R1500

Description

MMA unit

Processes

Important Information

All persons authorised to use, repair or service the R1500 Inverter based welding machine should read the section on safety, before any work is undertaken. Further information is available in publication HSG118 'Electric safety in arc welding', which may be obtained from the Health & Safety Executive. Please contact your distributor should you not understand any of the information within this document.

INSTRUCTION MANUAL 09/14

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Fire and Explosions

Pay attention to fire and safety regulations in force at the welding site.

- Remove all flammable or combustible materials from the welding area and the immediate vicinity.
- Suitable fire fighting equipment must always be present where welding is carried out.
- Be aware that a fire risk is present for a considerable time after welding operations have ceased because of sparks and hot slag etc. Take suitable precautions when you have finished welding.
- Take care when welding containers that have held flammable or combustible material, these should have been specially cleaned before being given to the welder. If in doubt do not weld them.

Burns

Be aware that burns may be the result of the heat involved in the welding process, welding spatter or the Ultra Violet Radiation given off by the arc itself.

- Wear suitable fireproof clothing over all your body.
- Wear protective gauntlets designed for welding use.
- Wear a welding facemask fitted with the correct filter shade suitable for the current at which you will be welding.
- Avoid wearing oily or greasy clothing as a spark may ignite them. Where possible ensure that a suitable first aid kit and a first aid person qualified in the treatment of burns are available nearby.

Fumes

Welding operations give off harmful fumes that are hazardous to your health.

- Make sure the welding area is well ventilated. Use suitable fume extractors or exhaust fans if necessary.
- If the ventilation is not suitable then breathing apparatus may have to be used.
- Do not weld plated metals or metals which contain lead, cadmium, Zinc, Mercury or Beryllium unless you are wearing suitable breathing apparatus.

Electric Shock

- Do not touch live electrical parts.
- Do not work in wet or excessively humid areas and do not site the R1500 on a wet surface.
- Avoid touching the work piece whilst welding.
- Do not use the R1500 without it's protective cover
- Keep your clothing and body dry

Welding and earth return cables

- If using long (above 10 meters in length) earth return and electrode holder cables then they must have a cross sectional area of at least 35mm^2 Only use copper cables, the use of Aluminium cables may have a detrimental effect on the performance of the machine.
- Regularly inspect welding cables and connectors for wear, abrasion and corrosion. Corroded cables and connectors may overheat and become a fire hazard.
- Ensure that all welding connectors are fully mated; the connectors should be pushed fully home and then turned clockwise to lock. If the connectors are not mated fully they may overheat and become a fire hazard.
- If possible, fasten the earth return clamp directly to the job to be welded and ensure that the surface is free from rust and paint.

Further information is available in publication HSG118 'Electric safety in arc welding', which may be obtained from the Health & Safety Executive.

SECTION 2 — SPECIFICATION

2.1 Description

The R1500 is a 150 amp constant current MMA welding machine based on IGBT technology. The inverter drive circuitry operates above the audio frequency spectrum making the R1500 virtually silent in operation.

The high operational frequency also means that the R1500 is able to respond quickly to changing arc dynamics, making for a very smooth stable arc.
The R1500 is capable of welding with all types of electrodes within the current rating of the machine, normally up to 4mm.

The R1500 is able to TIG weld using a TIG torch with a built in gas valve using the 'scratch start' technique.
The R1500 is available in three versions, a dedicated 230v, dedicated 115V and a 115/230V auto switching dual Voltage version.

1.3 Technical data		
Rated Supply Voltage	230 volts single phase 115V/230V/Dual Voltage	
Power Consumption	5.1 KVA	
Supply Current	230v	27.5 amps
	115v	44 amps
Mains Input Fuse	230v	28 amp s slow blow or type C MCB
	115v	45 amps slow blow or type C MCB
Mains Cable	230v	3 x 2.5mm² flexible cable
	115v	3 x 4mm² flexible cable
Output Current Range	15-150 amps	
Duty Cycle at 40°C	150A @100%	
Insulation Class	F	
Degree of Protection	IP21	
H x W x L (mm)	275 x 152 x 415	
Weight (kg)	16	

3. Installation

Positioning the R1500

- Site the R1500 on a clean dry surface, preferably above ground level.
- Make sure there is at least 20cm clearance at the front, rear and sides of the machine to allow good circulation of the cooling air.
- Protect the machine from heavy rain and if used in hot climates, against direct sunlight.
- Ensure that the machine is positioned in such a way that particles created by grinding and cutting operations do not enter the machine.

Note! Damage caused by metal particles and water entering the machine is not covered under warranty.

Connecting to mains supply

WARNING! All electric shocks are potentially fatal; a competent electrician should undertake the fitting of the mains plug.

Note! The Dual Voltage version of the machine is fitted with circuitry that senses the mains input voltage and automatically configures the machine. This requires no changing of tapping points inside the machine or intervention on the operator's part; just fit the relevant type of mains plug for the supply the machine is to be used on.

- Make sure that the mains supply is of the correct voltage and current capability for the machine.
- Make sure that the mains cable and any extension cables used are of sufficient current carrying capacity.
- Make sure that the mains plug and socket (if fitted) are in good condition. If the machine is wired directly to the mains supply then an isolator switch must be fitted

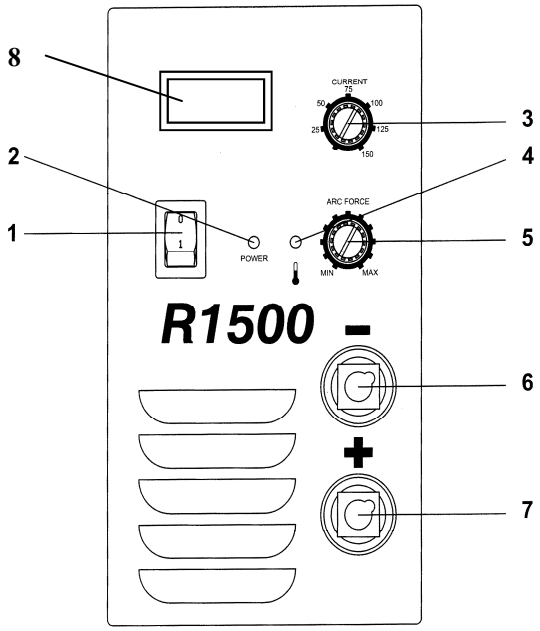
IMPORTANT! Primary cable length

Long extension cable lengths may reduce the performance of the machine; the welding arc may become unstable especially at higher currents. Ensure that the mains cable is not coiled up when you are welding.

Note! See the technical specifications page for correct supply information

SECTION 4 — OPERATION

4.1 Operational Controls and Connections



4.2 Description of controls

1 On-Off switch
Upon switching on, the overload indicator will light, after 15 seconds the overload indicator will extinguish and the machine is ready for use.

2 Power on indicator
Indicates that the machine is connected to the mains supply and turned on

3 Current control
Sets the output current of the R1500

4 Overload indicator
Indicates that the thermal cut-out has operated (see the fault finding and maintenance section for possible reasons)

5 Arc-force control
Operates in MMA mode only and controls the welding dynamics of the machine to facilitate welding with different types of welding electrodes Turning clockwise will increase penetration at the expense of increased welding spatter, turning anti-clockwise will reduce penetration but the arc will be smoother and less fierce.

6 Negative weld output connector.
Main welding power output connector, negative polarity.

7 Positive weld output connector
Main welding power output connector, positive polarity.

8 Digital Display
Displays the set welding current.

4.3 Operation

MMA Welding

- For straight polarity welding, connect the electrode holder to the positive weld terminal and the earth return lead to the negative weld terminal. For reverse polarity welding, reverse these connections.
- Press the mains switch to the on position, the power-on and overload indicators will light. After approximately 15 seconds the overload indicator will extinguish and the machine is ready to weld.
- Turn the current control to the recommended setting for the size and type of welding electrode to be used.
- When welding, adjust the Arc-force control to achieve the arc condition you require.
- The R1500 is suitable for welding all types of electrodes within the current rating of the machine, normally up to 3.2 or 4mm depending on the type of rod.

SECTION 5 — FAULT FINDING AND MAINTAINANCE

5.1 Machine operation

Most problems with the operation of the R1500 can be overcome by following the procedures below.

No power-on indicator on switch on.

- Check that the machine is attached to a working mains supply and that it is correctly plugged in and any isolator switch is closed.
- Have a competent electrician check that there are no fuses or overload devices interrupted, that the mains plug is fitted correctly and that there are no loose wires or connections, check that there are no breaks in the mains cable.

Power-on indicator lit but no output.

- Make sure that the overload indicator goes off after 15 seconds. If not see below.
- This indicator must be off for normal operation. If on it indicates that the R1500 has overheated and the power stages of the R1500 have been shut down so you will get no current output.

In normal climate conditions (40°C and below) the R1500 has a 100% duty cycle so operation of the thermal cut out indicates that the inside of the machine is likely to be choked with dust and therefore not being cooled properly.
In Hot climates (above 40°C) it may indicate that you are exceeding the duty cycle of the R1500.
Leave switched on for a few minutes and the R1500 should return to normal operation, do not switch the R1500 off as this will stop the operation of the cooling fan and greatly extend the cool down period.

Frequent tripping of the thermal cut-out, especially at low current settings is indicative that the inside of the machine is likely to be choked with dust.

For information about cleaning the dust out of the R1500 please refer to the relevant part of the next section.

Any operating problems not covered above should be referred to a trained Newarc service engineer or returned to the factory for repair.

5.2 Maintenance

Note! All Electric shocks are potentially fatal, switch the machine off and disconnect from the power supply before undertaking out any maintenance work.

- It is very important that the R15000 is regularly maintained. The amount of use and the working environment must be taken into account when scheduling the maintenance periods.
- Careful use and regular preventative maintenance will prolong the life of the machine and ensure trouble free operation.

5.2.1 Weekly

- Clean the exterior of the machine
- Inspect the machines exterior for obvious signs of damage.
- Check the condition of the welding cable, earth clamp, welding output and power in connectors for damage and any sign of over-heating.
- Check the condition of the mains lead and plug.

5.2.2 Three monthly

As per the weekly schedule, plus:-

- Remove the side covers from the machine. Remove the build up of dust and debris from inside the machine, particularly from the Heat-sink extrusion, by use of either compressed air at reduced pressure or an industrial type vacuum cleaner.
- Make a thorough visual inspection of the interior of the machine, look particularly for pieces of welding wire, or stubs of old welding rods that may have got through the cooling air intakes.
- Check the condition of the welding output connectors, look for any signs of discoloration. This could be an indication of overheating and can be a cause of welding set failure.

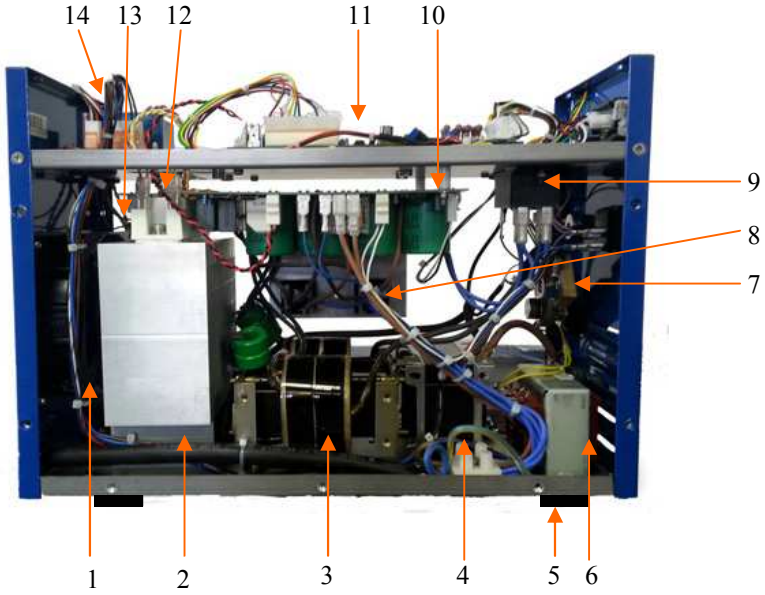
5.2.3 Annually

As per the three monthly schedule, plus :-

- Have the machines calibration checked, if necessary have the machine re-calibrated by a Newarc trained technician.

SECTION 6 — PARTS BREAKDOWN

6.1 Parts Locations



6.2 R1500 Parts list

Item no.	Description	Part No.
1	Cooling fan (230Vac)	M00311A
2	Diode module (behind bracket) (2 per machine)	M60121
3	Main transformer (quote serial number of machine when ordering)	M90136A
4	Secondary Inductor	M90133
5	Plastic feet (4 per machine)	M00096
6	Auxiliary transformer	M00305
7	200A Shunt	M00309
8	Diode bridge (2 per machine)	M60079
9	24v relay (Dual voltage only) (quote serial number for correct version)	M70026
10	Main PCB (Dual voltage or 110V model) Main PCB (230V model)	M90148/1 M90125/A
11	Control PCB (Display version)	M90127B-R1500
12	IGBT module	M60074
13	Thermostat (80°c)	M00332/80
14	Auto-switching PCB (Dual voltage only)	M90691
15	Digital display unit	M01916
16	Rocker switch	M70069A
17	Panel mount DIX type connectors (2 per machine)	M00037
18	Arc-force control potentiometer (470K linear)	M20099
	Control knobs	M00033A
19	Current control potentiometer (10K linear)	M20105
	Control knobs	M00033A
Misc.	2 amp, 20mm fuse (Quick blow)	M00274

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Waiver

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