USER'S MANUAL

Model: **MIGMATE T194**

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Safety Warning!

In the process of arc welding and cutting, hurt to you and others may be caused; therefore, protective measures shall be taken accordingly. For details, see Safety Protection Gulde for Operators in linc with the accident preventative requirements of the manufacturer.

Electric shock-May cause death!!

·As per the application standard, install the grounding unit properly.

· In case of skin exposure, wearing wet gloves or wet clothes, do not touch the living components or welding rods.

· Make sure that you are well insulated from the ground and workpieces.

· Make sure that your working position is in safety state.

Fume- May be harmful to your health!

· Keep your head out of fume.

· During arc welding, always use ventilation or air exhaust devices to avoid welding gas induction.

Arc radiation- May damage your eyes and burn your skin!

· Use suitable welding mask and filter glasses and wear protective clothes in order to protect your eyes and your body.

· Use suitable mask or curtain to prevent standers-by from being damaged.

Fire

· Welding sparks may cause fire, please make sure there are no flammables near the welding position.

Noise-Too much noise may be harmful to human's hearing!

· In order to protect your ears; always use ear mufflers or wear other hearing protectors.

· Warn standers-by that noise can cause potential injuries to hearing.

Failure-In case of difficultics, ask professionals for help!

· If you have problems during the installation and operation, please conduct an inspection as per the related information in this manual.

· If you still can not understand completely or solve related problems after reading this manual, you should contact your supplier or our service center in order to seek the help of some professionals.

Warning!

Make sure an electricity leakage protection switch is used when this device is working!!!

Description

Our welder adopts the rectifier designed with advanced inversion technology.

The emergence of inversion-type gas shield welding devices benefits from the emergence of the inverted power supply theory and inverted devices. The inversion-type gas shield welding power supply adopts the MOSFET field-effect tube of high-power devices to switch the power frequency of 50/60HZ to high frequency (e.g. above 100KHZ) and then reduces voltage and rectify current and outputs high-power voltage source through Pulse Width Modulation (PWM) so that the weight and volume of main transformer decrease greatly and the efficiency increases by above 30%. The appearance of the inversion welder is accredited by experts as a revolution in the welder industry.

Our CO2 shielded welder is an inversion type welder manufactured with the most advanced inversion technology in the world. This machine is inbuilt with unique electronic reactor circuit, which can rather accurately control the welding process of short circuit transfer and mixture transfer and thus allows the machine to have excellent welding property. Comparing with the SCR welder and the welder with taps, this welder has the following advantages: wire feed stable, convenient, energy-saving and electromagnetic noise free. It can work continuously and stably even at small current, so it is particularly suitable for the welding of low-carbon steel, alloy steel and stainless steel sheets. In addition, it has the power grid fluctuation self-compensation function and is characterized by small splash, excellent arc striking, deep molten pool , high duty cycle, etc.

Welcome to use our products and give us your precious suggestions and comments! We will dedicate ourselves to the perfection of products and services.

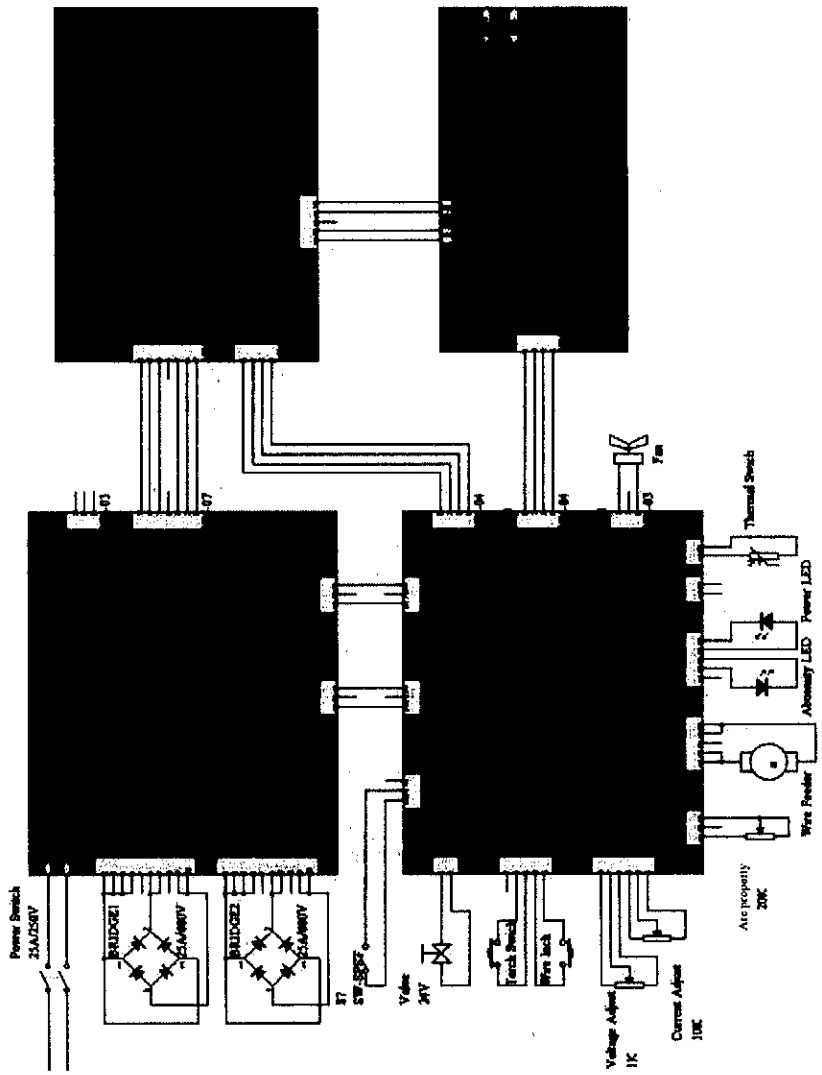
Warning!

This device is mainly used for industrial purpose. Under indoor conditions, this device may cause radio interference, so operators shall take adequate precautions.

Technical Parameter List

Model	MIGMATE T194
Input Power voltage (V)	One phase, 220V±15%
Frequency (HZ)	50/60
Rated input current (A)	23.8
Output current adjustment (A)	30-180
Output voltage adjustment (V)	15-26
Duty cycle (%)	60
Power factor	0.93
Efficiency (%)	85
wire feeder type	Inbuilt
Wire feed speed (m/min)	2-15
Post gas (S)	1
Welding wire diameter (mm)	200
Wire diameter (mm)	0.6/0.8/1.0
Housing protection level	IP21
Insulation class	F
Sheet thickness applicable (mm)	Above 0.5
Whole weight (kg)	14
Dimensions L * W * H (mm)	480×197×466

Wiring Diagram



Installation Instructions

Our welder is equipped with power voltage compensation device so that it can still continue working when the power voltage remains within ±15% of the rated one.

When long cables are used, in order to decrease voltage drop, it is suggested that cables with larger sections should be selected; if connection cables are too long, it may have a great effect on the arc striking performance of the welder and even other performances of the system. Therefore, we suggest you use the recommended configuration length.

MIGMATE T194 Installation (see Figure 1 and Figure 2):

1) Tightly connect the gas cylinder with CO2 regulator to the CO2 inlet on the back of this welder with gas pipe and insert the power plug of the CO2 relief flowmeter into the heating socket of the gas meter of this welder.
2) Insert the fast coupling device of the earth wire into the corresponding fast socket on the front panel, insert the torch into the output socket on the front panel and turn it until tight.
3) Fit the wire spool with wire onto the wire spool feeding shaft, align the holes of the wire spool and fixing bolts on the wire spool feeding shaft and insert the bolts in correctly.
4) The wire spool shall be rotated clockwise to unloosen the wire; in order to prevent the wire from loosening, the new wire spool head is often inserted into the fixed hole on the side of the wire spool. During normal operation, in order to prevent bent wire from jamming, please cut off such jammed part of the wire.
5) According to the diameter of the wire being used, choose a proper wire feeding trough.
6) Feed the wire through the guide wire tube into the wire feeding trough, insert the guide wire steel tube, make the pressure wheel press the wire, adjust the pressure handle to ensure the wire will not slip with small pressure in order to prevent wire distortion and wire feed being affected.
7) Press the wire check switch to feed the wire out of the torch.

Figure 1: Installation Diagram of MIGMATE T194

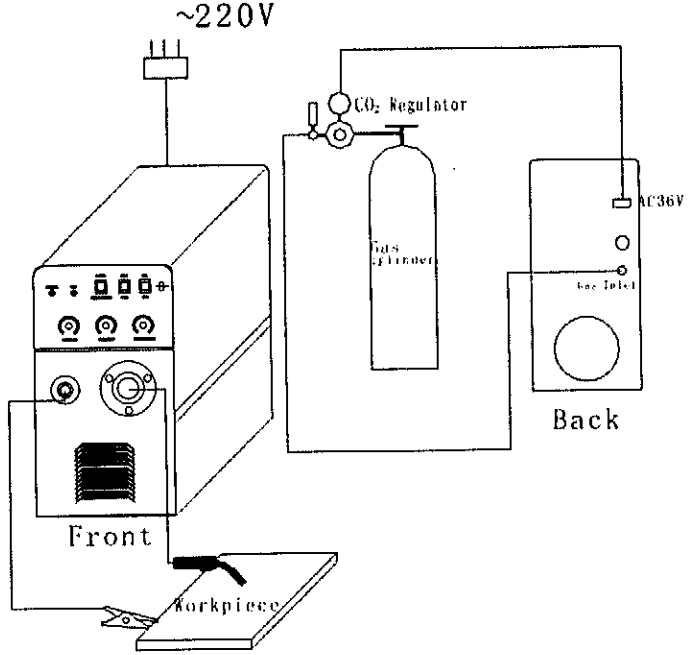
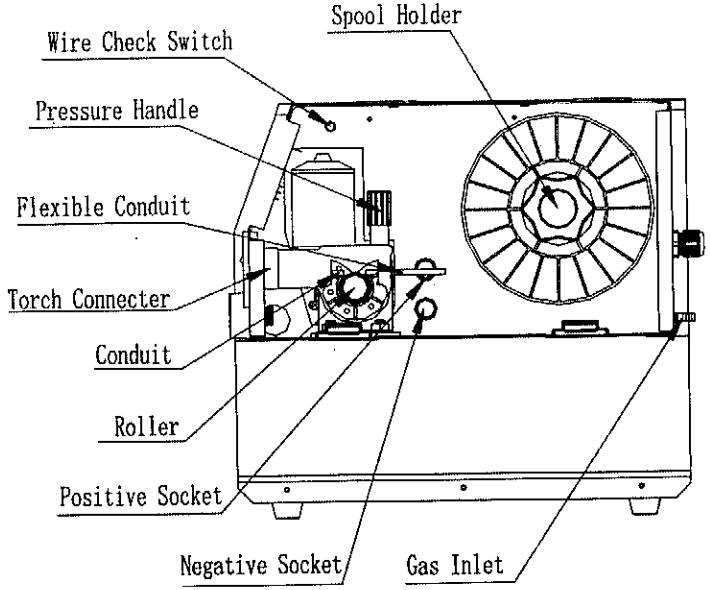


Figure 2: Installation Diagram of the Wire Feed Mechanism of MIGMATE T194



Instructions and Use of the Panel (see Figure 3)

1. Push the power switch of the welder to ON position. Turn on the gas cylinder valve, release the press handle, press the torch switch and adjust the flowmeter to the required flow.

2. Select the switch of wire diameter as per the adopted wire diameter: when φ0.6 or φ0.8 wire is adopted, push the switch to Rabbit position; when φ1.0 wire is adopted, push the switch to Tortoise position.

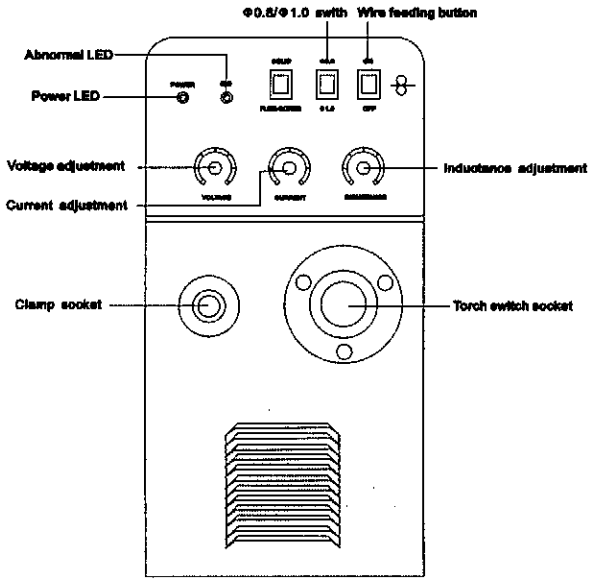
3. Select the contact tip with corresponding aperture as per wire diameter.

4. According to the thickness and process of the workpiece to be welded, adjust the voltage button and the current button to their corresponding positions.

5. The arc property regulating button is used to adjust the hardness of the arc in order to achieve the best effect. At small current, it should be a little harder, thus reducing arc break; at big current, it should be a little softer, thus reducing splashes.

6. After the workpiece is connected with earth cable, press the torch switch and then the welder starts work; release the torch switch and the welder stops work.

Figure 3: Panel Diagram



Notices and Precautions

1. Environment

1) The welding operation shall be conducted under a relatively dry condition with the air humidity generally not more than 90%.

2) The ambient temperature shall range from -10°C to 40°C.

3) Avoid welding in sunshine or rain; never let water or rain water penetrate into the welder.

4) Avoid welding in dust areas or under the environment with corrosive gas.

5) Avoid gas shielded welding under the environment with strong air flow.

2. Safety Notices

Our welder has been inbuilt with over-voltage, over-current and overheat protection circuits. When power grid voltage, output current and inside temperature exceed the rating, the welder will stop automatically. However, excessive use (e.g. too high voltage) may damage the welder, so the following safety notices should be paid attention to:

1) **Always keep excellent ventilation!**

Our welder is small and medium sized. During operation, large work current passes, however, natural ventilation can not meet the cooling requirements of the welder; therefore, the fan is installed in order to effectively cool the welder to make it work stably.

Operators shall confirm the ventilation opening is not covered or jammed and the distance between the welder and objects nearby is not less than 0.3m. They shall always pay attention to maintaining good ventilation, which is very important for the welder to work better for a longer time.

2) **No overload!**

Operators shall remember to observe maximum allowable load current (relative selectable load duration rate) at any time and maintain the welding current not more than the maximum allowable load current. Current overload will obviously shorten the service life of the welder and even can burn the welder. If the standard load duration rate is exceeded when the welder works, the welder may suddenly enter the protection status and terminate the work, which indicates the welder exceeds the standard load duration rate and the overheat triggers the temperature control switch and makes the welder stop work. Meanwhile, the red indicator light on the front panel is on. In this case, you do not need to unplug the power supply so that the cooling fan can continuously cool the welder. When the red indicator light is off and the temperature drops to the standard range, the welding can restart.

3) **No too high voltage!**

The power voltage is as listed in the "Table of Main Performance Parameters". Generally, the inbuilt voltage automatic compensation circuit of the welder will ensure the welding current within the allowable scope. If the power voltage exceeds the allowable value, the welder will be damaged. Operators shall understand this case completely and take corresponding precautions.

Problems in Welding and Analyses thereof

The cases listed here may be involved in your accessories, welding materials, environment factors and power supply. Please try to improve the environment to avoid such cases.

A. Hard arc striking and easily-broken arc:

1) Check if the earth clamp well contacts the workpiece.
2) Check if all connection points have bad contact.

B. Output current cannot reach the rating:

The deviation of power voltage from the rating will lead to the inconsistency of output current with the rating. When the power voltage is less than the rating, the max. output current may be less than the rating as well.

C. In use, the current of the welder cannot keep stable:

Such case may be related to the following factors:

1) Change of power grid voltage;
2) Severe interference from the power grid or other electrical devices.

D. Air holes exist on the weld joint:

1) Check if the gas supply loop has gas leakage.
2) Check if the surface of the parent materials has oil, stain, rust, paint, etc.

Daily Maintenance

Warning:
All maintenance and overhaul work must be conducted with power supply shutoff completely. Make sure the power plug is unplugged before opening the housing.

1. Remove dust regularly with dry compressed air. When the welder is used in the environment with much smoke and polluted air, it shall be removed of dust at least once a month.
2. Always choose a proper pressure for the compressed air to avoid damaging the components inside the welder.
3. Check the internal electric connection points and make sure all connection points (especially socket connector) have excellent contact, tighten the loose connection points. In case of oxidation, remove the oxide film with sand paper and reconnect the point.
4. Prevent water entering the welder or damp inside the welder, or dry it in time. Do not use it until its insulation is tested with a megohmmeter to be OK.
5. If the welder is idle for long, place it into the original package and store it in a dry place.
6. For every 300h operation of the wire feeder, be sure to repair and wind the motor carbon brush and clean the armature commutator, clean the reducer and apply 2# molybdenum disulfide grease onto the turbine, worm and bearing.

Daily Check

Position	Points	RMKS
Operation control panel	1. Check the operation, switching and installation of switches. 2. Check the on and off of the power indicator.	
Cooling fan	1. Check if it has air and its sound is normal.	If there is no fan rotation sound or there is abnormal noise, internal overhaul is needed. .
Power supply	1. In case of power-on, check if abnormal vibration or buzzes occur. 2. In case of power-on, check if abnormal odor occurs during. 3. Check if such heating phenomena as discoloration on the appearance.	
Peripheral	1. Check if the air duct is broken or connection points are loose. 2. Check if the housing and other fixed portions are loose.	

Position	Points	RMKS
Protective sleeve	1. Check if the installation is firm and the front end is distorted.	The reason for air holes.
	2. Check if spatters attach.	The reason for torch burning. (The effective method is to use splash agent)
Contact tip	1. Check if installation is firm.	The reason for the damage of the threads of the torch body.
	2. Check if the tip end is damaged or the hole is worn and blocked.	The reason for unstable arc or arc break.
Wire feeding hose	1. Check the size of the wire feeding hose stretching part.	Shall be replaced if less than 6mm. If the extending portion is too small, arc instability will occur.
	2. Check if the wire diameter is consistent with the inner diameter of the wire feeding hose.	Inconsistency is the reason for arc instability, please replace it with a proper wire feeding hose.
	3. Check the local bend and stretch.	The reason for ineffective wire feeding and instable arc. Please replace it.
	4. Check the jam of dirt in the wire feeding hose and the wire coating residue.	The reason for ineffective wire feeding and instable arc. (Clean with kerosene or replace it).
	5. Check if the wire feeding hose is damaged.	The damage of heat-shrink tube, replace it.
Gas diffuser	Forget inserting the diffuser, or the hole is blocked, or the components bought from other manufacturers are assembled.	May result in welding faults (such as splash, etc), burning of torch body (by the arc in the body), etc due to bad gas shielding, etc. Please treat these problems properly.

Daily Check

Position	Points	RMKS
Pressure handle	1. Check if the pressure handle is adjusted to the proper pressure indication station line.	May result in unstable wire feeding and unstable arc.
Guide wire steel tube	1. Check if cutting powder and scraps stack in the guide wire steel tube mouth and beside the feeding wire wheel.	Remove cut powder and waste scraps, check the occurrence cause and remove it.
	2. Check if the wire diameter is consistent with the inner diameter of the guide wire steel tube.	In case of inconsistency, result in unstable arc or cut power and waste scraps.
	3. Check if the center of the guide wire tube interface is consistent with the center of the wire feeding wheel groove. (visual inspection)	Inconsistency may result in the occurrence of cut powder and unstable arc.
Wire feeding wheel	1. Check if the wire diameter is consistent with the nominal diameter of the wire feeding wheel. 2. Check if the wire feeding wheel groove is jammed.	1. May result in the occurrence of cut powder of wire, blockage of wire feeding tube and instability of arc. 2. In case of fault, place it.
Pressure wheel	Check the rotation stability and the abrasion of the wire compression surface and the narrowing of the wire contact surface.	May result in ineffective wire feeding and thus unstable arc.

Position	Points	RMKS
Torch cable	1. Check if the torch cable has too high bent level. 2. Check if the fast plug metal connection points are loose.	1. May result in ineffective wire feeding. 2. Too much cable bent wire feeding, may cause unstable arc.
Input end cable	1. The connection between the power plug and the socket is not reliable. 2. Check if the cable in the input terminal joint of the welding power supply is connected securely. 3. During the wiring of the input terminal cable, check if its insulator is worn out or damaged to make the conductor exposed.	In order to ensure personal safety and stable welding, please adopt adequate servicing methods as per conditions of working sites. ● General and simple daily servicing; ● Thorough and careful regular serving.
Earth cable	Check if the earth cable for the parent material has short circuit and the connection is firm.	

Troubles and Troubleshooting

Note: For the following operations, operators are required to have enough professional electrical knowledge and comprehensive basic safety knowledge; they shall have valid qualifications proving their ability and knowledge. Before servicing, we recommend you contact local distributors first and obtain their approval.

Troubles	Solutions
The power indicator is off, the fan does not rotate and there is no welding output.	1. Check if the power supply is closed. 2. The power supply connected to the input cable is live. 3. Thermal resistors (4) are damaged (24V relay N.O. contact is not closed or badly connected). 4. The power panel goes wrong without DC310V input. (1) The silicon bridge is disconnected; the patch cords of such bridge are poorly connected. (2) Some places of the power panel are burned. (3) Check the patch cords from the power switch to the power panel and from such panel to the inversion panel (MOS panel). 5. The auxiliary power on the control panel goes wrong. (contact the dealer)
The power indicator is on; the fan does not rotate normally and there is no welding output.	1. Check if various patch cords are connected poorly. 2. The disconnection or poor contact occurs in the output terminal joint. 3. The control wire on the torch is broken or the microswitch is damaged. 4. The control circuit is damaged (contact the dealer).
The power indicator is on; the fan rotates normally and the fault indicator is on.	1. It may be in over-current protection; turn off the power supply and restart the device to restore to normal after the abnormal indicator light is off. 2. It may be in overheat protection; you do not need to switch off the device and it can naturally restore to normal after 2-3 min. 3. It may be the failure of inverter circuit; remove the power plug (VH-07 plug-in beside the fan) of the main transformer on the MOS panel and restart the device: (1) If the abnormal indicator light is still on, the individual field-effect tube on the MOS panel is damaged; please check and replace such tube with the same type. (2) If the abnormal indicator light is not on: a. the transformer on the medium panel may be damaged. b. the individual second rectifying tube of the transformer may be punctured; check and replace such tube with the same type.