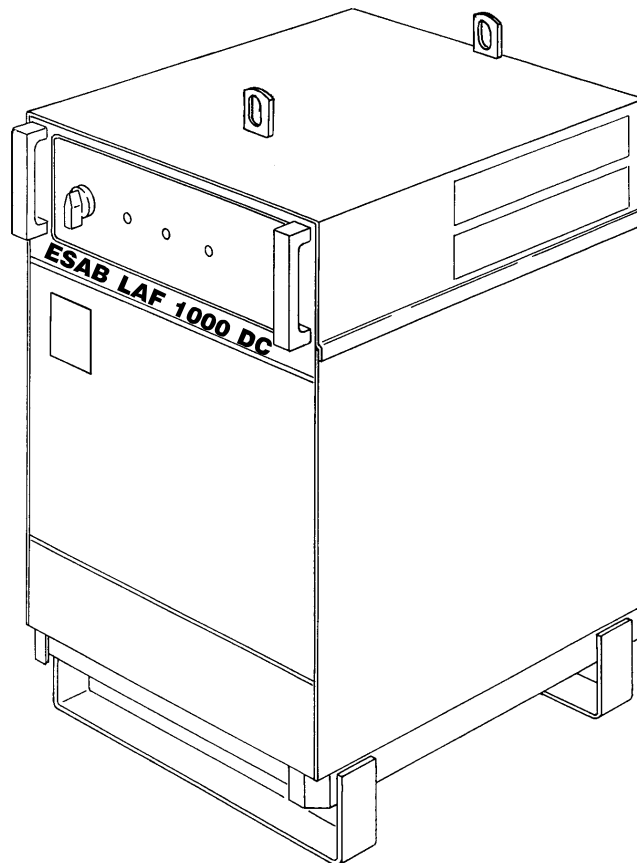


GB



LAF 1000/ 1000M DC



Instruction manual

DECLARATION OF CONFORMITY

ESAB AB, Welding Equipment, SE-695 81 Laxå, Sweden, declares under sole responsibility that welding power source **LAF 1000/ 1000M** from serial number **712** (2007 w.12) is designed and tested in conformity with standard EN 60974-1 and EN 60974-10 in accordance with the conditions in the directives (2006/95/EC) and (2004/108/EC).

Laxå 2007-03-30



Kent Eimbrodt
Global Director
Equipment and Automation

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1 SAFETY

Users of ESAB welding equipment have the ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions. Safety precautions must meet the requirements that apply to this type of welding equipment. The following recommendations should be observed in addition to the standard regulations that apply to the workplace.

All work must be carried out by trained personnel well-acquainted with the operation of the welding equipment. Incorrect operation of the equipment may lead to hazardous situations which can result in injury to the operator and damage to the equipment.

1. Anyone who uses the welding equipment must be familiar with:
 - its operation
 - location of emergency stops
 - its function
 - relevant safety precautions
 - welding
2. The operator must ensure that:
 - no unauthorised person is stationed within the working area of the equipment when it is started up.
 - no-one is unprotected when the arc is struck
3. The workplace must:
 - be suitable for the purpose
 - be free from draughts
4. Personal safety equipment
 - Always wear recommended personal safety equipment, such as safety glasses, flame-proof clothing, safety gloves.
 - Do not wear loose-fitting items, such as scarves, bracelets, rings, etc., which could become trapped or cause burns.
5. General precautions
 - Make sure the return cable is connected securely.
 - Work on high voltage equipment **may only be carried out by a qualified electrician.**
 - Appropriate fire extinguishing equipment must be clearly marked and close at hand.
 - Lubrication and maintenance must **not** be carried out on the equipment during operation.



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 take fumes and gases away 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.

NOISE – Excessive noise can damage hearing

- Protect your ears. Use earmuffs or other hearing protection.
- Warn bystanders of the risk.

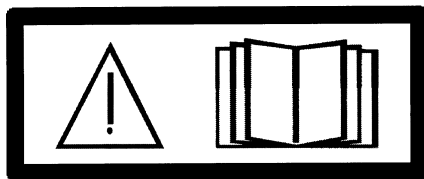
MALFUNCTION – Call for expert assistance in the event of malfunction.

READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

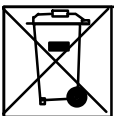
WARNING

This product is intended for industrial use. In a domestic environment this product may cause radio interference. It is the users responsibility to take adequate precautions.



WARNING!

Read and understand the instruction manual before installing or operating.



Do not dispose of electrical equipment together with normal waste!

In observance of European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation in accordance with national law, electrical equipment that has reached the end of its life must be collected separately and returned to an environmentally compatible recycling facility. As the owner of the equipment, you should get information on approved collection systems from our local representative.

By applying this European Directive you will improve the environment and human health!

2 INTRODUCTION

2.1 General

LAF 1000/ 1000M are remote-controlled 3-phase welding power sources designed for high-efficiency mechanical gas metal arc welding (MIG/MAG) or sub arc welding (SAW). They are always to be used in combination with ESAB's control box A2-A6 Process Controller (**PEH**) or A2 Welding Control Unit (**PEI**).

LAF is fan-cooled and monitored by a thermal overload protection. When the protection enters into action a yellow indicating lamp on the front panel goes on and is reset automatically as soon as the temperature has gone down to an acceptable level.

The welding power sources and the control unit are linked together over a 2-wire bus enabling precision control of the welding process.

All welding parameter settings for the power source can be made by the operator on the front panel of the control unit. The operation of the power source is completely controlled and monitored by this unit. Even the start and stop qualities can be set by way of the control unit. The preset welding current parameters can also be monitored in the course of welding.

For more detailed information regarding the settings and the working mode of the welding power source, please refer to the instruction manual for either the A2-A6 Process Controller or the A2 Welding Control Unit.

2.2 Technical data

	LAF 1000	LAF 1000M
Voltage	400/415/500 V, 3~50 Hz 400/440/550 V, 3~60 Hz	230/400/415/500 V, 3~50 Hz 230/400/440/550 V, 3~60 Hz
Permissible load at:		
100 % duty cycle	800 A/44 V	800 A/44 V
60 % duty cycle	1000 A/44 V	1000 A/44 V
Setting range		
MIG/MAG	50 A/17 V – 1000 A/45 V	50 A/17 V – 1000 A/45 V
SAW	40 A/22 V – 1000 A/45 V	40 A/22 V – 1000 A/45 V
No-load voltage	52 V	52 V
No-load power	145 W	145 W
Efficiency	0,84	0,84
Power factor	0,95	0,95
Weight	330 kg	330 kg
Dimensions L x W x H	646 x 552 x 1090	646 x 552 x 1090
Enclosure class	IP 23	IP 23
Application class	S	S

Enclosure class

The **IP** code indicates the enclosure class, i. e. the degree of protection against penetration by solid objects or water. Equipment marked **IP 23** is designed for indoor and outdoor use.

Application class

The symbol **S** indicates that the power source is designed for use in areas with increased electrical hazard.

3 INSTALLATION

3.1 General

The installation must be executed by a professional.

3.2 Unpacking and erection

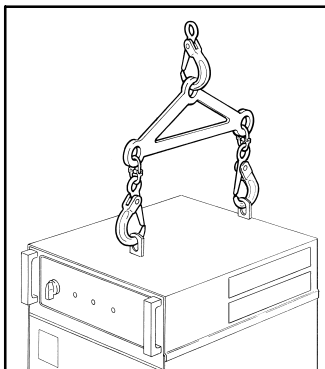


WARNING – TIPPING RISK!

Fasten the equipment – particularly if the ground is uneven or sloping.

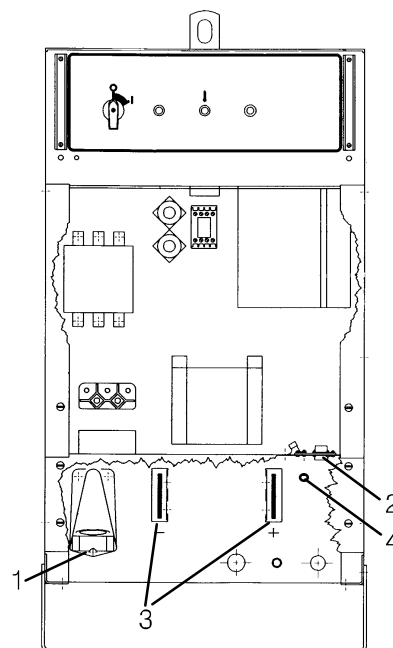
- Place the welding power source on a level foundation.
- Make sure there is nothing to prevent the cooling.

Lifting instructions



3.3 Connections

- On delivery the welding power source is connected for 400 V. For other supply voltage, switch over to the desired voltage on the main transformer and the control transformer according to the connection instructions on page 94.
- Make sure the mains cable has the right sectional area and fuse it with an adequate fuse according to applicable local directions (see table on page 88).
- Connect the earth cable to the screw marked .
- Tighten the cable support (1).
- Connect the mains cable to the main terminal blocks L1, L2 and L3.
- Connect the control cable between the LAF welding power source and the control unit to the 28-pole contact (2) inside the welding power source.
- Connect 1 pin socket measure cable (4).
- Connect a suitable welding and return cable to the contacts (3) marked + and – on the front of the power source.



Mains connection

LAF 1000	50 Hz			60 Hz		
	Voltage V	400	415	500	400	440
Current A						
100%	64	64	52	64	64	52
60%	80	80	65	80	80	65
Cable area mm ²	4 x 16	4 x 16	4 x 16	4 x 16	4 x 16	4 x 16
Fuse, slow A	63	63	63	63	63	63

LAF 1000M	50 Hz				60 Hz			
	Voltage V	230	400	415	500	230	400	440
Current A								
100%	111	64	64	52	111	64	64	52
60%	138	80	80	65	138	80	80	65
Cable area mm ²	4x50	4 x 16	4 x 16	4 x 16	4x50	4 x 16	4 x 16	4 x 16
Fuse, slow A	125	63	63	63	125	63	63	63

3.4 PC board

DIP switches

The PC board (AP1) has two DIP switches (SW1 and SW2) which are preset on delivery. The settings are not to be changed.

When spare parts are supplied the settings of the DIP switches must be checked (and set, if necessary) before fitting the PC board into the welding power source.

- **DIP switch SW1**
To make the communication with the A2–A6 Process Controller (PEH) work DIP switch 1 (SW1) must be set.
- **DIP switch SW2**
DIP switch 2 (SW2) must be set in order to inform the A2–A6 process controller (PEH) about the rating of the power source that is connected.

Setting of DIP switch SW1

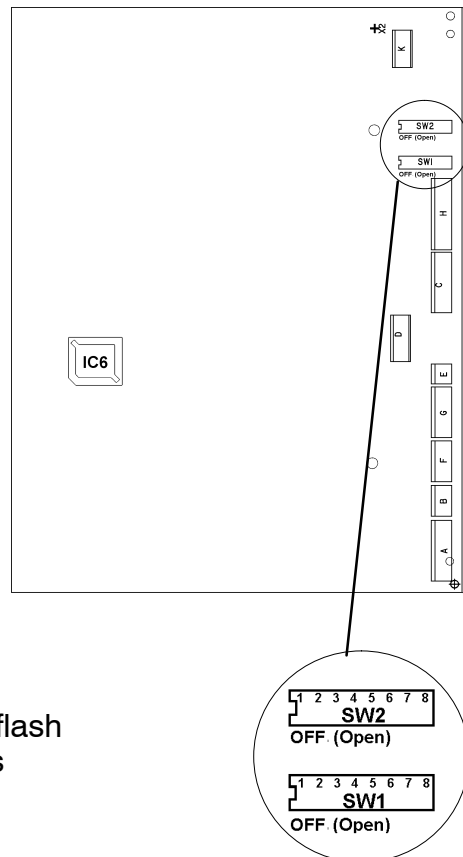
- Set pole 6 to “OFF” position and all other poles to “ON”.

Setting of DIP switch SW2

- Set pole 3 to “OFF” position and all other poles to “ON”.

Welding power source program

The welding power source program is stored in the flash memory **IC 6**. The capsule is fitted in a holder and is replaceable.



4 OPERATION

4.1 General

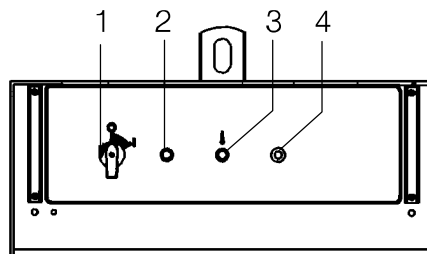
General safety regulations for the handling of the equipment can be found on page 84. Read through before you start using the equipment!

Note! Never use the welding power source without side plates.

4.2 Controls

The front panel contains:

1. Main switch, breaking the incoming mains voltage for the welding power source.
2. Indicating lamp (white), showing that the main switch is activated.
3. Indicating lamp (yellow), showing that the thermal protection has entered into action due to overheating in the transformer. The lamp is reset when the temperature has gone down to an acceptable level.
4. Pushbutton, for the resetting of automatic fuse FU1 for 42 V supply voltage.



4.3 Start-up

- Connect the return cable to the work piece.
- Set the main switch (1) to position "I".
The white indicating lamp (2) goes on and the fan starts.
- Set the welding parameters and start welding by way of the control box (see instruction manual 0443 745 xxx for A2–A6 Process Controller or instruction manual 0449 331 xxx for the A2 Welding Control Unit).

5 MAINTENANCE

5.1 General

Note:

All warranty undertakings given by the supplier cease to apply if the customer attempts to rectify any faults on the machine during the warranty period.

5.2 Cleaning

- Clean the welding power source as necessary.
Dry compressed air is recommended for the purpose.



WARNING!

Blocked air inlets or outlets will lead to overheating.

Note:

In order to ensure safe operation of the contactor, keep the magnetic parts clean. If the contactor has to be cleaned it **must** be taken apart, and all the pieces be cleaned.

Alternatively, the contactor can be replaced.



WARNING!

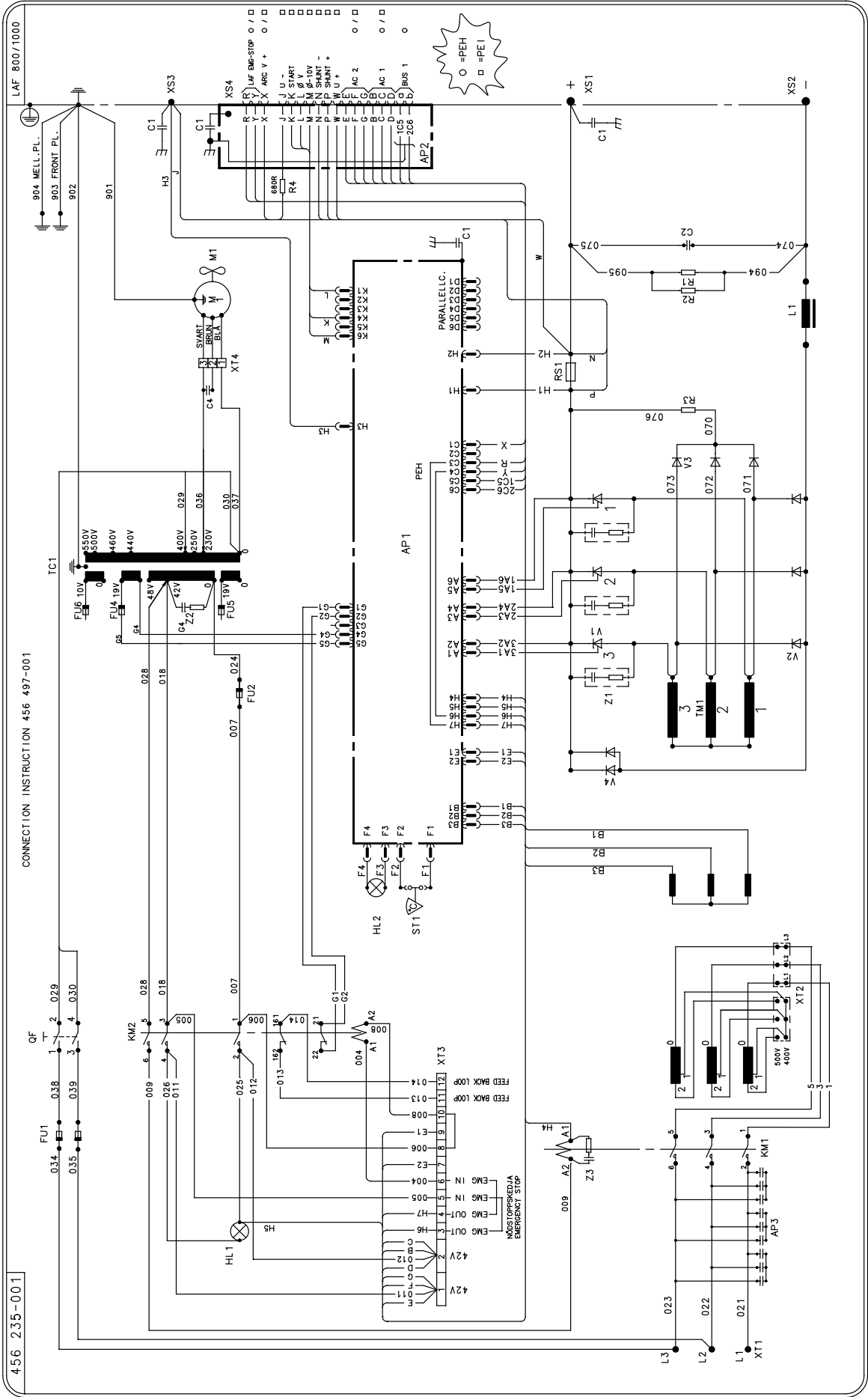
Never use compressed air to clean the contactor without first taking it apart completely.

6 ORDERING OF SPARE PARTS

LAF 1000/ LAF 1000 is designed and tested in accordance with the international and European standards IEC/EN 60974-1 and IEC/EN 60974-10.
It is the obligation of the service unit which has carried out the service or repair work to make sure that the product still conforms to the said standard.

Spare parts are ordered through your nearest ESAB representative, see back cover. When ordering spare parts, please state machine type and number as well as designation and spare part number as shown in the spare parts list on page 97. This will simplify dispatch and ensure you get the right part.

Diagram



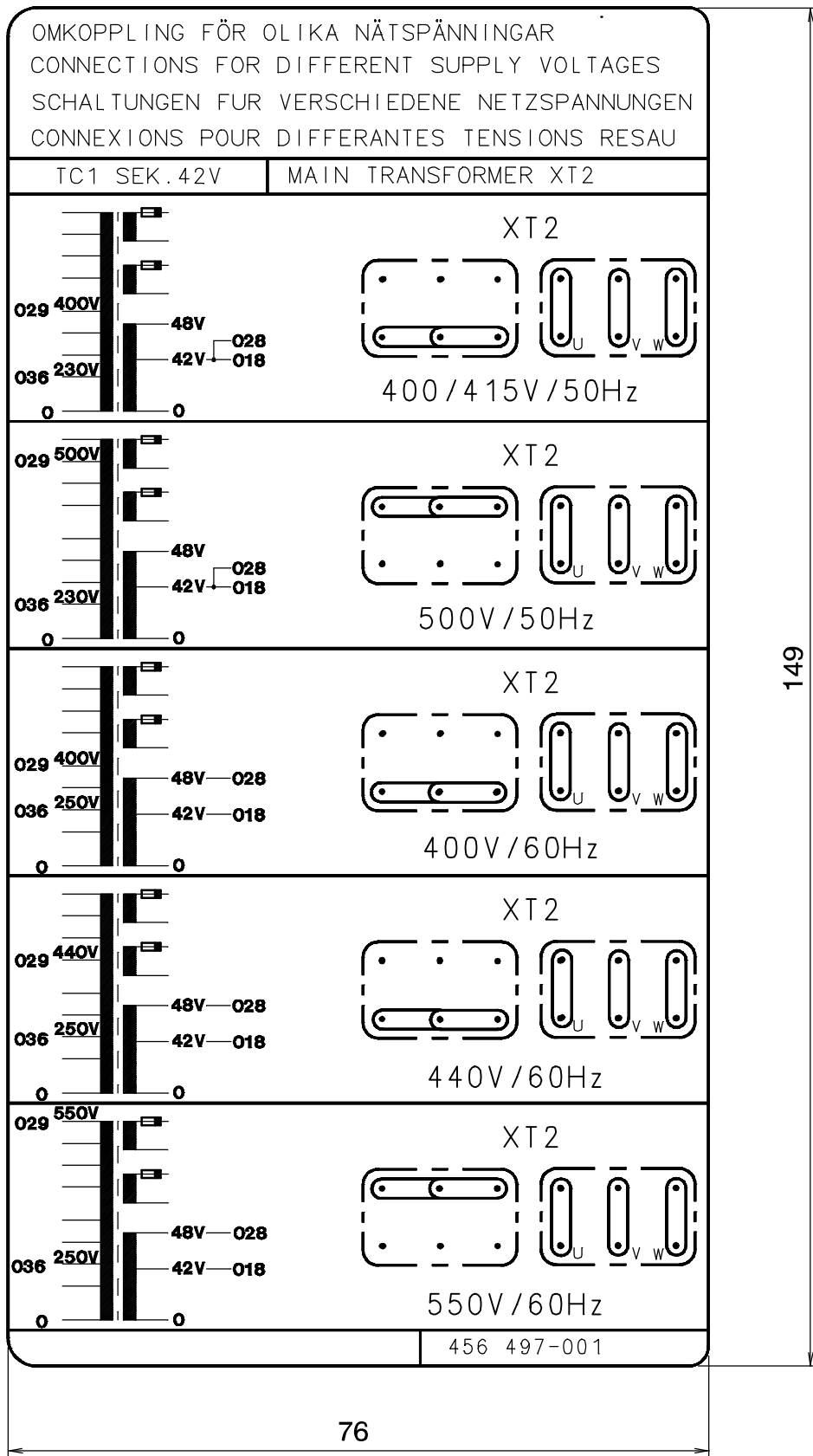
List of components

C = Component designation in the circuit diagram

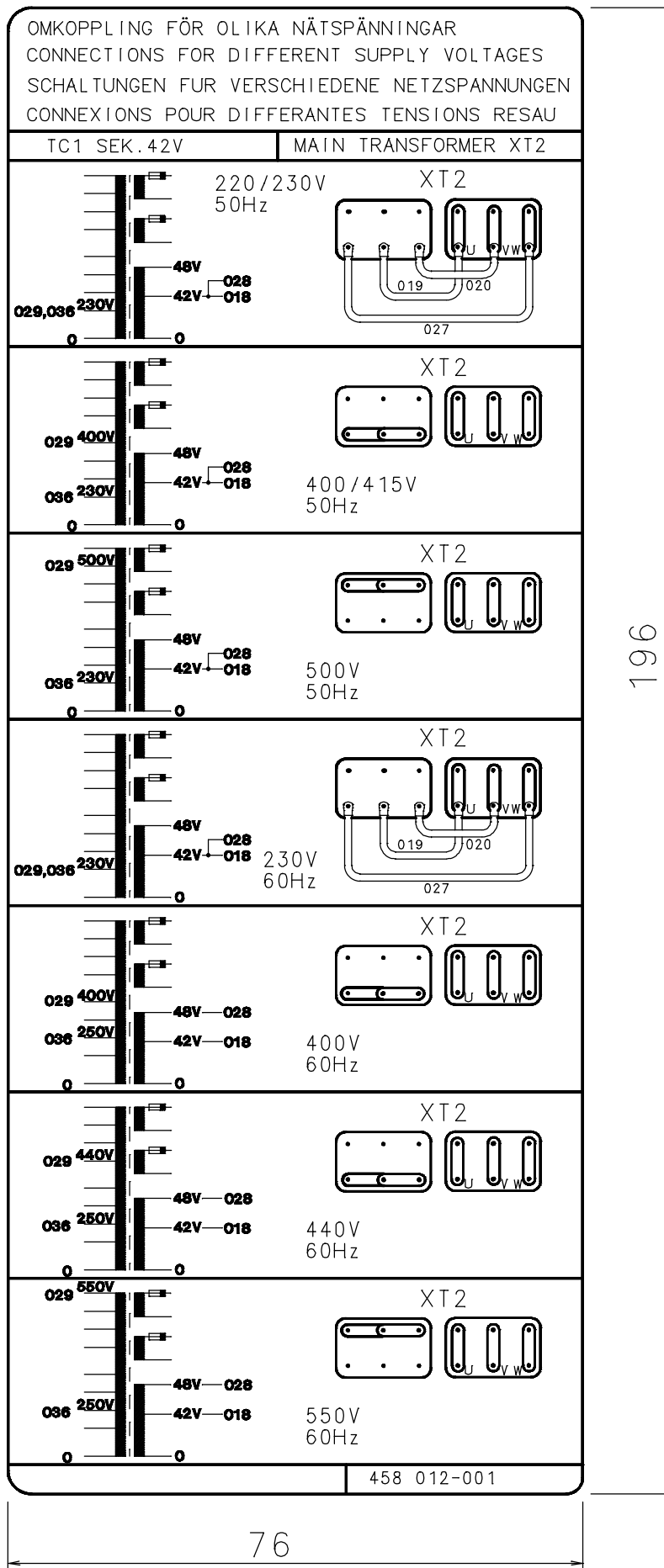
C	Denomination	C	Denomination
V3	Diode bridge	HL2	Indicating lamp (yellow)
V2	Silicon diode	XT2	Connection block
C4	Capacitor	RS1	Shunt
FU1	Fuse	ST1	Thermal guard
FU2	Automatic fuse	Z1, Z2, Z3	Contact protection
KM1	Contactactor	V1	Thyristor
KM2	Contactactor	TC1	Control transformer
AP1	Circuit board	AP2	Circuit board, insulation
V4	Diode bridge	AP3	Circuit board, EMC-filter
TM1	Transformer	L1	Inductor
R3	Resistor	FU4	Fuse
M1	Fan	FU5	Fuse
QF	Main switch (black)	FU6	Fuse
HL1	Indicating lamp (white)		

Connection instruction

LAF 1000



LAF 1000M

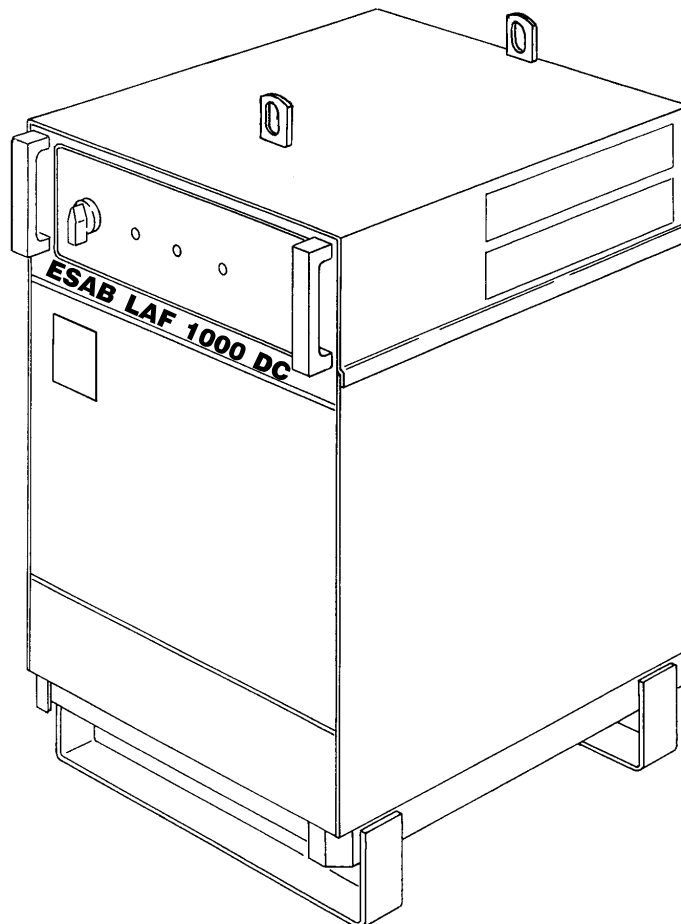


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Spare parts list

Edition 100615

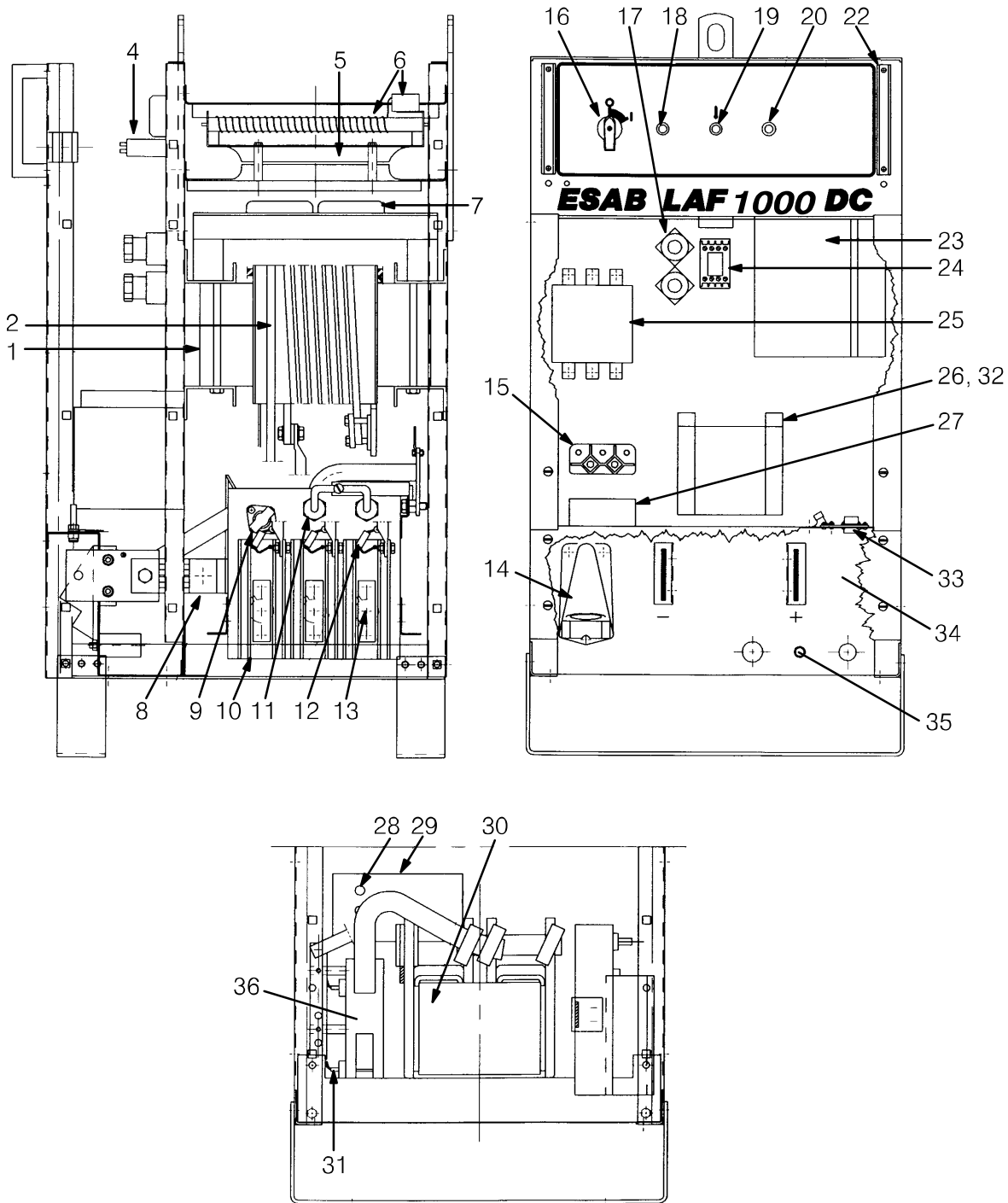


Ordering no.	Denomination	Notes
0456 321 881	Welding power source	LAF 1000
0456 321 882	Welding power source	LAF 1000M

Abbreviations used in the spare parts list:

C = Component designation in the circuit diagram

Item	Qty	Ordering no.	Denomination	Notes	C
		0456 321 881	LAF 1000		
		0456 321 882	LAF 1000M		
1	1	0469 844 882	Transformer		TM1
2		0469 841 880	Transformer coil		
4	1	0318 060 001	Capacitor		C4
5	1	0318 022 001	Fan		M1
6	1	0321 003 881	Resistor		R3
7	2	0040 894 001	Connection block		XT2
8	1	0551 202 980	Shunt		RS1
9	1	0319 445 001	Thermal guard		ST1
10	1	0320 116 881	Thyristor bridge		
11	2	0490 600 606	Silicon diode		V4
12	3	0041 051 606	Contact protection		Z1, Z2, Z3
13	3	0320 946 001	Thyristor		V1
14		0158 115 880	Cable inlet		
15	1	0162 772 001	Connection block		
16	1	0320 746 002	Main switch	Black	QF
17	2	0194 091 002	Fuse	16 A, 690 V	FU1
18	1	0192 576 004	Indicating lamp (white)		HL1
19	1	0192 576 304	Indicating lamp (yellow)		HL2
20	1	0193 586 104	Automatic fuse	20 A	FU2
22	2	0156 388 001	Handle		
23	1	0486 368 880	Circuit board		AP1
	1	0486 525 880	Flash memory		IC6
24		0805 586 131	Contacteur		KM2
25	1	0193 358 102	Contacteur	LAF 1000	KM1
	1	0442 849 880	Contacteur	LAF 1000M	KM1
26	1	0460 092 002	Control transformer	42 V, 900 VA	TC1
27	1	0486 224 880	Circuit board, EMC filter		AP3
28	3	0321 468 003	Silicon diode		
29	1	0321 489 880	Base current bridge		
30	1	0318 040 883	Inductor		L1
31		0490 600 626	Silicon diode		V2
32	1	0567 900 136	Fuse	1.25 AT	FU4, FU5
		0567 900 103	Fuse	3.15 AT	FU6
33	1	0487068880	Circuit board, insulation		AP2
		0368544006	Sleeve socket	28-pole, Burndy	XS24
34	1	0191093135	Resistor	680R	R4
35		0523300201	Positive terminal		
36		0320266880	Diode bridge		



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