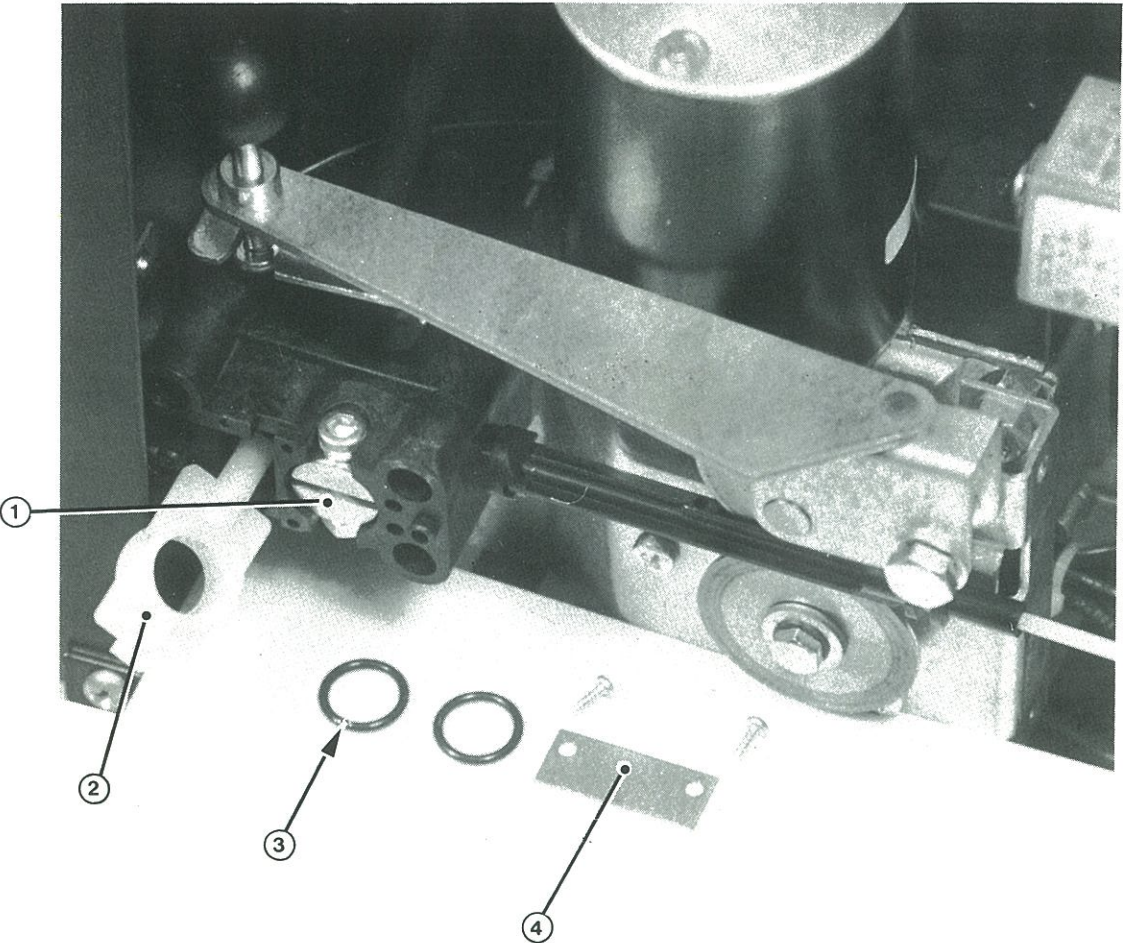


Fig. K - Feed Block Parts



Compact 125 240V 50Hz (368 466 880)

| Item | Qty. | Order No.   | Description         |
|------|------|-------------|---------------------|
| 1    | 1    | 0410 742-02 | Cable Terminal      |
| 2    | 1    | 156 597-001 | Connection Strip    |
| 3    | 2    | 2152 012-12 | O-ring (14.3 x 2.4) |
| 4    | 1    | 156 760-001 | Cover               |

Optional Extras:

Cylinder Support Tray Kit - Part No. 366 603-880



ESAB GROUP LTD.  
Gunnels Wood Road,  
Stevenage  
Herts.  
SG1 2BH

Telephone No: (0438) 728821  
Telex No: 826333  
Fax No: (0438) 722253



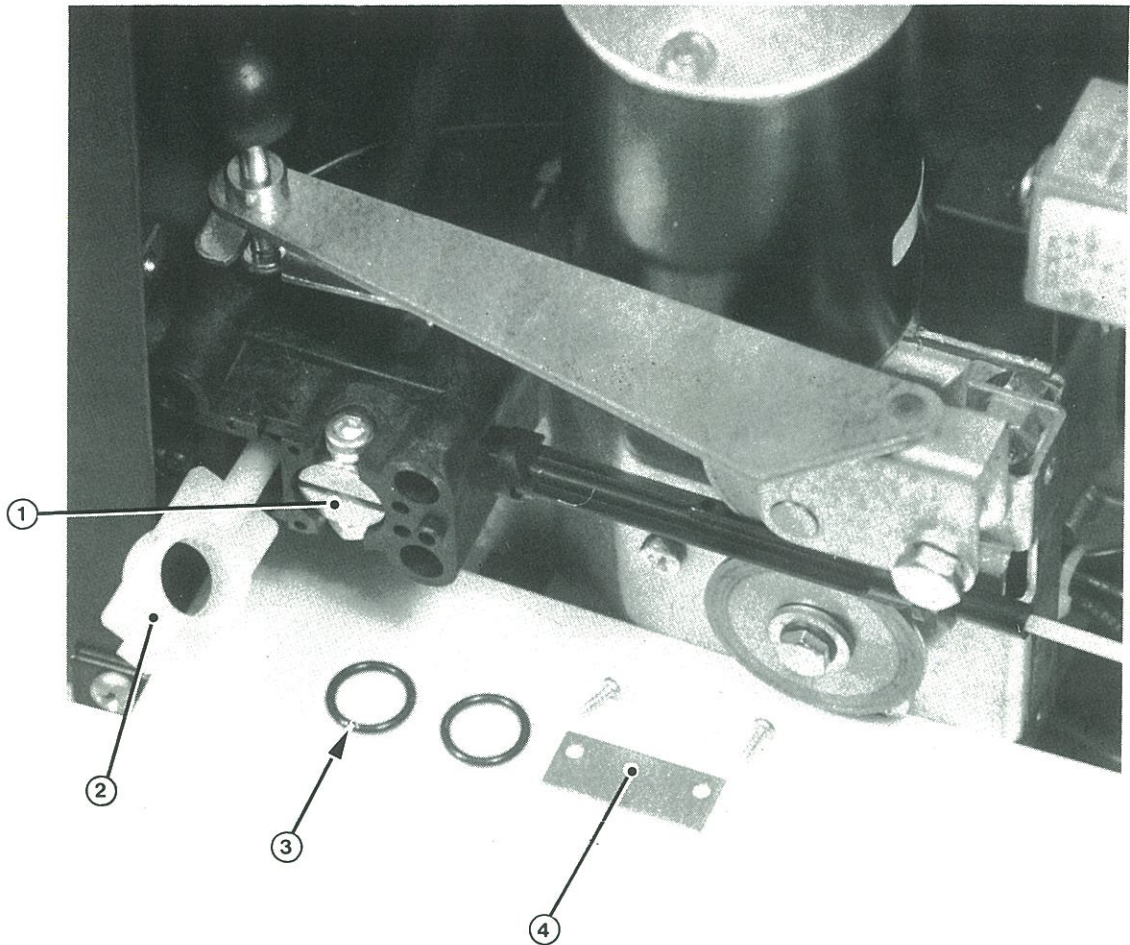
# Compact 125

## Semi-automatic MIG



## Manual and spare parts list

Fig. K - Feed Block Parts



Compact 125 240V 50Hz (368 466 880)

| Item | Qty. | Order No.   | Description         |
|------|------|-------------|---------------------|
| 1    | 1    | 0410 742-02 | Cable Terminal      |
| 2    | 1    | 156 597-001 | Connection Strip    |
| 3    | 2    | 2152 012-12 | O-ring (14.3 x 2.4) |
| 4    | 1    | 156 760-001 | Cover               |

Optional Extras:  
Cylinder Support Tray Kit - Part No. 366 603-880

**ESAB**  
ESAB GROUP LTD.  
Gunnels Wood Road,  
Stevenage  
Herts.  
SG1 2BH

Telephone No: (0438) 728821  
Telex No: 826333  
Fax No: (0438) 722253



# Compact 125

## Semi-automatic MIG



## Manual and spare parts list

## SAFETY PRECAUTIONS

In general, the welding system should be worked on by one person only when welding and when making adjustments to the controls or changing wire, drive rolls, etc. If two people work on a machine at one time it is possible that one might, for instance, operate the gun switch whilst the other is changing the drive rolls.

### 1. Electrical

The mains electricity input supply to the power source is at a high voltage, sufficient to cause electric shock. Therefore, observe all the normal precautions associated with high voltage supplies when connecting the machine.

Once correctly connected always isolate the Power Source from the mains before removing any of the covers from it.

It is recommended that the isolator switch is positioned within the reach of the operator.

The voltage of the output supplies from the Power Source for both welding and the control circuits is not high enough to cause electric shock under normal circumstances, but remember that the presence of moisture or skin damage can lead to shocks from quite low voltages. The high currents associated with the welding output can also cause accidents if the equipment is not used properly. Therefore, make certain that the welding power is off before changing welding wires or touching the drive rolls.

If a metal tool such as a screwdriver or spanner short circuits the weld supply then arcing and overheating can result which may cause eye damage, burns, or damage to the equipment. The following precautions should be observed when welding:-

### 2. Glare

The operator must wear the correct protective clothing and use a proper face mask. Also any other persons nearby must be protected from skin or eye injuries which might result from the arc light, either directly or via reflections from bright surfaces.

### 3. Fire and Fume

- Do not weld near degreasing plant or paint spraying booths. Apart from explosion risks associated with flammable vapours, there is sometimes a risk of poisonous fumes resulting from chemical reactions with vapours in the heat of the arc. If there is any doubt get expert advice before welding.
- Avoid breathing excessive fumes during welding as this can be a hazard to health. When welding in confined or badly ventilated places take expert advice as to what breathing apparatus or fume extraction equipment is needed.
- When alloy steels are to be welded such as manganese copper or lead bearing steels, check to ensure there is no risk of toxic fumes.
- When welding coated or painted metal pay particular attention to the possibility of toxic fumes being given off.

**NOTE;** It is recommended that Primers are removed before welding.

## Safety (Continued)

Never hold or place the welding gun in a position where it might accidentally arc onto anything. Particularly gas cylinders which could explode if an arc were stuck against them.

**NOTE;** Further information on safety hazards associated with welding is available in the Welding Manufacturers' Association booklet No. 237. Copies are obtainable either from W.M.A. or from this Company.

## TECHNICAL DATA

The Compact 125 is designed in accordance with international standards, SEN 8301, ISO 700, NF A 85-013 and BS 638 part 3:1979.

### Mains Connection 1-phase, 50Hz

|                               |     |
|-------------------------------|-----|
| Voltage (V)                   | 240 |
| Max. cont. current (A)        | 4.5 |
| Fuse, slow (A)                | 10  |
| Cable area (mm <sup>2</sup> ) | 1.5 |

Recommended cable areas and fuses comply with regulations governing rubber and plastic insulated cables.

### Permitted Load

|                |     |    |    |
|----------------|-----|----|----|
| Duty cycle (%) | 100 | 60 | 30 |
| Current (A)    | 40  | 55 | 80 |
| Voltage (A)    | 16  | 17 | 18 |

### Open-circuit voltage

$U_o = 23-33V$  1-phase

### Auxiliary voltage

42V, AC

### Power factor

at 90A/18.5V = 0.7

### Efficiency

at 90A/18.5V $\mu$  = 0.85

### Temperature class

F155°C (311°F)

### Protection criteria

IP 21 AN

### Work return cable

10mm<sup>2</sup> copper with contact clamp, length 3m.

### Wire dimensions

Steel 0.6-0.8mm

Weight 34kg

Dimensions - see page 8

## DESCRIPTION OF MIG WELDING SYSTEM

The mains electricity supplied to the POWER SOURCE is transformed and rectified to give a low voltage, high direct current output. One side of this output, normally the negative, is connected directly to the workpiece, the positive to the WELDING GUN via the WIRE FEEDER. The main characteristic of the output is that the voltage stays nearly constant over the whole current range which is available from the POWER SOURCE. An inductance (choke) is included in the output circuit to stabilise the welding arc.

## Description (Continued)

The SHIELDING GAS, which may be Carbon Dioxide (CO<sub>2</sub>) or Argon or one of a number of mixture gases, is normally taken from a high pressure storage cylinder, bulk supply system, fitted with a pressure reducer and flow control to regulate the flow of gas at the WELDING GUN. The flow of gas is automatically switched on and off as the gun trigger is pressed or released.

The WIRE FEEDER unreels the welding wire off the WIRE REEL and pushes it at a preset speed through the hose assembly to the WELDING GUN. It is the speed and diameter of the wire which determines the current demanded from the power source during welding.

The WELDING GUN is manipulated by the operator to ensure that the welding wire, as it melts in the arc, is deposited correctly into the joint. Only one on/off switch is needed on the gun to start and stop the welding operation - all welding variables having been preset before the start of welding. - See CONTROLS on page 6.

### UNPACKING

Before removing the unit:

**NOTE:** that the expanded polystyrene packing pieces contain three accessories.

- Plastic reel hub.
- Nylon strap (reel guard)
- Reel support bracket.

- Remove and retain these pieces.
- Remove the plastic bag containing the welding gun - note that 2 x contact tips (08 & 10) are taped to the handle.
- Remove small plastic bag containing:
  - Hose clips x 2 - Gas valve and regulator fitting.
  - M5 bolts and nuts x 2 - Reel bracket fittings.
  - M6 bolts, washer and nut x 1 - Work return clamp
  - M8 bolt, 2 washers and nut x 1 - Reel hub fitting.
  - 5m Hex wrench - for connector block clamp
- The PSE 90 welding gun (swan neck type) included in the Compact 125 package - see separate manual for details

### WARNING

When removing the unit, lift it out using the black lifting handles. It is inadvisable to remove the unit using the recesses in the expanded polystyrene packing.

### Removing the Unit

- Using the two black lifting handles, remove the unit from its container.
- Visually check the unit for any signs of transit damage. Any such damage must be reported to your supplier immediately, quoting the equipment type and serial number of the unit. Retain the packing materials.

# CONTENTS

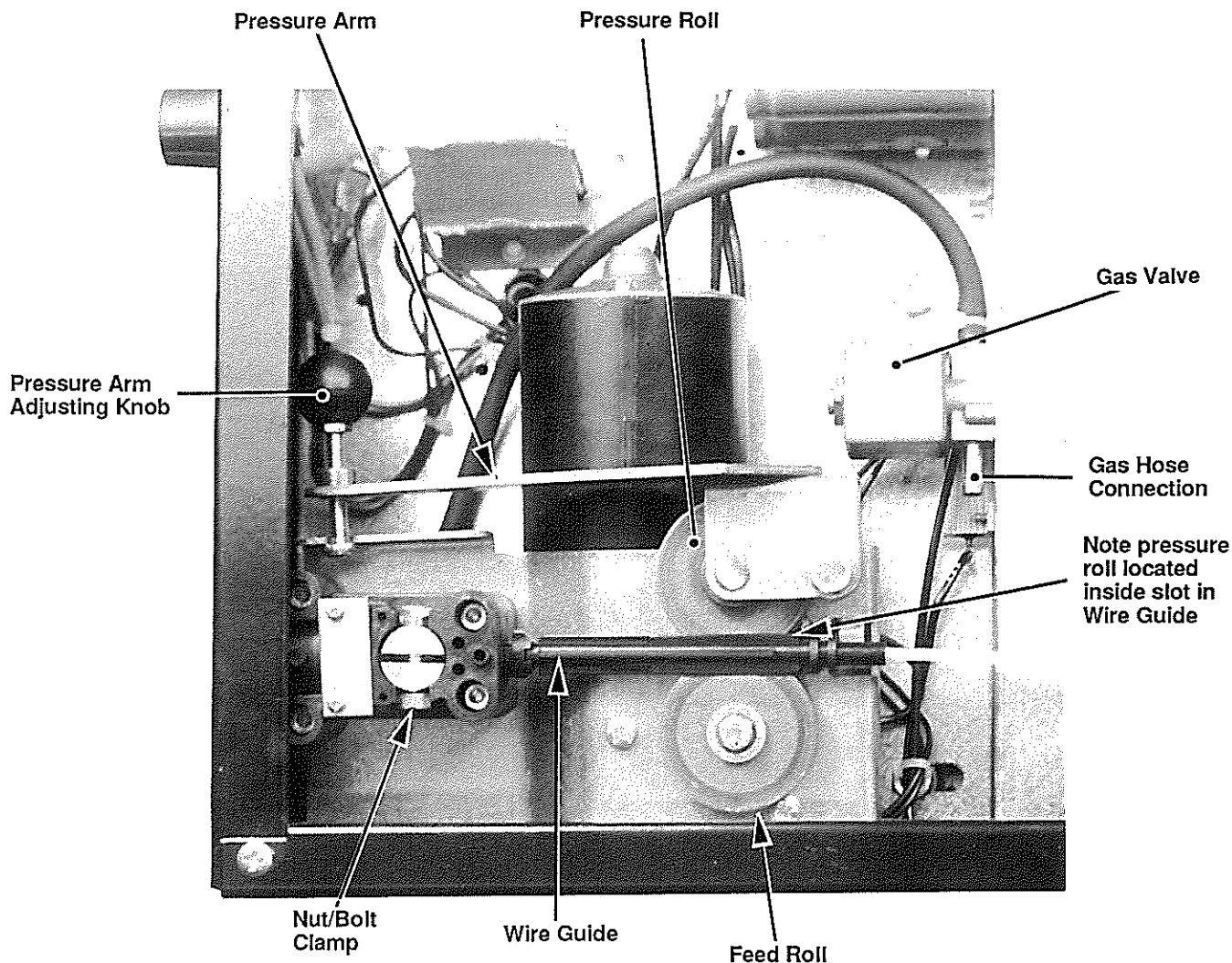
| Contents                               | Page No. |
|--|----------|
| Safety Precautions .....               | 3        |
| Technical Data.....                    | 3        |
| Description of MIG Welding System..... | 3        |
| Unpacking.....                         | 3        |
| Installation.....                      | 4 & 5    |
| Controls.....                          | 6        |
| Welding Data.....                      | 6        |
| Contact Tips.....                      | 7        |
| Welding Faults.....                    | 7        |
| Circuit Diagram.....                   | 8        |
| Dimensions.....                        | 8        |
| Parts List.....                        | 9 - 12   |

## Illustrations

|  |    |
|--|----|
| A. Mains Input Connection .....                  | 4  |
| B. Wire Reel Bracket and Reel Guard Fitting..... | 4  |
| C. Wire Feed Mechanism.....                      | 5  |
| D. Controls.....                                 | 6  |
| E. Circuit Diagram.....                          | 8  |
| F. Dimensions.....                               | 8  |
| G. Parts List - Front View.....                  | 9  |
| H. - Left Hand Side View.....                    | 10 |
| J. - Right Hand Side View.....                   | 11 |
| K. - Feed Block Parts.....                       | 12 |

## Tables

|                                  |   |
|----------------------------------|---|
| 1. Welding Control Settings..... | 6 |
| 2. Contact Tip Part Numbers..... | 7 |
| 3. Welding Faults.....           | 7 |



**Fig. C. - Wire Feed Mechanism**

#### 5. Fitting the Welding Gun

- Loosen the nut/bolt clamp in the feed roll block using the hex wrench provided.
- Push home the welding gun end connector and clamp firmly in position. Ensure that the connector is pushed and held in as far as it will go.
- Remove the welding nozzle but: **DO NOT FIT A CONTACT TIP AT THIS POINT.**

#### 6. Feeding the Welding Wire

- Fit the new reel on the hub so that wire is drawn off clockwise (fed from the bottom of the reel).
- Lift the pressure roll by pressing down and pulling the pressure arm adjusting knob.  
**Note: When lowering the pressure arm, the pressure roll must locate inside the slot provided in the black plastic wire guide. Failure to do so may damage or distort the guide and also prevent the wire from feeding.**
- Holding the end of the wire so that it does not spring out and uncoil, cut off any damaged or 'kinked' wire.

#### CAUTION

Remove any sharp edge or burrs before feeding - failure to do so may result in damage to the soft wire guide.

- Push wire through the wire guide and over the feed roll. Lower the pressure arm ensuring that the wire is located in the grooves of the feed roll and pressure roll.
- Connect the unit to the mains supply switch on and, using the switch on the welding gun, feed the wire through the gun.

#### CAUTION

Ensure that wire issuing from the gun does not come in contact with any metal surface - The wire is **LIVE!**

- Cut off the wire with a few inches protruding from the gas diffuser.
  - Slide a correct size of contact tip over the wire.
- #### 7. Fitting the Contact Tip
- The size of the tip is stamped on the side. The figure stamped on the tip refers to the interior diameter of the tip bore. - See page 7.  
'08' is for wire up to 0.6mm diameter  
'10' is for wire up to 0.8mm diameter
  - Screw in the tip and tighten using a pair of pliers or the inside handle edges of cutters. **DO NOT OVERTIGHTEN.**

#### 8. Refit the Nozzle onto the Gun.

**Note:** It is important that the nozzle is pushed on firmly, so that there is a tight gas fit between the back of the nozzle and the lock ring.

#### 9. Wire Feed Pressure Adjustment

The pressure roll may be adjusted by screwing the pressure roll adjustment knob up or down.

#### CAUTION

**Do not overtighten the pressure roll. This will result in damage to the wire and possible 'sticking' in the contact tip with internal ravelling of wire.**

Set the pressure arm adjustment by screwing the knob down until the wire ceases to slip. Hold the nozzle against a block of wood or other *insulating* material and note that the wire just slips.

#### 10. Gas Supply

Feed the gas hose through the hole in the back panel and connect it to the fitted gas valve using the hose clip provided.

Connect the other end of the hole to a suitable gas cylinder and regulator.

The recommended gas flow is between 8-10 Ltrs/min. A low flow rate will result in poor quality welding results.

A higher flow rate is wasteful.

## INSTALLATION

### 1. Mains Supply

Check that the unit supplied is suitable for the local mains supply - see rating information on front panel.

### 2. Mains Input Connection - Fig. A.

The mains input cable is connected to a 2-way terminal strip inside the left hand panel and earthed at an adjacent earth stud.

#### WARNING

Any electrical wiring must only be undertaken by a qualified or suitably trained technician.

If it is necessary to replace or rewire the mains input cable:

- Switch off and isolate the unit from the mains supply.
- Remove the top panel - 4 screws.
- Remove the left hand side panel - 2 screws.
- Retain the 6 screws for re-fitting.
- Identify the 2-way terminal strip and earthing stud.
- Leaving sufficient slack in the earth wire (to allow for stress) fit the cable.  
Blue wire - Terminal 1 (Neutral)  
Brown wire - Terminal 2 (Live)  
Green/Yellow wire - Earth Stud (Earth)
- Ensure that the cable is clamped firmly inside the front panel.
- Fit a standard three-pin plug to the cable using the normal wiring convention - see above 2f.

### 3. Fitting the Wire Reel Bracket-Fig.B.

- Remove the two self-tapping screws from the back panel.
- Fit the nylon strap (reel guard) between the support bracket and the rear panel, aligning the holes in the nylon strap and the top right hand hole in the support bracket.

Secure the bracket in position by replacing the self tapping screws (removed in 3a) in their original positions, and using the two M5 bolts, washers & nuts in the two left hand holes (viewed from the rear).

The plastic wire guide should protrude through the centre of the 3 holes at the bottom of the support bracket

#### WARNING

The plastic wire guide acts as an insulator for feed wire passing through the back panel. Therefore, on no account must the unit be used without this guide in position. Failure to do so will result in the wire short-circuiting.

### 4. Fitting the Wire Reel Hub

- Using the M8 bolt, washer & nut, fit the plastic hub to the bracket.  
**Note** The smaller of the two holes is the location hole for the stud on the inside face of the hub.
- Holding the M8 bolt in place inside the hub, and using a M8 socket and extension bar, fit the washer and nut to the bolt and tighten whilst ensuring that the stud is located in the smaller hole.

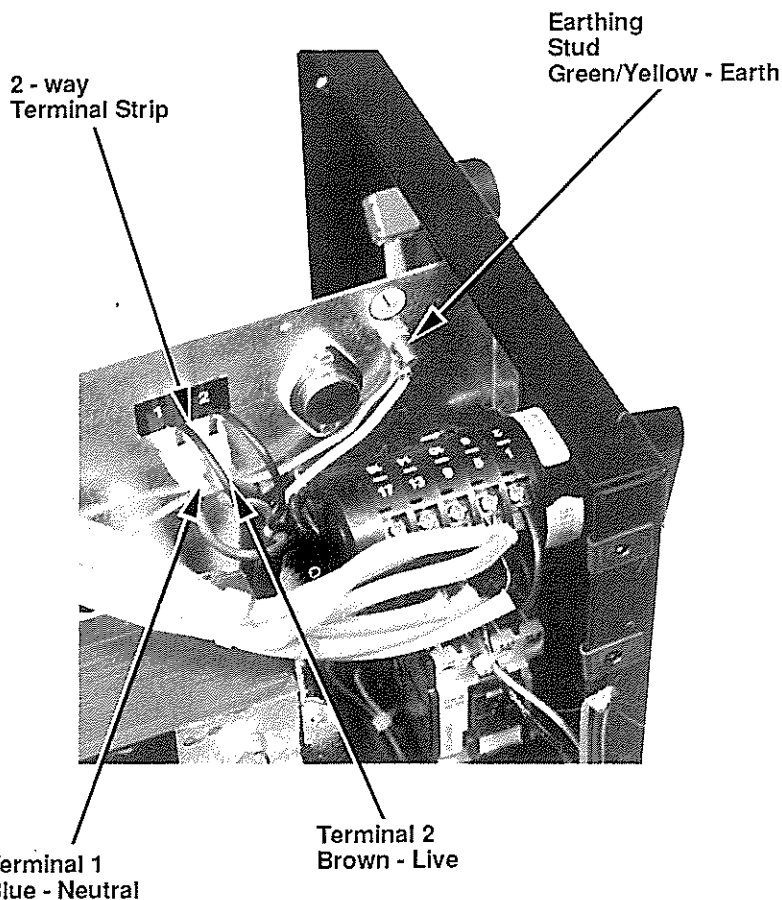


Fig. A. - Mains Input Connection

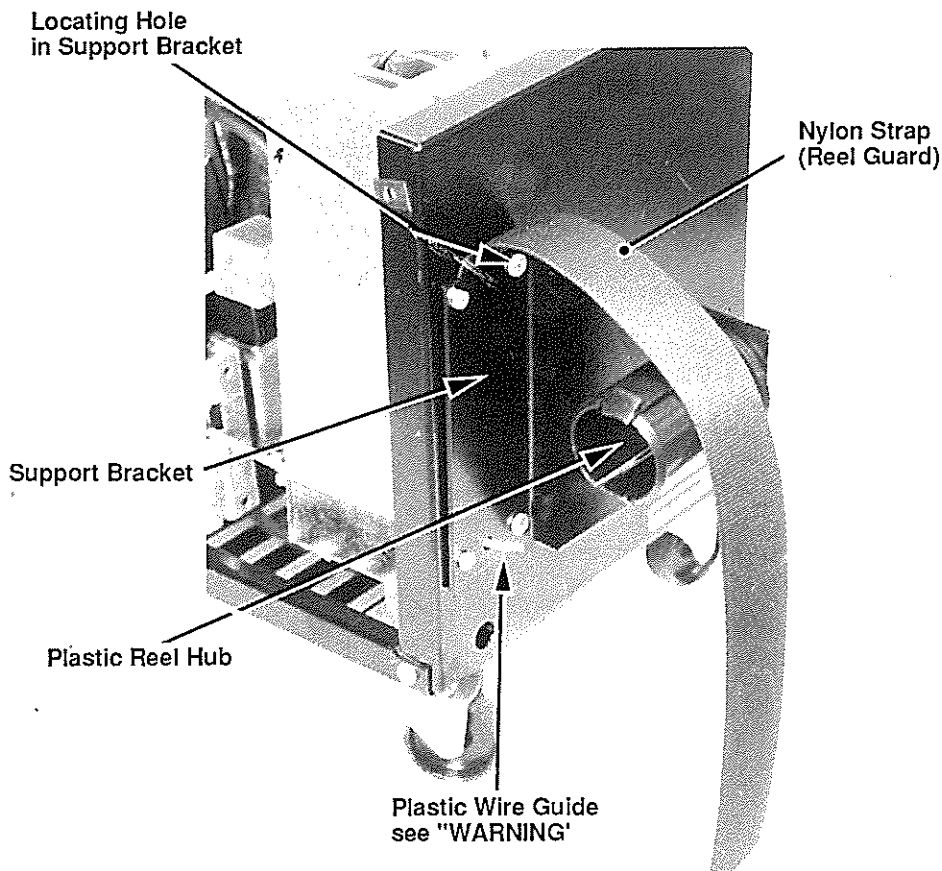
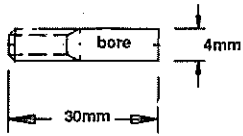
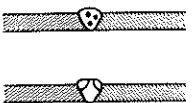

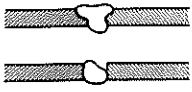





Fig. B. - Wire Reel Bracket and Reel Guard Fitting

**Table 2 - Contact Tip Part Numbers**

|  | Contact Tip   |     |       |                    |      |                 |      |
|---|---------------|-----|-------|--------------------|------|-----------------|------|
|   | Wire Diameter |     |       | Ar/CO <sub>2</sub> |      | CO <sub>2</sub> |      |
|   |               | mm  | Inch  | Part No.           | Bore | Part No.        | Bore |
| 12.51 Kg  | Fe            | 0.6 | 0.025 | 153503-001         | 08   | 153503-001      | 08   |
| 12.51 Kg  | Fe            | 0.8 | 0.030 | 153503-003         | 12   | 153503-002      | 10   |

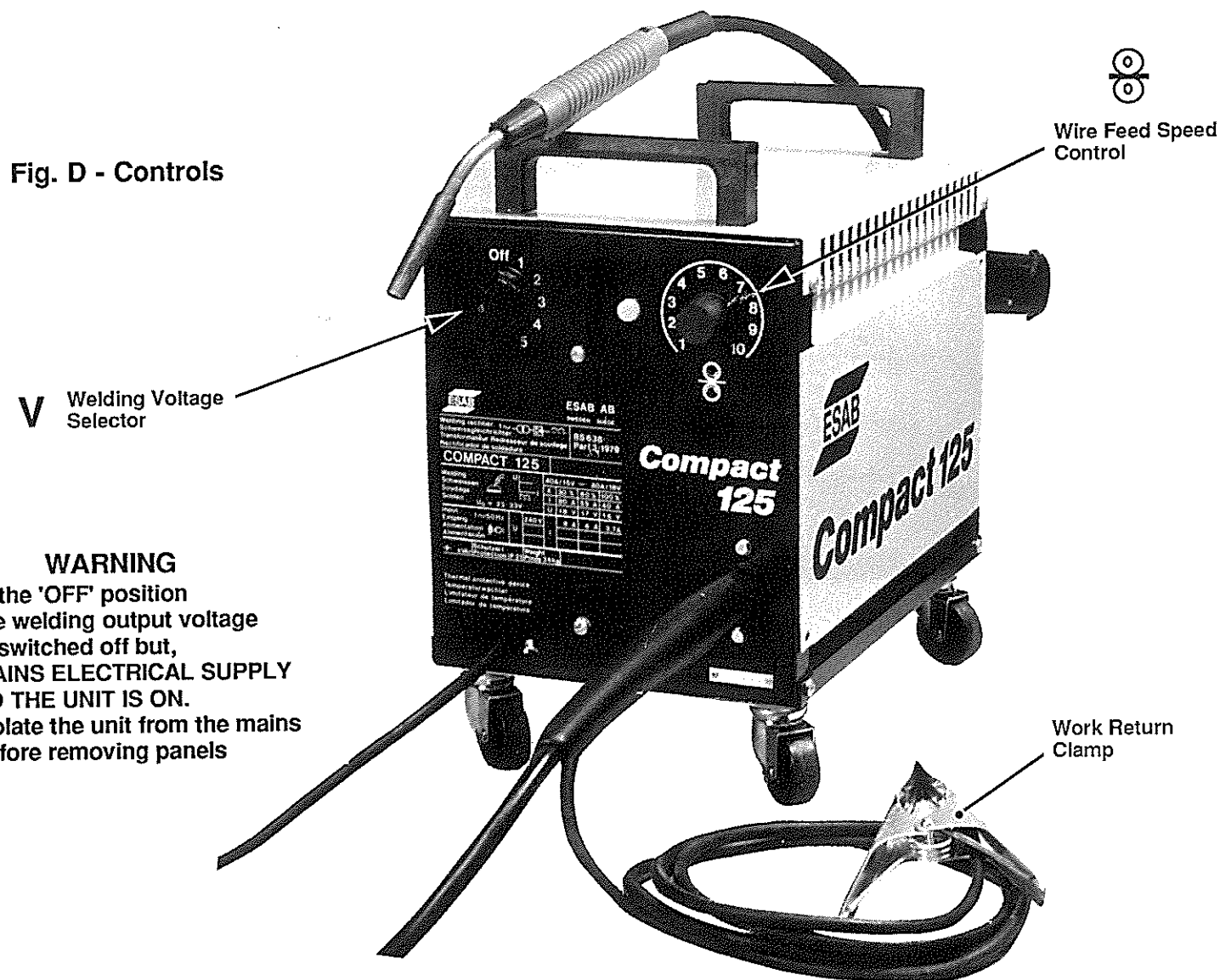
**Table 3 - Welding Faults (Irregular or no arc)**

| Trouble  |   | Possible causes   |
|--|---|---|
| Feed roller rotates, but no wire feed  |   | 1 Pressure roller not tightened<br>2 Dirt in wire conduit and/or contact tip  |
| Uneven wire feed   |   | 1 Contact tip defective<br>2 Dirt in the feed roller track<br>3 The feed roller track is defective  |
| Arc doesn't strike   |   | 1 Poor contact return cable/workpiece   |
| Arc is long and unstable   |   | 1 Voltage too high  |
| Almost no arc  |   | 1 Voltage too low   |
| Weld defects   | Appearance  | Possible cause  |
| Pores  |  | 1 Too much or too little gas.<br>Required 8–10 l/m<br>2 Insufficient gas shield due to spatter in gas nozzle<br>3 Draughty work area<br>4 Distance between gun and workpiece too great and/or incorrect handling of gun<br>5 Workpiece moist, oily or rusty |
| Insufficient deposition  |  | 1 Excessive welding speed<br>2 Current too low in proportion to welding speed   |
| Lack of fusion   |  | 1 Uneven gun movement<br>2 Voltage too low  |
| Spatter  |  | 1 Voltage too high<br>2 Gas nozzle not properly cleaned   |
| Uneven weld  |  | 1 Excessive wire stick-out<br>2 Current too high in proportion to voltage<br>3 Welding speed too low  |
| Insufficient penetration   |  | 1 Current too low in proportion to voltage  |
| <b>NOTE!</b> Defects or trouble in electric components, such as control circuits, contactor, switches, transformers, etc should be taken care of by trained service technicians. |   |   |

## CONTROLS

Set the wire feed speed control and welding voltage selector to the settings appropriate to the material, thickness and gas mixture in use  
- See Table 1 below

Fig. D - Controls



### WARNING

In the 'OFF' position the welding output voltage is switched off but, MAINS ELECTRICAL SUPPLY TO THE UNIT IS ON. Isolate the unit from the mains before removing panels



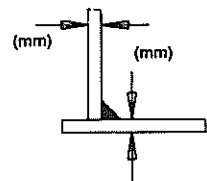
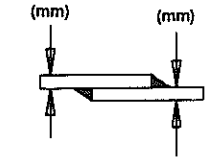
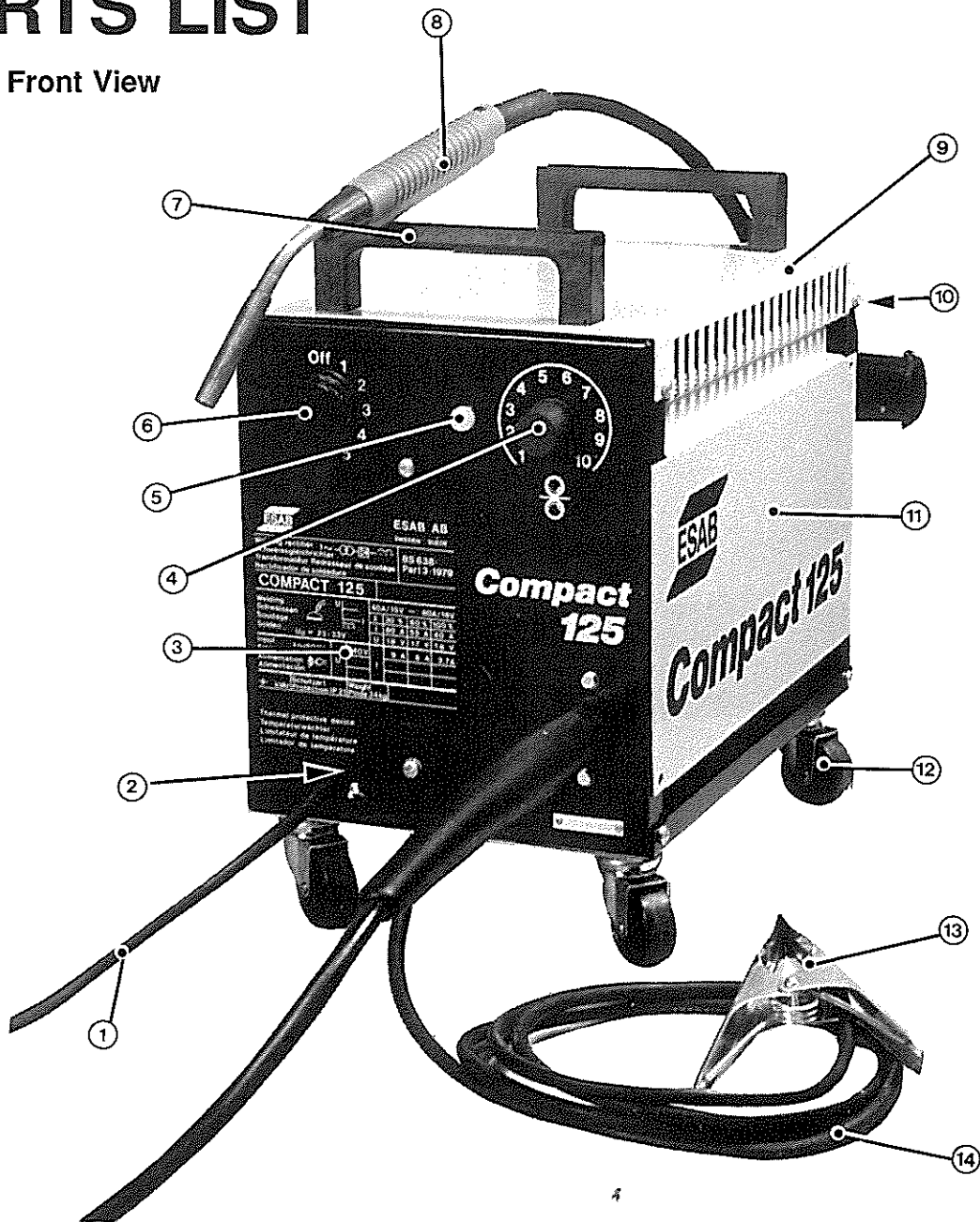
| Type of Joint   | Plate Thickness (mm) | Wire (Fe) | Ar/CO <sub>2</sub> |   | CO <sub>2</sub> |   |
|---|----------------------|-----------|--------------------|---|-----------------|---|
|   |                      |           | V                  |  | V               |  |
|  | 0.75                 | Fe0.6     | 1                  | 2.5   | 1               | 2   |
|   |                      | Fe0.8     | 1                  | 1.5   | 1               | 1   |
|   | 1.0                  | Fe0.6     | 2                  | 5   | 2               | 4   |
|   |                      | Fe0.8     | 2                  | 2.5   | 2               | 2   |
|   | 1.5                  | Fe0.6     | 4                  | 9   | 4               | 8   |
|   |                      | Fe0.8     | 4                  | 5   | 4               | 5   |
|  | 0.75                 | Fe0.6     | 1                  | 2.5   | 1               | 2   |
|   |                      | Fe0.8     | 1                  | 1.5   | 1               | 1   |
|   | 1.0                  | Fe0.6     | 2                  | 5   | 2               | 4   |
|   |                      | Fe0.8     | 2                  | 2.5   | 2               | 2   |
|   | 1.5                  | Fe0.6     | 4                  | 9   | 4               | 8   |
|   |                      | Fe0.8     | 4                  | 5   | 4               | 5   |
|   | 3.0                  | Fe0.8     | 5                  | 7   | 5               | 6   |
|   |                      | Fe0.8     | 5                  | 7   | 5               | 6   |

Table 1 - Welding Control Settings

# PARTS LIST

Fig. G - Front View



Compact 125 240V 50Hz (368 466 880)

| Item | Qty. | Order No.   | Description          |
|------|------|-------------|----------------------|
| 1    | 1    | 321 295-001 | Mains cable          |
| 2    | 2    | 321 220-001 | Grommet              |
| 3    | 1    | 367 568-001 | Front panel          |
| 4    | 1    | 321 259-880 | Rheostat complete    |
| -    | 1    | 191 510-106 | Knob                 |
| 5    | 10   | 192 576-010 | Pilot lamp           |
| 6    | 1    | 318 113-003 | Knob                 |
| 7    | 2    | 156 388-001 | Handle               |
| -    | 2    | 156 389-001 | Rail                 |
| 8    | 1    | 321 208-880 | Welding gun - PSE 90 |
| 9    | 1    | 321 216-001 | Cover                |
| 10   | 17   | 2121 107-42 | Screw                |
| 11   | 2    | 321 215-001 | Side panel           |
| 12   | 4    | 321 203-001 | Swivel castors       |
| 13   | 1    | 6281 038-01 | Welding clamp        |
| 14   | 1    | 321 272-881 | Return cable         |

## Maintenance and Service

In order to maintain trouble-free feed, frequent cleaning of the wire feed mechanism and wire feed guide of the welding gun with compressed air is required. The entire equipment should be cleaned with compressed air, once a year.

### WARNING

Maintenance which requires the removal of outer covers or interference with any electrical wiring must be only undertaken by qualified or suitably trained personnel.

Fig. E - CIRCUIT DIAGRAM

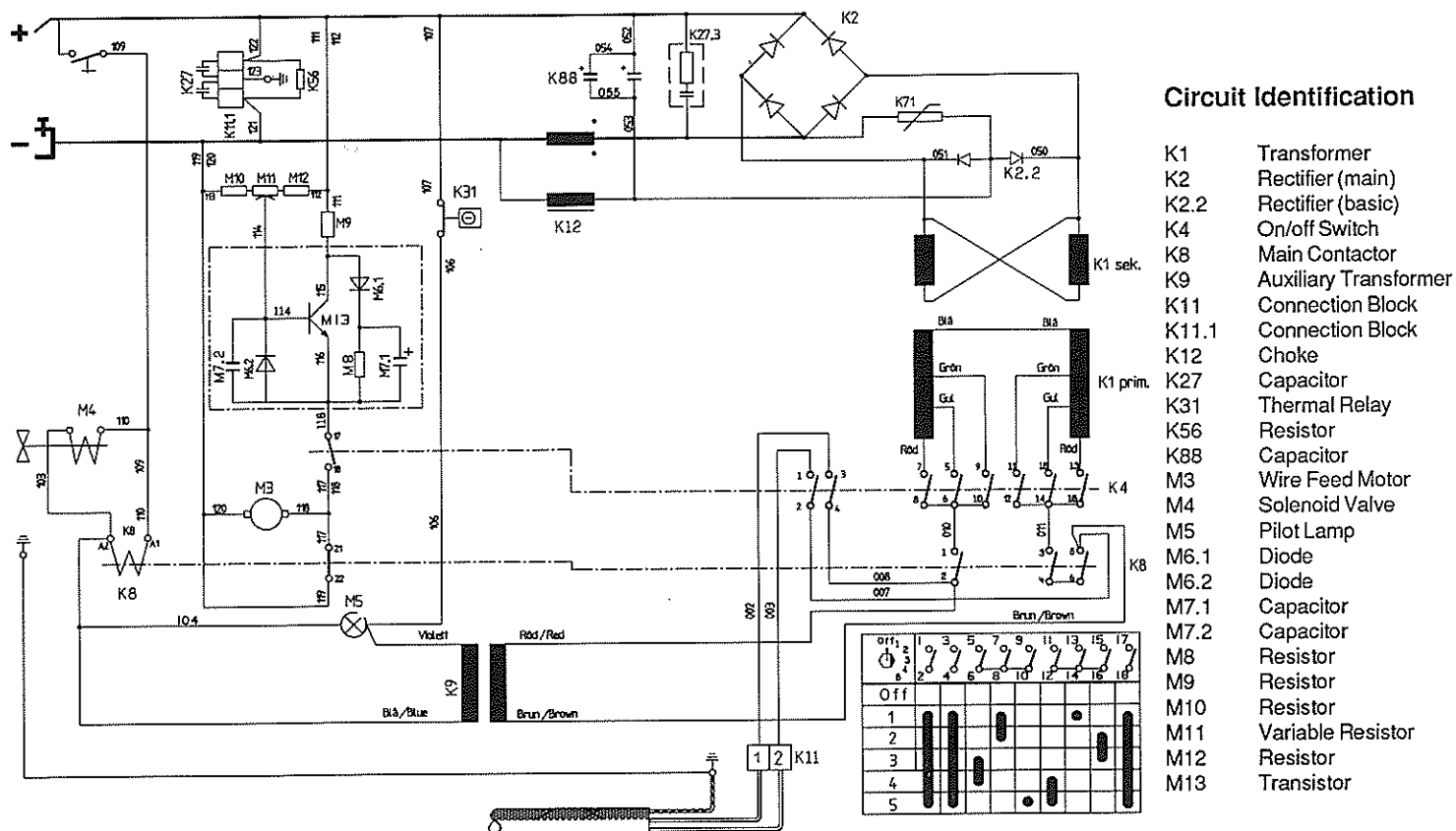


Fig. F - DIMENSIONS

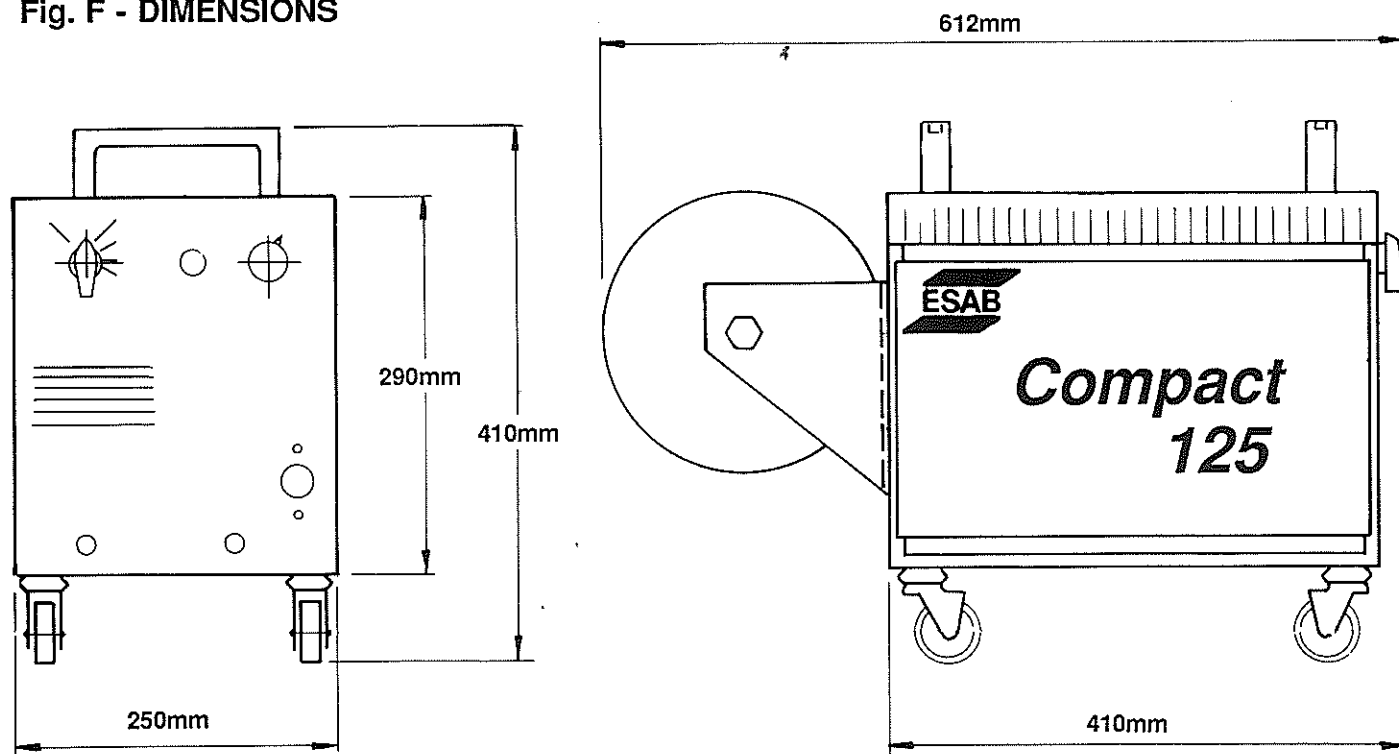
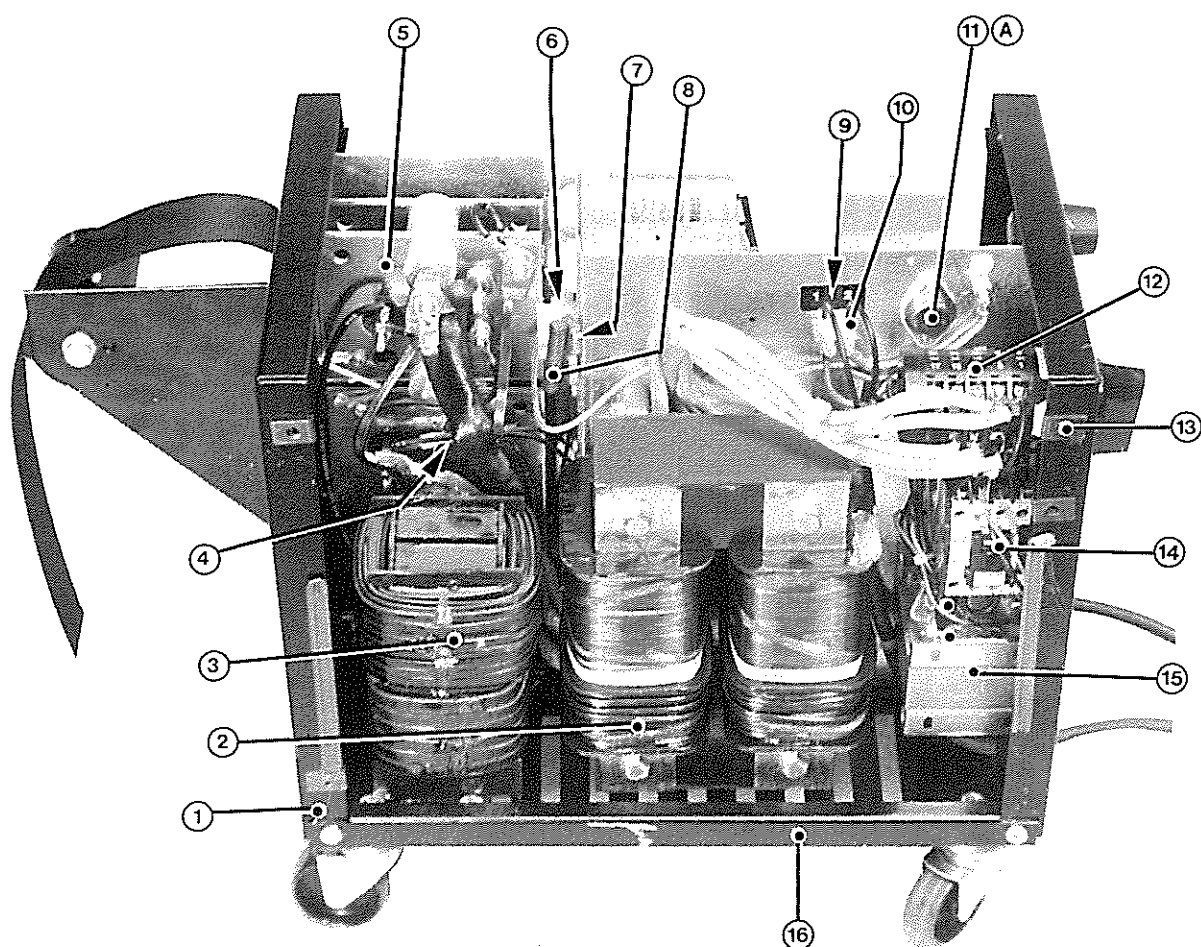


Fig. H. - Left Hand Side View

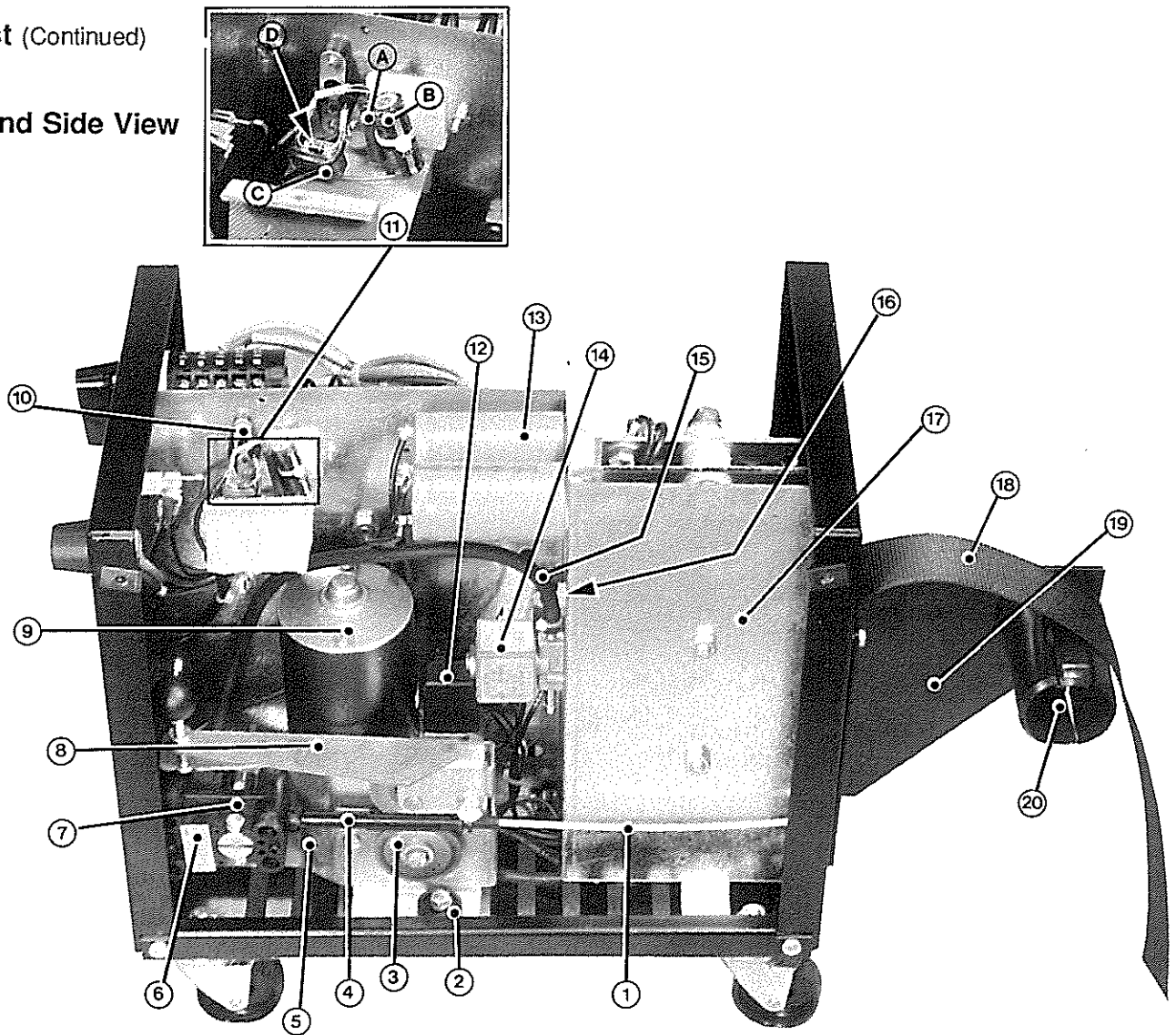


Compact 125 240V 50Hz (368 466 880)

| Item | Qty. | Order No.   | Description                |
|------|------|-------------|----------------------------|
| 1    | 1    | 321 227-001 | Rear panel                 |
| 2    | 1    | 321 296-880 | Transformer complete, 240V |
| 3    | 1    | 321 277-880 | Inductor                   |
| 4    | 1    | 321 229-001 | Thermostat                 |
| 5    | 1    |             | Diode Bridge comprising:-  |
| 5A   | 1    | 321 207-882 | Diode Bridge (black)       |
| -    | 1    | 321 219-004 | Diode black                |
| 5B   | 1    | 321 207-881 | Diode Bridge (Red)         |
| -    | 1    | 321 219-003 | Diode red                  |
| 6    | 1    | 193 045-002 | Connection Block 3-pole    |
| 7    | 2    | 192 883-003 | Capacitor 0.1μF            |
| 8    | 1    | 191 094-129 | Resistor 10W 220Ω          |
| 9    | 1    | 320 355-001 | Reference Plate            |
| 10   | 1    | 193 045-011 | Connection Block 12-pole   |
| 11   | 1    | 146 166-006 | Transistor                 |
| 11A  | 1    | 146 166-003 | Insulating Washer          |
| 12   | 1    | 321 228-001 | Switch                     |
| 13   | 18   | 151 270-001 | Spring Catch Nut           |
| 14   | 1    | 193 356-101 | Contractor                 |
| -    | 1    | 193 298-101 | Moving Contact             |
| 15   | 1    | 320 681-001 | Auxiliary Transformer      |
| 16   | 1    | 321 222-001 | Base Plate                 |

# Parts List (Continued)

Fig. J. -  
Right Hand Side View

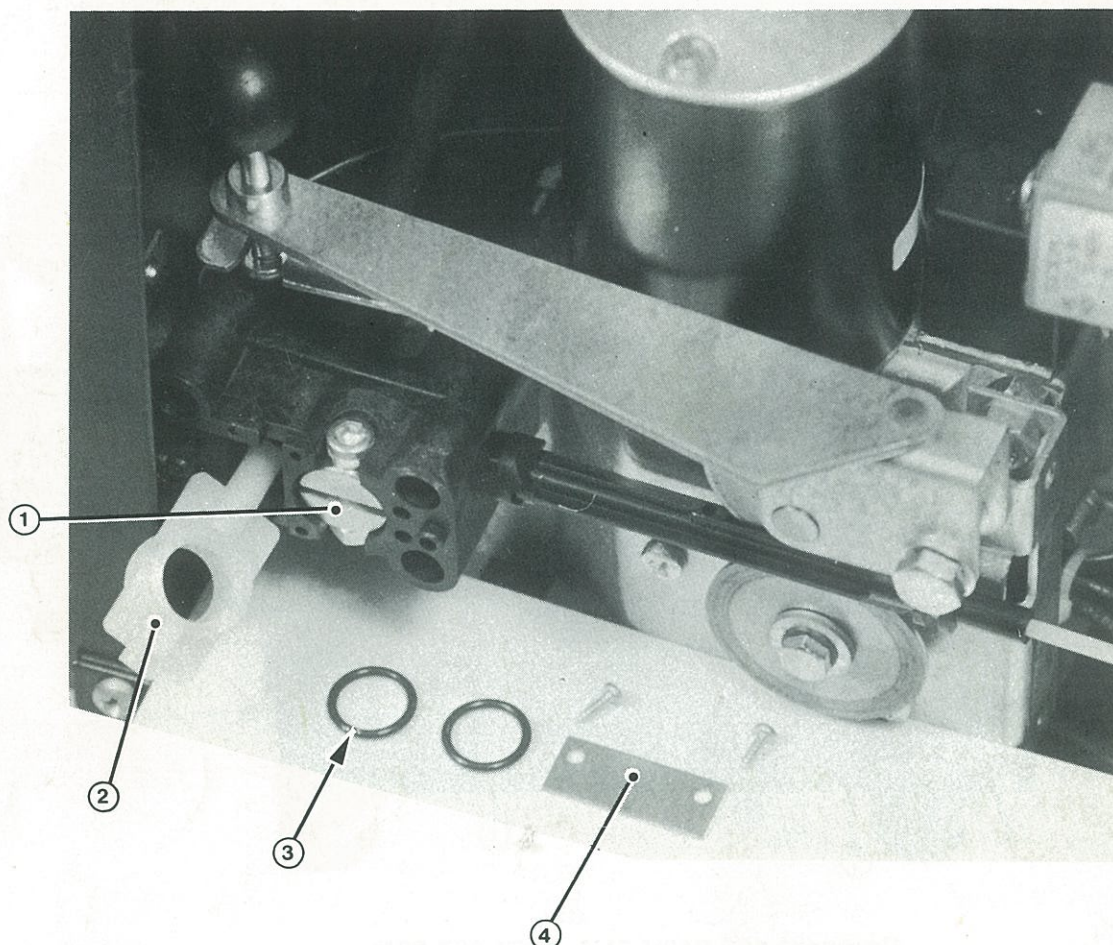


## Compact 125 240V 50Hz (368 466 880)

| Item | Qty. | Order No.   | Description                 |
|------|------|-------------|-----------------------------|
| 1    | 1    | 157 349-002 | *Wire Feed Conduit          |
| 2    | 2    | 153 043-002 | Insulating Washer           |
| 3    | 1    | 157 241-001 | Feed Roll                   |
| 4    | 1    | 365 511-881 | Guide Nozzle                |
| 5    | 1    | 157 246-001 | Bracket                     |
| 6    | 1    | 156 701-001 | Contact Plate               |
| 7    | 1    | 156 596-001 | Connection Block            |
| 8    | 1    | 157 245-880 | Pressure Arm complete       |
| 9    | 1    | 157 326-001 | Drive Unit                  |
| 10   | 1    | 192 578-001 | Mount                       |
| 11   |      | See Inset   |                             |
| 11A  | 1    | 191 093-141 | Resistor 2.2K $\Omega$ 4.2V |
| 11B  | 1    | 191 618-173 | Capacitor 22 $\mu$ F 100V   |
| 11C  | 1    | 192 883-006 | Capacitor 0.33 $\mu$ F      |
| 11D  | 2    | 192 736-007 | Diode                       |
| 12   | 1    | 157 453-001 | Casing                      |
| 13   | 2    | 367 573-001 | Capacitor 4.700 $\mu$ F     |
| 14   | 1    | 366 645-001 | Solenoid Valve              |
| 15   | 1    | 191 954-101 | Rubber Hose 350mm           |
| 16   | 1    | 192 579-209 | Resistor 3 $\Omega$         |
| 17   | 1    | 321 232-001 | Partition                   |
| 18   | 1    | 321 218-001 | Reel Protection             |
| 19   | 1    | 321 231-001 | Reel Support                |
| 20   | 1    | 152 177-001 | Hub                         |

## Parts List (Continued)

Fig. K - Feed Block Parts



Compact 125 240V 50Hz (368 466 880)

| Item | Qty. | Order No.   | Description         |
|------|------|-------------|---------------------|
| 1    | 1    | 0410 742-02 | Cable Terminal      |
| 2    | 1    | 156 597-001 | Connection Strip    |
| 3    | 2    | 2152 012-12 | O-ring (14.3 x 2.4) |
| 4    | 1    | 156 760-001 | Cover               |

### Optional Extras:

Cylinder Support Tray Kit - Part No. 366 603-880



ESAB GROUP LTD.  
Gunnels Wood Road,  
Stevenage  
Herts.  
SG1 2BH

Telephone No: (0438) 728821  
Telex No: 826333  
Fax No: (0438) 722253