

Viper2000



Description

TIG unit

Processes



Important Information

All persons authorised to use, repair or service the VIPER2000 tig unit, 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 03/14

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1.1 Servicing Hazards

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 undertaken.
- 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 made available to the welder. If in doubt do not proceed.

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 flame retardant 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 breathing apparatus approved for the purpose.

Electric Shock

- Do not touch live electrical parts.
- Do not work in wet or excessively humid areas.
- Avoid touching the work piece whilst welding.
- Keep your clothing and body dry.

The safe handling of gas cylinders

The VIPER2000 TIG units use argon gas during TIG welding. This is an inert gas and can displace oxygen in the atmosphere leading to asphyxiation.

- **Note!** Gas cylinders are under pressure and can explode if punctured. Please ensure the cylinder is secured in a stable location away from any heat source or potential mechanical damage.
- Always place gas cylinder on the rear shelf of the power source and securely fasten it using securing chain supplied, if it is not desired or possible to place the cylinder on the cylinder carrier of the power source then the cylinder must be securely fastened to a wall or placed in a specially designed cylinder carrier.
- Do not use gas cylinders whose contents you are unsure of.
- Check the gas cylinder, pressure regulator and gas hoses regularly for leaks and discard any suspect item.
- Do not connect directly to a gas cylinder without using a pressure-reducing regulator designed for use with argon.
- Always install and use pressure regulators in accordance with the manufacturers instructions
- It is advisable when attaching the regulator to the gas cylinder to briefly turn on the cylinder valve to expel any foreign objects that may be present. These may later block the solenoid valve of the machine if not dealt with. Turn your face away from the cylinder valve when undertaking this action.
- Always turn off the valve on the gas cylinder when you have finished welding.

Further information is available in publication HSG118 'The safe use of compressed gases in welding, flame cutting and allied processes' which may be obtained from the Health & Safety Executive.

Welding and earth return cables

- Earth return and electrode holder cables must have a cross sectional area of at least 35mm².
- 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 then 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.

2.1 - Description

The Viper 2000 is a compact D.C. TIG arc ignition unit providing contactor, gas timing and high frequency arc initiation facilities. The Viper 2000 uses state of the art electronics and microprocessor technology. It is rugged and reliable and is built to withstand typical site conditions. The Viper 2000 draws power from the welding cables and requires no auxiliary supply cables.

Standard features:

- Solid state arc ignition
- Contactor control of current
- Gas flow solenoid
- Torch switch latching
- Gas flow-meter option
- Reverse polarity protection

Technical Data	
Duty Cycle	200A @ 100%
Input Voltage	40 – 100 volts D.C.
Weight (kg)	5Kg
Dimensions	Height - 210mm
	Width - 127 mm
	Length - 322mm

SECTION 3 — INSTALLATION

Site the Viper 2000 on a clean dry base preferably above ground level. Ensure that the ventilation louvers on the side of the unit are not obstructed. Protect the machine against heavy rain.

Frequently inspect the interconnection cables and welding torch and repair any defects immediately.

3.1 - Connection to Power Source

The DC TIG process uses negative torch polarity with the work piece connected to the positive outlet of the power source. Connect the power cables as below: -

- Connect the negative cable from the power source to the bottom left connector on the rear of the unit. (-) input
- Connect the positive cable from the power source to the bottom right connector. (+) input
- Connect the welding ground to the uppermost right connector. (+)

3.2 - Connection of the Gas Hose

A gas hose suitable for use with pure argon should be connected between the pressure reduction regulator and the gas connection at the rear of the unit, do not over tighten!

Note: - the Viper 2000 requires a suitable flow meter to be fitted to the pressure reduction regulator.

Note: -The pressure reduction regulator should be set at approximately 5 Bar.

4.1 Front Panel Controls

1. Power switch, the power switch disconnects the internal electronic circuitry from the welding supply voltage. Note! The welding cables will still be live if the power source is switched on.
2. Power indicator, the power indicator will illuminate green when the power is switched on. If the power indicator illuminates red then the welding input cables are incorrectly connected and should be reversed. No damage will be caused if the power cables are incorrectly connected but the unit will not work.
3. Latch switch, the latch switch switches between the two different torch switch modes. In the off position the torch switch must be pressed and held during welding. In the on position the torch switch may be pressed and released during welding. To stop welding the torch switch must then be pressed and released again.
4. Flow meter, the flow meter gives an indication of gas flow and allows the gas flow rate to be adjusted from the front panel of the unit.

Note: - Do not over tighten the control knob as damage may occur to the flow-meter valve seat, note that if the control knob is unscrewed too far air may enter the valve assembly and may cause porosity or contamination of the weld.

4.2 Gas Control

Gas pre-flow, the Viper 2000 provides pre and post timing of gas flow using an internal gas solenoid. When the torch switch is operated for the first time there will be 0.25-second purge of shielding gas before the contactor and arc ignition circuits are energized. This initial delay is to ensure that the argon lines and welding torch are purged of air before welding commences.

Note: - for example, if the gas is already flowing after the end of a weld then both the contactor and arc ignition circuits will energize immediately upon pressing the torch switch.

If an arc is not struck within 5 seconds of pressing the torch switch gas solenoid, contactor and arc ignition will be turned off, releasing the torch switch will reset the sequence.

Gas post-flow, when the torch switch is released at the end of a weld the shielding gas will continue to flow for approximately 15 seconds to allow an inert gas shield to be present whilst the weld cools down. This prevents oxidization of the weld pool and contamination of the tungsten electrode.

4.3 Contactor

The internal contactor allows the welding current to be switched on and off by means of the torch switch. If the tungsten electrode is inadvertently touched into the weld pool whilst welding then the contactor will turn off the welding current. This reduces the possibility of tungsten inclusions in the weld. To avoid further weld pool contamination during this period shielding gas coverage is maintained until the torch switch is released.

4.4 Arc initiation

The arc ignition system used in the Viper 2000 displays a positive arc-striking characteristic over the full input voltage range of the unit. This excellent striking characteristic is achieved by using state of the art electronic techniques. As the arc ignition system does not require a spark gap for its operation it is virtually maintenance free.

5.1 Maintenance

Warning!

All electric shocks are potentially lethal. Disconnect the Viper 2000 from the power source and wait 5 minutes for internal capacitors to discharge before removing the outer casing.

User maintenance is limited to the following items: -

Regularly clean the exterior of the unit of dust and dirt. Build up of dirt around the torch connection may lead to high voltage tracking.

Regularly check the condition of welding cables, torch and gas hose.

Periodically clean dust and debris from the inside of the unit. This should be done using a soft brush and vacuum cleaner. Do not use compressed air at high pressure. Try not to dislodge any cable connectors while cleaning the inside of the unit.

5.2 Fault Finding

Unit appears to be dead – ensure that both power source and Viper 2000 are switched on. If the power indicator is not lit then check for breaks in the power cables. If the power indicator is red then the power cables need to be reversed. If the power indicator is green then the power cables are correctly polarized.

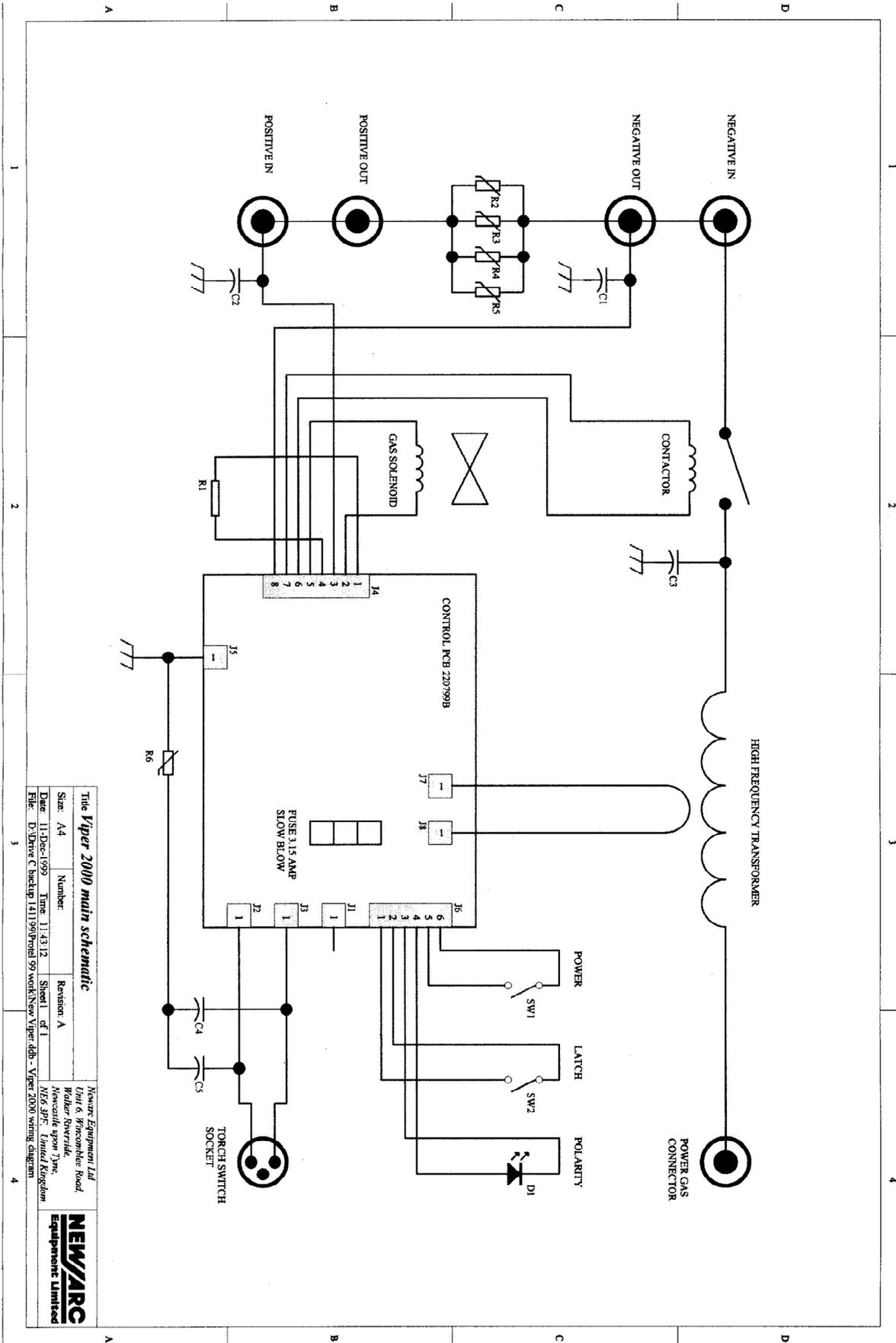
Porosity (holes) in weld - generally caused by lack of shielding gas, but could also result from contamination (oil, grease, paint or rust). Check for too low or too high a flow rate.

H.F. but arc will not strike – ensure that the work earth lead is connected to the positive output connector on the rear of the machine. Check that the correct shielding gas is being used. Check for too low or too high a gas flow rate.

Unit is sluggish in operation – if the operation of the unit seems sluggish then this may be due to a low supply voltage. Check that the supply voltage to the unit is in the range of 40 to 100 volts. Voltages outside this range may result in erratic operation or cause damage to the unit.

SECTION 6 — ELECTRICAL DIAGRAMS

6.1 - System Diagram

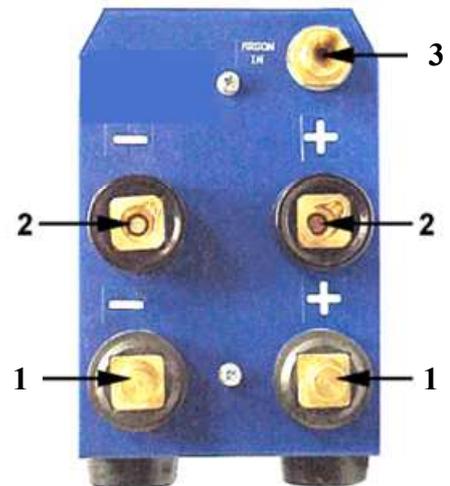
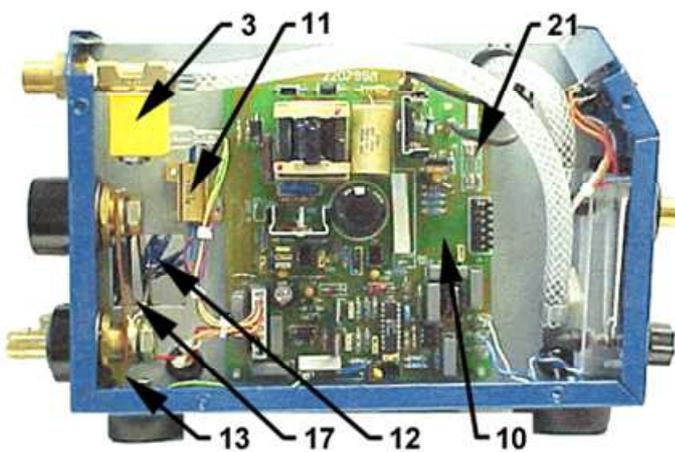
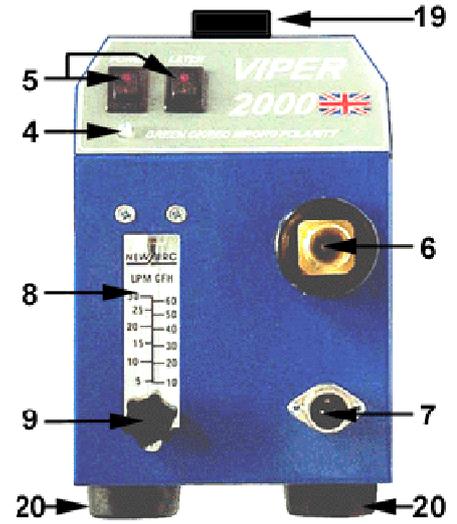
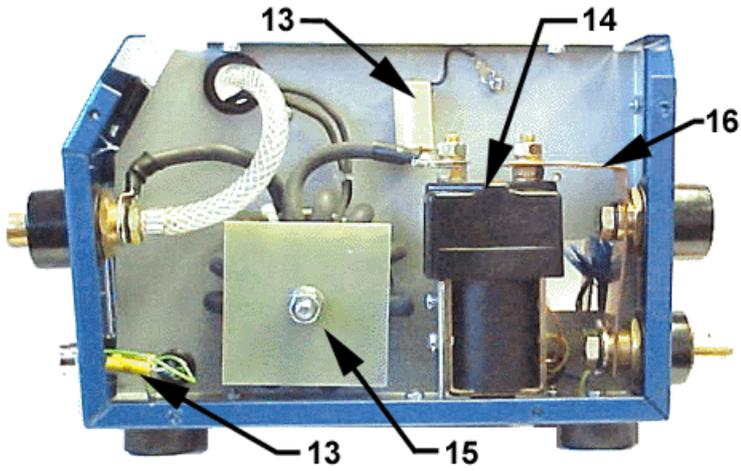


VIPER2000

Title Viper 2000 main schematic		Newarc Equipment Ltd Unit 6, Kingsholm Road, Walker Riverside, Mossdale upon Tyne, NE6 3PF, United Kingdom	
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Date: 11-Dec-1999	Time: 11:43:12	Sheet 1 of 1	
File: D:\Drive C\Backup 141199\Printed 99 work\New Viper.dbb - Viper 2000 wiring diagram			

SECTION 7—PARTS BREAKDOWN

7.1 - Component Locations



SECTION 7—PARTS BREAKDOWN

7.2 - Parts List

Item #	Description	Part no.
1	Input connector (male DIX)	M00036
2	output connector (female DIX)	M00037
3	Gas solenoid assembly 48V version up to serial number V0904850 24V version from V0904851 to NCL0009811 24V version from serial number NCL0009812	M90184 M90183 M90176
4	Power indicator LED	M60152
5	Power switch	M70050
5	Torch latching switch	M70050
6	Power gas connection 3/8" BSP	M00041
7	Torch switch socket	M00064
8	Argon flow meter	M00018
9	Flow meter control knob	M00019
10	Main PCB	M90473
11	Power resistor 470R	M20032
12	VDR assembly	M90474
13	HF bypass capacitor (3 per machine)	M40076
14	Contactator	M70070
15	HF inductor assembly	M90479
16	Negative bus bar	M90499
17	Positive bus bar	M90500
19	Molded handle	M00026
20	Mounting feet (4 per machine)	M00096
21	Fuse 3.15 amp slow blow	M00020
	Torch switch plug	M00063



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