LPC 50

Strömkälla för plasmaskärning
Plasma Cutting Power Source
Stromquelle für Plasmaschneiden
Source de courant pour coupage plasma

Instruktion och reservdelsförteckning
Instruction manual and parts list
Betriebsanweisung und Ersatzteilverzeichnis
Manuel d'instructions et liste des pièces détachées

320865-027 9309

VALID FROM MACHINE NO:806-xxx-xxx

INTRODUCTION

These instructions contain information for the use and maintenance of LPC-50. Should anything be unclear, the supplier will be glad to offer you further information.

Expert knowledge is necessary for fault location and repair. It is a general rule that anything of a major nature should be carried out only by specially trained.

In contacting ESAB or a distributor, please indicate type of unit and serial number.

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 the workpiece.
- Ensure your working stance is safe.

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.

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure therefore that there are no inflammable materials nearby.

MALFUNCTION - Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

Plasma and plasma cutting

The materials around us can be in four different states: solid, liquid, gas or plasma. Ice, water and steam are examples of the first three. To reach the plasma state the gas is heated so powerfully that it ionises and becomes electro-conductive.

In plasma cutting the electro-conductivity of the plasma is made use of to carry an arc from the torch to the workpiece. The gas that flows out of the torch is heated by means of high-frequency (HF) voltage. The gas then becomes conductive and carries the cutting current to the workpiece.
The plasma cutting arc thus formed has such a high content of energy that upon striking the workpiece it makes the metal melt, oxidize and blow away.

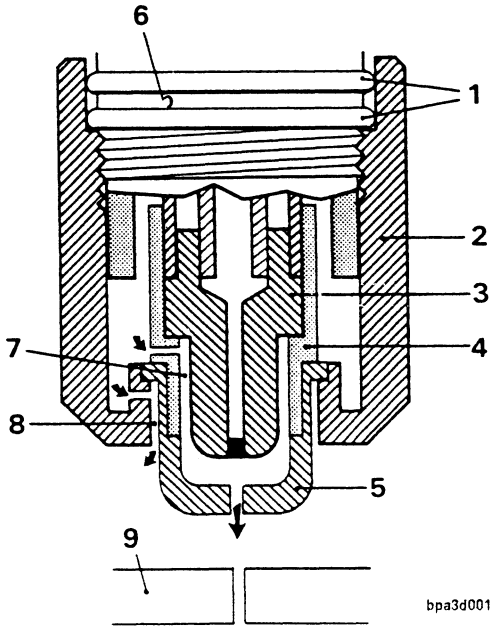
Cuts anything that conducts electricity
Since the plasma arc is so hot - over 20,000 C - it can cut any material that conducts electricity.

Previously it was non-alloy steel that could be cut. With the plasma method there is no problem in cutting trickier materials like aluminium, stainless steel and copper.

Cuts with compressed air
Several different gases are used as plasma gas, e.g. argon, nitrogen and hydrogen. To make it as easy as possible for the user, only ordinary compressed air is used as plasma gas in LPC-50.

Plasma torch

1. O-rings
2. Protective cap
3. Electrode
4. Insulator
5. Nozzle
6. Channel for pneumatic security system
7. Plasma gas
8. Cooling gas
9. Workpiece



Pilot arc
The pilot arc ionises the air and makes possible the transference of the cutting arc to the workpiece.
The HF voltage needed for starting and maintaining the pilot arc goes between the electrode and the nozzle. Both the HF voltage and the pilot arc cease when the cutting arc starts.

Cutting arc
The cutting arc starts automatically when the pilot arc comes in contact with the workpiece.

Security system
Plasma cutting requires high no-load voltage. To prevent the operator coming into contact with live parts there is a pneumatic security system in the torch. A compressed-air channel finishes between the O-rings. If air can flow out of the channel the machine perceives the change in pressure and cuts of the supply of current to the torch, making cutting impossible. This occurs if the O-rings are defective or if the protective cap is wrongly fitted.

N.B.
Only ESAB's PTH 50 manual torch and PTM 50 mechanical torch may be used with the LPC-50.

TECHNICAL DATA

Mains supply	3-phase 50 Hz		
Voltage (V)	220	380	415
Primary Current (A)	36	21	19
Fuse (A)	25	16	16
Cable area (mm^2)	4x4	4x1.5	4x1.5
Permissible load	50 A/125 V at 60% duty cycle 25 A/95 V at 100% duty cycle		
Setting range	Two steps:25 A and 50 A		
No-load voltage	Uo = 272 V		
Idling power	250 W		
Air consumption	120 l/min, 4.5-5 bar		
Art of protection	IP 23		
Weight	Approx. 115 kg		
Dimensions (hxwxd)	730x590x675mm		
	120 V/50 A	**95 V/25 A**	
Efficiency λ	0.78	0.42	
Power factor η	0.62	0.82	
Pre-flow	1 s		
Post-flow	10 s		
Cutting capacity			
Non-alloy/high-alloy steel	Max. 13 mm		
Aluminium	Max. 8 mm		
Manual piercing	70% of max. thickness		
Mechanical piercing	40-50% of max. thickness		

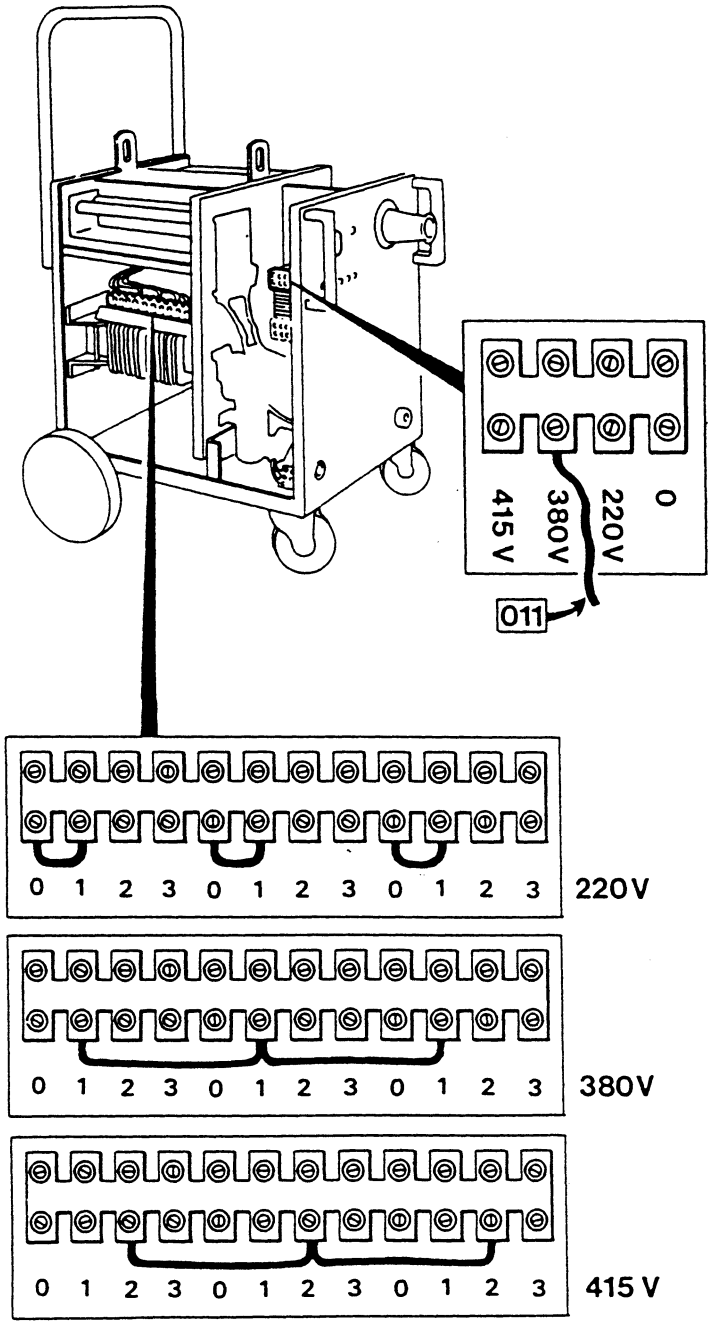
IP -The code describes the degree of protection provided by the casing, against the pentetration of fixed objects and water.

Equipment mark **IP 21** is designed for indoor use, while **IP 23** is also intended for outdoor use.

INSTALLATION

Voltage variants
- 220 V/50 Hz, 3-phase
- 380 V/50 Hz, 3-phase
- 415 V/50 Hz, 3-phase

Electrical installation is to be done by an expert. The machine as delivered is connected for 380 V.



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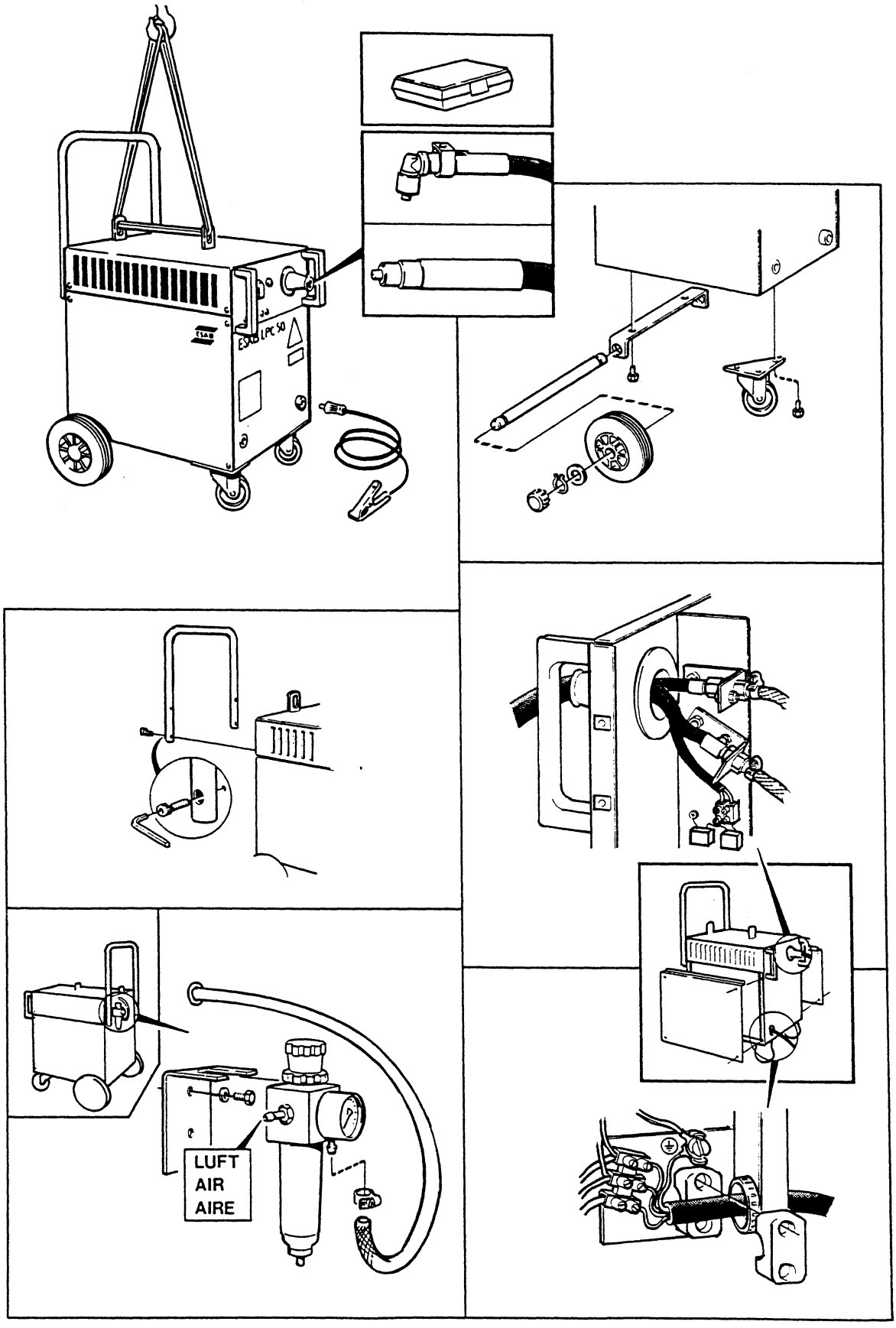
N.B.

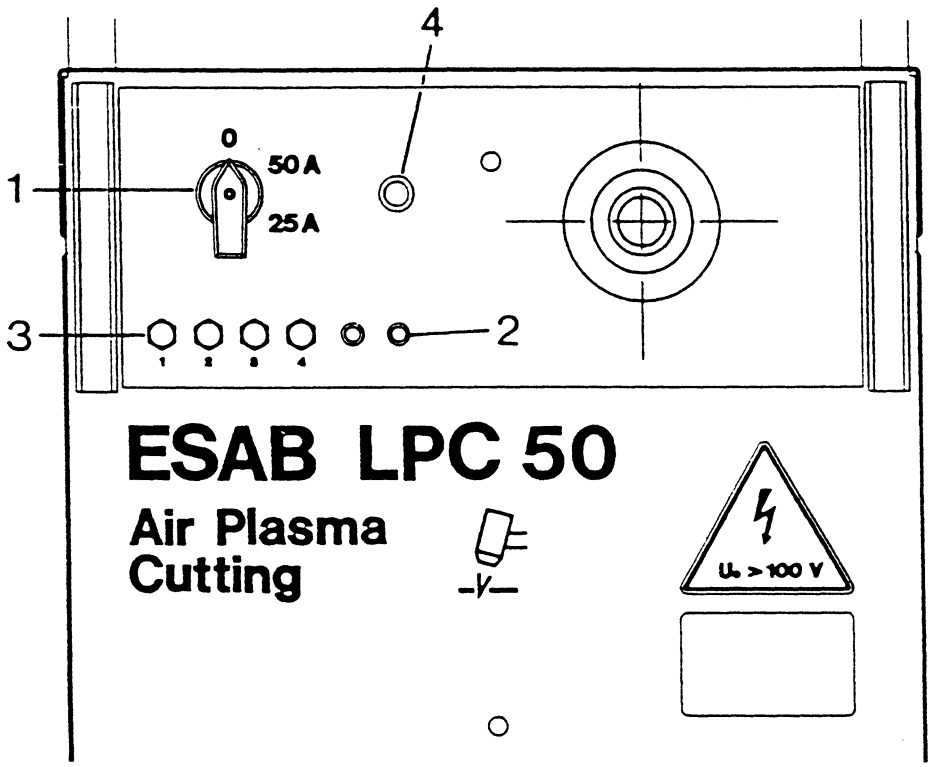
The compressed air has to be of high quality - dried, filtered and absolutely free of oil.



OPERATION

Check of functions

1. ON/OFF switch, choice of 25 or 50 A
2. Secondary fuses
3. Primary fuses, quick-blow
4. Indicating lamp, voltage ON



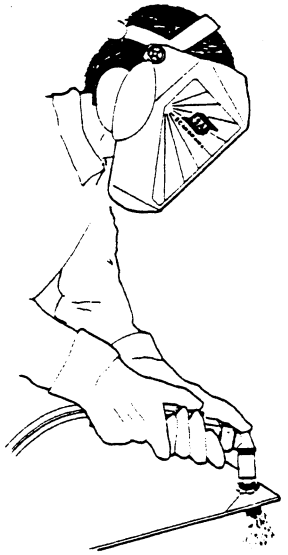
Setting of regulator pressure
Turn the switch to the 25 A position. The white lamp indicates that the machine is running.

Hold out the torch and quickly press the trigger once. For 10 s air will flow out, and the regulator pressure can be adjusted to 4.5-5 bar.

Check the pilot arc
Hold out the torch, press the trigger and keep it pressed. After an air pre-flow lasting 1 s the pilot arc starts. Release the trigger. The pilot arc is extinguished and for 10 s there is an air post-flow to cool the torch.

Cutting

WARNING!
Spatter from the cutting process can cause damage to treated surfaces and to materials like plastics and glass.

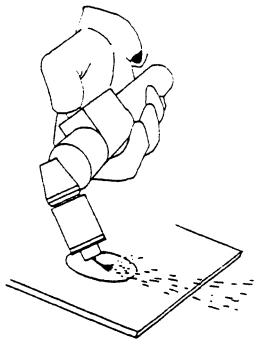


Hold the torch over the workpiece, lower your welding helmet and press the trigger of the torch. After 1 s the pilot arc comes on. When the nozzle of the torch with lit pilot arc gets closer than 5 mm to the workpiece, the cutting arc starts.

If the torch is lifted up or if it comes outside the workpiece while the trigger is kept pressed, the pilot arc starts automatically in order to strike the cutting arc again. The torch can be used with the nozzle either in contact with the workpiece or a bit away from it.
For cutting the maximum thickness of material with 50 A, however, the torch should not be in contact with the workpiece.

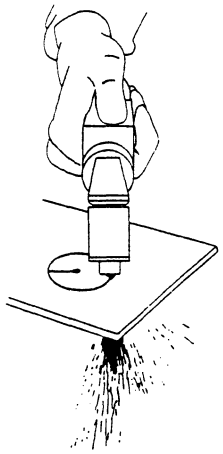
A thermal switch protects the machine against overloading.
If the duty cycle factor is exceeded the switch trips and shuts off the power source. The switch is automatically reset when the power source has cooled.

Cutting start from edge
Place the torch so that half the nozzle is outside the workpiece. Press the trigger so that the pilot arc will start. When the torch with lit pilot arc is moved in completely over the workpiece, cutting starts automatically.



Piercing
At start the torch should lean somewhat, so that any spatter which is thrown back does not hit the nozzle.

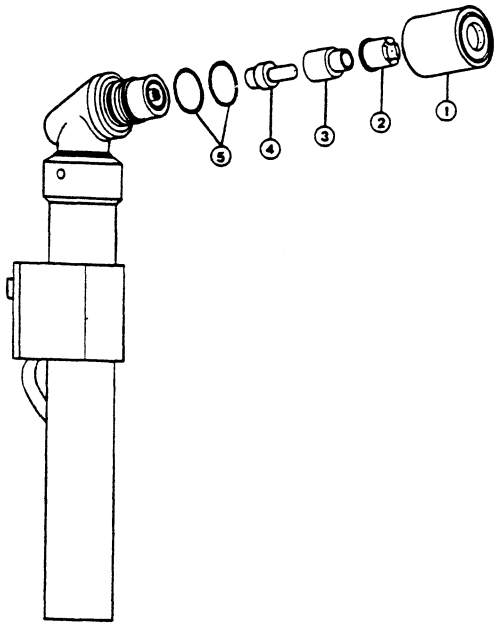
Stack cutting
In manufacturing quite a number of pieces that are alike it is possible to cut through stacked sheets of metal. Furthermore different materials can be combined in the same stack.



MAINTENANCE

N.B.
For servicing of the power source or torch, the power source must always be turned off.

Servicing the torch
Dismantle the protective cap and lubricate the O-rings, checking that the latter are tight and undamaged. The pneumatic security system in the torch makes it impossible to start cutting with defective O-rings or without the protection cap.



1. Protective cap
2. Nozzle
3. Insulator
4. Electrode
5. O-rings

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The material of the electrode gets worn by cutting, and the tip gets hollowed out. When the concavity reaches a depth of 5 mm the electrode needs to be replaced.

When the nozzle hole has been worn into an oval shape, the nozzle needs to be replaced. A worn nozzle gives an unstable cutting arc and a poorer quality of cut. Check at the same time that the insulating sleeve is not burnt or damaged.

Reassemble the torch after this check has been made.

Check of security system

Loosen the protective cap of the torch 2 revolutions. When an attempt is made to start, the pilot arc should not come on, because air can flow out of the security system between the O-rings.

Screw back the protective cap when the air has ceased to flow.