

SEALEY POWER WELDERS

INSTRUCTIONS FOR ELECTROSPOT Model 3000

Thank you for purchasing a Sealey Welder. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.

IMPORTANT: BEFORE USING THIS PRODUCT, PLEASE READ THE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS, AND CAUTIONS. USE THIS PRODUCT CORRECTLY, AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE, OR PERSONAL INJURY, AND WILL INVALIDATE THE WARRANTY.

(The use of symbols in this document is to attract your attention to possible danger, and reminders, the symbols and warnings themselves do not eliminate any danger, nor are they substitutes for proper accident prevention measures).

1. SAFETY INSTRUCTIONS

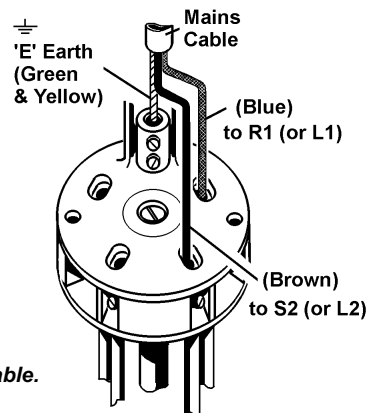
1.1. ELECTRICAL SAFETY.

WARNING! ELECTRICAL INSTALLATION OF SPOT WELDER TO A 3 PHASE 415VOLT SUPPLY MUST ONLY BE CARRIED OUT BY A QUALIFIED ELECTRICIAN. Make sure the power supply cable is correctly connected to the Earth. It is the user's responsibility to read, understand and comply with the following:

You must check all electrical equipment and appliances to ensure they are safe before using. You must inspect power supply leads, plugs and all electrical connections for wear and damage. You must ensure the risk of electric shock is minimised by the installation of appropriate safety devices. An RCCB (Residual Current Circuit Breaker) should be incorporated in the main distribution board.

You must also read and understand the following instructions concerning electrical safety.

- 1.1.1. The **Electricity At Work Act 1989** requires all portable electrical appliances, if used on a business premises, to be tested by a qualified Electrician at least once a year by using a Portable Appliance Tester (PAT).
- 1.1.2. The **Health & Safety at Work Act 1974** makes owners of electrical appliances responsible for the safe condition of the appliance, and safety of the appliance operator. **If in any doubt about electrical safety, contact a qualified electrician.**
- 1.1.3. Ensure insulation on all cables and product itself is safe before connecting to mains power supply.
- 1.1.4. Ensure that cables are always protected against short circuit and overload.
- 1.1.5. Regularly inspect power supply, leads, plugs and all electrical connections for wear and damage, especially power connections, to ensure that none are loose.
- 1.1.6. **Important:** Ensure the voltage marked on the product is the same as the electrical power supply to be used. A three phase plug must be fitted to this machine.
- 1.1.7. DO NOT pull or carry the powered appliance by any of the input or output cables.
- 1.1.8. DO NOT pull power plugs from sockets by the power cable.
- 1.1.9. DO NOT use worn or damage leads, plugs or connections. Immediately replace or have repaired by a qualified Electrician.
- 1.1.10. DO NOT use this product with a cable extension reel.
- 1.1.11. **This product must be fitted with a 3 phase plug according to the above diagram, and will require a minimum of 16AMPS per phase, (preferably 32AMP) electrical supply. You must contact a qualified Electrician to ensure an appropriately fused supply is available.**



THIS UNIT HAS 'SINGLE PHASE CABLE' BUT WORKS OFF 2 PHASES AND THE EARTH OF A 3 PHASE SUPPLY.

Connect GREEN/YELLOW wire to Earth 'E'

Connect BLUE wire to R1 (or L1) Terminal, (in this case the blue wire will act a a live connection).

Connect BROWN wire to S2 (L2) Terminal, (The brown wire is also a live connection).

When completed, check there are no bare wires, that all wires have been connected correctly and the cable restraint is tight.

1.2. GENERAL SAFETY **Note: Spot welding produces sparks and fused metal projectiles and fumes which are dangerous.**

WARNING: unplug from the mains power supply before performing maintenance or service.

- 3 Ensure the welder and all cables are in good order and condition.
- 3 Replace or repair damaged parts. *(use genuine parts only, non authorised parts may be dangerous and will invalidate the warranty).*
- 3 Keep the welder clean for best and safest performance.
- 3 Locate the welder in an adequate working area for its function, and ensure good ventilation is provided.
- 3 Keep working area clean and tidy and free from unrelated materials, and ensure there is adequate lighting.
- WARNING: ensure no flammable or combustible materials are near the work area. Welding containers or pipes which hold, or have held dangerous gases or substances may cause explosion or fire. Materials cleaned with chlorinated solvents, or varnished surfaces pose danger of toxic fumes.**
- WARNING: Spot welding generates strong magnetic fields. Take great care to ensure there are no items near your work area that may be attracted to welding process, and ensure there are no items that may be damaged or adversely effected by operating welder.**
- WARNING: Electronic watches may be damaged. Persons wearing heart pace-makers must not operate, or be in area of welder.**
- WARNING: You MUST use an appropriate shaded lens welding face mask, such as the Sealey SSP9, or SSP10.**
- DANGER! permanent eye damage may result if you do not use correct protection. Also wear safety welding gauntlets, and dry oil free safety protective clothing to protect yourself from sparks and hot droplets of fused metal. Cover exposed flesh to avoid potential burns from the arc's ultraviolet rays.**
- 3 The operator must be fully trained in the use of the welder and must be aware of the machines potential dangers.
- 3 The working area must be closed off in order to keep non essential persons at a safe distance from the welding operation. Persons within the work area are subject to the same dangers as user.
- 3 Remove ties, watches, rings, and other jewellery, and contain long hair.

- 7 DO NOT operate the welder if it or its cables are damaged.
- 7 DO NOT hold or touch the pieces to be welded. All work pieces must be suitable clamped or harnessed or held in suitable devices which will enable moving and positioning of any parts to be welded.
- 7 DO NOT place your hands near the electrodes.
- 7 DO NOT use the welder for any purpose other than for which it is designed.
- 7 DO NOT use the welder in damp or wet locations, or outside when raining or in the snow, DO NOT weld without a welding safety head shield, gauntlets, clothing, (see above warning).
- 8 **DANGER! DO NOT weld near inflammable materials, solids, liquids, or gases, (see above warning).**
- 7 DO NOT operate welder while under the influence of drugs, alcohol or other medication, or if you are fatigued.
- 7 DO NOT touch new welded parts as they may be very hot.
- 7 DO NOT pull the welder by the cable, or the welding clamp.
- 3 When not in use, switch machine off and remove the plug from the power supply and store in a safe dry location.



2. CONTENTS & SPECIFICATIONS

CONTENTS

Unpack the product and check there are no missing or damaged parts, If you do have a problem contact your supplier immediately.

Your kit should consist of the following:

- Complete studder kit with separate ground cables and accessories kit.
- Manual clamp with a pair of cables.
- "Non standard" electrodes arms for manual clamp (See parts list).
- "C" manual clamp with cables.
- Trolley.

SPECIFICATIONS

Power supply Voltage	400V (380V-415V)
Electrical Protection class	.I
Insulation class	.H
Casing protection class	.IP 22
Dimensions (Excluding trolley) . . (LxWxH) . .	.390x260x255mm
Mass	.13kg

INPUT

Max welding power (S max)	.16.2 kVA
Rated power at 50% (Sn)	.4 kVA
Power factor at Smax (COSφ)	.0,65
Delayed mains fuses	.16A
Automatic mains switch	.16A
Mains cable (L x 4m)	.3x2.5mm ²

OUTPUT

Secondary no-load voltage (U0 max)	.5.4V
Max welding current (I ₂ max)	.3kA
Spot-welding capacity (low carbon steel)	.max 1.5X1.5mm
Automatic spot welding current adjustment:	
Automatic spot welding time adjustment to suit sheet thickness and of the clamp used.	

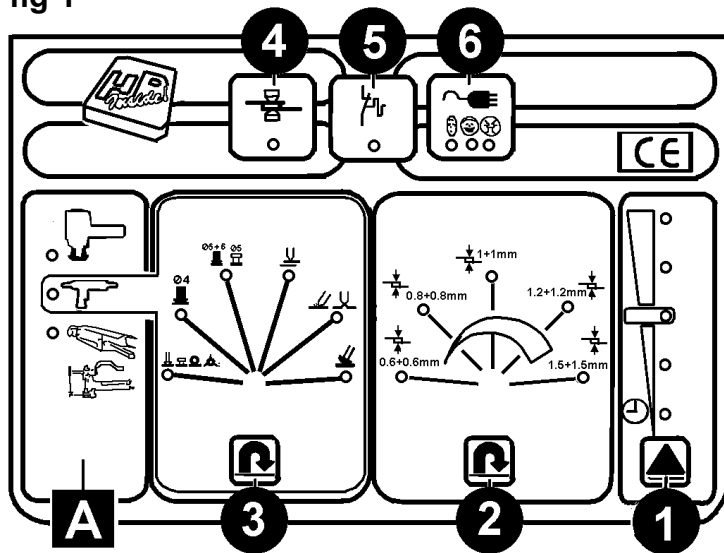
3. READING THE FRONT PANEL

Following describes the function of front panel key buttons and meaning of symbols, reference to figure 1.

- Key 1.** Press button to change factory metal default weld times.
- Key 2.** Press button to select the sheet thickness
- Key 3.** Function for use with the kit "Studder" as follow:

	To spot weld pins, rigets, washers, special washers with the proper electrode.
	To spot weld O 4mm diameter screws with the proper electrode
	To spot weld O5 6 mm screws and O5mm diameter rivets with the proper electrode
	To spot weld single stitches with the proper electrode
	To sheet temper with carbon electrode. To upset sheets with the proper electrode.
	Intermittent spot welding for patching on sheets with thr proper electrode
The spot welder automatically adjusts the spot welding time in function of the sheet and thickness	
Panel 'A'	Clamp "Studder" is used in all procedures selectable by pressing key (4)
	Manual clamp. To spot weld opposed sheets accessible from both sides
	Pneumatic clamp "Air Puller", is used to straighten out autobody dents

fig 1



Key 6.

- LED indicating voltage network
- Low network voltage (Spot welder under supplied)
- Normal network voltage (Spot welder supplied correctly)
- High network voltage (Spot welder over supplied).

Key 4.

- LED which indicates spot welder is operational

Key 5.

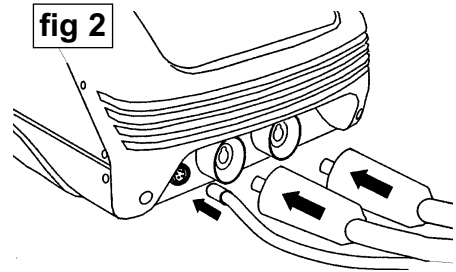
- LED which indicates thermostatic protection. Signals the spot welder blocking due to overtemperature on exit bars, on welding cables and on the working tool.

4. OPERATING INSTRUCTIONS

WARNING! Ensure you have read and understood and apply safety instructions in section 2.

4.1 CONNECTING CABLES. (Fig 2).

Connect the "Dinse" adaptors to the machine power connection.
Plug the "dinse" plug into the outlets (fig 2)
Plug in the control cable connector

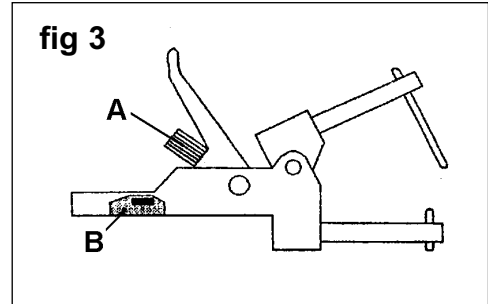


4.2. PRELIMINARY CHECKS.

At the start of each work cycle it is important to perform the following checks before using the welder.

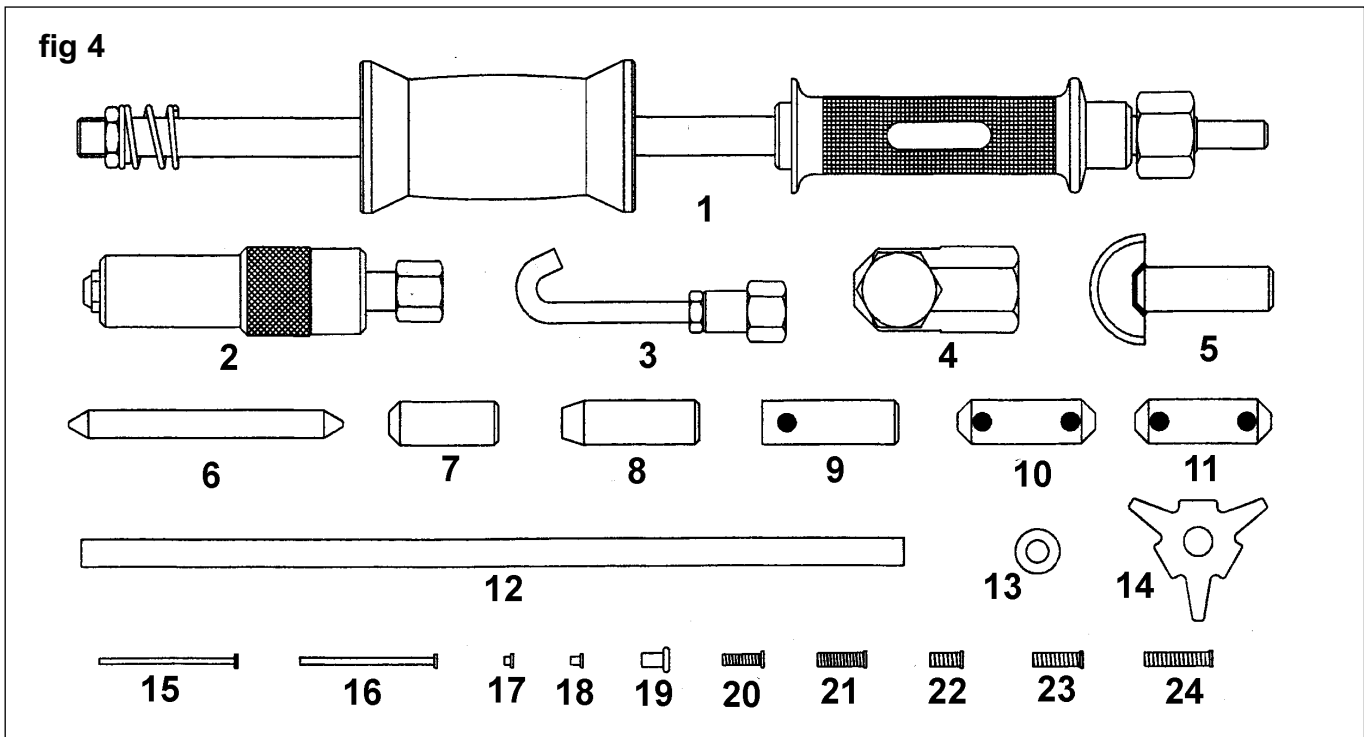
1. Check that the electrical connections are correct and fully plugged in.
2. When you use the pneumatic clamp, check the compressed air connections and adjust the pressure regulator knob accordingly.
3. Manual clamp adjustment.

Position a shim (having the same thickness as the sheets to be welded) between the electrodes. Ensure that, when the lever is operated the electrode arms are parallel and the electrode holders are in line. Make adjustments by loosening the locking screws on the electrode holders until you find the most suitable position for the job to be performed, and re-tighten the locking screws. Adjust the force of the electrodes during welding phase by adjusting the knurled nut (fig 3.A). Screw this nut clockwise to increase the clamp force, but adjust so that clamp will close exerting enough force to activate the microswitch (B).



4.3. ACCESSORY LIST.


The following operational text will refer to figure 4 below for identification of component parts.



4.4. OPPOSED SPOT WELDING

The parameters which determine the diameter and the strength of a spot weld are:

1. The clamp force of the electrodes.
2. The electrode face diameter.
3. Welding current and welding time.


- 4.4.1. Select the appropriate sheet thickness with key 3 and the welder will automatically select the optimum weld time. This selected time may be adjusted by key 2, if necessary. For example: If low voltage supply LED  is on, the weld time might need to be increased slightly.

IMPORTANT: A spot weld is considered satisfactory if, when subjected to a tensile stress test, the spot weld is torn from one of the sheets without any separation in the weld itself.

4.5. MANUAL CLAMPS

Place the lower electrode on the sheet to be welded. Operate clamping lever, giving:

a) Clamping of the sheets between the electrodes with a pre-adjusted clamp force.

b) A pre-set welding current for the pre-set time. Welding is indicated by the illumination of the green LED 

Release the clamp lever *a few moments after* the LED goes out. This delay in releasing the clamp load improves the mechanical strength of the weld.

4.6. HOW TO USE THE STUDDER.

To assemble or disassemble electrodes use two hex wrenches, one to prevent the clamp spindle rotating and the other to loosen the clamp nut.

When working on hinged barrels, doors, bonnets, tail gates, ensure that the ground cable is attached to the work panel rather than to the vehicle body, so that current does not pass through the hinges.

4.7. HOW TO CONNECT THE GROUND CABLE.

a) Base sheet area must be at least as big as the ground bar contact area, and should be as near as possible to the welding area.

b1) Fasten the copper ground bar to the sheet with an articulated e clamp (welding type) or -

b2) Spot weld a washer (part of kit), to the surface of the sheet pass the washer through the opening in the ground bar and lock it using the appropriate clamp supplied.


4.8. SPOT WELDING WASHER TO FASTEN GROUND BAR.

Mount the special electrode (fig 4. 9) on the clamp spindle and insert washer (fig 4.13).


Position washer on chosen "ground" area and contact ground terminal on the same area. Press torch push-button to weld washer.

Attach ground bar to washer as above.

4.9. SPOT WELDING SCREWS, WASHER, NAILS, RIVETS.

Fit the appropriate electrode and place the item to be welded in position on the sheet. Press the clamp push-button and release only after the green LED stops. 

4.10. SPOT WELDING SHEETS ON ONE SIDE ONLY.

Fit the electrode (fig 4.6) on the spindle by pressing on the surface to be welded. Press the clamp push-button and release only after the green LED stops. 

NOTE: The maximum sheet thickness that can be welded in this way is 1mm (i.e. 1mm per sheet, 2 sheets would therefore have a maximum thickness of 2mm (1mm + 1mm).

This method is not allowed on load bearing structures of vehicle bodies.

In order to achieve good results when spot welding sheets the following conditions must be met:

1. A perfect ground connection
2. Sheets to be welded must be clean and free from varnish, grease, oil, paint etc.
3. Sheet to be welded must be in contact with no air gap. If pressure is required to achieve this, apply pressure with a separate tool and not with the welding clamp as too much pressure from the clamp will result in a poor weld.
4. The thickness of the upper sheet must not exceed 1mm.
5. The electrode face must have a 2.5mm diameter.
6. Take care with the electrode fastening nut and ensure that the cable connectors are locked.
7. When spot welding press lightly (3-4kg) on electrode. DO NOT move electrode until the weld is completed - green LED stops.
8. DO NOT attempt to weld at a position more than 300mm from the ground bar.

4.11. SIMULTANEOUS TRACTION AND SPOT WELDING ON SPECIAL WASHERS.

This is achieved by mounting and fastening the spindle (fig 4.4) on the threaded end of the extractor body (fig 4.1), and then fastening the other end of the extractor into the studder.

Insert the special washer (fig 4.14) into the spindle and lock in place with the special screw. Spot weld washer in desired position as for normal washer spot welding and then apply traction.

Once finished rotate extractor by 90° to remove the washer which can be re-used.

4.12. HEATING AND SHEET UPSETTING.

For these operations the timer is "OFF". the duration is thus determined by the operator.

Current is controlled automatically according to the sheet thickness.

Mount the carbon electrode (fig 4.12) on the studder spindle and lock in place by tightening the nut ring.

Touch the carbon face of the electrode on the work area and press clamp push-button. Operate from the outside towards the inside of the work area, using circular movements, to heat the sheet which will go back to its original position. In order to prevent the sheet from tempering too much, work on a small area and, when finished, immediately wipe with a wet cloth to cool.

4.13. INTERMITTENT SPOT WELDING (PATCHING).

To weld small rectangular pieces of sheet over holes caused by corrosion or minor damage. Mount the electrode (fig 4. 5) on the studder spindle and tighten ring nut.

Position the patch piece and reset the electrode on it - press the clamp push-button and keep it pressed. Move the electrode during each 'pause' in the weld/pause cycle provided by the machine.

The work/pause cycles are controlled automatically by the spot welder according to sheet thickness.

Keep a light pressure on the electrode (3-4kg) and weld along a line ideally 2-3mm in from the edge of the new piece.

4.13.1. TO ACHIEVE GOOD RESULTS

DO NOT move more than 300mm from ground point.

Use sheet of 0.8mm maximum thickness

Only move electrode during the 'pauses' - never when welding.

4.14. EXTRACTOR (fig 4.1)

Mount and lock the hook spindle (fig 4. 3) onto the extractor (fig 4.1). Hook washer (fig 4.13), previously welded as section 4.10, and begin traction. When finished rotate the extractor through 90° to break off washer.

5. MAINTENANCE

WARNING! DO NOT remove any panels without first switching the machine off and unplugging the unit from mains power supply.

- 5.1. Periodically, depending on environmental conditions, remove panels and clean dust and metallic particles from inside the welder using dry, compressed air at no more than 10bar pressure (wear safety eye protection and dust mask).
Avoid directing compressed air at the electronic circuit board - rather clean with a soft brush and suitable solvents.
- 5.2. Check all cables are in good condition with undamaged insulation and clean un-oxidised connectors.
- 5.3. Check that screws connecting the transformer secondary circuit to the welding cable taps are secure and do not show signs of overheating or oxidation.
- 5.4. If the welder is not operating correctly check the following before contacting your service agent.
 - a) With welder connected to mains supply and welder mains switched 'OFF' green LED should be ON. If not there is a supply fault or supply voltage is too low.
 - b) That the microswitch in the clamp is operating correctly and signalling the electronic circuits - green (welding) LED on.
 - c) Thermal protection has not triggered (yellow LED flashed).
 - d) The connections in the secondary circuit (fuse, arm holders, arms, electrode holder), are not producing high resistance due to loose screws or oxidised contact surfaces.
 - e) The electrode face diameter and electrode pressure being used are appropriate to the weld being produced.

Declaration of Conformity We, the sole importer into the UK, declare that the product listed below is in conformity with the following EEC standards and directives.

**SPOT WELDER
MODEL ELECTROSPOT 3000**

73/23/EEC LV Directive
89/336/EEC EMC Directive



The construction file for this product is held by the Manufacturer and may be inspected on request by contacting Jack Sealey Ltd

Signed by Mark Sweetman

1st September 1999

For Jack Sealey Ltd. Sole importer into the UK of Sealey Power Welders

NOTE: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

IMPORTANT: No liability is accepted for incorrect use of this equipment

WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.

INFORMATION: Call us for a copy of our latest catalogue on 01284 757525 and leave your full name and address including your postcode.

SEALEY POWER WELDERS

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