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# Operating Manual

## Transmig Synergic 350



At the rear of this manual is a pull-out technical broadsheet and parts list. Please pass these documents to your Maintenance Department.

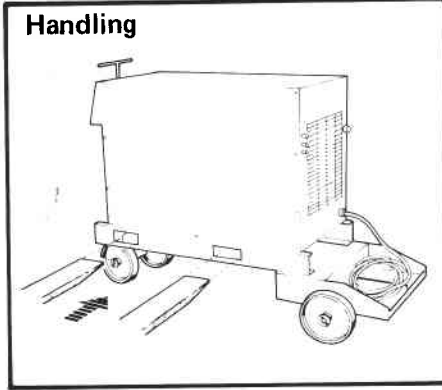
£1.50

**SAFETY** Operators of Electric arc welding equipment must always be aware of the inherent risks involved in the arc welding process. Your attention is therefore drawn to the Safety Leaflets available from the Welding Institute, particularly Publications 236 and 237.



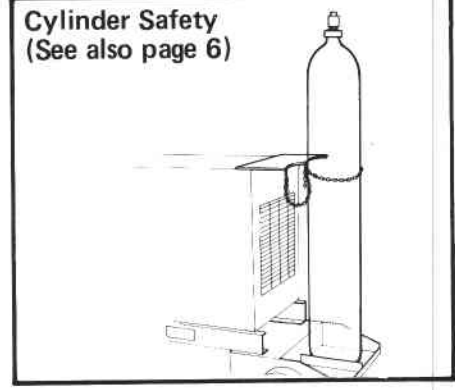
**Service**

Call in the experts if you don't know what to do.



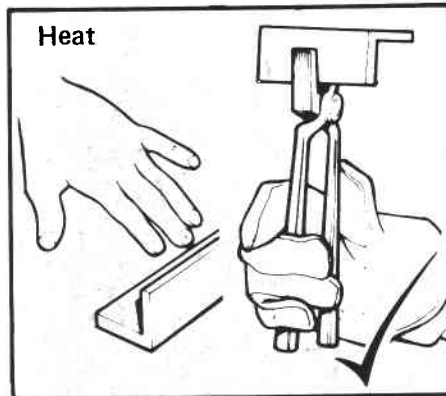
**Handling**

Lift the unit correctly. Use correct size forklift.



**Cylinder Safety**  
(See also page 6)

Secure the cylinder in position using the chain provided.



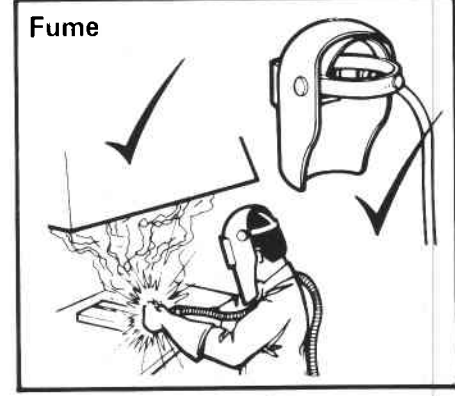
**Heat**

Don't burn yourself! Wear gauntlets and use tongs.



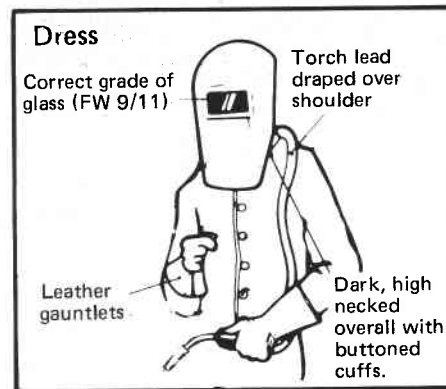
**Glare**

Wear your headshield (or face screen) and screen the welding area.



**Fume**

Ventilate the welding area to prevent a build-up of gas and fumes



**Dress**

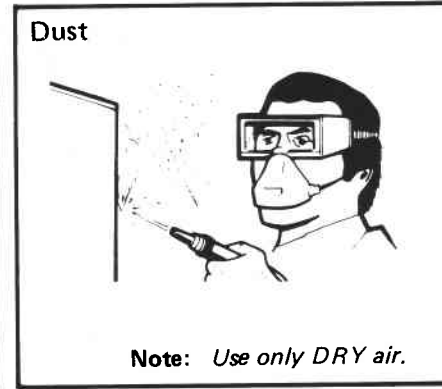
Correct grade of glass (FW 9/11)

Torch lead draped over shoulder

Leather gauntlets

Dark, high necked overall with buttoned cuffs.

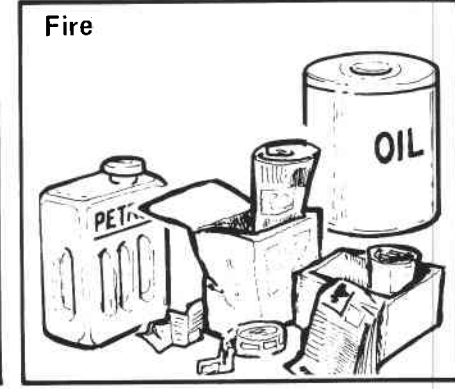
Dress correctly when welding and preparing the weld.



**Dust**

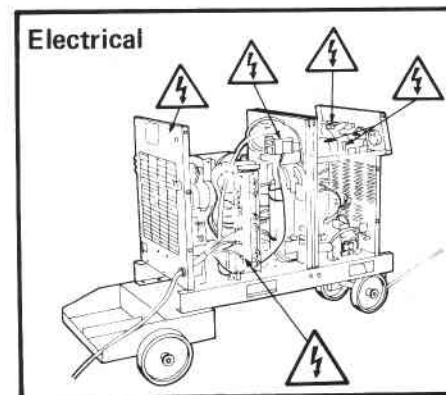
**Note:** Use only DRY air.

Wear goggles and mask when removing dust with an airline.



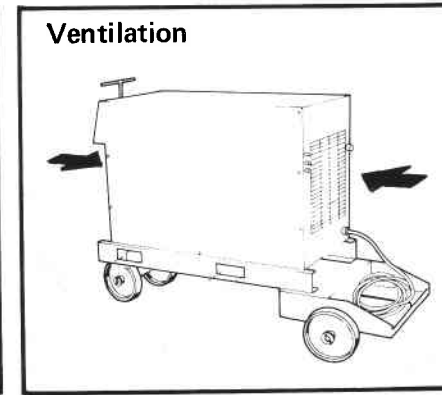
**Fire**

Before commencing welding, clear the area of flammable materials.



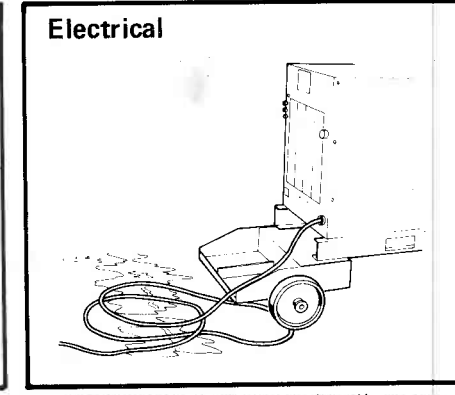
**Electrical**

Don't work with the cover off.



**Ventilation**

Position the unit so that the Louvres are free from obstruction.



**Electrical**

Don't allow leads to lie in oil, water or corrosive liquid.

## INTRODUCTION

The Transmig Synergic 350 Power Source is designed to be used in conjunction with the Transmatic 162M wire feed unit. It is designed for conventional or pulse welding of Mild or Stainless Steels, Aluminium and other materials.

Process set-up is extremely simple and once set the electronic control system maintains absolute accuracy

Once the process, material and current have been selected, welding current and voltage are automatically controlled. The unit employs an 'electronic' inductance therefore no inductance 'tappings' are required.

Soft Start and automatic wire 'burn-off' are also included in the wire feeder control circuitry.

Using the optional remote control unit, process selection, current and voltage trim controls are repeated allowing two independant welding conditions to be used, one local (main) and one remote.

Typically –Dip Transfer set locally for root passes.  
–Pulse selected on remote for fill passes.

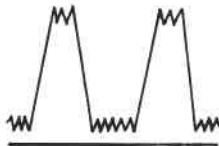

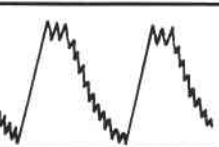
The process selection charts provided give the data required for setting up process. Material, wire diameter and current values for a wide range of materials are given together with the relevant switch selections.

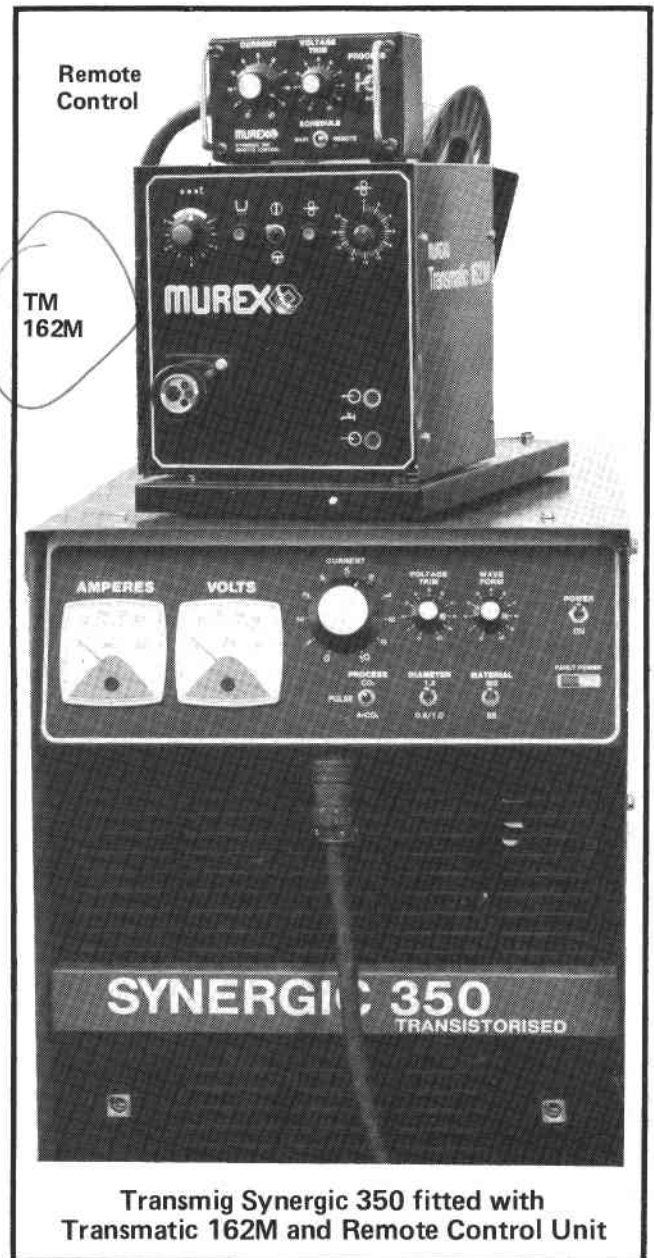
The Transmatic 162M is a standard wire feed unit modified for use with the TM Synergic 350. Details of the modifications are given in the Technical Notes.

In the event of a thermal overload condition the 'fault' lamp lights and the machine shuts down. If this condition occurs, check the unit for good all round ventilation and leave the unit to cool. The most common cause of 'overload' is misuse of the duty cycle rating – See Specification in the Technical Notes.

220V and 42Vac outlets are provided on a terminal strip inside the rear panel to supply a water cooler or CO<sub>2</sub> heater.

### Waveform Control Settings

Control Setting	Current Waveform	Remarks
0-2		Normal Setting. Full power spray, narrow forceful arc.
2-7		Less concentrated (less than 150A, Broader softer arc. Use less than 10% CO <sub>2</sub> for good transfer. Use these settings if 'arc blow' or 'pop-out' occurs.
7-10		These settings give softest arc, broadest arc column. Use above 200 Amps. Use less than 10% CO <sub>2</sub> for good transfer.



## INSTALLATION

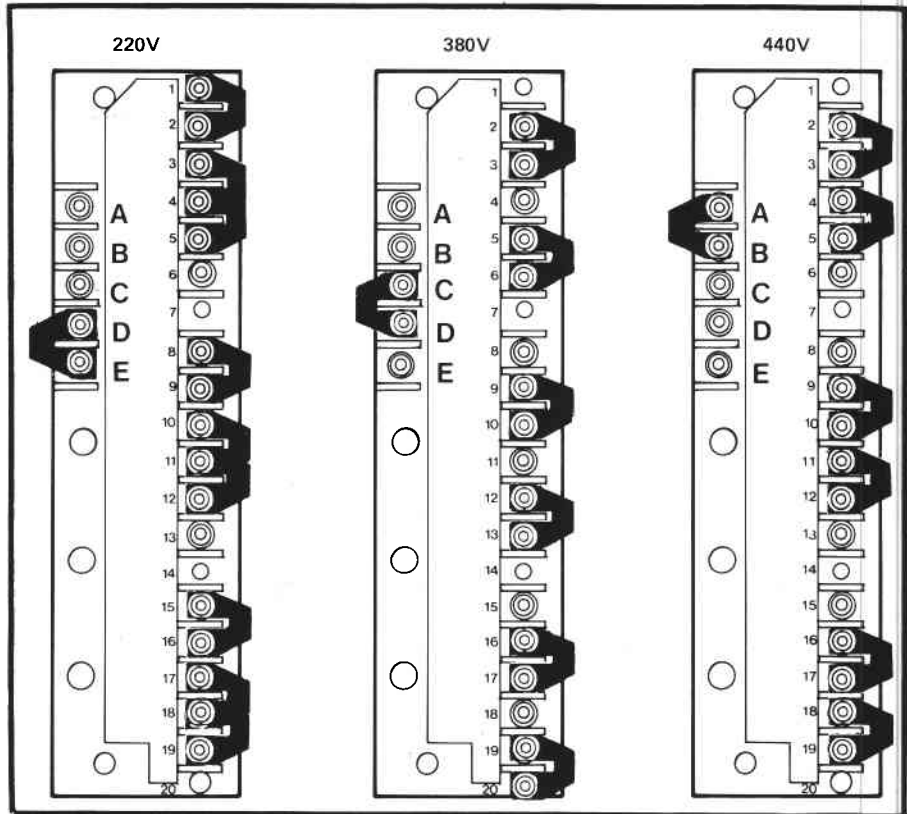
Installation must only be undertaken by a qualified electrician or suitably qualified person.

### Mains Input Selection

Before connecting the unit to the mains supply, set the mains selection links to their appropriate positions as shown.

**Note:** Store the 'unused' links by placing them in parallel with the selection links. Do not place them on 'spare' terminals.

The mains selection terminal block is located behind the lift-up panel on the left hand side of the unit.

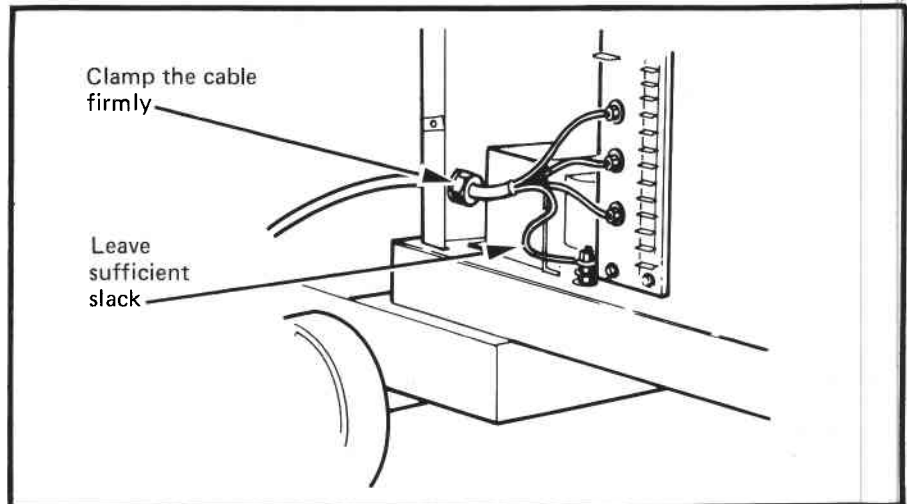


### Mains Cable Connection

Connect the three 'phase' wires to terminals L1, L2 & L3 respectively as shown. Then connect the Green/Yellow earth wire to the GRD terminal.

**Note:** Leave sufficient slack in the earth wire so that, in the event of undue stress, the earth wire is last to come under strain.

Clamp the cable firmly in the cable gland.

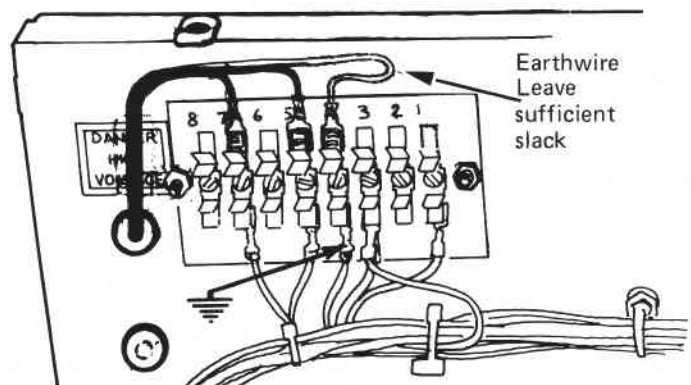


### Water Cooler Connection

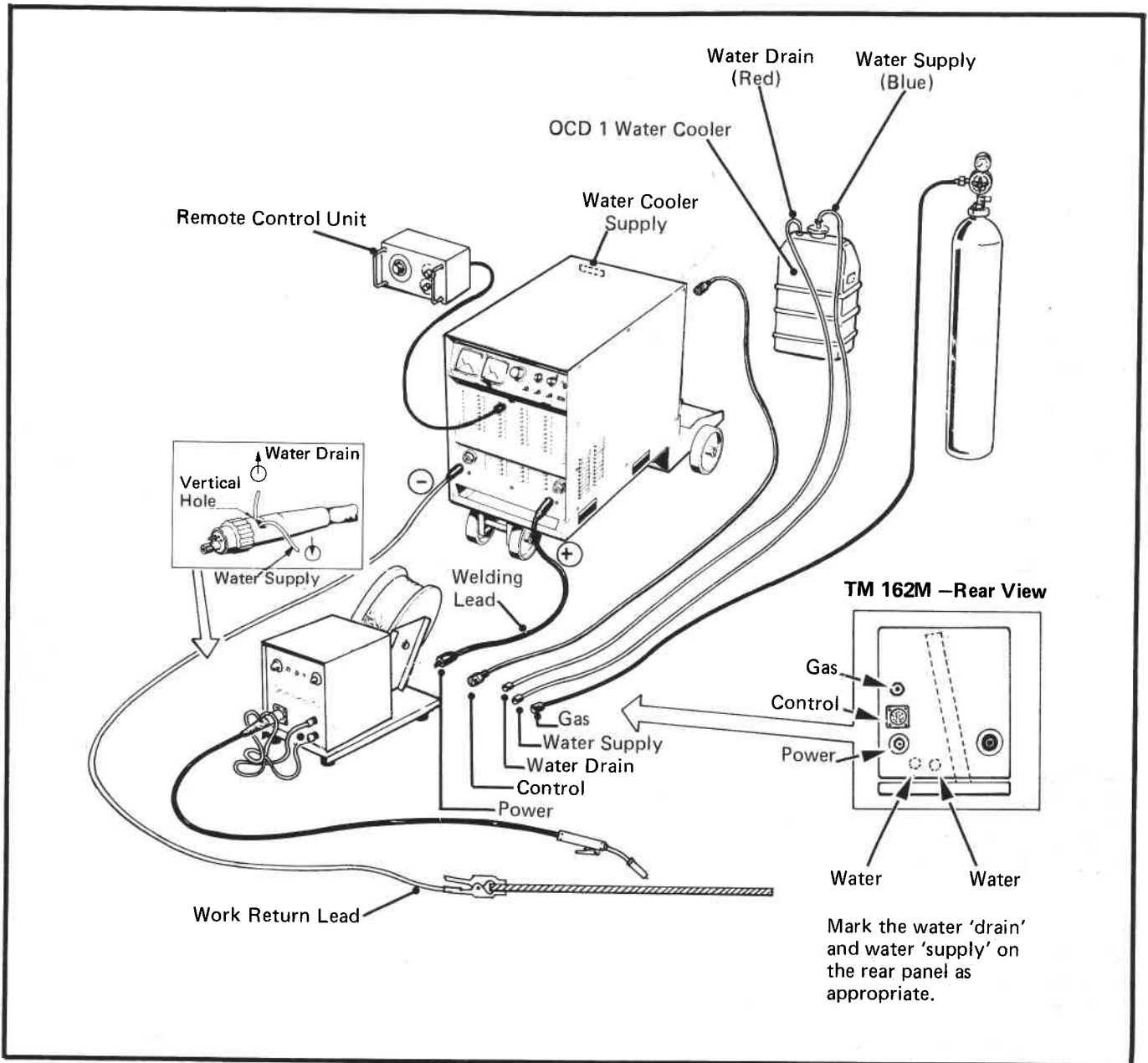
Feed the supply cable through the grommet provided in the back panel and, using crimp-on 'spade' connectors, connect the Live, Neutral and Earth wires to the terminal block as shown.

**220 Volts Connection pins 5 & 7**

(42Vac on pins 1 & 3)



## INSTALLATION (continued)



### Interconnections

Refer to drawing

#### Gas (with optional undergear)

Mount the gas cylinder on the cylinder tray and secure in position using the chain provided.

Connect the gas hose and regulator to the cylinder as described overleaf.

Fit the gas hose to the 'gas in' connection on the rear of the TM162M.

#### Water (with optional undergear)

If a water cooler is to be fitted, mount it on the cylinder tray and secure it in position using the chain provided.

Note that the position of the cylinder support bracket may have to be ad-

justed to accept the 'neck' of the water cooler.

Connect the cooler to the auxiliary supply on the terminal block inside the back panel as previously described. The blue water hose (cold) is fitted to the 'water-in' connection on the back of the TM162M and the red water hose (hot) to the 'water-out' (return) connection.

**Note:** When fitting a 'MW' torch, ensure that the hoses are correctly fitted to the water-in and water-out connections on the front of the TM 162M – see illustration.

#### Control

Connect the control cable between the 8-pin socket on the power source and

the reciprocal socket on the rear of the TM162M.

#### Power

Connect the power terminal on the back panel of the TM 162M to the positive output on the power source.

#### Work Return Cable

This cable is connected to the negative terminal of the power source and its clamp attached to the work piece of the clamp.

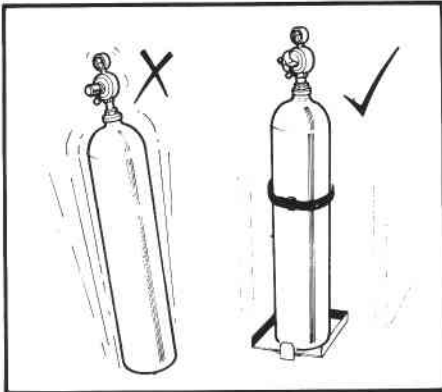
Poor electrical connection of the clamp will result in poor welding characteristics.

#### Remote Control Unit (optional)

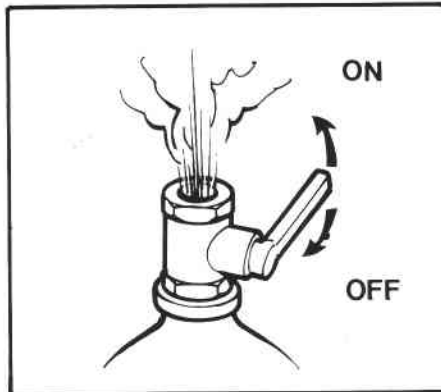
Screw the connector into its socket on the front panel (centre).

## INSTALLATION (continued)

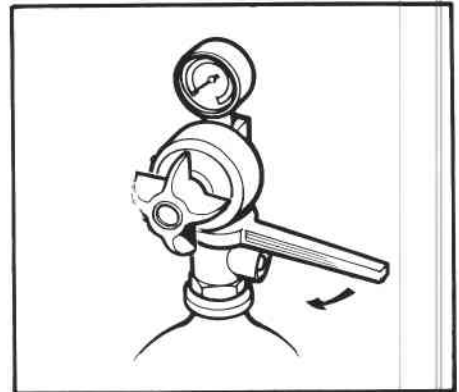
### Gas Fitting



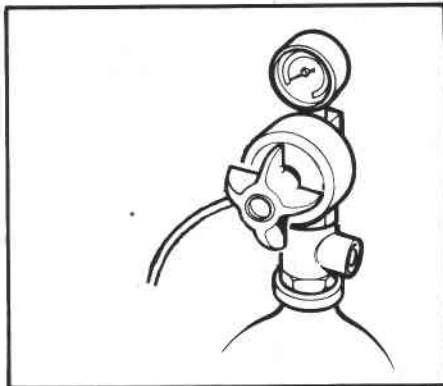
Support the gas cylinder with the retaining chain.



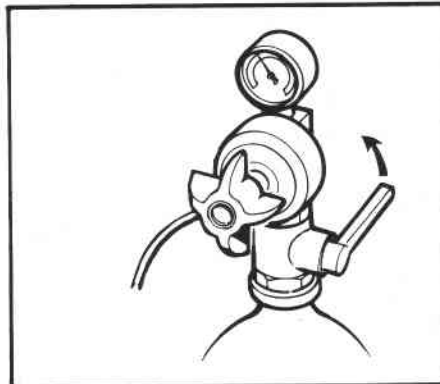
Protect the eyes and open the cylinder valve to remove any dirt in valve socket.



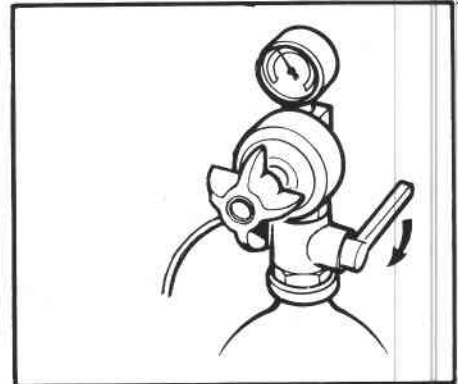
Fit the gas regulator to the cylinder and hand tighten using the correct size spanner. (A sharp blow with the hand at the end of the spanner will ensure a gas tight seal).



Fit the gas hose to the regulator.



Open the cylinder valve and check the cylinder pressure. (Must be greater than 10 bar (150 lb/in<sup>2</sup>)).

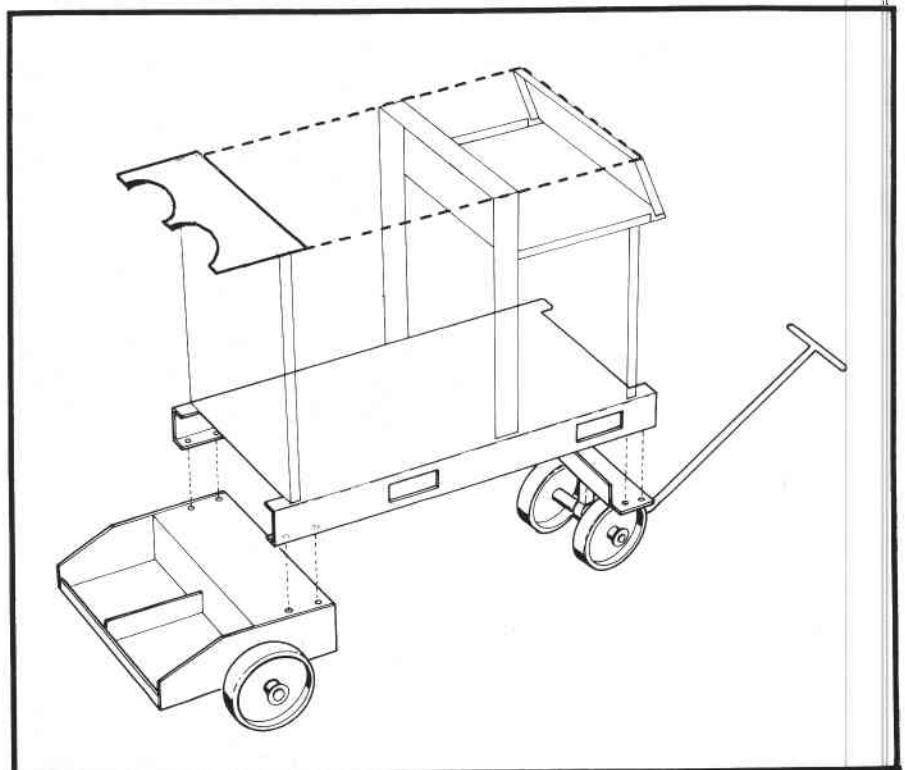


Close the cylinder valve.

### UNDERGEAR FITTING

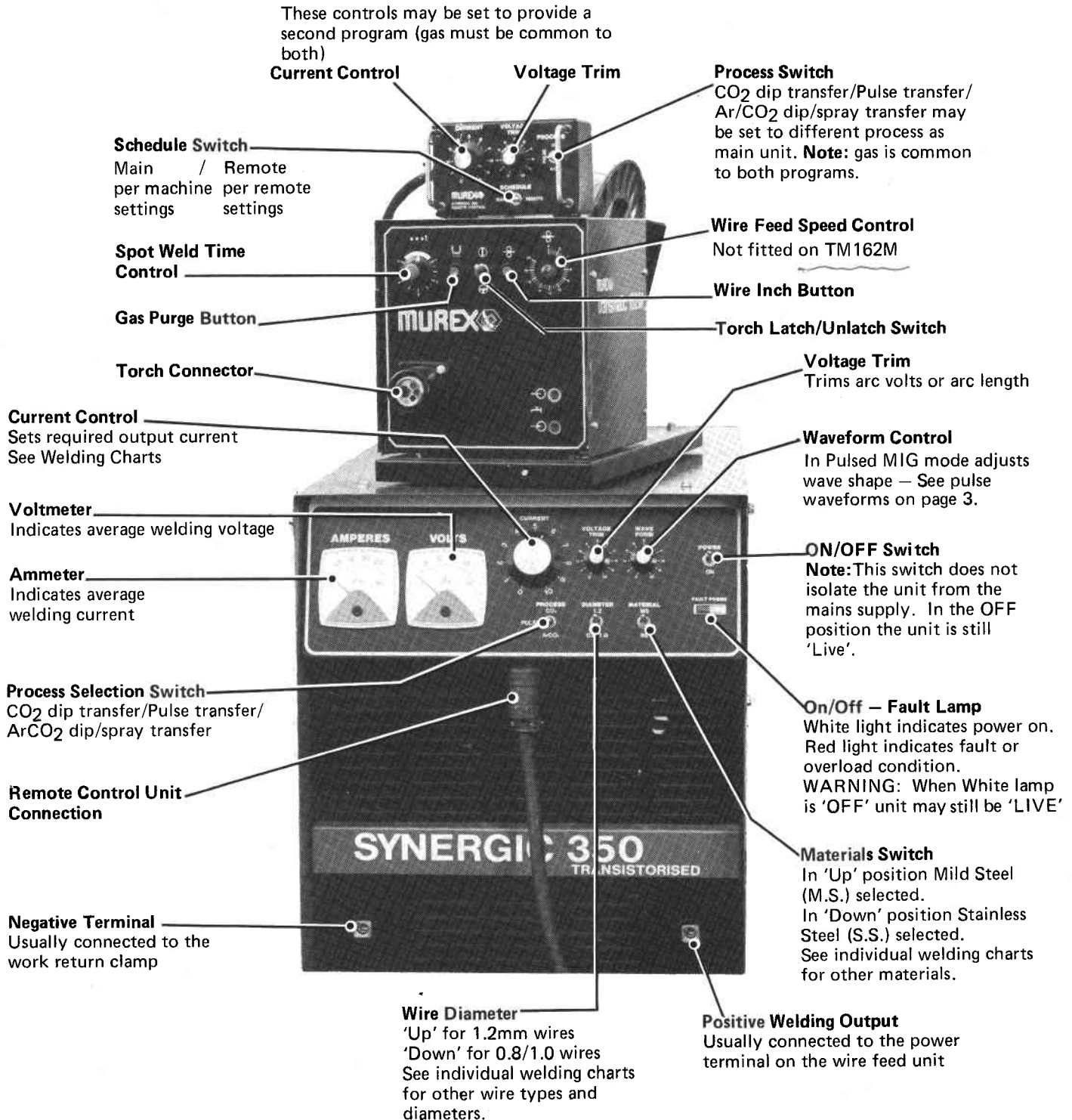
1. Assemble the undergear to the unit, using the fittings provided – See drawing.
2. Mount the Cylinder support plate on top cover of the unit.

Position the plate to fit up with cylinder.



## OPERATION

1. Select the chart appropriate to the process mode, wire diameter and wire material.
2. Set the process Selector Switch according to the process – CO<sub>2</sub> dip transfer – Pulse transfer – or ArCO<sub>2</sub> dip/spray transfer.
3. Set the diameter switch according to the chart.
4. Set the material switch according to the chart.
5. Use the voltage trim and if required the waveform control (Pulse mode) to obtain optimum welding performance.





## APPLICATIONS

**Mild Steel** — In vertical welding 12.7mm (½in.) plate and over, the low heat input obtained with dip-transfer often results in poor fusion. Pulsed-arc welding overcomes this while remaining faster and more economical than manual-arc welding. It is also excellent for root runs where absolutely uniform penetration is required and the joint is accessible from one side only— for example, pipe butt welds. The ability to use lower currents with pulsed-arc welding is also of immense assistance in sheet metal work involving awkward shapes and unsupported butt welds. Pulsed-arc welding is particularly suitable for thicknesses between 2 and 6.3mm (14 swg and ¼in.), falling between the thickness ranges more suitably covered by dip- or spray-transfer. The recommended shielding gas for mild steel is an Argon mixture.

**Alloy Steels** — Pulsed-arc welding gives much better alloy recovery than welding with CO<sub>2</sub>, and the carbon content remains at an acceptable level. This is vital for optimum low-temperature properties, particularly on quenched and tempered steels. The recommended shielding gas is an Argon mixture.

**Stainless Steel** — Pulsed-arc welding gives unequalled results in welding stainless steel. Using an Argon/Oxygen mixture, there is no increase at all in the carbon content of the weld, which can rise to an unacceptable level with CO<sub>2</sub>.

**Aluminium and its Alloys** — Because heat input can be controlled with pulsed-arc welding, larger wire diameters can be used on thin sections. The risk of porosity is significantly reduced — particularly on vertical, overhead and horizontal welds.

In addition, the minimum thickness of alloy sheet which can be welded with push-type wire feed equipment is extended. One of the outstanding features of pulsed-arc welding that is of particular value in aluminium welding is the ability to make corner and unbacked butt joints which have a very good appearance. The recommended shielding gas is pure argon.

## MAINTENANCE

**Switch off and disconnect the unit from the mains supply before undertaking any maintenance tasks.**

### Daily (Operator task)

1. Check all welding and electrical cables for signs of cracking or general deterioration.
2. Check that all electrical connections are in good physical condition.
3. Check the welding torch for damage. Replace any suspect part(s).

**ALWAYS CHECK THE WELDING AREA DAILY FOR POSSIBLE SAFETY HAZARDS. IF IN DOUBT CONSULT YOUR SAFETY OFFICER.**

### 6 Monthly (Maintenance Department Task)

1. Switch off the unit and **disconnect from the mains electrical supply.**
2. Remove the cover (retain the fixing screws).
3. Using a soft brush, remove any

dust or dirt from the interior of the unit. If compressed air is used to clean the unit the pressure must not exceed 2kg/cm<sup>2</sup>, (30lbs/in<sup>2</sup>), and the air must be dry.

**SUITABLE EYE AND MOUTH PROTECTION SHOULD BE WORN.**

4. Replace the cover.
5. Reconnect the unit to the mains supply.



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