

Clantrke® weld



Shown with wheel kit fitted

200AMP WELDER GENERATOR

Model No: WH215

Part No: 8130535

USER INSTRUCTIONS



0706



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Waste electrical products should not be disposed of with household waste. Please dispose of at your local recycling facility.

Please Note that details and specifications herein, are correct of time of going to print.
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Thank you for purchasing this CLARKE Welder Generator, designed to provide single phase electrical power for power or arc welding. No other appliance other than those indicated should be used with this machine.

Please read through this instruction leaflet, and the instruction manuals for the engine and alternator thoroughly before operating the machine, in doing so you will ensure the safety of yourself and that of others around you, this will also ensure that the welder generator will give you long and satisfactory service.

It is important that all accompanying instructions are observed. Clarke International does not accept responsibility for any injury or damage caused through improper use.

Please keep these instructions in a safe place for future reference as they are to be considered an integral part of the machine and must be produced in the event of sale.

CLARKE 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.

ELECTROMAGNETIC INTERFERENCE (EMC)

Whilst this unit complies with EMC regulations, the user is responsible for installing and using the welding equipment according to the manufacturers instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the user of the welding equipment to resolve the situation. In some cases this remedial action may be as simple as earthing the welding circuit, see 'Note'. In other cases it could involve constructing an electromagnetic screen enclosing the power source and the work complete with associated input filters. In all cases electromagnetic disturbances must be reduced to the point where they are no longer troublesome.

Note - The welding circuit may or may not be earthed for safety reasons. Changing the earthing arrangements should only be authorised by a person who is competent to assess whether the changes will increase the risk of injury, e.g. by allowing parallel welding current return paths which may damage the earth circuits of other equipment.

1. ASSESSMENT OF AREA

Before installing welding equipment the user shall make an assessment of potential electromagnetic problems in the surrounding area. Avoid using your inverter in the vicinity of:

- a) other supply cables, control cables, signalling and telephone cables; above, below and adjacent to the welding equipment;
- b) radio and television transmitters and receivers;
- c) computer and other control equipment;
- d) safety critical equipment, e.g. guarding of industrial equipment;
- e) pacemakers and hearing aids etc;
- f) equipment used for calibration or measurement;
- g) other equipment in the environment. The user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures;

It may be possible to avoid the above by changing the time of day that welding or other activities are to be carried out.

The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

2. METHODS OF REDUCING EMISSIONS

2.1 Mains supply

Welding equipment should be connected to the mains supply according to the manufacturers recommendations. If interference occurs, it may be necessary to

take additional precautions such as filtering of the mains supply. 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.

2.2 Maintenance of the welding equipment

The welding equipment should be routinely maintained according to the manufacturers recommendations. All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustments covered in the manufacturers

instructions. In particular, the spark gaps of arc striking and stabilizing devices should be adjusted and maintained according to the manufacturers recommendations.

2.3 Welding cables

The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

2.4 Equipotential bonding

Bonding of all metallic components in the welding installation and adjacent to it should be considered. However, metallic components bonded to the work piece will increase the risk that the operator could receive a shock by touching these metallic components and the electrodes at the same time. The operator should be insulated from all such bonded metallic components.

2.5 Earthing of the workpiece

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of its size and position, e.g. ships hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances.

Care should be taken to prevent the earthing of the workpiece increasing the risk of injury to users, or damage to other electrical equipment.

Where necessary, the connection of the workpiece to earth should be made by a direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

2.6 Screening and shielding

Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding installation may be considered for special applications.

SAFETY PRECAUTIONS

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

1. GENERAL PRECAUTIONS

A) Burn prevention

Wear protective clothing - gauntlet gloves designed for use in welding, hat, 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 cover glass). This is a MUST for welding or cutting, (and chipping) to protect the eyes from radiant energy and flying metal. Replace cover glass when broken, pitted, or spattered. Avoid oily greasy clothing. A spark may ignite them. Hot metal such as electrode stubs and workpieces should never be handled without gloves. First aid facilities and a qualified first aid person should be available for each shift unless medical facilities are close by for immediate treatment of flash burns of the eyes and skin burns. Ear plugs should be worn when working overhead or in a confined space. A hard hat should be worn when others work overhead. Flammable hair preparations should not be used by persons intending to weld or cut.

B) 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 while it is being 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 products. The ultraviolet (radiant) energy of the arc can also decompose trichloroethylene and perchloroethylene vapours to form phosgene. DO NOT WELD or cut where solvent vapours can be drawn into the welding or cutting atmosphere or where the radiant energy can penetrate to atmospheres containing even minute amounts of trichloroethylene or perchloroethylene.

C) Fire and explosion prevention

Causes of fire and explosion are:

- 1) combustibles reached by the arc, flame, flying sparks, hot slag or heated material;
- 2) misuse of compressed gases and cylinders;
- 3) 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. Sparks and slag can fly 10m.

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 area, do NOT weld or cut. Move the work if practicable, to an area free of combustibles.

Avoid paint spray rooms, dip tanks, storage areas, ventilators. If the work cannot be moved, move combustibles at least 10m. away out of reach of sparks and heat; or protect against ignition with suitable and snug fitting, fire- resistant covers or shields.

Walls touching combustibles on opposite sides should not be welded on (or cut).

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:

- a) appreciable combustibles (including building construction) are within 10m.
- b) appreciable combustibles are further than 10m but can be ignited by sparks.
- c) openings (concealed or visible) in floors or walls within 10m can expose combustibles to sparks.
- d) combustibles adjacent to walls, ceilings, roofs or metal partitions can be ignited by radiant or conducted heat.

After work is done, 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 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 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 or cutting - they can explode.

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

2. ELECTRIC ARC WELDING

Comply with precautions in 1 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, weldments are hot. The wise operator avoids unnecessary risks and protects himself and others from accidents.

2A) BURN PROTECTION

Comply with precautions in 2. The welding arc is intense and visibly bright. Its 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.

DON'T GET BURNED! COMPLY WITH PRECAUTIONS!

1) Protective clothing

Wear long sleeved clothing (particularly for gas shielded arc) in addition to gloves, hat and shoes (2A). 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 collar to protect chest and neck and button pockets to prevent entry of sparks.

2) Eye and head protection

Protect eyes from exposure to arc. NEVER look at an electric arc without protection. Welding helmet or shield containing a filter plate shade no. 12 or denser must be used when welding. 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 a 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.

3) Protection of nearby personnel

For production welding, a separate 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.

2B) TOXIC FUME PREVENTION

Comply with precautions in 2-B. Engine exhaust must be vented to the outside air. ***Carbon monoxide can kill.***

2C) FIRE AND EXPLOSION PREVENTION

Comply with precautions in 2-C. Equipment's rated capacity. 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.

2D) 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, LEAN ON, OR TOUCH** a wet surface when welding, without suitable protection.

2E) PROTECTION FOR WEARERS OF ELECTRONIC LIFE SUPPORT DEVICES (PACEMAKERS)

Magnetic fields from high currents can affect pacemaker operation. Persons wearing electronic life support equipment (pacemaker) should consult with their doctor before going near arc welding, gouging, or spot welding operations.

2F) TO PROTECT AGAINST SHOCK:

Keep body and clothing dry. Never work in damp area without adequate insulation against electrical 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.

1) Earthing the equipment

When arc welding equipment is earthed according to the National Electrical Code, and the work 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.

2) Electrode holders

Fully insulated electrode holders should be used. Do NOT use holders with protruding screws or with any form of damage.

3) Connectors

Fully insulated lock-type connectors should be used to join welding cable.

4) 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.

5) Terminals and other exposed parts

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

6) Electrode

a) Equipment with output on/off control (contactor)

Welding power sources for use with the gas metal arc welding, gas tungsten arc welding and similar processes normally are equipped with devices that permit on/off control of the welding power output. When so equipped the electrode wire becomes electrically LIVE when the power source switch is ON and welding gun switch is closed. Never touch the electrode wire or any conducting object in contact with the electrode circuit unless the welding power source is off.

b) Equipment without output on/off control (no contactor)

Welding power sources used with shielded metal arc welding and similar processes may not be equipped with welding power output on/off control devices. With such equipment the electrode is electrically LIVE when the power switch is turned ON. Never touch the electrode unless the welding power source is off.

7) 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. Power disconnect switch must be available near the welding power source.

FIRE PREVENTION

- **ALWAYS** switch the engine OFF when refuelling.
- **ALWAYS** refuel away from any source of heat.
- **ALWAYS** refuel in a well ventilated area.
- **NEVER** overfill fill the tank, fill to the level specified.
- **NEVER** smoke whilst refuelling and avoid smoking or using a naked flame near the machine.
- **NEVER** start the engine if there is a fuel spill. Any spillage must be wiped clean and the machine allowed to dry before attempting to start the engine.

PREVENTION OF ELECTRIC SHOCK

- **ALWAYS** store the machine undercover when not in use and away from damp or wet conditions.
- **NEVER** use the machine when it is raining or snowing or in wet or damp conditions.
- **NEVER** operate the machine with wet hands.
- **NEVER** use water or any other liquids to clean the unit.

POSITIONING THE MACHINE FOR USE

- **ALWAYS** leave at least a 1 metre gap between the machine and any surrounding building or structure.
- **ALWAYS** ensure the machine is on a solid, flat surface.
- **ALWAYS** ensure the surrounding area is free from any material that could burn or be damaged by heat.
- **NEVER** move or tilt the machine whilst it is switched on.
- **NEVER** cover or enclose the machine whilst it is in use.
- Be aware of the weight of the machine, do not attempt to lift or move the machine without the assistance of other personnel or suitable lifting equipment.

EXHAUST GAS PRECAUTIONS

WARNING!: EXHAUST FUMES CAN BE FATAL.

- **ALWAYS** ensure that there is adequate ventilation when using the machine.
- **ALWAYS** position the machine so that the exhaust is pointing away from people or animals.
- If the machine is to be used indoors, the exhaust **MUST** be piped to atmosphere

PREPARATION OF THE WORKING AREA

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 annoyance to the operator.

Avoid welding by contact with humid parts nearby combustible liquids. Least of all, do not weld upon tanks which may contain inflammable residuals.

SAFETY EQUIPMENT

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

ADDITIONAL SAFETY PRECAUTIONS FOR ARC WELDERS

- X NEVER** attempt to remove any of the panels unless the machine is disconnected from the supply.
- X NEVER** use the machine with any of the panels removed.
- X 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.
- X NEVER** use or store in a wet/damp environment. DO NOT EXPOSE TO RAIN.
- X NEVER** allow children or animals in the vicinity of a welding operation.

- ✓ ALWAYS** remove all flammable materials from the welding area.
- ✓ ALWAYS** ensure that there is full free air circulating around the outer casing of the machine, and that the louvres are unobstructed.
- ✓** Welding arc can seriously damage your eyes. Both the operator and any spectators should **ALWAYS** use a proper welding face shield or helmet, with suitable filter lenses. Proper gloves and working clothes should be worn at all times.
- ✓ ALWAYS** wear a pair of safety spectacles/goggles when chipping away slag after welding,. Remember, ordinary eye glasses are not safety gasses.
- ✓ ALWAYS** ensure there is adequate ventilation or extraction in the work area as the welding process gives off toxic fumes.
- ✓ ALWAYS** ensure there is a fire extinguisher on hand.
- ✓ ALWAYS** ensure that a medical supply is on hand, and that treatment for burns is provided.

PREPARATION FOR USE

Fuelling:

Fill with fuel, according to the instructions within the engine manual.

NOTE: Always use a fuel funnel to fill the tank so as to avoid accidental spillage of fuel. If fuel is spilled it must be removed from the unit and the surrounding area, BEFORE attempting to start the engine.

⚠ WARNING: ⚠

- Observe all safety precautions when handling fuel. Always refuel in a well ventilated area away from any heat sources.
- Ensure there is adequate fuel in the tank when using the machine. Running out of fuel or stopping the engine suddenly with a load connected could cause serious damage.
- Allow the unit to cool down before refuelling.
- Be aware that fuel and lubricants are potentially carcinogenic, direct skin contact should be avoided, wear suitable rubber gloves.

EXTENSION CABLES

All extension cables, from the generator set to the appliance, must be carefully selected, fitted and maintained. Cables in accordance with IEC 245-4 should be used.

Cables should be inspected regularly, and should be replaced, not repaired in the event of a defect.

The length and cross section of conductors should be selected according to the job to be done. The table below is an indication of the sizes that should be used.

Conductor (mm ²)	Max. Length (M)	Current (Amps)	Single Phase (kW)
1.5	25	10	2.3
2.5	40	16	3.7
4.0	60	28	6.5

IMPORTANT! Ensure the cable is fully unwound when in use to avoid overheating, and the placing of extra load on the generator.

OPERATION - GENERATOR

IMPORTANT! Ensure all precautions are taken, referring to this and the engine manual, before proceeding.

1. Start the engine. (refer to engine manual) and allow to run for a few minutes at full speed in order for it to warm up.

IMPORTANT! Ensure no appliances are connected to the generator when starting the engine.

2. Check the condition of the appliance, including the supply cable and the extension cable if used, and ensure it is switched OFF. Ensure also that the operating voltage is the same as the output from the generator.
3. Ensure the voltage selector switch, shown at 'C' Fig.2 is set to the deliver the appropriate output - 115V or 230V.



Fig.1

4. Turn the Gen/Weld knob - 'A' Fig.1, to **GEN**.
5. Turn the Welding Current knob - 'B' Fig.1, to **GEN 230V**
6. With the engine running smoothly, connect the appliance to the appropriate receptacle: **BLUE - 230V, YELLOW - 115V.**
5. Switch ON the appliance.



Fig.2

NOTE: If the AC circuit is overloaded the circuit protection switch will trip. To reset the circuit, first disconnect the appliance, and rectify the cause of the overload. Wait a short period and then press the appropriate reset button, shown at 'A' and 'B', Fig.2.

BE AWARE!

Some appliances draw more current on start-up than their normal running current, i.e. electric motors, and compressors. If in any doubt as to whether an appliance is compatible or not, please consult your CLARKE dealer.

Additionally, please refer to the specifications, to ensure the machine is used under the correct operating conditions.

OPERATION - WELDING

The welding capabilities of your welder are given on the data label printed on the rear panel of the machine, and reproduced on page 16 . An explanation of markings and symbols appearing on the data label is shown on page 21.

Thermal Overload Protection

If the duty cycle of the welder is exceeded (see Specifications), the **Overload Protection Device** will automatically cut the power to prevent damage to the machine. Should the cut-out operate, you will have to wait until the transformer cools down (approx. 30 minutes), when the overload device will automatically reset itself.

Although no harm will be done to the machine if/when the overload device is actuated, its frequent use could eventually result in damage.

Preparation for Welding

1. Set the GEN/WELD knob - 'A', Fig.1 to WELD
2. Set the Welding Current knob - 'B', Fig.1, to the appropriate welding current, noting that TWO ranges are provided - HIGH and LOW.

High range is indicated in RED, Low range in BLACK

3. Connect the welding lead to the appropriate DIN socket:
135Amp - LOW range
200Amp - HIGH range.

4. Connect the earth lead to the COM DIN socket.
Ensure the earth lead is connected to the work piece.

IMPORTANT: Ensure also that the earth clamp is attached to clean, solid metal. If necessary thoroughly clean with a wire brush or similar to guarantee a good connection.

5. Select the appropriate electrode, which should be approximately the same thickness as the piece to be welded, for single pass welding.

NOTE: With practice you will get a feel for the best current settings for different welding rod thicknesses.

The chart below is an indicator of the thickness of material/welding rod thickness and the corresponding welding current. This is intended as a guide only.

SIZE OF WELDING ROD THICKNESS OF METAL			CURRENT SETTING
1/16	16 swg	1.5 mm	40-55
	14 swg	2.0 mm	60-75
	12 swg	2.5 mm	75-105
1/8	10 swg	3.25mm	105-135
		4.0 mm	135-200

SHUTTING DOWN THE MACHINE

IMPORTANT! Never switch OFF the engine whilst an electrical appliance is connected.

1. Switch OFF the electrical appliance.
2. Unplug the appliance from the generator.
3. Switch the engine OFF (refer to engine manual).
4. Turn the fuel OFF (refer to engine manual).

DUTY CYCLES

This model is covered by regulations EN 60974-1 and EN 50199, where the Duty Cycle (X) is expressed as a percentage of time the machine may be used in a given period for a specified welding current.

IDENTIFICATION		Clarkeweld			
Clarke International, Hemnall Street, Epping, Essex CM16 4LG, England					
Model No. WH215	Part No. 8130535	Serial No.			
		EN60974-1:1998			
WELDING OUTPUT					
	$U_0 \dots 58V$	X	35%	60%	100%
		I_2	200A	170A	120A
		U_2	30V	26V	22V
ENERGY INPUT					
		3,000rpm	3,050rpm	12Hp	
AUXILIARY POWER OUTPUT					
1AC \sim /50Hz	230V	23A			
	115V	35A			

i.e. using the example above:

When welding at 170 Amps the machine may be used for 6 minutes (60%) in any 10 minute period, or, the machine may be used continuously, (100%) when welding at 120 Amps.

MAINTENANCE

- Check all cables periodically; they must be in good condition and not cracked.
- Always ensure the generators air vents are completely clear. Brush away any dust which may have accumulated.
- The engine requires periodic servicing. Please refer to the engine manual for details.
- If the machine is not going to be used for some time, the engine must be adequately prepared. Please refer to the engine manual for details.

IMPORTANT - ALWAYS switch the engine OFF before servicing or cleaning.

ELECTRICAL TROUBLE SHOOTING

PROBLEM: No AC Output.	
CAUSE:	TROUBLE SHOOTING:
Selector switch in wrong position.	Set selector switch.
Tripped circuit breaker.	Reset AC safety trip.
Poor connection or faulty lead.	Check connection and/or replace lead.
Broken AC connector.	Contact CLARKE servicing.
Faulty circuit breaker.	Contact CLARKE servicing.
PROBLEM: Erratic Supply.	
CAUSE:	TROUBLE SHOOTING:
Incorrect engine RPM.	Set engine RPM - Consult your CLARKE dealer.
Internal alternator problem.	Contact CLARKE servicing.

ENGINE TROUBLE SHOOTING

Consult the engine manual.

WELDING TECHNIQUE

1. With the welder correctly connected to the mains supply and the leads attached to the machine, ensure the earth clamp is firmly attached to the workpiece on CLEAN, SOLID metal, and as close to the proposed weld as is practical, and the appropriate current setting for the job has been set.
2. Start the engine

NOTE:

If the machine stops at any time and the amber light on the front panel illuminates, the thermal cutout has intervened. Wait until the transformer has cooled sufficiently for work to recommence. This could take considerable time and is denoted by the amber light going OUT.

3. Bring the electrode to the work surface at an angle of approx. 70° then, **BEFORE** you strike an arc, bring the face shield up to protect your eyes.
Strike an arc by briefly touching the work surface with the tip of the electrode. Once the arc is struck or primed, raise the electrode slightly and maintain it at a distance of approx 1.5mm (1/16") from the work surface, then proceed to move the electrode along its intended path, keeping the tip in the molten pool at all times. An even crackling noise should be heard, which is an indication of a good weld.

NOTE:

This is the most difficult aspect for most beginners. It is recommended that you practice on some scrap material in order to get a feel of the operation.

If the electrode is not withdrawn quickly enough once the arc is primed, there is a possibility that the electrode will weld itself to the workpiece. Should this happen, give it a sharp tug to free it, and try again. If this fails to free it, turn OFF the machine immediately as it will quickly overheat.

If you withdraw the electrode too far once the arc is primed, you will lose the arc and have to try again.

4. Inspect the job carefully. With a correct combination of electrode size and current setting the area of weld should be complete fusion of the electrode and parent metal/s. Any slag which forms on the surface should be chipped away with a pick/brush.

If the resultant weld looks messy and irregular, this is an indication of porosity or slag contamination, and you have almost certainly failed to achieve the correct combination. This is a common problem, so do not worry as practice will quickly cure this.

The following tips should help you improve your welding technique fairly quickly.

WARNING

When welding ALWAYS ensure there is adequate ventilation in the work area as the welding process give off toxic fumes

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.

1. Arc too short

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



2. 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



3. 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.



4. Electrode moved too quickly

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



5. 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.



6. 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.



7. 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, even crackling sound.



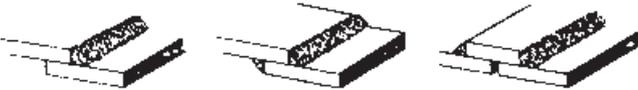
TYPES OF JOINTS



BUTT JOINT SINGLE V-JOINT DOUBLE V-JOINT



SINGLE BEVEL JOINT DOUBLE BEVEL JOINT CORNER JOINT



SINGLE FILLET LAP JOINT DOUBLE FILLET LAP JOINT SINGLE STRAP JOINT



DOUBLE STRAP JOINT SINGLE FILLET T-JOINT DOUBLE FILLET T-JOINT



CLOSED JOINT OPEN JOINT VEE JOINT

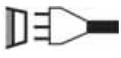


FEATHER EDGE 3 mm. OR MORE SHOULDER EDGE 6 mm. OR MORE DOUBLE VEE JOINT

ELECTRICAL SYMBOLS EXPLAINED

The full technical specification for your welder is to be found printed in a table on the rear panel of the machine.

The meaning of the markings and symbols shown in the table are explained as follows.

	Symbol for dropping characteristic
	Symbol for manual arc welding and covered electrodes
	Symbol for the mains supply and No. of phases
X	Duty Cycle, expressed as a % in a 10 min period
1~ 	Single Phase Transformer
$U_{0_} \text{---} U_{1_} \text{---} \text{V}$	Min. and Max. rated no load voltage
50Hz	Rated frequency for alternating current
$I_2 \text{---} \text{---} \text{A}$	Min. and Max. rated value of the welding current
$\varnothing \text{mm}$	Symbol and dimension for the diameter of reference electrodes
$I_2 \text{A}$	Symbol and dimension for the welding current
n_c	Symbol for the number of reference electrodes capable of being melted with the welding power source, starting from the cold state without operation of the thermal cut-out
n_h	Symbol for the No. reference electrodes being melted with the welding power source at the hot state , without operation of the thermal cut-out.
E/h	No. Electrodes that can be burned per hour from the cold state
$U_{1_} \text{---} \text{---} \text{V}$	Rated value of the supply voltage
 $\text{---} \text{---} \text{A}$	Size of the necessary main fuse
$I_1 \text{ max_} \text{---} \text{---} \text{A}$	Symbol, rated value and dimension of the max. supply current
IP_ _	Degree of protection (e.g. IP21)
H	Code letter for degree of insulation

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This is an important document, and should be retained.



DECLARATION OF CONFORMITY

We declare that this product complies to the following standards/directives:

- 98/37/EEC
- 89/336/EEC
- 93/68/EEC
- 2000/14/EC
- 73/23/EEC

Measured Sound Power Level: 97dB_{LWA}

Guaranteed Sound Power Level: 97dB_{LWA}

Product Description: WELDER/GENERATOR

Model No: WH215

Serial No: _____

Signed  _____
L.E. FERGUSSON
Engineering Manager

Clarke[®] INTERNATIONAL
Hemnal Street, Epping, Essex CM16 4LG

Clarke International is a trading style of Clarke International Limited

TECHNICAL SPECIFICATION

Description:

Model: WH215
 Part No: 8130535

General Specifications:

Output: (min/max) 60 - 200 amps
 Open Circuit Voltage: 45 - 48V
 I.P. Rating: 23

Electrodes:

Diameters: 4 mm (max)
 Material Type: ARC

Output Cable Assembly:

Length: 6m
 Cross Sectional Area: 25 mm²
 Plug Type: DIN Small
 Welding Gun Type: 400A (screw type)

Engine Specifications: (refer to engine manual for complete specifications)

Type: Petrol
 Make: Honda
 Model: GX390
 Capacity: 389 cc/cm³
 Oil Capacity: 1.1 Litres
 Lubrication Grade: 10W 30
 Air Filter Type: Dry
 Starting System: Pull
 Engine Power: 13HP
 Fuel Tank Capacity: 6.5 Litres
 Spark Plug Type: BPR 6ES
 Fuel Type: UNLEADED
 Fuel Consumption: 313 g/KwH
 Fuel Consumption: (@75% Power) 2.15 Litres/Hour
 Cooling System: Air
 Choke Type: Manual

Auxiliary Generator: (refer to alternator manual for complete specifications)

Rated Output Power: 6.5kVA @ 230V (5.2kW) / 4kVA @ 115V (3.2kW)
 Rated Output: 23amps @ 230V / 35amps @ 115V
 Operating Voltages: 230/115V - 1ph
 Run Time @ Rated Load: (max) 2 hours
 Earthing Type: Floating
 Operating Temperature: -20°C ~ 40°C
 Number of Sockets: 2 x 16amps @ 230V / 2 x 16amps @ 115V

Noise Emissions:

Noise @ 7m: 72dB(A)
 Sound Power Measured: 97dB(LWA)
 Sound Power Guaranteed: 97dB(LWA)

Dimensions/Weights:

Product:(LxWxH) 945 x 690 x 685mm
 Weight: 88Kg