



# MASTERWELD

## Instruction manual

## Installation & use of

## VRD450i

# Voltage reduction device for MMA welding

**CAUTION BEFORE INSTALLING OR OPERATING THIS MACHINE ENSURE ALL INSTRUCTIONS AND WARNINGS HAVE BEEN READ AND UNDERSTOOD.**



### **Description**

VRD 300i & 450i are quality British made hazard reducing devices to comply with BS EN IEC60974-1.

MMA welding power sources have high open circuit (no load) output voltage, typically between 65-120V this is a risk to the operator & can cause serious injury in some situations.

VRD models reduce the no load output voltage to below 24V when welding is not being carried out. This lower voltage significantly reduces the risk to the operator, this is especially important when welding in areas of increased hazard such as mines, shipyards, offshore industries etc.

These models work with both AC and DC type welding power sources & the output voltage from the VRD will be the same as the input, therefore if AC input there will be AC output voltage present.

The switch on/off point is just below 200Ω in accordance with the IEC standard.

The VRD is protected to IP21 & is suitable for use inside, for outside use an additional shelter is required.

### **Technical specifications**

Power source	OCV 50 – 100 V AC or DC (max 120V peak).
Amperage rating – 300i	300A@60%, 250A@100% AC or DC
Amperage rating – 450i	450A@60%, 350A@100% AC or DC
Reduced OCV	Less than 24 V AC/DC
Switch on/off point	Below 200Ω
Operating time T1	(start time available after touch down) 0-1 sec (0.8 as standard)
Operating time T2	0.3 seconds
Enclosure type	Steel case with powder coated finish

### **Declaration of conformity – VRD300i & 450i models**

This equipment is manufactured to comply with LVD2014/35/EU, for use with power sources in accordance with BS EN 60974-1.

This equipment is manufactured to RoHS directive 2006/95/EU



Date 21/07/2025

Lloyd Robertson

A handwritten signature in black ink, appearing to read 'Lloyd Robertson'.

Materweld Equipment UK Limited

Didcot UK

## **Safety**

This equipment is designed for use only by experienced operators only.

All users must be competent & familiar with welding processes and safe electrical practices.

Before using this product you should carry out a risk assessment & take appropriate action to minimise all risks.

Some of the risks involved are listed below.

- Risk of burns & eye damage.
- Risk of electrocution.
- Risk from inhalation of welding fumes.
- Risk of fire caused by welding sparks etc.
- Risk from installing & using welding gas & cylinders.
- Risk of pacemaker malfunction from strong magnetic fields.
- Risk of bodily crush damage from wire drive system gears & rollers.
- Risk from build up of gas in confined spaces.
- Risks from welding wire, sharp wire can cause blindness or other injury.
- Other risks may be present.

The British Health and Safety Executive publish good information regarding this please see

[www.hse.gov.uk/welding/other-welding-risk.htm](http://www.hse.gov.uk/welding/other-welding-risk.htm)

Check for your local rules & guidelines for safe practices.

This machine is designed for use indoors.

For outdoor use this machine must be sheltered from rain.

Only use this machine in the upright position.

If this unit is used with tig feed wire feed unit and it is to be mounted at any height such as on a boom arm etc care must be given to safe mounting methods.

In the event of mounting this at height some additional restraint of the wire spool is necessary as the wire spool holder is not designed to safely support a wire spool over head & there is a risk of severe injury from a falling spool.

Do not try to connect this unit to any other supply other than what's marked on the rear.

Always keep this machine maintained in accordance with this manual & good workshop practice.

**DO NOT TAKE ANY UNNECESSARY RISKS**

## **Pre installation & EMC information**

The installer of this equipment must make an assessment of the area before installing.

Welding power sources & processes are inherently noisy.

It is the user's responsibility to ensure that if any electromagnetic disturbances are detected to resolve this before continuing.

As with other welding equipment it is preferable to use this machine as far away as possible from sensitive electrical or electronic equipment such as computers, telecom equipment, safety critical equipment, transmitters and receiving equipment etc.

This machine is designed for use in industrial environments in conjunction with welding & cutting power sources, when used in other environments there could be potential difficulties with electromagnetic interference with other equipment.

Consideration must be also given to other premises as the emissions may not be limited to the installed premises.

Any emissions are most likely to arise from the actual welding power source or the arc & not from the AVC.

The following are methods to reduce emissions.

- 1) Keep all welding cables short close together and at ground level.
- 2) Equipotential bonding of metal components in the work area and bonding of the work piece can be considered however there are electrical safety implications for the operator with increased risk of shock if the electrode is touched; therefore, it is important the operator is aware and adequately protected from making contact with the work and the electrode. **Before bonding the area and work piece consult an experienced electrician.**
- 3) This equipment must be properly maintained and all screws holding the sides etc kept in place.
- 4) Sometimes it may be necessary to fit additional mains input filters or even screen the cables and / or work area. This will involve consulting an experienced engineer.

## **Installation**

The VRD must be mounted vertically using the fixing points at the rear, either directly onto the power source or close to the power source.

Both outputs from the power source need to be connected inside the top of the VRD. The VRD is not polarity conscious so can accept DC electrode negative or positive or AC input.

The electrode connection from the power source must connect to the contactor input as marked inside, the electrode holder lead must connect to the contactor output terminals as marked.

The work return lead from the power source (earth lead) must connect inside the VRD & the actual work lead (earth lead) to the job connects to the same point inside. Therefore, the work lead (earth) is a loop in & out connection.

All connections must be in the correct size cable for the welding application & all connections tightened carefully.

There are 2 cable glands for the input & two for the outputs these should be tightened a little to grip the cable.

## Using the VRD450i

Make sure the unit is connected correctly as above.

When welding power is present the green ready light on the front should be illuminated.

The VRD is now ready for use.

With any VRD unit connected to a welding machine there is a short delay time at start up compared to using no VRD. This delay is only a few milliseconds & with experience operators quickly adapt to using equipment with a VRD connected with no noticeable reduction in productivity.

The electrode should be momentarily scratched on the work & very quickly the VRD senses this & switches on full power to commence welding.

When the electrode is pulled away and the arc snaps out the VRD reduces the voltage to below 24 V within 0.3 seconds.

The Red warning light on the VRD illuminates if the output voltage exceeds approx. 45-50V, this should flash once at the end of every weld.

An additional benefit of the VRD450i is in the event of the electrode sticking to the work the VRD switches off the power thus enabling the electrode to be freed easily and without the normal arcing.

The VRD constantly monitors the no load voltage, in the event of a fault i.e. over voltage the red warning light on the front of the VRD will illuminate constantly, if the red light is on do not use the equipment, remove from service and investigate.

As mentioned previously the red light will flash briefly at the finish of every weld, this is normal and confirms that this warning circuit is functioning, it is highly recommended to carry out a daily check of the red light status before use.

It is also strongly recommended that this unit is checked for correct operation by a competent person on a regular basis as in the unlikely event of a fault on this unit could expose the operator to the full no load welding voltage of the power source.

The operating time T1 (starting time) is set internally on the PCB; adjustment is possible and may be required for some applications. However, the VRD is set to comply with EN standards and adjustment must be made with care, and by a competent person with understanding of the technical operation of the unit. T2 time is set to 0.3 seconds in accordance with the current standard.

### **Note;**

From November 2020 onwards some specifications have been updated to comply with the latest standard IEC60974-1

## **Maintenance**

The VRD450i is designed to be very reliable, however the operator should carry out regular checks of all cables and connections & check the warning light is operating correctly; any faults must be reported to a competent person and the machine taken out of service until repaired.

It is advisable to have a planned maintenance schedule set up to inspect the internal components of the VRD every year or every 6 months in harsh operating conditions.

## **Spare parts**

All parts are available from the supplier or direct from the manufacturer Masterweld Equipment UK Limited

## **Notes**


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