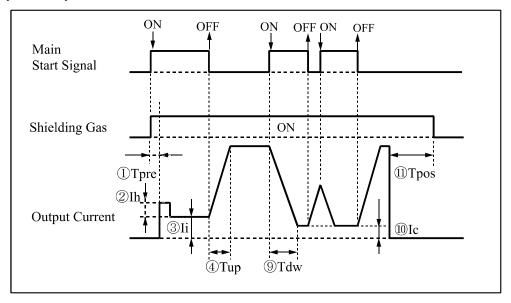
(*1) In 4T mode, the operation when welding ends can be set to be synchronized or not synchronized with the main start signal by setting internal parameter P20.

4.3.2.3. REPEAT MODE

• Operation elements



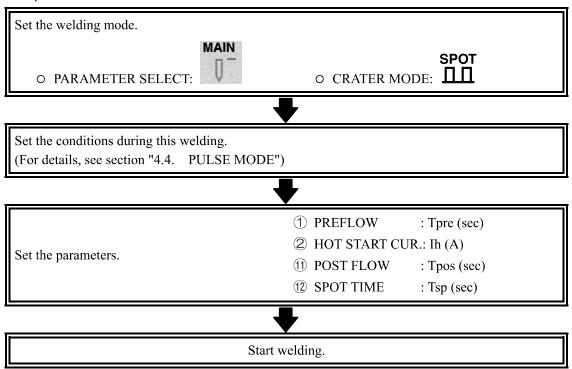
• Operation sequence



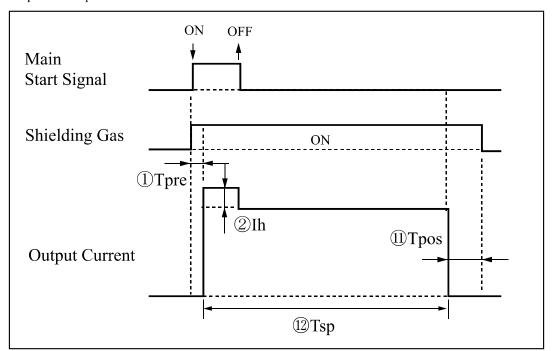
(*1) The REPEAT operation is enabled by turn ON the setting of internal parameter P21.

4.3.2.4. SPOT MODE

• Operation elements



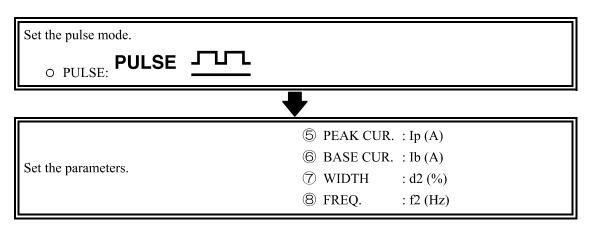
• Operation sequence



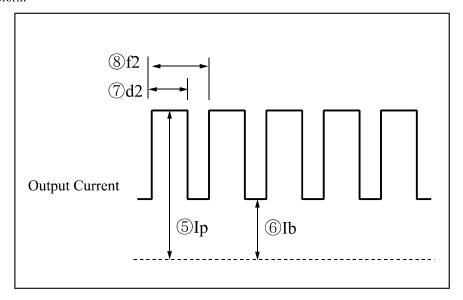
4.4. PULSE MODE

4.4.1. PULSE MODE

• Operation elements



Waveform



5. FUNCTIONS

5.1. FUNCTION FOR AUTOMATION

The external input and output signals shown below can be used for automation by connecting an external controller to the External Input/Output Signal Terminal Block.

1. Main Start Signal: Terminal Numbers: 1, 2

An externally received contactor closure condition will turn the main output ON.

2. Pilot Start Signal: Terminal Numbers: 3, 4

An externally received contactor closure condition will turn the pilot output ON.

Note: This is the same function as utilizing the "PILOT ON/OFF" button on the front panel.

3. Gas Check Signal: Terminal Numbers: 5, 6

An externally received contactor closure condition will turn the shield gas and pilot gas ON.

Note: The shield gas and pilot gas are both ON when the gas check signal is ON.

4. Emergency Stop Signal: Terminal Numbers: 7, 8

An externally received contactor open condition initiates an emergency stop (Error code E09). Output current will turn OFF.

5. User Saved File Selection Signal: Terminal Numbers: 9, 10, 11, 12, 13

Externally received contact closures can retrieve previously saved user welding parameters. Defined by the input status of the terminal block and the status of internal parameter P40. Only previously saved user file numbers 1~15 are retrievable using the External Input/Output Signal Terminal Block. Previously saved user file numbers 1~15 and additional file numbers 16~30 are retrievable thru the front operator panel. Saved data is not retrieved when terminal 9~12 are all OFF, contacts open, and the current parameters are retained. Retrieving data is only possible during stand-by and welding.

Terminal 9: bit0

Terminal 10: bit1

Terminal 11: bit2

Terminal 12: bit3

Terminal 13: common

Note: The external retrieving function of user saved data is only available when internal parameter P40 is "ON".

INTERNAL	Г	ERMINA	L NUMBE	R	LOAD DATA NO.
PARAMETER P40 SETTING	12 (bit3)	11 (bit2)	10 (bit1)	9 (bit0)	
OFF	-	-	-	-	Invalid terminal block input.
	OFF	OFF	OFF	OFF	Saved data is not retrieved
	OFF	OFF	OFF	ON	1
	OFF	OFF	ON	OFF	2
	OFF	OFF	ON	ON	3
	OFF	ON	OFF	OFF	4
	OFF	ON	OFF	ON	5
	OFF	ON	ON	OFF	6
OM	OFF	ON	ON	ON	7
ON	ON	OFF	OFF	OFF	8
	ON	OFF	OFF	ON	9
	ON	OFF	ON	OFF	10
	ON	OFF	ON	ON	11
	ON	ON	OFF	OFF	12
	ON	ON	OFF	ON	13
	ON	ON	ON	OFF	14
	ON	ON	ON	ON	15

Note: ON = contact closure to terminal 13, OFF = contact open.

6. OK to Move Current Detect Signal: Terminal Numbers: 15, 16

An internal contactor closure output condition indicates that main current flows. Note: The contact output logic can be inverted by turning internal parameter P26 ON. (An internal contactor open output condition indicates the main current flows.)

7. Pilot Current Detect Signal: Terminal Numbers: 17, 18

An internal contactor closure output condition indicates that pilot current flows. Note: The contact output logic can be inverted by turning internal parameter P27 ON. (An internal contactor open output condition indicates the pilot current flows.)

8. Error Signal: Terminal Numbers: 19, 20

An internal contactor closure output condition indicates an abnormal condition.

An error code is displayed on the front panel digital display.

Note: The contact output logic can be inverted by turning internal parameter P41 ON.

(An internal contactor open output condition indicates an abnormal condition.)

9. Pulse Synchronization Signal: Terminal Numbers: 21, 22

An internal open collector signal turns ON during peak current flow.

The pulse synchronization signal is output only the when frequency is less than 20Hz.

Terminal 21, open collector (50mA max)

Terminal 22, return.

Note: The open collector signal logic can be inverted by turning internal parameter P25 ON.

(An internal open collector signal turns ON during base current flow.)

10. External Peak (welding) Current Setting Signal: Terminal Numbers: 23, 24, 25

The peak current (welding current) can be set within the range of 5-300A remotely by utilizing a 0-10VDC analog voltage.

Terminal 23, +10VDC output.

Terminal 24, 0~10VDC analog signal input.

Terminal 25, return.

This remote function is available when the Change REMOTE Mode button is ON.

Change REMOTE Mode button is set to ON...

External current setting value: ENABLED, Panel current setting value: DISABLED.

Change REMOTE Mode button is set to OFF...

External current setting value: DISABLED, Panel current setting value: ENABLED.

11. Scaled Output Main Voltage Signal: Terminal Numbers: 26, 28

Monitor voltage is output in the ratio of 1V to main output voltage of 10V.

Terminal 26: scaled output voltage signal (5mA max)

Terminal 28: return

12. Scaled Output Main Current Signal: Terminal Number: 27, 28

Monitor voltage is output in the ratio of 1V to main output current of 100A.

Terminal 27: scaled output current signal (5mA max)

Terminal 28: return



☆ Wire the signal lines of terminal numbers 23 to 28 separately from power lines such as input cable and output cable (base material cable, torch cable).

5.2. SAVE/LOAD FUNCTIONS

You can save and load configured welding conditions (welding process, welding sequence, parameters, REMOTE setting).

Up to 30 sets of welding conditions can be saved.

• SAVE procedure

Press the SAVE button. (*1)



Turn the Encoder to select the save number ("S.01" to "S.30") to display in the Parameter Display.



Press the SET button to save the welding parameters to the selected save data number.

- (*1) Press the SAVE button again to cancel the operation.
- LOAD procedure

Press the LOAD button. (*2)



Turn the Encoder to the right

to select the saved data number ("L.1" to "L.30") you want to load in the Parameter Display.



Press the SET button to load the welding conditions previously saved from the saved data number.

- (*2) Press the LOAD button again to cancel the operation.
- NOTE: When SAVEing and LOADing configured welding conditions, be aware that S.01~S.15 can be accessed by both the front panel display and the External Input/Output Signal Terminal Block. Configured welding conditions S.16~S.30 can only be accessed utilizing the front panel display.

5.3. HISTORY FUNCTION

When welding, after the welding parameters have been changed, the previous 5 sets of welding parameter settings have been stored and can be reloaded.

• Load history procedure

Press the LOAD button. (*1)



Turn the Encoder to select the history number ("L. -1" to "L. -5") you want to load in the Parameter Display. (*1)

Example: When you want to load the welding condition that was used two times before the current welding conditions, select -2.



Press the SET button to load the welding conditions that correspond to the displayed history number.

(*1) Press the LOAD button again to cancel the operation.

5.4. CONTROL PANEL LOCK FUNCTION

When the control panel lock function is turned ON, welding setting and parameter operation changes via the control panel are disabled.

• Set control panel lock procedure

Simultaneously press the SET button and the PILOT CUR. DISPLAY button.



The control panel lock function turns ON. (*1)

- (*1) In this state, welding parameters and the welding conditions cannot be changed.
 The GAS CHECK button, the Change Parameter buttons, the PILOT ON/OFF button, the PILOT CUR.
 DISPLAY button and the Lower Section Digital Parameter Display Switch button can be used. (If a disabled operation is attempted, "LOC" is displayed in the Parameter Display.
- Reset control panel lock procedure

Password ON selected (*2)

Password OFF selected (*2)

Turn the Encoder to enter the password set value with internal parameter P31 and press the SET button. (*3) (*4)

The control panel lock function turns OFF.

- (*2) See section "6.1.7. [P31] CONTROL PANEL LOCK PASSWORD SETTING"
- (*3) If the password is mistakenly input 3 times, the power supply returns to the original panel lock state.
- (*4) If you forget the password, the setting can be reset by entering "309".

6. INTERNAL PARAMETER SETTING

6.1. INTERNAL PARAMETER DESCRIPTION

The settings of the internal parameters can be changed for the following functions. The settings are changed by displaying the function code on the digital panel meter.

FUNCTION	FUNCTION	CONFIGURABLE	UNIT	DEFAULT
CODE		RANGE		SETTING
P14	Peak Current Maximum Setting	OFF/ON	-	ON
P19	2T Slope Function	OFF/ON	-	OFF
P20	Select 4T/4TS	OFF(4T)/ ON(4TS)	-	OFF
P21	Select 4T/REPEAT	OFF(4T)/ ON(REPEAT)	-	OFF
P25	Pulse Synchronization Signal Output Logic Inversion	OFF/ON	-	OFF
P26	OK to Move Current Detect Signal Output Logic Inversion	OFF/ON	-	OFF
P27	Pilot Current Detect Signal Output Logic Inversion	OFF/ON	-	OFF
P31	Control Panel Lock Password Setting	OFF/ON	-	OFF
P36	Pilot Ignition Gas Flow Amount	0.0 to 5.0SCFH	0.1SCFH	0.0SCFH
P37	Gas Slope Function	OFF/ON	-	OFF
P40	External Call of User Saved Data	OFF/ON	-	OFF
P41	Error Signal Output Logic Inversion	OFF/ON	-	OFF

6.1.1. [P14] PEAK CURRENT MAXIMUM SETTING

Set the operation of peak current when in REMOTE Mode (when the Change REMOTE Mode button is ON) The peak current value to the remote controller outlet or peak of external input output signal (welding) current order input (0-10V) is

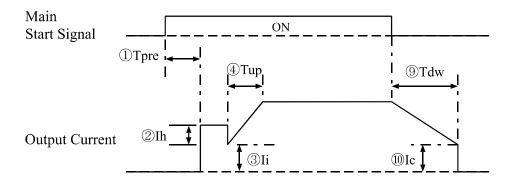
ON : It changes by the range of minimum current (5A) to Maximum current (300A).

OFF : It changes by the range of minimum current (5A) to panel setting current value.

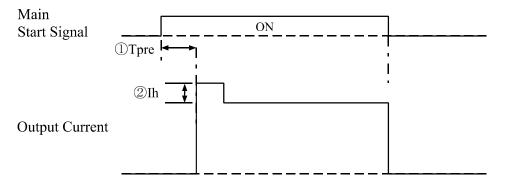
6.1.2. [P19] 2T SLOPE FUNCTION

This function controls the slope in 2T mode. When the function is enabled (ON), the UP SLOPE, DOWN SLOPE, INITIAL CUR, and CRATER CUR settings are available for modification. The output current waveform when this function is enabled and when it is disabled (OFF) is shown in the following figures.

2T SLOPE FUNCTION ON



2T SLOPE FUNCTION OFF

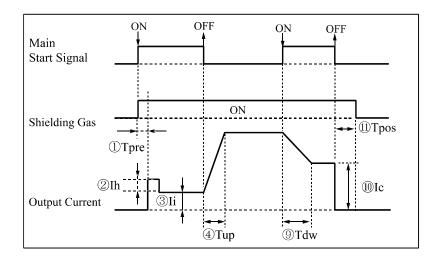


6.1.3. SELECT [P20] 4T/4TS, SELECT [P21] 4T/REPEAT

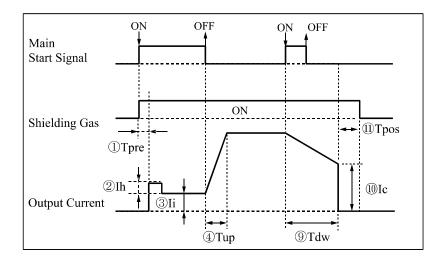
In [P20], when 4T mode is selected and the main start signal is turned OFF during the down slope, this function selects whether or not to end welding after sloping down to CRATER CUR. In [P21], select to have REPEAT mode enabled or disabled when you select 4T mode.

MODE	P20 SETTING	P21 SETTING
4T mode	OFF	OFF
4TS mode	ON	OFF
REPEAT mode	OFF	ON

4T mode: End welding at the same time as the main start signal turns OFF.



4TS mode: End welding after sloping down to CRATER CUR.



REPEAT mode: see section "4.3.2.3. REPEAT MODE".

6.1.4. [P25] PULSE SYNCHRONIZATION SIGNAL OUTPUT LOGIC INVERSION

Select logic inversion or not for the pulse synchronization signal (terminal number: 21, 22).

ON : Open Collector Signal turns ON when base current flows.OFF : Open Collector Signal turns ON when peak current flows.

6.1.5. [P26] OK TO MOVE CURRENT DETECT SIGNAL OUTPUT LOGIC INVERSION

Select logic inversion or not for the OK to move current detect signal (terminal number: 15, 16).

ON : Contact "OPEN" when main current flows.

OFF : Contact "CLOSE" when main current flows.

6.1.6. [P27] PILOT CURRENT DETECT SIGNAL OUTPUT LOGIC INVERSION

Select logic inversion or not for the pilot current detect signal (terminal number 17, 18).

ON : Contact "OPEN" when pilot current flows.

OFF : Contact "CLOSE" when pilot current flows.

6.1.7. [P31] CONTROL PANEL LOCK PASSWORD SETTING

This function selects whether or not to set a password when resetting the control panel lock.

ON: Set password.

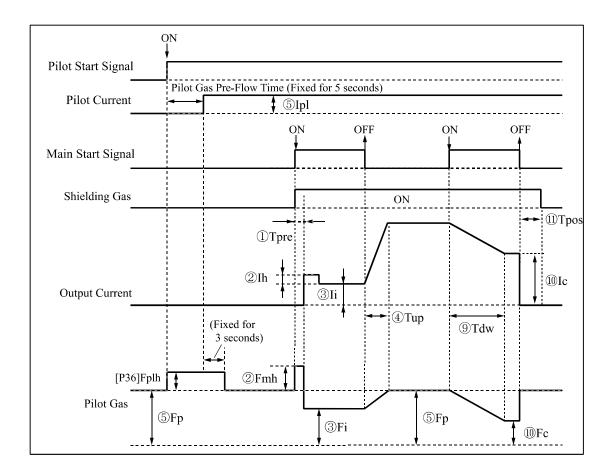
OFF: Do not set password. (Initial setting)

6.1.8. [P36] PILOT IGNITION GAS FLOW AMOUNT

Set Pilot Ignition Gas Flow amount. This function [P37] is available only when gas slope function is ON. The Pilot Ignition Gas Flow function is only available on power supplies equipped with the optional mass flow controller.

6.1.9. [P37] GAS SLOPE FUNCTION

By ON setting, it enables the setting of pilot gas control (Pilot Ignition Gas, Main Ignition Gas, Initial Welding Gas, Peak Welding Gas Flow amount, Pilot Gas Flow amount, Crater Welding Gas). Gas Slope functions are only available on welding power supplies equipped with the optional mass flow controller.



6.1.10. [P40] EXTERNAL CALL OF USER SAVED DATA

By ON setting, it enables the external call of user saved data function. By press the Lower Section Digital Parameter Display Switch button, display the External File Selection number, you can check the current file number. File number is changed depending on the input signal to External Input Output Signal Terminal Block.

6.1.11. [P41] ERROR SIGNAL OUTPUT LOGIC INVERSION

Select logic inversion or not for the error signal (terminal number: 19, 20).

ON : Contact "OPEN" when an abnormality occurs.

OFF : Contact "CLOSE" when an abnormality occurs.

6.2. PROCEDURE TO CHANGE INTERNAL PARAMETERS

6.2.1. PROCEDURE TO CHANGE INTERNAL PARAMETERS

Press and hold the SET button (3 sec). Turn the Encoder to display the internal parameter that you want to change on the Parameter Display and press the SET button. Turn the Encoder to set the desired setting and press the SET button. Turn the Encoder to display "End" on the Parameter Display and press the SET button. 6.2.2. PROCEDURE TO CHANGE INTERNAL PARAMETERS (P31) Press and hold the SET button (3 sec). Turn the Encoder to display the internal parameter (P31) that you want to change on the Parameter Display and press the SET button. Turn the Encoder to select password setting ON/OFF and press the SET button. Password ON setting Password OFF setting Turn the Encoder to set the desired password and press the SET button.

Turn the Encoder to display "End" on the Parameter Display and press the SET button.

(Configurable range: "000" to "999")

7. DAILY INSPECTION

To optimally maintain the performance of the welding power supply and to work safely and efficiently, regularly inspect and maintain the welding power supply.

NOTE DAILY	3- TO 6-MONTH INSPECTION	
Operation of the switches		
Cooling fan rotation (Qty. 2)		
Unusual vibrations, buzzing, or odor	Torch, work lead damage	
Gas leaks		
Cable connections		

The welding power supply uses multiple semiconductor components such as IGBTs and diodes. Carelessly measuring the insulation resistance and dielectric strength may lead to injury to the operator or others or to welding power supply breakdown. If these tests are necessary, contact the retailer from which you purchased the welding power supply in order to request these tests from a service center specified by Sansha Electric Mfg. Co., Ltd.



 $\not\approx$ Be extremely careful not to electrocute yourself when testing insulation resistance and withstand voltage.

- Cleaning the interior of the welding power supply:
 - Once or twice every 6 months, remove the top panel and side panels and remove any dust in the interior using compressed air
- Warning against electric shock:
 - If you discover any conductors exposed on the input terminals or the cables, immediately replace them with new cables.
- Maintenance and inspection precautions:
 - If the top panel or side panels are removed for maintenance or inspection, always ensure that the top panel and side panels are attached in their original location before operating the welding power supply once again. Please be aware that the internal cooling efficiency is reduced and may cause damage to the transformers and semiconductors if the welding power supply is operated with the panels removed.
- Inspecting the tungsten electrode:
 - If the tip of the tungsten electrode becomes round or dirty, use a new electrode otherwise HF will travel with more difficulty and the electrode will lose the ability to concentrate the arc. (*1)
 - A finer welding effect will be achieved by regularly taking care of the electrode.
 - (*1) The electrodes used in plasma welding are manufactured to exacting tolerances. Do not regrind or polish the electrode, replace it with a new electrode. If the point of the electrode is not centered it will cause premature failure of the tip.

8. DIAGNOSING FAILURES

8.1. ERROR CODE LIST

Error codes are displayed on the Parameter Display and you may no longer be able to weld. This table summarizes the occurrence conditions and recovery conditions of the error codes.

ERROR CODE	ERROR NAME	OCCURRENCE CONDITION	RECOVERY CONDITION	
E01	Abnormal temperature in the main primary circuit / Case open error	The main primary circuit semiconductor device in the welding power supply has exceeded the rated value. / The right side case is disconnected.	When the temperature of the primary circuit semiconductor device in the welding power supply is less than the rated value, the error will reset. (*1) / Attach the right side case. (*1)	
E02	Abnormal temperature in the main secondary circuit	The main secondary circuit semiconductor device in the welding power supply has exceeded the rated value.	When the temperature of the secondary circuit semiconductor device in the welding power supply is less than the rated value, the error will reset. (*1)	
E03	Main primary over current abnormality	Overcurrent flows in the main primary circuit.	First turn OFF the power supply and eliminate the cause of the error, then recover by turning the power supply ON again.	
E05	Current detection error	An error has occurred in the output current detection signal of the primary circuit inverter.		
E08	Start signal error	The start signal is ON when the power supply was turned ON.	Turn OFF the start signal. (*1)	
E09	Emergency stop	The emergency stop signal was input to the automated machine terminal block.	Turn OFF the emergency stop signal. (*1)	
E11	Input overvoltage error	The input voltage has risen above the rated value.	_	
E12	Low input voltage error	The input voltage has dropped below the rated value.	Use the welding power supply within its rating. (*1)	
E14	Low input voltage warning	The input voltage has dropped below the rated value.		

^(*1) The error alarm sound will stop when the error condition is remedied. The indication of error code is cancelled and returns back to normal by pressing the SET button.

^{*} If the error code is displayed again, even after you take the action listed in the action column in the table above, please contact our business office.

E21	Abnormal temperature in the pilot primary circuit / Pilot fan error	The pilot primary circuit semiconductor device in the welding power supply has exceeded the rated value. / Pilot circuit fan is not rotating.	When the temperature of the pilot primary circuit semiconductor device in the welding power supply is less than the rated value, the error is reset. (*1) / First turn OFF the power supply and eliminate the cause of the error, then recover by turning the power supply ON again.
E22	Abnormal temperature in the pilot secondary circuit	The pilot secondary circuit semiconductor device in the welding power supply has exceeded the rated value.	When the temperature of the pilot secondary circuit semiconductor device in the welding power supply is less than the rated value, the error is reset. (*1)
E23	Pilot Ignition failure	Pilot Arc was not established within 3 seconds of Pilot Output ON signal, or, unexpected Pilot Arc outage detected.	Please turn "OFF" start signal. (*1)
E24	Main Ignition Failure	Main Arc was not established within 3 seconds of Main Output ON signal, or, unexpected Main Arc outage detected.	Please turn "OFF" start signal. (*1)
E33	Decrease of torch water flow amount / Abnormal temperature of torch water	When the returning water flow amount of the water cooling circulation device is less than the rated value. / When the returning water temperature of the water cooling circulation device exceeds the rated value.	Increase the flow amount to more than rated value. (*1) / Reduce the water temperature below the rating. (*1)
E34	Coolant Conductivity warning / Input phase failure warning	Coolant fluid conductivity reading is higher than rated value. / Incorrect single phase AC input power wiring detected.	Please replace the coolant. / Correct the input phase connection. (Refer to section 3.4. WIRING THE INPUT CABLE)
E35	Pilot gas pressure drop	Input pressure of pilot gas is lower than rated value.	Please raise a gas pressure more than rated value. (*1)
E36	Shied gas pressure drop.	Input pressure of shield gas is lower than rated value.	Please raise gas pressure more than rated value. (*1)

^(*1) The error alarm sound will stop when the error condition is remedied. The indication of error code is cancelled and returns back to normal by pressing the SET button.

^{*} If the error code is displayed again, even after you take the action listed in the action column in the table above, please contact our business office.

E37	Pilot primary over current abnormality	Overcurrent flows in the pilot primary circuit.	
E81	Link Setting is mismatched.	AC input voltage setting of terminal block TB2 and the detected that the AC input voltage does not match.	First turn OFF the power supply and eliminate the cause of the error, then
E82	Link Switch signal abnormality	AC input voltage setting of terminal block TB2 abnormality detected.	recover by turning the power supply ON again.
E85	Pre charge abnormality	DC bus voltage is less than rated value when rated time passed after powered on.	
E86	Voltage balance abnormality	DC bus voltage abnormality. This error is available only when the AC input of 480V system is configured.	Use the welding power supply within its rating. (*1)
E99	Power reception detection error	An error has occurred in the input voltage power reception detection circuit.	First turn OFF the power supply and eliminate the cause of the error, then recover by turning ON the power supply again.

^(*1) The error alarm sound will stop when the error condition is remedied. The indication of error code is cancelled and returns back to normal by pressing the SET button.

^{*} If the error code is displayed again, even after you take the action listed in the action column in the table above, please contact our business office.

8.2. ACTIONS FOR ABNORMAL OPERATION

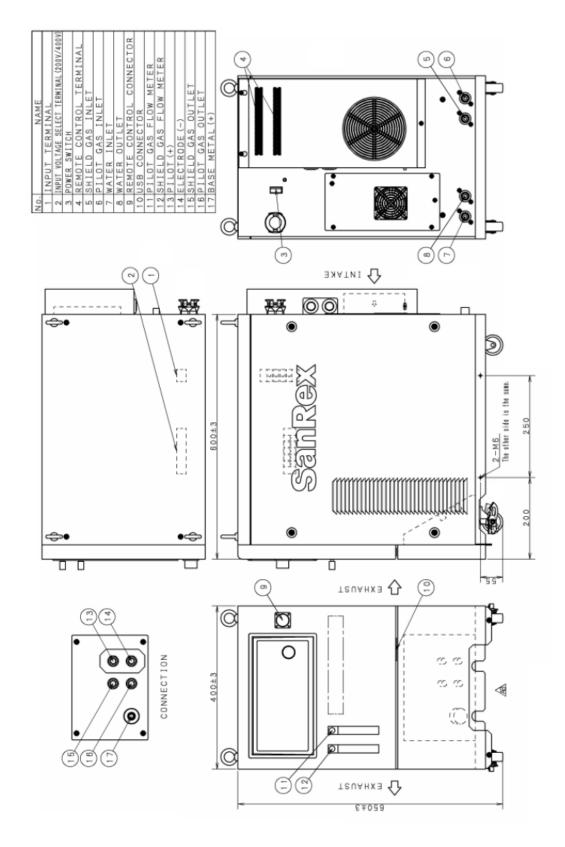
SYMPTOM	CAUSE	ACTION
The fan is not rotating Panel LEDs are OFF	 Distribution panel switch fuse is faulty. Bad input cable connection	Inspect the cable connections and securely tighten them.
The fan is not rotating Panel LEDs are ON	Control circuit is faultyFan is faulty	Contact our business office.
Error code displayed on the Parameter Display		See section "8.1. ERROR CODE LIST"
No gas flow when torch switch is pressed	 Torch switch is faulty or torch switch cable is broken Gas hose damage or loose connection 	Inspect with a tester and replace the switch or repair the cable. Repair the gas hose.
The arc does not initiate	 Bad torch cable or base metal cable connection Tungsten electrode is faulty 	Securely tighten the cables and repair when broken. Check for sharp pint and clean appearance of electrode. (*1)
HF does not stop even after the arc appears	Control circuit is faulty	Contact our business office
Cannot adjust the output current	Control circuit is faulty	Contact our business office
Severe tungsten electrode consumption	 The current is too large for the electrode diameter No gas is flowing or the flow rate is insufficient The electrode is touching the base metal during welding or when starting The torch is connected to the 	Use the appropriate electrode for the current. Set the appropriate flow rate for the gas Do not touch the electrode to the base metal Connect the torch to the (-) side.
The arc is unstable	 (+) side. The welding current is small for the electrode diameter The electrode has oxidized or is dirty 	Use the appropriate electrode for the current. Use a new electrode. (*1)

^(*1) The electrodes used in plasma welding are manufactured to exacting tolerances.

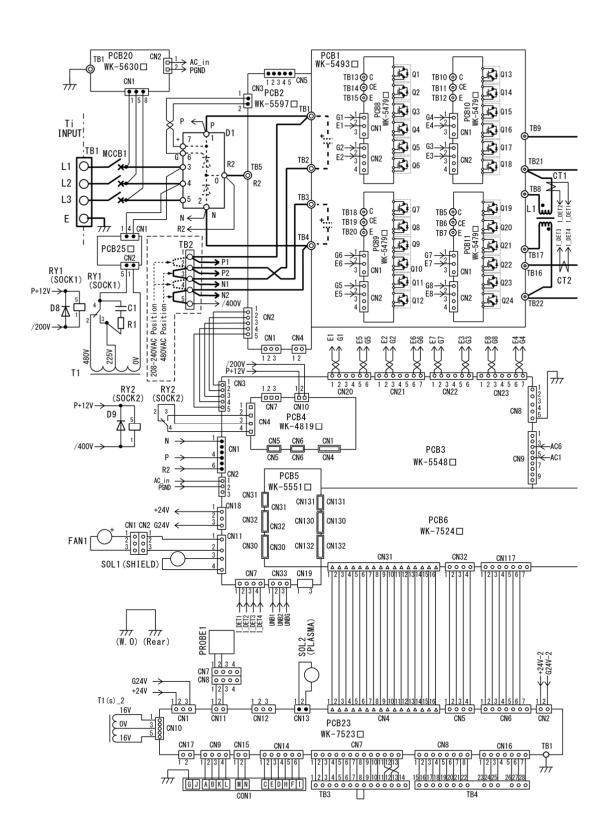
Do not regrind or polish the electrode, replace it with a new electrode.

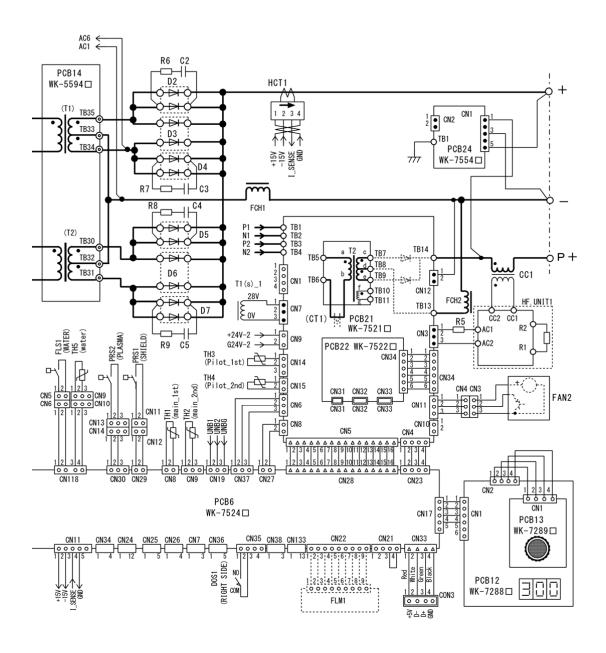
If the point of the electrode is not centered it will cause premature failure of the tip.

9. OUTLINE DRAWING



10. CONNECTION DIAGRAM





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11. APPENDIX A

11.1. AUTOMATION I/O RELATIONSHIP SUMMARY

300PW				END USER	INVERSION Y/N
	14-PIN		TB3		
	A B K L	MAIN START SIGNAL	1		N
			2		
		PILOT START SIGNAL	3		N
			4		
		GAS CHECK SIGNAL	5		N
			6		
		E-STOP	7		N
		SIGNAL	8		N
			9		
		LICED CAVED FILE	10		
		USER SAVED FILE SELECTION SIGNAL	11		N
			12		
			13		
			TB4		
	М	OK TO MOVE SIGNAL	15		Υ
	N		16		WITH P26 ON
		PILOT CURRENT DETECT	17		Υ
		SIGNAL	18		WITH P27 ON
• •		ERROR DETECT SIGNAL	19		Υ
			20		WITH P41 ON
_/		PULSE SYNC SIGNAL	21	30VDC MAX	Υ
Na		(OPEN COLLECTOR)	22	50mA MAX	WITH P25 ON
+10VDC (2mA) ►	С	PEAK CURRENT OUTPUT	23		
CONTROL SIGNAL ◀	Е	ADJUSTMENT	24	 -Ū	N
SIGNAL RETURN	D	SIGNAL	25		
1/10V OUT	Н	V OUT SIGNAL	26	5mA MAX LOAD	N
1/100A OUT	F	A OUT SIGNAL	27	5mA MAX LOAD	N
SIGNAL RETURN	I	V/A OUT COMMON	28		N
GROUND	G				



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