ADC 200

DC INVERTER AC TIG/DC TIG/PULSE TIG WELDING MACHINE



Operation Manual

(Read the manual carefully before installation operation and maintenance)

Safety Depends on You

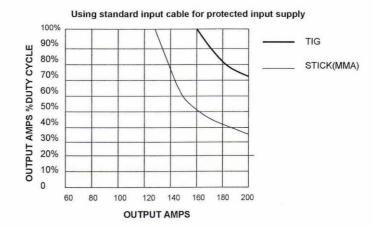
WEICO arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.
And, most importantly, think before you act and be careful.

TECHNICAL SPECIFICATIONS

max. rated Output Amps @% Duty Cycle (Based on a 10 minute cycle) (Example; 200A@35% for AC/DC Stick and 200A@60% for AC/DC Balance TIG)

	MODEL	ADC160	ADC200	
INPUT	Voltage	AC 220/230/240V 50/60Hz		
	No-load Voltage	60 -	80V	
мма	Base current Adjusting Range	5A~130A	5~160A	
IVIVIA	Rated Output Current	130A	160A	
	Rated Duty Cycle	35	5%	
	No-load Voltage	60 -	80V	
	Base current Adjusting Range	20A~160A	20~200A	
AC TIG	SP %	30-	-70	
	AC Square Wave Frequency	20~100Hz		
	Rated Duty Cycle	60%		
	Pulse Current Adjusting Range	5~160A	5~200A	
	Rated Duty Cycle	60%		
	Current Up-slope Time	0~1	10S	
DC -	Current Down-slope Time	0~10S		
TIG	Base Current Adjusting Range	5A~160A	5A~200A	
110	Pulse Width Ratio	0.1~0.9		
	Pulse Frequency	0.5~25Hz		
	After Flow Time	1~25s		
	Arc starting Mode	high frequency arc striking		
Efficiency		≥8	0%	
	Mass	25	kg	
F	Protection Class of enclosure	IP2	18	
	Outline Dimensions mm ³	430x20	0x290	

Chart gives max. rated Output Amps @% Duty Cycle (Based on a 10 minute cycle) (Example; 200A@35% for AC/DC Stick and 200A@60% for AC/DC Balance TIG)



(1)

Wiring and protection based on the IEC60974.1-2005 National Electric Code: Use a Super Lag type fuse or circuit breaker with a delay in tripping action. Models with NEMA 6-50P plug may be used with a 50 amp protected 6-50R receptacle, or with a maximum 70 amp protected 6-50R receptacle if dedicated for the welder.

SAFETY PRECAUTIONS

Read entire installation section before starting installation.

A WARNING



ELECTRIC SHOCK can kill.

Only qualified personnel should perform this installation.

·Turn the input power OFF at the disconnect switch or fuse box

before working on this equipment.

Do not touch electrically hot parts.

Always connect the MACHINE to a power supply grounded per the National Electrical Code and any local codes.

SELECT SUITABLE LOCATION

Place the welder where clean cooling air can freely circulate in and out through the rear louvers. Dirt, dust or any foreign material that can be drawn into the welder should be kept at a minimum. Failure to observe these precautions can result in excessive operating temperatures and nuisance shut-downs.

GRINDING

Do not direct grinding particles towards the welder. An abundance of conductive material can cause maintenance problems.

STACKING

The machine cannot be stacked.

TRANSPORT - UNLOADING



Never underestimate the weight of the equipment.



Never make the cargo pass or leave it suspended over people or things.

Neither let the equipment or the single unit fall, nor put it down with force.

Once it has been removed from the packing, the power source can be used to move it in the hand or on the shoulder.

A WARNING



FALLING EQUIPMENT cause injury

Never lift welder with gas cylinder attached. Never lift welder above personnel.

TII TING

Each machine must be placed on a secure, level surface, either directly or on a recommended undercarriage. The machine may topple over if this procedure is not followed. 10°

ENVIRONMENTAL RATING

The welding machine power source carries an IP21s environmental rating. It may be used in normal industrial and commercial environments. Avoid using it in environments which have falling water such as rain.

Read and follow "Electric Shock Warnings" in the Safety section if welding must be performed under electrically hazardous conditions such as welding in wet areas or on or in the workpiece.

MACHINE GROUNDING AND HIGH FREQUENCY INTERFERENCE PROTECTION

This welder must be grounded! See your local and national electrical codes for proper grounding methods.

The high frequency generator, being similar to a radio transmitter, may cause radio, TV and electronic equipment interference problems. These problems may be the result of radiated interference. Proper grounding methods can reduce or eliminate radiated interference.

Radiated interference can develop in the following four ways:

- 1 Direct interference radiated from the welder.
- 2 Direct interference radiated from the welding leads
- 3 Direct interference radiated from feedback into the power lines.
- 4 Interference from re-radiation of "pickup" by ungrounded metallic objects.

Keeping these contributing factors in mind, installing equipment per the following instructions should minimize problems.

- 1 Keep the welder power supply lines as short as possible and enclose as much of them as possible in rigid metallic conduit or equivalent shielding for a distance of 50 feet (15.2m). There should be good electrical contact between this conduit and the welder case ground. Both ends of the conduit should be connected to a driven ground and the entire length should be continuous.
- 2 Keep the work and electrode leads as short as possible and as close together as possible. Lengths should not exceed 25 ft (7.6m). Tape the leads together when practical.
- 3 Be sure the torch and work cable rubber coverings are free of cuts and cracks that allow high frequency leakage.
- 4 Keep the torch in good repair and all connections tight to reduce high frequency leakage.
- 5 The work piece must be connected to an earth ground close to the work clamp, using one of the

following methods:

radiating antennas.

- a) A metal underground water pipe in direct contact with the earth for ten feet or more.
- b) A 3/4" (19mm) galvanized pipe or a 5/8" (16mm)solid galvanized iron, steel or copper rod driven at least eight feet into the ground. The ground should be securely made and the grounding cable should be as short as possible using cable of the same size as the work cable, or larger. Grounding to the building frame electrical conduit or along pipe system can result in reradiation, effectively making these members
- 6 Keep cover and all screws securely in place.
 7 Electrical conductors within 50 ft (15.2m) of the welder should be enclosed in grounded rigid metallic conduit or equivalent shielding, wherever possible. Flexible metallic conduit is generally not aviitable.
- 8 When the welder is enclosed in a metal building, the metal building should be connected to several good earth driven electrical grounds (as in 5 (b) above) around the periphery of the building. Failure to observe these recommended installation procedures can cause radio or TV and electronic equipment interference problems and result in unsatisfactory welding performance resulting from lost high frequency power.

INPUT CONNECTIONS

Be sure the voltage, phase, and frequency of the input power is as specified on the rating plate, located on the rear of the machine. Have a qualified electrician provide input power supply to the recentagle or cord in accordance with

supply to the receptacle or cord in accordance with all local and national electrical codes. Use a single phase line or one phase of a two or three phase line.

Choose an input and grounding wire size according to local or national codes. Refer to **the Technical Specifications** page at the beginning of this section. Fuse the input circuit with the recommended super lag fuses or delay type1 circuit breakers.

Using fuses or circuit breakers smaller than recommended may result in "nuisance" shut-off from welder inrush currents even if not welding at high currents.

1Also called "inverse time" or "thermal/magnetic" circuit breakers; circuit breakers which have a delay in tripping action that decreases as the magnitude of the current increases.

INPUT RECONNECT PROCEDURE

On multiple input voltage welders, be sure the machine is connected per the following instructions for the voltage being supplied to the welder. Failure to follow these instructions can cause immediate failure of components within the welder and void machine's warranty.

Multiple voltage models are shipped connected for the highest voltage. To change this connection refer to the following instructions. The Inverter machine is recommended for use on an individual branch circuit.

1Also called "inverse time" or "thermal/magnetic" circuit breakers.

These circuit breakers have a delay in tripping action that decreases as the magnitude of the current increases.

220/230/240V INPUT

The equipment is provided with a 220/230/240V cable, 6.6ft.(2m) in length with a 230V 6-50P attachment plug.

The Inverter machine performs best when connected to 220/230/240VAC inputs. This input allows full output of the machine (200 amps).

A WARNING

ELECTRIC SHOCK can kill.



Turn the input power OFF at the disconnect switch or fuse box before working on this equipment.

Have a qualified electrician install and service this

equipment.

- . Turn the input power OFF and unplug the machine from the receptacle
- before working on this equipment.
- . Allow machine to sit for 5 minutes minimum to allow the power capacitors to discharge before working inside this equipment.
- . Do not touch electrically hot parts.
- . Machine must be plugged into a receptacle that is grounded according to the National Electrical Code and local codes.
- . Do not remove or defeat the purpose of the power cord ground pin.

RECONNECT PROCEDURE

The Inverter machine reconnects to 220/230240V supply.

Fuse the input circuit with time delay fuses or delay type1 circuit breakers. Using fuses or circuit breakers smaller than recommended may result in "nuisance" shut-offs from welder inrush currents even if not welding at high currents.

ATTACHMENT PLUG INSTALLATION

Connect the white (neutral) wire under terminal clamp with silver screw, and black (hot) wire under terminal clamp with brass screw. Connect green wire under terminal clamp with green screw.

A WARNING

. Failure to wire as instructed may cause personal injury or damage to equipment. To be installed or checked by an electrician or qualified person only.

In all cases, the green or green/yellow grounding wire must be connected to the grounding pin of the plug, usually identified by a green screw.

Attachment plugs must comply with the Standard for Attachment Plugs and Receptacles,

The product is considered acceptable for use only when an attachment plug as specified is properly attached to the supply cord.

For use on engine drives, keep in mind the above input draw restrictions and the following precaution.

ENGINE DRIVEN GENERATOR

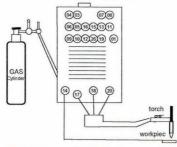
The Inverter machine can be operated on engine driven generators as long as the 220/230/240 volt auxiliary meets the following conditions:

. The AC waveform peak voltage is below 400 volts. . The AC waveform frequency is between 45 and 65Hz

The following Lincoln engine drives meet these conditions when run in the high idle mode:

■Ranger 250,305 ■. Commander 300, 400, & 500 Some engine drives do not meet these conditions (e.g. Miller Bobcats, etc). Operation of the Inverter machine is not recommended on engine drives not conforming to these conditions. Such drives may deliver unacceptably high voltage levels to the Inverter machine power source.

CONNECTIONS FOR TIG (GTAW) WELDING



TIG TORCH CONNECTION

Refer to Included Equipment in the Operation Section of this manual for TIG welding equipment which is included with the machine The TIG Torch Twist-Mate and work cable Twist-Mate Connectors are supplied with the welder. To connect the cables, turn the Power Switch "OFF". Connect the torch cable Twist-Mate plug into the DC(-)

Electrode Receptacle on the front of the welder and turn it clockwise until snug,(Do not Over tighten). This is a quick connect terminal

To avoid receiving a high frequency shock, keep the TIG torch and cables in good condition. WORK CABLE CONNECTION

Next, connect the work cable to the "+" output terminal in the same way.

To minimize high frequency interference, refer to Machine Grounding and High Frequency Interference Protection section of this manual for the proper procedure on grounding the work clamp and work piece.

SHIELDING GAS CONNECTION

Obtain the necessary inert shielding gas (usually argon). Connect the cylinder of gas with the pressure regulator and flow gage. Install the gas hose between the regulator and gas inlet (located on the rear of the welder). The gas inlet has a 5/16-18 right hand female thread; CGA#032. CYLINDER could explode if damaged.

1

Keep cylinder upright and chained to a support.
Keep cylinder away from areas where it could be damaged.
Never allow the torch to touch

the cylinder.

Keep cylinder away from live electrical circuits.

Maximum inlet pressure 150 psi.

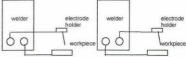
A cylinder is loaded by leaning it slightly sideways and rocking it up on the platform, being careful not to allow the Under-Storage Cart to roll. Secure the cylinder in place with the provided chain. Unload by following these steps in reverse.

REMOTE CONTROL CONNECTION

A remote control receptacle is provided on the case front of the welder for connecting a remote control to the machine. A Adjustable foot control activated remote control, is included with the Inverter machine Ready-Pak models and available separately for other models. Refer to the Optional Accessories section of this manual for other available remote controls.

CONNECTIONS FOR STICK (SMAW) WELDING

A. NEGATIVE CONNECTION B. POSITIVE CONNECTION



STICK ELECTRODE CABLE AND WORK CABLE CONNECTION

Refer to Field Installed Options in Accessories Section of this manual for STICK welding equipment which is available for use with the inverter machine. An electrode holder with Twist-Mate cable and Twist-Mate connector are available separately for use with the inverter machine. (See Accessories Section). Turn the Power Switch "OFF". Connect the Twist-Mate quick connect plug into the Electrode and turn it clockwise until it is tight. The work cable and work clamp are factory connected.

Read and understand this entire section before operating the machine.

SAFETY PRECAUTIONS

A WARNING

ELECTRIC SHOCK can kill.



- Do not touch electrically live parts or electrode with skin or wet clothing.
- · Insulate yourself from work and ground.
- · Always wear dry insulating gloves.
- Read and follow "Electric Shock Warnings" in the Safety section if welding must be performed under electrically hazardous conditions such as welding in wet areas or on or in the workpiece.

FUMES AND GASES can be dangerous.



- · Keep your head out of fumes.
- · Use ventilation or exhaust at the arc, or both, to remove fumes and gases

from breathing zone and general area.

WELDING SPARKS can cause fire or explosion



- · Keep flammable material
- · Do not weld on containers that have held combustibles.

RC RAYS can burn.



Wear eye, ear and body protection.

Only qualified personnel should operate this equipment. Observe additional Safety Guidelines detailed in the beginning of this manual.

GRAPHIC SYMBOLS THAT APPEAR ON THIS MACHINE OR IN THIS MANUAL



INPUT POWER



POSITIVE OUTPUT



NEGATIVE OUTPUT



DIRECT CURRENT



PROTECTIVE GROUND



WARNING OR CAUTION



DO NOT SWITCH WHILE WELDING

PRODUCT DESCRIPTION

The Precision TIG ADC160 OR ADC200 is a member of our field acclaimed Precision TIG family of industrial arc welding power sources. Premium features include:

- 1 Precise constant current output.
- 2 Full range square wave AC/DC TIG (GTAW) welding
- 3 Enhanced version of the patented Micro-Start Technology for its lower Minimum(5 amps at DC) to higher Maximum output control range.
- 4 Built-in high frequency stabilization for DC TIG starting and continuous AC TIG welding.
- 5 AC/DC Stick (SMAW capability.)

The Precision TIG patented convenient built-in storage provisions for welding components and cable management.

The Precision ADC also provides advanced features such as:

- Digital Meter
- Timers for fixed Preflow and variable Postflow shielding gas.
 - Auto-Sense remote control selection.
 - Tool-less Twist-Mate electrode cable onnection.

Four models are available for 60Hz. with Domestic and Canadian input voltages, as well as an International model with 50/60Hz voltages.

RECOMMENDED PROCESSES AND EQUIPMENT

RECOMMENDED PROCESSES

The Precision TIG is recommended for the TIG (GTAW) and Stick (SMAW) welding processes within its output capacity range of 5 amps DC, or 20 amps AC, to 200 amps AC/DC. It is compatible with most Magnum TIG accessories, as well as many industry standard items, such as TIG torches (adapted for Twist-Mate), hoses.

PROCESS LIMITATIONS

The Precision TIG machines are not recommended

for arc gouging due to it's limited output capacity, and are also not recommended for pipe thawing.

RECOMMENDED QUIPMENT/INTERFACE

(See Installed Options in Accessories Section for more details)

The Precision TIG will be available as a basic Machine (Only) and in two Factory Basic module will also be available as with Domestic,.

(SEE PACKING LIST, PLEASE)

EQUIPMENT LIMITATIONS

The Precision TIG machines are protected from over loads beyond the output ratings and duty cycles, per the Specifications in the Installation Section, with Thermostat protection of the output power coils and rectifiers.

If a Precision Tig is powered from an engine generator which doesn't have sufficient capacity, the AC Balance control and the Output control will not provide full range of control.

WELDING CAPABILITY(Duty Cycle)

The PRECISION TIG is rated at 200 amps, 18 volts, at 60% duty cycle on a ten minute basis. It is capable of higher duty cycles at lower output currents. See rated output graph, on specification sheet located in the Installation Section. If the duty cycle is exceeded, a thermal protector will shut off the output until the machine cools.

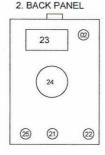
CONTROLS AND SETTINGS

All operator controls and adjustments are located on the case front of the TIG machine. Refer to Figure B.1 and the corresponding explanations.

FIGURE B.1 CONTROL PANEL

1. FRONT PANEL





1.indication of welding current 2.power switch 3.welding/pulse current regulator

4.base current regulator 5.pulse width regulator 6.pulse Freq. regulator 7.indicating light of power 8.warning indicating light

9.current up-slope time regulator

10.current down-slope time regulator
11.after flow time regulator
11.after flow time regulator
13.SP % 14.output"+" 15.AC square
wave Frequency 16. arc force
17.argon out 18. REMOTE RECEPTACLE
(OR argon arc control) 19.MMA/TIG switch 20.
output"-" 21.argon inlet 22.power supply
23.nameplate 24.fan 25.safety earthing
column 26. 2 steps/ 4 steps switch

CONTROL FUNCTIONALITY

1 DIGITAL METER - A 3 digit LED meter is used to display the preset output current level before welding, and actual output level while welding: A lit display indicates input power is turned on. (See Item 2.)

2.POWER SWITCH - Input line switch turns input power ON or OFF, as indicated by the on or off status of the front panel digital display (See Item

3.welding/pulse current regulator

Regulating the knob, It can be selected between 5A TO 200A. For Pulse TIG this knob sets the Peak Pulse level, with the Remote Adjustable foot control (if used).

4.base current regulator

Regulating the knob, It can be selected between 5A TO 200A.

5.pulse width regulator

Regulating the knob, It can be selected between 0.1 TO 0.9.

6.pulse Freq. regulator

Regulating the knob, It can be selected between 0.5Hz TO 25Hz.

7.indicating light of power

Turn power on, it will illuminate indicating.

8.warning indicating light

a)Over heat(yellow(green and red light at the same time) lamp lights) -If the welder overheats due to blocked air flow, high ambient air temperature, or exceeded duty cycle, an internal thermostat will open disabling the welding output and this yellow light will illuminate. The cooling fans will continue to run to cool the unit during this time. The light will go out when the unit cools and the thermostat resets. Once the light goes out, the machine will again become available to weld.

b)Over current(Green lamp lights)

output current is too high or the machine fails.

c) Over voltage or low voltage(red lamp lights)
Input voltage is too high or too low.

9.current up-slope time regulator

Regulating the knob, It can be selected between 0s TO 10s

10.current down-slope time regulator Regulating the knob, It can be selected between 0s TO 10s.

11.after flow time regulator

Sets the TIG mode shielding gas post flow time over the range of about 1 to 25 seconds after the arc is shut off.

Note: Gas preflow time is fixed at 0.5 second only in TIG mode, but no preflow time will occur if the arc is restarted during Post Flow time, since shielding gas would not have stopped flowing.

12.AC/DC TIG SWITCH Select the mode of output

A CAUTION



Do not switch the switch while welding or damage may result to the machine.

The AC Balance Control permits adjustment of the AC TIG wave balance adjustment from Max.

Penetration (70% negative wave) at full CW rotation setting, to Max. Cleaning (70% positive wave) at CCW rotation.

This setting position feature automatically provides the proper amount of cleaning and penetration for normal AC TIG welding.

14.output"+" (Electrode Connection (Positive)) - For quick disconnect system using Twist-Mate cable plugs

15.AC square wave Frequency

Regulating the knob, It can be selected between 20 TO 100Hz.

16arc force Regulating arc force

17.argon out

connected gas pipe of torch

18. REMOTE RECEPTACLE (OR argon arc control)

Provides for connection of remote control and/or are start switch in TIG Mode: Plugging a remote current control (Adjustable foot control) into this receptacle automatically switches the output control from the panel Max Output Control (See Item 3) to the remote control.

The connected remote control will then control the output current between the Min. range of the machine and the setting of the panel Max Output Control.

19.MMA/TIG switch (MODE SWITCH) Select the mode of output

20. output"-" (Electrode Connection (Negative)) – This quick connect Twist-Mate receptacle provides

electrical connection to the electrode holder and cable for Stick welding and connection for the TIG torch when TIG welding.

21.argon inlet

connected gas pipe of flow meter

22.power supply

connected main supply

23.nameplate

The data plate stamped on the metal structure complies with the EN 60974-1, EN50199(EN60974-10) international standards and contains the following information:

- * (a) Manufacturer's name and address
- * (b) Trademark
- * (c) Model
- * (No) Serial number

* (1 1/12) The welding power source comprises a frequency converter followed by an transformer and rectifier that transforms input voltage into direct current.

- * (EN 60974-1/EN 50199) Standards applied.
- * (_____) Direct current.
- * (x) Utilisation factor expressed as a percentage of useful work over a cycle of 10 minutes at an ambient temperature of 40°C.
- * (I2) Rated weld current.
- * (U2) Conventional load voltage.
- * (Uo) Rated no-load voltage.
- * (_____) TIG welding.
- * (J) MMA welding
- *() =) 1input phases.

* (IP21S) Casing protection degree in compliance with the EN 60529 Standard:

IP2XX Casing protected against access to dangerous components with fingers and against the introduction of foreign matters with diameter 12.5 mm.

IPX3X Casing protected against rain failing at 60~on the vertical line.

IPXXC Casing protected against contact of a test gauge \$\phi\$ 2.5 mm length 100 mm with live dangerous parts,

- * (U₁) Rated power supply voltage.
- * (50/60 Hz) Power supply rated frequency.
- * (I_{lmax}) Maximum supply current.
- (I_{1 eff}) Effective supply current.

- * (S) Generator suitable for installation in places where major risks of electric shocks are preset * (CE) In compliance with the European regulations
- in force

24.fan

when power switch on, the cooling fan runs

25.safety earthing column

The earthing must be made according to the national regulations. Make sure that the supply mains and the earthing are sufficient and adequate

26. 2 steps/ 4 steps switch

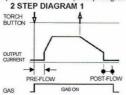
Tig Trigger Sequences -

For the TIG machine AC/DC, TIG welding can be done in either the 2-step or 4-step mode which is selected with the Trigger Mode Push Button.

2-Step Sequence

With the Trigger Mode switch in the 2-step position, the following welding sequence will occur. This

sequence is shown in (2-step diagram 1)



1. Press and hold the Arc Start Switch to start the

The machine will open the gas valve to start the flow of the shielding gas. After a 0.5 second preflow time, to purge air from the torch hose, the output of the machine is turned ON. At this time the arc is started

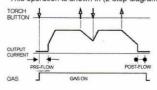
After the arc is started the output current will be increased from the start current to the welding current. Both the start current and increase, or upslope time are presettable. The default start current is 15 amps and the default upslope time is 0.2 seconds

2. Release the Arc Start Switch to stop welding.

The machine will now decrease the output current at a controlled rate, or down slope time, until the Finish current, (also commonly referred to as Crater Current) is reached and the output of the machine is turned OFF. Both the Down slope Time and the Finish Current are can be preset.

After the arc is turned OFF, the gas valve will remain open to continue the flow of the shielding gas to the hot electrode and work piece. The duration of this postflow shielding gas is adjusted by the Postflow Parameter.

Possible variations of this standard sequence is shown in (2 step diagram 2). It is possible to press and hold the TIG torch trigger a second time during downslope to restart. After the trigger is pressed the output current will increase to the welding current. This operation is shown in (2 step diagram 2).



2 STEP DIAGRAM 2

4-Step Sequence

With the 4-step Selected, the following welding sequence will occur.

1. Press and hold the Arc Start Switch to start the sequence

The machine will open the gas valve to start the flow of the shielding gas. After a 0.5 second preflow time, to purge air from the torch hose, the output of the machine is turned ON. At this time the arc is started

After the arc is started the output current will be at the Start current. This condition can be maintained as long or as short as necessary.

If the Start current is not necessary, do not hold the TIG torch trigger as described at the beginning of this step. Instead, quickly press and release the trigger. In this condition, the machine will automatically pass from Step 1 to Step 2 when the arc is started.

2. Release the TIG torch trigger to start the main part of the weld

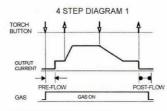
The output current will be increased from the start current to the welding current. Both the start current and increase, or upslope time are presettable. The default start current is 15 amps and the default upslope time is 0.2 seconds

3. Press and hold the TIG torch trigger when the main part of the weld is complete.

The machine will now decrease the output current at a controlled rate, or down slope time, until the Finish current is reached. Both the Down slope Time and the Finish Current are presettable. This Finish current can be maintained as long or as short as necessary

4. Release the TIG torch trigger.

The output current of the machine will turn OFF and the gas valve will remain open to continue the flow of the shielding gas. The duration of this postflow time is adjusted by the Postflow parameter. This operation is shown in (4 step diagram 1).



OPERATING STEPS WELDING IN TIG MODE

1 Connect the TIG torch and cable Twist-Mate quick connect plug to the Electrode/Gas output receptacle. This receptacle also contains an integral gas connection for the torch. Connect the work clamp to the work piece.

- 2 Set the TIG/MMA switch to "TIG".
- 3 Set the AC/DC Switch to DC for welding steel or stainless steel: or to AC for welding aluminum.
- 4 Connect the arc start switch (or Adjustable foot control) to the Remote Control Connector.
- 5 Turn on the cylinder gas valve and adjust the flow regulator to obtain desired flow.
- 6 Turn the power switch to "ON".
- 7 Preset the Output Control on the control panel to the maximum desired amps,
- 8 Depress the Adjustable foot control to energize the torch and establish an arc with the work piece. The digital meter reads the actual amps while welding.

NOTE: When the TIG/MMA switch is set to "TIG", depressing the remote control will start a 0.5 second gas pre-flow before energizing the TIG torch. When the remote control is released the TIG torch is de-energized and gas flow will continue for the time set by the Post Flow Time control. When the polarity switch is set to DC, the TIG Arc Starter will turn on and off automatically to start and stabilize the arc. In AC the TIG Arc Starter will turn on with the output and remain on continuously until the remote control is released.

WELDING POLARITY

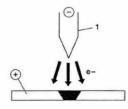
DC Electrode Negative Polarity (Direct Current

Straight Polarity) (see FIGURE B.4)

While Welding, there is a continuous flow of electrons from the electrode to the workpiece.

This is the most used polarity, ensuring limited wear of the electrode, since the majority of the heat concentrates on the anode (workpiece). Narrow and deep welds are obtained with high travel speeds. Most materials, with the exception of aluminum and magnesium, are welded with this polarity.

FIGURE B.4



DC Electrode Positive Polarity. (Direct Current Reverse Polarity) (see Figure B.5)

In this case, there is a continuous flow of electrons from the workpiece to the electrode. The reverse polarity is used for welding alloys covered with a layer of refractory oxide.

With this polarity the electrode functions as anode and is subjected to a high degree of heat, the workpiece is bombardment by positive ions sent from the electrode which break the surface oxide.

In Electrode Positive Polarity, high currents cannot be used, since they would cause an excessive wear of the electrode.

FIGURE B.5



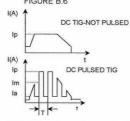
D.C.-Pulsed TIG (see Figure B-6)

The use of pulsed direct current allows better control of the weld pool during certain operating conditions.

When compared with traditional TIG welding

performed at the same average current, pulsed welding results in a smaller heat affected zone which results in fewer deformations and reduced chance of cracking and gas entrapment.

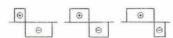
Increasing the frequency constricts the arc, increases stability and improves weld quality. FIGURE B 6



A.C. (Alternating Current) (see Figure B.7)

Alternating Current welding is typically used for Tig welding aluminum (and its alloys) or magnesium. The polarity alternates between Electrode Positive and Electrode Negative (EN). During the positive halfwave the oxide is broken. During the negative halfwave, the electrode cools, the workpiece melts and penetration occurs

FIGURE B.7

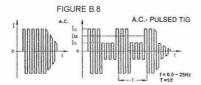


50 % (EN) Greater % EN = MORE PENETRATION 50% (EN) Lesser % EN = more CLEANING

Changing the wave balance alters the ratio between the cleaning and the penetrating current.

A.C.-Pulsed TIG

When AC welding, a pulsed current can be used, with similar effects to those described in pulsed direct current welding.



STEEL TIG WELDING

The TIG process is very effective for welding both carbon steel and alloy steel, especially in applications requiring precision results. DC Electrode Negative Polarity is required. Since this process does not include the removal of impurities, proper cleaning and preparation of the edges is required

FILLER MATERIAL:

The filler rods must deposit welds with mechanical characteristics appropriate for the application.

COPPER TIG WELDING

Since the TIG welding is a process characterized by high heat concentration, it is particularly suitable for welding materials with high thermal conductivity. like copper. As with steel, the DC Electrode Negative

Polarity is employed, with argon as protective gas. Considering the fluidity of molten copper, the use of backup support may prove useful.

FILLER MATERIAL:

In order to avoid the oxidation of the molten material. filler materials containing phosphorus, silicon or other deoxidating materials are typically used. The mechanical properties can also be improved through the use of silver.

TIPS FOR AC TIG WELDING

AC Inverter TIG power sources offer two significant advantages over conventional Silicon Controlled Rectifier (SCR) / transformer power sources:

- 1. The AC wave balance(SP%) can be set to a higher percentage electrode negative which minimizes tungsten heating and erosion.
- 2. The AC frequency can be varied to "focus" the arc. Increasing the AC frequency above 60Hz will narrow the cone shape arc from the tungsten's tip. Decreasing the AC frequency below 60Hz will broaden the cone shape arc from the tungsten's tip. The two above benefits can be used to maintain a tight focus of the arc for precise heat control and tight joint access. Because of the AC inverters in these areas the recommendations are made as a starting point:
- A 2% Thoriated tungsten is recommended instead of the Pure tungsten that is normally recommended for AC welding. Thoriated tungstens emit electrons easier and therefore will improve starting.
- . Sharpen the tungsten to a point. Normally it is recommended to preball a pure tungsten when AC welding with a conventional power source.

However, the AC inverter with it's extended AC balance control minimized tungsten heating thus allowing for a pointed tungsten to be used.

Set the AC Balance control to maximum 70% electrode negative. This can be reduced if the material welded is heavily oxidized, however starting at maximum and adjusting to less is

desired.

. •Set the AC Frequency in the 100 to 120 Hz range. This is a "Sweet Spot" for most aluminum applications.

GTAW Process

Electrode Polarity	DC		AC	Approximate Argon			
Electrode Tip Preparation	Sharpened	Balled		Sharpened Balled Gas F		Gas Flo	w Rate
Electrode Type	EWTh-1, EWLa-1		EWTh-1, EWLa-1	C.F.H.	(I/min.)		
Electrode Size-in. (mm)	EWTh-2, EWCE-2 EWG	EWP	EWTh-2, EWCE-2 EWG, EWZr	Aluminum	Stainless Steel		
.010 (0.25)	Up to 15 A.	Up to 10 A.	Up to 15 A.	3-8 (2-4)	3-8 (2-4)		
.020 (0.50)	Up to 15 A.	Up to 15 A.	Up to 20 A.	5-10 (3-5)	5-10 (3-5)		
040 (1.0)	. Up to 80 A.	Up to 40 A.	Up to 60 A.	5-10 (3-5)	5-10 (3-5)		
1/16 (1.6)	Up to 150 A.	Up to 100 A	Up to 130 A	. 5-10 (3-5)	9-13 (4-6)		
3/32 (2.4)	Up to MAX. A.	Up to 160. A.	Up to MAX. A.	13-17 (6-8)	11-15 (5-7)		
1/8 (3.2)	X	Up to MAX. A.	X	15-23 (7-11)	11-15 (5-7)		

Tungsten electrodes are classified as follows by the American Welding Society (AWS):

 Pure
 EWP
 green
 +1% Thoria
 EWTh-1, yellow

 +2% Thoria
 EWTh-2, red
 +2% Ceria
 EWCF-2, orange

 +.5% Lanthana
 EWUa-1 .black
 +0.5% to 0.40%Zirconia
 EWZr
 brown

TRI-MIX of elements......EWG......gray

Ceriated Tungsten is now widely accepted as a substitute for 2% Thoriated Tungsten in AC and DC applications.

PROTECTIVE GAS

Both argon and helium work when welding aluminum. Argon is preferred, due to its lower cost and consumption rate. This gas also tends to stabilize the arc, thus making it easy to operate. For some applications, however, the use of helium, or argon-helium blends, is recommended due to better weld penetration and faster travel speed. Helium is especially suitable for welding thick workpieces. The recommended gas flow rates are shown in table 5.

TABLE 5

Current (A)	Helium cfh-(I/min)
50	29 - (14)
100	29 - (14)
150	42 - (20)
200	42 - (20)
250	53 - (25)
300	53 - (25)

AC TIG WELDING QUICK START UP

A WARNING



ELECTRIC SHOCK can kill.

Have an electrician install and service this equipment.

. Turn the input power off at the fuse box, disconnect or unplug supply lines and allow machine to sit for five minutes minimum to allow the power capacitors to discharge before working inside this equipment.

. Do not touch electrically hot parts.

Connect the shielding gas - typically argon - using a appropriate regulator. Connect the Adjustable foot control, torch and work lead to the power source.

With the work cable connected to a properly grounded work piece, turn the power source on. The Inverter machine is ready to AC TIG weld with the following features:

- . AC TIG
- . Trigger Mode in 2 step mode
- . Local control
- . Pulse off
- . AC Square Wave . AC Balance(sp%) 50% EN
- . AC Frequency 100Hz
- .. Post Flow 5 sec.
- . High Freq Start

Set the maximum output current desired using the Output Control. Initiate the arc by closing the arc start switch. The Adjustable foot control will control the output current from 10 amps to current level set by Output Control.

To change the AC Frequency, Regulating

the AC Frequency knob, It can be selected between 20 TO 100Hz.. The AC Frequency is now selected and can be varied by the Output Control. To change the (SP%) AC Balance, Regulating the AC SP% knob, It can be selected between 30% TO 70%. Adjust the Output Control for the desired AC Balance.

To change the Post Flow time. Regulating the Post flow knob, It can be selected between 1 to 25s. Adjust the Output control to the desired Post Flow time

DC TIG WELDING QUICK START UP

A WARNING



ELECTRIC SHOCK can kill. . Have an electrician install and service this equipment.

. Turn the input power off at the fuse box, disconnect or

unplug supply lines and allow machine to sit for five minutes minimum to allow the power capacitors to discharge before working inside this equipment.

. Do not touch electrically hot parts.

Connect up the shielding gas - typically argon using an appropriate regulator. Connect Adjustable foot control, torch and work lead to power source. With the Work cable connected to a properly grounded work piece, turn the power source on. To change to DC TIG Welding:

- Press Mode button to select "DC TIG."
- Press Trigger Mode button and set to 2-step.
- Press Local / Remote Mode button and set for Remote . Pulsing parameters selected by Parameter button.
- and changed using Output Control.

Set the maximum output current desired using the Output Control

Initiate the arc by closing the Adjustable foot control's arc start switch. The Adjustable foot control will control the output current from 10 amps to current level set by output control.

To change the Post Flow time, repeatedly push the Parameter button until the Post Flow indicator light is on. Adjust the Output control to the desired Post Flow time as indicated on digital display.

REMOTE CONTROL OPERATION

A Adjustable foot control (optional) is included with the PRECISION TIG models and available for other models (See Accessories Section) for remote current control while TIG welding. An Arc Start

Switch may be used to start and stop the welding if no remote control of the current is desired. Refer to the Accessories Section of this manual. Both the Hand and Adjustable foot control work in a similar manner. For simplicity, the following explanation will refer only to "Ampcontrol", meaning both Foot and Hand models. The term "minimum" refers to a foot pedal in the "up" position, as it would be with no foot pressure, or a Hand Ampcontrol in the relaxed position, with no thumb pressure. "Maximum" refers to a fully depressed Foot Ampcontrol, or a fully extended Hand Ampcontrol. When the welder is in TIG modes activating the Ampcontrol energizes the electrode terminal and varies the output welding current from its minimum value of 5 Amp (DC) or 20 Amp (AC), to the maximum value set by the Current Control on the control panel. This helps eliminate accidental high current damage to the work piece and/or tungsten, and provides a fine control of the current. When the welder is in the stick mode a remote control has no effect and is not used.

It is important to note that, in some cases, the tungsten will not start an arc at the minimum current because the tungsten may be too large or cold. To start an arc reliably, it is important to depress the Ampcontrol far enough so that the machine output current is near the tungsten operating range. For example, a 3/32" tungsten may be used on DC- to weld over the full range of the machine.

To start the arc, the operator may have to turn the cur-rent control up and depress the Ampcontrol approximately 1/4 of the way down. Depressing the Ampcontrol to its minimum position may not start the arc. Also if the current control is set too low, the arc may not start. In most cases, a large or cold tungsten will not readily establish an arc at low currents. This is normal. In Direct Current mode the PRECISION TIG will start a 3/32", 2% thoriated tungsten electrode at 20 amperes provided the electrode tip is properly grounded and not contaminated.

BENEFITS OF THE PRECISION TIG DESIGN

In AC TIG welding of aluminum, the positive portion of the AC wave provides cleaning (removal of aluminum oxide) of the work piece. This is desirable on materials with a heavy oxide coating. However the positive portion may also cause the electrode to overheat at high currents causing "tungsten spitting". The negative portion of the AC wave offers no cleaning action but concentrates more heat on the work.

The AC waveform of the PRECISION TIG optimizes cleaning and heating of the work. The result is the capability to weld through the complete range in AC TIG or DC TIG requiring only one electrode, a 3/32" 2% thoriated tungsten.

WELDING IN STICK MODE

- 1 Put the electrode holder and cable quick connect plug into the electrode output receptacle. Turn clockwise until tight. Connect the work clamp to the work piece.
- 2 Set the TIG/MMA switch to "MMA".

- 3 Set the MMA/TIG Switch to the MMA mode desired for the type of electrode being used (most commonly DC+).
- 4 Place the electrode in the electrode holder.

A WARNING

In Stick Mode the output terminal and electrode will be electrically hot whenever the power switch is turned on.

- 5 Turn the power switch to "ON".
- 6 Adjust the Current Control to the desired amps.
- 7 Strike an arc and weld.

NOTE: When the MMA/TIG switch is set to "MMA" the output is always on when the power switch is on. A remote control has no effect on the welding current and the gas flow and high frequency TIG arc starter are disabled.

RECOMMENDED ELECTRODE AMPERAGE RANGES

The ADC200 is rated from 5-200 Amps.

SMAW Process

	Welding Amp Range for Stick Electrode Size					
ELECTRODE TYPE	POLARITY	3/32"	1/8"	5/32"		
Fleet weld 5P, Fleet weld 5P+ E6010	DC+	40 -70	75 - 130	90 - 175		
Fleet weld 180E6011	DC+	40 - 80	55 - 110	105 - 135		
Fleet weld 37E6013	DC+	70 - 95	100 - 135	145 - 180		
Fleet weld 47E7014	DC-	75 - 95	100 - 145	135 - 200		
Excalibur E7018	DC+	85 - 110	110 - 160	130 - 200		
Blue Max Stainless	DC+	40 - 80	75 - 110	95 - 150		
Red Baron Stainless	DC+	40 - 70	60 - 100	90 - 140		

Mild steel procedures are based on recommended procedures listed in C2.10 8/94 and the maximum rating of the PRECISION TIG

Blue Max procedures are based on C6.1 6/95

Red Baron Procedure are based on ES-503 10/93

FACTORY INSTALLED OPTIONS

The Precision TIG ADC160 will be available in two Factory-Configured Welding Packages:

1. Precision TIG ADC160 Ready-Pak (FADC1601)

PACKING LIST

model	quantity	remark	note
ADC160 Welding machine	1	With remote receptacle	
300A Welding clamp	1		
300A Ground pliers	1		
TIG welding torch	1		
Adjustable foot control	1	Optional accessory	
gas inlet pipe	1		
Operation instructions	1		
Certificate of quality	1		

2. Precision TIG ADC160 Ready-Pak (FADC1602)

PACKING LIST

model	quantity	remark	note
ADC160 Welding machine	1		
300A Welding clamp	1		
300A Ground pliers	1		
TIG welding torch	1		
gas inlet pipe	1		
Operation instructions	1		
Certificate of quality	1		

3.

Certificate of quality

Name of product: AC/DC/PULSE TIG WELDING

Type of product: ADC160

Packing No:_____

Test results of this welder fulfils_____

__technical requirements and its release from the works is granted.

Inspector_____Date

The Precision TIG ADC200 will be available in two Factory-Configured Welding Packages:

1. Precision TIG ADC200 Ready-Pak (FADC2001)

PACKING LIST

model	quantity	remark	note
ADC200 Welding machine	1	With remote receptacle	
300A Welding clamp	1		
300A Ground pliers	1		
TIG welding torch	1		
Adjustable foot control	1	Optional accessory	
gas inlet pipe	1		
Operation instructions	1		
Certificate of quality	1		

No.			

2. Precision TIG ADC200 Ready-Pak (FADC2002)

PACKING LIST

model	quantity	remark	note
ADC200 Welding machine	1		
300A Welding clamp	1		
300A Ground pliers	1		
TIG welding torch	1		
gas inlet pipe	1		
Operation instructions	1		
Certificate of quality	1		

No.	
3.	Certificate of quality

Name of product: AC/DC/PULSE TIG WELDING

Type of pro	duct: ADC200	
Packing	No:	
Test results	of this welder fulfils	_
t	echnical requirements and its relea	se
from the wo	orks is granted.	
spector	Date	

SAFETY PRECAUTIONS

A WARNING



ELECTRIC SHOCK can kill.

Only qualified personnel should per-form this maintenance.

 Turn the input power OFF at the disconnect switch or fuse box before working on this equipment.

. Do not touch electrically hot parts.

INPUT FILTER CAPACITOR

DISCHARGE PROCEDURE

A WARNING

The machine has internal capacitors which are charged to a high voltage during power-on conditions. This voltage is dangerous and must be discharged before the machine can be serviced. Discharging is done automatically by the machine each time the power is switched off. However, you must allow the machine to sit for at least 5 minutes to allow time for the process to take place.

A WARNING

To avoid receiving a high frequency shock, keep the TIG torch and cables in good condition. ROUTINE AND PERIODIC MAINTENANCE

- 1 Disconnect power supply lines to machine before performing periodic maintenance.
- Periodically clean the inside of the machine with a low pressure air system. Be sure to clean the following components thoroughly.

Main Transformer

Electrode/Gas Output Receptacle

Polarity Switch

Rectifier Assembly

Arc Starter/Spark Gap Assembly

PC Boards

Fan Blades

- 3 Inspect welder output and control cables for fraving, cuts, and bare spots.
- 4 Keep TIG torch and cables in good condition. 5 Clean air louvers to ensure proper air flow and
- 6 The fan motor has sealed ball bearings which require no maintenance.

7 SPARK GAP ADJUSTMENT

The spark gap .020(.5mm) is set at the factory to a gap of 0.015 inches (0.4mm) See Figure D.1. This setting is adequate for most applications. Where less high frequency is desired, the setting can be reduced to 0.015 inches (0.4mm).

A WARNING

Use extreme caution when working with circuit of the high frequency. The high voltages developed can be lethal. Turn the input power off using the disconnect switch or fuse box before working inside machine. This is particularly important when working on the secondary circuit of the high voltage transformer (T3) because the output voltage is dangerously high.

Refer to figure D.1. Note in highly dirty environments where there is an abundance of conductive contaminants, use a low pressure air stream or a firm piece of paper to clean the spark gap. Do not disturb the factory setting. To check the spark gap:

-Turn off input power as specified above.

- -Remove the right side panel from the machine, the
- spark gap box is located on the lower right side.
 -Check the spark gap with a feeler gauge. If
 adjustment is needed:
- -Adjust the gap by loosening the head screw in one of the aluminum blocks, near the front of the unit and tighten the screw in the new position. If the gap is correct:
- -Replace the wraparound.
- 8 Inspect gas hose and inlet fitting for cracks or leaks
- 9 Replace any unreadable labels or decals.
 10 Verify that the machine and welding circuit is properly grounded.

FIGURE D.1 SPARK GAP



FAN MOTOR OR FAN BLADE REPLACEMENT When installing a new fan blade or fan motor be sure to maintain proper shaft spacing.

HOW TO USE TROUBLESHOOTING GUIDE



Service and Repair should only be performed by our Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).

Look under the column labeled "PROBLEM (SYMPTOMS)". This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. POSSIBLE CAUSE.

The second column labeled "POSSIBLE CAUSE" lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION This column provides a course of action for the Possible Cause, generally it states to contact local Authorized Field Service Facility. If you do not understand or are unable to perform the Recommended Course of Action safely, contact local Authorized Field Service Facility.

A CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact Local Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

OUTPUT PROBLEMS

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS	RECOMMENDED COURSE OF ACTION
Machine is Dead -No Output - No Fan	Make certain that the input power switch is in the "ON" position and machine is plugged in. Check the input voltage at the machine. Input voltage must match the rating plate and voltage connection. Refer to Reconnect Procedure in the Installation section of this manual.	333,02 0, 70,10,1
Fan runs normally at power up - No output from machine in either Stick or TIG modes.	nameplate and voltage reconnection. n either Stick or 2. Check to make sure polarity switch is	
Fan runs - No output from machine in either Stick or TIG modes and the yellow light on the control panel is on.	Welding application may have exceed the recommended duty cycle. Allow the unit to run until the fan cools the unit and the yellow light goes out.	persists, Contact local Authorized Field Service Facility.
Machine does not respond (no gas flow, no high frequency and no open circuit voltage) when arc start switch or Ampcontrol is activated - fan is working.	Machine MUST be in the TIG Mode. The Ampcontrol may be defective. Check for continuity between pins "D" and "E" on cable connector when Ampcontrol is depressed.	

Note:Both the Hand and Adjustable foot control work in a similar manner. For simplicity, the following explanation will refer only to "Ampcontrol", meaning both Foot and Hand models

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Local Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

OUTPUT PROBLEMS

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS(S)	RECOMMENDED COURSE OF ACTION
Machine regularly over heats - thermostat opens, Yellow (green and red light at the same time) light on front panel glows The fan runs but machine has no output	Welding application may exceed recommended duty cycle. Reduce the duty cycle. Dirt and dust may have clogged the cooling channels inside the machine. Blow out unit with clean, dry low pressure air. Air vents and exhaust louvers may be blocked due to inadequate clearance around machine.	
Output current reduced significantly when AC Balance control knob is set near or at max. penetration or when Output control is set near or at full output.	Input power to machine doesn't have sufficient capacity. Try changing Input power to a sufficient supply, refer to Installation section. Machine is powered from an engine generator or an engine welder. If welding at high currents are needed, try powering machine from electricity grid instead of engine generator. Set AC Balance control at 50% position.	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact local Authorized Field Service Facility.

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact Local Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

TIG MODE PROBLEMS

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS(S)	RECOMMENDED COURSE OF ACTION
Machine output is intermittently lost. Gas flow and high frequency are also interrupted.	1. Problem may be caused by high frequency interference. Make sure that the machine is grounded properly according to the installation instructions. If there are other high frequency sources in the area, make certain that they are grounded properly. 2. Check Ampcontrol for proper operation and loose connections. 3. Check for proper input voltage and proper voltage reconnection.	If all recommended possible areas of misadjustmen
Arc "Flutters" when TIG welding.	Tungsten electrode may be too large in diameter for the current setting. Tungsten not "sharp" when welding in DC - mode. Gas shielding may be insufficient. Increase gas flow; reduce tungsten stick out beyond gas cup. Check for contaminated gas or leaks in the gas line, torch, or connections. If a helium blend is used as a shielding gas, then reduce the percentage of helium.	have been checked and the problem persists, Contact local Authorized Field Service Facility.
Arc "Pulsates" when AC TIG welding.	Micro Switch mounted on Polarity Switch is not opening in "AC" mode.	

Note:Both the Hand and Adjustable foot control work in a similar manner. For simplicity, the following explanation will refer only to "Ampcontrol", meaning both Foot and Hand models

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact Local Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

TIG MODE PROBLEMS

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS(S)	RECOMMENDED COURSE OF ACTION
Black areas along weld bead	Clean any oily or organic contamination from the work piece. Tungsten electrode may be contaminated. Replace or sharpen. Check for contaminated gas or leaks in the gas line, torch, or connections. Gas shielding may be insufficient. Increase gas flow; reduce tungsten stick out beyond gas cup.	
Weak high frequency - machine has normal welding output.	Check for poor connections in the welding circuit. Gas shielding may be insufficient. Increase gas flow; reduce tungsten stick out beyond gas cup. Check for work and electrode cables in poor condition allowing high frequency to "Leak Off". Keep cables as short as possible. Check Spark Gap operation and setting (0.5mm).	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact local Authorized Field Service Facility.
High frequency "spark" is present at tungsten electrode, but operator is unable to establish a welding arc. Machine has normal open circuit voltage (refer to Technical Specifications in the Installation Chapter).	The tungsten electrode may be contaminated. Replace or sharpen. The current control may be set too low. The tungsten electrode may be too large for the process. If a helium blend is used as a shielding gas, then reduce the percentage of helium.	

Note:Both the Hand and Adjustable foot control work in a similar manner. For simplicity, the following explanation will refer only to "Ampcontrol", meaning both Foot and Hand models

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact Local Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

TIG WELD PROBLEMS

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS(S)	RECOMMENDED COURSE OF ACTION
No high frequency. Machine is in the TIG Mode and has normal output.	If the machine location is in a highly dirty environment with conductive contaminants, check and clean the spark gap with a low pressure air stream per the maintenance instructions.	
No gas flow when Ampcontrol is activated in the TIG Mode. Machine has output - fan runs. A "Click" can be heard indicating that the gas solenoid valve is operating.	Gas supply is empty or not turned on. Flow regulator may be set too low. Gas hose may be pinched. Gas flow may be blocked with dirt. Check filter screen inside gas inlet fitting to solenoid valve. Use filters to prevent reoccurrence. Consult your local welder/gas distributor.	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact local Authorized Field Service Facility.
When AC TIG welding, the arc is erratic and there is a loss of "cleaning" of the work piece.	Tungsten electrode may be too small for process. Use a larger diameter tungsten or a pure tungsten. If a helium blend is used as a shielding gas, then reduce the percentage of helium.	
The end of the tungsten electrode melts away.	The welding current is too high for the electrode type and/or size. See Electrode Amperage Ranges in the Operation Section of this manual.	

Note:Both the Hand and Adjustable foot control work in a similar manner. For simplicity, the following explanation will refer only to "Ampcontrol", meaning both Foot and Hand models

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact Local Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

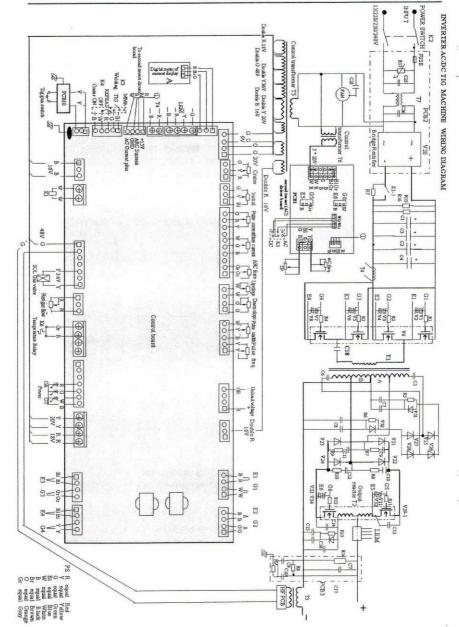
STICK WELDING PROBLEMS

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENTS(S)	RECOMMENDED COURSE OF ACTION
Stick electrode "Blasts Off" when arc is struck.	Weld current may be set too high for electrode size. Reduce current control setting, or use a larger diameter electrode. Dirty materials Hydrogen in weld (present on electrode coating).	
Stick electrode "sticks" in the weld puddle.	The weld current may be set too low. Increase the current control setting or use a smaller diameter electrode. Arc too short.	If all recommended possible areas of misadjustment
Excessive spatter	Long arc High current	have been checked and the problem persists, Contact
Craters	Fast movement of the electrode away from piece.	local Authorized Field Service Facility.
Inclusions	Poor cleanliness or distribution of the Welding passes. Improper movement of the electrode.	,
Insufficient penetration	High progression speed. Welding current too low. Narrow chamfering.	
Porosity	Humidity in electrode. Long arc.	

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact Local Authorized Field Service Facility for technical troubleshooting assistance before you proceed.

INVERTER AC/DC TIG MACHINE COMPONENT LISTS

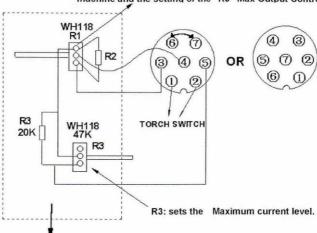
	1	WSE-160		second invert (AC) driver board	PCB1	72
	1	QP-DH		HF portire board	HF PCB	86
	-	CONTRX		EMI board	PCB10	ક્ષ
	ISET	TIGOUT		OUTPUTENSPCE	PCBS	X
	18:1	IGROD		INPOI EMS PCD	7002	2
	-	AASWC 200C		PIGLIC BORG	0000	3 6
AND CAMBERDS		Medical Supplier of the Suppli	The second secon	Control board	DCB	3 5
POWERLED		BTOM 2		TOWNER THE COUNTY	LEO.	2 8
		WHO-SIK		AC OF WK of regulator	RPIL	5 4
	1	WH5-33K		AC requency VR of regulator	KP11	å
	1	WX14-2K2		Initial current YR of regulator	RP10	67
	1	WX14-2K2		Crater current VR of regulator	RP9	ô
	1	WH5-100K		Post gas flowVR of regulator	RP8	5
	-	WH5-33K		Pulse width VR of regulator	RP7	4
	ı	WH5-100K		Pulse frequency VR of regulator	RP6	43
	1	WX14-22K		ARC force VR of regulator	RP5	2
	1	WX14-2K2		Pulse current VR of regulator	RP4	41
	3	WX14-2K2		Base current VR of regulator	RP3	40
Knob:0FR02003	-	WX14-2K2		Up-slopetine VR of regulator	RP2	39
Knob:DFR02003	1	WX14-2K2		Down-slope tine VR of regulator	RP1	8
	1	80FZ\6-D-220V	16	Cool Fan	FAN	37
	1	22XD-2AC36V		Gasvalve	SOL	8
		JUF6F80°C		Temperature Relay	K6	35
	1	KCD1-102		DC/AC switch	KS	34
	1	KCD1-102		Craler switch	K4	ಜ
		KCD1-102		Weiding switch	2	2
		DZ47-D32/2P		Power switch	2	31
		GPF112DMFDC12V	OP	Sont start Relay	Z.	0
		LEMADDA		LEM current sensor	LEM	8
	1321	viter of current display	Distribution of	Meter of current display	^	26
		X2MPX 1 D.F. 280VAC	WCX	Capacitance	C25, C26	27
	aproce :	FRD1 DUF 400VAC	FR	Fan startup Capacitance	C21	38
	apiece1	U47NZEV VHZNVAV		Capacitance	C19C20	13 2
	apiece 1	223/16004		Capacianica	C13C14 C18C17	24
	apiece1	339260V		Capacitaco	090000000	1
	apiece 1	22480VV		Capacianos	676876	3 =
	apiece1	560w450V		Electrolytical Capacitance	C1-C4	8
	1	10K/ZW		Resistance	R14	19
		50/50/V		Residence	R13	18
	epiece 1	24/0 <i>SW</i>		Resistance	R11R12	17
	apiece 1	5.6/5W		Resistance	R7,R8,R9,R10	6
	apiece 1	200/S0/V		Resistance	R5/R6	5
	notice 1	1505W	17 30000	Residence	R1.R2.R3.R4	2 6
	apiece 1	30000 30000 S	1900033	second inset ICBT mouse	V99, 140, 140	ة ا
	spiece 4 (1, 1, 1, 1)	30UBD (DBC2F150PBS, DBC2F150N6S)	30U80 (DBC2F	Dide Reciber	97.457.477.17A	3 =
	2 2	KBP C3510	KBPC3510	Bridge Rectiter	07.4	č
	1 1	F4-75R12KS4	F4-75R12KS4	IODI	**	9
	apiece1	1N4738		Voltage regulation Diode	V2,V4,V6,V8,V32,V34	00
	apiece1	1N4746		Votage regulation Diode	Y1,V3,V5,W,Y31,V33	-
	1	AD C20022		Control transformer	16	(C)
85.07.8 455.07.9 +817.02+65.0 70.07.17.8 455.07.90-655.0 789	-	ADC20021		Control transformer	15	5
	1	ADC20026		Mutual inductance	74	4
	-		AD C20025	HF transformer (coil)	13	ω
		ADC20024	ADC18024	Output reactor	172	1
X emark	1 000	ADCORPO	ADC18020	Invert transformer	11	-
Marian's						



ie.

REMOTE CONTROL BOX circuit diagram

R1:control the output current between the Min. range of the machine and the setting of the "R3" Max Output Control.



Adjustable Foot control unit

- ① ② CONNECTING SWITCH OF TORCH
- **® THEOREM CONNECT WITH LEAD**

R1: WH118-10K

R2: 3K-0.5W

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

PACKING LIST

******	*****

model	quantity	remark	note
ADC200 Welding machine	1		
300A Welding clamp	1		
300A Ground pliers	1		
TIG welding torch	1		
gas inlet pipe	1		
Operation instructions	1		The same of the sa
Certificate of quality	1		

Vđ.				
VO.				

Certificate of quality

Name of pr	oduct: A	AC/DC/PULSE TIG WELDING
Type of pro	duct:	ADC 200
Packing	No:	- •
Test result	s of this	welder fulfils
	technica	al requirements and its release
from the w	orks is (granted.
nspector		Date