parweld

GTK4000

OPERATOR MANUAL

ISSUE 1

Welcome

Thank you and congratulations on choosing Parweld. This Owner's Manual is designed to help you get the most out of your Parweld products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards in the workplace. With proper maintenance this equipment should provide years of reliable service. All our systems conform to ISO9001: 2000 and are independently audited by NQA.

The entire product range carries the CE mark, and is constructed in accordance with European directives and the product specific standards where they apply.

Further Information

Parweld is the UK's leading manufacturer of MIG, TIG and Plasma torches and consumables.

For more information about Parweld's complete range visit: www.parweld.com


parweld
parweld


WATER RECIRCULATION SYSTEM
XTS 902
www.parweld.com

1.0 Safety Precautions

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on.

Do not touch live electrical parts.

Wear dry, sound 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 ground.

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.

Disconnect input power before installing or servicing this equipment. Lockout/tagout input power according to Safety Standards.

Properly install and ground this equipment according to national and local standards.

Always verify the supply ground - check and ensure that input power cable ground wire is properly connected to ground terminal in the receptacle outlet.

When making input connections, attach proper grounding conductor first - double-check connections.

Frequently inspect input power cable for damage or bare wiring - replace cable immediately if damaged - bare wiring can kill.

Turn off all equipment when not in use.

Do not use worn, damaged, under sized, or poorly spliced cables.

Do not drape cables over your body.

If earth grounding of the work piece 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.

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 work piece or worktable as near the weld as practical.

Insulate work clamp when not connected to work piece to prevent contact with any metal object.

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

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 respirator.

Read and understand the Material Safety Data Sheets (MSDS's) and the manufacturer's instructions for metals, consumable, coatings, cleaners, and de-greasers.

Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch person 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 de-greasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours 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.
Arc rays from the welding process produce intense, visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

Wear an approved welding helmet fitted with a proper shade of filter lense to protect your face and eyes when welding or watching

Wear approved safety glasses with side shields under your helmet.

Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.

Wear protective clothing made from durable, flame resistant material (leather, heavy cotton, or wool) and foot protection. 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 work piece, 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.

WELDING can cause fire or explosion.
Remove all flammables within 10m of the welding arc. If this is not possible, tightly cover them with approved covers.

Do not weld where flying sparks can strike flammable material.

Protect yourself and others from flying sparks and hot metal.

Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.

Watch for fire, and keep a fire extinguisher nearby. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.

Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to local regulations

Connect work cable to the work as close to the welding area as practical to prevent welding current from travelling along, possibly unknown paths and causing electric shock, sparks, and fire hazards.

Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap. Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.

FLYING METAL can injure eyes.
Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool they can throw off slag. Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.
Shut off shielding gas supply when not in use. Always ventilate confined spaces or use approved air-supplied respirator.

HOT PARTS can cause severe burns.
Do not touch hot parts with bare hands.

Allow cooling period before working on gun or torch.

To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

MAGNETIC FIELDS can affect pacemakers.
Pacemaker wearers keep away.

Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

NOISE can damage hearing.
Noise from some processes or equipment can damage hearing.

Wear approved ear protection if noise level is high.

Shielding gas cylinders contain gas under high pressure.

CYLINDERS can explode if damaged.
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 or tipping. Keep cylinders away from any welding or other electrical circuits. Never drape a welding torch over a gas cylinder. Never allow a welding electrode to touch any 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.

Turn face away from valve outlet when opening cylinder valve.

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) recommendations.

2.0 Product Description

The air carbon-arc process (CAC-A) physically removes metal, not chemically as in oxy-fuel cutting (OFC). Gouging or cutting occurs when the intense heat of the arc between the carbon electrode and the workpiece melts part of the workpiece. Simultaneously, air passes through the arc quickly enough to blow the molten material away.

The air carbon-arc process does not require oxidation to maintain the cut, so it can gouge or cut metals that the OFC process cannot. Most common metals (e.g., carbon steel, stainless steel, many copper alloys and cast irons) can be cut using the air carbon-arc process. The metal removal rate depends on the melting rate and the air jet's efficiency in removing molten metal. In the process, the air must lift the molten metal clear of the arc before the metal solidifies.

3.0 Technical Specifications

Power rating 1000A @60%

Torch	Air Pressure psi (kPa)	Air Consumption cfm (L/min.)	Compressor rating		
			Intermittent hp (kW)	Continuous hp (kW)	Receiver gal(litre)
GTK4000	80 (550)	33 (934)	7.5 (5.6)	10 (7.5)	80 (303)

4.0 Operation

Like arc welding, CAC-A uses an intense arc to create a molten pool on the workpiece. Compressed air blows away this molten metal.

The process requires a welding power source, air compressor, carbon electrode, and gouging torch.

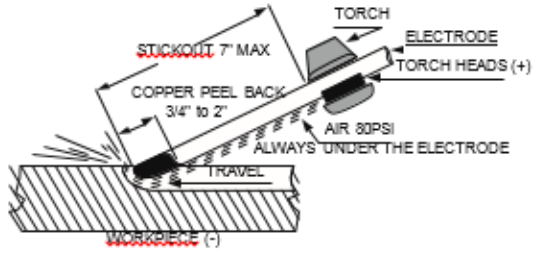


Figure 2

Cut or gouge only in the direction of air flow. The electrode angle varies, depending on the application. The operator should maintain the correct arc length so air will remove molten metal. See Figure 2.

POWER SOURCES

Single-phase machines with low, open-circuit voltage may not work for air carbon-arc gouging (CAC-A). However, any three-phase welding power source of sufficient capacity may be used for air carbon-arc gouging. The open-circuit voltage should be higher than the required arc voltage to allow for a voltage drop in the circuit. The arc voltage used in air carbon-arc gouging and cutting ranges from a low of 35V (volts) to a high of 56V; thus, the open-circuit voltage should be at least 60V. The actual arc voltage in air carbon-arc gouging and cutting is governed by arc length and the type of gouging.

Aside from special uses addressed later, CAC-A is used with DCEP (reverse polarity). The electrode should extend at most 7" (178 mm) from the gouging torch, with the air jet between the electrode and workpiece. Use a minimum extension of 2" (50.8 mm). Torch parts will damage if the stickout of the electrode is less than the 2" (50.8 mm).

COMPRESSED AIR

Use ordinary compressed air for air carbon-arc gouging. Normal pressures range between 80 psi (551.6 kPa) and 100 psi (690 kPa) at the torch; higher pressures may be used, but they do not remove

Table 2

Electrode Diameter in (mm)	DC Electrode DCEP min - max	AC Electrode AC min - max	AC Electrode DCEN min - max
1/8 (3.2)	60 - 90	N/A	
5/32 (4.0)	90 - 150		
3/16 (4.8)	200 - 250	200 - 250	150 - 180
1/4 (6.4)	300 - 400	300 - 400	200 - 250
5/16 (7.9)	350 - 450	N/A	
3/8 (9.5)	450 - 600	350 - 450	300 - 400
1/2 (12.7)	800 - 1000	N/A	
5/8 (15.9)	1000 - 1250		
3/4 (19.1)	1250 - 1600		
1 (25.4)	1600 - 2200		
3/8 (9.5) FLAT	250 - 450		
5/8 (9.5) FLAT	300 - 500		

GOUGING WITH MANUAL TORCHES

The electrode should be gripped, as shown in Figure 2, so a maximum of 7" (178 mm) extends from the torch.

For aluminum, this extension should be 3" (76.5 mm). Table 2 shows suggested currents for the different electrode types and sizes.

Turn on the air jet before striking the arc, and hold the torch as shown in Figure 5. The electrode slopes back from the direction of travel with the air jet behind the electrode.

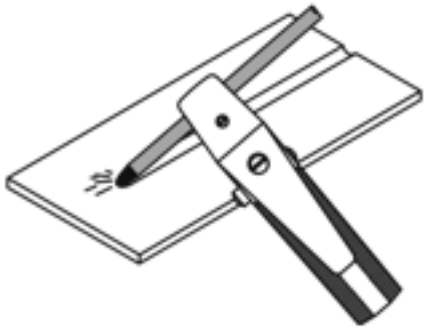


Figure 5

During gouging, the air jet sweeps beneath the electrode end and removes all molten metal. The arc can be ignited by lightly touching the electrode to the workpiece. The electrode should not be drawn back once the arc is ignited.

Gouging is different from arc welding because metal is removed, not deposited. To maintain a short arc, work in the direction of the cut fast enough to keep up with metal removal. Steadiness of movement controls the smoothness of the resulting cut.

For gouging vertically, hold the gouging torch as shown in Figure 6. Perform gouging downhill to permit gravity to help remove the molten metal.

Vertical gouging may be done uphill, but it is difficult. Gouging horizontally may be done either to the right or left, but always with forehand gouging

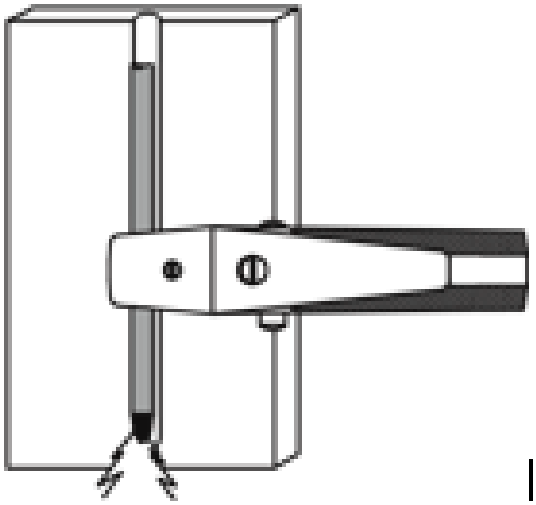


Figure 7

In gouging to the left, hold the torch as shown in Figure 7. In gouging to the right, reverse the torch hold. Position the air jet behind the electrode. When gouging in the overhead position, as shown in Figure 8, hold the electrode and torch so molten metal will not drip on the operator's glove.

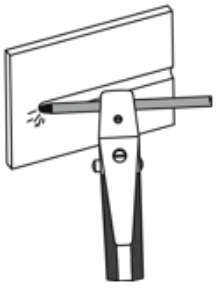


Figure 7 Horizontal

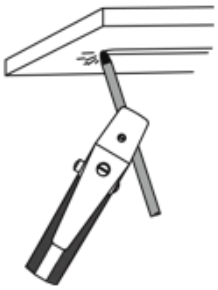


Figure 8 Overhead

The groove's depth is controlled by travel speed. Grooves up to 1" (25 mm) deep may be made. However, the deeper the groove, the more experienced the operator needs to be. Slow travel speed produces a deep groove, with fast travel speeds producing a shallow groove. The width of the groove is determined by the size of the electrode used and is typically about 1/8" (3.2 mm) wider than the electrode's diameter. A wider groove may be made with a small electrode by oscillating in a circular or weave motion.

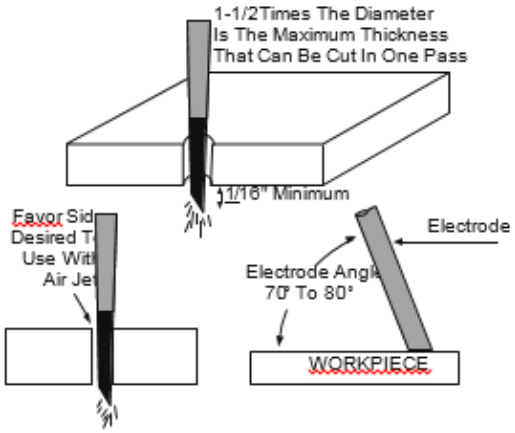
When gouging, use a push angle of 35° from the workpiece surface for most applications. A steady rest ensures a smoothly gouged surface, especially in the overhead position.

Proper travel speed depends on the size of the electrode, the base metal used, amperage, and air pressure. Proper speed (produces a smooth hissing sound) results in a good gouge.

SEVERING

Figure 9 shows the electrode ready for severing. The severing technique is like gouging, except the operator holds the electrode at a steeper angle, between 70° and 80° to the workpiece surface.

For cutting thick nonferrous metals, hold the electrode perpendicular to the workpiece, with the air jet favouring the desired side. Then, the operator severs the metal by moving the arc up and down with a sawing motion.

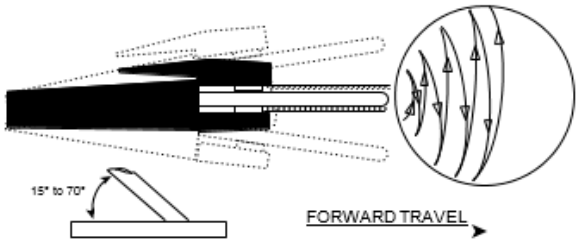


Gouging torches with fixed-angle heads are well suited for this application because they hold the electrode at the correct angle. With other types of torches, be sure to keep the air behind the electrode. The steadiness of the operator determines the smoothness of the surface produced.

WASHING

Position the electrode as shown in Figure 10 to use the air carbon-arc process for removing metal from large areas, surfacing metal, and riser pads on castings. Weave the electrode from side-to-side while pushing forward at the depth desired. In the padwashing operation, use an angle of 15° to 70° to the workpiece. Use the 15° angle for light finishing passes. Steeper angles perform deeper rough gouging with more ease. To padwash:

1. Keep the torch parallel to the workpiece and weave side-to-side across the width of the area to be cleaned.
2. Maintain forward motion across the workpiece.
3. Hold the electrode work angle 15° to 70° (mainly on cast iron). The shallower angles produce a smoother finish.



BEVELING

To use beveling method for thick plates, hold the electrode as in Figure 11A, with a travel angle of 90° and a work angle equal to the bevel angle. Place the air jet between the electrode and the workpiece.

The beveling method used for thin plates is shown in Figure 11B. Hold the torch parallel to the edge being beveled, with the electrode angle equal to the bevel angle. Place the air jet between the electrode and the workpiece surface.

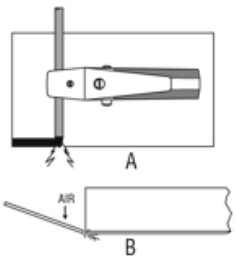


Figure 11

PROCESS VARIABLES

Like any thermal-cutting process, air carbon-arc gouging is sensitive to variables in operation. Variables can cause changes in the finished gouge that range from undetectable to unacceptable results.

Here are some variables in air carbon-arc process:

Electrode Diameter	Determines the size of the groove.
Amperage	Determined by the diameter of electrode being used. This current flow melts the base metal.
Voltage	The pressure behind the amperage, or arc force. Determined by arc length on CC power supplies and set on CV power supplies.
Air Pressure and Flow Rate	The medium for removing molten metal.
Travel Speed	Determines the depth/quality of a finished groove.
Electrode Travel and Work Angle	Can determine groove shape.
Electrode Extension	Affects metal removal rates and quality of groove.
Base Metal	Affects many other variables.

ELECTRODE DIAMETER AND TYPE

The electrode's size and type determine groove size. The electrode also affects productivity, groove quality, and metal-removal rates. The width of the groove will be about 1/8" (3.2 mm) wider than the diameter of the electrode.

Determine the proper electrode by desired groove size. Available power dictates the outer limit.

9.0 EC declaration of conformity

Hereby we declare that the machines as stated below

Type: GTK4000

Conform to the EC Directives: 73/23/EEC and 89/336/EEC

European standard: EN/IEC 60974-7

This is to certify that the tested sample is in conformity with all provisions of the above detailed EU directives and product standards.

9.1 Rohs Compliance Declaration

Directive 2002/95/ec of the European Parliament

Restriction of use of certain hazardous substances in electrical and electronic equipment

Type: GTK4000

The above listed products are certified to be compliant with the rohs directive with all homogeneous component parts being controlled to ensure material contents as per the list below.

Cadmium 0.01% by weight
Lead 0.1% by weight
Mercury 0.1% by weight
Hexavalent chromium 0.1% by weight
Polybrominated biphenyl's (pbbs) 0.1% by weight
Polybrominated diphenyl ethers (pbdes) 0.1% by weight

It should be noted that under specific exempted applications, where lead is used as an alloying element the following limits are applied in accordance with the regulations.

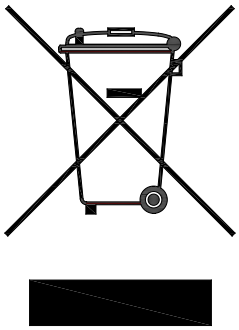
Copper and copper alloy parts use less than 4% by weight of each homogeneous component.

Steel and steel alloy parts use less than 4% by weight of each homogeneous component.

Aluminium and aluminium alloy parts use less than 4% by weight of each homogeneous component.

Only dispose off in authorised sites for electrical and electronic waste do not dispose of with general refuse or landfill waste.

9.2 WEEE Statement



WEEE (Waste Electrical & Electronic Equipment) 2002/96/EC

In relation to implementing the legislation, Parweld has established relevant recycling and recovery methods. We have been fully compliant against the marking requirements since August 2005. Parweld is registered in the UK with the Environment agency as detailed below. For WEE compliance outside the UK please contact your supplier/Importer

Parweld is registered with a compliance scheme Official registration number is WEE/FD0255QV

When your equipment reaches the end of its service life you should return it to Parweld where it will be reconditioned or processed for recycling.

9.3 Statement of warranty

Limited Warranty:

Parweld Ltd, hereafter, “Parweld” warrants its customers that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the Parweld products as stated below, Parweld shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with Parweld’s specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at Parweld’s sole option, of any components or parts of the product determined by Parweld to be defective.

Parweld makes no other warranty, express or implied. This warranty is exclusive and in lieu of all others, including, but not limited to any warranty of merchantability or fitness for any particular purpose.

Limitation of Liability:

Parweld shall not under any circumstances be liable for special, indirect or consequential damages, such as, but not limited to, lost profits and business interruption. The remedies of the purchaser set forth herein are exclusive and the liability of Parweld with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by Parweld whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based. No employee, agent, or representative of Parweld is authorized to change this warranty in any way or grant any other warranty.

Purchaser’s rights under this warranty are void if replacement parts or accessories are used which in Parweld’s sole judgement may impair the safety or performance of any Parweld product.

Purchaser’s rights under this warranty are void if the product is sold to purchaser by non-authorized persons.

The warranty is effective for the time stated below beginning on the date that the authorized Distributor delivers the products to the purchaser. Notwithstanding the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date Parweld delivered the product to the authorized distributor.

Parweld Limited
Bewdley Business Park
Long Bank
Bewdley
Worcestershire
England
DY12 2TZ

tel. +44 1299 266800
fax. +44 1299 266900

www.parweld.com
info@parweld.co.uk