



TIG 300i

**INVERTER TIG
Welding Power Source**

Instruction manual



TIG 300i

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.

| | |
|--|---|
| | <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> |
|--|--|

RATING

RATING OF TIG 300i INVERTER WELDING POWER SOURCE

| Contents of parameters | | Unit | TIG 300i |
|--------------------------------|---|-------|---|
| Output | No-load voltage | V | 76 |
| | The working voltage of manual welding | V | 20.4-30 |
| | The working voltage of argon arc welding | V | 10.4-22 |
| | Rated welding current | A | TIG: 300 MMA: 250 |
| | Current adjustment range | A | TIG: 10-300 MMA: 10- 250 |
| | Rated load duty cycle (Argon arc welding) | | 300A/ 100% |
| | Rated load duty cycle (Manual welding) | | 250A/ 100% |
| Input | Number of phases | Phase | 3 |
| | Frequency | HZ | 50/60 |
| | Supply voltage | V | 415V |
| | Rated input current (Argon arc welding) | A | 13 |
| | Maximum effective input current (Argon arc welding) | A | 13 |
| | Rated input current (Manual welding) | A | 17 |
| | Maximum effective input current (Manual welding) | A | 17 |
| | Rated input capacity | KVA | 12 |
| Static external characteristic | | | Down slope characteristic |
| Lifting device | | | Handle |
| Efficiency η | | | $\geq 85\%$ |
| Power Factor | | | 0.99 |
| Insulation grade | | | H |
| Enclosure protection grade | | | IP21S |
| Weight | | Kg | 35 |
| Boundary dimensions (L* W* H) | | mm | 510x275x420 Without handle 510x275x510 With handle |

INSTALLATION

Input wiring

- Ensure that the voltage, number of phases, frequency and capacity of the input power are consistent with the calibration values on the nameplate of the welding machine.
- Wiring shall be performed by professional electrician.
- The input cable and air inlet are located on the back panel of the welding machine. Please refer to the structure diagram of welding machine for detailed location.
- Connect the input cable to the power to ensure the reliable connection.
- The casing must be grounded, and the grounding bolt is located at the lower right corner of the back panel of the welding machine and marked with a grounding \oplus mark.
- Confirm the air inlet is connected smoothly with the argon cylinder during the weld of argon arc welding.
- The recommended specifications of ground wire, fuse protector or breaker are as follows:

| Specifications for input cables, ground wires and input fuse protectors or breakers at three-phase /50Hz rated load duty cycle | | | | | | | |
|--|-----------------|---------------|---------------|---------------------------------|--------------------------|--------------------|---------------------------|
| Welding machine model | Load duty cycle | Input voltage | Input current | Maximum effective input current | 60°C cable specification | | Fuse protector or breaker |
| | | | | | Three-phase input cable | Ground wire | |
| TIG 300i | 100% | 415V | 17A | 17A | ≥4 mm ² | ≥4 mm ² | 60 A |

Output connection

- The positive pole of the output end, the negative pole of the output end and the control connector (welding torch switch) are all located on the lower side of the front panel, please refer to the structure diagram of welding machine for details.

(1) Manual arc welding connection method

- Connect one end of the negative output cable to the negative quick coupling, and the other end to the job.
- Connect the negative quick coupling to the negative pole of the output end and tighten it clockwise.

- Connect one end of the positive output cable to the positive quick coupling, and the other end to the electrode holder.
- Connect the positive quick coupling to the positive pole of the output end and tighten it clockwise.

(2) Argon arc welding connection method

- Connect one end of the positive output cable to the positive quick coupling, and the other end to the job.
- Connect the positive quick coupling to the positive pole of the output end and tighten it clockwise.
- Connect the two-core control plug in the argon arc welding torch cable to the control connector (welding torch switch) and tighten it, and connect the cable connector in the argon arc welding torch cable to the negative quick coupling.
- Connect the negative quick coupling to the negative pole of the output end and tighten it clockwise.
- Connect the air pipe of the argon cylinder to the input of the gas inlet. Please refer to the structure diagram of back panel for the location of the input gas connection.
- Connect the air pipe of argon arc welding torch to air outlet nozzle of the air outlet. Please refer to the front panel structure diagram for the position of the air outlet nozzle.
- Note: confirm that the air inlet is reliably connected with the argon cylinder.

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 $+45^{\circ}\text{C}$ 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.

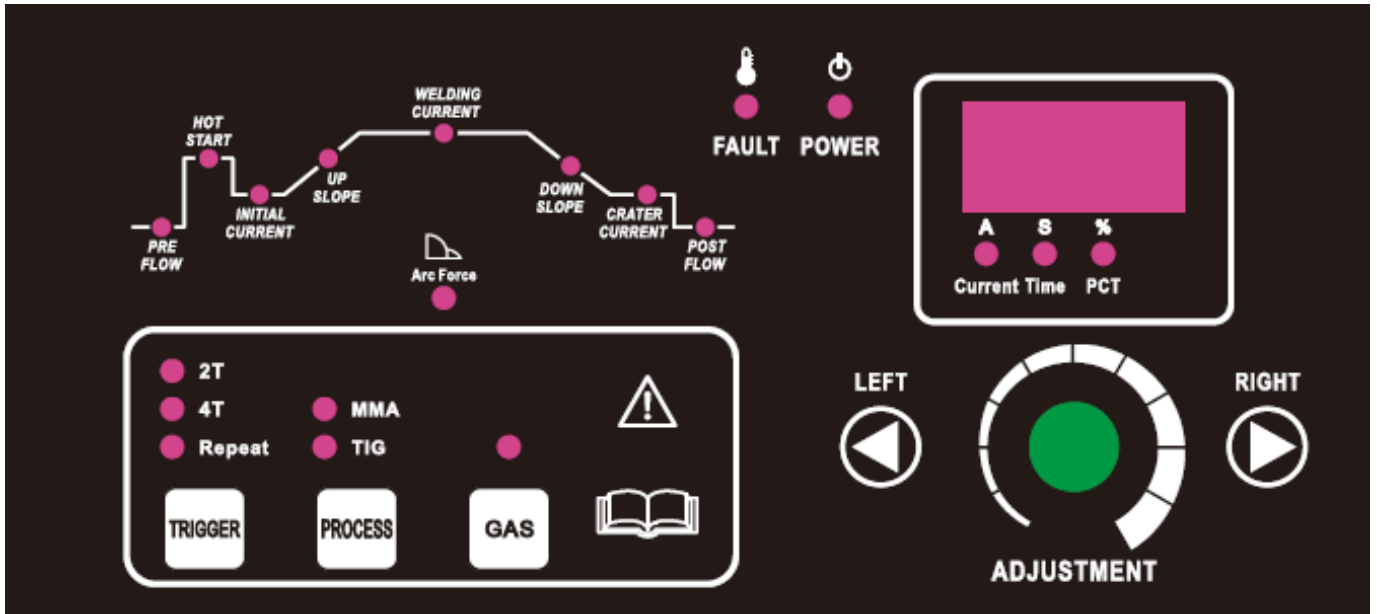
b) Ventilation

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.

WELDING OPERATIONS

Front Panel

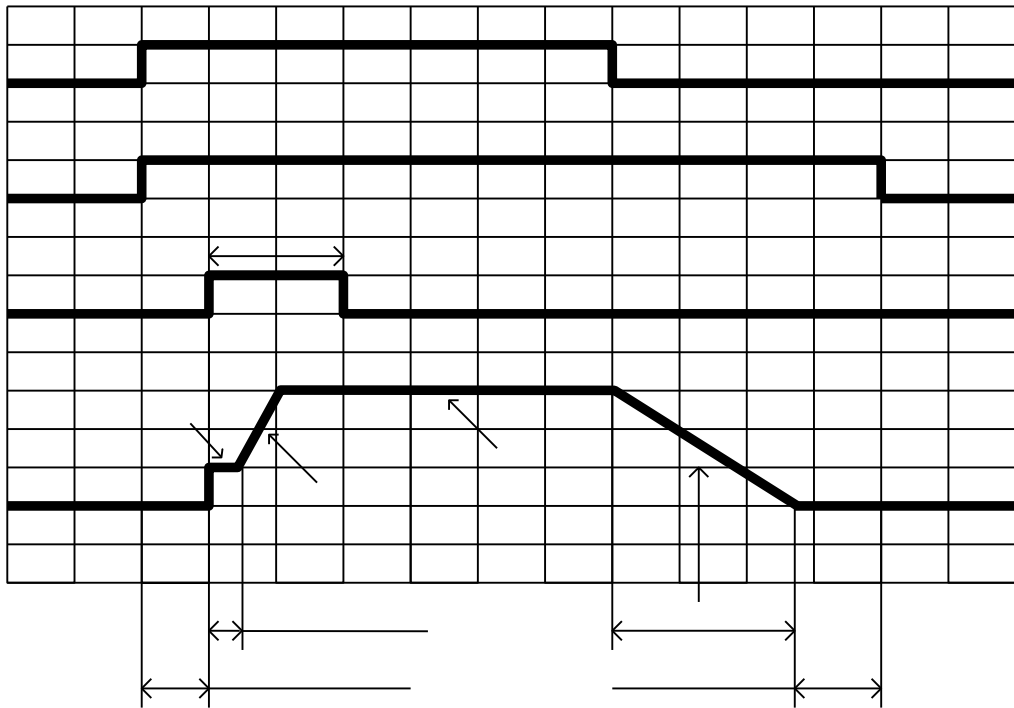


- Select the parameters to be adjusted by adjusting the **LEFT** or **RIGHT** shift keys on the front panel, and preset the parameters to be welded through the panel **ADJUSTMENT** knob.
- Each welding parameter on the front panel can be independently adjusted, and the ranges are as follows:

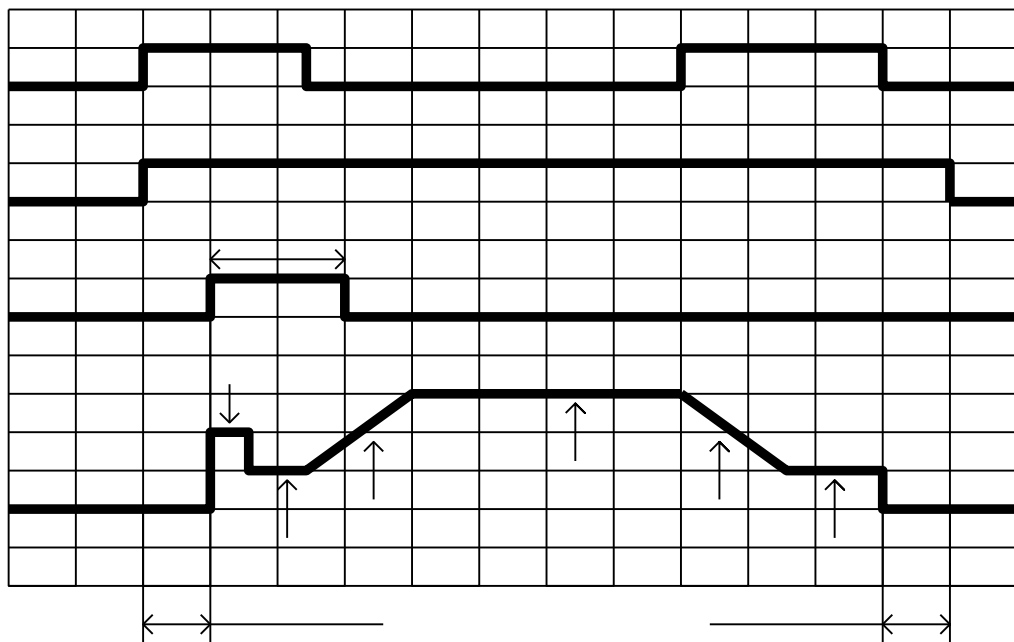
| Pre flow Gas | Initial current | Up slope time | Welding current |
|-----------------|--------------------|---------------|-----------------|
| 0.1-10s | 10-welding current | 0-15s | 10-300A |
| Down slope time | Crater current | Post Flow Gas | Arc Force |
| 0-25s | 10-welding current | 0.5-30s | 0-100% |

TIG welding has three modes of operation, which are 2-step, 4-step and repeat mode. The schematic diagram of the operational modes are as follows:

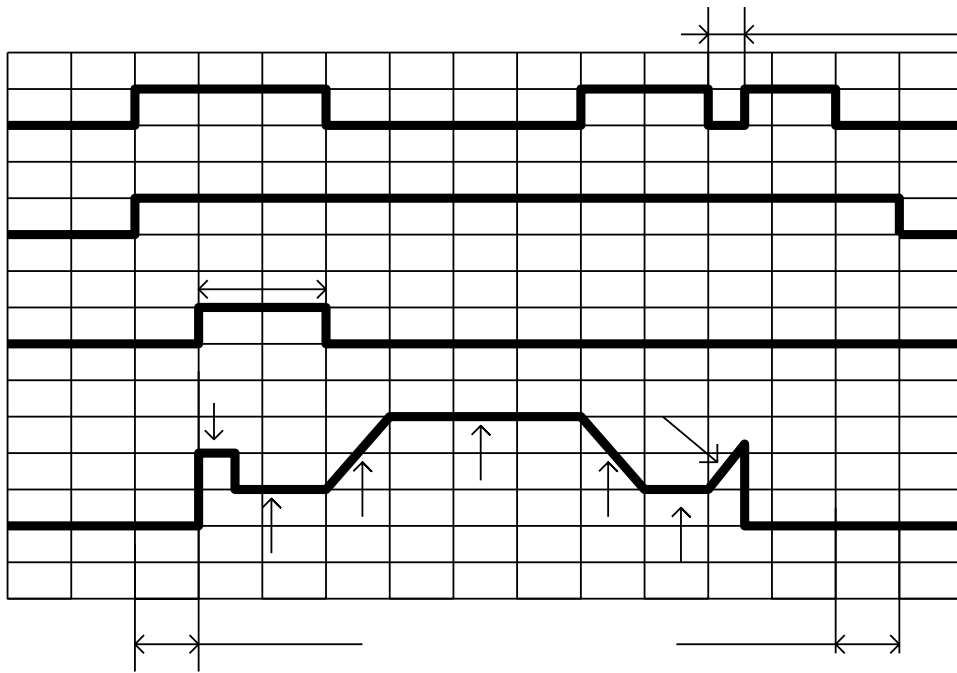
2- Step Mode

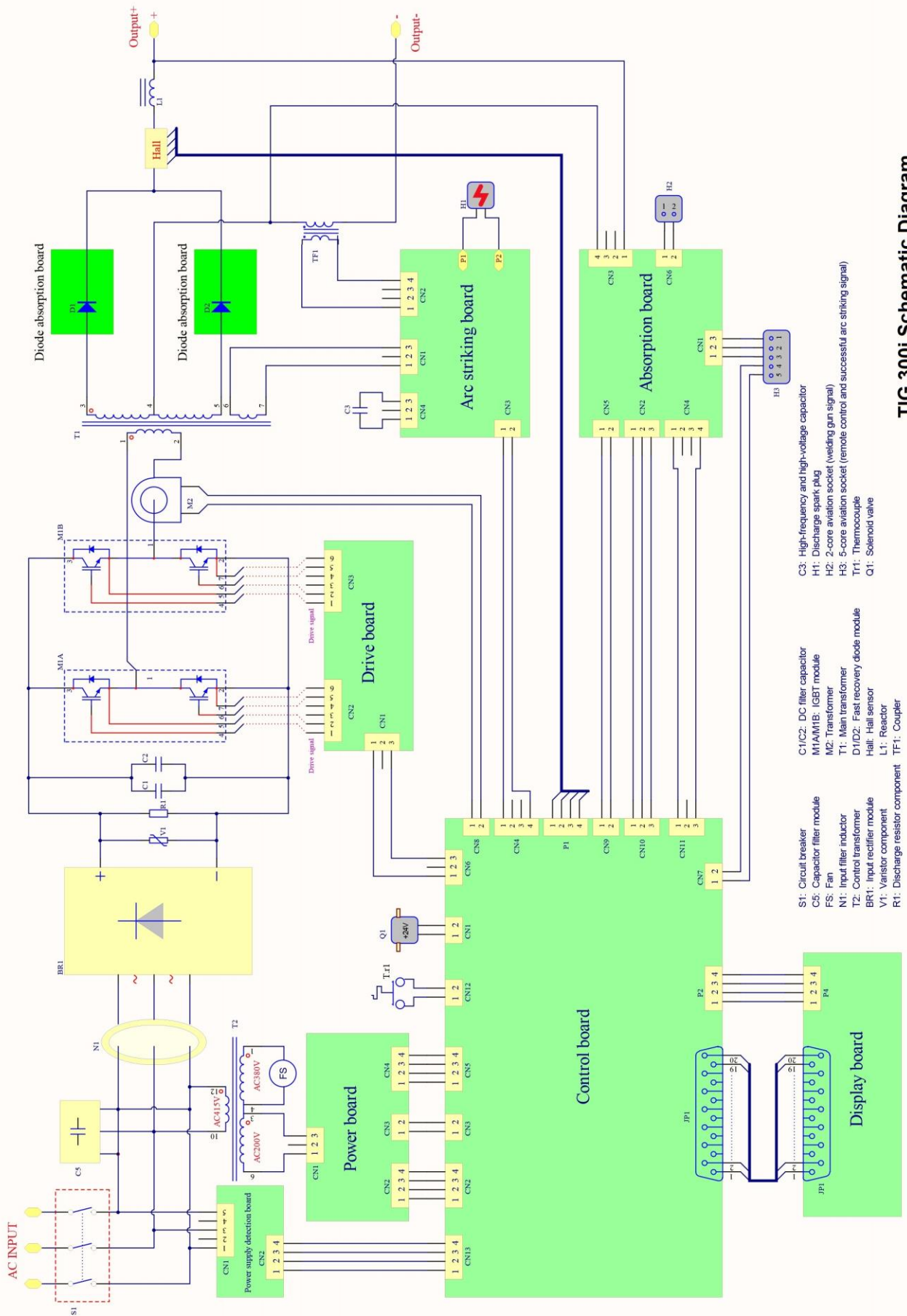


4-Step Mode



Repeat





TIG 300i Schematic Diagram

General maintenance

No additional maintenance for fan is required as all parts of the fan are sealed.

If the welding machine is used where there is a lot of dust, the dust may block the air duct of the welding machine and cause the welding machine to heat up. Therefore, it is necessary to use dry compressed air to remove the dust inside the welding machine at set intervals.

Overload protection

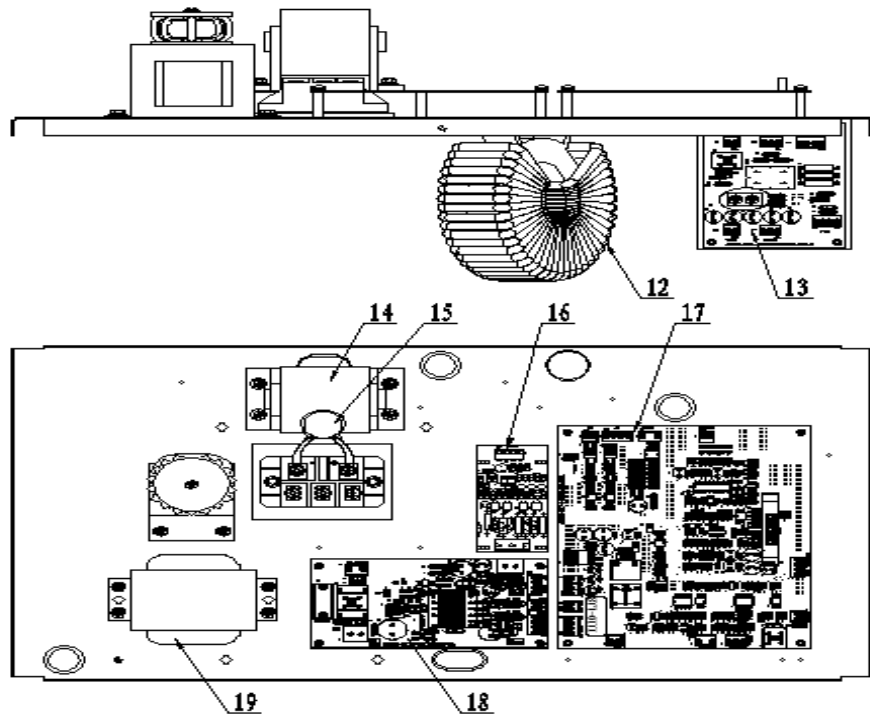
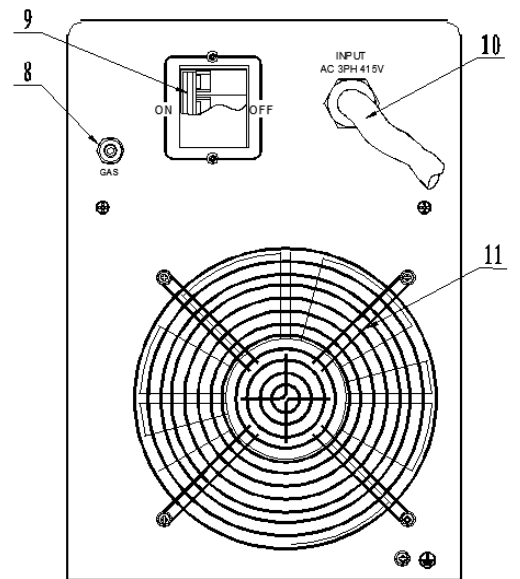
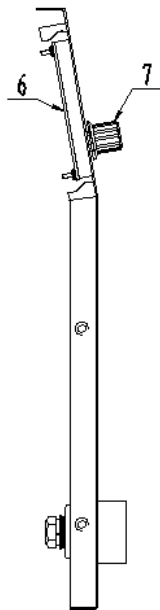
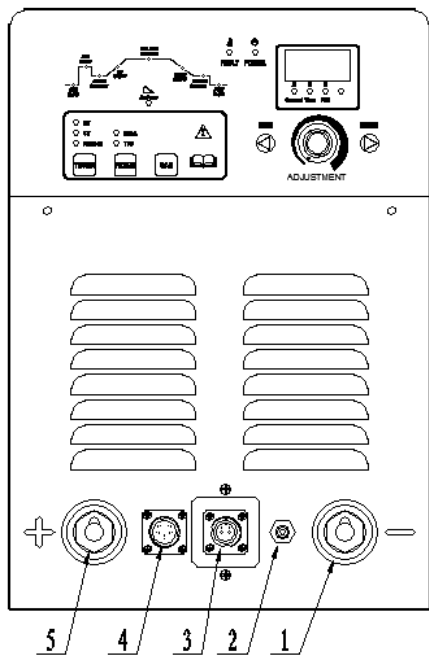
The temperature monitoring device in the welding machine, which uses the thermistor (temperature sensor) to prevent overload or insufficient cooling, can provide effective protection for the important power devices of the welding machine. When continuous overload occurs or power device IGBT and fast recovery diode cannot get adequate heat dissipation, the overheating indicator light will be on, and the normal output of the welding machine will be stopped. After these power devices cool down, the overheating indicator light will die out and the output of the welding machine will automatically return to normal.

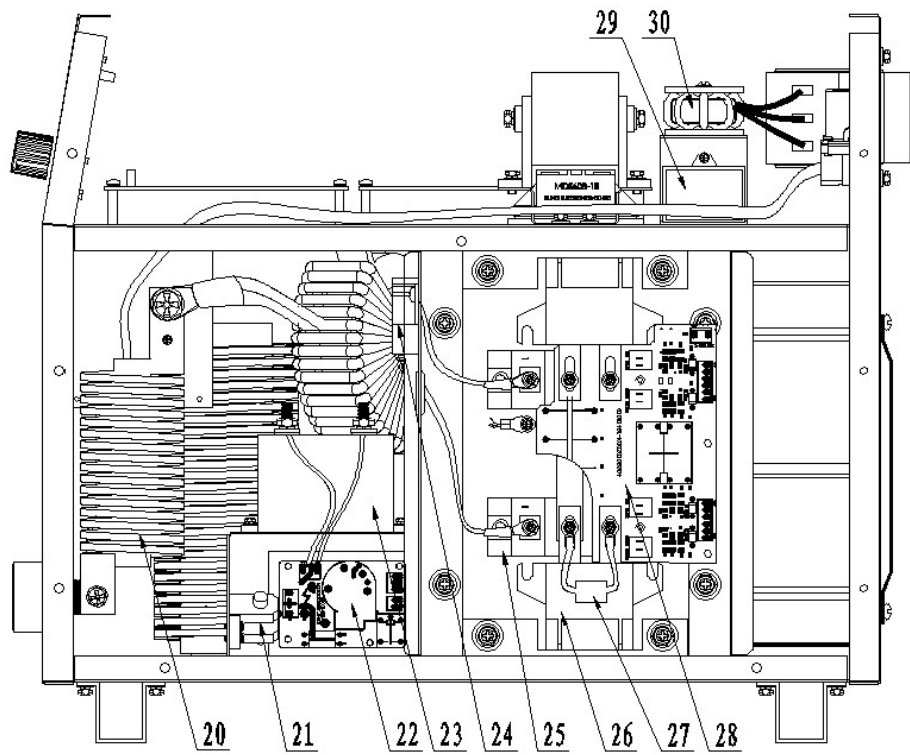
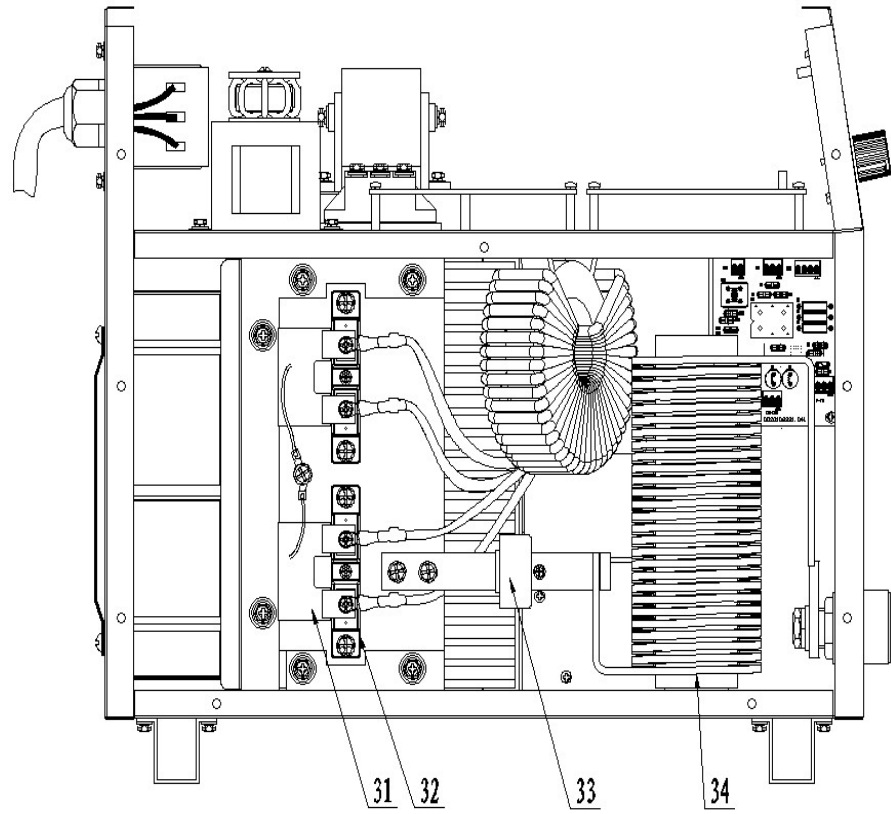
The control circuit power supply of the welding machine is designed with latest integrated power supply chip to ensure that the normal power supply of the welding machine will not be affected when the network voltage is too low or too high, and the function of the welding machine will not be affected by the network voltage. However, excessive power grid input voltage will cause damage to main circuit capacitors, IGBT, rectifier bridges, fans and other devices.

Parts List and Exploded view

| No | Part Name | Part Number |
|----|---|-------------|
| 1 | Welding cable coupling device: Socket (plate-type) | 0050804030 |
| 2 | Air outlet nozzle | 0061301356 |
| 3 | Aviation socket (2-core) | 0012001047 |
| 4 | Aviation socket | 0012001045 |
| 5 | Welding cable coupling device Socket | 0050804024 |
| 6 | Display board | 0030101841 |
| 7 | Potentiometer knob (large) | 0010603056 |
| 8 | Two-position two-way solenoid valve | 0011001003 |
| 9 | Miniature circuit breaker | 0011501003 |
| 10 | Input cables | 0030501596 |
| 11 | Axial flow fan | 0011702012 |
| 12 | Main transformer | 0030801632 |
| 13 | Absorption board | 0030101744 |
| 14 | Filter capacitor | 0010222002 |
| 15 | Three-phase rectifier module | 0012103001 |
| 16 | Power supply detection board | 0030101618 |
| 17 | Control panel | 0030101842 |
| 18 | Power panel | 0030101748 |
| 19 | Control transformer | 0060101206 |
| 20 | Coupler | 0030801612 |
| 21 | Arc striking device (spark plug) | 0012301292 |

| | | |
|----|---|------------|
| 22 | High-frequency arc striking board | 0030101746 |
| 23 | High-frequency and high-voltage capacitor | 0010227003 |
| 24 | Current transformer | 0011303019 |
| 25 | IGBT module | 0012101060 |
| 26 | Filter capacitor | 0010222014 |
| 27 | Discharge resistor component | 0030502252 |
| 28 | Drive board | 0030101747 |
| 29 | Capacitor | 0010227001 |
| 30 | Three-phase input inductance | 0031001147 |
| 31 | Diode absorption board | 0030101565 |
| 32 | Fast recovery diode module | 0012102033 |
| 33 | Hall current sensor | 0011301023 |
| 34 | Reactor | 0030901172 |





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