INVERTER WELDING TRANSFORMER

ITB-780C6

OPERATION MANUAL

AMADA®

AB04OM1214141-01

Thank you for purchasing our product.

- This operation manual explains its method of operation and precautions for use.
- Before using, read this operation manual carefully; after reading, save it in a proper place where you can easily access.

Contents

1. **Special Precautions** ..... 1-1 to 1-5
2. **Overview** ..... 2-1 to 2-2
3. **Installation and Connection** ..... 3-1 to 3-3
4. **Specifications** ..... 4-1 to 4-4
5. **Troubleshooting** 5-1
6. **Outline Drawing** ..... 6-1 to 6-2
7. **Duty Cycle Graph** 7-1

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

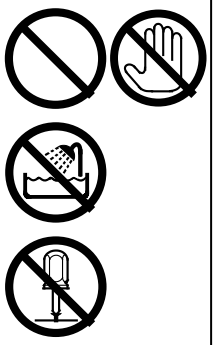
Denotes operations and practices that may imminently result in serious injury or loss of life if not correctly followed.

⚠ WARNING

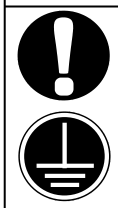
Denotes operations and practices that may result in serious injury or loss of life if not correctly followed.

⚠ CAUTION

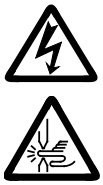
Denotes operations and practices that may result in personal injury or damage to the equipment if not correctly followed.



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 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.

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

This product incorporates parts containing gallium arsenide (GaAs).

⚠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.

Securely connect only specified cables.

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

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.

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 surface flash and expulsion gets in your eye, you may lose your eyesight.

Persons with pacemakers must stay clear of the 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. Surface flash and expulsion 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.

Surface flash and expulsion 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,
  - Places at an altitude above 1000 meters.

- Do not block up the vent slits and provide the clearance of 10 cm minimum for better radiation.

- There's a risk of failure, prevent a foreign matter into the Transformer from slits.

- Clean the outside of the 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 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.

- The Transformer is dedicated to our Inverter Welding Power Supply **IPB-5000□** and cannot be used with other power supplies.

- Verify that contents of the container agree with the kit list. If you see any the deficiency, please contact us.

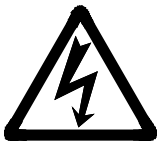
Packaged Kit	Quantity
Main unit	1
Voltage-sensing cable	1

(3) On Disposal

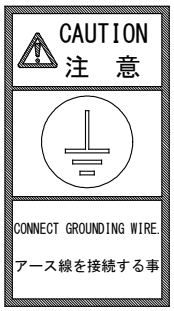
This product incorporates parts containing gallium arsenide (GaAs). At the time of disposal, separate it from general industrial waste or domestic waste and carry out the disposal in accordance with applicable laws and regulations.

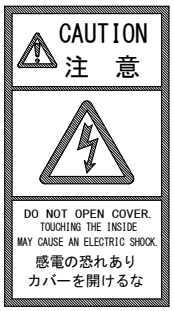
(4) Warning Labels

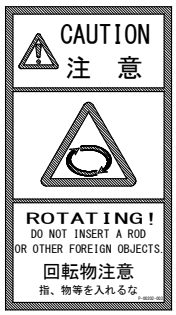
Warning labels are pasted on the Transformer for safety. The pastingplace and meaning of each label is as shown below.



Pasting place: Upper part of the terminal cover
Meaning: Danger of electric shock







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

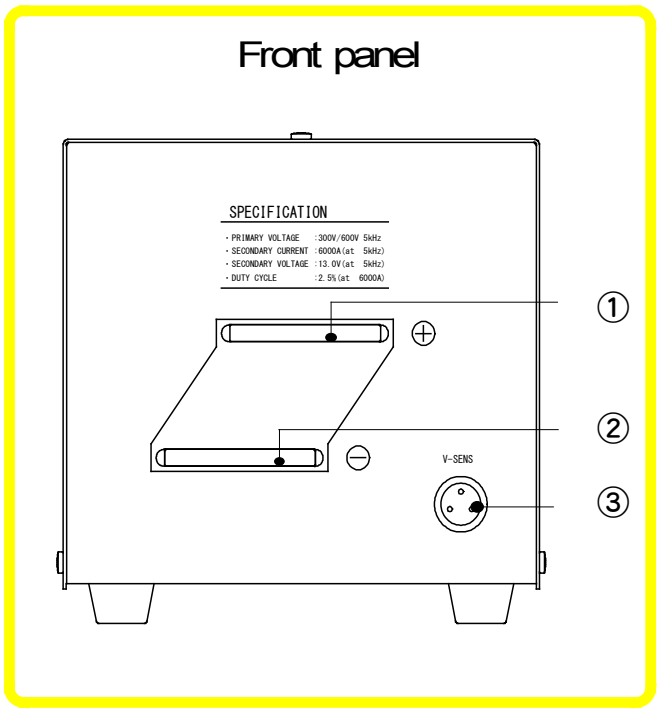
Caution for grounding wire connection	Danger of electric shock	Pay attention to rotary materials such as fan

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

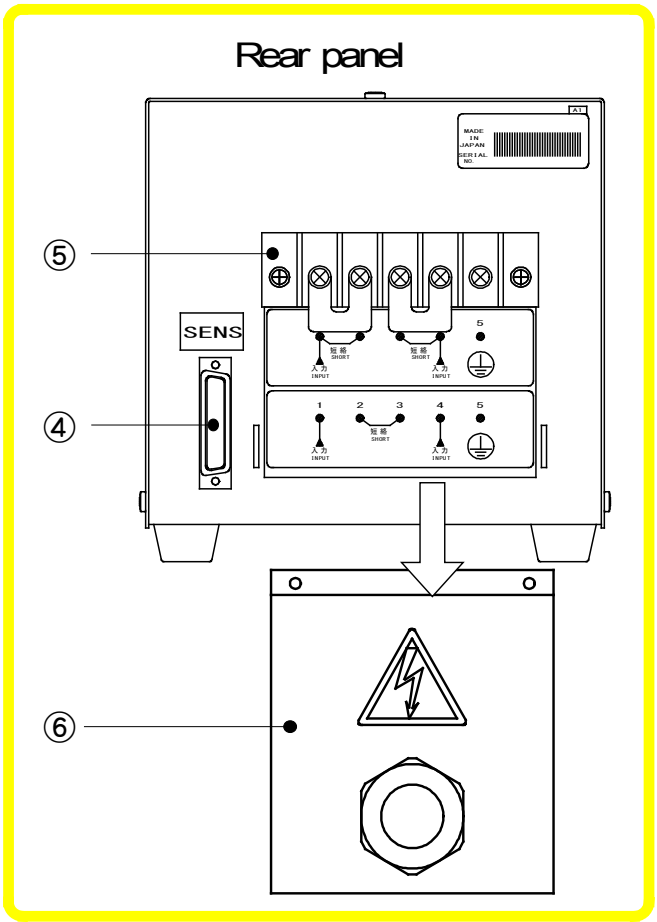


① [+] terminal *
Connect the positive (+) cable of the welding head to this terminal.

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 side of this cable to a screw near the electrode, such as by co-tightening it to the electrode holder of the welding head.

* **[+] terminal** and **[-] terminal** are connected to chassis with a 30 Ω of resistance.



④ [SENS] connector
This is a connecter for connecting to our inverter welding power supply with a sense cable sold separately.

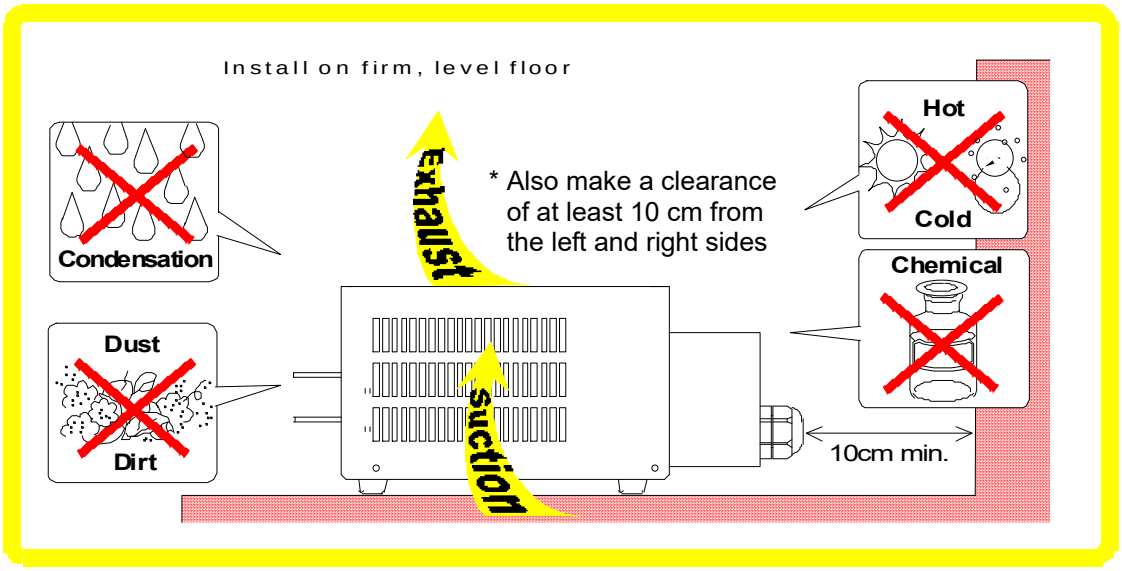
⑤ Terminal block
Connect the output cables(sold separately) to these terminals and to our inverter weldig power supply. Terminal screw M5×12.

⑥ 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

For better radiation, ITB-780C6 has slits on side. Install **ITB-780C6** in a well-ventilated place and make a clearance of at least 10 cm from the surrounding walls. Don't block each slit.



(2) Connection

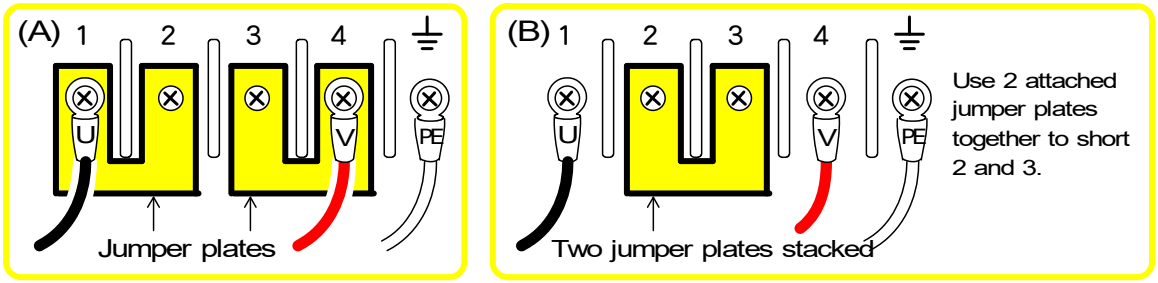
After deciding where to install **ITB-780C6**, connect it to the other devices according to the explanatory drawings on pages 3-2 to 3-3.

Notice

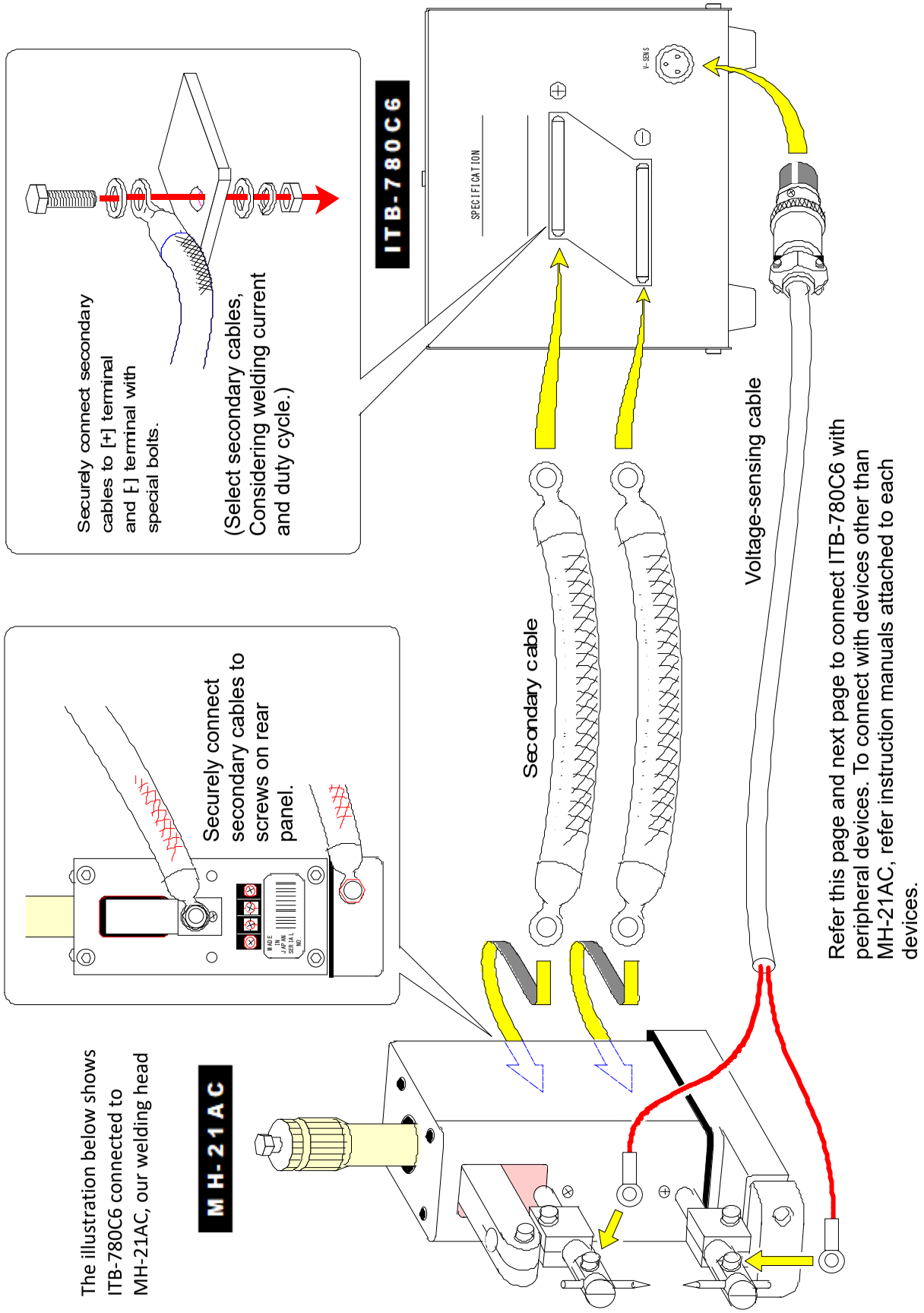
Explanatory drawing shows how to connect with **MH-21AC** welding head and **IPB-5000**☐ welding power supply.
The way of connection varies with the type and usage of the devices to be used.For connection, refer instruction manual of each devices.
And make sure to turn off the supplying power before connecting work.

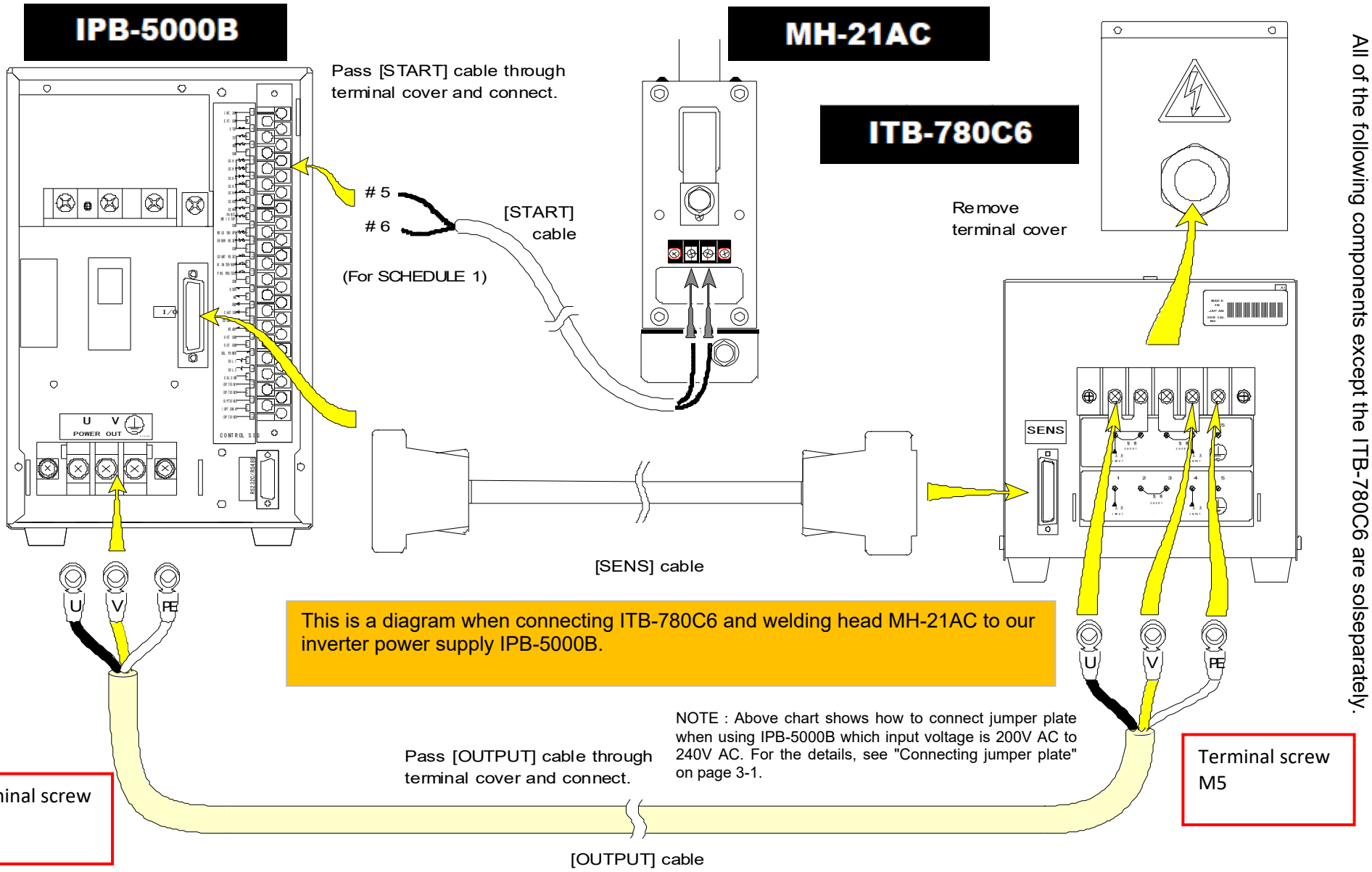
(3) Connecting jumper plate

When the welding power supply voltage is 200V to 240V 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).
The terminals are factory-wired as shown in (B).



All of the following components except the ITB-780C6 are sold separately.




IPB-5000B
MH-21AC
ITB-780C6
Pass [START] cable through terminal cover and connect.
5
6
[START] cable
(For SCHEDULE 1)
Remove terminal cover
SENS
[SENS] cable
U
V
PE
This is a diagram when connecting ITB-780C6 and welding head MH-21AC to our inverter power supply IPB-5000B.
NOTE : Above chart shows how to connect jumper plate when using IPB-5000B which input voltage is 200V AC to 240V AC. For the details, see "Connecting jumper plate" on page 3-1.
Pass [OUTPUT] cable through terminal cover and connect.
Terminal screw M6
Terminal screw M5
[OUTPUT] cable

4. Specifications

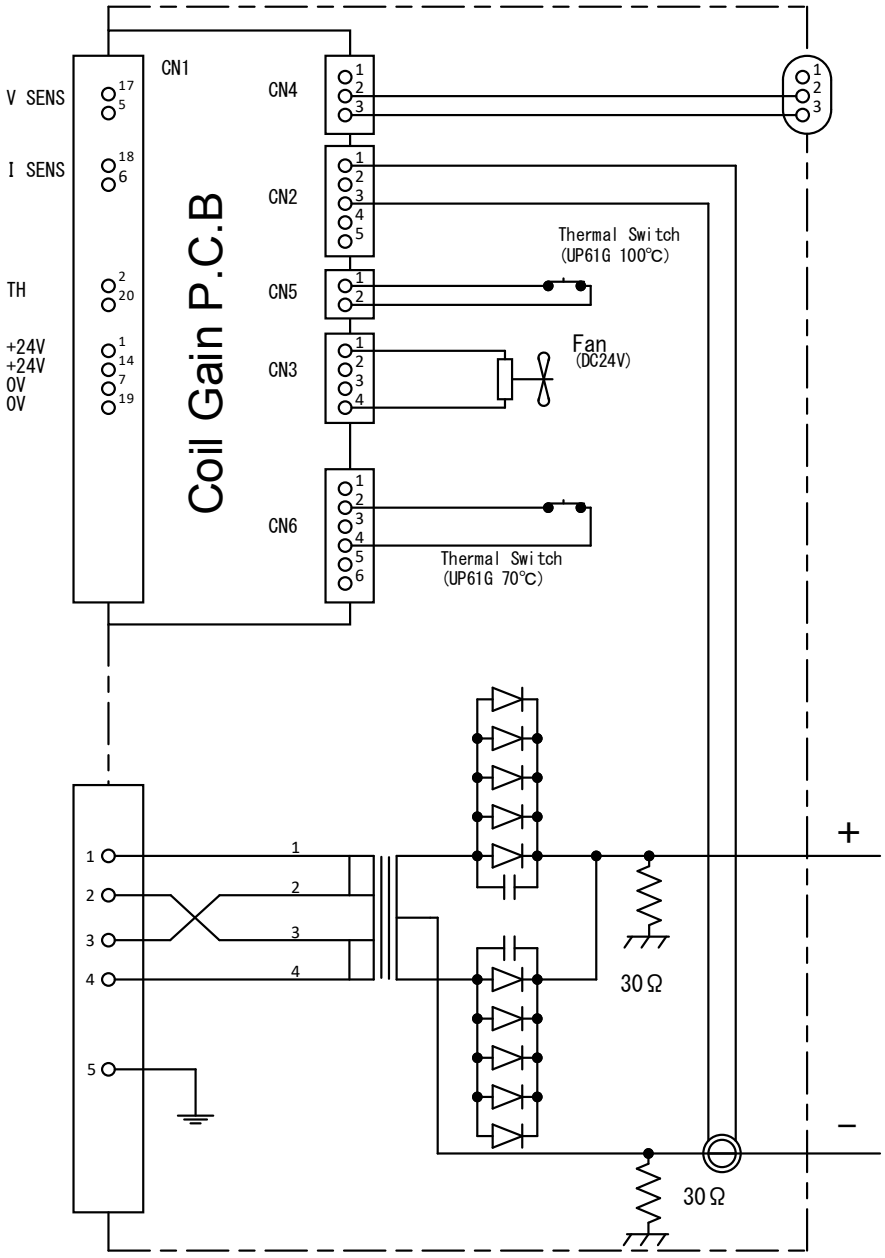
(1) Product Specifications

Rated capacity	17.4 kVA
Continuous capacity	12.3kVA
Number of phases	1
Rated frequency	5kHz
Rated input voltage	200–240 V AC of welding power supply: 300 V 380–480 V AC of welding power supply: 600 V
Rated No-load voltage(1)	13V
Turn ratio	200–240 V AC of welding power supply: 23:1 380–480 V AC of welding power supply: 46:1
Max. output current(2)	6000 A *
Continuous output current	948A
Max. duty cycle	2.5% (6000 A) NB: See 7. Duty Cycle Graph
Cooling method	Forced air cooling
Protection	100°C thermostat switch (built-in)
Operating environment	Temperature between 5℃ - 40℃, 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 between -10℃ and +55℃ , dew condensation not allowed
Heat-resistant class	H
Protection class	IP20
Protection class for electric shock	Class I
Compliant standard	GB15578-2008
Outline dimensions	183 mm (H) × 190 mm (W) × 455 mm (D)

	(Not including projections)
Weight	Approx. 13 kg
Accessories	Voltage-sensing cable × 1

(1) Excluding losses in diode.
(2) The maximum current fluctuates, when load fluctuates.
When connecting a welding head, the approximate maximum current is 4000 A.
(3) When internal temperture of ITB-780C6 reaches 70℃ or higher, the fan motor built in ITB-780C6 start to work.

(2) Operating Principle Diagram



(3) Main parts list

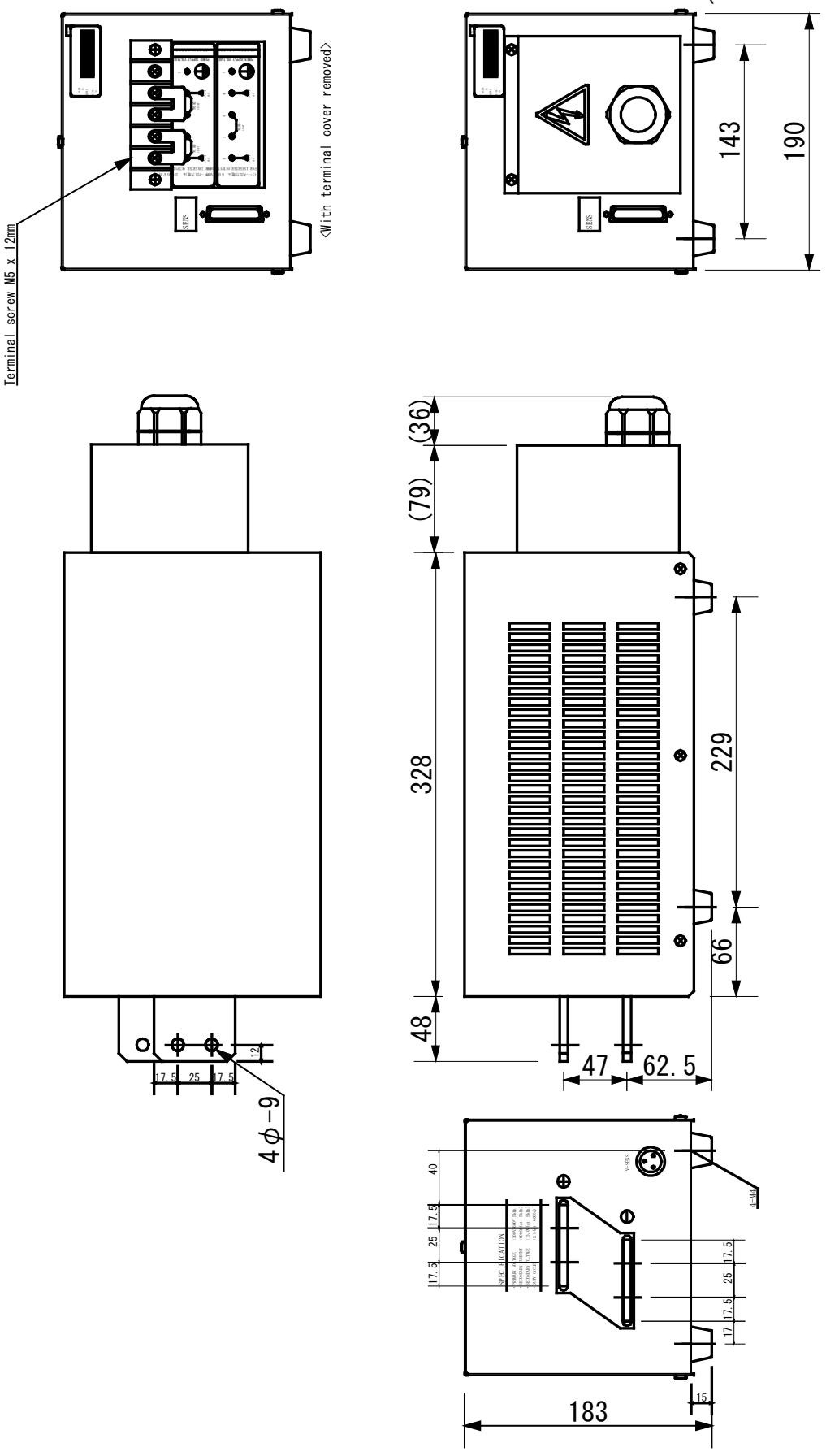
Product name	Quantity
Fan motor	1
Transformer	1
Thermal protector	2
Diode module	5

5. Troubleshooting

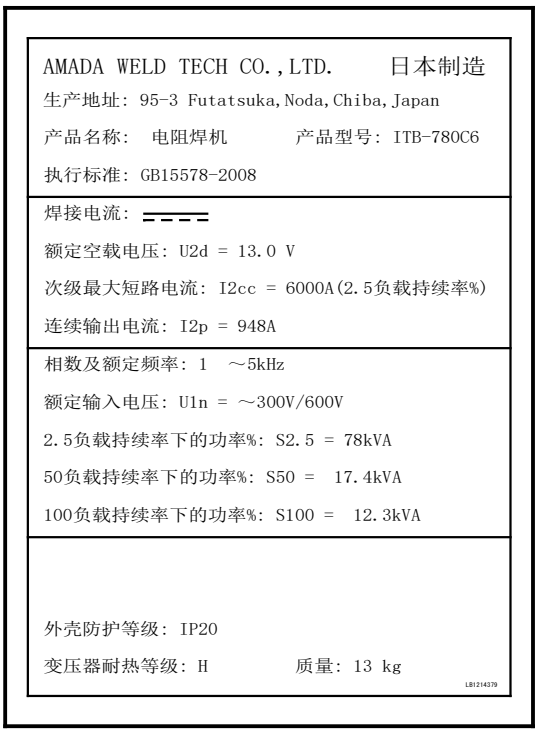
Contents	Cause	Measures
Body of **ITB-780C6** becomes hot extremely.	Fan motor does not working properly	Consult us or your distributor.
Current does not flow.	Secondary cables are not connected correctly.	Check that all cables are connected correctly.
	Output cable attached to power supply is not connected correctly.	
Current is reduced.	The connections of secondary cables oxidized. For example, secondary cables and electrode holder, or secondary cables and [+] / [-]terminal of, transfomer, or electrode and electrode holder, and so on.	Disconnect secondary cables and polish their contacts.
	Internal trouble of transformer	Consult us or your distributor.

6. Outline Drawing

(Dimensions in mm)



Specitification sticker



Address	95-3Futatsuka,Noda,Chiba,Japan
Product name	Resistance welding equipment Product model : ITB-780C6
Compliance standards	GB15578-2008

Weld current	⎓ DC
Rated no-load output voltage	U_{2d} = 13.0V
Maximum short-circuit current in class	I_{2cc} = 6000A（2.5％Load duration）
Continuous output current	I_{2p} = 948A

Number of phases and rated frequency	1 ～5kHz
Rated input voltage	U_{1n} = ～300/600V
Power at 2.5% duty cycle	$S_{2.5}$ = 78kVA
Power at 50% duty cycle	S_{50} = 17.4kVA
Power at 100%-duty cycle	S_{100} = 12.3kVA

Protection class	IP20
Insulation class	H
Weight	13kg

7. Duty Cycle Graph