



Temperature Technology Ltd.



SR50 Bench Portable Welder Operations & Instruction Manual

Whatever stage of development your production line is in, TTL have the products to help you produce temperature sensors quicker, easier and more efficiently.

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Operating Instructions

1.0 What is Capacitance Welding?

An electrical charge at a preset energy level is stored. This charge is then released across two electrodes, the positive electrode being the workpiece. This discharge of stored energy is sufficient to weld the workpiece.

Capacitance welding is generally used for the welding of similar and dissimilar wires (thermocouple junction welds) and for impact welding wires to a conductive material.

2.0 Installation and set up.

2.1 Mains connection.

The SR50 is a battery / mains powered device. If running from mains power connect the mains adaptor to the charger socket on the front instrument panel. The mains adaptor should then be connected to a standard 240V / 50Hz supply unless otherwise stated.

2.2 Re-charging of batteries.

The batteries will need re-charging once the "BATT OK" light in the instrument panel fails to be illuminated. The mains adaptor should be connected to the charger socket on the front panel. The mains adaptor should then be connected to a standard 240V / 50Hz supply unless otherwise stated.

The SR50 should be charged for approx. 4 hours. Please note that the SR50 can be used whilst re-charging (ie running from mains powers) but re-charge time will be increased.

2.3 Footswitch connection.

If using the footswitch, plug the 3.5mm jack into the "Foot Switch" socket on the instrument panel.

2.4 Wire holding pliers connection.

Plug the wire holding pliers into the red "POS" socket on the instrument panel.

3.0 Operation and controls.

3.1 Initial settings.

Switch on the unit via the "POWER" switch on the instrument panel (see 2.2 for battery charging) and the green lamp will be illuminated.

Adjust the "ENERGY" level by using the potentiometer to a sufficient level, appropriate to the size of wires to be welded.

Operating Instructions

3.2 Preparing wires.

Insulated wires should have their insulation stripped sufficiently to allow at least 2mm to protrude when gripped in the pliers. They should be laid side by side and in contact and the ends square and level. With smaller diameter wires it will be found advantageous to twist them together before trimming. This also applies when welding stranded wires together or stranded wires to solid wires, e.g. when fitting flexible leads to platinum detectors.

3.3 Weld action.

The "WAIT" lamp will illuminate whilst the energy level is being reached. Once this light has gone out, the SR50 is ready to weld.

With the wires to be welded gripped in the wire holding pliers, bring the wires up to the carbon electrode (positioned centrally on the panel) until just in contact with.

The weld switch or foot switch may now be pressed after which the capacitors will discharge.

During recharging the red 'WAIT' lamp will be illuminated and welding is prevented before the recharging is complete.

4.0 Specific applications.

4.1 Thermocouple junctions.

Thermocouple junction welds are the most common application for the SR50 and as such the instructions given under 3.3 should be followed.

In summary, the thermocouple wires should be prepared as stated in 3.2. The prepared wires should then be gripped in the wire holding pliers, making sure that they are in contact with each other and then held lightly against the carbon electrode. The weld switch (or footswitch) is then depressed, the resulting discharge will weld the wires thus forming the thermocouple junction. See fig 4.1



Fig. 4.1
Thermocouple
Junction

4.2 Impact welding.

This is the term used for welding wires to a metal (conductive) surface. This type of application is common when thermocouples are required to be welded to a chassis or framework for testing or heat treatment applications.

The electrode housing should be removed and the welding clip attachment should be plugged into one of the exposed sockets on the instrument panel. The clip should then be attached to the surface close to where the wires need to be attached. (It should be noted that the electrode housing can also be extended by means of a wire attached to exposed sockets and the rear of the housing.)



Fig. 4.2
Impact Weld

The prepared wires are then gripped in the wire holding pliers and then pressed on to the surface to which they are to be attached.

Operating Instructions

The weld switch (or footswitch) is then depressed and the resulting discharge will weld the wires to the surface after which the weld clip can be removed. See fig.4.2.

4.3 Pt100 elements.

The SR50 can be used for attaching wires to Pt100 (or other types of sensing element) to manufacture resistance thermometers.

Where possible, the element lead wires should be lightly twisted around the prepared extension in reversed plane (see fig 4.3a) wires to ensure a good contact. These wires are then gripped in the wire holding pliers. If the wires cannot be twisted (eg if using a multicore cable) then hold in pliers in a 'V' shape.

The wires should then be held lightly against the carbon electrode and the weld switch (or footswitch) should be pressed. The resulting discharge will weld the wires.

The element wires can then be straightened (see fig 4.3b) and insulated as appropriate.



Fig 4.3a



Fig 4.3b

4.4 Weld quality.

Examine the weld using the magnifying glass supplied. A good weld will produce a spherical ball of metal on the end of the wires. A flat bridge between the wires indicates too low an energy setting. A flattened hemisphere indicates that the energy setting is too high.

5.0 Specifications.

General Specifications:

Energy output: 0 to 50 Joules.

Weld capacity: Up to 2 x 1 mm dia.

Battery life: At least 500 welds on full power.

Charging time: 4 hours.

Weight: 4Kg.

Dimensions: 310 x 230 x 120mm.

Operating Instructions

Indicators and Controls:

LED indication: Indicates battery status.
Wait lamp: To prevent premature discharge.
Weld switch: Releases energy from capacitors.
Potentiometer: Sets energy level.
On/off switch and power on indicator.

Accessories included:

Mains powered battery charger.
Plier electrodes.
Impact Weld Clip.
Welding goggles.

Accessories optional:

Footswitch.
Tweezer Electrodes.

6.0 Maintenance.

Apart from carbon electrode replacement, the SR50 contains no user serviceable parts. In the event of failure, please return the welder, carefully packed, to the distributor from which it was purchased who will arrange for the necessary repair.

6.1 Carbon Electrode Replacement.

After considerable use, the carbon electrode will need attention. The carbon may be trimmed in a drill or lathe chuck using a metal file to give an included angle of about 30° with the tip approx. 2mm dia. To remove the carbon electrode, simply undo the thumbscrew at the top of the electrode housing and remove the electrode. When fitting a new or trimmed electrode, insert it into the holder and tighten the thumbscrew (do not overtighten).

7.0 Safety and tips.

Accidental over-setting of the energy level can result in flying particles and it is strongly recommended that the welding goggles supplied are used at all times to prevent arc-eye.

If the pliers become pitted or soiled, clean the faces by pulling through a piece of folded fine emery paper whilst applying slight pressure to the handles.
Keep a notebook by the welder and make a record of the settings for each type of job, noting wire size, materials, energy range and meter reading.

Checklist

- WELDER UNIT FUNCTION CHECK.....
- 1 x MAINS ADAPTOR.....
- 1 x SET OF WELDING PLIERS
- 1 x INSTRUCTION MANUAL.....
- 1 x MAGNIFYING GLASS
- 3 x SPARE CARBON ELECTRODES (one fitted).....
- 1 x PAIR WELDING GOGGLES.....

SERIAL NO.:

CHECKED BY:

DATE:.....



CE Marked.

The HSC-1 complies with EMC directives and safety requirements.

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