

Clarke®



SPOTCAR ALU WELDER MODEL NO: SPOTCAR ALU

PART NO: 6030025

OPERATION & MAINTENANCE INSTRUCTIONS



GC0915

INTRODUCTION

Thank you for purchasing this CLARKE Stud 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 product giving you long and satisfactory service.

Ensure the welder and its components suffered no damage during transit and that all components are present. Should any loss or damage be apparent, please contact your CLARKE dealer immediately.

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.

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 WARNINGS



WARNING: WHEN USING ELECTRICAL TOOLS, BASIC SAFETY PRECAUTIONS SHOULD ALWAYS BE FOLLOWED TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK AND PERSONAL INJURY

WARNING: READ ALL THESE INSTRUCTIONS BEFORE ATTEMPTING TO OPERATE THIS PRODUCT AND KEEP THESE INSTRUCTIONS IN A SAFE PLACE.

ELECTRIC SHOCK

1. Remove the plug from the socket and wait 5 minutes to allow the capacitors to discharge before carrying out any servicing or maintenance on this welder.
2. Do not touch live electrical parts.
3. Never use electrode holders or cables which are damaged.
4. Keep the working environment, equipment, cables and clothing free from grease, oil, moisture and dirt.
5. Ensure the welding machine has been correctly earthed.
6. The operator must be insulated from the floor and work bench using a dry insulation mat.
7. Always ensure a second person is present in case of accident.
8. Keep welding cables away from power cables.
9. Regularly inspect the condition of the cables for signs of damage.
10. Remove the plug from the mains socket when not in use.
11. Ensure the earth connector is secured to bare metal adjacent to the weld, and when not in use insulated for safety. - Keep all equipment well maintained.
12. The operator must prevent any gas cylinders in the vicinity of the work piece from becoming part of the welding circuit.

FUMES & GASES

1. The welding process generates hazardous fumes as a by-product. Inhalation of these fumes is hazardous to health.
2. Keep your head away from the weld to avoid breathing the fumes.
3. If welding in confined spaces ensure adequate ventilation and use a fume extractor.
4. By-products of welding can react to create a toxic/explosive environment.

FIRE OR EXPLOSION

1. Welding can cause fire and explosions. Precautions should be taken to prevent these hazards.
2. Before starting work ensure the area is clear of flammable materials and move any combustible materials to a safe distance, especially substances likely to generate a dangerous vapours.
3. The welding arc can cause serious burns. Avoid contact with skin.
4. Sparks and molten metal may be ejected during welding. Take precautions to prevent fire.
5. Sparks and molten metal can pass through gaps. Be aware that fire can start out of sight.
6. Do not weld to pressurised containers, or containers containing flammable vapours e.g. fuel tanks.
7. Always have appropriate fire fighting equipment to hand suitable for use in electrical environments.
8. Avoid carrying any fuels with you e.g. cigarette lighters or matches.

PERSONAL PROTECTION

1. The body should be protected by suitable clothing.
2. The use of neck protection may be necessary against reflected radiation.
3. Arc machines generate a magnetic field which is detrimental to pacemakers. Consult your doctor before going near active welding equipment/operations.
4. The UV and IR radiation generated by welding is highly damaging to the eyes, causing burns. This can also affect the skin.
5. Always use suitable welding shields equipped with appropriate protection filters.
6. Where there are pedestrians and traffic ensure a protective screen is used to avoid accidental arc glare.
7. Do not weld in the vicinity of children or animals and ensure no one is looking before striking an arc.
8. Wear hearing protection if required.
9. Allow the weld to cool. Hot metal should never be handled without gloves.
10. Take care when adjusting or maintaining the electrode/holder, that it has had time to cool sufficiently and the welder is disconnected from the mains supply.

11. 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 burns.
12. Flammable hair sprays/gels should not be used by persons welding.

PROTECTIVE CLOTHING

1. Wear gauntlet type gloves designed for use when welding.
2. Wear an apron, and protective shoes.
3. Wear cuffless trousers (not turned up) to avoid catching sparks and slag.
4. Avoid wearing oily or greasy clothing.
5. Wear protective head and shoulder coverings if welding overhead.
6. Wear a 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.

NOTE: All protective wear inc. masks & head shields **MUST** comply with Personal Protective Equipment Directive 89/686/EEC.

ADDITIONAL SAFETY PRECAUTIONS FOR STUD WELDING

1. Always ensure that there is ample free air circulating around the outer casing of the machine, and that the louvres are unobstructed.
2. Always inspect the cable before use to ensure it is in good condition.
3. Always remove all flammable materials from the welding area.
4. Always keep a fire extinguisher handy;-Dry Powder, CO² or BCF, NOT Water.
5. Never remove the cover panels unless the machine is disconnected from the power supply, and never use the machine with the panels removed.
6. Never attempt any electrical or mechanical repair unless you are a qualified technician. If you have a problem with the machine contact your local CLARKE dealer.
7. Never use or store in a wet/damp environment.
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 hose to become wrapped around the operator or any person in the vicinity.
10. Never change electrodes with bare hands or damp gloves.
 - Please read these instructions carefully and retain for future reference.

ELECTRICAL CONNECTIONS



WARNING! READ THESE ELECTRICAL SAFETY INSTRUCTIONS THOROUGHLY BEFORE CONNECTING THE PRODUCT TO THE MAINS SUPPLY.


Connect the mains lead to a standard, 230 Volt (50Hz) electrical supply through an approved 13 amp BS1363 plug, or a suitably fused isolator switch.

If the plug has to be changed because it is not suitable for your socket or because of damage, it must be removed and a replacement fitted, following the wiring instructions shown below. The old plug must be discarded safely as insertion into a power socket could cause an electrical hazard.

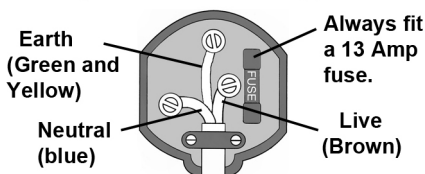


**WARNING: THE WIRES IN THE POWER CABLE OF THIS PRODUCT ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:
BLUE = NEUTRAL BROWN = LIVE YELLOW AND GREEN = EARTH.**

The wires in the mains lead should be wired up in accordance with the following colour code:

- Connect the GREEN & YELLOW coloured wire to the plug terminal marked with a letter E or  or coloured GREEN or GREEN & YELLOW.
- Connect the BROWN coloured wire to the plug terminal marked a letter "L" or coloured RED.
- Connect the BLUE coloured wire to the plug terminal marked a letter "N" or coloured BLACK.

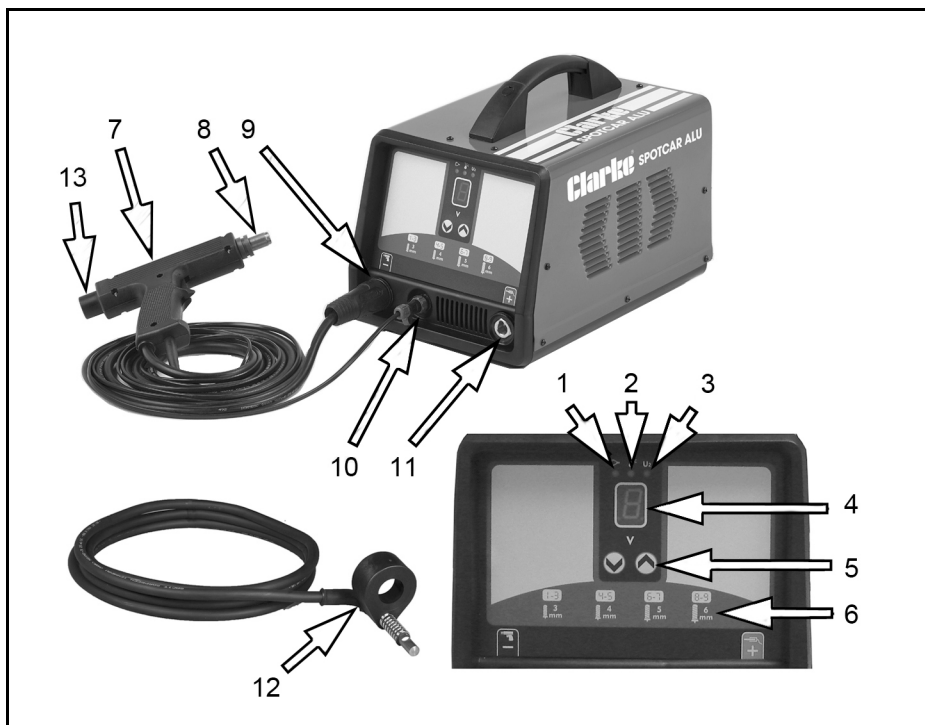
Plug must be BS1363/A approved



Ensure that the outer sheath of the cable is firmly held by the clamp

We strongly recommend that this machine is connected to the mains supply via a Residual Current Device (RCD). If you are not sure, consult a qualified electrician. DO NOT try to carry out any repairs yourself.

OVERVIEW



No	DESCRIPTION	No	DESCRIPTION
1	Power on LED	8	Collet/Electrode Assembly
2	Over-temperature LED	9	Welding Gun Cable Socket
3	Output Voltage LED	10	Weld Control Connector Socket
4	Power Level Display	11	Quick Ground Cable Socket
5	Power Level Selection Keys	12	Quick Ground Cable with Control Foot
6	Power/Stud Diameter Indicators	13	Adjusting Knob for Safety Pressure Switch
7	Welding Gun Assembly		

PRODUCT USE

The Spotcar Alu is a microprocessor controlled power source for capacitor discharge welding of studs from M3 to M6 sizes. Studs are welded to the bodywork and then pulled to facilitate easy removal of dents.

It is particularly suited to quick repairs on aluminium bodywork and with appropriate studs, and can also be used with mild or stainless steel. The Spotcar is equipped with a safety system that allows the discharge of the capacitor only when the stud is in contact with the work piece.

INVENTORY

The following components are supplied with the welding unit;

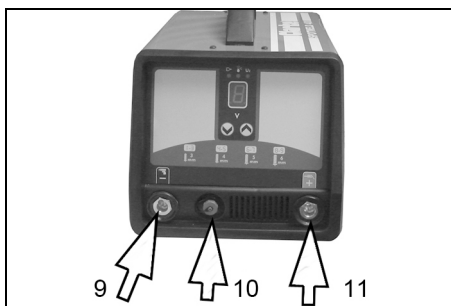
- Control Foot with quick earth cable and earth clamps
- Gun with power cable and control cable
- Stud Collet with electrode
- Hex key
- Accessory Kit (100 aluminium studs and eyelet pieces)

The accessories supplied include a stock of M4 studs and eyelets. Other stud sizes are available (see page 11) which can be used in the Spotcar Alu when operated at the power settings shown on page 10.

SETUP OF THE WELDER

CONNECTING THE CABLES

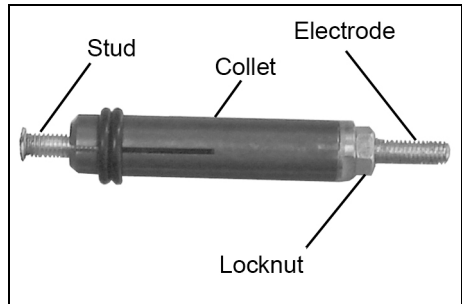
1. Connect the gun to the socket (9) on the welder.
2. Connect the plug of the weld control cable to the middle socket (10).
3. Connect the red earth connection from the Quick Ground Cable to the socket 11.



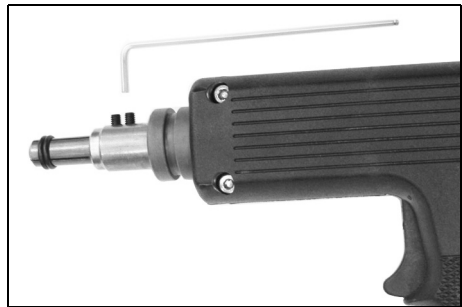
FITTING THE ELECTRODE

The electrode can be adjusted to suit the different lengths of stud available. To achieve good welding it is essential that the components make a good contact with no gap between the electrode and the stud.

1. Insert the stud into the collet.
2. Screw the electrode into the collet until it touches the stud and lock in position using the locknut.



3. Insert the collet into the head of the welding gun (electrode end first).
4. Use a hex key to secure the collet into the gun.



POSITIONING THE CONTROL FOOT

1. Fit the control foot over the end of the gun as shown.



STUD WELDING

The variables of stud welding are:

- The stud material (depending on the material to be welded).
- The discharge power (set by the welder program from 1 to 9).

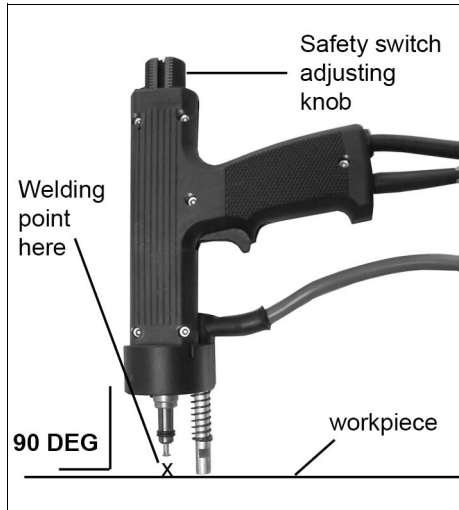
- The safety pressure switch on the gun (adjustable by operator experience using the adjusting knob).

Following the preparation above, proceed using the following steps;

1. Make sure the metal to be welded is free from oil and paint, and isolated from the vehicle electrical components.
2. Plug the welder in to the mains supply and switch on with the switch at the rear.
3. Select the correct power setting for the available studs using the up/down arrows on the front panel. (Refer to the table below).

POWER SETTING	1	2	3	4	5	6	7	8	9
Stud M3	Y	Y	Y						
Stud M4			Y	Y	Y				
Stud M5				Y	Y	Y	Y		
Stud M6					Y	Y	Y	Y	Y

4. Set the gun at 90 degrees to the workpiece with the stud above the desired welding point.
5. Apply pressure at 90 degrees to the workpiece until there is enough pressure to operate the safety pressure switch.
6. Squeeze the trigger on the gun to perform the weld.
 - Welding will be very brief with some sparking.
7. If the welder fails to perform as expected, twist the knob shown to adjust the safety pressure switch.
 - This switch is to prevent the electrical discharge until physical pressure is established between the stud and the workpiece.
8. After each weld, pull the gun vertically from the welded stud.
9. Insert the next stud into the collet ready for the next weld.
10. Always switch the welder off before removing the collet/electrode.



MAINTENANCE

CLEANING

1. Always turn off the unit and disconnect it from the power supply before cleaning.
2. Clean the outside surfaces of the unit with a duster or a soft, moist cloth. Do not use solvents which could damage the plastic components.

STORAGE

1. Turn off the unit and disconnect it from the power supply.
2. Remove and coil the earth cable and gun assembly/cables and store them carefully.
3. Cover the unit and store in a dry location.

DE-COMMISSIONING THE PRODUCT

Should the product become completely unserviceable and require disposal, it should be taken to a recycling centre for disposal according to the European WEEE Directive or according to local regulations.

ACCESSORIES

The following items are available from the Clarke spares department.

Electrode holders (collets) in M3, M4, M5 & M6 sizes

5pcs washer kits are available in M3, M4, M5 & M6 sizes.

Studs in the following sizes are also available in boxes of 100:

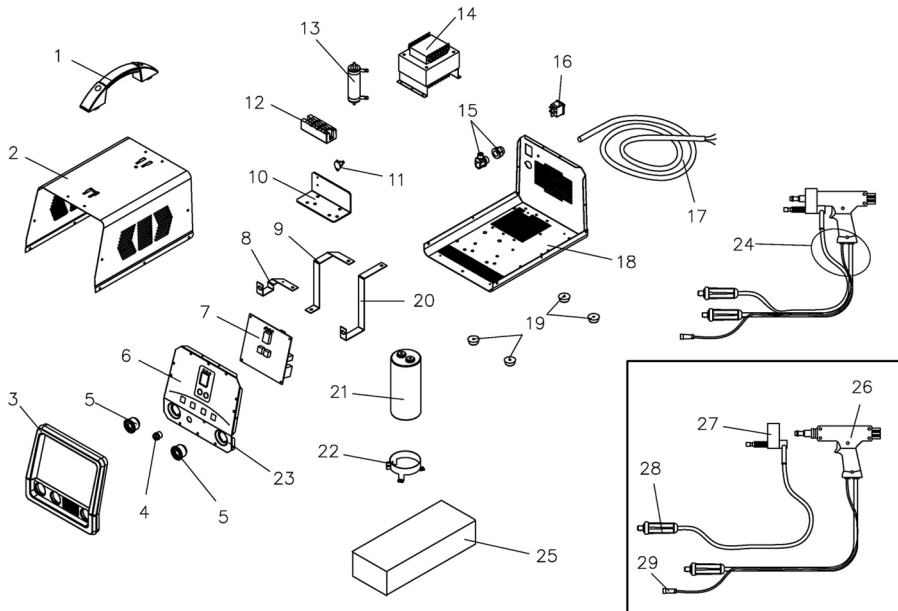
- ALMG3 - M3 x 12mm
- ALMG3 - M4 x 16mm
- ALMG3 - M5 x 20mm
- ALMG3 - M6 x 20mm
- ALSI12 - M3 x 12mm
- ALSI12 - M4 x 16mm
- ALSI12 - M5 x 20mm
- ALSI12 - M6 x 20mm

Accessories Box containing 100 x ALMG3 (M4), ALSI12 (M4) studs + washers

TROUBLESHOOTING

PROBLEM	CAUSE	REMEDY
The stud cannot be properly welded to the metal plate	Contact pressure switch pressure set too low.	Adjust the contact switch pressure. (See page 8)
	Dirty working surface.	Clean the surface.
	Power setting too low.	Increase the welding power setting.
	Gun is not at 90 deg to the workpiece.	Try the spot weld again with the gun at 90 deg to the workpiece.
Bad quality welds	Damaged electrode.	Unscrew the electrode from the collet and replace.
	Power setting too high.	Reduce the welding power.
	Bad contact at the control foot.	Check for proper contact.
	Dirty working surface.	Clean the work surface.
No welding	Cable not properly connected.	Check for correct contact between unit and cables.
	Overheating.	Check the control LEDs and wait for the machine to cool down.
	No current.	Check for proper connections.
	Mechanical failure/problem with the software.	Contact your Clarke dealer.

PARTS LIST/DIAGRAM

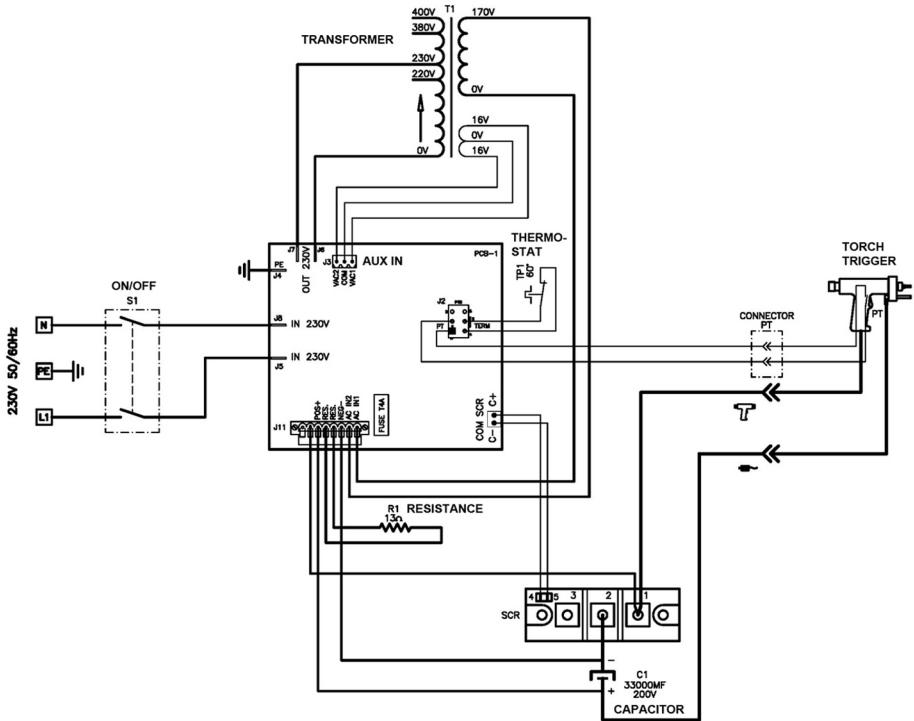


NO	DESCRIPTION	NO	DESCRIPTION
1	PLASTIC HANDLE	16	ROCKER SWITCH (FUSED)
2	COVER PANEL	17	POWER CABLE & PLUG
3	FRONT FRAME	18	LOWER PANEL
4	3-PIN FEMALE CONNECTOR	19	RUBBER FOOT
5	CONNECTOR 50MM	20	CAPACITOR SUPPORT BRACKET
6	PANEL LABEL	21	CAPACITOR
7	PRINTED CIRCUIT BOARD 230V	22	CAPACITOR HOLDER
8	ALU CONNECTION	23	FRONT PANEL
9	CAPACITOR BRACKET	24	GUN ASSEMBLY COMPLETE
10	HEAT SINK	25	ACCESSORIES KIT
11	THERMOSTAT 70/5MA	26	GUN WITH POWER/CONTROL LEADS
12	SCR MODULE	27	CONTROL FOOT
13	RESISTOR 13 OHM	28	GROUND CONNECTION PLUG
14	TRANSFORMER	29	3-PIN MALE CONNECTOR
15	CABLE CLAMP/GLAND		

TECHNICAL SPECIFICATIONS

Power Supply	220-230V/50Hz
Weight	11 kg
Dimensions (L x W x H)	310 x 295 x 175 mm
Power supply	230V/50Hz/1ph
Protection Level	IP22S
Capacitance	33000 uF
Max Energy	650 Joule
Range of stud sizes	3-6 mm

CIRCUIT DIAGRAM



DECLARATION OF CONFORMITY



Clarke[®]
INTERNATIONAL

Hemnal Street, Epping, Essex CM16 4LG

DECLARATION OF CONFORMITY

This is an important document and should be retained.

We hereby declare that this product(s) complies with the following directive(s):

2004/108/EC *Electromagnetic Compatibility Directive.*

2006/95/EC *Low Voltage Equipment Directive.*

2011/65/EU *Restriction of Hazardous substances.*

The following standards have been applied to the product(s):

EN 60974-1, EN 60974-6, EN 60974-10.

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

The CE mark was first applied in: 2015

Product Description:	Discharge Capacitor Welder .
Model number(s):	Spotcar Alu
Serial / batch Number:	N/A
Date of Issue:	01/08/2015

Signed:

J.A. Clarke
Director

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