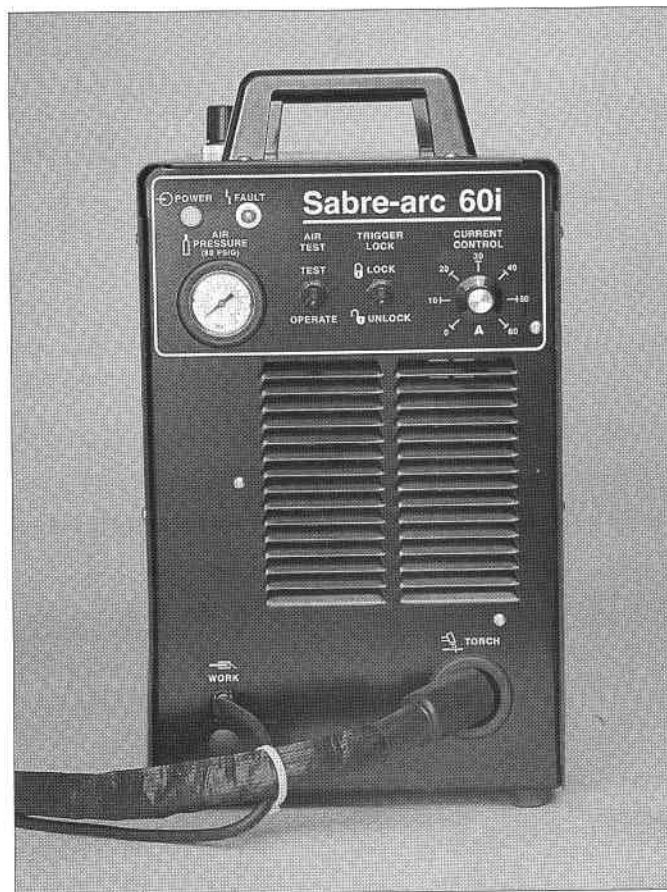


Operating Manual

Sabre Arc 60i/PT-81 Air Plasma Cutting System



**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.

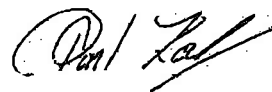
Declare hereby that:

Murex Sabre-arc 60i/PT-81 Air Plasma Cutting Equipment

Part No: 1415410

- is 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.
- conforms 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.
- is manufactured in accordance with EN60974-1 Safety Requirements for Arc Welding Equipment and EN50192 Plasma Cutting Systems.
- is manufactured in accordance with EN50199 Electromagnetic Compatibility for Arc Welding Equipment.

On behalf of Esab Group (UK) Ltd
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Managing Director
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1st January 1996

Manufactured by Esab Welding & Cutting Products
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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 18 PUBLICATION 237
'The arc welder at work' AVAILABLE FROM THE MANUFACTURER.**

PROTECT YOURSELF AND OTHERS

SAFETY

In any arc welding, cutting 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 18. 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.

1. 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.

2. 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 ultraviolet light.

3. 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.

4. 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.

5. 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.

INTRODUCTION

Sabre-Arc 50i & 80i power sources

The Murex Sabre-arc 60i is a portable plasma cutting system designed to work on industrial 380/415V power supplies and utilises clean and dry factory compressed air for both the plasma and secondary cooling gas. The power source uses inverter technology to give precise control of the cutting current and together with the PT-81 torch enables conducting materials up to 20mm to be cut.

PT-81 Plasma Cutting Torch

The patented Murex PT-81 torch is designed to operate to a maximum of 80 amperes at 100% duty cycle using clean dry air for both cooling and plasma gases. A built in air checkvalve inside the PT-81 torch head, in combination with air flow detection circuitry in the Sabre-arc power source, ensures the torch cannot be energised when the heatshield is removed.

The PT-81 is available with either 7.6m or 15m cables (7.6m is standard on the Sabre-arc 60i).

The PT-81 is best applied using a 3mm to 6mm stand off distance (tip to work) for cutting material thicknesses of 3mm to 20mm.

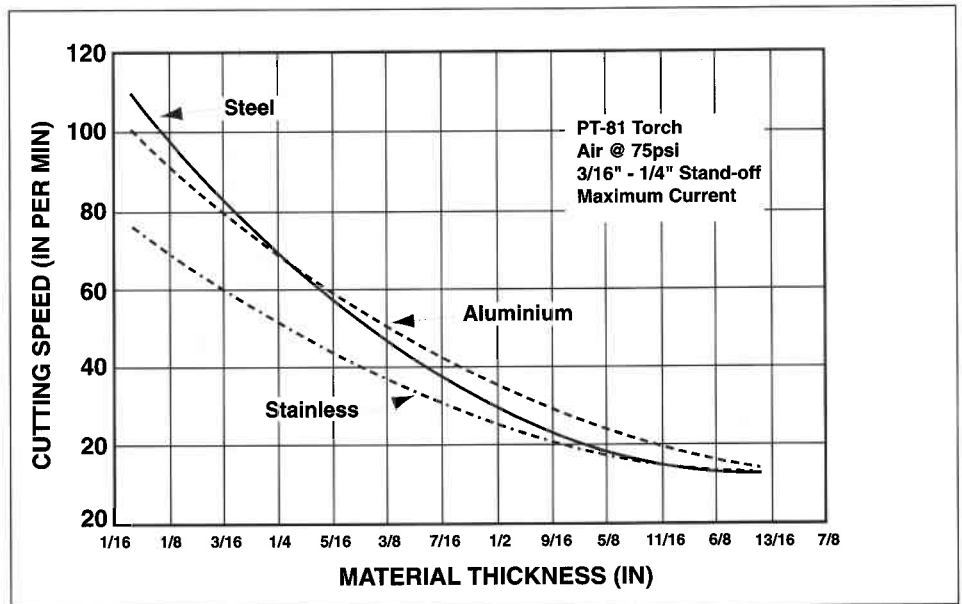


Figure 1.

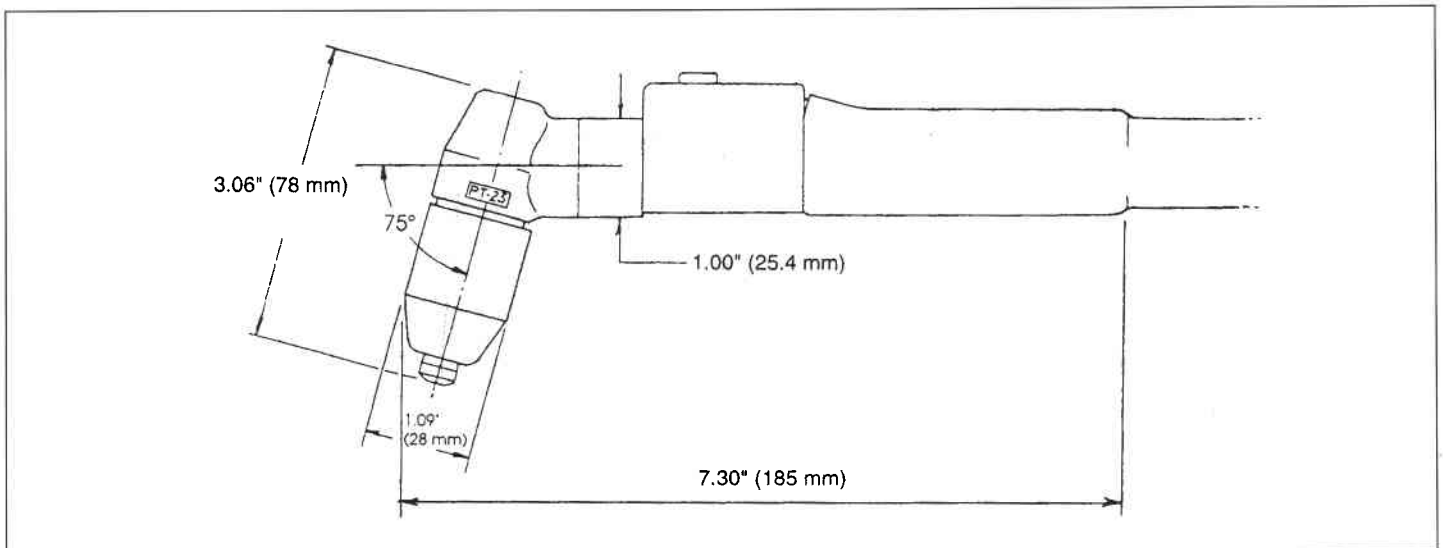


Figure 2. PT-81 Dimensions

SPECIFICATION

		SABRE-ARC 60I
Output		
Open Circuit Voltage		275Vdc
Output Current		10-60A
Duty Cycle	60%	60A @ 120Vdc
	100%	50A @ 120Vdc
Input		
Mains Voltage		400Vac \pm 10%
Frequency		50/60Hz
Phases		3
Primary Current at Max Output		13A/Phase
Fuse Rating		25 A
Dimensions		
Length		516mm
Height		409mm
Width		275mm
(inclusive of torch storage)		
Weight		40kg

PT-81 PLASMA TORCH		
Duty Cycle		80A @ 100%
Weight	7.6mm	2.4kg
	15m	4.4kg

UNPACKING

The Murex Sabre systems comprise the following items

Description	Part No
SABRE-ARC 60i PACKAGE Containing: Sabre-Arc 60i Power Source with regulator	1415410
PT80 Plasma Torch 7.6m	1415302
Work cable 7.6m	680560
Spare parts kit (see table 1)	1415304

Check that all required items are present and inspect carefully for evidence of damage which may not have been apparent on the external packing. If necessary notify the carrier or your Murex distributor immediately.

Table 1 PT-81 Spare Part Kits

Description	Pt. No.	Qty
Heat Shield Long	1415306	2
50-60A Nozzle	1415211	4
Stand off guide	1415215	1
Swirl Baffle	1415213	1
Electrode	1415214	3
Fuse	951780	4
Valve Pin	21619	1

INSTALLATION

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

1. Choose a location so that the louvres on the front and rear are clear of any obstruction and permit free flow of air through and around the unit. Refer to Safety section for other precautions regarding siting the unit.

WARNING

Electric shock can kill! Precautionary measures should be taken to provide maximum protection against electric shock. Be sure that all power is off by opening the line (wall) disconnect switch and by unplugging the primary cable to the unit when connections are made inside the power supply.

2. The Sabre-arc 60i Power Source

The power source is equipped with a 3m primary input cable suitable for use on 400V 3 phase 50/60Hz supply.

Correction should be made as follows:

Brown - L1
Blue - L2
Yellow - L3
Green/Yellow - Earth

A suitable switched isolator should be used and the circuit must be protected by a suitable fuse.

3. For operator safety, the torch and work return cable corrections are located on a panel behind the cover on the left hand side of the unit.

WARNING!

Before making any corrections to the power source output terminals make sure that all primary input power to the machine is off at the main disconnect switch and that the input power cable is unplugged.

WARNING!

Do not use any torch with this unit other than the PT-81 without consulting Murex Welding products technical department. Serious injury may occur if used with any other torch.

4. Connect a supply of CLEAN DRY COMPRESSED AIR to the regulator input nipple. The supply requirements are 6 bar minimum, 10 bar maximum (90-150 psi) at 100-150 L/min. Do not use compressed air that has been oil loaded for pneumatic tools etc.

5. Clamp the earth clamp onto the workpiece ensuring that the correction point is free from rust, salt or paint.

6. Connect the workpiece or work table to an approved earth ground with a properly sized ground cable refer to figs 3 and 4.

Radio Interference

7. Murex welding power sources have been designed to high standards of electromagnetic compatibility. However, arc welding, by its very nature, generates radio-frequency energy and may cause interference. By installing and using the equipment correctly, in accordance with these instructions, the problems of interference may be minimised.

8. This equipment satisfies the requirements of the EU Directive 89/336/EC on EMC and complies with the limits in EN 50 199, 'EMC product standard for arc welding equipment'. These limits are designed to provide reasonable protection against interference in heavy industrial areas.

9. If this equipment is used in domestic areas, eg. for repair or maintenance, particular care should be taken. The time of day should be chosen and the duration of welding limited, to minimise any potential problems.

10. If this equipment caused interference the guidance given below should be considered. If a solution cannot be found please contact your distributor or the manufacturer.

11. Before installing this welding equipment an assessment should be made of potential EMC problems that may occur. It is good practice not to install welding equipment next to computers or safety critical control circuits, eg electronic machine guards, unless they have been suitably protected.

12. This equipment should be connected to the primary supply using the cable provided. However, for permanent installation, if interference problems occur, shielded cable or conduit should be considered. The primary cabling and welding cables should be kept separate to other mains wiring and control, signalling or communications (eg telephone) cables. If interference occurs then greater separation or re-routing should be considered. Welding cables should be kept as short as practically possible.

13. Interference may also be reduced by separating the welding equipment from the other equipment affected. A partition, brick wall or particularly, a metal screen will also reduce interference. Earthing and equi-potential bonding should also be considered but guidance should be sought from a competent person, the distributor or manufacturer.

14. To ensure continued compliance to the EMC Directive this equipment should be routinely maintained according to the manufacturers instructions and using only approved spare parts. In particular, the spark gaps of HF units should be adjusted and maintained according to the manufacturers recommendations.

15. All access and service door and covers should be closed and properly fastened when the equipment is being used. This equipment should not be modified in any way except for those changes and adjustments approved by the manufacturer.

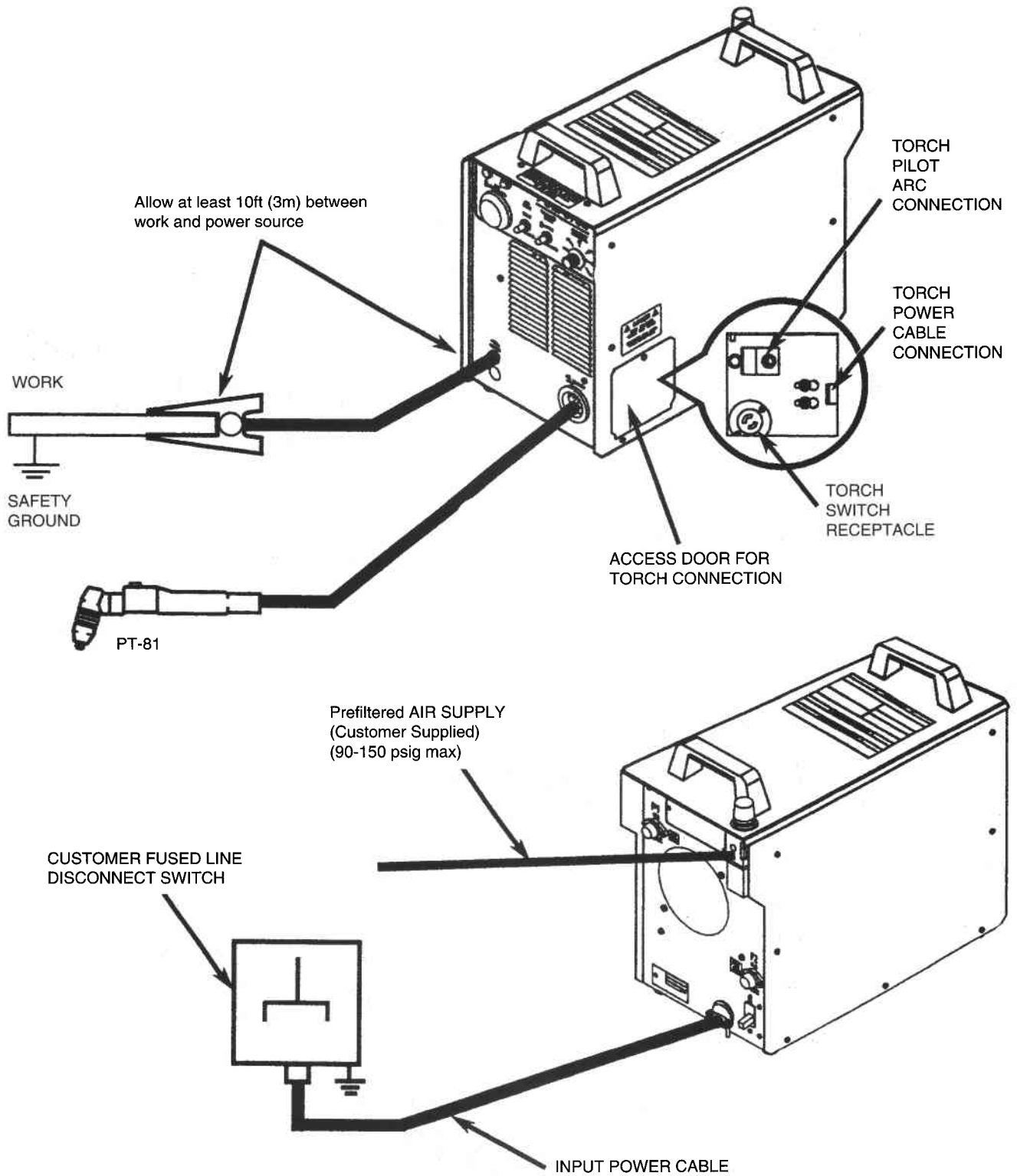


Figure 3 Sabre-Arc 60i Connection diagram