

Cold TIG-220/Cold TIG-300

STICK&TIG WELDING MACHINE

Jan. 2022



OPERATOR'S MANUAL

KeyGree®

Copyright © KeyGree



To help us serve you better, go to www.KeyGree.com

Table of Contents

Welder Safety - Read Before Using
General Functions and Descriptions
Specifications
Contents
Operating Controls
Connections and Installations
Troubleshooting



CALIFORNIA PROPOSITION 65 WARNINGS

Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

For Gasoline Engines: Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines: Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.



SAFETY PRECAUTIONS - READ BEFORE USING

Warning: protect yourself and others from injury - read and follow these precautions.

Do not install, operate, or repair this equipment without reading this manual and the safety precautions contained throughout this manual. Be sure that all installation, operation, maintenance and repair procedures are performed only by qualified individuals.



FOR ELECTRICALLY powered equipment.

- Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.



FUMES AND GASES can be hazardous

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watchperson nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



ARC RAYS can burn eyes and skin.

- Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Head shield and filter lens should conform to ANSI Z87.1 standards.
- Wear suitable clothing made from durable flame-resistant material to protect your skin and others from the arc rays.
- Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



ELECTRIC SHOCK can kill.

- The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground. In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in ramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the work piece or ground) use the following equipment: MIG Semiautomatic DC Constant Voltage (Wire) Welder DC Manual (Stick) Welder, AC Welder with Reduced Voltage Control. TIG Welder AC/DC or DC. SIGNIFICANT DC VOLTAGE exists in inverter-type welding power sources after removal of input power. Turn Off inverter, disconnect input power and discharge input capacitors according to instructions before touching any parts.
- In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.
- Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- Ground the work or metal to be welded to a good electrical (earth) ground

- Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation
- Never dip the electrode in water for cooling.
- Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the work piece or ground. For these conditions, use the following equipment in order presented: a semiautomatic DC constant voltage (wire) welder, a DC manual (stick) welder, or an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner’s Manual and national, state, and local codes.
- Always verify the supply ground - check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first - double-check connections.
- Frequently inspect input power cord for damage or bare wiring; replace cord immediately if damaged - bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.

- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object
- Do not connect more than one electrode or work cable to any single weld output terminal.



WELDING and CUTTING SPARKS can cause fire or explosion

- Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available. Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding
- Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- Remove all flammables within 35 ft (10.7m) of the welding arc. If this is not possible, tightly cover them with approved covers.

- Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to ensure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been “cleaned”. For information, purchase “Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances”, AWS F4.1 from the American Welding Society
 - Vent hollow castings or containers before heating, cutting or welding. They may explode.
 - Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuff less trousers, high shoes and a cap over your hair.
- Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shield when in a welding area.
- Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
 - Do not use a welding power source for pipe thawing of frozen pipes.
 - Do not weld where flying sparks can strike flammable material.
 - Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
 - Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
 - Remove any combustibles, such as butane lighter or matches, from your person before doing any welding.
 - Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a firewatcher and extinguisher nearby.



CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure, If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling, tipping and chained to an undercarriage or fixed support.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder
- Never weld on a pressurized cylinder - explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.



MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging or spot welding operations.
- Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

- Exposure to EMF fields in welding may have other health effects. ELECTROMAGNETIC FIELDS (EMF) and ELECTROMAGNETIC COMPATIBILITY (EMC) All electrical equipment generates small amounts of electromagnetic emission. Electrical emission may be transmitted through power lines or radiated through space, similar to a radio transmitter. When emissions are received by other equipment, electrical interference may result. The user is responsible for installing and using welding equipment according to the manufacture instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the user to resolve the situation. H.F. RADIATION can cause interference. High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment. Have only qualified persons familiar with electronic equipment perform this installation. The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation. If notified by the FCC about interference, stop using the equipment at once. Have the installation regularly checked and maintained. Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference

ARC WELDING can cause interference.

Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots. Be sure all equipment in the welding area is electromagnetically compatible. To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor. Locate welding operation 100 meters from any sensitive electronic equipment. Be sure this welding machine is installed and grounded according to this manual. If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

SPECIFICATIONS

Model Item	Cold TIG-220	Cold TIG-300
Rated Input Voltage(V)	AC220V±15%	AC220V±15%
Frequency	50/60	50/60
Phase	1	1
Rated Input Current(A)	24	24
Output No-load Voltage(V)	55	55
Rated Work voltage	18	18
TTG Current Range	10-210	10-300
Duty Cycle(%)	100	100
Cooling Method	Fan Cooling	Fan Cooling
TIG-Arc Start Method	High Frequency	High Frequency
Efficency(%)	85	85
Power Factor	0.93	0.93
Insulation Class	B	B
Casing Protection Grade	IP21	IP21

Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating. If unit overheats, thermostat(s) opens, output stops, and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or Duty Cycle before welding. Exceeding duty cycle can damage unit or gun and void warranty.

INCLUDES

Cold TIG-220/300 Welding Machine

WP-26 Torch

WP-9F Torch

Earth Clamp

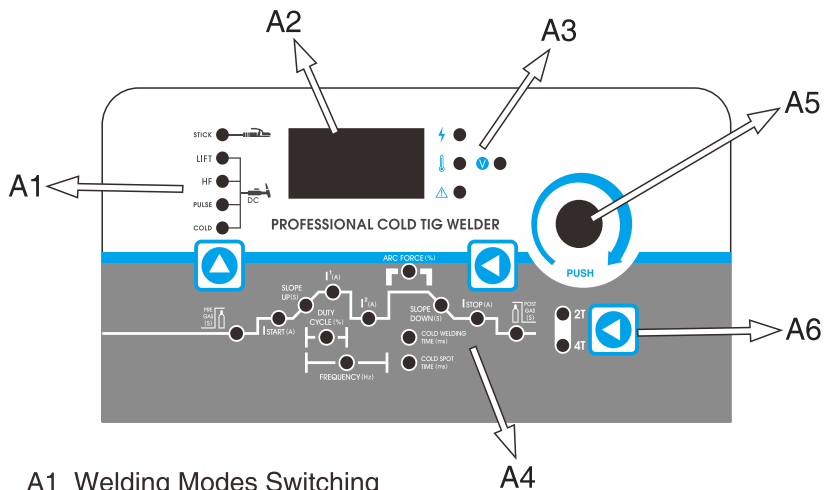
Electrode Holder

OPERATING CONTROLS

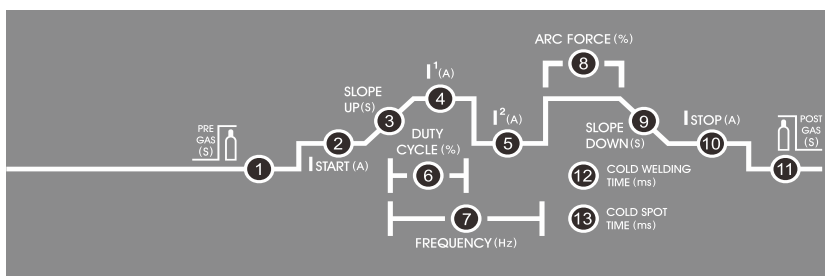
Operating Controls Location and Description

The welding machine is equipped with power voltage compensation device. When the power voltage fluctuates between $\pm 15\%$ of rated voltage, it still can work normally. When the machine is used with longer cables than are provided, in order to prevent voltage from decreasing, increase the cable size is suggested.

- Make sure intake of the machine is not blocked or covered to avoid malfunction of cooling system.
- Correctly connect the electrode holder and work clamp cables to match the type welding electrode you have selected. Reference the welding electrode manufacturer's polarity and amperage setting. Make sure the cable, electrode holder, work clamp, and twist lock connector is in good working condition and tight. Put the fastening plug into the fastening socket at the "+" polarity and fasten it clockwise.
- Please pay attention to the connecting terminal, DC welding machine has two connecting ways: Positive connection and Negative connection. Positive connection: holder connects with "-" terminal, while work piece with the "+" terminal. Negative connection: work piece with the "-" terminal, holder with the "+" terminal. Choose suitable way according to working demands. If unsuitable choice, it will cause unstable arc, more spatters and conglutination. If such problems occur, please change the polarity of the fastening twist lock plug at the welding machine panel.
- Make sure the voltage of power supply does not exceed permission range.



- A1 Welding Modes Switching
- A2 Parameter Indicate
- A3 Power on/ Over Heat Alarm/Over Current Alarm/Over and leakage Input Voltage Alarm
- A4 Parameter Setting of TIG/Cold TIG
- A5 Parameter Adjusting Knob
- A6 2 Steps and 4 Steps Switching



- ① Pre gas flow time setting
- ② Starting arc current setting
- ③ Slope up time from starting arc current to I1 peak current
- ④ I1 peak current of welding
- ⑤ I2 base current of welding(available on pulse on)

- ⑥ Duty cycle, 11 percentage of time in single pulse welding period
- ⑦ Frequency of pulse
- ⑧ Arc force added on start arc welding, % added basis on setting stick welding current
- ⑨ Slope down time from I1 peak current to stop arc current
- ⑩ Stop arc current setting
- ⑪ Post gas flow time setting
- ⑫ Welding time of cold spot
- ⑬ Interval time of cold spot

STICK Welding Specifications

Item	Welding Current (A)						
	10 ~ 20	20 ~ 30	30 ~ 55	55 ~ 70	70 ~ 85	85 ~ 140	140 ~ 220
Electrode Diameter Φ mm	Φ 1.0~1.4	Φ 1.4~1.6	Φ 1.6~2.0	Φ 2.0~2.5	Φ 2.5~3.2	Φ 3.2~4.0	Φ 4.0~5.0
Workpiece Thickness (mm)	0.5~0.8	1.0~1.5	1.5~2.5	2.5~3.0	3.0~4.0	4.0~5.0	> 5.0

TIG Welding Specifications:

Item	Welding Current (A)			
	3 ~ 20	15 ~ 80	70 ~ 160	100 ~ 220
Tungsten electrode Diameter (mm)	Φ 0.5	Φ 1.0	Φ 1.6	Φ 2.0
Gas Flow (L/min)	4~5	5~7	6~8	8~12
Nozzle Diameter (mm)	Φ 4, Φ 6, Φ 8	Φ 6, Φ 8, Φ 10	Φ 8, Φ 10	Φ 10, Φ 12
Filled Wire Diameter (mm)	$\leq \Phi$ 1.0	$\leq \Phi$ 1.6	Φ 1.0 ~ Φ 2.4	Φ 1.6 ~ Φ 3.0

Connections and Installations


(MAKE SURE ALL POWER IS OFF DURING THIS SECTION WHEN MAKING CONNECTIONS)

WELDING IN STICK MODE

- Put the electrode holder and cable and the work clamp and cable connections into the output receptacle. Turn clockwise until tight. Connect the work clamp to the work piece.
- Polarity selection is done at the machine using the cable connections. You will need to switch the cables to match the polarity for the type of electrode you will be welding with. The most common is DC-. For this the electrode cable will be on the + positive connection and the work will be on the – negative connection. Check the polarity directions of the electrode you are using, check with your welding dealer for settings.
- Place the electrode in the electrode holder.
- Turn the power switch to “ON”.
- Adjust the Output AMP Control to the desired amp setting for the electrode you are using.
- Strike an arc and weld.

WELDING IN TIG MODE

- Connect the TIG torch and cable to the gas and power fitting and tighten.
- Connect the work clamp to the work piece and the cable connector to the + positive connection on the welder. The correct polarity setting for TIG is DC- for welding steel, stainless steel.
- Set the TIG/STICK switch to “TIG”.
- Turn on the compressed cylinder valve and adjust the flow regulator to obtain desired flow. Make sure you are using the correct shielding gas for the material you are welding. Check with your local gas dealer if you have questions. Normally pure Argon is used.
- Turn the power switch to “ON”
- Set the Current Control on the control panel to the maximum desired amp setting for the material and thickness you will be welding. If you are using a remote AMP controller it will adjust the Amps as required during

welding. If you are using a remote-control device make sure the machine is set to remote. Depress the contactor trigger control on the torch and establish an arc with the work piece. When Welding Mode is set to "  depressing the torch trigger control this will start the shielding gas pre-flow before energizing the TIG torch. When the trigger control is released the TIG torch is de-energized and gas flow will continue post flow. When the polarity switch is set to DC, the TIG LIFT Arc Starter will turn on and off automatically to start and stabilize the arc. Hold the tungsten to the work and slight pull away to start the arc. Post flow is preset for DC.

- Put the TIG torch cable into the combination gas out and power connection and the work clamp and cable connections into the output receptacle, NOTE: work clamp connection on TIG is on the + connection. Turn clockwise until tight. Connect the work clamp to the work piece.
- **Polarity selection is done at the machine using the cable connections. You will need to switch the cables to match the polarity for TIG welding the most common is DC -. For this the TIG cable will be on the - negative connection and the work will be on the + positive connection.** Check the polarity directions of the electrode you are using, check with your welding dealer for settings.

General TIG and Stick Welding Guidelines

- Read the operating instructions in this manual for set up procedures.
- Read all Safety instructions before welding. If you are not sure of any safety points or require addition safety instructions. Contact your local welding supply dealer.
- The charts and general welding settings and procedures are suggestions. You will need to make adjustments to your setting depending on metal, wires and external conditions at your welding site.
- Make sure the correct welding polarity and shield gas is used for the type welding wire and material you are welding

- Connect your work clamp to the base metal that is to be welded. Make sure the work clamp has good electrical contact to the base metal and the metal is clean and free of paint, grease, rust, oils, etc. It is recommended to place your ground clamp as close to the weld area as possible for best electrical flow.
- Make sure your work area is clean and no flammable materials are near the welding area. Read the safety section of the manual for addition information.
- Make sure all safety equipment is used. This includes safety eye protection, welding helmet with shaded lens, gloves, and protective clothing.
- Warn any persons in the general area that you will be welding. They should have protective equipment as well.
- Never look into the welding arc without protective shaded eye protection.
- Plug in the welder to an approved electrical receptacle; consult professional electrical assistance if you're not sure of voltage and ampere rating. If extension cords are used, make sure they are of correct size and length. Voltage drop can occur and damage welder if wrong cord sizes are used.
- Safely open the compressed gas cylinder if shielding gas is being used. Read the correct safety and hook up procedure in this manual.
- When you release the torch trigger, the welding process will stop. To continue welding, depress the trigger again.
- When you are finished, turn the welder power switch to the off position and turn the shielding gas cylinder valve to the closed position.
- Make sure the area around you is clear of any fire hazards, since the welding process created sparks that could have come in contact with material.
- It takes time to learn the proper technique, practice will help. Check with local schools for welding classes if you want to learn more on welding processes.

- Report any damaged equipment, so it can be safely repaired
- SAFETY IS VERY IMPORTANT. Make sure you read all safety warning labels and the instruction manual.

Troubleshooting

STICK-striking is difficult and easy to pause: Make sure electrode is correct, If the electrode is not dried, it will cause unstable STICK, welding defect increases and the quality is down., If use extra-long cable, the output voltage will decrease, so please shorten the cable.

Output current not to rated value : When power voltage departs from the rated value, it will make the output current not matched with rated value; when voltage is lower than rated value, the max output may lower than rated value.

Current is not stabilizing when machine is been operating: It has something with factors as following., Electric voltage should been checked., There is harmful interference from electric wire net or other equipment

When use Stick welding, too much spatter: Maybe the welding current is too high and the electrode diameter is too small. Output terminal polarity connection is wrong; it should apply the opposite polarity at the normal technique.