GB

LAF 1001 / LAF 1001M

Instruction manual

0449 503 001 GB 20111128

Valid for serial no. 935-xxx-xxxx,126-xxx-xxxx

DECLARATION OF CONFORMITY

According to

The Low Voltage Directive 2006/95/EC, entering into force 16 January 2007

The EMC Directive 2004/108/EC, entering into force 20 July 2007

Type of equipment
Welding power source

Type designation etc.
LAF 1001, LAF 1001M, from serial number 935 xxx xxxx (2009 w.35)

Brand name or trade mark
ESAB

Manufacturer or his authorised representative established within the EEA
Name, address, telephone No, telefax No:

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The following harmonised standard in force within the EEA has been used in the design:
EN 60974-1, Arc welding equipment – Part 1: Welding power sources
EN 60974-10, Arc welding equipment – Part 10: Electromagnetic compatibility (EMC) requirements

Additional information: Restrictive use, Class A equipment, intended for use in locations other than residential

By signing this document, the undersigned declares as manufacturer, or the manufacturer's authorised representative established within the EEA, that the equipment in question complies with the safety requirements stated above.

Date	Signature	Position
Laxå 2009-09-15	Kent Eimbrodt Clarification	Global Director Equipment and Automation

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1 SAFETY

Users of ESAB 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 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 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 equipment must be familiar with:
   - its operation
   - location of emergency stops
   - its function
   - relevant safety precautions
   - welding and cutting
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 drafts
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 extinquishing equipment must be clearly marked and close at hand.
   - Lubrication and maintenance must **not** be carried out on the equipment during operation.

CAUTION

This product is solely intended for arc welding.

GB

WARNING

Arc welding and cutting can be injurious to yourself and others. Take precausions when welding and cutting. Ask for your employer's safety practices which should be based on manufacturers' hazard data.

ELECTRIC SHOCK - Can kill
- Install and earth the 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.

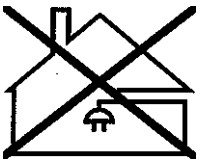
MALFUNCTION - Call for expert assistance in the event of malfunction.

Read and understand the instruction manual before installing or operating.

PROTECT YOURSELF AND OTHERS!

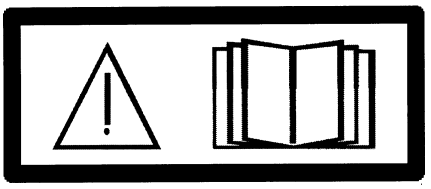
CAUTION

Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility of class A equipment in those locations, due to conducted as well as radiated disturbances.



CAUTION

Read and understand the instruction manual before installing or operating.



Dispose of electronic equipment at the recycling facility!

In observance of European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation in accordance with national law, electrical and/or electronic equipment that has reached the end of its life must be disposed of at a recycling facility.

As the person responsible for the equipment, it is your responsibility to obtain information on approved collection stations.

For further information contact the nearest ESAB dealer.

ESAB can provide you with all necessary welding protection and accessories.

2 INTRODUCTION

LAF 1001/ LAF 1001M are remote-controlled 3-phase welding power sources intended for highly productive mechanised gas metal arc welding (MIG/MAG) or submerged arc welding (SAW).

The welding power sources are fan-cooled and are monitored by a thermal cutout against overload. When the thermal cutout is deployed the yellow lamp on the front panel illuminates automatically. The reset is carried out automatically when the temperature has decreased to a permitted level.

3 TECHNICAL DATA

	LAF 1001	***LAF 1001M***
Mains connection:	400/415/500 V, 3∼50 Hz	230/400/415/500 V, 3∼50 Hz
	400/440/550 V, 3∼60 Hz	230/400/440/550 V, 3∼60 Hz
Primary current	I_{max} 80 A	I_{max} 138 A
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		
SAW	100-1000 A /24-44 V	100-1000 A /24-44 V
MIG/MAG	100-1000 A /19-44 V	100-1000 A /19-44 V
No-load voltage	53 V	53 V
No-load power	130 W	130 W
Effiency	88%	88%
Power factor	0,92	0,92
Weight	330 kg	330 kg
Dimensions L x W x H	646 x 552 x 1090	646 x 552 x 1090
Insulation class (transformer):	**H**	**H**
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 **IP23** 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.

GB

4 INSTALLATION

The installation must be carried out by a professional.

Note

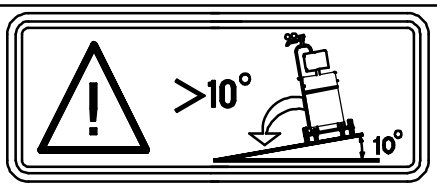
Mains supply requirements

High power equipment may, due to the primary current drawn from the mains supply, influence the power quality of the grid. Therefore connection restrictions or requirements regarding the maximum permissible mains impedance or the required minimum supply capacity at the interface point to the public grid may apply for some types of equipment (see technical data). In this case it is the responsibility of the installer or user of the equipment to ensure, by consultation with the distrubution network operator if necessary, that the equipment may be connected.

4.1 Location

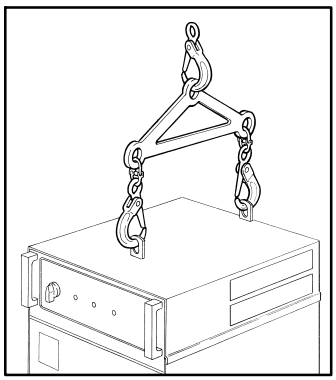
WARNING

Secure the equipment - particularly if the ground is uneven or sloping.

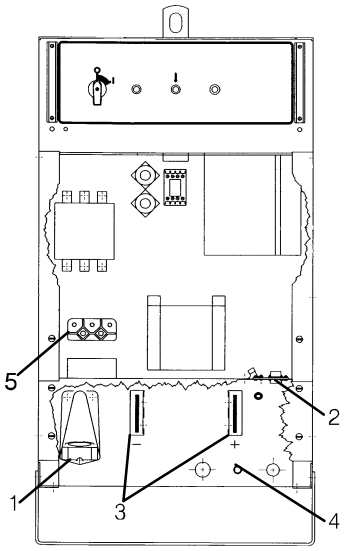


- Place the welding power source on a level foundation.
- Make sure there is nothing to prevent the cooling.

Lifting instructions



4.2 Connections



- On delivery the welding power source is connected for 400 V.
- For other supply voltage:

  Remove the left side plate.

  Perform the switchings on the main and control transformer in accordance with the connection instruction on page 16.
- Select the mains cable with the correct cable area and fuse the cable with the correct fuse in accordance with local regulations (see the table on page 8).
- Remove the front plates (x 2).
- Connect the ground cable to the screw marked ⏚.
- Tighten the cable clamp (1).
- Connect the mains cables to the main connection terminals L1, L2 and L3 (5).
- Connect the control cable between the welding power source and the control box to the 28-pin connector (2) on the inside of the welding power source.
- Connect the 1-pin measuring cable (4) for measuring the arc voltage to the return cable/welding head.
- Connect a suitable welding and return cable in the connectors (3) marked + and - on the front of the welding power source.
- Fit the side/ front plates.

Mains connection

LAF 1001	50 Hz			60 Hz		
Voltage (V)	400	415	500	400	440	550
Phase current I_{1eff} (A)	64	64	52	64	64	52
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 1001M	50 Hz				60 Hz			
Voltage (V)	230	400	415	500	230	400	440	550
Phase current I_{1eff} (A)	111	64	64	52	111	64	64	52
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

Note:
The mains cable areas and fuse sizes as shown above are in accordance with Swedish regulations. They may not be applicable in other countries: make sure that the cable area and fuse sizes comply with the relevant national regulations.

5 OPERATION

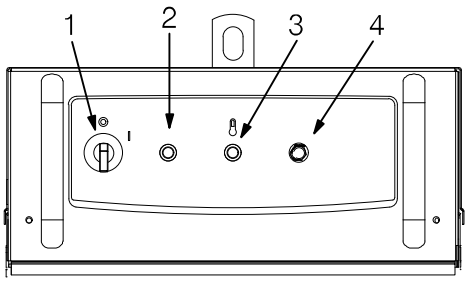
General safety regulations for handling the equipment can be found on page 4. Read through before you start using the equipment!

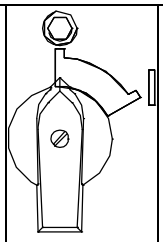
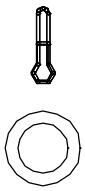
Note! Never use the welding power source without side plates.

Note! The power source must be set to analogue mode to use the PEI control unit.

5.1 Controls

The front panel contains:



1.		Main circuit-breaker for switching the mains voltage and the fan on and off in the welding power source. • Position "1" On • Position "0" Off
2.		• The indicator lamp (white) illuminates when the main switch is switched on.
3.		Indicator lamp for overheating (yellow) • The indicator lamp illuminates when the thermal cutout is deployed due to excess temperature in the welding power source. • The indicator lamp goes out when the temperature in the welding power source has decreased to a permitted level.
4.		Pushbutton resetting the automatic fuse *FU2* for 42 V supply voltage.

6 MAINTENANCE

CAUTION

All guarantee undertakings from the supplier cease to apply if the customer attempts any work to rectify any faults in the product during the guarantee period.

6.1 Cleaning

6.1.1 Welding power source

WARNING!
Blocked air inlets or outlets will lead to overheating.

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

6.1.2 Contactor

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

Note:
To ensure the reliable operation of the contactor, the magnetic parts must be kept 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.

7 ORDERING OF SPARE PARTS

Repair and electrical work should be performed by an authorised ESAB service technician. Use only ESAB original spare and wear parts.

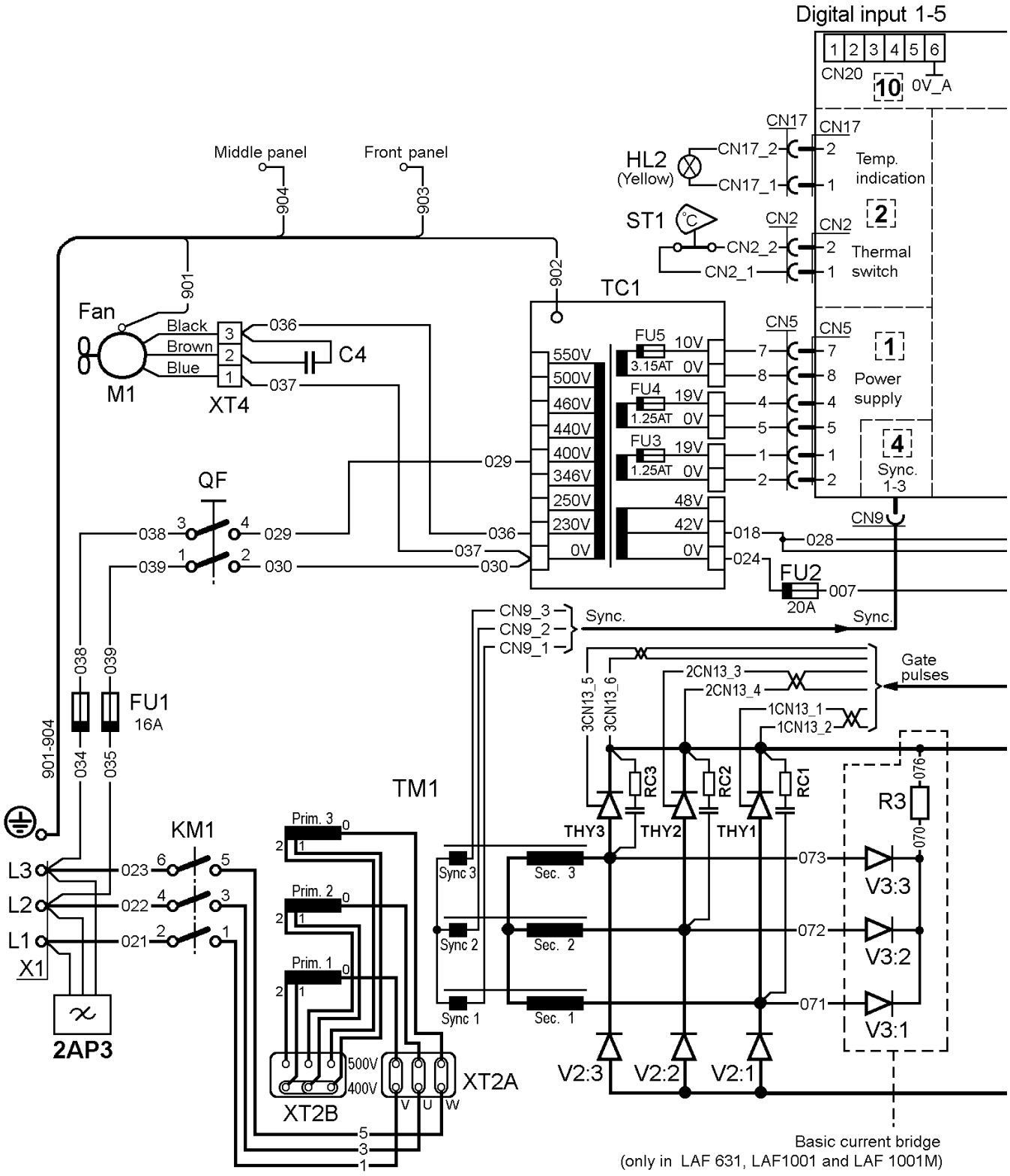
LAF 1001 / LAF 1001M is designed and tested in accordance with the international and European standards 60974-1 and 60974-10. It is the obligation of the service unit which has carried out the service or repair work to make sure that the product still conforms to the said standard.

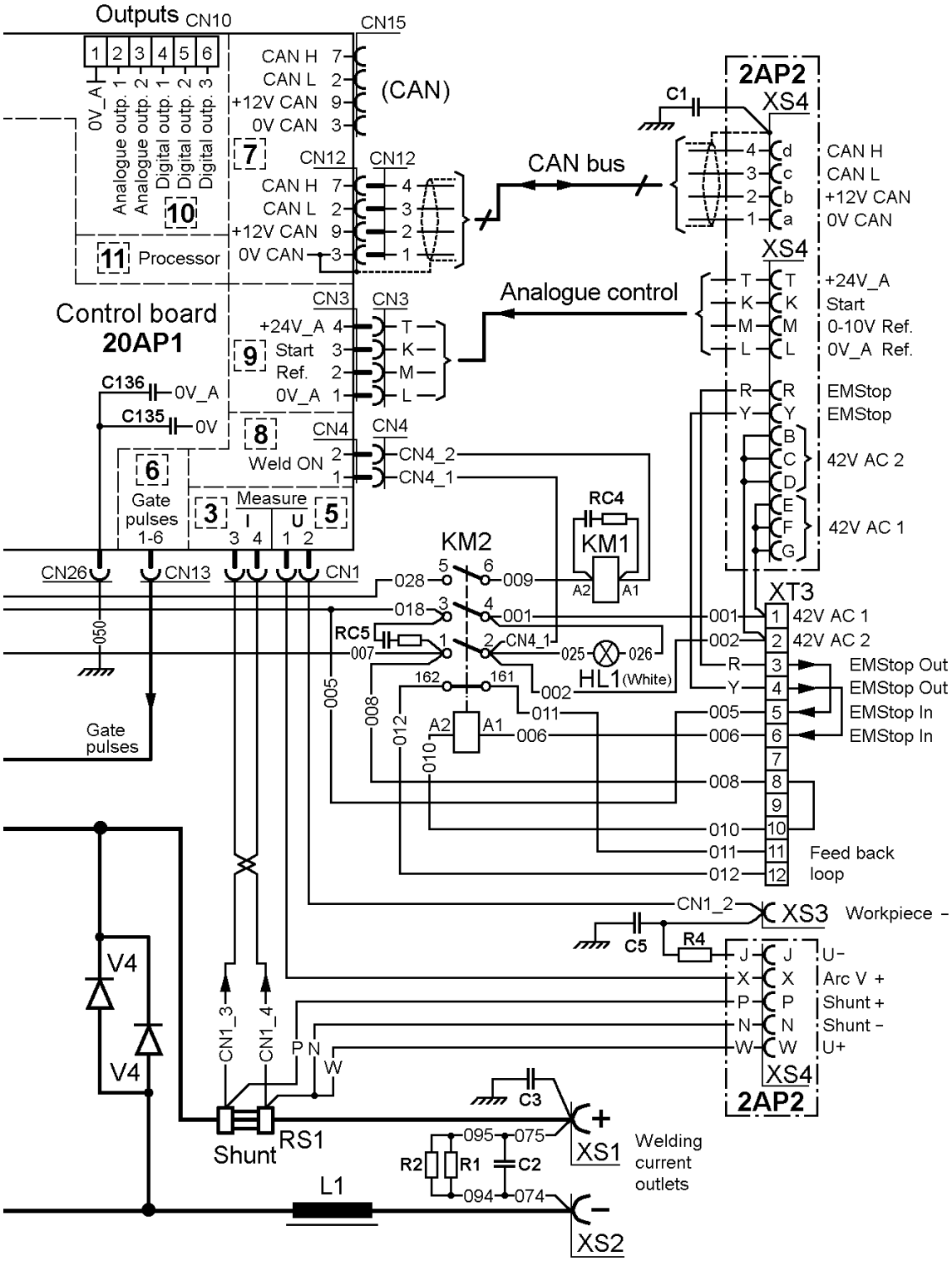
Spare parts may be ordered through your nearest ESAB dealer, see the last page of this publication.

NOTES

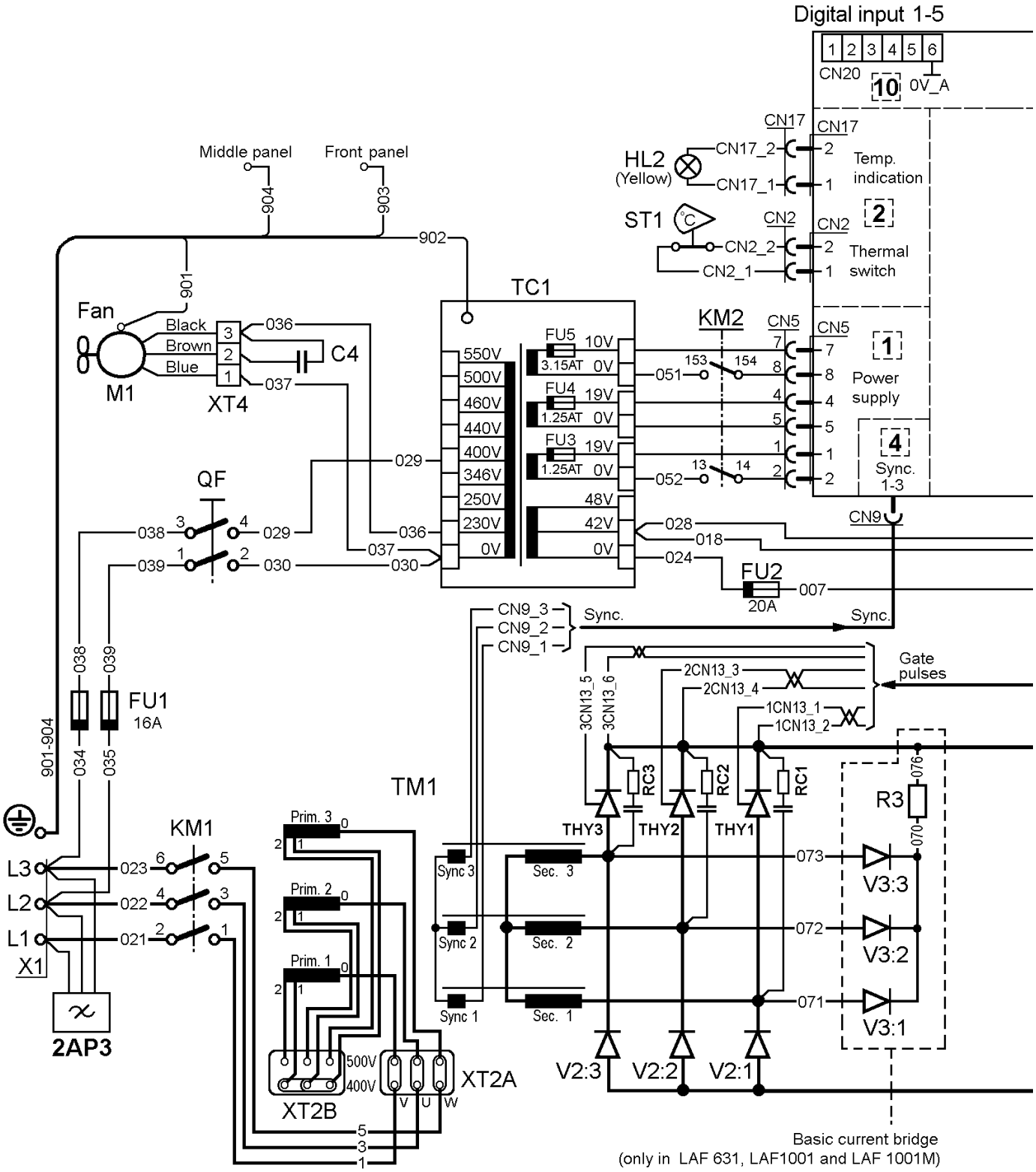
Diagram

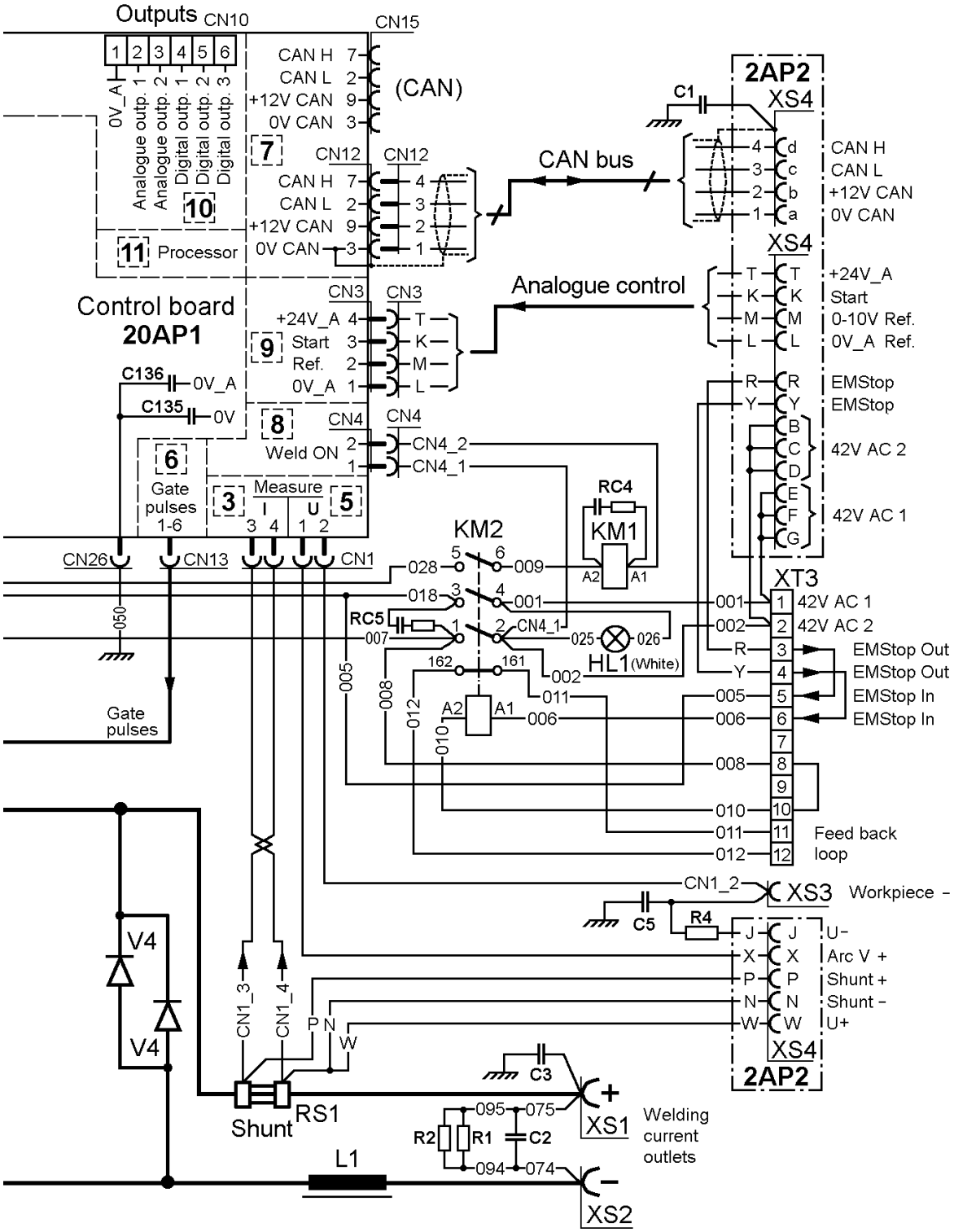
Valid for serial number 935-xxx-xxxx



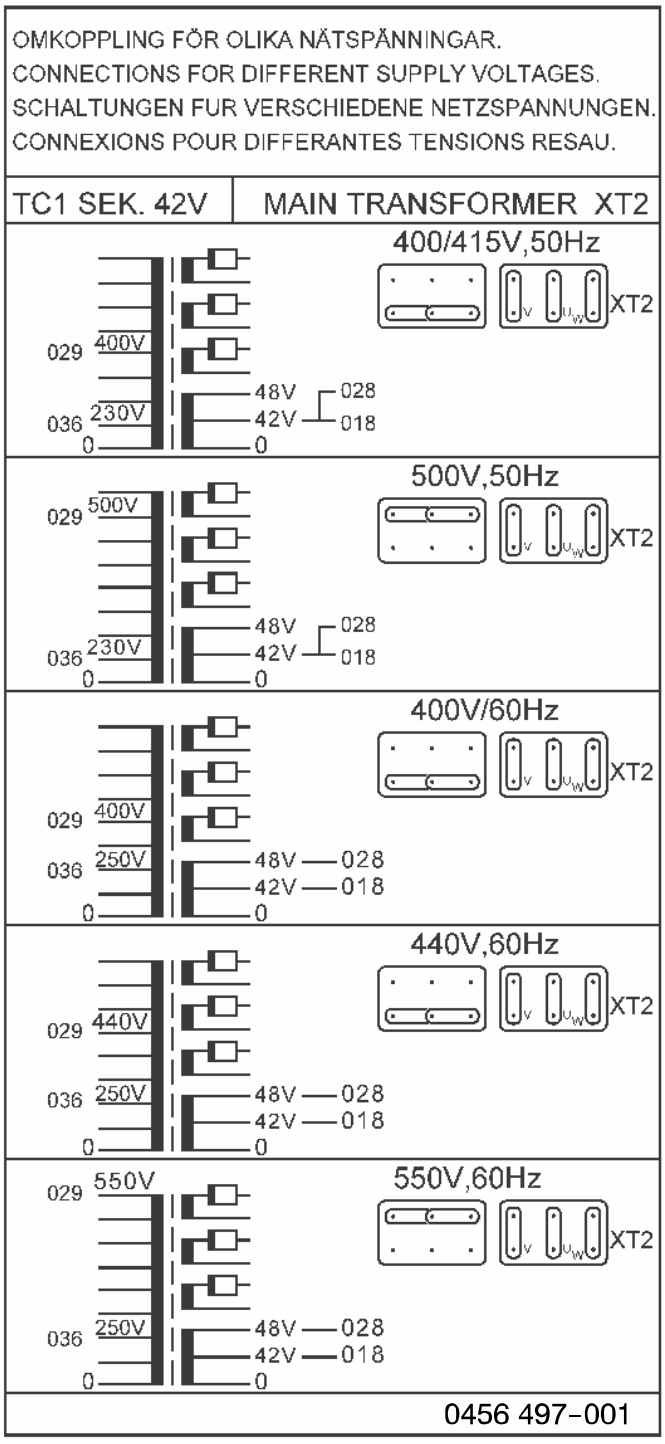

Outputs CN10
CN15
1 2 3 4 5 6
0V_A
Analogue outp. 1
Analogue outp. 2
Digital outp. 1
Digital outp. 2
Digital outp. 3
10
11 Processor
CAN H 7
CAN L 2
+12V CAN 9
0V CAN 3
(CAN)
7
CN12
CN12
CAN bus
2AP2
XS4
C1
CAN H
CAN L
+12V CAN
0V CAN
Analogue control
Control board
20AP1
CN3
CN3
+24V_A 4
9 Start 3
Ref. 2
0V_A 1
+24V_A
Start
0-10V Ref.
0V_A Ref.
C136 0V_A
C135 0V
8 Weld ON
CN4
CN4
CN4_2
CN4_1
EMStop
EMStop
42V AC 2
42V AC 1
6 Gate pulses 1-6
3 Measure I U 5
3 4 1 2
RC4
KM1
KM2
A2 A1
CN26 CN13 CN1
XT3
028 009
018 001
RC5
007 025 026
HL1 (White)
002
001 42V AC 1
002 42V AC 2
EMStop Out
EMStop Out
EMStop In
EMStop In
162 161
011
005 006
008
010
011
012
Feed back loop
Gate pulses
050
005
008
012
010
A2 A1
006
CN1_2
XS3
Workpiece -
C5
R4
V4
V4
CN1_3
CN1_4
P N W
U-
Arc V +
Shunt +
Shunt -
U+
XS4
2AP2
C3
Shunt
RS1
095 075
R2 R1 C2
094 074
XS1
XS2
Welding current outlets
L1

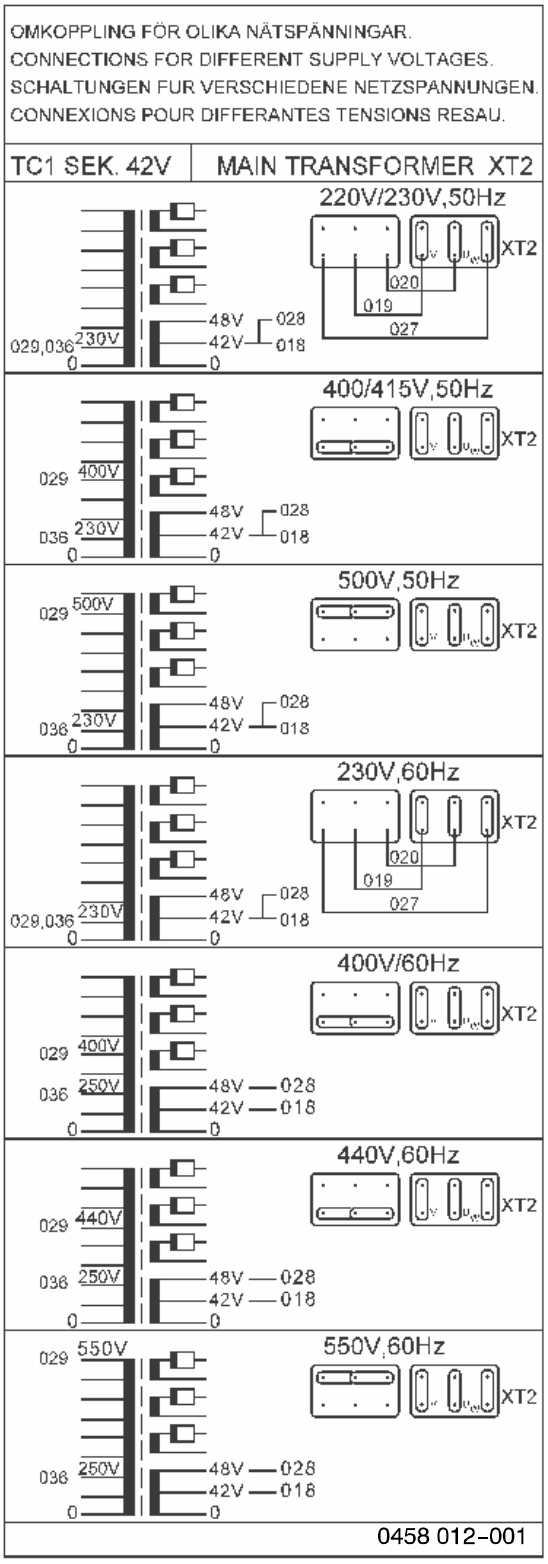
Valid for serial number 126-xxx-xxxx




Outputs CN10
CN15
1 2 3 4 5 6
0V_A
Analogue outp. 1
Analogue outp. 2
Digital outp. 1
Digital outp. 2
Digital outp. 3
10
11 Processor
CAN H 7
CAN L 2
+12V CAN 9
0V CAN 3
(CAN)
7
CN12
CN12
CAN bus
2AP2
XS4
C1
CAN H
CAN L
+12V CAN
0V CAN
Control board
20AP1
CN3
CN3
Analogue control
+24V_A 4
9 Start 3
Ref. 2
0V_A 1
+24V_A
Start
0-10V Ref.
0V_A Ref.
C136 0V_A
C135 0V
8 Weld ON
CN4
CN4
CN4_2
CN4_1
EMStop
EMStop
42V AC 2
42V AC 1
6 Gate pulses 1-6
3 Measure I U 5
3 4 1 2
RC4
KM2
KM1
A2 A1
CN26 CN13 CN1
028 009
018 001
RC5
007 CN4_1 025 026
HL1 (White)
162 161 002
011
A2 A1 006
050
Gate pulses
005
008
012
010
XT3
001 1 42V AC 1
002 2 42V AC 2
R 3 EMStop Out
Y 4 EMStop Out
005 5 EMStop In
006 6 EMStop In
7
008 8
9
010 10
011 11 Feed back
012 12 loop
CN1_2
XS3
Workpiece –
C5
R4
J U–
X Arc V +
P Shunt +
N Shunt –
W U+
V4
V4
CN1_3
CN1_4
P N W
C3
095 075
R2 R1 C2
094 074
XS1
XS2
Welding current outlets
Shunt RS1
L1

Connection instruction




OMKOPPLING FÖR OLIKA NÄTSPÄNNINGAR.
CONNECTIONS FOR DIFFERENT SUPPLY VOLTAGES.
SCHALTUNGEN FUR VERSCHIEDENE NETZSPANNUNGEN.
CONNEXIONS POUR DIFFERANTES TENSIONS RESAU.
TC1 SEK. 42V
MAIN TRANSFORMER XT2
220V/230V,50Hz
XT2
020
019
027
029,036
230V
0
48V
42V
028
018
400/415V,50Hz
029
400V
036
230V
500V,50Hz
500V
230V,60Hz
400V/60Hz
250V
440V,60Hz
440V
550V,60Hz
550V
0458 012-001

Order number

Ordering no.	Denomination	Type
0460 513 880	Welding power source	LAF 1001
0460 513 881	Welding power source	LAF 1001M
0459 839 057	Spare parts list	LAF 1001 / LAF 1001M

Technical documentation is available on the Internet at **www.esab.com**

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