Clarke®

weld

MMA INVERTER WELDER

MODEL NO: MMA150

PART NO: 6013053

OPERATION & MAINTENANCE INSTRUCTIONS

UK CA | CE

ORIGINAL INSTRUCTIONS

GC09/25

INTRODUCTION

Thank you for purchasing this CLARKE Welder. Before attempting to operate the machine it is essential that you read this manual thoroughly and carefully follow all instructions given. In doing so you will ensure the safety of yourself and that of others around you, and you can also look forward to the welder giving you long and satisfactory service.

When unpacking, any damage or deficiency should be reported to your CLARKE dealer immediately.

SPECIFICATIONS

Model	MMA150
Unpacked Weight (kg)	3.95
Dimensions (L x W x H) (mm)	280 x 140 x 207
Power Supply	230V-50Hz
Connecting plugs	(32A)
Peak Input Power	5980 W
Max Input Current I1Max / I1eff	26A/16.4A
Output Welding Current	MMA 10A-20.4V / 140A/25.6V
IP Rating	IP21S
Insulation Grade	Class 1 - Grade H
Electrode size	1.6mm - 4.0mm
Welding Capacity (Mild Steel)	1-6 mm (MMA)

NOTE: The details and specifications contained herein, are correct at the time of going to print. However, CLARKE International reserve the right to change specifications at any time without prior notice.

PRINCIPLES OF THE MACHINE

The MMA150 is an inverter type welding machine, suitable to carry out No Gas welding with the advantages of high energy efficiency, strong arc penetration and small welding deformation.

Weldable materials include low carbon steel, low alloy steel, high strength steel, stainless steel and aluminium alloy.

Manual Metal Arc (MMA) welding uses a coated consumable electrode (stick) to lay the weld, therefore an additional welding torch kit is not used. The arc melts the core of the electrode to produce drops of molten metal (weld pool) that cool to create the welded joint. Because of the versatility and simplicity of MMA welding, it requires less skill and is used primarily to weld iron and steel (including stainless steel. but nickel and copper can also be welded using this method.)

A wide selection of accessories and consumables are available from your CLARKE dealer (see page 24).

When using the welder outside you may need to erect a wind break to make sure the shielding gas is not blown away, thereby leaving a poor quality weld.

ENVIRONMENTAL RECYCLING POLICY

Through purchase of this product, the customer is taking on the obligation to deal with the WEEE in accordance with the WEEE regulations in relation to the treatment, recycling & recovery and environmentally sound disposal of the WEEE.

In effect, this means that this product must not be disposed of with general household waste. It must be disposed of according to the laws governing Waste Electrical and Electronic Equipment (WEEE) at a recognised disposal facility.

If disposing of this product or any damaged components, do not dispose of with general waste. This product contains valuable raw materials. Metal products should be taken to your local civic amenity site for recycling of metal products.

SAFETY PRECAUTIONS FOR ALL WELDING

WARNING: AS WITH ALL MACHINERY, THERE ARE CERTAIN HAZARDS INVOLVED WITH THEIR OPERATION AND USE. EXERCISING RESPECT AND CAUTION WILL CONSIDERABLY LESSEN THE RISK OF PERSONAL INJURY. HOWEVER, IF NORMAL SAFETY PRECAUTIONS ARE OVERLOOKED, OR IGNORED, PERSONAL INJURY TO THE OPERATOR MAY RESULT.

FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY.

GENERAL PRECAUTIONS

BURN PREVENTION

Wear protective clothing - gauntlet gloves designed for use in welding, apron, and protective shoes. Button shirt collar and pocket flaps and wear cuffless trousers to avoid entry of sparks and slag. Wear helmet with safety goggles or glasses with side shields underneath, appropriate filter lenses or plates (protected by clear glass). This is a **MUST** for welding (and chipping) to protect the eyes from radiant energy and spatter. Replace cover glass when broken, pitted, or spattered. Avoid oily or greasy clothing. A spark may ignite them. Hot metal should NEVER be handled without gloves. First aid facilities and a qualified first aid person should be available, unless medical facilities are close by, for immediate treatment of flash burns of the eyes and skin. A hard hat should be worn when others work overhead. Flammable hair preparations should not be used by persons intending to weld or cut.

NOTE: ALL protective wear incl. masks & head shields MUST comply with PPE Regulation (EU) 2016/425.

TOXIC FUME PREVENTION

Severe discomfort, illness or death can result from fumes, vapours, heat, or oxygen enrichment or depletion that welding (or cutting) may produce. Prevent them with adequate ventilation. **NEVER** ventilate with oxygen. Lead, cadmium, zinc, mercury and beryllium bearing materials, when welded (or cut) may produce harmful concentrations of toxic fumes. Adequate local exhaust ventilation must be used, or each person in the area as well as the operator must wear an air- supplied respirator. For beryllium, both must be used. Metals coated with or containing materials that emit toxic fumes should not be heated unless coating is removed from the work surface, the area is well ventilated, or the operator wears an air-supplied respirator. Work in a confined space only when it is being force ventilated and, if necessary, while wearing an air-supplied respirator. Vapours from chlorinated solvents can be decomposed by the heat of the arc (or flame) to form PHOSGENE, a highly toxic gas, and other lung and eye irritating by-products. The ultraviolet (radiant) energy of the arc can also decompose trichloroethylene and perchloroethylene vapours to form phosgene. **DO NOT WELD** where solvent vapours can be drawn into the welding

atmosphere or where the radiant energy can penetrate to atmospheres containing even minute amounts of trichloroethylene or perchloroethylene.

FIRE AND EXPLOSION PREVENTION

Causes of fire and explosion are:

1. Combustibles reached by the arc, flying sparks, hot slag or heated material;
2. Short circuits.

BE AWARE that flying sparks or falling slag can pass through cracks, along pipes, through windows or doors, and through wall or floor openings, out of sight of the goggled operator.

To prevent fires and explosion: keep equipment clean and operable, free of oil, grease, and (in electrical parts) of metallic particles that can cause short circuits. If combustibles are in the area, **DO NOT** weld. Move the work if practicable, to an area free of combustibles.

Avoid working in paint spray rooms, dip tanks, storage areas, ventilators. If the work cannot be moved, move combustibles away from sparks and heat; or protect against ignition with suitable fire-resistant covers or shields.

Walls, ceilings, and floor near work should be protected by heat resistant covers or shields. Fire watcher must be standing by with suitable fire extinguishing equipment during and for some time after welding or cutting if:

1. Appreciable combustibles (including building construction) are within 10m.
2. Appreciable combustibles are further than 10m, but can be ignited by sparks.
3. Openings (concealed or visible) in floors or walls can expose combustibles to sparks.
4. Combustibles adjacent to walls, ceilings, roofs or metal partitions can be ignited by radiant or conducted heat.

After work, check that area is free of sparks, glowing embers and flames. An empty container that held combustibles or that can produce flammable or toxic vapours when heated, must never be welded on or cut, unless the container has first been cleaned. This includes a thorough steam or caustic cleaning (or a solvent or water washing, depending on the combustible's solubility) followed by purging and inerting with nitrogen or carbon dioxide, and using protective equipment.

Water filling just below the working level may substitute for inerting.

A container with unknown contents should be cleaned (see paragraph above). **DO NOT** depend on sense of smell or sight to determine if it is safe to weld or cut. Hollow castings or containers must be vented before welding as they can explode.

In explosive atmospheres, **NEVER** weld or cut where the air may contain flammable dust, gas, or liquid vapours.

DO NOT overload arc welding equipment. It may overheat cables and cause a fire. Loose cable connections may overheat or flash and cause a fire. **NEVER** strike an arc on a cylinder or other pressure vessel. It creates a brittle area that can cause a violent rupture or lead to such a rupture later under rough handling.

ELECTRIC ARC WELDING

Comply with precautions in above and this section. Arc welding, properly done, is a safe process but a careless operator invites trouble. The equipment carries high currents at significant voltages. The arc is very bright and hot. Sparks fly, fumes rise, ultraviolet and infrared energy radiates and work pieces are hot. The wise operator avoids unnecessary risks and protects himself and others from accidents.

BURN PROTECTION

The welding arc is intense and visibly bright. It's radiation can damage eyes, penetrate lightweight clothing, reflect from light coloured surfaces and burn the skin and eyes. Skin burns resemble acute sunburn, those from gas - shielded arcs are more severe and painful.

PROTECTIVE CLOTHING (PPE) MUST BE WORN

Wear long sleeved clothing (particularly for gas shielded arc) in addition to gloves, apron and strong shoes. As necessary, use additional protective clothing such as leather jacket or sleeves, flameproof apron, and fire-resistant leggings. Avoid outer garments of untreated cotton. Bare skin protection: Wear dark substantial clothing, button collars closed to protect the chest and neck and button any pockets to prevent entry of sparks.

EYE AND HEAD PROTECTION

Protect eyes from exposure to arc. **NEVER** look at an electric arc without protection. Welding helmet or shield containing an appropriate filter plate (Please refer to the section 'Welding Shield on page 13). Place over face before striking arc. Protect filter plate with a clear cover plate. Cracked or broken helmet or shield should NOT be worn; radiation can pass through to cause burns.

Cracked, broken, or loose filter plates must be replaced IMMEDIATELY. Replace clear cover plate when broken, pitted, or spattered. WE SUGGEST you wear flash goggles with side shields under the helmet, to give some protection to the eyes should the helmet not be lowered over the face before an arc is struck. Looking at an arc momentarily with unprotected eyes (particularly high intensity gas-shielded arc) can cause a retinal burn that may leave a permanent dark area in the field of vision. Before welding whilst wearing contact lenses, seek advice from your optician.

PROTECTION OF NEARBY PERSONNEL

For production welding, a separate, well vented room or enclosed bay is best. In open areas, surround the operation with low reflective, non- combustible screens or panels. Allow for free air circulation, particularly at floor level. Provide face shields for all

persons who will be looking directly at the weld. Others working in the area should wear flash goggles. Before starting to weld, make sure that screen or bay doors are closed.

SHOCK PREVENTION

Exposed live conductors or other bare metal in the welding circuit, or in unearthed, electrically-LIVE equipment can fatally shock a person whose body becomes a conductor. **DO NOT** stand, sit, lie or lean on or touch a wet surface when welding without suitable protection.

PROTECTION FOR WEARERS OF ELECTRONIC LIFE SUPPORT DEVICES (PACEMAKERS)

Magnetic fields from high currents can affect pacemaker operation. Persons wearing pacemakers should consult with their doctor before going near arc welding or spot welding operations.

PROTECTION AGAINST SHOCK

Keep your body and clothing dry. **NEVER** work in damp area without adequate insulation against electric shock. Stay on a dry duckboard or rubber mat when dampness or sweat can not be avoided. Sweat, sea water, or moisture between body and an electrically LIVE part - or earthed metal - reduces the body surface electrical resistance, enabling dangerous and possibly lethal currents to flow through the body.

EARTHING THE EQUIPMENT

When arc welding equipment is earthed according to the National Electrical Code and the workpiece is earthed, a voltage may exist between the electrode and any conducting object.

Examples of conducting objects include, but are not limited to, buildings, electrical tools, work benches, welding power source cases, workpieces, etc. **NEVER** touch the electrode and any metal object unless the welding power source is off. When installing, connect the frames of each unit such as welding power source, control, work table, and water circulator to the building earth. Conductors must be adequate to carry earth currents safely. Equipment made electrically live by stray current may shock, possibly fatally. **DO NOT** earth to electrical conduit or to a pipe carrying ANY gas or a flammable liquid such as oil or fuel.

CABLES

Frequently inspect cables for wear, cracks and damage. IMMEDIATELY REPLACE those with excessively worn or damaged insulation to avoid possibly lethal shock from bared cable. Cables with damaged areas may be taped to give resistance equivalent to original cable. Keep cable dry, free of oil and grease and protected from hot metal and sparks.

TERMINALS AND OTHER EXPOSED PARTS

Terminals and other exposed parts of electrical units should have insulating covers secured before operation.

SAFETY DEVICES

Safety devices such as interlocks and circuit breakers should not be disconnected or shunted out. Before installation, inspection, or service of equipment, shut off all power and remove line fuses (or lock or red-tag switches) to prevent accidental turning ON of power. **DO NOT** open power circuit or change polarity while welding. If, in an emergency, it must be disconnected, guard against shock burns, or flash from switch arcing. **ALWAYS** shut OFF and disconnect all power to equipment. A power disconnect switch must be available near the welding power source.

PREPARATION OF THE WORKING AREA

WARNING: ELECTRIC SHOCK CAN BE FATAL. A PERSON QUALIFIED IN FIRST AID SHOULD ALWAYS BE PRESENT IN THE WORKING AREA. IF PERSON IS UNCONSCIOUS AND ELECTRIC SHOCK IS SUSPECTED, DO NOT TOUCH THE PERSON IF HE OR SHE IS IN CONTACT WITH THE WELDER OR CABLES. DISCONNECT THE WELDER FROM THE POWER SOURCE AND THEN USE FIRST AID. DRY WOOD OR OTHER INSULATING MATERIAL CAN BE USED TO MOVE CABLES, IF NECESSARY, AWAY FROM THE PERSON.

The working area must be sufficiently spacious, not humid, and well-ventilated as to avoid any fumes which develop from the welding process and from incidental material adhering to the pieces to be welded (oils, paints, tars...) which may cause danger to the operator.

Avoid welding tanks which may contain flammable residuals.

PRECAUTIONS FOR MMA WELDING

1. **ALWAYS** ensure that there is full free air circulating around the outer casing of the machine and that the louvres are unobstructed.
2. A welding arc can seriously damage your eyes. Both operator and spectators must **ALWAYS** use a proper welding face shield or helmet with suitable filter lenses. Proper gloves and working clothes should be worn at all times.
3. **ALWAYS** remove all flammable materials from the welding area.
4. **NEVER** remove any of the panels unless the machine is disconnected from the supply and NEVER use the machine with any of the panels removed.
5. **NEVER** use or store in a damp environment. **DO NOT** expose to rain.
6. **NEVER** attempt any electrical or mechanical repair unless your are a qualified technician. If you have a problem with the machine contact your local CLARKE dealer.

7. **ALWAYS** keep a fire extinguisher handy (Dry Powder, $C0_2$ or BCF, NOT Water).
8. **NEVER** continue to weld, if, at any time, you feel even the smallest electric shock. Stop welding IMMEDIATELY and **DO NOT** attempt to use the machine until the fault is diagnosed and corrected.
9. **NEVER** allow the earth cable or torch to become wrapped around the operator or any person in the vicinity.

A comprehensive range of CLARKE safety equipment for use when welding is available from your local dealer. See page 24.

Consideration should be given to shielding the supply cable of permanently installed welding equipment, in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length.

The shielding should be connected to the welding power source so that good electrical contact is maintained between the conduit and the welding power source enclosure.

The welding equipment should be routinely maintained according to the recommendations (see page 25). All covers should be closed and properly fastened when the machine is in operation. The welding equipment should not be modified in any way except for those changes and adjustments covered in these instructions.

SAFETY SYMBOLS

The following symbols may be displayed on the machine or its packaging.

	Read this instruction booklet carefully before use.		Do not expose to rain.
	Wear welding mask		Recycle unwanted materials under WEEE Directive
	Wear protective gloves		General Hazard
	Wear a dust mask		Warning;- Magnetic field created
	Caution:- Hot surface		Danger! Harmful fumes
	Risk of Electric Shock		Do not weld near flammable or combustible materials
	May interfere with pacemakers		Danger:- Arc Rays

ELECTRICAL CONNECTION

⚠	**WARNING! READ THESE ELECTRICAL SAFETY INSTRUCTIONS THOROUGHLY BEFORE CONNECTING THE PRODUCT TO A POWER SUPPLY. THE INSTALLATION OF THIS APPLIANCE SHOULD BE CARRIED OUT BY A COMPETENT ELECTRICIAN AND BE IN ACCORDANCE WITH CURRENT IEE WIRING REGULATIONS (BS4343).**

This welder MUST be connected to a 230 Volt, 1 phase 50Hz supply through a suitably rated isolator switch. Before switching on, ensure the voltage of your power supply is correct. Connecting it to any other power source may cause damage.

The user should purchase a suitable connecting cable capable of handling 32 Amps with a supply plug rated at 32A or better. A length of 2-3 metres is recommended giving mobility to the appliance but without becoming a trip hazard.

If the plug has to be changed due to damage a replacement should be fitted following the wiring instructions shown below.

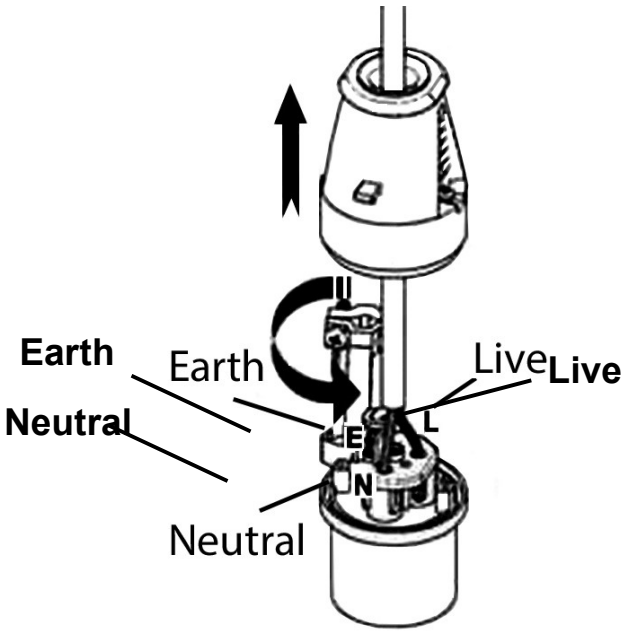
⚠	**WARNING: THE WIRES IN THE POWER CABLE OF THIS PRODUCT ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:** **BLUE = NEUTRAL BROWN = LIVE YELLOW = EARTH**

If the wire colours of the power cable of this product do not correspond with the markings on the terminals of your plug, proceed as follows.

- The **Blue** wire must be connected to the terminal which is marked **N** or **Neutral**.
- The **Brown** wire must be connected to the terminal which is marked **L** or **Live**.
- The **Yellow** wire must be connected to the terminal which is marked **E** or **Earth**.

If in any doubt, consult a qualified electrician. **DO NOT** attempt any repairs yourself.

Plug must be BS60309 approved.



OVERVIEW

The MMA150 welder comes with the following features:

1	Power-On LED
2	Overheating LED
3	Digital voltage display meter (V)
4	Welding voltage selector knob
5	Positive socket

6	Negative socket
7	Welding Mask
8	Electrode holder/cable
9	Wire brush
10	Earthing cable

FEATURES OF THE MACHINE

1. Power-On LED

When the power is switched on at the back of the machine the switch will be illuminated, as will the green 'Power On' LED.

2. Thermal overload LED

If the duty cycle is exceeded as a result of welding for too long with a high current, the overload light will illuminate and the welder will turn off. When the welder has cooled down (approx. 5 to 10 minutes), the power will be restored and welding can recommence.

3. Digital voltage display meter

- Displays selected output voltage the machine.

4. Welding voltage selector knob

Adjusts the output voltage according to the welding task being performed.

5. Positive Output Terminal

- Connect the electrode holder cable to the positive terminal

6. Negative Output Terminal

- Connect the earth clamp cable to the negative terminal

LOOSE ITEMS SUPPLIED INCLUDE:

7. Welding Mask

- c/w handle, lenses & locking nuts for assembly

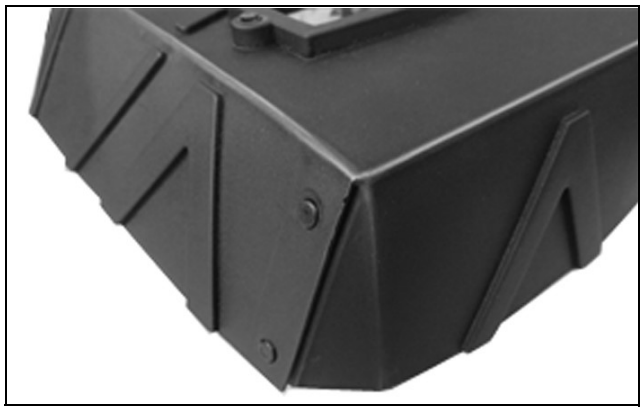
8. Welding electrode holder/cable

9. Wire Brush/chipping hammer

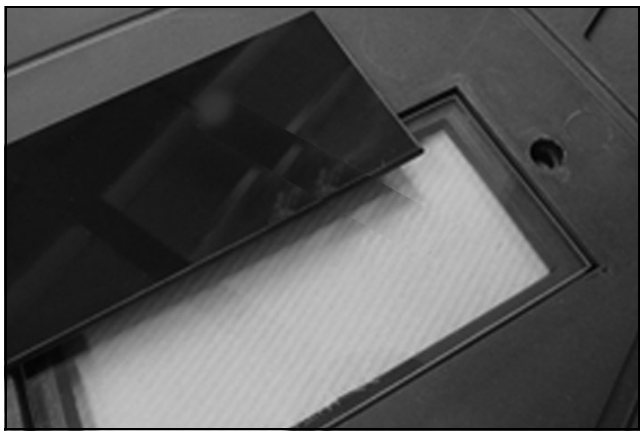
10. Earth Cable/clamp

ASSEMBLING THE WELDING SHIELD

1. The welding shield shown is supplied flat for shipping. Fold the sides of the shield around and clip to the top panel.



2. Insert both the glass lens panels into the recess inside the shield.



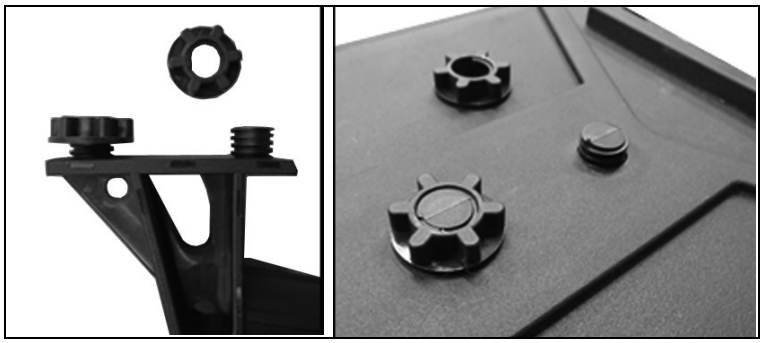
- The clear glass must be fitted first to face the outside.

3. Insert the two plastic screws and use the plastic wing-nuts to clamp the glass panels to the shield.

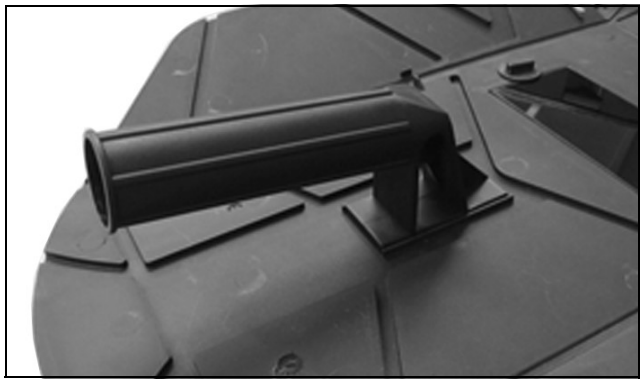
- The clear glass panel should be replaced when it becomes badly pitted.

4. When replacing the glass panels, only use parts supplied by CLARKE International. The dark panel is a certified, optical glass and should not be exchanged for any other type.

5. Secure the handle in position using the plastic nuts provided.



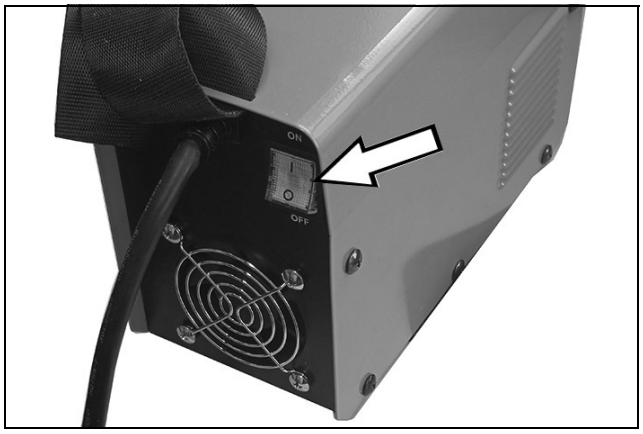
- The handle will be mounted on the inside of the shield.



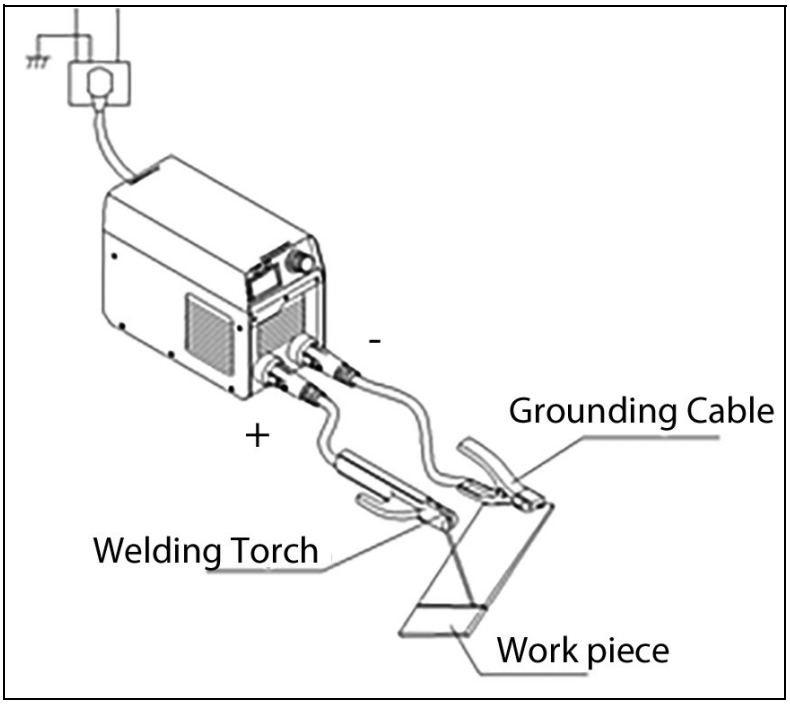
PREPARING THE WELDER FOR USE

FITTING THE WELDING ROD

1. Make sure that the ON/OFF switch, located on the rear panel is in the OFF position.

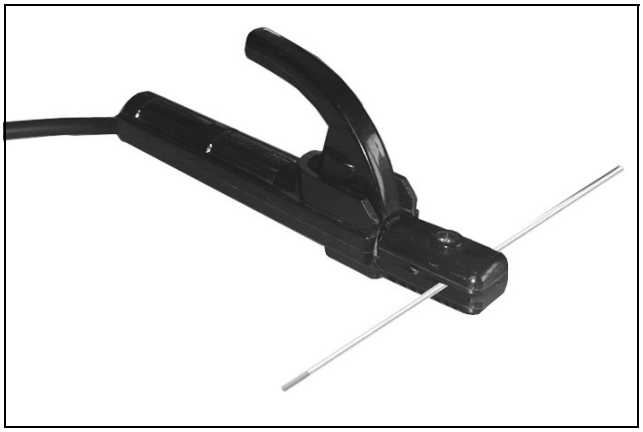


2. Connect the earth clamp to the positive terminal and the electrode holder to the negative as shown.
3. Switch on using the switch located on the rear panel.



4. Select the appropriate welding rod and insert it into the welding rod holder.

- It should be approximately the same thickness as the workpieces being welded.



The following sizes of rods can be used and are available from your CLARKE dealer.

ROD DIAMETER	WORKPIECE THICKNESS
1.6 mm wire	1.5 - 2.0 mm
2.5 mm wire	2.5 - 3.0 mm
3.2 mm wire	3.5 - 4.5 mm
4.0 mm wire	5.0 - 6.5 mm

5. Attach the earth clamp to the workpiece as close as possible to the area being welded. Clean the workpiece with a wire brush where necessary to ensure the connection is as clean as possible.

PREPARING THE WORKPIECE

The area being welded should be perfectly clean. Any coating, plating or corrosion must be removed, otherwise a good weld will be impossible to achieve.

CONTROL SETTINGS

Refer to page 12 for control panel functions.

1. Set the Welding Current Selector knob (4) according to the size of the weld being performed.
2. Confirm the electrode and cables are configured as shown on page 15.
3. Aim at the welding line and scratch the work piece to start the arc. The "working" indicator will be on.

With practice you will gain a feel for the correct current setting for different welding rod thicknesses.

THERMAL OVERLOAD

The 'Thermal Overload' shuts off the welder when it becomes too hot, due to the duty cycle being exceeded. This is to prevent any damage to the machine.

When this occurs, the warning lamp will light up. Allow the welder to cool until the amber light extinguishes before resuming work.

OPERATING THE WELDER (MMA)

WARNING: WHEN WELDING ALWAYS ENSURE THERE IS ADEQUATE VENTILATION IN THE WORK AREA DUE TO TOXIC FUMES.

WARNING: DO NOT STRIKE THE ELECTRODE ON THE WORKPIECE, AS THIS MAY DAMAGE THE ELECTRODE.

WARNING: WELDING ARCS PRODUCE HARMFUL UV/IR LIGHT WHICH CAN SERIOUSLY DAMAGE YOUR EYES. ALWAYS USE A WELDING FACE-SHIELD WITH A SUITABLE FILTER THAT CONFORMS TO CURRENT STANDARDS.

WARNING: PROTECT BYSTANDERS BY USING WELDING SCREENS.

The consumable electrode is connected to a high amperage low voltage supply which creates an electric arc between the electrode and the workpiece.

The most difficult aspect of the arc welding process, particularly for beginners, is that of striking an arc. We strongly recommend that you practice on some pieces of scrap metal to get the feel of the operation before you start an actual welding job.

1. Holding the welding mask close-up to your face, give a short stroke with the electrode on the workpiece. As soon as the arc is primed, withdraw the electrode from the workpiece to leave a gap. The current will flow across the gap with a crackling noise and a brilliant arc. Continue to weld in one direction, maintaining the small gap as you go.
2. As soon as the arc is struck, maintain a distance from the workpiece equal to the diameter of the electrode. Keep this distance as constant as possible for the duration of the weld. As you advance along the workpiece the angle of the electrode must be maintained at between 20º and 30º.

NOTE: When you prime the arc be sure to withdraw the electrode swiftly to leave the gap, otherwise the electrode will weld itself to the workpiece. If this occurs give the electrode a short sharp jerk to free it and, if necessary, prime the arc again. If you cannot free the electrode, switch the machine off immediately and free it. Take care the electrode will get red hot very quickly and will be capable of burning through welding gloves.

3. At the finish of the weld, bring the end of the electrode backward in order to fill the weld crater and then quickly lift the electrode from the weld pool to extinguish the arc.
4. Inspect the job carefully. Any slag forming on the surface should be chipped away with a chipping hammer or pick. ALWAYS wear your safety goggles when chipping away slag.

WELDING SETTINGS TABLES

L-SHAPED BUTT WELDING

Metal thickness (mm)	Electrode diameter (mm)	Welding current (A)	Welding voltage (V)
0.8		60-70	16-16.5
1.0		75-85	17-17.5
1.2		80-90	17-18
1.6		95-105	18-19
2.0		110-120	19-19.5
2.3		120-130	19.5-20
3.2		140-150	20-21
4.5		140-150	22-23
6.0		170-185	24-26
9.0		320-340	32-34

ANGLE JOINT (THIN PLATE)

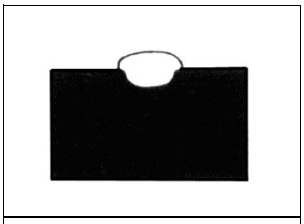
Metal thickness (mm)	Electrode diameter (mm)	Welding current (A)	Welding voltage (V)
1.6		65-75	16-17
2.3		80 - 100	19-20
3.2		130 - 150	20-22
4.5		150 - 180	21-23

FLAT FILLET WELDING LAP JOINT (THIN PLATE)

Metal thickness (mm)	Electrode diameter (mm)	Welding current (A)	Welding voltage (V)
0.2		60-70	16-17
1.2		80-90	18-19
1.6		90-100	19-20
2.3		100-130	100-130
		120-150	120-150

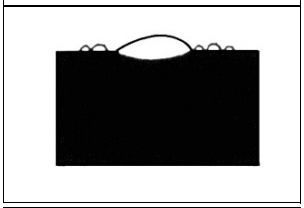
WELDING PITFALLS

The arc welding technique is an acquired skill and requires considerable practice before perfect results are obtained. The diagrams below will help to explain the pitfalls in your technique and how to overcome them.



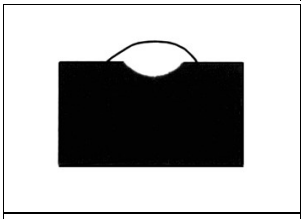
ARC TOO SHORT

This causes irregular masses of weld to be deposited, with slag contamination on an uneven surface.



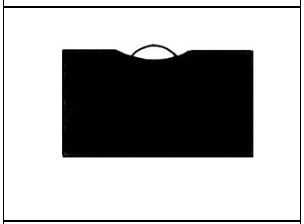
ARC TOO LONG

This causes poor penetration resulting in a weak weld with excessive spatter and porosity. Surface of the weld is rough and the arc makes a hissing sound



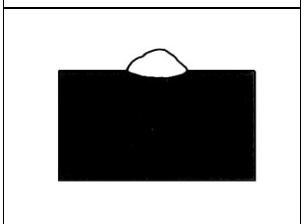
ELECTRODE MOVED TOO SLOWLY

This causes a very wide and heavy deposit which overlaps at the sides. It is wasteful both in terms of time and electrode use.



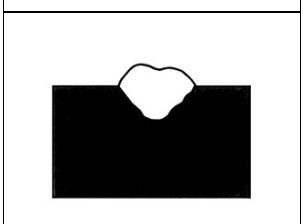
ELECTRODE MOVED TOO QUICKLY

This causes poor penetration with a 'stringy' and incomplete weld deposit. Slag is very hard to remove.



CURRENT TOO LOW

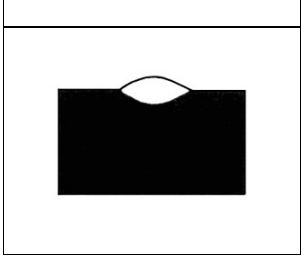
This causes poor penetration and causes the electrode to stick to the workpiece too readily. Also results in a very irregular and high weld deposit. Slag is very hard to remove.



CURRENT TOO HIGH

This causes excessive penetration with spatter and deep pointed crater. It may also cause holes to be burned in the workpiece.

Burns electrodes very quickly.



THE PERFECT WELD

With the correct combination of arc length, current regulation, inclination and speed of the electrode, you will, with practice, produce the perfect weld.

This should be regular with uniform ripples and no slag contamination. The arc will make a steady crackling sound.

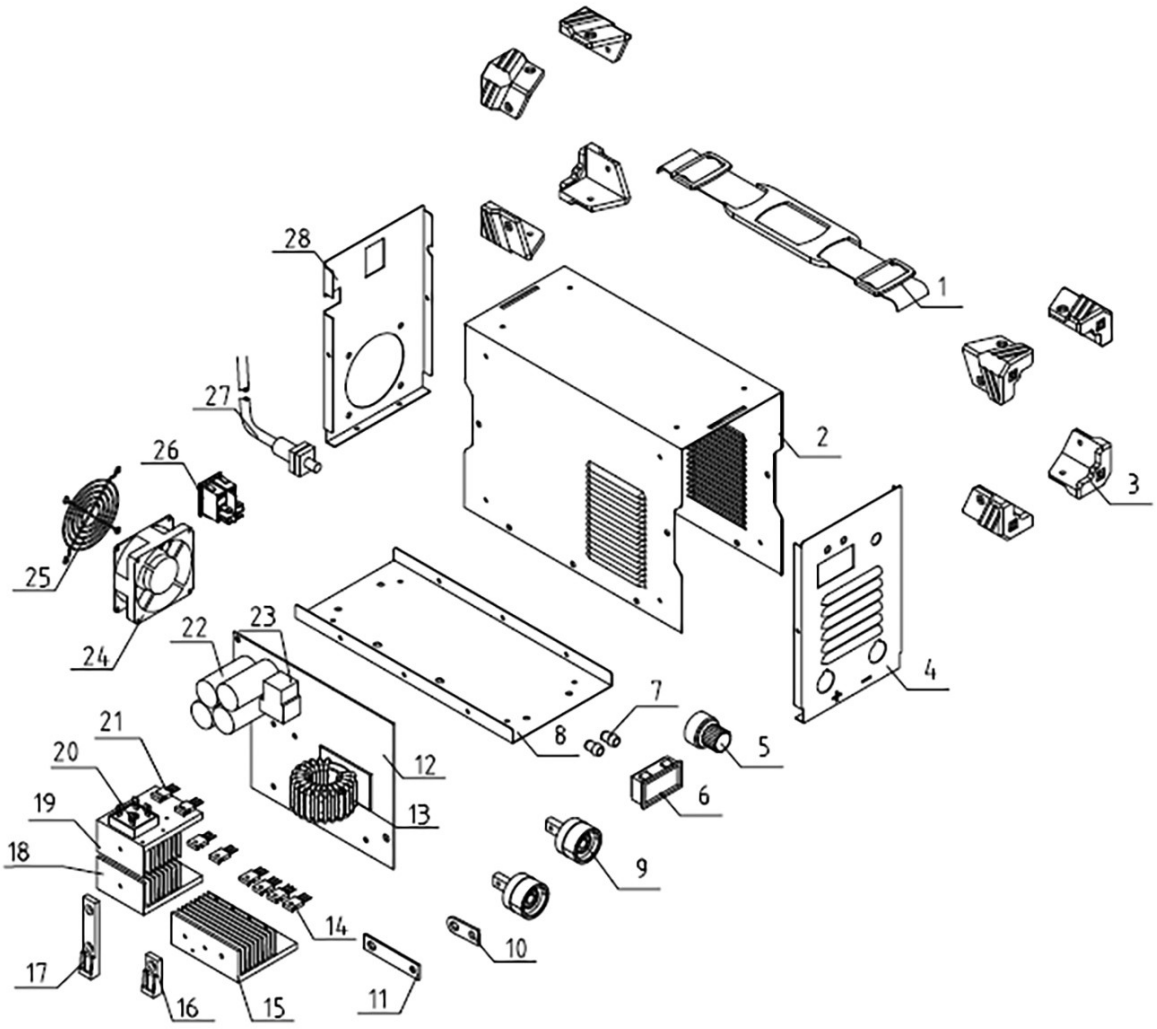
TROUBLESHOOTING

Your CLARKE Welder has been designed to give long and trouble free service. If however, having followed the instructions in this booklet carefully you still encounter problems, the following points should help identify and resolve them.

DEFECT	CAUSES	SUGGESTIONS
Spark will not start	Bad clamp connection. Inverter printed circuit is defective.	Check clamp connection. Contact your nearest CLARKE dealer.
No output voltage	Overheated machine (the amber LED should be on).	Wait for thermal cutout to be reset.
	Internal relay has failed.	Contact your nearest CLARKE dealer.
	Inverter printed circuit is defective.	Contact your nearest CLARKE dealer.
Wrong output current	Current selector control is defective.	Contact your nearest CLARKE dealer.
	Low power supply voltage.	Check the mains distribution system.
Porosity of welds	Acid electrode on steel with high sulphur content. Electrode oscillates too much. Workpieces are too far apart. Workpiece being welded is cold.	Use basic electrode. Move edges to be welded closer together. Move slowly at the beginning.
Cracks in weld	Material being welded is dirty (e.g.oil, paint, rust, oxides). Not enough current.	Clean workpiece before welding is an essential method of achieving neat weld beads. Also increase current output.
Limited penetration	Low current, high welding rate, reversed polarity. Electrode inclined in position opposite to it's movement.	Ensure operating parameters are regulated and improve preparation of work pieces.

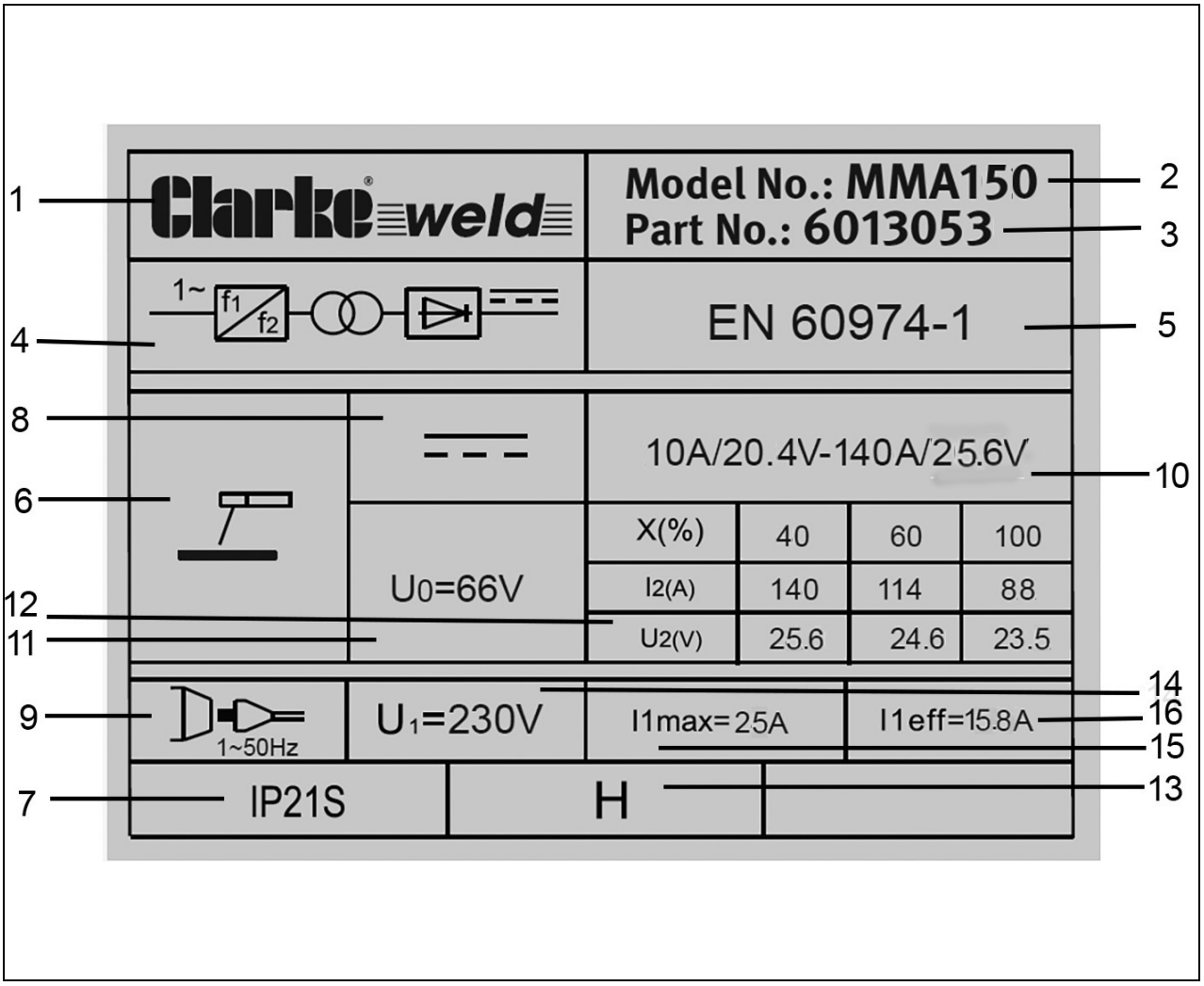
DEFECT	CAUSES	SUGGESTIONS
Profile defects	Welding parameters are incorrect. Pass rate is not related to operating parameter requirements. Electrode not inclined constantly while welding.	Follow basic and general welding principles.
High Sprays	Electrode is too inclined.	Make appropriate corrections.
Arc is unstable	Insufficient current.	Check condition of electrode and earth wire connection.
Electrode melts obliquely	Electrode is not centred. Magnetic blow phenomenon.	Replace electrode. Connect two earth wires to opposite sides of the work piece.
No response from welder.	Check fuses and power cable.	Replace fuses as necessary. If problem persists return welder to your local dealer.
		Check fuse size.
Poor quality welds.	Rusty, painted, damp, oil or greasy workpiece.	Ensure workpiece is clean and dry.
	Poor earth contact.	Check earth clamp/workpiece connection.
Welder cuts out whilst in use.	Duty cycle exceeded (auto cut-out operates).	Allow welder to cool 15-30 mins before continuing. Note: If duty cycle is continually exceeded, damage to the welder may result and welder output is probably too small for application.

COMPONENT PARTS



1	Lifting strap	11	Support bar	21	IGBT diode
2	Outer shell	12	Control board	22	Capacitor
3	Protective foot	13	Main board	23	Relay
4	Front panel	14	Transformer	24	Cooling fan
5	Potentiometer knob	15	IGBT diode	25	Fan guard
6	Digital display	16	Rectifier bridge radiator	26	Power switch
7	Indicator lamp	17	Plastic support	27	Power cable
8	Base frame	18	Quick recovery radiator	28	Rear panel
9	Euro quick socket	19	IGBT radiator		
10	Bracket	20	Fast recovery diode		

THE MACHINE RATING PLATE



1	Name/address of manufacturer	9	Energy Supply symbol
2	Model Number	10	Range of Output
3	Part number	11	Rated No-load Voltage
4	Welding Power Source	12	Conventional Load Voltage
5	Standards applied	13	Insulation grade
6	Welding Process symbols	14	Rated Supply Voltage
7	Degree of Ingress Protection	15	Rated Maximum Supply Current
8	Welding Current symbol	16	Max Effective Supply Current

This welder is covered by regulations EN 60974-1:2018+A1:2019 / EN 60974-10:2014+A1:2015, where the Duty Cycle is expressed as a percentage of time the machine may be used in a given period for a specified welding current. e.g. When welding at 140 Amps the machine may be used for 6 minutes (60%) in any10 minute period,

CONSUMABLES

The following are some of the accessories available from your CLARKE dealer. Please quote the part numbers shown below:

Item	Description	Part number
Welding Rods	1.6 x 300mm	3050590
	2.0 x 350mm	3050592
	2.5 x 350mm	3050594
	3.25 x 350mm	3050596
	4.0 x 400mm E6013	3050598
Welding Apron	610mm x 915mm	6000920
Gauntlets	Leather (EN407 rated)	8133492
Welding screen	WSC2 and replacement screen	6000945 6000910

A Gas Regulator, Arc Activated Headshields, Anti-spatter Spray are also available from your CLARKE dealer or our parts division.

ARC ACTIVATED HEADSHIELDS

These highly popular head-shields activate instantly when the arc is struck and allow you to have both hands free when welding.

Model	Arc Activated	Grinding function	Solar Powered	Fixed Shade	Flip Up	Part Number
GWH4	X	X	X			6000706
GWH5	X	X	X			6000707
GWH6	X	X	X			6000708
GWH7	X	X	X			6000709
GWH8	X	X	X			6000714
PG4	X	X	X			6000716
HS1				X	X	6000700
HSF1				X	X	6000705

CARE AND MAINTENANCE

WARNING: ELECTRICITY CAN KILL - NEVER TOUCH LIVE ELECTRICAL COMPONENTS.

WARNING: DISCONNECT THE POWER SUPPLY BEFORE ALL INSPECTIONS AND MAINTENANCE OPERATIONS. BEWARE HOT SURFACES.

The machine requires no maintenance other than the following guidelines. Cleaning is advisable if the unit is operating in a very dusty environment. Avoid getting particles of metal inside the machine since they could cause short circuits.

1. Keep the louvres clean to avoid a build up of dirt and oxides inside the machine which can reduce machine output.
2. Check all cables periodically for good condition and security.
3. Always inspect the earth cable and torch hose before use, to ensure they are in perfect condition and that the earth clamp is clean and secured correctly to the cable.
4. Check the hose for security and damage.

GUARANTEE

This CLARKE product is guaranteed against faulty manufacture for a period of 12 months from the date of purchase. Please keep your receipt as proof of purchase.

This guarantee is invalid if the product is found to have been abused or tampered with in any way, or not used for the purpose for which it was intended.

Faulty goods should be returned to their place of purchase, no product can be returned to us without prior permission.

This guarantee does not effect your statutory rights.

UK CA

Clarke® INTERNATIONAL

DECLARATION OF CONFORMITY

This is an important document and should be retained.

We hereby declare that this product(s) complies with the following legislation:		**The following standards have been applied to the product(s):**
2016/425	*Personal Protective Equipment (PPE) Regulation*	*EN IEC 60974-1:2022/A12:2023, IEC 62321-7-1:2015, IEC 62321-1:2013, IEC 62321-2:2013,*
2009/125/EC	*Ecodesign Directive*	*EN 60974-1:2018+A1:2019, EN IEC 60974 10:2021, IEC 62321-7-2:2017, IEC 62321-5:2013,*
2014/30/EU	*Electromagnetic Compatibility Directive*	*IEC 62321-4:2013/AMD1:2017, EN ISO 16321-1:2022, EN ISO 16321-2:2021, EN 175:1997,*
2014/35/EU	*Low Voltage Directive*	*EN 50525-2-81:2011, IEC 62321-3-1:2013, IEC 62321-6:2015, IEC 62321-8:2017,*
2011/65/EU	*Restriction of Hazardous Substances (RoHS) Directive*	*IEC 60974-13:2021, EN 60974-11:2010, EN 60974-12:2011*

The technical documentation required to demonstrate that the product(s) meet(s) the requirement(s) of the aforementioned legislation has been compiled and is available for inspection by the relevant enforcement authorities.

The UKCA mark was first applied in: 2025

Manufacturer:	Clarke International Ltd, Hemnall Street, Epping, Essex, CM16 4LG, United Kingdom	**Notified Body:**	DIN CERTCO Gesellschaft für Konformitätsbewertung mbH (ID Number: 0196), ECS GmbH (ID Number: 1883)
Product Description:	MMA Inverter Welder	**PPE Certificate Number:**	C3479XTW/R2, C4167XTW/R2, C3285.1LEYON
Model Number(s):	MMA150	**PPE Assessment Category:**	II
Serial/Batch Number:	Refer to product/packaging label	**PPE Assessment Module(s):**	B & C
Date of Issue:	22/01/2025	**Signed:**	**J.A Clarke** **Director**

CE

Clarke® INTERNATIONAL

DECLARATION OF CONFORMITY

This is an important document and should be retained.

We hereby declare that this product(s) complies with the following legislation:		**The following standards have been applied to the product(s):**
2016/425	*Personal Protective Equipment (PPE) Regulation*	*EN IEC 60974-1:2022/A12:2023, IEC 62321-7-1:2015, IEC 62321-1:2013, IEC 62321-2:2013,*
2009/125/EC	*Ecodesign Directive*	*EN 60974-1:2018+A1:2019, EN IEC 60974 10:2021, IEC 62321-7-2:2017, IEC 62321-5:2013,*
2014/30/EU	*Electromagnetic Compatibility Directive*	*IEC 62321-4:2013/AMD1:2017, EN ISO 16321-1:2022, EN ISO 16321-2:2021, EN 175:1997,*
2014/35/EU	*Low Voltage Directive*	*EN 50525-2-81:2011, IEC 62321-3-1:2013, IEC 62321-6:2015, IEC 62321-8:2017,*
2011/65/EU	*Restriction of Hazardous Substances (RoHS) Directive*	*IEC 60974-13:2021, EN 60974-11:2010, EN 60974-12:2011*

The technical documentation required to demonstrate that the product(s) meet(s) the requirement(s) of the aforementioned legislation has been compiled and is available for inspection by the relevant enforcement authorities.

The CE mark was first applied in: 2025

Manufacturer:	Clarke International Ltd, Fitzwilliam Hall, Fitzwilliam Place, Dublin 2, Republic of Ireland	**Notified Body:**	DIN CERTCO Gesellschaft für Konformitätsbewertung mbH (ID Number: 0196), ECS GmbH (ID Number: 1883)
Product Description:	MMA Inverter Welder	**PPE Certificate Number:**	C3479XTW/R2, C4167XTW/R2, C3285.1LEYON
Model Number(s):	MMA150	**PPE Assessment Category:**	II
Serial/Batch Number:	Refer to product/packaging label	**PPE Assessment Module(s):**	B & C
Date of Issue:	22/01/2025	**Signed:**	**J.A Clarke** **Director**

A SELECTION FROM THE VAST RANGE OF

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