

INVERTER WELDING TRANSFORMER

IT-H930A6W

OPERATION MANUAL



Thank you for purchasing our product.

- Before using this Transformer, read this operation manual carefully until you have familiarized yourself with it.
After reading keep the manual in place where operators can refer to it at any time.

Contents

1. Special Precautions	1-1 to 1-5
2. Name and Function of Each Section	2-1
3. Installation and Connection	3-1 to 3-3
4. Specifications	4-1 to 4-4
5. Maintenance	5-1
6. Troubleshooting	6-1
7. Outline Drawing	7-1 to 7-2
8. Duty Cycle Graph.....	8-1

1. Special Precautions

(1) Safety Precautions

Before using, read "Safety Precautions" carefully to understand the correct method of use.

- These precautions are shown for safe use of our products and for prevention of damage or injury to operators or others. Be sure to read each of them, since all of them are important for safety.
- The meaning of the words and symbols is as follows.

DANGER

Denotes operations and practices that may imminently result in serious injury or loss of life if not correctly followed.

WARNING

Denotes operations and practices that may result in serious injury or loss of life if not correctly followed.

CAUTION

Denotes operations and practices that may result in personal injury or damage to the equipment if not correctly followed.



These symbols denote "prohibition". They are warnings about actions out of the scope of the warranty of the product.



These symbols denote actions which operators must take.



Each symbol with a triangle denotes that the content gives notice of DANGER, WARNING or CAUTION to the operator.

DANGER



Do not touch the "terminal block" on the rear panel of the Welding Transformer.

Since very high voltage is applied to the "Terminal block", it is very dangerous to touch it unnecessarily. When connecting or disconnecting a cable, be sure to turn off the power. After connecting the cable, install the terminal cover so that operator can not touch the terminal block during work.



Never disassemble, repair or modify the Transformer.

These actions can cause electric shock and fire. Consult your distributor or us for repair and maintenance. Use the unit without any modification.



Never burn, destroy, cut, crush or chemically decompose the Transformer.

These actions can cause injury and explosion.

WARNING



Do not put your hands between the electrodes.

When welding, keep your fingers and hands away from the electrodes.



Ground the Transformer.

If the Transformer is not grounded, you may get an electric shock when there is trouble, or when electricity leaks.



Use the rated voltage.

Applying a voltage exceeding rated voltage can cause abnormal heat and fire.



Do not touch +/- terminal, secondary cable, any welded part or electrodes during welding and just after welding finished.

These parts are very hot while and right after processing. Do not touch them; otherwise you may be burnt.



Securely connect only specified cables.

Use of a cable of insufficient capacity or loose connection can cause fire and an electric shock.



Do not damage the connecting cables.

Do not tread on, twist or tense any cable. The connecting cables may be broken, and that can cause electric shock, short and fire. When repairing or replacing, consult us or your distributor.



Stop the operation if any trouble occurs.

Continuous operation after occurrence of a trouble such as burning smell, abnormal sound, abnormal heat, smoke, etc. can cause electric shock and fire. If such a trouble occurs, immediately consult us or your distributor.



Wear protective glasses.

If you look at the flash directly during welding, your eyes may be damaged. If any spatter gets in your eye, you may lose your eyesight.



Persons with pacemakers must stay clear of the welding transformer.

A person who uses a pacemaker must not approach the welding transformer or walk around the welding shop while the welding transformer is in operation, without being permitted by his/her doctor. The welding transformer generates a magnetic field and has effects on the operation of the pacemaker while it is turned on.



Protective gear must be worn.

Put on protective gear such as protective gloves, long-sleeve jacket, leather apron, etc. Spatter can burn the skin if they touch the skin.

CAUTION



Do not use this Transformer for any purpose other than welding.

Use of this Transformer in a manner other than specified can cause electric shock and fire.



Use proper tools (wire strippers, pressure wire connectors, etc.) for termination of the connecting cables.

Do not cut the wire conductor. A flaw on it can cause fire and electric shock.



Install the Transformer on firm and level surface.

If the Transformer falls or drops, injury may result.



Do not splash water on the Transformer.

Water splashed over the electric parts, can cause electric shock and short-circuits.



Do not place a water container on the Transformer.

If water spills, insulation will deteriorate, and this may cause electric leak and fire.



Keep combustible matter away from the Transformer.

Spatter can ignite combustible matter. If it is impossible to remove all combustible matter, cover them with non-combustible material.



Do not cover this Transformer with a blanket, cloth, etc.

Do not cover this Transformer with a blanket, cloth, etc. while you are using it. The cover may be overheated and burn.



Keep a fire extinguisher nearby.

Keep a fire extinguisher in the welding shop in case of fire.



Use ear protectors.

Loud noises can damage hearing.



Maintain and inspect the Transformer periodically.

Maintain and inspect the Transformer periodically, and repair any damage nearby before starting operation.

(2) Precautions for Handling

- When transporting or moving the Transformer, do not lay it down. Also, handle the Transformer with care so as not to make an impact such as drop on it.
- Install this Transformer securely on a firm and level surface. If it is inclined malfunction may result.
- Do not install this Transformer in the following places:
 - Damp places where humidity is higher than 90%,
 - Hot or cold places where temperatures are above 40°C or below 5°C,
 - Places near a high noise source,
 - Places where chemicals are handled,
 - Places where water will be condensed,
 - Dusty places,
 - Places exposed to large amounts of vibration or shock, and
 - Places at an altitude above 1000 meters.
- For better radiative effect, leave a space of 20 cm or more against the wall.
- Clean the outside of the Welding Transformer with a soft, dry cloth or one wet with a little water. If it is very dirty, use diluted neutral detergent or alcohol. Do not use paint thinner, benzine, etc., since they can discolor or deform the Welding Transformer.
- Operate the Transformer according to the method described in this operation manual.
- To use the transformer, it is necessary to prepare the welding power supply, the welding head, and secondary cables for connecting to the welding head, and so on.
- For the coolant use city water or water for industrial use. Note that the water temperature, flow rate and water pressure fall within the specified range.
- Verify that contents of the container agree with the kit list. If you see any the deficiency, please contact us.

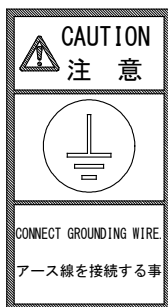
Packaged Kit	Quantity
IT-H930A6W	1
Voltage-sensing cable	1

(3) On Disposal

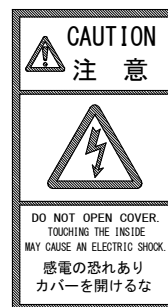
At the time of disposal this product, dispose of it as general industrial waste.
In addition, if there are related ministerial ordinances in the area where you use the product, please dispose of it in accordance with those ministerial ordinances.

(4) Warning Labels

A warning label is pasted on the welding power supply unit for safe use. The pasting place and meaning of each label are as shown below.



Pasting place: Front side of the upper part of the main unit
Meaning: Caution for grounding wire connection



Pasting place: Front side of the upper part of the main unit
Meaning: Danger of electric shock

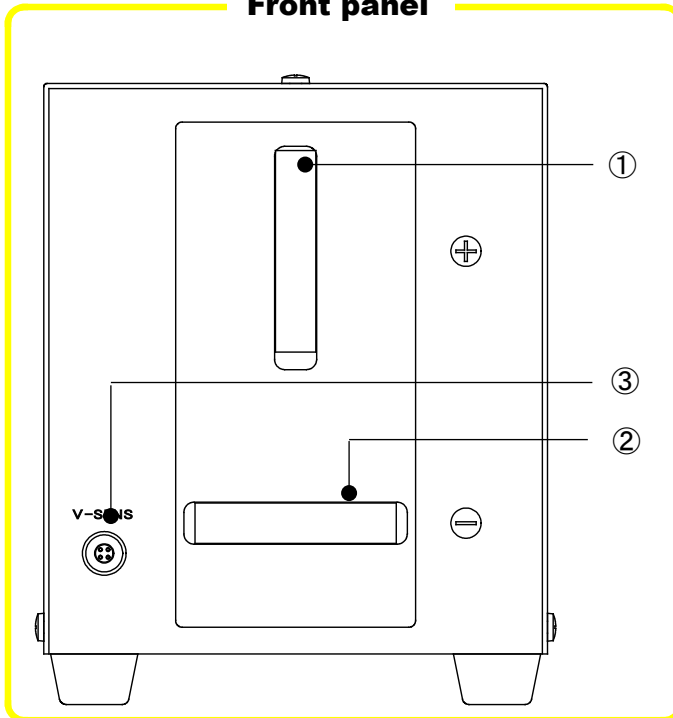
2. Overview

(1) Inverter Welding Transformer

An inverter welding transformer is a type of transformer that supplies welding current by converting the high-voltage, high-frequency AC current output of an inverter welding power supply into DC current by using a built-in rectifier diode.

(2) Name and Functions of Each Section

Front panel



① [+] terminal

Connect the positive (+) cable of the welding head to this terminal.

② [-] terminal *

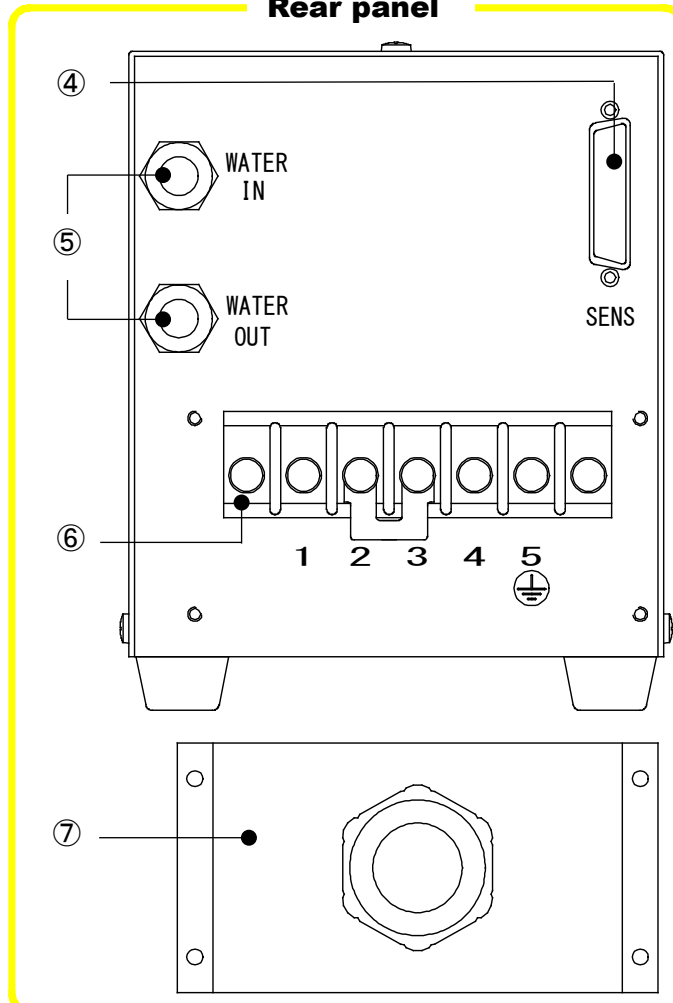
Connect the negative (-) cable of the welding head to this terminal.

③ [V-SENS] connector

Connect the plug of the attached voltage-sensing cable. Connect the other end of this cable to a screw near the electrode, such as by co-tightening it to the electrode holder of the welding head.

* [-] terminal is connected to chassis with a 100 Ω of resistance.

Rear panel



④ [SENS] connector

This is a connector for connecting to our inverter welding power supply with a sense cable sold separately.

⑤ Hose connector

Connect cooling water hoses to [WATER IN] and [WATER OUT] connectors. An outside diameter of these connectors is 10.5 mm. [WATER IN] connector is for supply, and [WATER OUT] connector is for discharge. Supply hoses with 35°C or less water and at 3 L/min minimum.

⑥ Terminal block

Connect the output cables (sold separately) to these terminals and to our inverter welding power supply. Terminal screw M5 $\times$ 12

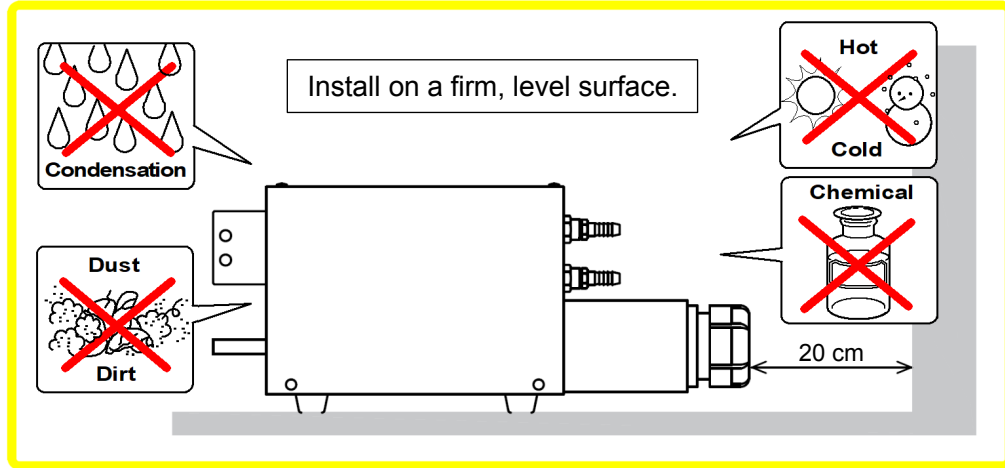
⑦ Terminal cover

This cover is installed so that a worker will not touch the terminal block directly. Keep this cover installed normally.

3. Installation and Connection

(1) Place for installation

Install **IT-H930A6W** in a well-ventilated place and make a clearance of at least 20 cm from the surrounding walls to extract the full performance.



(2) Connection

After deciding where to install **IT-H930A6W**, connect it to the other devices according to the explanatory drawings on pages 3-2 to 3-3.

Notice

Explanatory drawing shows how to connect with MH-31AC welding head and IS-300A welding power supply.
The way of connection varies with the type and usage of the devices to be used. For connection, refer instruction manual of each device.
And make sure to turn off the supplying power before connecting work.

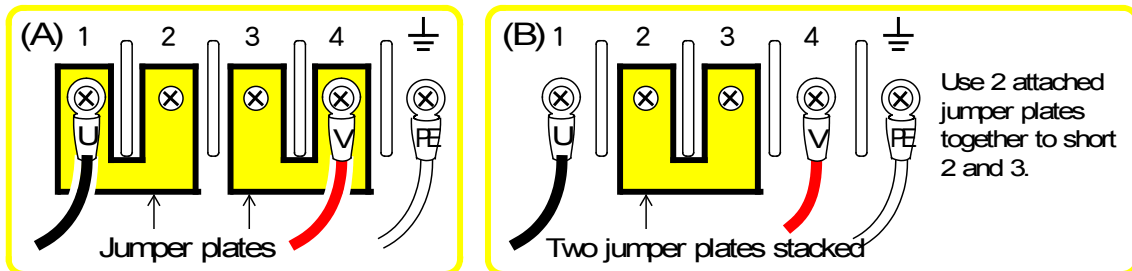
Connecting jumper plate

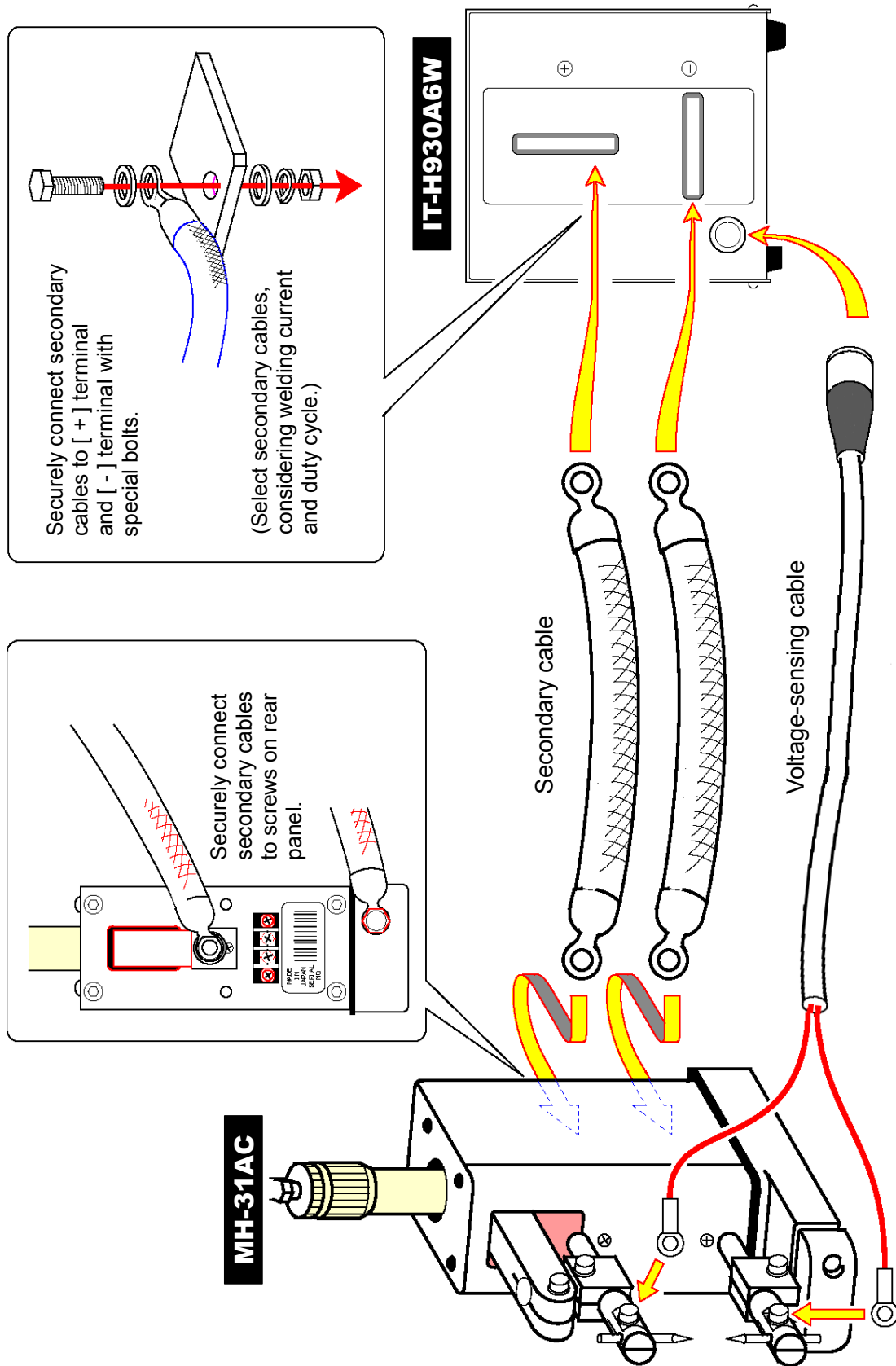
When the welding power supply voltage is 200 V to 240 V AC, connect the attached jumper plates to the terminals 1 and 2, and the terminals 3 and 4 as shown in the illustration (A);

When, 380 V to 480 V AC, two jumper plates to the terminals 2 and 3 as shown in the illustration (B).

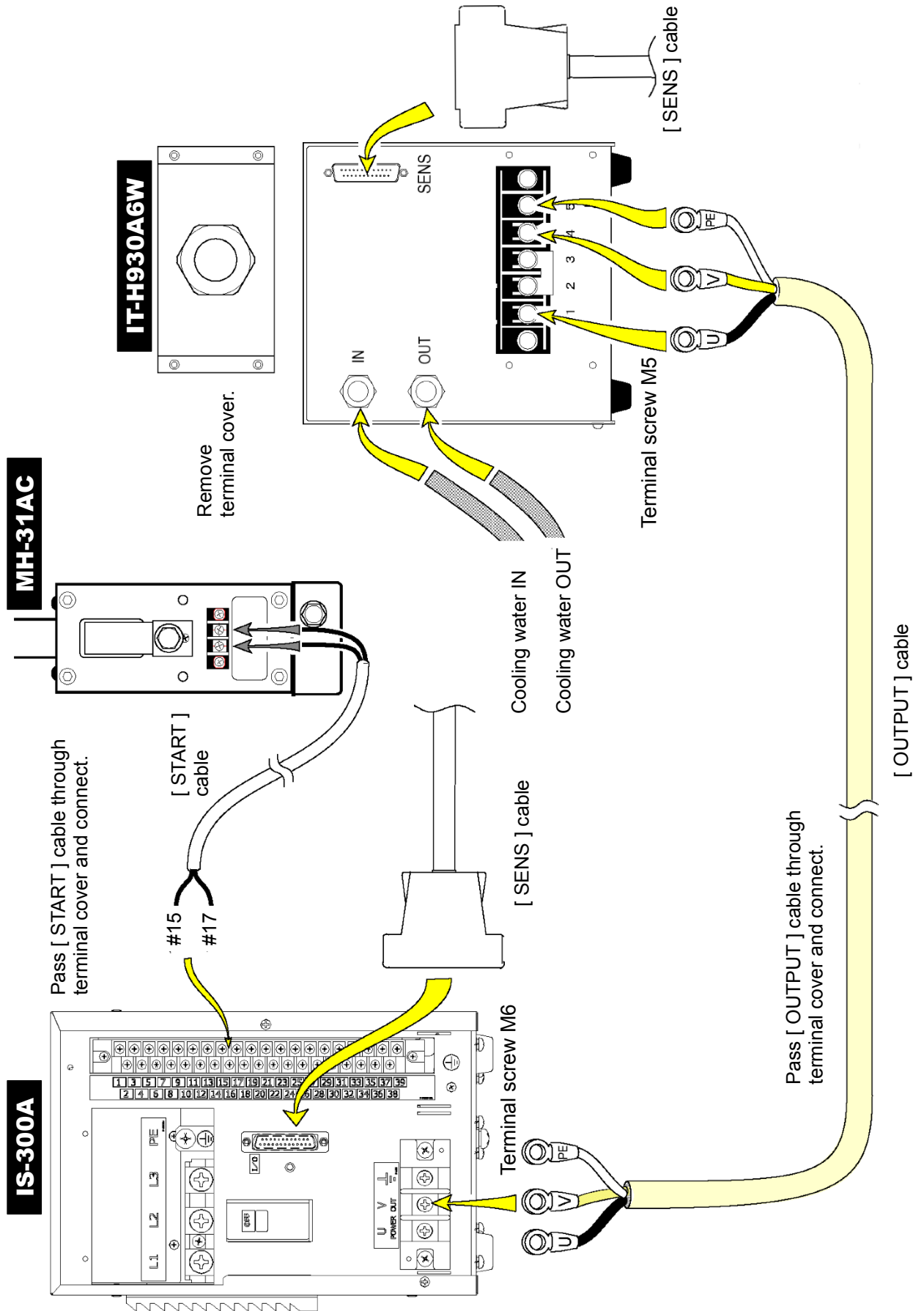
When the power supply voltage of the power supply part is 200 V to 240 V AC, the output voltage is 9.3 V with a connection shown in (A) and 4.6 V with a connection shown in (B).

The terminals are factory-wired as shown in (B).





Refer this page and next page to connect IT-H930A6W with peripheral devices. To connect with devices other than MH-31AC, refer instruction manuals attached to each device.



4. Specifications

(1) Product Specifications

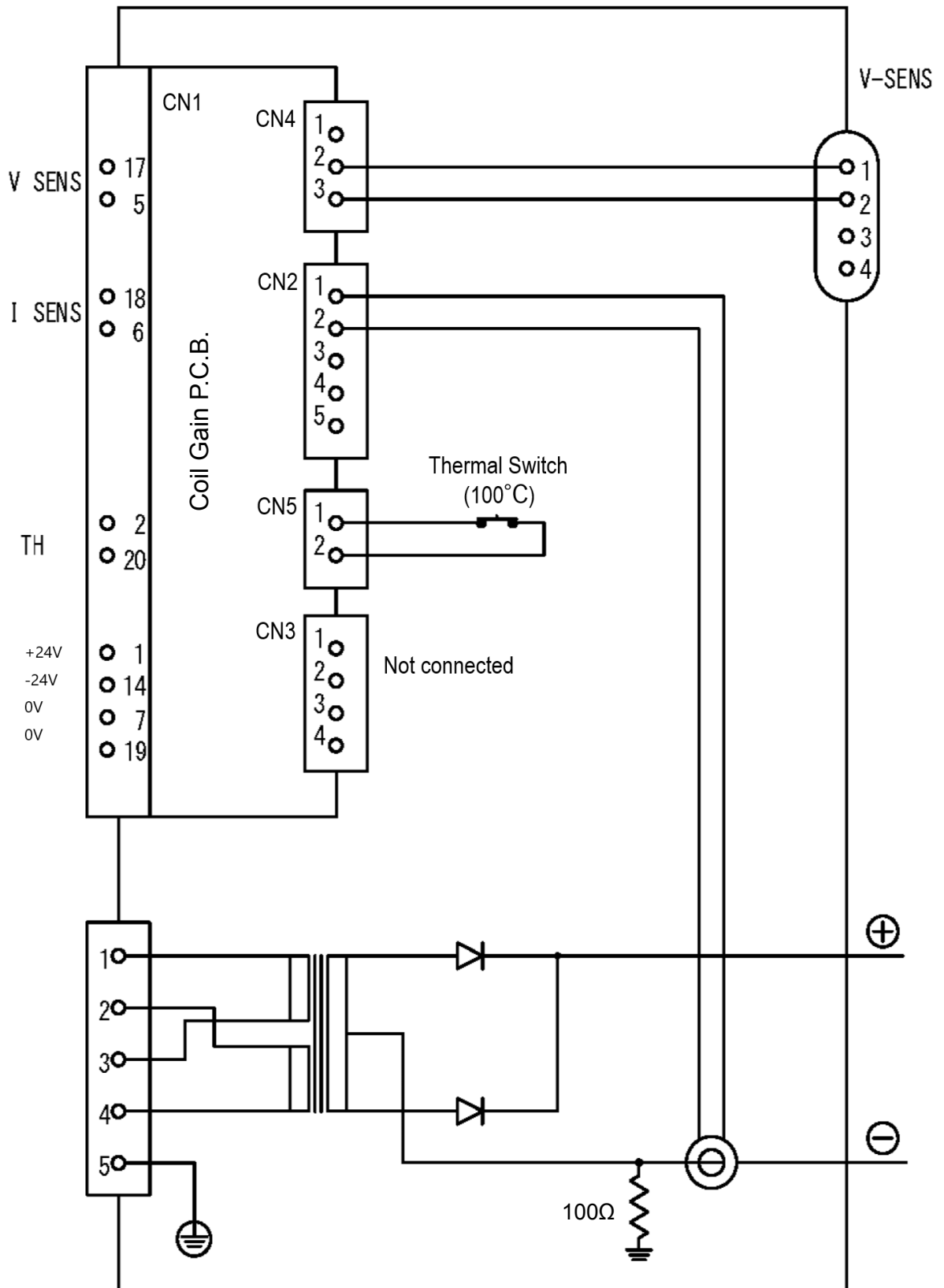
Rated capacity	32.5 kVA
Continuous capacity	13.9 kVA
Number of phases	1
Rated frequency	1 kHz
Rated input voltage	200–240 V AC welding power supply: 300 V 380–480 V AC welding power supply: 600 V
Rated No-load voltage ⁽¹⁾	200–240 V AC welding power supply: 9.3 V 380–480 V AC welding power supply: 4.6 V
Turn ratio	200–240 V AC welding power supply: 32:1 380–480 V AC welding power supply: 64:1
Max. short circuit current ⁽²⁾	10000 A
Continuous output current	1500 A
Max. duty cycle	8.5% (at 10000 A) NB: See 7. Duty Cycle Graph.
Cooling method	Water cooling
Rated cooling water flow	$\leq 35^{\circ}\text{C}$, $\geq 3\text{L/min}$ (Water pressure $\geq 0.15\text{Mpa}$, $\leq 0.25\text{Mpa}$)
Overheat protection	100°C thermostat switch (built-in)
Operating environment	Temperature 5°–40°C, Humidity 90% or less (Dew condensation not allowed), Altitude 1000 meters or lower Caution: Use this product in the environment without conductive dust. If conductive dust enters in the product, this may result in a failure, electric shock, or fire. When using this product in this environment, make contact with us.
Storage environment	Temperature -10°–55°C and dew condensation not allowed
Insulation class	H
Protection class	IP20

Protection class for electric shock	I
Compliance standards	GB15578-2008
Outline dimensions	185 mm (H) × 150 mm (W) × 363 mm (D) (Not including projections)
Weight	Approx. 13 kg
Accessories	Voltage-sensing cable × 1

(1) Excluding losses in diode.

(2) When circuit is shorten by our standard load(400μΩ)

(2) Operating Principle Diagram



(3) Main parts list

Product name	Quantity
Transformer	1
Thermal protector	1
Diode module	2

5. Maintenance

(1) Draining cooling water

In the following cases, please make sure to drain cooling water.

- When the transformer is moved or transferred.
- When the transformer is offline, and there is a possibility that the cooling water in pipes freezes.
- When the transformer is stored.

When the cooling water in pipes freezes, its volume expands for turning water into ice. Therefore there is a possibility of piping breakage and water leak.

Draining procedure

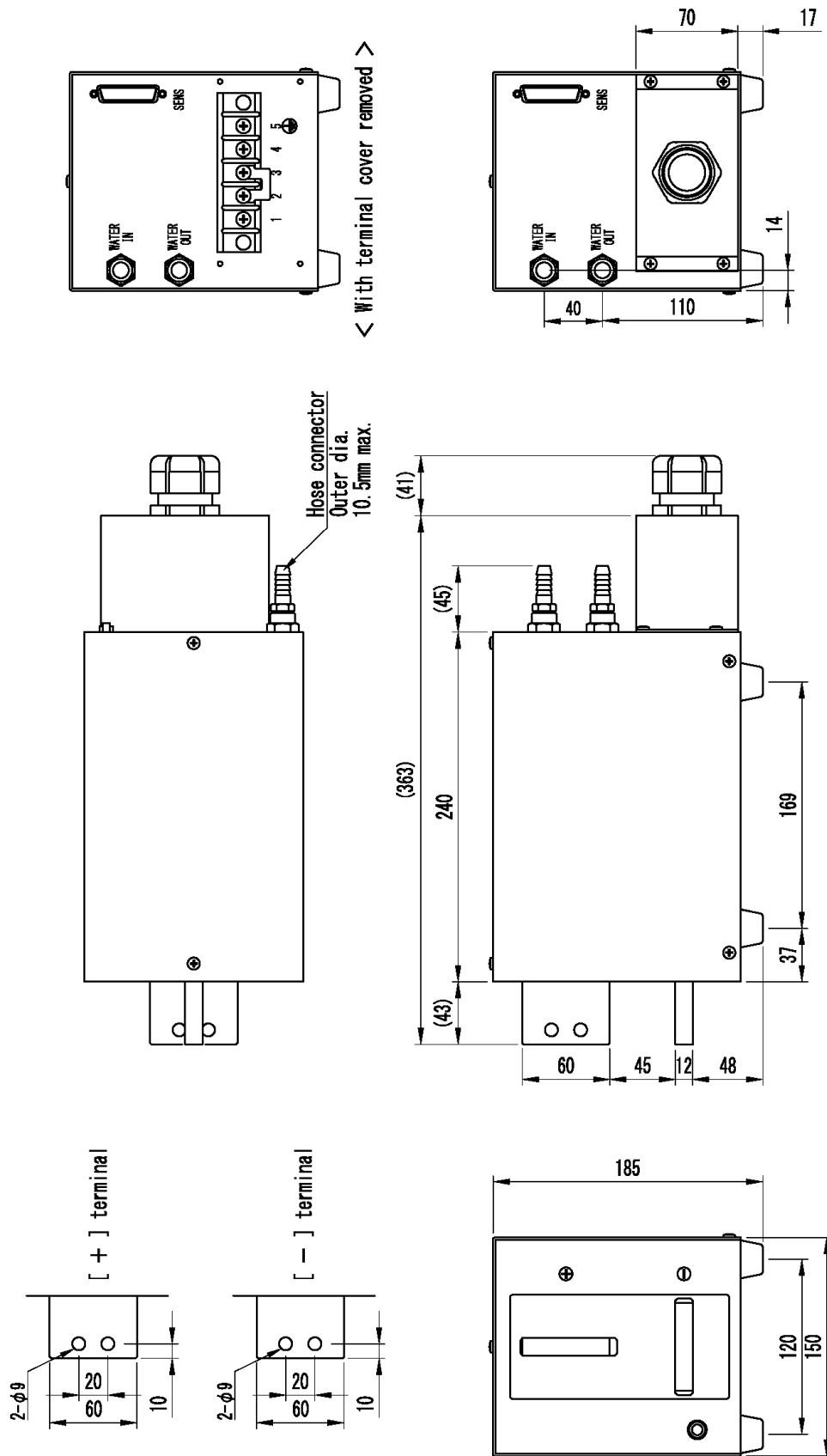
- 1) Remove 2 hoses from hose connectors on the rear panel and drain water.
Sometimes, cooling water spout out. Take care to avoid splashing water onto the transformer. If the transformer is splashed with water, wipe off it with a cloth thoroughly.
- 2) Blow clean compressed air which is under 0.3 MPa (approx. 3 kgf/cm²) into the feed water inlet or the discharge water outlet, and drain cooling water in pipes forcibly.
- 3) When you resume the supply of cooling water, please check whether hoses connect with the feed water and the discharge water outlet correctly, and check them for leaks.

6. Troubleshooting

Contents	Cause	Measures
Body of IT-H930A6W becomes hot extremely.	Cooling water does not flow.	Clean up cooling water circuit, especially cooling water hose.
Current does not flow.	Secondary cables are not connected correctly.	Check that all cables are connected correctly.
	Output cable is not connected correctly to the welding power supply.	
Current is reduced.	The connections of secondary cables oxidized. For example, secondary cables and electrode holder, or secondary cables and [+] / [-]terminal of, transformer, or electrode and electrode holder, and so on.	Disconnect secondary cables and polish their connections.
	Internal trouble of transformer	Consult us or your distributor.

7. Outline Drawing

(Dimensions in mm)



Specification sticker.

AMADA WELD TECH CO., LTD. 日本制造 生产地址: 95-3Futatsuka, Noda, Chiba, Japan 产品名称: 电阻焊机 产品型号: IT-H930A6W 执行标准: GB 15578-2008
焊接电流: ===== 额定空载电压: $U_{2d} = 9.3V$ 次级最大短路电流: $I_{2cc}=10000A$ (8.5%负载持续率) 负载状态下的输出电流: $I_{2R}=10000A$ ($400\mu\Omega$) 连续输出电流: $I_{2p} = 1500A$
相数及额定频率: 1 ~1kHz 额定输入电压: $U_{1N} = 1\sim300V/600V$ 8.5%负载持续率下的功率: $S_{8.5} = 93kVA$ 50%负载持续率下的功率: $S_{50} = 32.5kVA$ 100%负载持续率下的功率: $S_{100}(S_{ip}) = 13.9kVA$
额定冷却液流量: $Q = 3L/min$ 额定冷却液压降: $\Delta P = 0.15MPa$ 外壳防护等级: IP20 class I 变压器耐热等级: Class H 质量: $m=13\text{ kg}$

Address	95-3Futatsuka, Noda, Chiba, Japan
Product name	Resistance welding equipment Product model : IT-H930A6W
Compliance standards	GB15578-2008

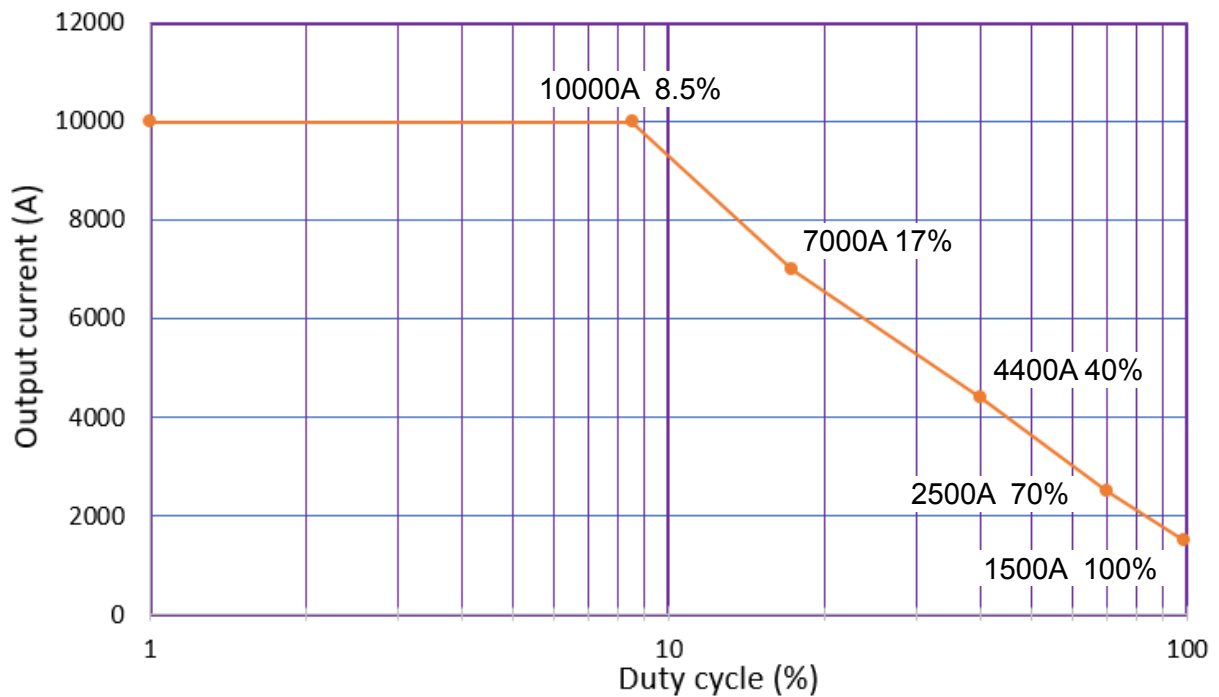
Weld current	===== DC
Rated no-load output voltage	$U_{2d} = 9.3V$
Maximum short-circuit current in class	$I_{2cc} = 10000A$ (8.5% Load duration)
Output current under load condition	$I_{2R} = 10000A$ ($400\mu\Omega$)
Continuous output current	$I_{2p} = 1500A$

Number of phases and rated frequency	1 ~1kHz
Rated input voltage	$U_{1N} = 1\sim300V/600V$
Power at 8.5% duty cycle	$S_{8.5} = 93kVA$
Power at 50% duty cycle	$S_{50} = 32.5kVA$
Power at 100% duty cycle	$S_{100} = 13.9kVA$

Rated flow rate	$Q = 3L/min$
Cooling liquid pressure drop	$\Delta p = 0,15Mpa$
Protection class	IP20
Protection class for electric shock	I
Insulation class	H
Mass	13kg

8. Duty Cycle Graph

Ambient temperature: 40°C



Note 1: Duty cycle graph is calculated based on the results of temperature evaluation tests which are done secondary side of transformer shorten with our standard load.

Note 2: Limit the continuous weld time to 900ms. If the continuous weld time exceeds 900ms, use the current at usage rate of 100%.