



Operating Manual

Tradesmig 186T/191/251/253 & 313



**Please ensure that this
Instruction Manual and Parts List
is made available to the user of
the equipment**



DECLARATION OF CONFORMITY

Murex Welding Products Ltd.

Declare hereby that:

Murex Tradesmig 186T, 191, 251, 253 & 313 power sources

Part No: 1416117, 1415520, 1415522, 1415524 & 1416123

- are manufactured in accordance with the Council Directive 73/23/EEC (1973-02-19) and 89/336/EEC (1989-05-03) amended by Council Directive 93/68/EEC relating to electrical equipment designed for use within certain voltage limits.
- conform with the protection requirements of Council Directive 89/336/EEC, amended by Council Directives 91/263/EEC, 92/31/EEC and 93/68/EEC relating to electromagnetic compatibility.
- are manufactured in accordance with EN60974-1 Safety Requirements for Arc Welding Equipment
- are manufactured in accordance with EN50199 Electromagnetic Compatibility for Arc Welding Equipment.

On behalf of ESAB Group (UK) Ltd
Hertford Road
Waltham Cross
Herts. EN8 7RP
England

A handwritten signature in black ink, appearing to read "P.G. Dodd".

P.G. Dodd
Managing Director
ESAB Group (UK) Ltd
September 2002



Contents

	Page
• Declarations of Conformity	2
• Warnings	4
• Safety	5
• Introduction	6
• Installation	7
• Welding Notes	9
• Welding Faults	10
• Technical Notes Specification	11
• Routine Maintenance	12
• Wiring Diagrams	13
• Parts Lists	17



WARNING



This welding equipment has been designed, manufactured and tested to the highest standards to ensure long and trouble free life. However, regular maintenance is an essential part of keeping the machine operating in a reliable and safe manner and your attention is drawn to any maintenance instructions that are contained in this manual.

In general, all welding equipment should be thoroughly inspected, tested and serviced at least annually. More frequent checking will be required when the equipment is heavily used.

Wear and tear, particularly in electro-mechanical and moving components, are gradual processes. Caught in time, repair costs are small and the benefits in performance, reliability and safety are significant. Left alone, they can put the equipment, and you, at risk.

Have this equipment regularly inspected and maintained by an approved service centre.



WARNING



ARC WELDING AND CUTTING CAN BE INJURIOUS TO YOURSELF AND OTHERS. TAKE PRECAUTIONS WHEN WELDING. ASK FOR YOUR EMPLOYER'S SAFETY PRACTICES WHICH SHOULD BE BASED ON MANUFACTURERS' HAZARD DATA.

ELECTRIC SHOCK – Can Kill

- Install and earth the welding unit in accordance with applicable standards.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves, or wet clothing.
- Insulate yourself from earth and work.
- Ensure your working position is secure.

FUMES AND GASES – Can be Dangerous to Health

- Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to keep fumes and gases from your breathing zone and the general area.

ARC RAYS – Can Injure Eyes and Burn Skin

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.

NOISE– Excessive noise can damage hearing

- Protect your ears. Use ear defenders or other hearing protection.
- Warn bystanders of the risks.

**READ AND UNDERSTAND THE INSTRUCTION MANUAL
BEFORE INSTALLING OR OPERATING AND SEE WMA PUBLICATION 237
'The arc welder at work' AVAILABLE FROM THE MANUFACTURER.**

PROTECT YOURSELF AND OTHERS

SAFETY

In any arc welding or gouging operation, it is the responsibility of the user to observe certain safety rules to ensure his personal safety and to protect those working near him.









Read all safety articles relevant to arc welding published by the WMA. Pay particular attention to any CAUTION or WARNING Notes included in this manual. CAUTION indicates possible equipment damage. WARNING indicates possible hazard to life.

WARNING




*The ON/OFF switch on this equipment does not isolate the unit from the mains electrical supply. **AC POWER IS PRESENT ON THE ON/OFF SWITCH TERMINALS.***

*The On/Off lamp is an indication that the supply is switched on and does not imply that the unit is isolated from the supply. **BEFORE REMOVING THE COVERS FOR MAINTENANCE, ISOLATE THE UNIT FROM THE MAINS ELECTRICAL SUPPLY.***




1 Electrical

-  Treat electricity with respect. Even the open circuit voltage of this equipment can be dangerous. Adjustments to the torch or replacement of torch parts should be undertaken with the mains supply isolated from the unit.
- If damaged torch cables or torch components are found, the unit must be disconnected from the mains and defective parts must be replaced using only Murex spare parts.
-  Do not work on live circuits or cables. Disconnect the main power supply before checking the machine or performing any maintenance operation.
-  Be sure the case of the welding machine is properly connected to a good electrical earth.
-  Have the wiring for the welding machine installed by a qualified electrician. All connections must be made according to specifications in force and to general safety standards.
-  Do not stand in water or on damp floors while using an arc welder or cutter. Do not use in the rain.
-  Do not operate with worn or poorly connected cables. Inspect all cables frequently for insulation failure, exposed wires and loose connections.
-  Do not overload cables or continue to operate with overheating cables. Cables which are too small for the current carried will overheat, causing rapid deterioration of the insulation.
-  Pay attention that live parts of the torch do not touch any metal which is connected to the earth cable. Fix an insulated hook to hang the torch on when it is not in use.





2 Ventilation

-  Do not weld or cut on containers which have held combustible or flammable materials, or materials which give off flammable or toxic vapours when heated, without proper cleaning.
-  Locate the welding/cutting operation far enough from any vapour-type degreaser using trichlorethylene or other chlorinated hydrocarbons as solvents. The ultraviolet light from the arc can decompose these vapours into toxic gases at a considerable distance from the arc, even though the concentration of the gases is low enough to be undetectable by smell.
-  Be sure to provide adequate ventilation for removal and dilution of fume and gases. Fume exhaust facilities near the arc, or a ventilated helmet should be used when cutting in confined spaces or on toxic material.



3 Glare

-  Never look at the arc without wearing eye protection. Always use the proper protective clothing, filter glasses, and gloves. Be careful to avoid exposed skin areas. Do not use cracked or defective helmets or shields.
-  Never strike an arc when there is someone near who is not protected from the strong light of the arc.
-  Warn bystanders who are not aware of the dangers of ultra-violet light.



4 General

-  Take care when lifting the unit.
-  Ensure that cylinders are secured by chains.
-  Locate the unit so that there is adequate air flow to the ventilation louvres.
-  Always dress correctly to protect against glare, radiation and spatter.

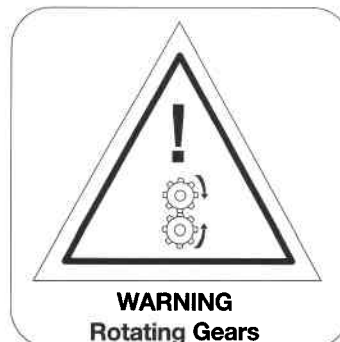
5 Fire

-  Ensure that the correct type of fire extinguisher is available in the welding area.
-  Do not weld near flammable materials or liquids, in or near explosive atmospheres, or on pipes carrying explosive gases.

6 Vehicle Electrics

-  When working on motor vehicles, remove the battery and any circuitry which may be damaged by the arc.
-  Whilst welding be aware of the possibility of 'hidden wires' behind panels or bulkheads.

7 Warning



Switch off before accessing areas which contain moving parts. Particular care should be taken when accessing the wire feed mechanism.

INTRODUCTION

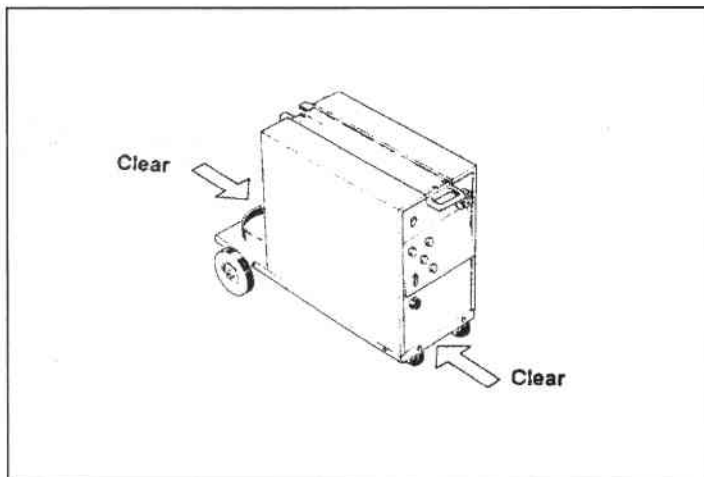
The Tradesmigs 186T, 191, 251, 253 and 313 are Transformer/Rectifier MIG/MAG welding power sources fitted with integral wire feed system. Excluding the 186T Challenger model they are capable of continuous spot and stitch welding using CO2 or Argon rich gases. The 186T provides continuous welding mode only.

A 42 volt a.c. output is available to power a CO2 heater on the 191, 251, 253 & 313 - see Fig 1.

Protection against the effects of overheating is provided by thermal protection devices mounted on the transformer assembly and rectifier bridge. In the event of overheating, power to the unit is interrupted and the fault lamp is illuminated. The protective devices automatically reset when cools.

INSTALLATION

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



Place the unit so that the vents are clear of any obstruction to ventilating air.

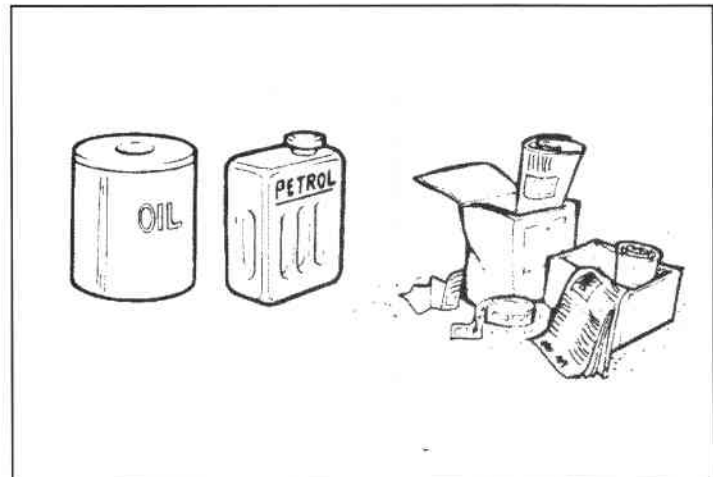
42Vac Heater Connection TM 191, 252, 253, 313.

Feed the cable through the grommet in the back panel and connect the wires to the terminal block marked 1 & 42V on the auxiliary transformer (see Fig 1).

Clamp the cable firmly in the panel mounted clamp provided.

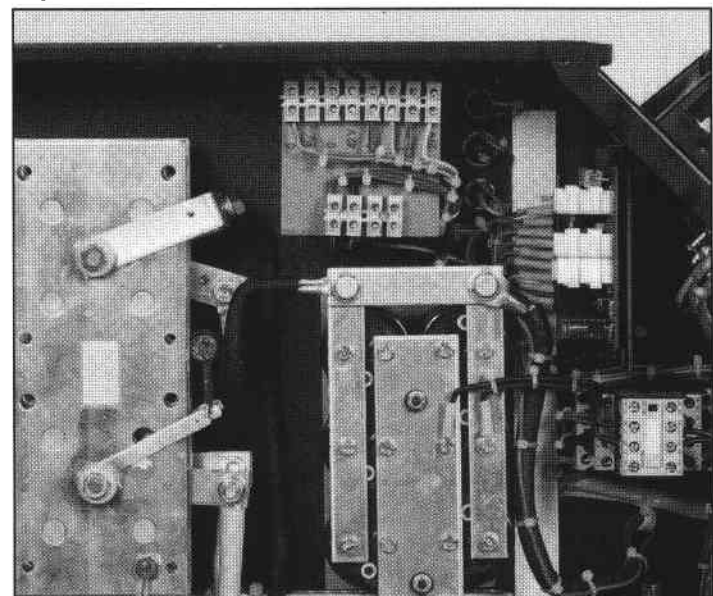
NOTE
If the fault light comes on whilst welding, do not switch off but leave the unit switched on with the fan running until the protection devices reset. If the fault persists call for technical assistance.

WARNING!
If the fault lamp lights more than once or the fault lamp lights repeatedly after resetting, isolate the unit from the mains supply (remove the supply fuses) and call for technical assistance (from your Murex Service Centre Network).



Remove all flammable materials from the area.

Fig 1.



WARNING!
Installation work must be performed by a trained, competent electrician. Do not permit untrained persons to repair this equipment.

WARNING!
Be sure that all primary power to the machine has been externally disconnected. Open wall disconnect switch or circuit breaker before attempting inspection or work inside the power source.

INSTALLATION

Initial Setting up

1. Check the ON/OFF switch is 'OFF'.

WARNING!

This switch does not isolate the unit from the mains electrical supply.

2. **Feed Roll**

Before connecting the gas supplies, ensure that the equipment is set up for the type of size of wire to be used.

3. **Work Return Lead**

Connect the work return lead between the work return socket and a clean area on the work piece.

WELDING WIRE

Fit the reel of welding wire:

1. Remove the hand nut from the hub.
2. Place the reel of wire on the hub so that the wire will be drawn off from the bottom. Ensure that the pin on the hub locates in the hole in the side of the reel. Replace hub hand nut.
3. Release the end of the wire from the side of the reel but do not allow the coils to loosen. Cut off the kinked portion and remove any sharp edges from the end of the wire. This should be done every time the wire is threaded through the equipment.
4. Release the pressure roll arm.
5. Thread the wire through the inlet guide under the feed roll and into the outlet guide, for approximately 150mm until the wire protrudes from the torch connector by approximately 50mm.

Lock down the pressure roll arm so that the welding wire is clamped into position in the groove.
6. Check that the torch lead is laid out straight and connect the torch to the adaptor, ensuring that the wire enters the liner correctly.
7. Remove the nozzle and contact tip from the torch. Using the torch switch, feed the wire through the torch. Thread a contact tip over the wire and screw it into the torch. Tighten the contact tip with the key provided.
8. Fit the nozzle.

WARNING!

The wire, contact tip and wire feed mechanism are 'live' when the torch switch is pressed.

9. Press the torch switch and check that the wire feeds smoothly from the torch.

Do not over tighten the adjusting screw.

10. Cut off the wire to protrude 10mm from the torch connector.

REPLACEMENTS AND ADJUSTMENTS

1. **Guide Tube Removal**

(a) Release the pressure roll.

(b) If the guide tube will move freely, push it forward out of the torch adaptor using a pencil or soft wooden dowel rod, then withdraw it from the torch adaptor using a pair of long nose pliers.

If the guide tube does not move freely, it may be necessary to drive it out using a hard wooden dowel or old guide tube.

NOTE

Do not use a screwdriver or metal tool to push out the tube. Use of such a tool may damage the end of the guide and impair wire feeding.

2. **Feed Roll Changing**

Remove the feed roll retaining screw. It may be necessary to give the screwdriver a sharp twist to avoid turning the motor.

Drop the pressure arm and pull off the feed roll. When replacing the feed roll, note the wire size which is stamped on the face of the roll. The required size must face outwards when the roll is refitted. Ensure that the Woodruff Key is not lost.

Fit the feed roll and lock the pressure arm. Refit the retaining screw giving it a sharp twist with the screwdriver to tighten.

3. **Feed Roll Pressure**

Correct feed roll pressure will provide smooth, uninterrupted feeding of the wire. Inspection of the wire should reveal only slight marks from the feed rolls and no deformation of the wire. Use of the correct pressure is especially important when feeding aluminium wires.

The press should be just enough to provide positive wire drive without slipping.

4. **Overrun adjustment**

Tighten or unscrew the hub tension nut in the centre of the wire reel hub until sufficient hub friction is achieved to prevent overrun.

NOTE

Do not over tighten or the wire will slip in the feed rolls.

ON/OFF SWITCH

With this switch in the ON position power is applied to the fan and control circuits

OVER TEMPERATURE INDICATOR

(see Note 1)

t₂ - 'ON' TIME CONTROL

For spot welding and 'stitch on' time (not on 186T).

t₂ - 'OFF' TIME CONTROL

For 'stitch off' time (not on 186T).

VOLTAGE SELECTOR SWITCH

WORK RETURN LEAD SOCKET



MODE SELECTOR SWITCH

Continuous/Spot/Stitch (not on 186T)

OPTIONAL DIGITAL METER KIT

(not on 186T)

WIRE FEED SPEED (CURRENT) CONTROL

Note 1

The indicator will illuminate and the power source will be inhibited if the temperature of internal components becomes excessive. Should this occur, leave the power source to idle for a few minutes to cool down, do not switch the power source off as this will remove power from the cooling fan.

CAUTION

If this indicator lamp persistently operates do not use until the power source has been checked by an approved Service Engineer.

WARNING

The ON/OFF switch on this equipment does not isolate the unit from the mains electrical supply. **AC POWER IS PRESENT ON THE ON/OFF SWITCH TERMINALS.**

The On/Off lamp is an indication that the supply is switched on and does not imply that the unit is isolated from the supply. **BEFORE REMOVING THE COVERS FOR MAINTENANCE, ISOLATE THE UNIT FROM THE MAINS ELECTRICAL SUPPLY.**

Welding Modes

(Note Spot and Stitch not available on 186T)

Continuous

Spot - t₁

Stitch - t₁ and t₂

