

A SELECTION FROM THE VAST RANGE OF

ClarkeTM

QUALITY PRODUCTS



AIR COMPRESSORS
From DIY to industrial. Plus air tools, spray guns and accessories.

GENERATORS
Prime duty or emergency standby for business, home and leisure.

POWER WASHERS
Hot and cold, electric and engine driven - we have what you need.

WELDERS
Mig, Arc, Tig and Spot. From DIY to auto/industrial.

METALWORKING
Drills, grinders and saws for DIY and professional use.

WOODWORKING
Saws, sanders, lathes, mortisers and dust extraction.

HYDRAULICS
Cranes, body repair kits, transmission jacks for all types of workshop use.

WATER PUMPS
Submersible, electric and engine driven for DIY, agriculture and industry.

POWER TOOLS
Angle grinders, cordless drill sets, saws and sanders.

STARTER/CHARGERS
All sizes for car & commercial use.



ClarkeTM

Weld



MIG WELDERS

MIG 110E - MIG 135TE - MIG 151TE
MIG 110EN - MIG 130EN - MIG 160EN

0501

ClarkeTM INTERNATIONAL

For spare parts and servicing, please contact your nearest dealer, or Clarke International on

020 - 8988 - 7400

e-mail: Parts@clarkeinternational.com e-mail: Service@clarkeinternational.com

OPERATING & MAINTENANCE INSTRUCTIONS



CONTENTS

PAGE

Guarantee	3
Parts & Service Contacts	3
Electromagnetic Interference (EMC)	4
Safety Precautions	6
Additional Safety Precautions for MIG Welding	11
Principles of Operation	13
Electrical Connections	14
Unpacking and Parts Identification	15
Assembly	15
Loose Components	15
Welding Shield	16
Installing the Welding Wire	16
Connecting the Gas Supply	18
Preparation for Use	19
Electrical Connections	19
Welding Gas Settings	20
Setting the Controls	20
Welding Wire Preparation	21
Attaching the Earth Clamp	21
MIG Welding Operation	22
Welding Tips	22
Maintenance	23
Control Settings Reference Tables	24 - 25
Welder Specifications	26
Wiring Diagrams	27 - 29
Parts Lists and Diagrams	30 - 41
Troubleshooting	42
Accessories	43
Parts & Service Contacts	43

Clarke
INTERNATIONAL

ACCESSORIES

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

1. Welding Wire Spools

	Mild Steel	Stainless Steel	Aluminium
Mini - 0.6mm	6000641	-	-
Mini - 0.8mm	6000481	6000498	6000483
Mini - 9mm (FLUX Core)	6000664	-	-
5kg - 0.6mm	6000476	-	-
5kg - 0.8mm	6000475	-	-
4.5-5kg - 9mm (FLUX Core)	6000666	-	-

2. Welding Gas

CO ₂ (250g)	6000642	For welding Mild Steel
CO ₂ (600g)	6000643	For welding Mild Steel
Argon	6000661	For welding Aluminium
CO ₂ /Argon Mix	6000660	For welding Stainless/Thin Sheet MS

3. Welding Tips

0.6mm (pack of 5)	8132260
0.8mm (pack of 5)	8132270

4. Gas Regulator

8132000

In addition to the above, your Clarke dealer can provide you with a wide range of welding accessories, safety equipment etc., to increase productivity where necessary and to simplify and assist in the welding process.

PARTS AND SERVICE CONTACTS

For Spare Parts and Service, please contact your nearest dealer, or CLARKE International, on one of the following numbers.

PARTS & SERVICE TEL: 020 8988 7400

PARTS & SERVICE FAX: 020 8558 3622

or e-mail as follows:

PARTS: Parts@clarkeinternational.com

SERVICE: Service@clarkeinternational.com

TROUBLESHOOTING

Your **Clarke** Mig 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.

PROBLEM	CAUSE	REMEDY
1. No "life" from welder	Check fuses and mains lead	a) Replace fuses as necessary If problem persists return welder to your local dealer b) Check fuse size
2. No wire feed	Motor malfunction	Return welder to your local dealer
3. Feed motor operates but wire will not feed	a) Insufficient Feed Roller Pressure b) Burr on end of wire c) Liner blocked or damaged d) Inferior wire e) Roller worn out	a) Increase roller pressure b) Re-cut wire square with no burr c) Clean with compressed air or replace liner. d) Use only good "clean" wire e) Replace roller
4. Wire welds itself to tip	a) Wire feed speed too low b) Wrong size tip	a) Unscrew tip, cut wire and fit new tip Increase wire speed before operating again b) Fit correct size tip
5. Wire feeds into 'birds nest' tangle	a) Wire welded to tip b) Wire liner damaged preventing smooth operation	a) As above plus reduce feed roller pressure so that if blockage occurs wire slips on roller i.e. no feed b) Renew wire liner
6. Loose coils of wire tangle around wire drum inside machine	Drum brake too slack	Tighten drum brake Caution: Do not over-tighten
7. Erratic wire feed	a) Drum brake too tight b) Feed roller worn c) Insufficient pressure on feed roller d) Wire dirty, rusty, damp or bent e) Liner partially blocked	a) Loosen drum brake slightly b) Check and replace if necessary c) Increase pressure on feed roller Caution: Do not over-tighten d) Re-cut wire and ensure it is clean e) Clean with compressed air
8. Poor quality welds	a) Insufficient gas at weld area b) Incorrect gas/wire combination c) Rusty, painted, damp, oil or greasy workpiece d) Rusty/dirty wire e) Poor earth contact	a) Check that gas is not being blown away by draughts and if so move to more sheltered weld area. If not increase gas supply b) Consult your MIG welding manual for correct set-up c) Ensure workpiece is clean and dry d) Ensure wire is clean and dry e) Check earth clamp/workpiece conn
9. Wire jams in tip when welding aluminium	Tip too small	Use slightly oversize tip i.e., for .8mm wire use 1mm tip. (Note: Applies to aluminium only)
10. Welder cuts out whilst in use	Duty cycle exceeded (auto cut-out operates)	Allow welder to cool 15-30 mins before continuing <i>Note: If duty cycle is continually exceeded, damage to the welder may result, and welder output is probably too small for application</i>

If you have any problems which cannot be resolved by reference to the above, or if you require spare parts for your welder please contact your local Clarke dealer.

Thank you for purchasing this CLARKE MIG Welder.

The 'EN' versions are designed to operate with or without gas....so-called GAS/NO-GAS welders. The 'E' and 'TE' versions are designed to operate using a gas cylinder with plain metal welding wire **ONLY**. This is explained in greater detail within the manual.

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.

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.

PARTS AND SERVICE CONTACTS

For Spare Parts and Service, please contact your nearest dealer, or CLARKE International, on one of the following numbers.

PARTS & SERVICE TEL: 020 8988 7400

PARTS & SERVICE FAX: 020 8558 3622

or e-mail as follows:

PARTS: Parts@clarkeinternational.com

SERVICE: Service@clarkeinternational.com

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:

- other supply cables, control cables, signalling and telephone cables; above, below and adjacent to the welding equipment;
- radio and television transmitters and receivers;
- computer and other control equipment;
- safety critical equipment, e.g. guarding of industrial equipment;
- pacemakers and hearing aids etc.;
- equipment used for calibration or measurement;
- 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.

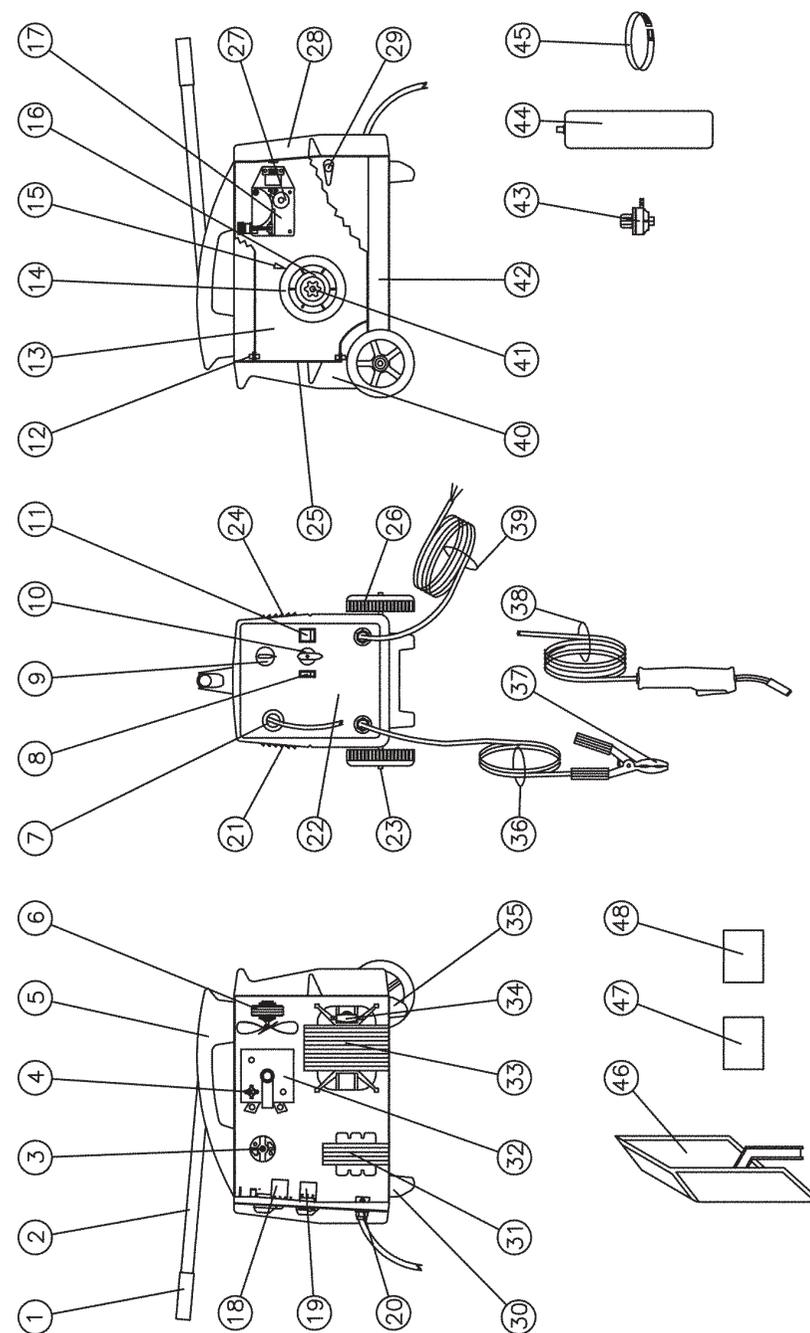
The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

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

PARTS DIAGRAM - MIG 160EN



PARTS LIST - MIG 160EN

No.	Description	Part No.
1	Handle-extension Grip	EM21600006
2	Handle-extension	EM33725054
3	Wire Feeding Motor	EM22810012
4	Thermostat	EM04600113
5	Plastic Handle	EM21600021
6	Complete Fan	EM04600055
7	Torch Grommet	EM21690001
8	Welding Current Switch	EM22200006
9	P.C. Board Knob	EM21690017
10	Switch Knob	EM21690015
11	Yellow Pilot-light Switch	EM22200022
12	Side-panel pin	EM21690178
13	Dividing Panel	EM33720063
14	Wire Spool	See Accessories
15	Fixed Spool Holder	EM21690011
16	Spool Holder Retaining Ring	EM21690012
17	Plastic Wire Feeder	EM44400013
18	P.C. Board	EM22710043
19	Switch	EM22205001
20	Cable Clamp	EM21605010
21	Left-side Panel	EM33705217
22	Front Panel	EM33710194
23	Wheels-axle	EM55200014
24	Right-side Upper Panel	EM33705216
25	Back Panel	EM33715063
26	Wheel	EM21625034
27	Wire Feed Roll Knurled	EM33805001
28	Front Plastic Frame	EM21690175
29	2 Pins Male Connector	EM22105040
29	Male Connector	EM22105042
30	Front Plastic Foot	EM21610014
31	Choke	EM44135018
32	Rectifier	EM22400038
33	Transformer	EM44120052
34	Thermostat	EM22210016
35	Back Plastic Foot	EM21610015
36	Earth Clamp	EM22110005
37	Earth Cable	EM43210108
38	Torch compl.	EM23000049
39	Input Cable	EM20220014
40	Back Plastic Frame	EM21690176
41	Spool Holder Knob w/Nut	EM21800036
42	Lower Panel	EM33700138
43	4 Lobes Hand-wheel	EM21800051
44	Gas/No Gas Change Board	EM21800050
45	Side Panel Clip	EM21690177
46	Plastic Mask W/Handle	EM21905018
47	Transparent Glass	EM21905020
48	Dark Glass 82x108 BS Din11	EM21905021

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 FOR ALL TYPES OF WELDING

1. 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

2. GENERAL PRECAUTIONS

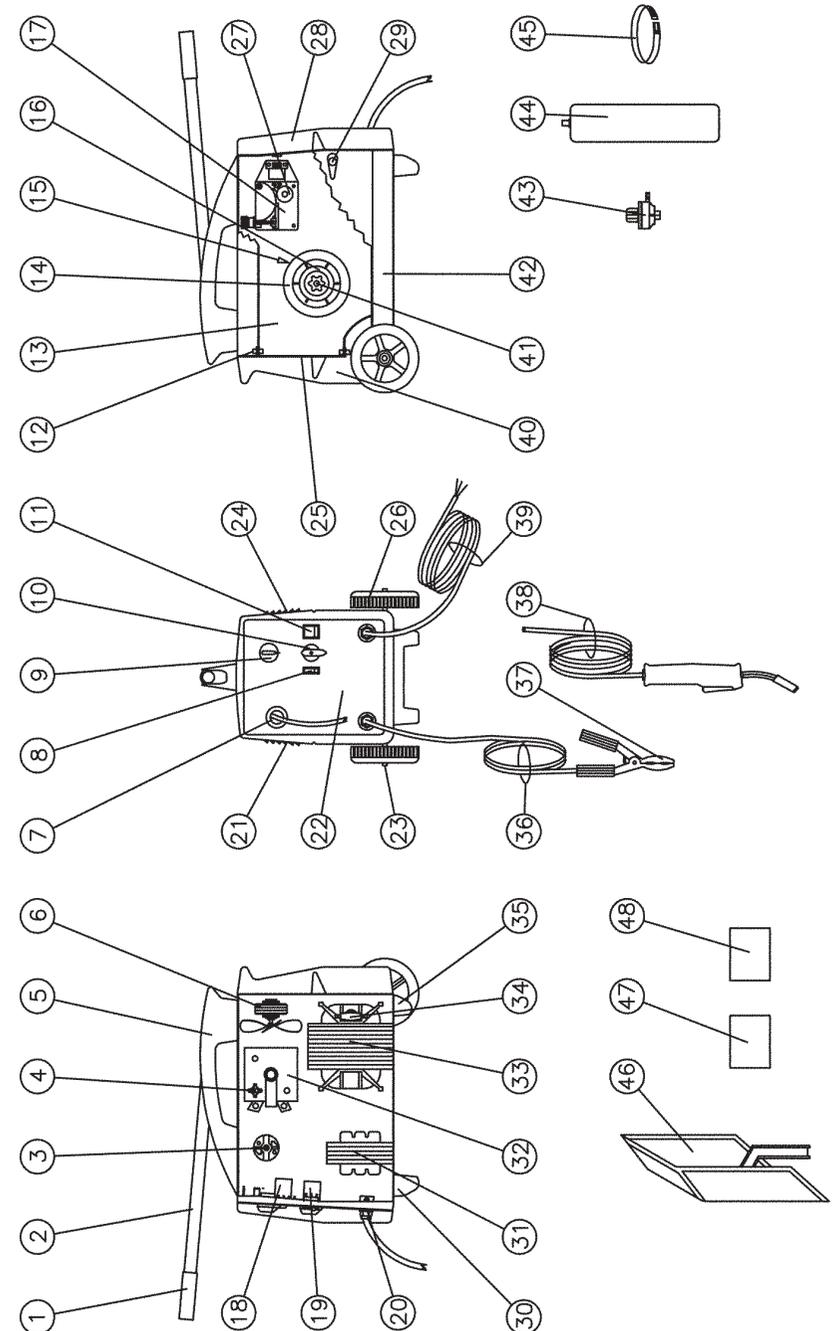
A) Burn prevention

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 cover glass). This is a MUST for welding or cutting, (and chipping) to protect the eyes from radiant energy and spatter. 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 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.

PARTS DIAGRAM - MIG 151TE



PARTS LIST - MIG 151TE

No.	Description	Part No.
1	Handle-extension Grip	EM21600006
2	Handle-extension	EM33725054
3	Wire Feeding Motor	EM22810012
4	Thermostat	EM22210014
5	Plastic Handle	EM21600021
6	Complete Fan	EM04600055
7	Torch Grommet	EM21690001
8	Welding Current Switch	EM22200006
9	P.C. Board Knob	EM21690017
10	Switch Knob	EM21690015
11	Yellow Pilot-light Switch	EM22200022
12	Side-panel Pin	EM21690178
13	Dividing Panel	EM33720092
14	Wire Spool	See Accessories
15	Fixed Spool Holder	EM21690011
16	Spool Holder Retaining Ring	EM21690012
17	Plastic Wire Feeder	EM44400013
18	P.C. Board	EM22710037
19	Switch	EM22205001
20	Cable Clamp	EM21605010
21	Left-side Panel	EM33705217
22	Front Panel	EM33710194
23	Wheels-axle	EM55200014
24	Right-side Upper Panel	EM33705216
25	Back Panel	EM33715063
26	Wheel	EM21625034
27	Wire Feed Roll Knurled	EM33805001
28	Front Plastic Frame	EM21690175
29	Side Panel Clip	EM21690177
30	Front Plastic Foot	EM21610014
31	Choke	EM44135018
32	Rectifier	EM22400038
33	Transformer	EM44120052
34	Thermostat	EM22210016
35	Back Plastic Foot	EM21610015
36	Earth Cable	EM43210119
37	Earth Clamp	EM22110005
38	Red Torch	EM23000050
39	Input Cable	EM20220014
40	Back Plastic Frame	EM21690176
41	Spool Holder Knob	EM21800036
42	Lower Panel	EM33700138
43	Regul. W/Out Gauge	EM22905001
44	Spare Cartridge	See Accessories
45	Hose Clamp	EM22915004
46	Plastic Mask W/Handle	EM21905018
47	Transparent Glass	EM21905020
48	Dark Glass 82x108 BS Din11	EM21905021

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, 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.

3. ELECTRIC ARC (MIG, TIG) 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.

3A) 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, apron 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.

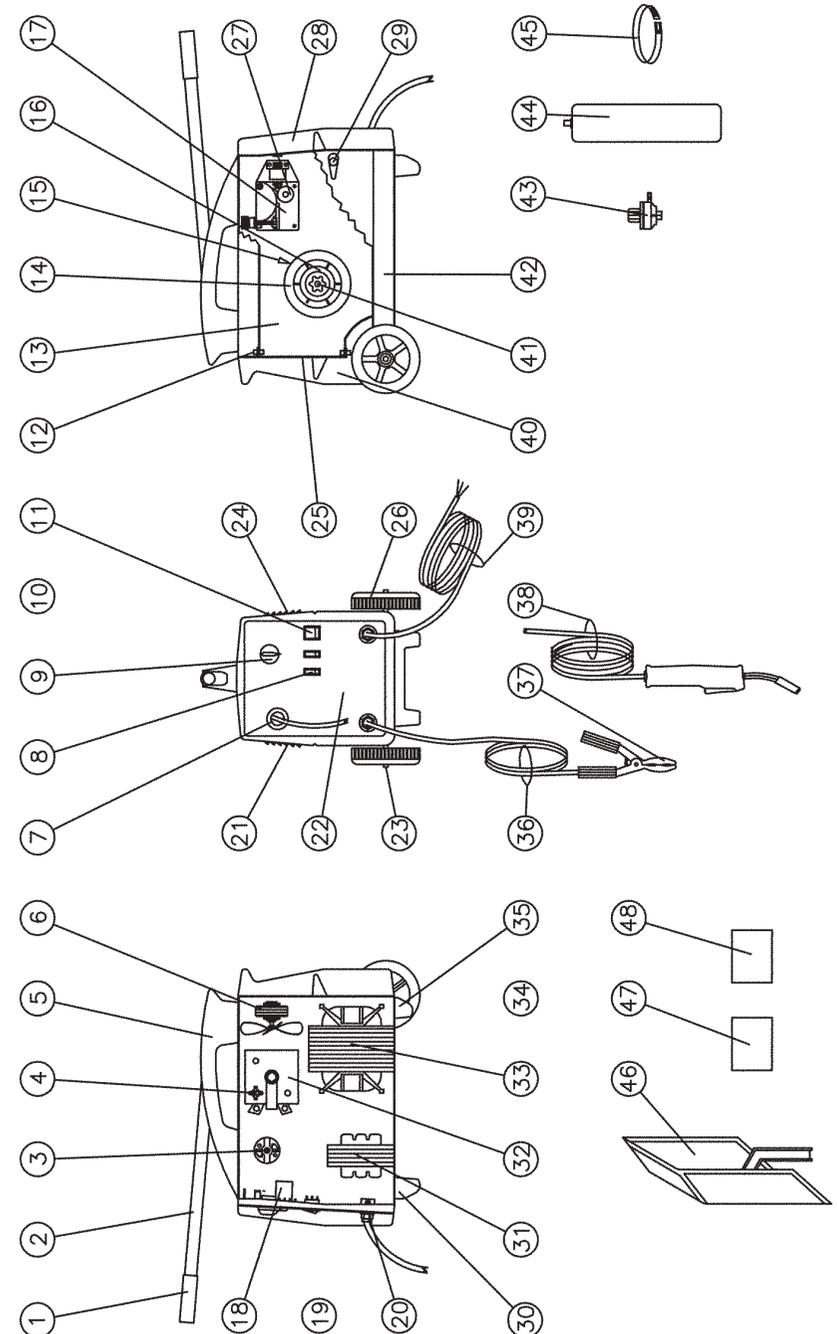
2) Eye and head protection

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.

PARTS DIAGRAM - MIG 135TE



PARTS LIST - MIG 135TE

No.	Description	Part No.
1	Handle-extension Grip	EM21600006
2	Handle-extension	EM33725054
3	Wire Feeding Motor	EM22810001
4	Complete Thermostat	EM04600113
5	Plastic Handle	EM21600021
6	Complete Fan	EM04600055
7	Torch Grommet On Front Panel	EM21690001
8	Welding Current Switch	EM22200006
9	Potentiometer Knob	EM21690017
11	Yellow Pilot-light Switch	EM22200022
12	Access Panel Hinge	EM21690178
13	Dividing Panel	EM33720092
14	Wire Spool	See Accessories
15	Fixed Spool Holder	EM21690011
16	Spool Holder Retaining Ring	EM21690012
17	Plastic Wire Feeder	EM44400001
18	P.C. Board	EM22710043
20	Cable Clamp	EM21605010
21	Left Access Panel	EM33705217
22	Front Panel	EM33710165
23	Wheels-axle	EM55200014
24	Right-side Upper Panel	EM33705216
25	Rear Panel	EM33715063
26	Wheel	EM21625034
27	Wire Feed Roll Knurled	EM33805001
28	Front Plastic Frame	EM21690175
29	Side Panel Clip	EM21690177
30	Front Plastic Foot	EM21610014
31	Inductance	EM44135060
32	Rectifier	EM22400049
33	Transformer	EM44120049
35	Back Plastic Foot	EM21610015
36	Earth Cable	EM43210119
37	Earth Clamp	EM22110005
38	Red Torch	EM23000050
39	Input Cable, Plug + 13A Fuse	EM20220068
40	Back Plastic Frame	EM21690176
41	Spool Holder Handwheel With Nut	EM21800036
42	Lower Panel	EM33700138
43	Reducer W/Out Gauge	EM22905001
44	Spare Cartridge C02	See Accessories
45	Hose Clamp	EM22915004
46	Plastic Mask W/Handle	EM21905018
47	Transparent Glass	EM21905020
48	Dark Glass 82x108 BS Din11	EM21905021

3B) TOXIC FUME PREVENTION

Comply with precautions in 2B. Generator engine exhaust must be vented to the outside air. Carbon monoxide can kill.

3C) FIRE AND EXPLOSION PREVENTION

Comply with precautions in 2C. 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.

3D) 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.

3E) PROTECTION FOR WEARERS OF ELECTRONIC LIFE SUPPT 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.

3F) 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 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.

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.

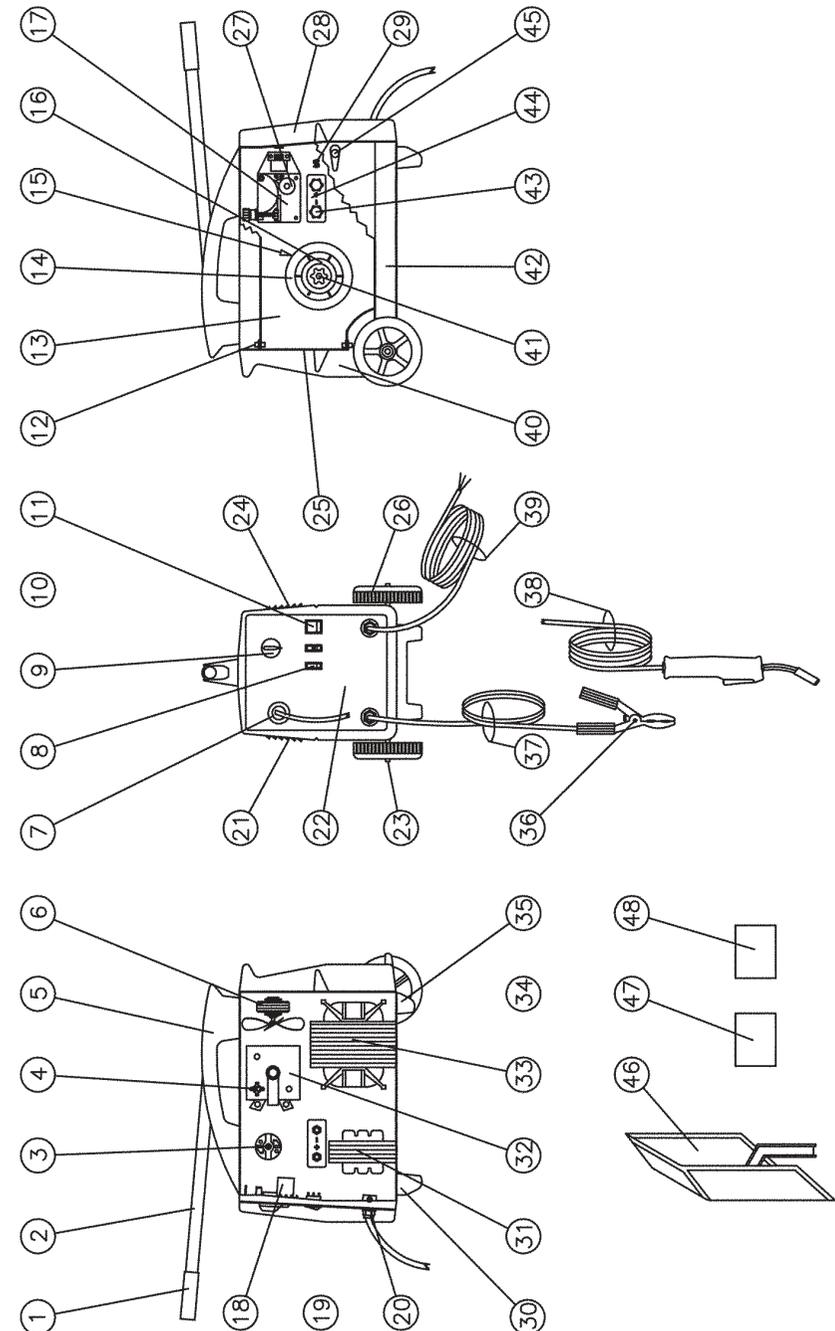
b) Equipment without output on/off control (no contactor)

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.

PARTS DIAGRAM - MIG 130EN



PARTS LIST - MIG 130EN

No.	Description	Part No.
1	Handle-extension Grip	EM21600006
2	Handle-extension	EM33725054
3	Wire Feeding Motor	EM22810001
4	Complete Thermostat 100 + Support	EM04600113
5	Plastic Handle	EM21600021
6	Complete Fan	EM04600055
7	Torch Grommet On Front Panel	EM21690001
8	Welding Current Switch	EM22200006
9	Potentiometer Knob	EM21690017
11	Yellow Pilot-light Switch	EM22200022
12	Access Panel Hinge	EM21690178
13	Dividing Panel	EM33720063
14	Wire Spool	See Accessories
15	Fixed Spool Holder	EM21690011
16	Spool Holder Retaining Ring	EM21690012
17	Plastic Wire Feeders	EM44400001
18	P.C. Board	EM22710043
20	Cable Clamp	EM21605010
21	Left Access Panel	EM33705217
22	Front Panel	EM33710165
23	Wheels-axle	EM55200014
24	Right-side Upper Panel	EM33705216
25	Rear Panel	EM33715063
26	Wheel	EM21625034
27	Wire Feed Roll Knurled	EM33805001
28	Front Plastic Frame	EM21690175
29	2 Pins Male Connector	EM22105040
29	Male Connector	EM22105042
30	Front Plastic Foot	EM21610014
31	Inductance	EM44135060
32	Rectifier	EM22400049
33	Transformer	EM44120049
35	Back Plastic Foot	EM21610015
36	Earth Clamp	EM22110005
37	Earth Cable	EM43210108
38	Torch compl.	EM23000049
39	Power Cable w/Plug +13A Fuse	EM20220068
40	Back Plastic Frame	EM21690176
41	Spool Holder Handwheel with Nut	EM21800036
42	Lower Panel	EM33700138
43	4 Lobes Hand-wheel	EM21800051
44	Gas/No Gas Change Board	EM21800050
45	Side Panel Clip	EM21690177
46	Plastic Mask W/Handle	EM21905018
47	Transparent Glass	EM21905020
48	Dark Glass 82x108 BS DIN11	EM21905021

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 flammable residuals.

ADDITIONAL SAFETY PRECAUTIONS for MIG WELDING

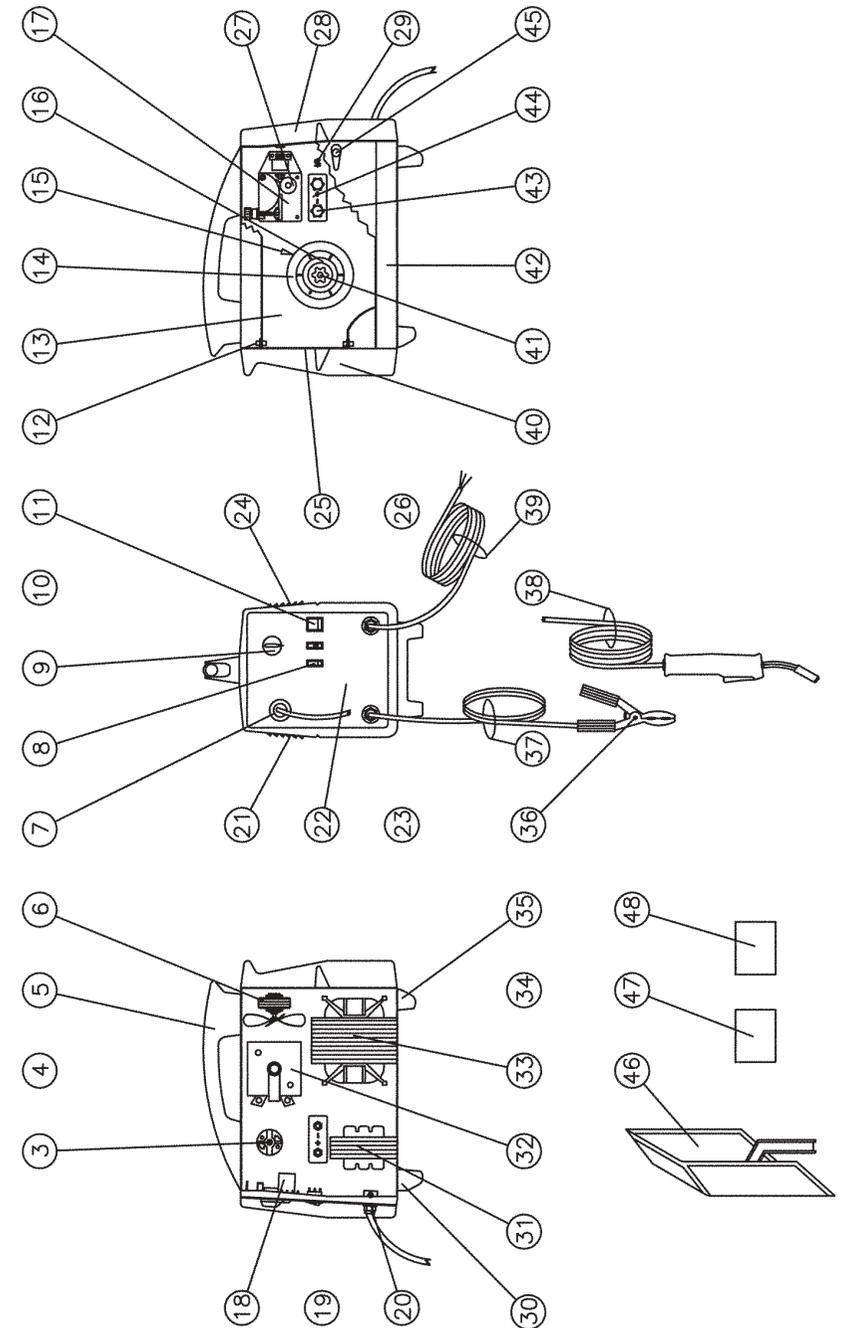
- ✓ **ALWAYS** ensure that there is full free air circulating around the outer casing of the machine, and that the louvres are unobstructed.
- ✓ Welding arc can seriously damage your eyes. Both operator and spectators must **ALWAYS** use a proper welding face shield or helmet, with suitable filter lenses. Proper gloves and working clothes should be worn at all times.
- ✓ **ALWAYS** check that the pressure regulator and gauges (where fitted), are working correctly. DO NOT lubricate the regulator.
- ✓ **ALWAYS** use the correct regulator. Regulators are designed to be used with a specific gases.
- ✓ **ALWAYS** inspect the hose before use to ensure it is in good condition.
- ✓ **ALWAYS** keep the free length of gas hose outside the work area.
- ✓ **ALWAYS** remove all flammable materials from the welding area.
- ✓ **ALWAYS** Keep fire extinguisher handy....' **Dry Powder, CO₂ or BCF, NOT Water**
- X **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.
- X **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.

- X NEVER** use or store in a wet/damp environment. DO NOT EXPOSE TO RAIN.
- X** The MIG welding process uses an INERT gas to protect the weld pool. It is important to ensure the appropriate gas is being used. **NEVER** use gas from a cylinder, the content of which is unknown.
- X NEVER**
 - a. Use a damaged cylinder.
 - b. Lift the cylinder by the valve.
 - c. Expose the cylinder to a heat source or sparks.
- X 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.
- X NEVER** point the MIG torch at any person or animal.
- X NEVER** touch the MIG torch nozzle until the welder is switched OFF and the nozzle has been allowed to cool off.
- X NEVER** connect, disconnect, or attempt to service the MIG torch, until the machine is switched OFF and disconnected from the mains supply.
- X NEVER** allow the cables to become wrapped around the operator or any person in the vicinity.

DANGER - 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.

PARTS DIAGRAM - MIG 110EN



PARTS LIST - MIG110EN

No.	Description	Part No.
3	Wire Feeding Motor	EM22810001
5	Plastic Handle	EM21600021
6	Complete Fan	EM04600055
7	Torch Grommet On Front Panel	EM21690001
8	Welding Current Switch	EM22200006
9	P.C. Board Knob	EM21690017
11	Yellow Pilot-light Switch	EM22200022
12	Side-panel Pin	EM21690178
13	Dividing Panel	EM33720063
14	Wire Spool	See Accessories
15	Fixed Spool Holder	EM21690011
16	Spool Holder Retaining Ring	EM21690012
17	Plastic Wire Feeder	EM44400001
18	P.C. Board	EM22710043
20	Cable Clamp	EM21605010
21	Left-side Panel	EM33705217
22	Front Panel	EM33710165
24	Right-side Upper Panel	EM33705216
25	Back Panel	EM33715063
27	Wire Feed Roll Knurled	EM33805001
28	Front Plastic Frame	EM21690175
29	2 Pins Male Connector	EM22105040
29	Male Connector	EM22105042
30	Front Plastic Foot	EM21610014
31	Choke	EM44135001
32	Rectifier	EM22400001
33	Transformer + Thermostat	EM44120068
35	Back Plastic Foot	EM21610015
36	Earth Clamp	EM22110005
37	Power Cable	EM43210108
38	Torch Compl.	EM23000049
39	Power Cable	EM20220068
40	Back Plastic Frame	EM21690176
41	Spool Holder Knob 4w/Nut	EM21800036
42	Lower Panel	EM33700138
43	4 Lobe Hand-wheel	EM21800051
44	Gas/No Gas Change Board	EM21800050
45	Side Panel Clip	EM21690177
46	Plastic Mask W/Handle	EM21905018
47	Transparent Glass	EM21905020
48	Dark Glass 82x108 BS Din11	EM21905021

SAFETY EQUIPMENT

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

MIG WELDING - PRINCIPLES OF OPERATION

MIG (Metal Inert Gas) welding is a process in which a power wire electrode is fed continuously into the weld pool at a controlled, constant rate.

The wire is connected to the positive side of a rectified voltage supply. The workpiece is connected to the negative side of the supply.

When the wire is fed, it comes into contact with the workpiece and an arc is struck. The arc melts the wire and the material, fusing it together.

The wire, which is fed by the wire feed motor is fed into the weld pool, burning itself off at a rate dependent upon the selected wire feed speed.

To protect the weld pool from oxidation and impurities during the welding process, a shielding gas flows over and around the weld pool. This gas flow must be sufficient to protect the weld, but not wasteful.

NOTE: Poor gas coverage will result in poor welding. Excessive gas coverage is wasteful and expensive.

GAS/NO GAS

The 'EN' models are capable of welding with or without gas, so-called 'Gas/No Gas'. It is **MOST IMPORTANT** that the operator reads the notes on page 19 before attempting to use this welding technique.

BENEFITS OF MIG WELDING

1. 50% faster welding time.
2. Operator training time kept to a minimum.
3. There is no slag removal, thus eliminating almost all post-welding cleaning operations.
4. Minimum waste of welding consumables.
5. Overall, a faster more efficient way of getting the job done.
6. Less heat - less distortion.
7. Ability to weld thin material.

ELECTRICAL CONNECTIONS

⚠ WARNING+! THIS APPLIANCE MUST BE EARTHED.

A. MIGs 110E, 110EN, 130EN, 135TE ONLY

These welders are fitted with a standard 13 amp BS 1363 plug, fitted with a 13 amp fuse. Connect to a 230 volt (50Hz) domestic electrical supply and **we strongly recommend that this be done via a Residual Current Device (RCD).**

IMPORTANT: If the welder is fitted with a plug which is moulded onto the electric cable (i.e. non- re-wirable) please note:

1. The plug must be thrown away if it is cut from the electric cable. There is a danger of electric shock if it is subsequently inserted into a socket outlet.
2. Never use the plug without the fuse cover fitted.
3. Should you wish to replace a detachable fuse carrier, ensure that the correct replacement is used (as indicated by marking or colour code). Replacement fuse covers can be obtained from your local dealer or most electrical stockists.

Fuse Rating

The fuse in the plug must be replaced with one of the same rating (**13 amps**) and this replacement must be ASTA approved to BS1362.

B. MIGs 151TE and 160EN ONLY

Connect the mains lead, through a suitably fused isolator switch, to a 230 Volt (50Hz) electrical supply, with a 15Amp fuse rating. **A standard 13 Amp plug MUST NOT be used with these welders.**

C. ALL MODELS

IMPORTANT: The wires in the mains lead are coloured in accordance with the following code:

Green & Yellow Earth
Blue Neutral
Brown Live

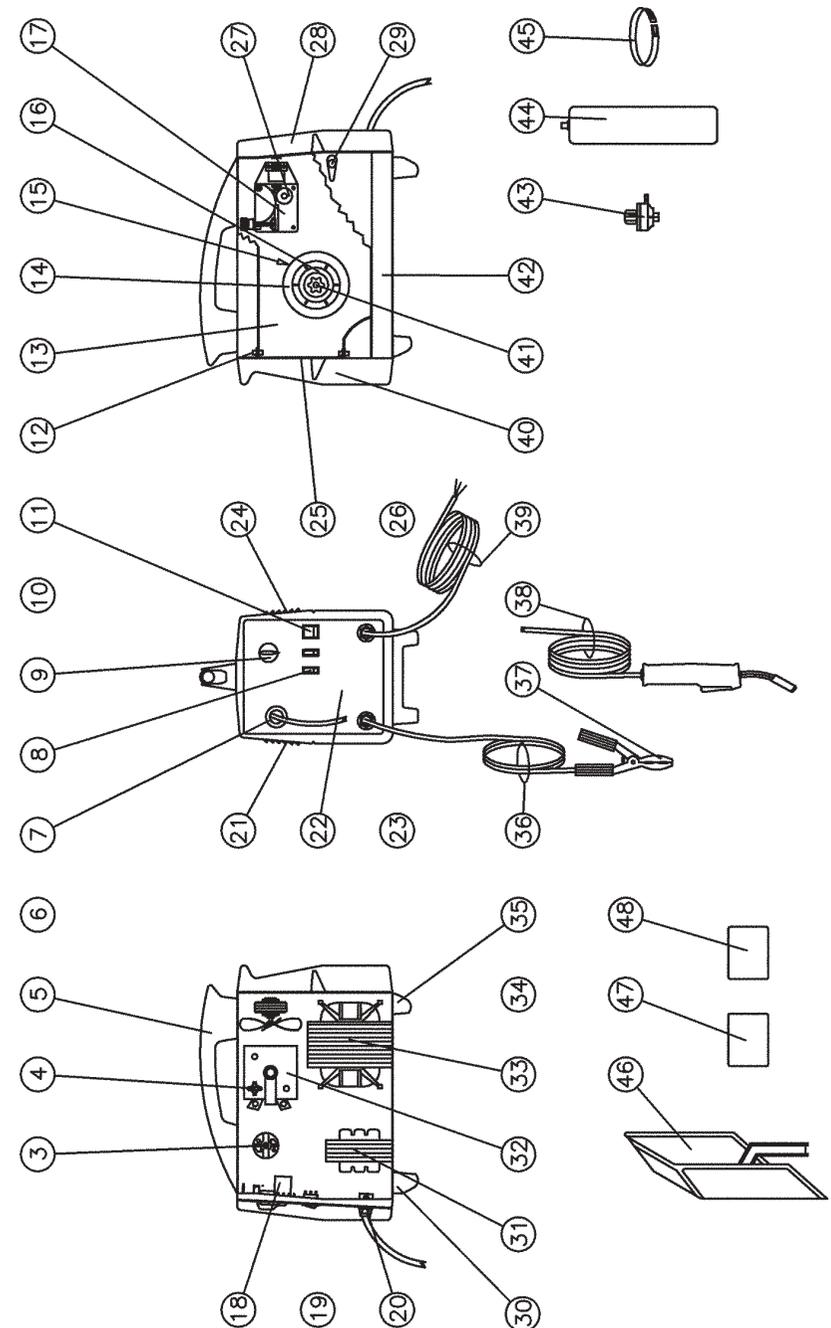
As the colours of the flexible cord of this appliance may not correspond with the coloured markings identifying terminals in your plug, proceed as follows:

- Connect GREEN & YELLOW cord to plug terminal marked with a letter "E" or Earth symbol "⏚", or coloured GREEN or GREEN & YELLOW.
- Connect BROWN cord to plug terminal marked letter "L" or coloured RED.
- Connect BLUE cord to plug terminal marked letter "N" or coloured BLACK.

Extension Cable

If an extension cable is fitted, ensure the minimum cross section of the conductor is 1.5mm² for up to 15 metres in length, and 2.5mm² for up to 25 metres.

PARTS DIAGRAM - MIG 110E



PARTS LIST - MIG 110E

No.	Description	Part No.
3	Wire Feeding Motor	EM22810001
4	Complete Thermostat	EM04600113
5	Plastic Handle	EM21600021
7	Torch Grommet on Front Panel	EM21690001
8	Welding Current Switch	EM22200006
9	Potentiometer Knob	EM21690017
11	Yellow Pilot-light Switch	EM22200022
12	Access Panel Hinge	EM21690178
13	Dividing Panel	EM33720092
14	Wire Spool	See Accessories
15	Fixed Spool Holder	EM21690011
16	Spool Holder Retaining Ring	EM21690012
17	Plastic Wire Feeder	EM44400001
18	P.C. Board	EM22710043
20	Cable Clamp	EM21605010
21	Left Access Panel	EM33705217
22	Front Panel	EM33710165
24	Right-side Upper Panel	EM33705216
25	Rear Panel	EM33715063
27	Wire Feed Roll Knurled	EM33805001
28	Front Plastic Frame	EM21690175
29	Side Panel Clip	EM21690177
30	Front Plastic Foot	EM21610014
31	Choke	EM44135061
32	Rectifier	EM22400021
33	Transformer	EM44120105
35	Back Plastic Foot	EM21610015
36	Earthcable	EM43210119
37	Earth Clamp	EM22110005
38	Red Torch compl.	EM23000050
39	Power Cable	EM20220068
40	Back Plastic Frame	EM21690176
41	Spool Holder Handwheel with nut	EM21800036
42	Lower Panel	EM33700138
43	Reducer W/Out Gauge	EM22905001
44	Spare Cartridge CO ₂	See Accessories
45	Hose Clamp	EM22915004
46	Plastic Mask W/Handle	EM21905018
47	Transparent Glass	EM21905020
48	Dark Glass 82x108 BS Din11	EM21905021

UNPACKING & PARTS IDENTIFICATION

Unpack and lay out the components, checking against the following list. Any damage or deficiency should be reported to your CLARKE dealer immediately.

Most of the components are stored within the side compartment. To open the compartment, put your finger in the hole in the side cover, and pull sharply.

1. Welder complete with Torch and Hose, Earth Cable with Clamp and Power cable.

NOTE:

Migs 151TE and 160EN are NOT provided with 13 Amp plugs. These machines MUST NOT be connected to a standard 13 Amp domestic supply. See 'Electrical Connections' for full details.

2. 2 plastic feet + 2 Wheels w/Axle and 2 Lock washers.(110E, 110EN, - 2 Feet only)
3. 1xHandle Extension and Hand Grip (**NOT 110E, 110EN**)
4. 1xHandle
5. 1x2-Piece Welding Mask
6. 1xWelding Mask handle, complete with plastic nut and 2xplastic screws.
7. 1xPackage containing 1x Clear Glass and 1x Dark Glass Lens
8. 1xMini Wire Spool, fitted to the Spool Holder
9. 1xplastic bag containing the following:
 - a1. **110E** - 2xSpare Nozzles, 0.6/0.8mm (0.6mm fitted to torch)
 - a2. **110EN, 130EN, 160EN** - 0.6/0.8mm (1.00mm fitted to torch)
 - a3. **135TE, 151TE** - 0.8/1.0mm (0.6mm fitted to torch)
 - b. 2xScrews for fixing Handle
 - c. 4xSelf Tapping Screws with flat washers for fixing feet
 - d. 1xHex Wrench
 - e. 1xScrew for fixing Handle extension (**110E and 110EN**)
10. 1xDisposable Gas Cylinder CO₂, (**NOT EN Models**)
11. 1xGas Regulator (**NOT EN Models**)
12. 1xLarge Worm Drive Clip (**NOT EN Models**)

ASSEMBLY & INSTALLATION

A. Loose Components

Lie the welder on its side and attach the two feet using the four screws with flat washers provided. For those models with wheels you have the option of fitting the two feet, or the wheels as follows: Remove the plug covering the hole for the axle, insert the axle, then attach the wheels, securing them by pushing the star locking washers provided, on to the axle, using a piece of tube or an old socket, ensuring the centre tines face outwards.

Attach the handle to the top of the machine by slotting it into place and securing with the two screws provided. For those models with a handle extension, simply slide it into the handle and secure with the screw provided.

The gas bottle is secured to the machine using the large worm drive clip which is threaded through the opening provided on the rear panel of the machine, (**NOT EN Models**).

B. The Welding Shield

To assemble the welding shield, (Fig.1), insert the clear glass panel first, followed by the dark glass panel into the recess in the shield, i.e. the clear glass **MUST** be on the outside of the shield. Securing them with the plastic screws provided.

Slot the two pieces together as shown, and enter the threaded end of the handle through the holes provided. Thread on the plastic nut and tighten.

It is important to pay attention to the notes on welding shield maintenance, given on page 23. When replacing the glass panels, use **ONLY** those parts supplied by Clarke International. The dark panel is a certified, specific optical class, and should not be exchanged for any other type. The clear glass panel should be replaced when it becomes badly pitted.

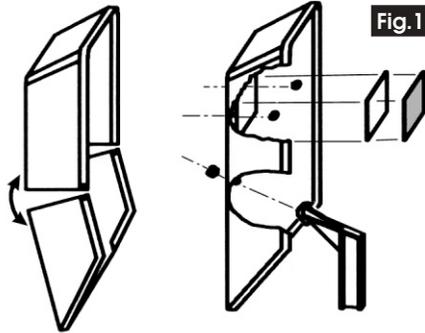


Fig.1

WARNING:

NEVER look at an electric arc without eye protection as this can injure the eyes permanently. **ALWAYS** use a protection mask or welding helmet.

C. Installing the Welding Wire

NOTE: These machines are designed to accept either the Clarke 'Mini' or 5kg wire spools of mild steel, stainless steel or aluminium according to the type of metal you wish to weld. Mini Mild Steel wire spools are supplied with the machine...others must be purchased separately. See 'Accessories' or your Clarke dealer for full details.

- IMPORTANT:** Ensure that the gas and electrical supplies are disconnected.
- (Ref. Fig. 2). To fit the wire spool (2), firstly pull open the cover, on the left hand side of the unit, by inserting your finger in the hole provided and pulling sharply.

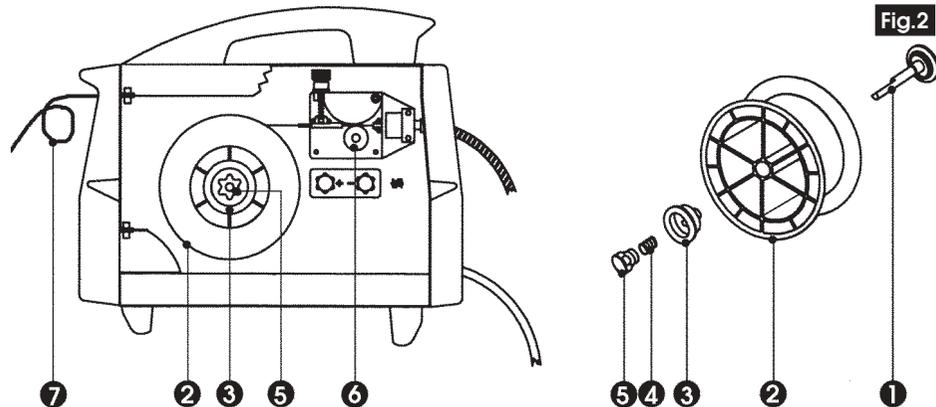
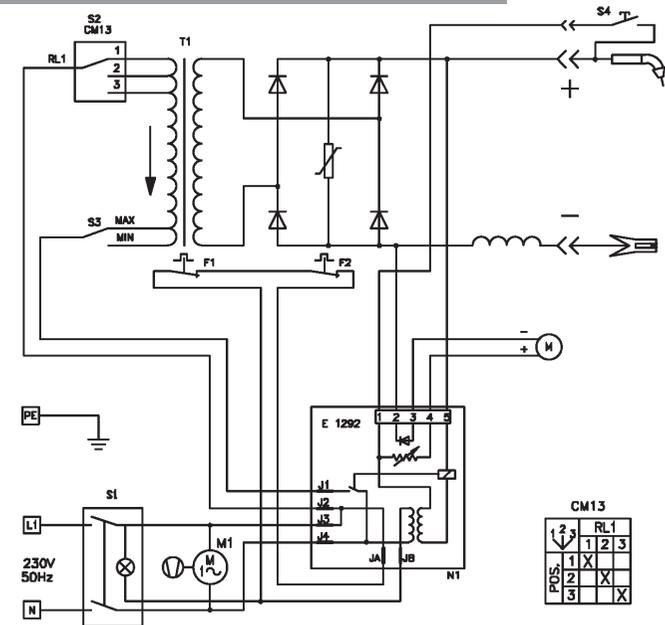


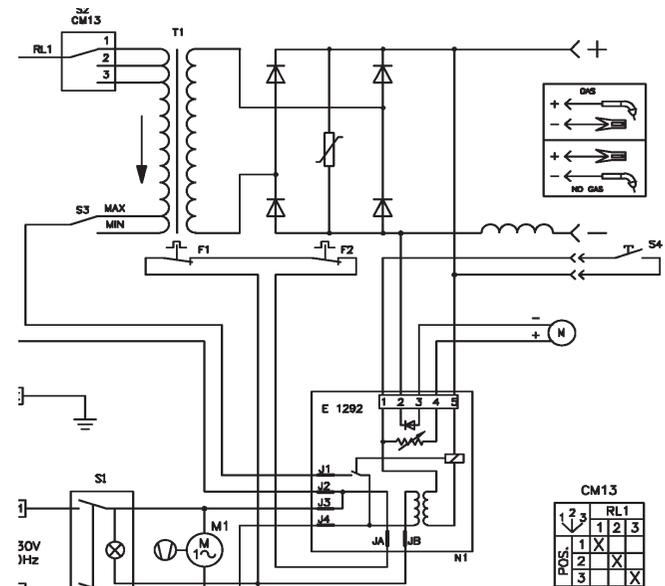
Fig.2

WIRING DIAGRAMS

MIG 151TE

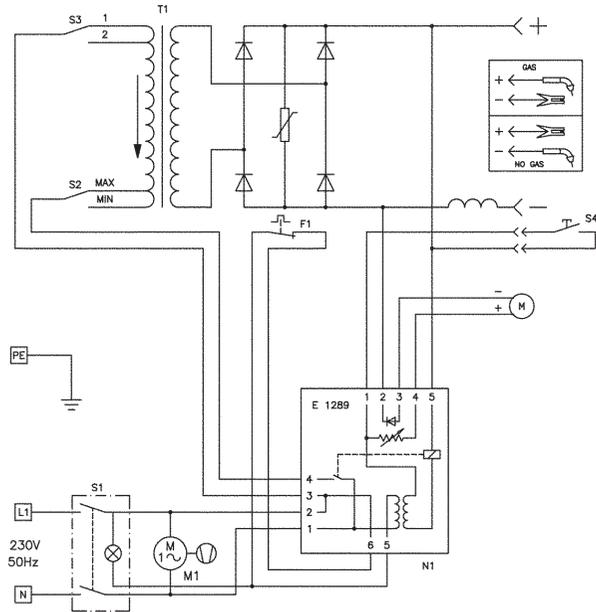


MIG 160EN

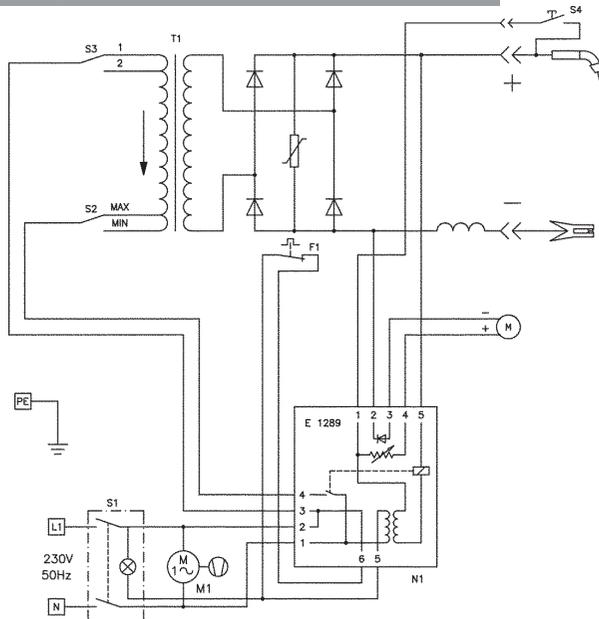


WIRING DIAGRAMS

MIG 130EN



MIG 135TE



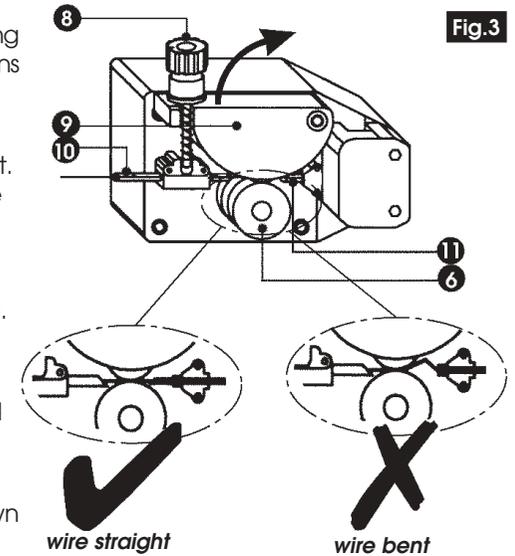
Unscrew and remove the plastic knob (5), followed by the spring (4) and collar (3) from the hub (1). (If the spool is already fitted during initial assembly, remove the plastic covering).

- Slide the spool over the hub, ensuring that it sits snugly, and replace the collar, spring and plastic knob, tightening it sufficiently to allow the spool to rotate smoothly but with a slight amount of braking friction. Do not over tighten as this will exert undue pressure on the wire drive motor and may cause serious damage.

4. (Ref. Fig. 3)

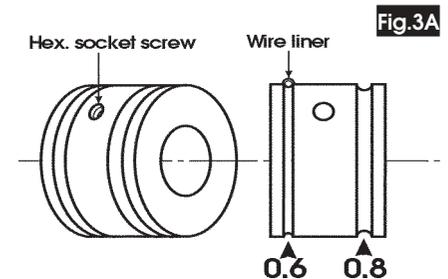
Loosen the plastic knob (8) by turning it anticlockwise, (this device maintains pressure on the wire).

Pull, on the plastic knob, so that the screw rod hinges out of its slot. This releases the pivoted pressure roller bracket (9). Raise the bracket, in the direction of the arrow, and pull out any wire that has been left in the wire liner (11).



- If you are changing the size of wire, you must also select the appropriate groove on the feed roller (6) - see Fig.3A.

To change to the other groove, undo the Hex. Socket Screw, shown in Fig.3A, and remove the roller from its shaft. Turn it through 180°, replace it on the shaft, and adjust so that the groove is **directly** in line with the Wire Liner, as shown. Firmly secure it in that position with the Hex. Socket Screw.



- Clip the end of the wire **cleanly**, ensuring there are no burrs or sharp edges, and, **ensuring it is straight** (see: Fig.3), feed it through the guide tube (10), over the channel on the roller (6) and into the wire liner (11), by approx. 10 - 15cm.

- Reposition the pressure roller bracket (9) and plastic knob (8) and tighten slightly.

CAUTION:

Tightening the knob (8) too tightly will crush the wire and damage the wire feed motor, too loose will not allow the wire to be pulled by the roller.

8. (Ref. Fig 4)

Unscrew and pull off the torch shroud (12) by twisting it anti clockwise, then unscrew the contact tip (13).

Should any wire protrude from the tip....pull it out completely and discard.

Close the side panel of the machine, plug into a 230V, 50HZ outlet (or switch on isolator), switch on the machine and press the trigger.

The wire will feed through the hose and when it appears at the torch end, release the trigger, switch off the machine and disconnect the machine from the mains supply. Replace the contact tip and the torch shroud.

IMPORTANT:

Ensure the hose is kept straight during this operation, to assist the wire as it is fed through to the wire liner and contact tip.

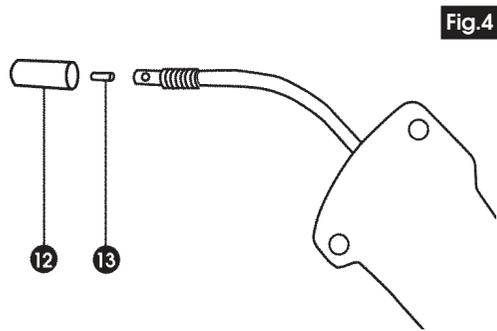


Fig.4

D. The Gas Supply

MIG 110E, 135TE and 151TE ONLY

NOTES:

These models require the gas bottle and regulator, to be fitted.

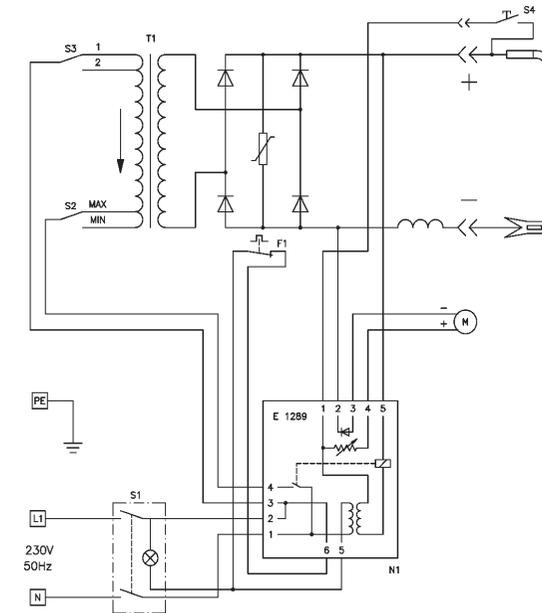
A mini gas bottle complete with gas regulator is provided. Should you prefer to use larger gas cylinders, the appropriate gas regulator and fittings need to be acquired. Your Clarke dealer will be happy to advise in this regard.

Always use the appropriate gas for the material being welded. Three types are provided by Clarke International, as follows:

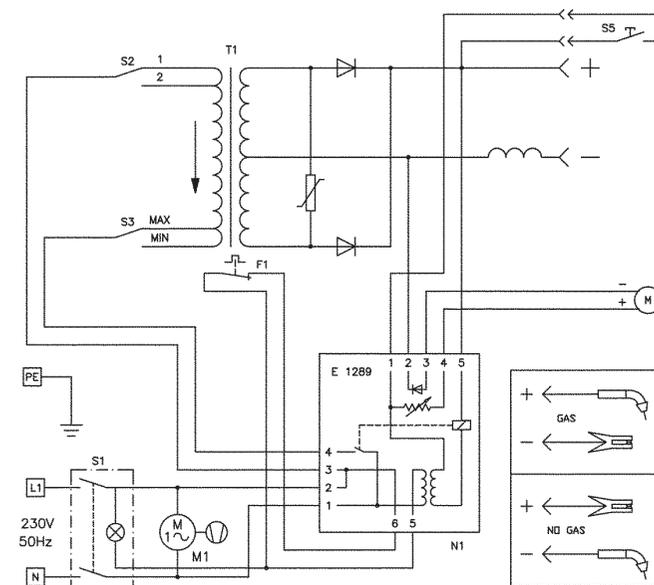
- Carbon Dioxide (CO₂) For Mild Steel Part No. 6000642
- Argon For Aluminium Part No. 6000661
- CO₂/Argon Mix For Thin Sheet metal
- Mild Steel/ Stainless Part No. 6000660
- Additionally a larger CO₂ bottle is available Part No. 6000643
- Replacement Gas Regulator Part No. 8132000

WIRING DIAGRAMS

MIG 110E



MIG 110EN



SPECIFICATIONS

	110E	110EN	130EN	135TE
Power Supply(All Models)	230V 50Hz 1Ph	230V 50Hz 1Ph	230V 50Hz 1Ph	230V 50Hz 1Ph
Fuse Rating (All Models)	13Amps	13Amps	13Amps	13Amps
Current Range	30-100A	30-100A	30-130A	30-130A
Max. Metal Thickness	3mm	2-3mm	4-5mm	5mm
Welding Wire Sizes	0.6-0.8mm	0.6-0.9mm	0.6-0.9mm	0.6-0.8mm
Duty Cycle* 8%	100A	-	130A	130A
15%	-	100A	115A	115A
60%	40A	55A	57A	57A
100%	30A	40A	44A	44A
Dimensions (All Models)	500x280x420mm	500x280x420mm	500x280x420mm	500x280x420mm
Weight	24kg	24kg	24.5kg	28.5kg
Part No.	6015110	6014500	6014530	6015135

	151TE	160EN
Power Supply(All Models)	230V 50Hz 1Ph	230V 50Hz 1Ph
Fuse Rating (All Models)	15Amps	15Amps
Current Range	30-150A	30-150A
Max. Metal Thickness	5-6mm	5-6mm
Welding Wire Sizes	0.6-0.8mm	0.6-0.9mm
Duty Cycle* 10%	150A	150A
20%	130A	130A
60%	75A	75A
100%	55A	55A
Dimensions (All Models)	500x280x420mm	500x280x420mm
Weight	24kg	24kg
Part No.	6015151	6014560

* Duty Cycle: Determines the machine 'down time'.

eg MIG130-EN, operating at 57 Amps - Duty Cycle - 60%. This means that in ANY 10 minute period, the machine may operate for 6 minutes and must have a down time of 4 minutes.

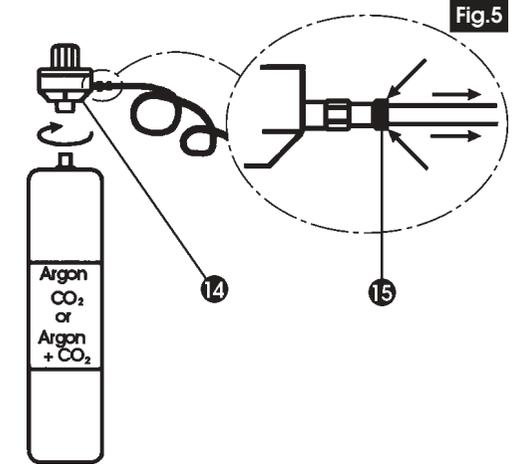
Please note that the details and specifications contained herein, are correct at the time of going to print. However, CLARKE International reserve the right to change specifications at any time without prior notice. ALWAYS CONSULT THE MACHINE'S DATA PLATE

Attach the mini gas bottle to the machine as described in 'Assembly' on page 15, then connect up as follows: (Ref. Fig. 5)

1. Remove the protective cap from the cylinder outlet and screw on the regulator (14), fully, BUT DO NOT OVERTIGHTEN.
2. Simply push the gas hose, at the rear of the machine, into the gas regulator outlet, as far as possible and release. This is a self sealing coupling.

To remove the hose, hold back the ring (15) then pull the hose out.

All components are now correctly attached, and the welder may now be prepared for operation, as follows:



PREPARATION FOR USE

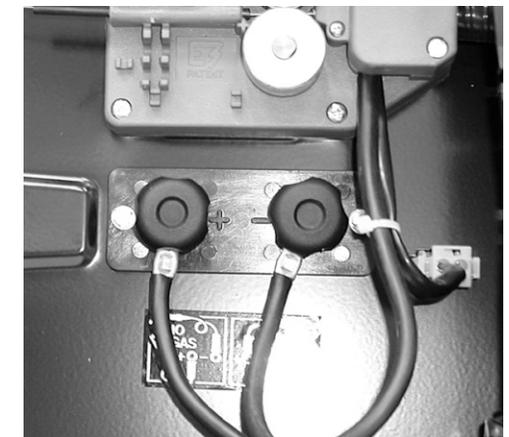
A. Electrical Connections

1. NO-GAS WELDING (EN Models ONLY)

IMPORTANT: ENSURE THE ELECTRICAL CONNECTIONS WITHIN THE WELDERS SIDE COMPARTMENT ARE CORRECTLY CONNECTED...as follows:

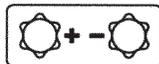
TORCH to the NEGATIVE (-ve) terminal,
EARTH cable to the POSITIVE (+ve) terminal.

The terminals within the side compartment are shown in Fig. 6



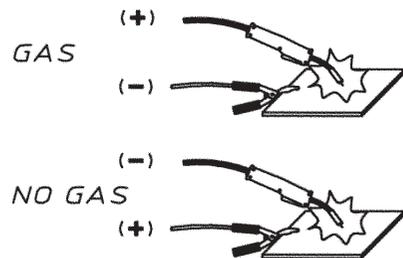
2. GAS WELDING

Fig.7



Connections should be made as follows:

TORCH to the POSITIVE (+ve) terminal,
EARTH cable to the NEGATIVE (-ve) terminal.



B. Welding Gas

(Models 130E, 135TE and 151TE ONLY)

The Gas Regulator Knob turns on a graduated plate, marked from 0 to 6. With the knob pointer set to zero (0) the gas flow is OFF.

Set the Regulator to 3 or 4 which will provide a gas flow of 2-3 litres per minute. This volume will provide adequate gas for a good weld without porosity under normal conditions.

ALWAYS close the regulator by turning the knob to the 0 (zero) position whenever you finish welding, or when changing gas cylinders.

C. Set the Controls

1. Models 110E, 110EN, 130EN & 135EN

Fig.8

These models are provided with two, 2-position switches and a rotary knob, as shown in Fig. 8.

The rotary knob, with graduations from 0 to 10, is used to control the wire speed.

Two of the 2-position switches are marked 1- 2 and Max - Min respectively, and are used to control the welding current according to the type and thickness of material to be welded, and in accordance with the charts shown in the 'Reference Tables' on pages 24 and 25.

The remaining 2-position switch is the ON/ OFF switch



CONTROL SETTINGS - REFERENCE TABLES

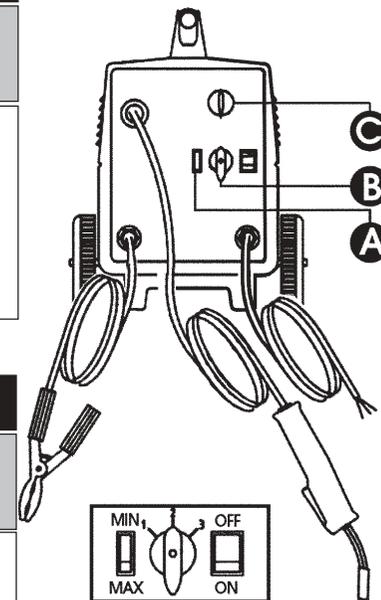
B. MIGs 151TE & 160EN

STEEL	0.6 mm Gas Welding Wire			0.8 mm Gas Welding Wire			
	Workpiece Thickness (mm)	Welding Position	Wire Speed Adjustment	Welding Position	Wire Speed Adjustment	Wire Speed Adjustment	
		A	B	C	A	B	C
0.6 - 0.8	MIN	1	5-6	MIN	1	5-6	
0.8 - 1.0	MIN	2	5-6	MIN	2	5-6	
1.0 - 1.2	MIN	3	5-6	MIN	3	6	
1.2 - 2.0	MAX	1	6	MAX	1	6	
2.0 - 3.0	MAX	2	7	MAX	2	7	
>3.0	MAX	3	7-8	MAX	3	7-8	

ALUMINIUM	0.8 mm Gas Welding Wire		
Workpiece Thickness (mm)	Welding Position	Wire Speed Adjustment	Wire Speed Adjustment
	A	B	C
1.0 - 1.5	MIN	1	9
1.5 - 2.0	MIN	2	9
2.0 - 2.5	MIN	3	9
2.5 - 3.0	MAX	1	9
>3.0	MAX	2/3	10

NO GAS

SOFT STEEL	0.9 mm Gas Welding Wire		
Workpiece Thickness (mm)	Welding Position	Wire Speed Adjustment	Wire Speed Adjustment
	A	B	C
0.9	MIN	1	5-6
0.9 - 1.0	MIN	2	5-6
1.0 - 1.2	MIN	3	5-6
1.2 - 2.0	MAX	1	6
2.0 - 3.0	MAX	2	7
>3.0	MAX	3	7-8



CONTROL SETTINGS - REFERENCE TABLES

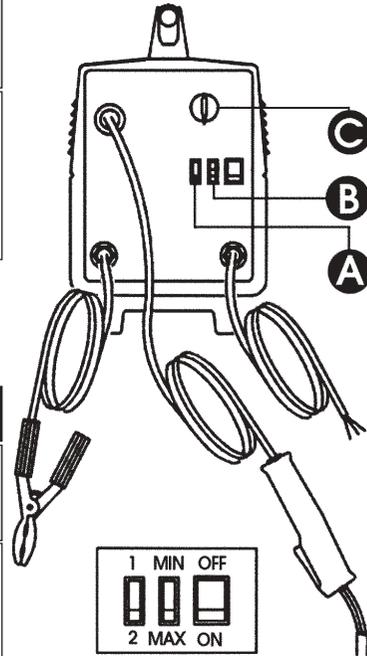
A. MIGs 110E, 110EN, 130EN & 135TE

STEEL	0.6 mm Gas Welding Wire		0.8 mm Gas Welding Wire			
	Workpiece Thickness (mm)	Welding Position	Wire Speed Adjustment	Welding Position	Wire Speed Adjustment	
	A	B	C	A	B	C
0.6 - 0.8	1	MIN	5-6	1	MIN	5-6
0.8 - 1.0	2	MIN	5-6	2	MIN	5-6
1.0 - 2.0	1	MAX	6	1	MAX	6
2.0 - 3.0	2	MAX	7	2	MAX	7

ALUMINIUM	0.8 mm Gas Welding Wire		
Workpiece Thickness (mm)	Welding Position	Wire Speed Adjustment	
	A	B	C
0.8	1	MIN	8-9
1.0 - 2.0	2	MIN	9
2.0 - 3.0	1	MAX	9

NO GAS

SOFT STEEL	0.9 mm Gas Welding Wire		
Workpiece Thickness (mm)	Welding Position	Wire Speed Adjustment	
	A	B	C
0.6 - 0.8	1	MIN	5-6
0.8 - 1.0	2	MIN	5-6
1.0 - 1.2	1	MAX	6
1.2 - 2.0	2	MAX	7



2. Models 151TE and 160EN

Fig.9

These models are provided with an ON/OFF switch, a rotary knob, with graduations marked from 0 to 10, a single two position switch marked Max - Min, and a 3-position rotary switch as shown in Fig.9.

The 10-position rotary switch is used to control wire speed, and the other two switches are used to control the welding current according to the type and thickness of material to be welded, and in accordance with the charts shown in the 'Reference Tables' on pages 24 and 25. Set the controls accordingly.



3. ALL Models

The 10-position wire speed control should be set to 6 to begin with for welding steel, and 9 for welding aluminium, then adjusted as required.

Note: This control is for fine tuning the wire speed. The speed of wire delivery will increase automatically as the current is increased and vice versa. Therefore, once the ideal speed is achieved, by fine tuning, it should not be necessary to adjust this control when the welding current is changed.

It is always better to start with too high a speed, and back off slightly, to avoid the possibility of the wire welding itself to the tip.

D. Trim the Welding Wire

Trim the welding wire so that it protrudes no more than 5mm from the end of the shroud.

E. Attach the Earth Lead

Attach the earth lead to the workpiece with the earth clamp, as close to the point of weld as possible, without it being intrusive.

Ensure there is good contact, if necessary, clean the area with a wire brush beforehand.

————— Your welder is now fully prepared for welding. —————

OPERATION

Plug the machine into the mains supply or switch on at the isolator and ensuring all precautions have been taken and with the machine set up correctly, lower the torch to the workpiece with one hand, whilst holding the welding mask in the other.

Approach the work with the tip at an angle of approx. 45° and pull the torch trigger fully.

As the electrode touches the workpiece, an arc will be struck.....before it is struck, cover the face with the face mask.

Simultaneously gas will be generated, if the wire is flux cored, or gas will be issued if you are gas welding, and the wire will be fed into the molten pool.

Maintain a gap of approx. 5 - 7mm from the workpiece to the tip.

The speed of weld will depend upon the wire speed and welding current. It is advisable to test your settings on a scrap piece of metal with similar characteristics to those of the workpiece. Fine tune the welding speed and/or current flow, as required, until a satisfactory weld is achieved.

Listen to the sound made. An irregular crackling sound denotes too high a wire speed. Decrease the speed until a regular, strong buzzing sound is heard.

Whenever the welding current regulation is changed, a corresponding change in wire speed may be necessary. If the speed is too slow, the wire will weld itself to the tip.

WELDING TIPS

1. Try to maintain the tip of the nozzle at an angle of approx. 45° and at a constant distance of approx 5-7mm from the workpiece.
2. Try to maintain a constant speed of movement with the torch.
3. Do not weld in windy conditions or in an area where ventilation is a problem, or where air flow fluctuates.
4. ALWAYS keep the wire and nozzle clean...NEVER use rusted wire.
5. Avoid sharp bends or kinks in the welding hose.
6. Whenever possible, clean out the wire liner with compressed air when replacing the wire spool.
7. Periodically remove the dust, using LOW PRESSURE compressed air, within the casing. Adequate heat dissipation is essential during the welders operation.

Clarke
INTERNATIONAL

MAINTENANCE

Frequency of maintenance operations depends on the operating conditions, how intensively the welder is used, and how clean or dirty the welding site is (aggressive atmospheres, etc).

Always inspect the cables, both earth return and torch cable, before use to ensure they are in perfect condition.

Ensure the earth clamp is clean and secured correctly to the cable.

Check the gas hose and Pressure Regulator for security and serviceability, and ensure there is sufficient gas to complete the job in hand.

As a general rule the power supply should be inspected internally at least annually. Consult your CLARKE dealer

⚡ WARNING! ⚡
ELECTRICITY CAN KILL
NEVER TOUCH LIVE ELECTRICAL COMPONENTS
DISCONNECT THE POWER SUPPLY BEFORE ALL INSPECTIONS AND
MAINTENANCE OPERATIONS
BEWARE HOT SURFACES.....ALWAYS LET THE POWER SUPPLY COOL DOWN
BEFORE ACCESSING INTERNAL COMPONENTS.

WELDING SHIELD

Always maintain the welding mask in good condition. If the clear glass protection lens becomes badly pitted, sufficient to interfere with vision, or cracked, have it replaced immediately.

Replacement clear and dark lenses are available from your Clarke dealer - see Parts Lists for details. NEVER use any dark filter lens other than that provided by CLARKE International, or one with the same certified 'Optical class' (degree of protection).

The shield should always be cleaned with a clean soft cloth after use, ensuring the lenses are clean. Remove any dust that may have accumulated and store it in a safe place where it cannot be damaged.

NEVER use a shield that is **not** in perfect condition.