

TRANSFORMER SELECTOR

MA-650A

OPERATION MANUAL



Thank you for purchasing our Transformer Selector **MA-650A**.

- For correct use, read this operation manual carefully.
- After reading, save it in a proper place where you can easily access to.

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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 safe operation.
- The meaning of the words and symbols is as follows.



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



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



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 DANGER, WARNING or CAUTION to the operator.



Do not touch the inside of the Product unnecessarily.

Since very high voltages are charged to the inside of this product, it is very dangerous to touch it unnecessarily.

Any person other than service personnel, or authorized representatives' personnel must not touch the inside.



Never disassemble, repair or modify the Product.

These actions can cause electric shock and fire.

If any part needs to be checked or repaired, contact us or your distributor for help.



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

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.



Do not touch any welded part or electrodes during welding and just after welding finished.

The welded part of a workpiece, electrodes and arm are very hot.
Do not touch them; otherwise you may be burnt.



Ground the equipment.

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



Connect the specified cables securely.

Cables of insufficient current capacities and loose connections can cause fire and electric shock.



Do not damage the power cable and connecting cables.

Do not tread on, twist or tense any cable. The power cable and connecting cables may be broken, and that can cause electric shock and fire.
If any part needs to be repaired or replaced, consult us or your distributor.



Do not use any damaged power cable, connecting cable and plug.

That can cause electric shock, short circuits and fire.
If any part needs to be repaired or replaced, 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.



Persons with pacemakers must stay clear of the welding machine.

A person who uses a pacemaker must not approach the welding machine or walk around the welding shop while the welding machine is in operation, without being permitted by his/her doctor. The welding machine 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.



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.



CAUTION



Connect the cords and cables securely.

Loose connection can cause fire and electric shock.



Do not splash water on the equipment.

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



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

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



Install the equipment on firm and level surface.

If the equipment falls over or drops from an uneven surface, injury may result.



Do not sit on or do not put things on it.

Sitting on it, or putting things on it may cause malfunction.



Keep combustible matter away from the welding machine.

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 equipment with a blanket, cloth, etc.

If such a cover is used, it may be overheated and burn.



Use ear protectors.

Loud noises can damage hearing.



Keep a fire extinguisher nearby.

Make sure there is a fire extinguisher in or near the welding shop in case of fire.



Regularly inspect and maintain the equipment.

Regular inspect and maintenance is essential to safe operation of the equipment. If you see any damage, make necessary before starting the operation.

(2) Precautions for Handling

- When transporting or moving the Selector, do not lay it down. Also, handle the Selector with care so as not to make an impact such as drop on it.
- Install the Transformer Selector on a firm and level surface. If it is used inclined or on its side, it may have a malfunction.
- Do not install this Transformer Selector in the following places:
 - Where there is considerably damp (humidity is higher than 90%).
 - Where the ambient temperature is above 40°C or below 5°C.
 - Where there is nearby high noise source.
 - Where the Selector may be exposed to chemicals.
 - Where moisture may be condensed on the surface of the Selector.
 - Where there is considerable dirt.
 - Where the Selector may be subjected to vibration or impact.
 - Where an altitude is above 1000 meters.
- If the outside of the Selector is stained, wipe it with a dry cloth or a moistened cloth. If it is badly stained, use diluted neutral detergent or alcohol to clean it. Do not use paint thinner, benzene, etc., which can discolor or deform the parts.
- Do not put screws, coins, etc., in the Selector, as they may cause a malfunction.
- Operate the Selector according to the method described in this operation manual.
- The Selector is not equipped with auxiliary power such as an outlet for lighting.
- The welding transformer **IPB-5000A** is required to use the Selector.

(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.

2. Features

- **MA-650A** is a transformer selector exclusively used for **Inverter-type Welding Power Supply IPB-5000A** (Here in the followings, simply shown as **IPB-5000A**).
(Note)
As the input of a thermostatic sensor in a welding power supply has been connected in series with each welding transformer in the conventional transformer selector, a dummy connector has been necessary for an unused I/O connector **(4.(2)④ [SENS] Cable Connector)**. However, the dummy connector is not required because of the modification of a control method in **MA-650A**.
- **MA-650A** can switch the output power of a welding power supply into a maximum of 5 transformers one by one.
- **MA-650A-00** is for **IPB-5000A-00-01/-00-02/-00-04/-00-05** of 380–480V AC, Input Voltage.
MA-650A-01 is for **IPB-5000A-00-00/-00-03** of 200–240V AC, Input Voltage.
MA-650A-02 is for **IPB-5000A-03-06** of 200–240V AC, Input Voltage.

3. Packaging

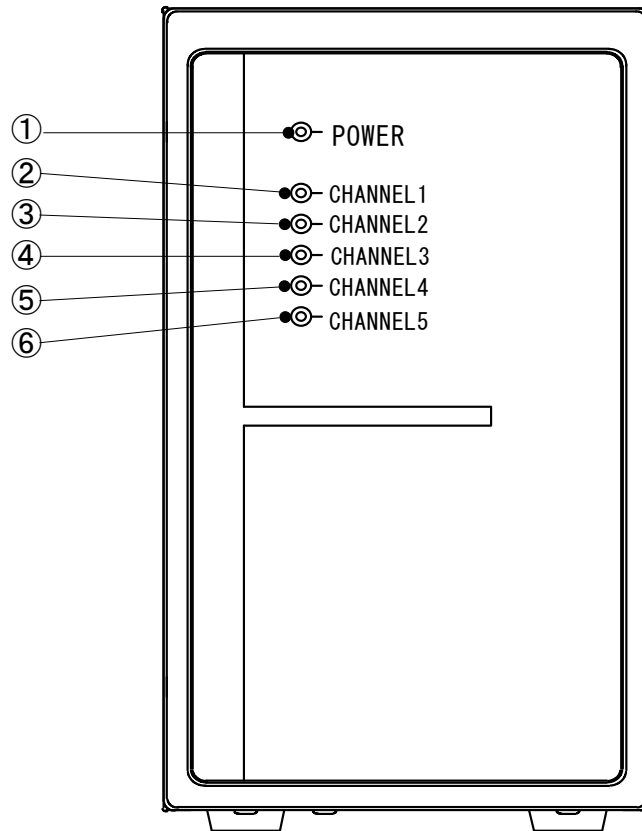
Shipping Kit List

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

Packaged Kit	Quantity
MA-650A	1
Operation Manual	1
Banding Band	6

4. Description of Panels

(1) Front Panel



① **Power Lamp**

Lights up when the power switch of **IPB-5000A** is turned on to supply the power and **MA-650A** works normally.

② **CHANNEL 1 Lamp**

Lights up when Weld Transformer 1 is selected.

③ **CHANNEL 2 Lamp**

Lights up when Weld Transformer 2 is selected.

④ **CHANNEL 3 Lamp**

Lights up when Weld Transformer 3 is selected.

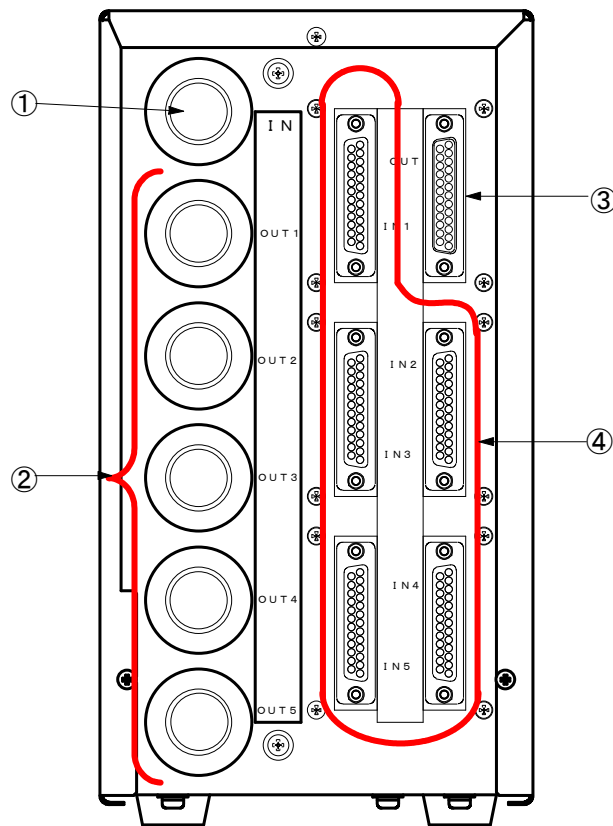
⑤ **CHANNEL 4 Lamp**

Lights up when Weld Transformer 4 is selected.

⑥ **CHANNEL 5 Lamp**

Lights up when Weld Transformer 5 is selected.

(2) Rear Panel



① **IPB-5000A Output Cable Inlet (IN)**

A grommet with a thin film on eyelet through which an output cable of **IPB-5000A** is inserted.

Put a slit on the thin film on eyelet for use.

② **Transformer Output Cable Inlet (OUT1 to OUT5)**

Grommets with a thin film on eyelet through which an output cable from each weld transformer (No.1 to 5) is inserted.

③ **IPB-5000A [SENS] Cable Connector (OUT)**

Connect [SENS] Cable from **IPB-5000A**.

④ **Transformer [SENS] Cable Connector (IN1 to IN5)**

Connect [SENS] Cable to each weld transformer (No.1 to 5).

5. How to Connect

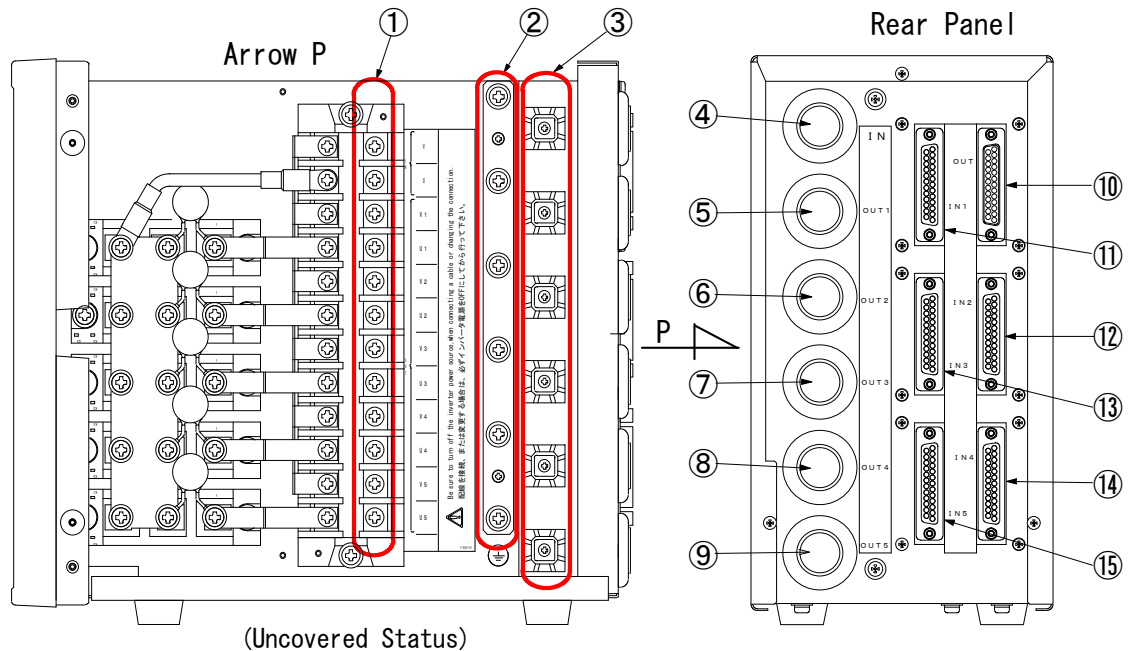
(1) Connection

Connect **MA-650A** to **IPB-5000A** by **Output Cables** and **[SENS] Cables ((3))**.
Uncover **MA-650A** for the connection.
See **(2) Connection Diagram**.

MA-650A is for 5 Channels' use.

Although a maximum of 5 transformers can be switched, even 2, 3 or 4 transformers also can be used. In the case of 4 or less transformers used, the transformers have to be connected to "OUT1" at the beginning, and then to "OUT2", "OUT3" consecutively.

Be sure to connect no articles to unused terminal strips and connector.



① Output Cable Connection Terminal Strip (M5)

Connect Output Cable (U, V) from **IPB-5000A** and Output Cables (U1 to U5, V1 to V5) connected to each transformer. Connect them correctly according to the instruction for the connection.

If they are incorrectly connected, the equipment results in breakdown.

Be sure to turn off **IPB-5000A** when connecting or changing Cables.

② Copper Bar for Connecting Ground [E, E1 to E5] (M5)

Connect Output Cable from **IPB-5000A** and grounding cables of Output Cables connected to each transformer. The ground of E and E1 to E5 are all connected in common.

③ Cable Fixtures

Fix Output Cables by Banding Bands, Accessories.

④ IPB-5000A Output Cable Inlet [IN]

Insert Output Cable of **IPB-5000A** and connect to the terminals of U, V and E (①, ②).

Put a slit on the thin film on the eyelet of a grommet for use (same in the followings).

⑤ Transformer 1 Output Cable Inlet [OUT1]

Insert Output Cable connected to Transformer 1 and connect to the terminals of U1, V1 and E1 (①, ②).

⑥ Transformer 2 Output Cable Inlet [OUT2]

Insert Output Cable connected to Transformer 2 and connect to the terminals of U2, V2 and E2 (①, ②).

⑦ Transformer 3 Output Cable Inlet [OUT3]

Insert Output Cable connected to Transformer 3 and connect to the terminals of U3, V3 and E3 (①, ②).

⑧ Transformer 4 Output Cable Inlet [OUT4]

Insert Output Cable connected to Transformer 4 and connect to the terminals of U4, V4 and E4 (①, ②).

⑨ Transformer 5 Output Cable Inlet [OUT5]

Insert Output Cable connected to Transformer 5 and connect to the terminals of U5, V5 and E5 (①, ②).

⑩ IPB-5000A [SENS] Cable Connector [OUT]

Connect [SENS] Cable from **IPB-5000A**.

⑪ Transformer 1 [SENS] Cable Connector [IN1]

Connect [SENS] Cable connected to Transformer 1.

⑫ Transformer 2 [SENS] Cable Connector [IN2]

Connect [SENS] Cable connected to Transformer 2.

⑬ Transformer 3 [SENS] Cable Connector [IN3]

Connect [SENS] Cable connected to Transformer 3.

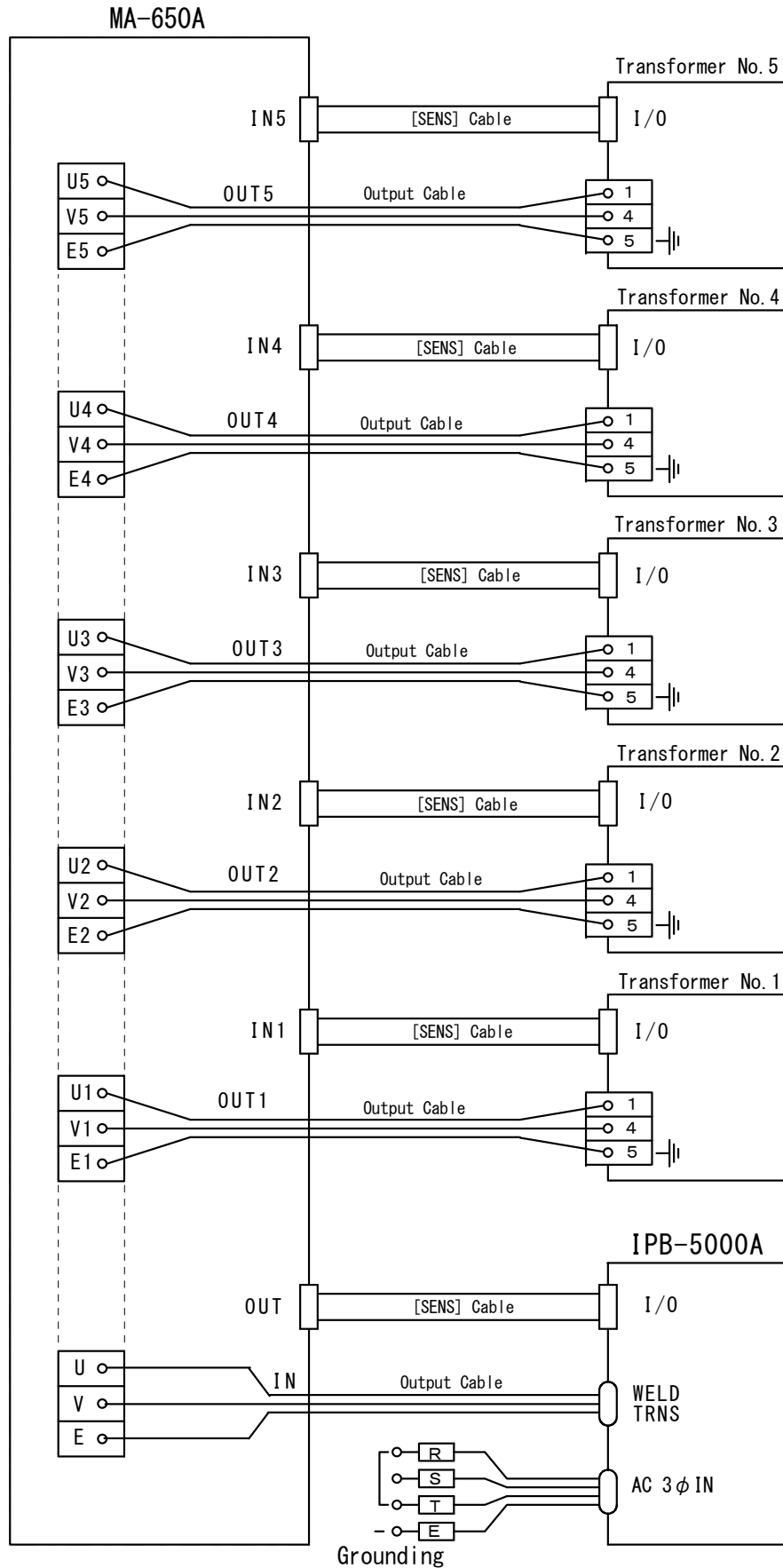
⑭ Transformer 4 [SENS] Cable Connector [IN4]

Connect [SENS] Cable connected to Transformer 4.

⑮ Transformer 5 [SENS] Cable Connector [IN5]

Connect [SENS] Cable connected to Transformer 5.

(2) Connection Diagram



(3) Output Cables and [SENS] Cables

We prepare the following cables as separately sold articles.

If a customer procures the cable by oneself, prepare it in accordance with the following specifications.

① Output Cables PK-01856-□□□

Type	Branch No.	Length (m)
Standard	-002	2
	-005	5
	-010	10



Specifications of Standard Cable	
Rated Voltage	600V AC min.
Section Area	8 mm ² min.
No. of Cores	3
Cable Dia.	25 mm max.

Type	Branch No.	Length (m)
CE Marking Compliant	-102	2
	-105	5
	-110	10



Specifications of CE Marking Compliant Cable	
Rated Voltage	750V AC min.
Section Area	10 mm ² min.
No. of Cores	3
Cable Dia.	25 mm max.
Compliance Standard	Conductor: VDE0812/0281 Insulation: VDE0250/0281

② [SENS] Cables SK-05741-□□□

Item	Branch No.	Length (m)
[SENS] Cable SK-05741	-002	2
	-005	5
	-010	10

6. How It Works

For the movement and sequence timing, refer to **9. (8) Behavior in TRANS SCAN MODE** in Operation Manual packaged with **IPB-5000A**.

All circuit power supply and switching signals are output through the I/O Connector of **IPB-5000A** to the OUT Connector of **MA-650A**.

Turning on the switch of **IPB-5000A** makes **POWER Lamp** on the front panel lighting, and the weld starting makes the lamps of **CHANNEL (1 to 5)** lighting through which the weld current flows.

7. Specifications

Operation 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
Case protection	IP20
Outline dimensions	269 mm (H) × 142 mm (W) × 300 mm (D) (Not including projections)
Mass	Approx. 5 kg

8. Outline Drawing

Dimensions in mm

