



ARC400i

INVERTER MMA Welding Power Source

Instruction manual



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INVERTER MMA WELDING POWER SOURCE



Instruction manual
For
Installation, Operation & General maintenance

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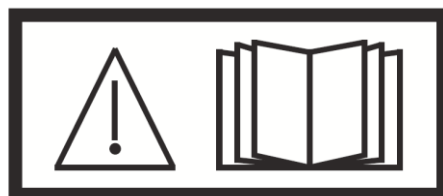
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SAFETY

Users of ESAB welding equipment have the ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions. Safety precautions must meet the requirements that apply to this type of welding equipment. The following recommendations should be observed in addition to the standard regulations that apply to the workplace.

Trained personnel well acquainted with the operation of the welding equipment must carry out all the work. Incorrect operation of the equipment may lead to hazardous situations, which can result in injury to the operator and damage to the equipment.

1. Anyone who uses the welding equipment must be familiar with:
 - its operation
 - location of emergency stops
 - its function
 - relevant safety precautions
 - welding
2. The operator must ensure that:
 - no unauthorized person is stationed within the working area of the equipment when it is started up.
 - no one is unprotected when the arc is struck
3. The workplace must:
 - be suitable for the purpose
 - be free from drafts
4. Personal safety equipment
 - Always wear recommended personal safety equipment, such as safety glasses, flameproof clothing, and safety gloves.
 - Do not wear loose—fitting items, such as scarves, bracelets, rings, etc., which could become trapped or cause burns.
5. General precautions
 - Make sure the return cable is connected securely.
 - Only a qualified electrician may carry out work on high voltage equipment.
 - Appropriate fire extinguishing equipment must be clearly marked and close at hand.
 - Lubrication and maintenance must not be carried out on the equipment during operation.



Read and understand the instruction manual before installing or operating.
ESAB can provide you with all necessary welding protection and accessories.



WARNING

Arc welding and cutting can be injurious to yourself and others. Take precautions when welding.

Ask for your employer's safety practices which should be based on manufacturers' hazard data.

	<p>ELECTRIC SHOCK – Can kill</p> <ul style="list-style-type: none"> • Install and earth the welding unit in accordance with applicable standards. • Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing. • Insulate yourself from earth and the workpiece. • Ensure your working stance is safe.
	<p>FUMES AND GASES – Can be dangerous to health</p> <ul style="list-style-type: none"> • Keep your head out of the fumes. • Use ventilation, extraction at the arc, or both, to take fumes and gases away from your breathing zone and the general area.
	<p>ARC RAYS – Can injure eyes and burn skin.</p> <ul style="list-style-type: none"> • Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing. • Protect bystanders with suitable screens or curtains.
	<p>FIRE HAZARD</p> <ul style="list-style-type: none"> • Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.
	<p>NOISE – Excessive noise can damage hearing</p> <ul style="list-style-type: none"> • Protect your ears. Use earmuffs or other hearing protection. • Warn bystanders of the risk.
<p>MALFUNCTION – Call for expert assistance in the event of malfunction. PROTECT YOURSELF AND OTHERS!</p>	
	<p>CAUTION! <i>This product is solely intended for arc welding</i></p>

	<p>Do not dispose of electrical equipment together with normal waste! In accordance with national law, electrical equipment that has reached the end of its life must be collected separately and returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from the local representative. By applying this Directive you will improve the environment and human health</p>
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RATING OF ARC400i INVERTER WELDING POWER SOURCE

Parameters		Unit	ARC400i	
Output	No-load voltage	V	72	
	Working voltage	V	22.4-36	
	Rated welding current	A	400	
	Current range	A	60-400	
	Rated duty cycle			100%
			310A	400A
Input	Phases	phase	3	
	Frequency	Hz	50	
	Supply voltage	V	415	
	Rated input current	A	26	
	Maximum effective input current	A	20	
	Rated input capacity	kVA	24	
Efficiency η			$\geq 85\%$	
COS ϕ			0.93	
Insulation class			H	
Degrees of protection provided by enclosure			IP21S	
Weight		kg	25	
Dimensions (LxWxH)		mm	510x250x483	

INSTALLATION

The complete installation should consist the following items:

	Description	Type	Quantity
1.	Welding Power Source	ARC400i	1
2.	Welding Cable with Holder		1
3.	Earth cable with Clamp		1
4.	Remote (Optional)	RT-ARC400i	1

CAUTIONS FOR INSTALLATION

- Provide a Switch Box for every Welding Power Source, and use designated fuse
- Tolerance of Power Voltage Variation is $\pm 10\%$ of rated input voltage.

a) Installation place

- Install in the place where less moisture and dust exist. Avoid direct sunlight and rain, and maintain ambient temperature within -10° to $+45^{\circ}$ C as much as possible.
- Keep the welding power source at least 20 cm. away from the wall (if any).
- In case of installation of more two units side by side, a distance of more than 20 cm is recommended between the two power sources.
- Use a shield to protect the welding arc in case of excessive air draft.

b) Ventilation

Adequate ventilation is recommended at the place of installation. For example the following guideline should be followed:

- a) In case of the area being more than 300 square meters (per unit), no ventilation is required, provided the room is not completely airtight.
- b) In case of the area being less than 300 square meters and the welding is continuously performed, adequate ventilation is recommended with the help of vent fan or exhaust duct.
- c) While performing the grounding work, it is recommended that a skilled electrician does the work.

CONNECTIONS

a) Input

The specifications of recommended input cable, grounding line and fuse or circuit breaker are listed below:

	Rated duty cycle @ 400A	Input voltage	Input current	Maximum effective input current	60°C cable specifications		Fuse or circuit breaker
					Three-phase input cable	Grounding wire	
ARC400i	60%	415V	33A	26A	>6 mm ²	>4 mm ²	80A

b) Output

The positive and negative terminals of output circuit are at the bottom of the front panel, marked with “+” and “-”.

Connect and rotate to tightened output cable from the “+” terminal to the positive OKC quick connector at one end and the electrode holder at the other.

Connect and rotate to tightened output cable from the “-” terminal to the negative OKC quick connector at one end and the work piece at the other.

Remote control can be connected at the bottom of the front panel depending on the user selection.

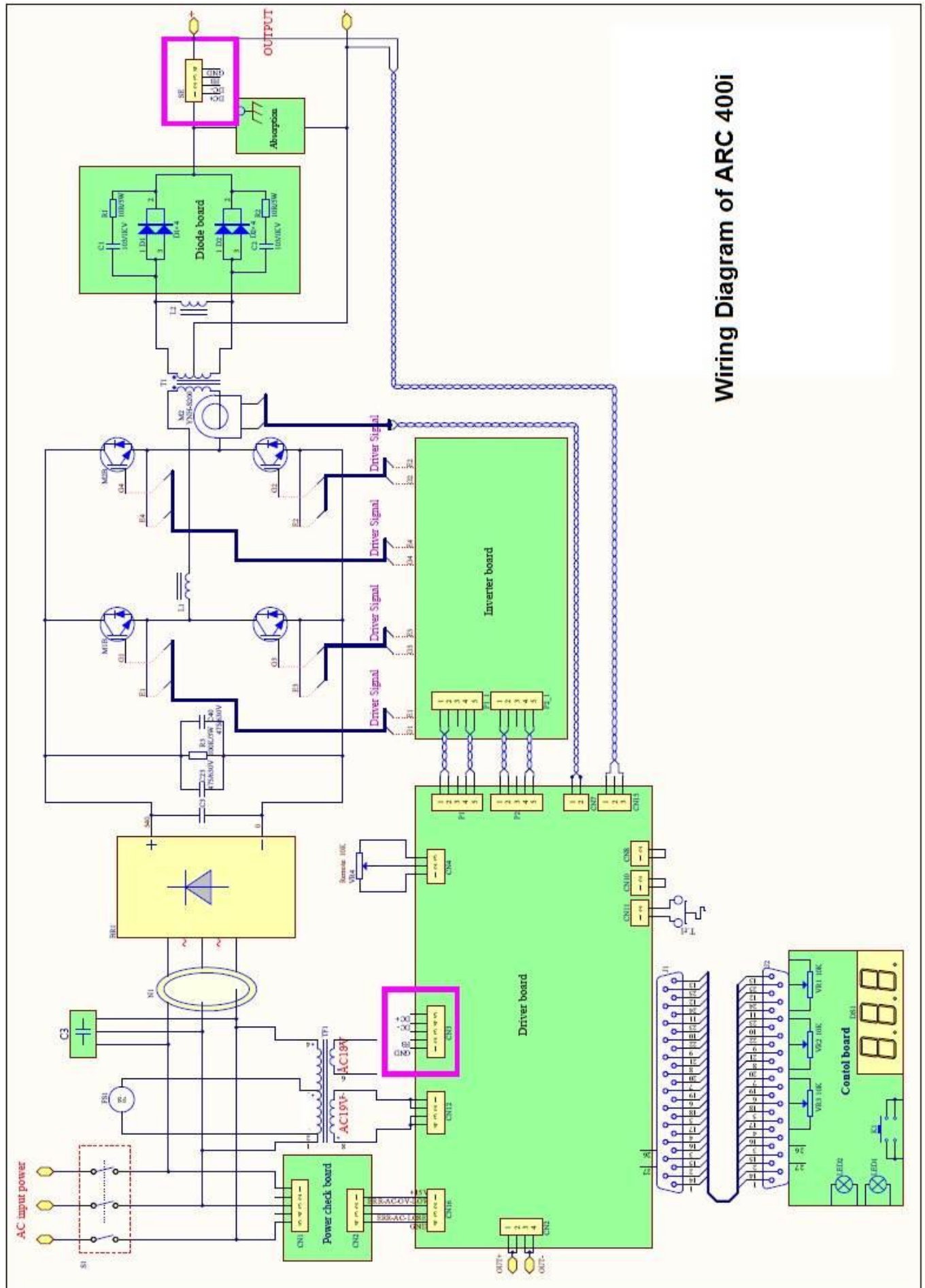
WELDING OPERATIONS

Switch on the power switch at the rear panel of the machine. After switching on the machine, the power indicator on the front panel will be lighted (red), the current digital meter displays will be ON, the fan starts running and voltage is available at the output terminal.

The welding current can be set continuously from minimum to maximum value by turning the welding current knob on the front panel when machine is local mode. When the machine is in remote mode current can be set by remote potentiometer.

When the power switch at the rear panel is turned off, machine is shut off and power indicator light is off, digital display will be off, Fan stops rotating.

The droplet transfer property of the welding could be improved through adjusting the ARC FORCE knob and the arc property of cold electrodes could be regulated through adjusting the HOT START knob. When the above two knobs are set properly and the welding current is regulated at right value, the welding will be much easier and more stable.



Wiring Diagram of ARC 400i

TROUBLESHOOTING

All parts of the fan are sealed such that extra maintenance is not required for the fan.

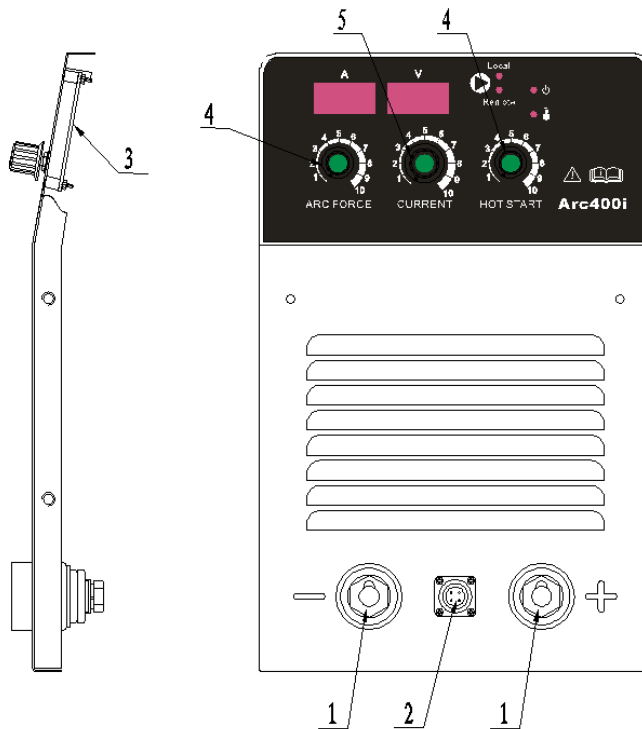
When operated at dusty place, the machine's air duct may get plugged to cause the machine overheated, therefore, remove inside of the machine's dust with dry compressed air regularly.

Overload protection

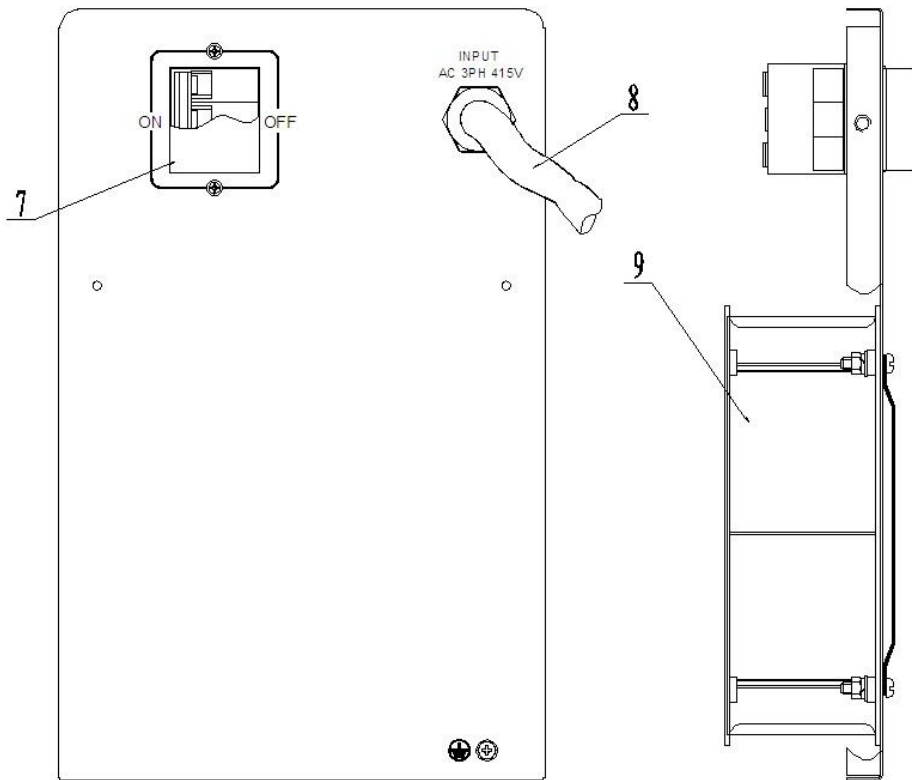
The thermostat inside the welding machine can effectively protect important power devices with overload or insufficient cooling, by the thermostat switch. When the machine is continuously overloaded or the power device IGBT and fast recovery diodes are not cooled adequately, the over temperature indicator will be lighted and normal output of the machine will be stopped. When these components are sufficiently cooled, the over temperature indicator will be off and the voltage output of the machine returns to normal.

Under-voltage protector is equipped in the machine control circuit to stop operation of the machine when the input voltage is too low. When the input voltage is not within limits, the output of the machine will stop. If no voltage is available at the output terminals and the power signal is on while the overheat indicator is off, please check the input supply voltage.

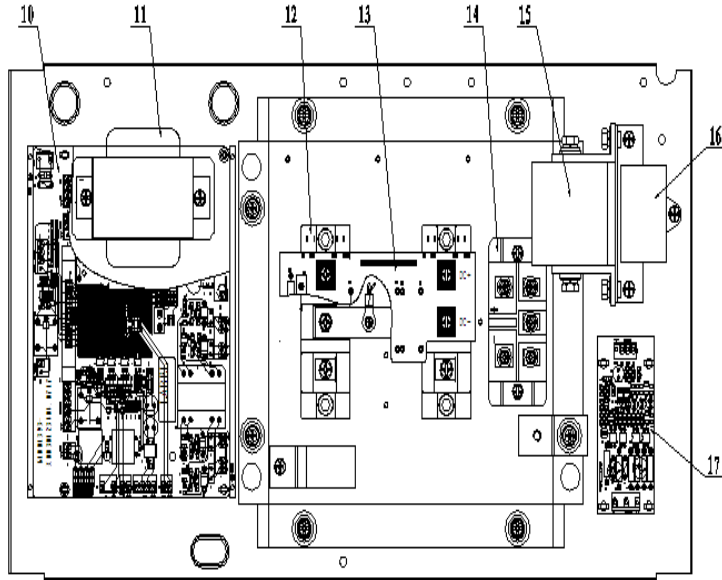
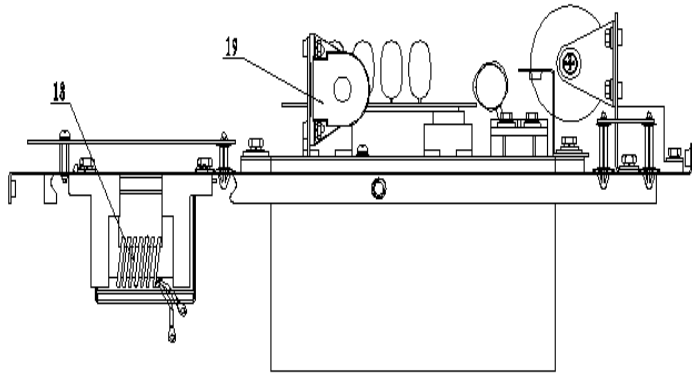
PARTS LIST AND EXPLODED VIEW



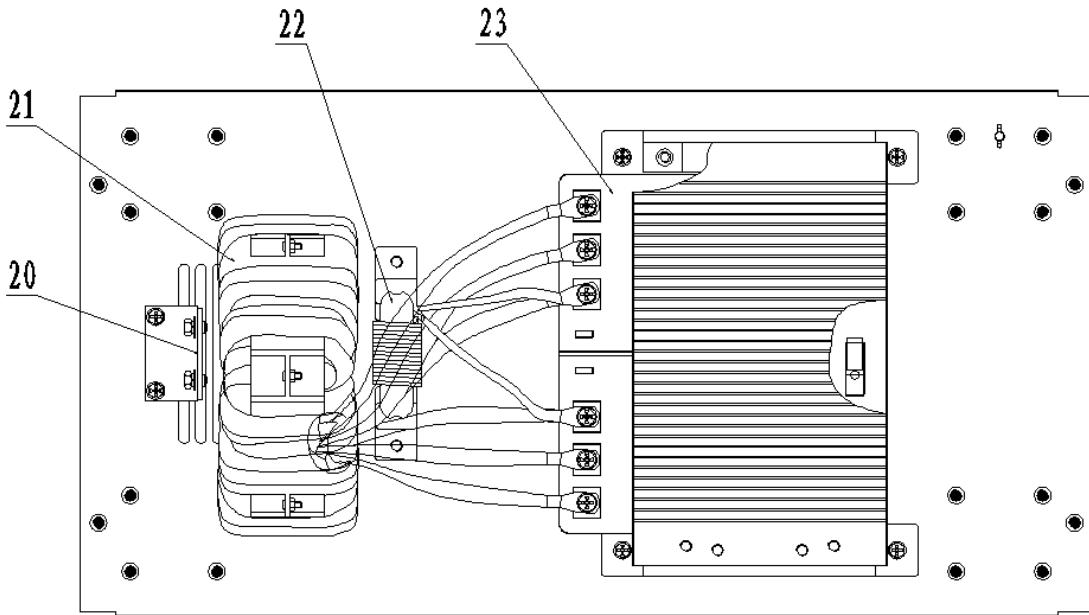
Serial No.	Name of component	Material code
1	Output terminal	0050804024
2	Remote Socket	0012001004
3	Control board	0030101625
4	Arc Force and Hot Start current knob	0010603057
5	Welding current knob	0010603056

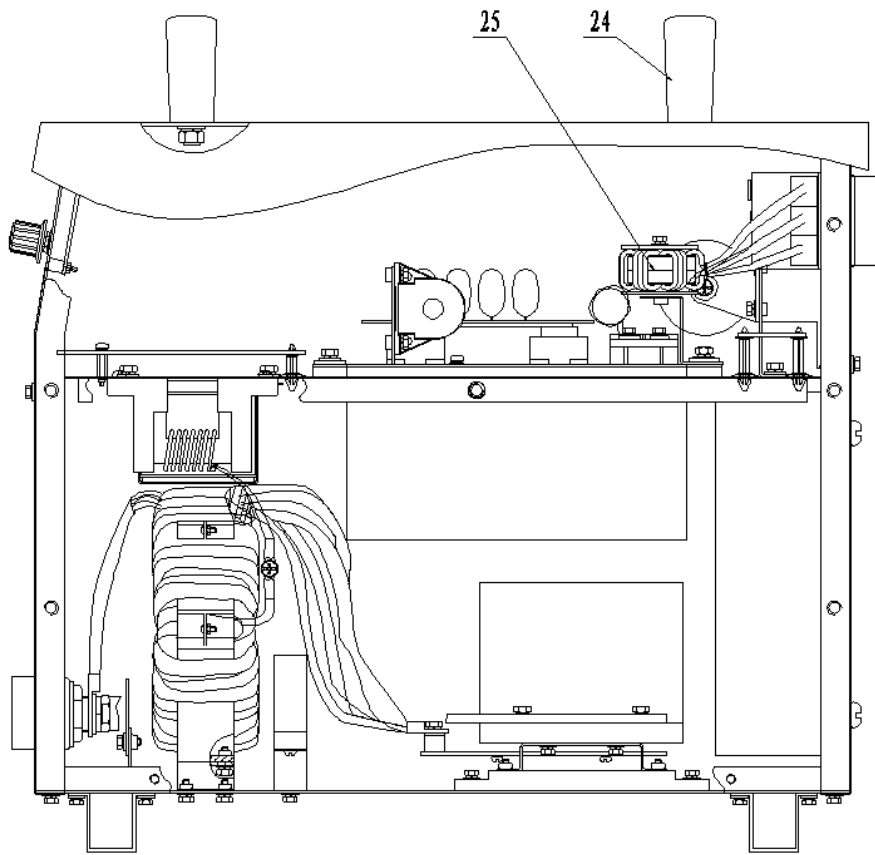


Serial No.	Name of component	Material code
7	Miniature circuit breaker	0011501003
8	Input cable	0030501596
9	Fan	0011702012



Serial No.	Name of component	Material code
10	Driving board	0030101626
11	Control transformer	0060101174
12	IGBT module	0012101029
13	Contra variant board	0030101617
14	Three phase rectifier module	0012103013
15	Filter capacitor	0010222002
16	AC polypropylene capacitor	0061301063
17	Power supply detection board	0030101618
18	Primary inductance	0031001022
19	Current transformer	0011303003
20	Absorption board	0030101384
21	Main transformer	0030801246
22	Auxiliary inductance	0031001012
23	Diode board	0030101102





Serial No.	Name of component	Material code
24	Handle	0061301073
25	Three phase input inductance	0030501187

The material code of components within the wiring board in the diagram

Circuit board Model	Driving board	Control board	Diode board	Absorption board
ARC400i	0030101626	0030101625	0030101102	0030101384

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