ARC 301i

INVERTER MMA
Welding Power Source

Instruction manual

ARC 301i

INVERTER WELDING POWER SOURCE

Instruction manual
For
Installation, Operation & General maintenance

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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.

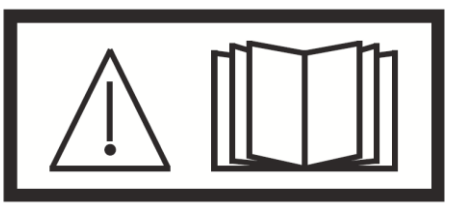
1. Anyone who uses the welding equipment must be familiar with:
   - its operation
   - location of emergency stops
   - its function
   - relevant safety precautions
   - welding

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.

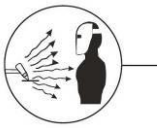
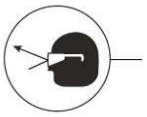
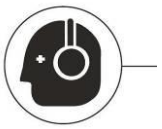


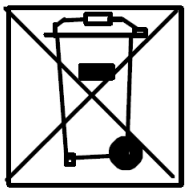
Read and understand the instruction manual before installing or operating.
ESAB can provide you with all necessary welding protection and accessories.

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.

	*ELECTRIC SHOCK – Can kill* • 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.
	*FUMES AND GASES – Can be dangerous to health* • 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.
	*ARC RAYS – Can injure eyes and burn skin.* • Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing. • Protect bystanders with suitable screens or curtains.
	*FIRE HAZARD* • Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.
	*NOISE – Excessive noise can damage hearing* • Protect your ears. Use earmuffs or other hearing protection. • Warn bystanders of the risk.
	MALFUNCTION – Call for expert assistance in the event of malfunction. PROTECT YOURSELF AND OTHERS!
	CAUTION! *This product is solely intended for arc welding*

	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

RATING

ARC 301i INVERTER WELDING POWER SOURCE

Parameters	
Mains Supply, V / Ph,Hz	415 ± 15% / 3, 50/60
Input Power (Max), KVA	11
Rated Input Current, A	16
Maximum effective input current, A	8.76
Current Range, A	30-300A
Voltage Range, V	21.2 – 32.0
Permitted Load at 60% Duty Cycle, A	250
Permitted Load at 30% Duty Cycle, A	300
Open Circuit Voltage (OCV), V	70
VRD Voltage, V	<15
Power Factor (Max)	0.9
Efficiency at Maximum Current, %	>85
Enclosure Class	IP21
Insulation Class	H
Dimensions L X W X H, mm	440 x 220 x 360
Weight, Kg	15

INSTALLATION

The complete installation for TIG application should consist of the following items:

	Description	**Type**	**Quantity**
1.	Welding Power Source	ARC 301i	1
2.	Welding Cable with holder		1
3.	Earth cable with Clamp		1
4.	Remote (Optional)		1

CAUTIONS FOR INSTALLATION

- Provide a Switch Box for every Welding Power Source and use designated fuse.
- Tolerance of Power Voltage Variation is ± 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^{o} to +45^{o} 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

Input

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

	Rated duty cycle @ 300A	Input voltage	Input current	Maximum effective input current	60°C cable specifications		Fuse or circuit breaker
					Three-phase input cable	Grounding wire	
ARC301i	30%	415V	16A	8.76A	>6 mm2	>4 mm2	80A

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.

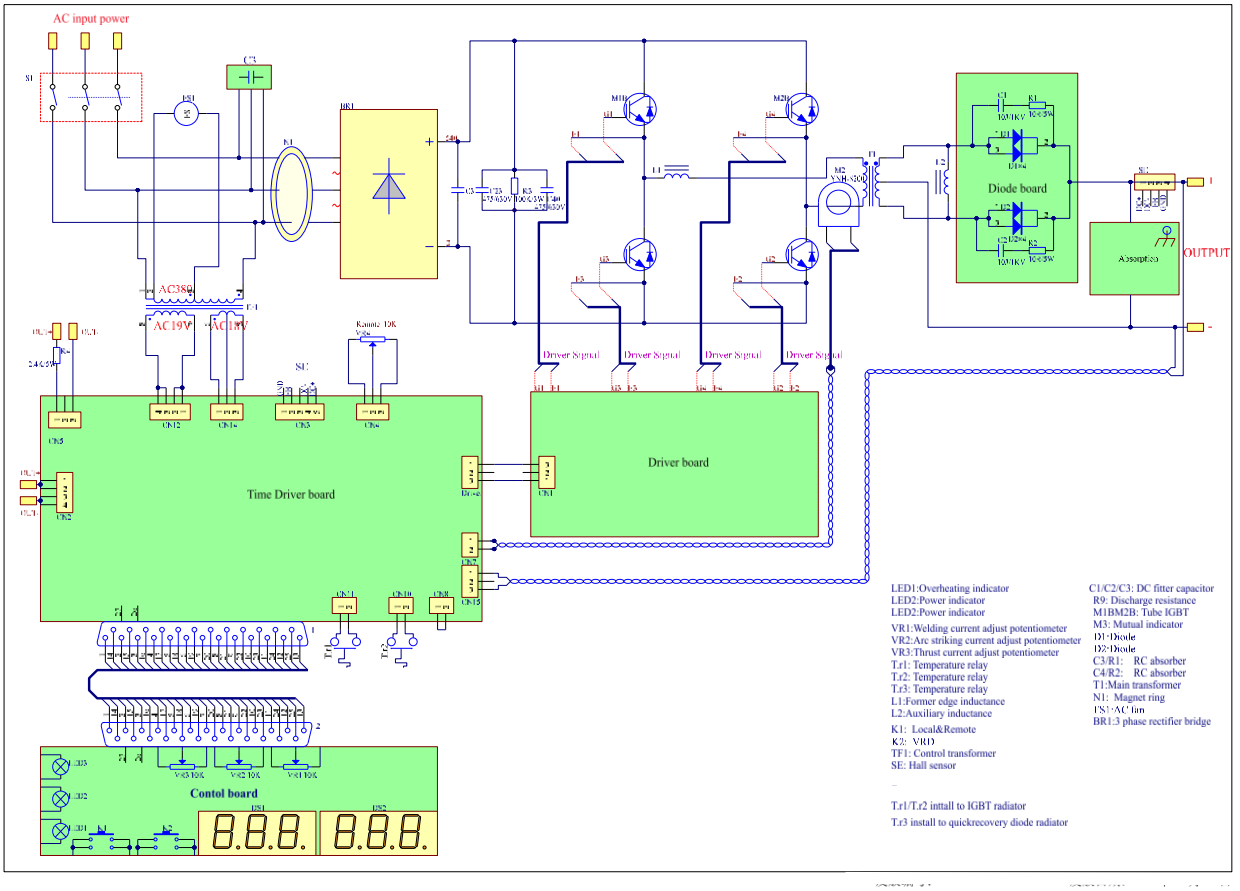
Remote control can be connected at the bottom of the front panel depending on the user selection.

Cable selection at rated duty cycle	
Model	0~50 m
ARC 301i	（35 mm^2 ~ 85 mm^2）× 2

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



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

Model \ Circuit board	Driving board	Control board	Diode board	Inverter board	Absorption board
ARC 301i	30101711-01	30101710-01	30101182	30101717	30101715

TROUBLESHOOTING

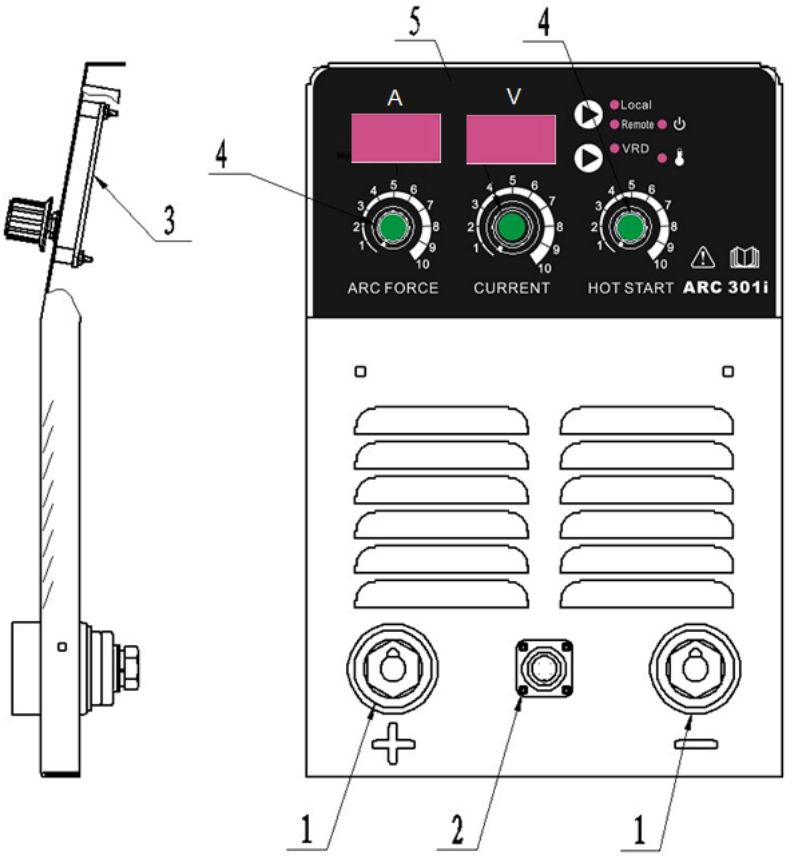
All parts of the fan are sealed such that extra maintenance is not required for the fan. When operated at dusty place, the machine's air duct may get plugged to cause the machine overheated, therefore, remove inside of the machine's dust with dry compressed air regularly.

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.

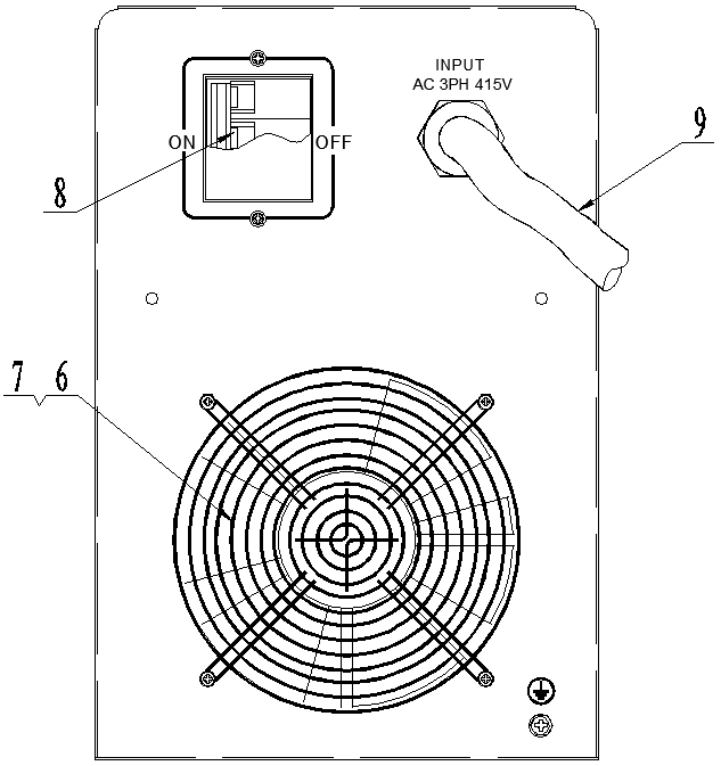
PARTS LIST AND EXPLODED VIEW

Front View



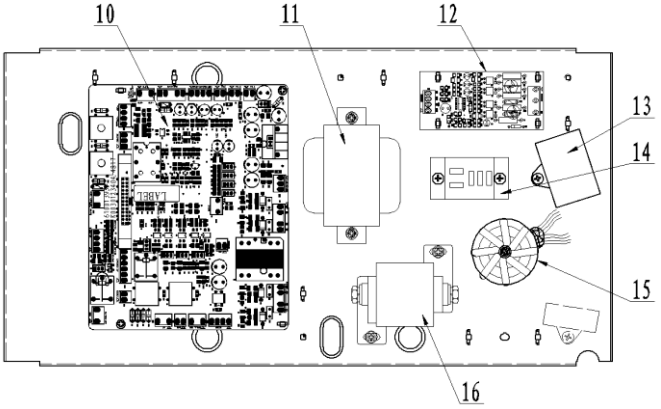
Sl. No.	Name of component	Item Code
1	Output terminal	50804024
2	Aviation Socket	12001004
3	Control board	30101710-01
4	Arc striking and thrust current knob	10603057
5	Welding current knob	10603056

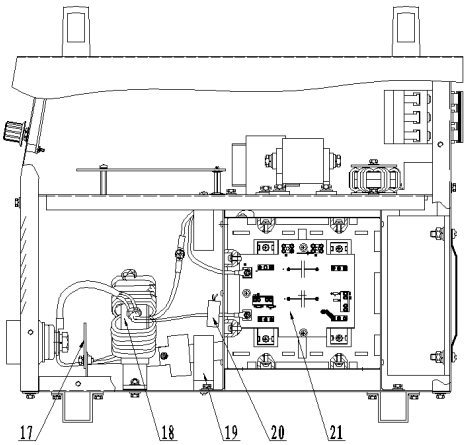
Rear View

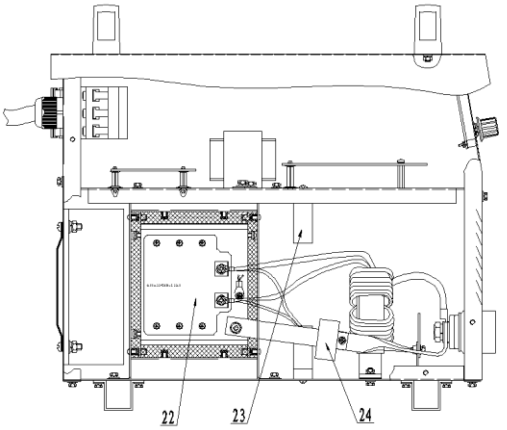


Sl. No.	Name of component	Item Code
6	Fan shield	11701017
7	Fan	11702020
8	Miniature circuit breaker	11501003
9	Input cable	30502040

Top & Side View







Sl. No.	Name of component	Item Code
10	Driving board	30101711-01
11	Control transformer	60101174
12	Power supply detection board	30101618
13	AC polypropylene capacitor	61301063
14	Three phase rectifier module	12103019
15	Three phase input inductance	30101111
16	Filter capacitor	10222008
17	Absorption board	30101715
18	Main transformer	30801607
19	Auxiliary inductance	31001106
20	Current transformer	11303015
21	Inverter board	30101717
22	Diode board	30101182
23	Primary inductance	31001079
24	Hall sensor	11301006

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