parweld
inverter technology

Instructions for use

XTI 140

XTI 140 DV

Inverter MMA welders

WARNING
Operation and maintenance of arc welding equipment can be dangerous and hazardous to your health.

To prevent possible injury, read, understand and follow all warnings, safety precautions and instructions before using the equipment

GASES AND FUMES
Gases and fumes produced during the arc welding/cutting process can be dangerous and hazardous to your health.

Keep all fumes and gases from the breathing area.

Keep your head out of the welding fume plume.

Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.

The kinds of fumes and gases from the arc welding/cutting depend on the kind of metal being used, coatings on the metal, and the different processes. You must be careful when cutting or welding any metals which may contain one or more of the following:

Antimony, Chromium, Mercury, Arsenic, Cobalt, Nickel, Barium, Copper, Selenium, Beryllium, Lead, Silver, Cadmium, Manganese, Vanadium

Always read the safety data sheets (SDS) that should be supplied with the material you are using. These SDS will give you information regarding the kind and volume of fumes and gases that may be dangerous to your health.

Use special equipment, such as water or down draft welding/cutting tables, to capture fumes and gases.

Do not use the welding torch in an area where combustible or explosive gases or materials are located.

Phosgene, a toxic gas, is generated from the vapours of chlorinated solvents and cleansers.
Remove all sources of these vapours.

ELECTRIC SHOCK
Electric shock can injure or kill. The arc welding process uses high voltage electrical energy. This electric energy can cause severe or fatal shock to the operator or others in the workplace.

Never touch any parts that are electrically “live”

Wear dry gloves and clothing. Insulate yourself from the work piece or other parts of the welding circuit.

Repair or replace all worn or damaged parts.

Extra care must be taken when the workplace is moist or damp.

Disconnect power source before performing any service or repairs.

FIRE AND EXPLOSION
Fire and explosion can be caused by hot slag, sparks, or the arc weld.

Be sure there is no combustible or flammable material in the workplace. Any material that cannot be removed must be protected.

Ventilate all flammable or explosive vapors from the workplace.

Do not cut or weld on containers that may have held combustibles.

Consult the site safety officer before working in areas where fire hazards exist.

Do not cut aluminum alloys underwater or on a water table unless the hydrogen gas can be eliminated or dissipated. Trapped hydrogen gas that is ignited will cause an explosion.

NOISE
Noise can cause permanent hearing loss. Arc welding/cutting processes can cause noise levels to exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.

To protect your hearing from loud noise, wear protective ear plugs and/or ear muffs.
Protect others in the workplace.

Noise levels should be measured to be sure the decibels (sound) do not exceed safe levels.

ARC WELDING RAYS
Arc welding/cutting rays can injure your eyes and burn your skin. The arc welding/cutting
Process produces very bright ultra violet and infra red light. These arc rays will damage your eyes and burn your skin if you are not properly protected.

To protect your eyes, always wear a welding helmet or shield. Also always wear safety glasses with side shields, goggles or other protective eye wear.

Wear welding gloves and suitable clothing to protect your skin from the arc rays and sparks.

Keep helmet and safety glasses in good condition. Replace lenses when cracked, chipped or dirty.

Protect others in the work area from the arc rays. Use protective booths, screens or shields.

GENERAL DESCRIPTION
This welding machine is manufactured using advanced inverter technology. The input voltage is rectified to DC and then inverted to high frequency AC voltage. This allows the use of a much smaller transformer and so allowing weight saving and improved power efficiency.

INSTALLATION

ENVIRONMENT
The XTI140 is designed for use in environments with increased risk.

Examples of environments with increased risk are -

- In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts;

- In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator, or

- In wet or damp hot locations where humidity or perspiration considerably reduces the Skin resistance of the human body and the insulation properties of accessories.

Environments with increased risk do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard, have been insulated.

LOCATION
Be sure to locate the welder according to the following guidelines:
˜ *In areas, free from moisture and dust.˜ ambient temperature between 0 degrees c to 40 degrees c.*
˜ *In areas, free from oil, steam and corrosive gases.*
˜ *In areas, not subjected to abnormal vibration or shock.*
˜ *In areas not exposed to direct sunlight or rain.*
˜ *Place at a distance of 12" (304.79mm) or more from walls or similar that could restrict natural airflow for cooling.*

CONNECTION OF POWER SUPPLY CABLE

Warning:
Parweld advises that this equipment be electrically connected by a qualified electrician.

Connect the power supply cable with required voltage. The primary cable should be connected to the correct socket to avoid arcing or over heating. Ensure the power supply is sufficiently rated to match the machines maximum output (refer to specification table on machine).

Operate the welding power source from a single-phase 50/60 Hz, ac power supply. The input voltage must match one of the electrical input voltages shown on the input data label on the unit nameplate. The XTI140-DV machine will automatically detect and switch between 110 and 230v single phase. The XTI140 machine should only be used on 230v supply. Refer to the specifications table for voltage tolerances.

Connect the earth (green/yellow) conductor to a suitable ground. Use a grounding method that complies with all applicable electrical regulations

Voltage reduction device (VRD)

VRD open circuit voltage is 15.3 to 19.8v between welding terminals
VRD resistance is 148 to 193 ohms the required resistance between welding terminals to turn on the welding power
VRD turn off time 0.2 to 0.3 seconds, the time taken to turn off the welding
Power once the welding current has stopped

VRD maintenance

Routine inspection and testing of the power source, insulation resistance test and earth resistance test shall be carried out.

- for transportable equipment, at least once every 3 months; and
- for fixed equipment, at least once every 12 months.

The owners of the equipment shall keep a suitable record of the periodic tests.

In addition to the above tests and specifically in relation to the VRD fitted to this machine,
The following periodic tests should also be conducted by a qualified service agent.

IEC 60974-1 requirements

VRD open circuit voltage less than 20v; at Vin=115v or 230v
VRD turn on resistance less than 200 ohms
VRD turn off time less than 0.3 seconds
If this equipment is used in a hazardous location or environments with a high risk of
Electrocution then the above tests should be carried out prior to entering this location.

Connection of torches and operation

Wide safety margins provided by the coil design ensure that the welding power source will withstand short-term overload without adverse effects.

The welding current range values should be used as a guide only. Current delivered to the arc is dependent on the welding arc voltage, and as welding arc voltage varies between different classes of electrodes, welding current at any one setting would vary according to the type of electrode in use. The operator should use the welding current range values as a guide, and then finally adjust the current setting to suit the application.

CAUTION:
Before connecting the work clamp to the work and inserting the electrode in the Electrode holder make sure the primary power supply is switched off. Remove any packaging material prior to use. Do not block the air vents at the front or rear or sides of the welding power source.

MMA cable connections
Connect work lead to negative terminal
Connect electrode lead to positive terminal; insert an electrode in the holder
Switch machine on
Use the control knob to adjust the require output current
Commence welding

MMA WELDING GUIDE

Electrode polarity
MMA electrodes are generally connected to the '+' terminal and the work lead to the˜'' terminal
But if in doubt consult the electrode manufacturer's literature.

Effects of stick welding various materials
High tensile and alloy steels
The two most prominent effects of welding these steels are the formation of a hardened zone in the weld area, and, if suitable precautions are not taken, the occurrence in this zone of under-bead cracks. Hardened zone and under-bead cracks in the weld area may be reduced by using the correct electrodes, preheating, using higher current settings, using larger electrodes sizes, short runs for larger electrode deposits or tempering in a furnace.

Manganese steels
The effect on manganese steel of slow cooling from high temperatures is enbrittlement. For this reason it is absolutely essential to keep manganese steel cool during welding by quenching after each weld or skip welding to distribute the heat.

Cast iron
Most types of cast iron, except white iron, are weldable. White iron, because of its extreme brittleness, generally cracks when attempts are made to weld it. Trouble may also be experienced when welding white-heart malleable, due to the porosity caused by gas held in this type of iron.

Copper and alloys
The most important factor is the high rate of heat conductivity of copper, making preheating of heavy sections necessary to give proper fusion of weld and base metal.

Types of electrodes
Arc welding electrodes are classified into a number of groups depending on their applications. There are a great number of electrodes used for specialized industrial purposes which are not of particular interest for everyday general work. These include some low hydrogen types for high tensile steel, cellulose types for welding large diameter pipes, etc. The range of electrodes dealt with in this publication will cover the vast majority of applications likely to be encountered; are all easy to use and all will work on even the most basic of welding machines.

Metals being joined & electrode comments
Mild steel
6013 ideal electrodes for all general purpose work. Features include outstanding operator appeal, easy arc starting and low spatter.

Mild steel
7014 all positional electrode for use on mild and galvanized steel furniture, plates, fences, gates, pipes and tanks etc.
Especially suitable for vertical down welding.

Cast iron
99% nickel suitable for joining all cast irons except white cast iron.

Stainless steel
318l-16 high corrosion resistance. Ideal for dairy work, etc. On stainless steels.

BASIC TIG WELDING GUIDE

TIG welding cable connection
Connect the TIG torch to the - torch terminal and the work lead to the + work terminal for direct current straight polarity. Direct current straight polarity is the most widely used polarity for dc TIG welding. It allows limited wear of the electrode since 70% of the heat is concentrated at the work piece.

TIG welding guide ranges

Electrode diameter	dc current (amps)
0.040" (1.0mm)	30 – 60
1/16" (1.6mm)	60 – 115
3/32" (2.4mm)	100 – 165

Tungsten electrode types

Electrode type	Welding application
Thoriated 2%	dc welding of mild steel, stainless steel and copper. Excellent arc starting, long life, high current carrying capacity.
Ceriated 2%	dc welding of mild steel, stainless steel, copper, aluminium, magnesium and their alloys longer life, more stable arc, easier starting, wider current range, narrower more concentrated arc.

Guide for selecting filler wire diameter

Filler wire diameter	dc current range
1/16" (1.6 mm)	20 - 90
3/32" (2.4 mm)	65 - 115
1/8" (3.2 mm)	100 - 165
3/16" (4.8 mm)	200-350

The filler wire diameter specified is a guide only, other diameter wires may be used according to the welding application
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Shielding gas selection

Alloy	shielding gas
Aluminium & alloys	argon
Carbon steel	argon
Stainless steel	argon
Nickel alloy	argon
Copper	argon
Titanium	argon

ROUTINE MAINTENANCE

The only routine maintenance required for the power supply is a thorough cleaning and inspection, with the frequency depending on the usage and the operating environment.

Warning
Disconnect primary power at the source before removing the cover. Wait at least two minutes before opening the cover to allow the primary capacitors to discharge.

To clean the unit, remove the screws securing the outer cover, lift off the outer cover and use a vacuum cleaner to remove any accumulated dirt and dust. The unit should also be wiped clean, if necessary; with solvents that are recommended for cleaning electrical apparatus.

TROUBLE SHOOTING

TIG welding problems
Weld quality is dependent on the selection of the correct consumables, maintenance of equipment and proper welding technique.

Description	Possible cause	Remedy
Excessive bead build up or poor penetration or poor fusion at edges of weld	Welding current is too low	Increase weld current and/or faulty joint preparation
Weld bead too wide and flat or undercut at edges of weld or excessive burn through	Welding current is too high	Decrease weld current
Weld bead too small or insufficient penetration or ripples in bead are widely space apart	Travel speed too fast	Reduce travel speed
Weld bead too wide or excessive bead build up or excessive penetration in butt joint	Travel speed too slow	Increase travel speed
Uneven leg length in fillet joint	Wrong placement of filler rod	Re-position filler rod
Electrode melts when arc is struck	Electrode is connected to the '+' terminal	Connect the electrode to the '-' terminal
Dirty weld pool	(a) Electrode contaminated through contact with work piece or filler rod material	(a) Clean the electrode by grinding off the contaminates
	(b) Gas contaminated with air	(b) Check gas lines for cuts and loose fitting or change gas cylinder
Electrode melts or oxidizes when an arc is struck	(a) No gas flowing to welding region	(a) Check the gas lines for kinks or breaks and gas cylinder contents
	(b) Torch is clogged with dust	(b) Clean torch
	(c) Gas hose is cut	(c) Replace gas hose
	(d) Gas passage contains impurities	(d) Disconnect gas hose from torch then raise gas pressure to blow out impurities
	(e) Gas regulator is turned off	(e) Turn on
	(f) Torch valve is turned off	(f) Turn on
	(g) The electrode is too small for the welding current	(g) Increase electrode diameter or reduce the welding current
Poor weld finish	Inadequate shielding gas	Increase gas flow or check gas line for gas flow problems
Arc flutters during TIG welding.	(a) Tungsten electrode is too large for the welding current	(a) Select the right size electrode. Refer to basic TIG welding guide.
	(b) Absence of oxides in the Weld pool.	(b) Refer basic TIG welding guide for ways to reduce arc flutter
Welding arc cannot be established .	a) Connect the work clamp to the work piece or connect the work/torch leads to the right welding terminals	(a) Work clamp is not connected to the work piece or the work/torch leads are not connected to the right welding terminals
	(b) Torch lead is disconnected	(b) Connect it to the '.' terminal
	(c) Gas flow incorrectly set, cylinder empty or the torch valve is off	(c) Select the right flow rate, change cylinders or turn torch valve on
Arc start is not smooth	(a) Tungsten electrode is too large for the welding current	(a) Select the right size electrode
	(b)The wrong electrode is being used for the welding job	(b) Select the right electrode type. Refer to basic TIG welding guide
	(c) Gas flow rate is too high	(c) Select the correct rate for the welding job. Refer to basic TIG welding guide
	(d) Incorrect shielding gas is being used	(d) Select the right shielding gas. Refer to basic TIG welding guide
	(e) Poor work clamp connection to work piece	(e) Improve connection to work piece

MMA welding problems

Description	Possible cause	Remedy
Gas pockets or voids in weld metal (porosity)	(a) Electrodes are damp (b) Welding current is too high. (c) Surface impurities such as oil, grease, paint, etc	(a) Dry electrodes before use (b) Reduce welding current (c) Clean joint before welding
Crack occurring in weld metal soon after solidification commences	(a) Rigidity of joint. (b) Insufficient throat thickness. (c) Cooling rate is too high.	(a) Redesign to relieve weld joint of severe stresses or use crack resistance electrodes. (b) Travel slightly slower to allow greater build up in throat. (c) Preheat plate and cool slowly.
A gap is left by failure of the weld metal to fill the root of the weld	(a) Welding current is too low (b) Electrode too large for joint. (c) Insufficient gap (d) Incorrect sequence	(a) Increase welding current (b) Use smaller diameter electrode. (c) Allow wider gap (d) Use correct build-up sequence
Portions of the weld run do not fuse to the surface of the metal or edge of the joint.	(a) Small electrodes used on heavy cold plate (b) Welding current is too low (c) Wrong electrode angle (d) Travel speed of electrode is too high (e) Scale or dirt on joint surface	(a) Use larger electrodes and preheat the plate (b) Increase welding current (c) Adjust angle so the welding arc is directed more into the base metal (d) Reduce travel speed of Electrode (e) Clean surface before welding.

Description	Possible cause	Remedy
Non-metallic particles are trapped in the weld metal (slag inclusion). . .	(a) Non-metallic particles may be trapped in undercut from previous run (b) Joint preparation too restricted (c) Irregular deposits allow slag to be trapped. (d) Lack of penetration with slag trapped beneath weld bead. (e) Rust or mill scale is preventing full fusion. (f) Wrong electrode for position in which welding is done.	(a) If bad undercut is present, clean slag out and cover with a run from a smaller diameter electrode (b) Allow for adequate penetration and room for cleaning out the slag (c)If very bad, chip or grind out Irregularities (d) Use smaller electrode with sufficient current to give adequate penetration. Use suitable tools to remove all slag from corners (e) Clean joint before welding. (f) Use electrodes designed for position in which welding is done, otherwise proper control of slag is difficult.

Power source problems

Description	Possible cause	Remedy
The welding arc cannot be established	(a) The primary supply voltage has not been switched on (b) The welding power source switch is switched off (c) Loose connections internally	(a) Switch on the primary supply voltage (b) Switch on the welding power source. (c) Have a qualified service engineer repair the connection
Maximum output welding current cannot be achieved with nominal mains supply voltage	Defective control circuit	Have a qualified service engineer inspect then repair the welder
Welding current reduces when welding	Poor work lead connection to the work piece	Ensure that the work lead has a positive electrical connection to the work piece
A total loss of power, pilot lamp is off, no output, the fan is not operating	(a) Failure of input voltage (b) Possible over voltage (c) Internal fault with the machine	(a) Re-establish mains supply (b) Check voltage and if necessary move machine to alternative supply (c) Have a qualified service engineer inspect then repair the welder
Fault lamp is on, no power output.	(a) Machine overheated (b) Over current state (c) Internal fault with machine	(a) Allow to cool with fan running (b) Switch off mains power to the machine and re start (c) Have a qualified service engineer inspect then repair the welder

EC DECLARATION OF CONFORMITY

Hereby we declare that the machines as stated below

Type: XTI 140, XTI 140-DV

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

European standard: EN/IEC 60974-1

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

Rohs Compliance Declaration

Directive 2002/95/ec of the European Parliament

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

Type: XTI 140, XTI 140-DV

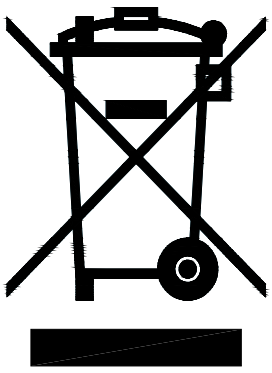
The above listed products are certified to be compliant with the rohs directive with all homogeneous component parts being controlled to ensure material contents as per the list below.

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.

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.