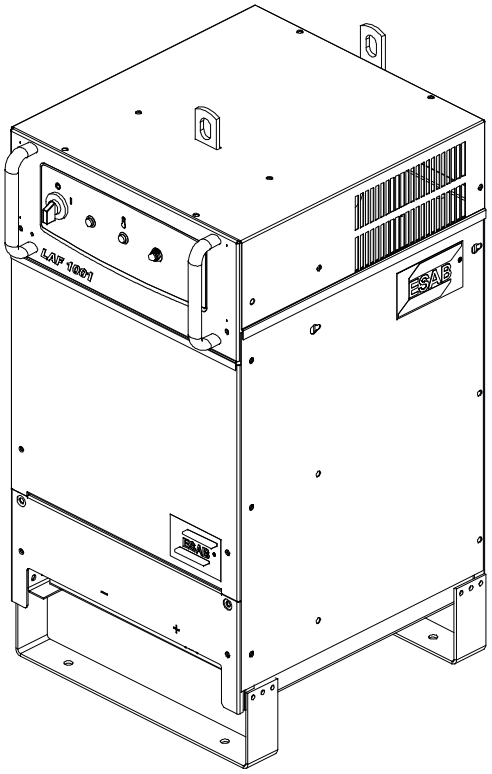
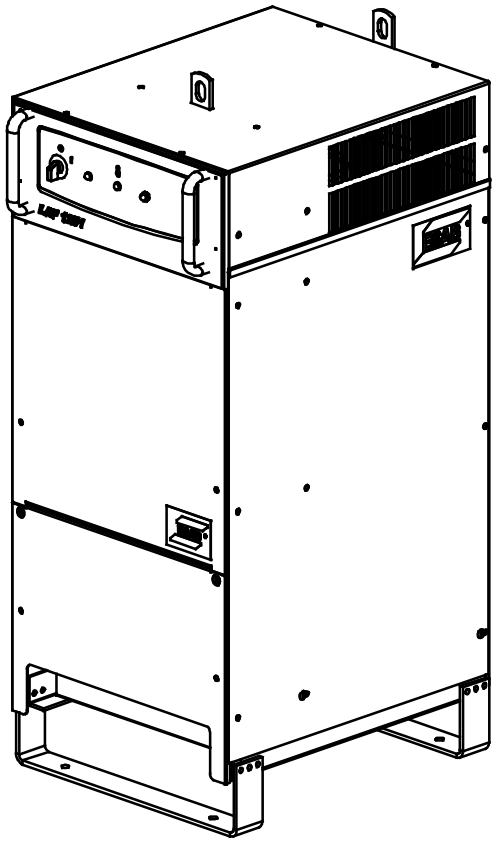
Parallel connection of LAF-welding power source



Master



Slave

Instruction manual

0449 546 001 110217

GB

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. **Note!** *Do not use safety gloves when replacing wire.*
   - 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.

GB

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 MANUFACTURER'S 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.

NOISE - Excessive noise can damage hearing

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

MALFUNCTION

- Call for expert assistance in the event of malfunction.

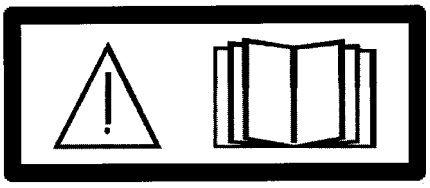
READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR OPERATING.

PROTECT YOURSELF AND OTHERS!

GB

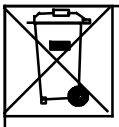
CAUTION!

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 electromagnic compatibility of class A equipment in those locations, due to conducted as well as radiated disturbances.



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!

CAUTION!

The welding power source and control box PEH can't be used together.

GB

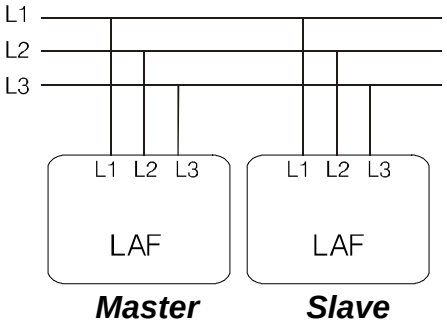
2 INTRODUCTION

2.1 General

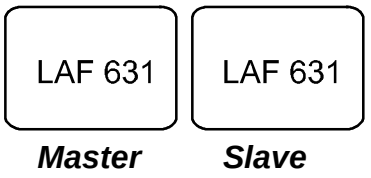
Connection in parallel can be done with all sizes of the LAF welding power source. The current outlet from each welding power source depends on its size, see below.

The mains connection is to be done in the same way for ***Master*** and ***Slave.***

It is possible to use the so-called six-thyristor effect by inverting the primary terminal of the main transformer, see page 12.

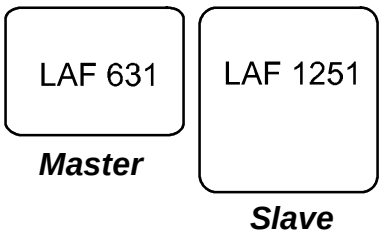


Connection in Parallel of Welding Power Sources of the Same Size



Connection in Parallel of Welding Power Sources of Different Size

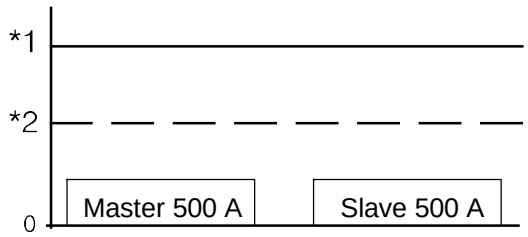
When the welding power sources are of different size the smallest one is to be ***Master***.



Current Outlet for Welding Power Sources of the Same Size

If the power sources are of the same size the current outlet will be evenly distributed.

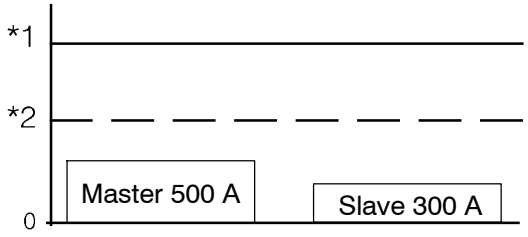
*1 Max = 1600 A
*2 500+500 = 1000 A



Current Outlet for Welding Power Sources of Different Sizes

If the Welding power sources are of different sizes the current outlet will be procentually evenly distributed.

*1 Max = 1000+600= 1600 A
*2 500+300 = 800 A



hga7d1ea

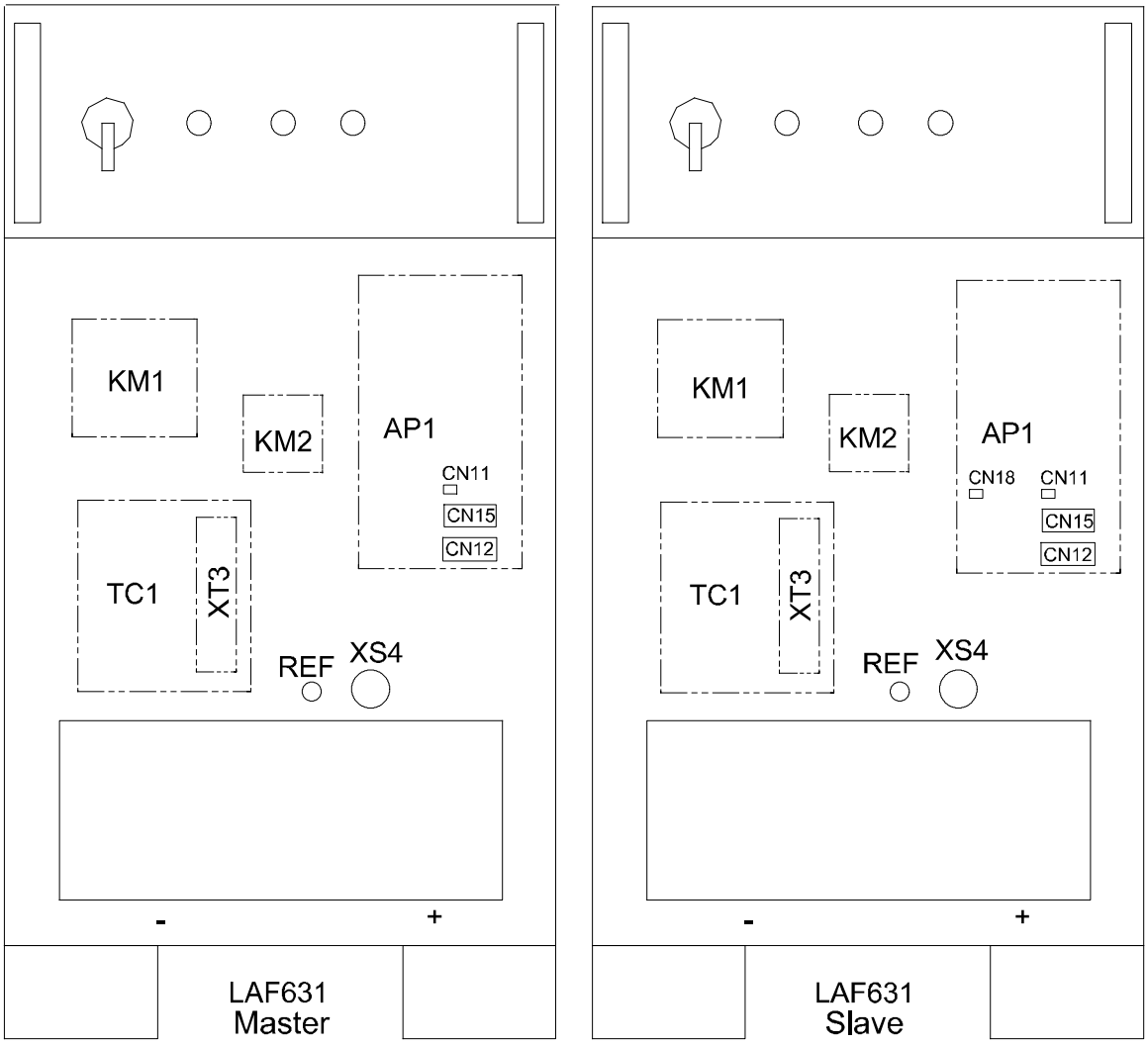
2.2 Connection instructions for two parallel-connected welding power sources and one PEK control box

1. Emergency stop coil ***W01***, is connected together with the enclosed contact block, which in turn has been fitted on ***KM2***, in accordance with the diagram on page 14 (automatic welding machine) or page 15 (automation).
2. On the welding power source defined as Slave ***CN18*** (pin 1 and 2), on ***AP1***, shall be clamped for analogue control.
3. Start up both welding power sources and connect ***ESAT*** to the ***Master*** welding power source.
4. Set parameter ***762*** to ***1***, Master searches for the welding power source selected as Slave.
5. Set parameter ***767*** to ***10***, Node address on the welding power source selected as Slave.
6. Move the ***ESAT*** connection to the welding power source defined as ***Slave***.
7. Set parameter ***10*** to ***16***, Slave function.
8. Set parameter ***67*** to ***0***, with value 1 so the welding power source expects an analogue signal.
9. Set parameter ***712*** to ***0***, the wire feed is not controlled by the welding power source defined as Slave.
10. Set parameter ***713*** to ***0***, the travel motor is not controlled by the welding power source defined as Slave.
11. Set parameter ***762*** to ***0***, Slave does not search for another power source.
12. Set parameter ***767*** to ***2***, Node address on the welding power source defined as Master.
13. Set parameter ***9000*** to ***10***, Node address for the welding power source defined as Slave.
14. Switch off the voltage to both welding power sources.
15. Remove the clamp on ***CN18*** (pin 1 and 2) on the Slave welding power source.
16. Remove the clamp on ***CN11*** on the Master welding power source.
17. Connect cable ***W02*** to the welding power sources.
18. Switch on the voltage to the Slave welding power source.
19. Switch on the voltage to the Master welding power source.
20. Check that the emergency stop coil is working, both the welding power sources (emergency stop relay/emergency stop contactors) are switched off. After resetting, the welding power sources start up normally and are ready for use.
21. Check that the parallel current value can be set in ***PEK***.

For more information on component location on the circuit board, see the service manual for the LAF welding power source.

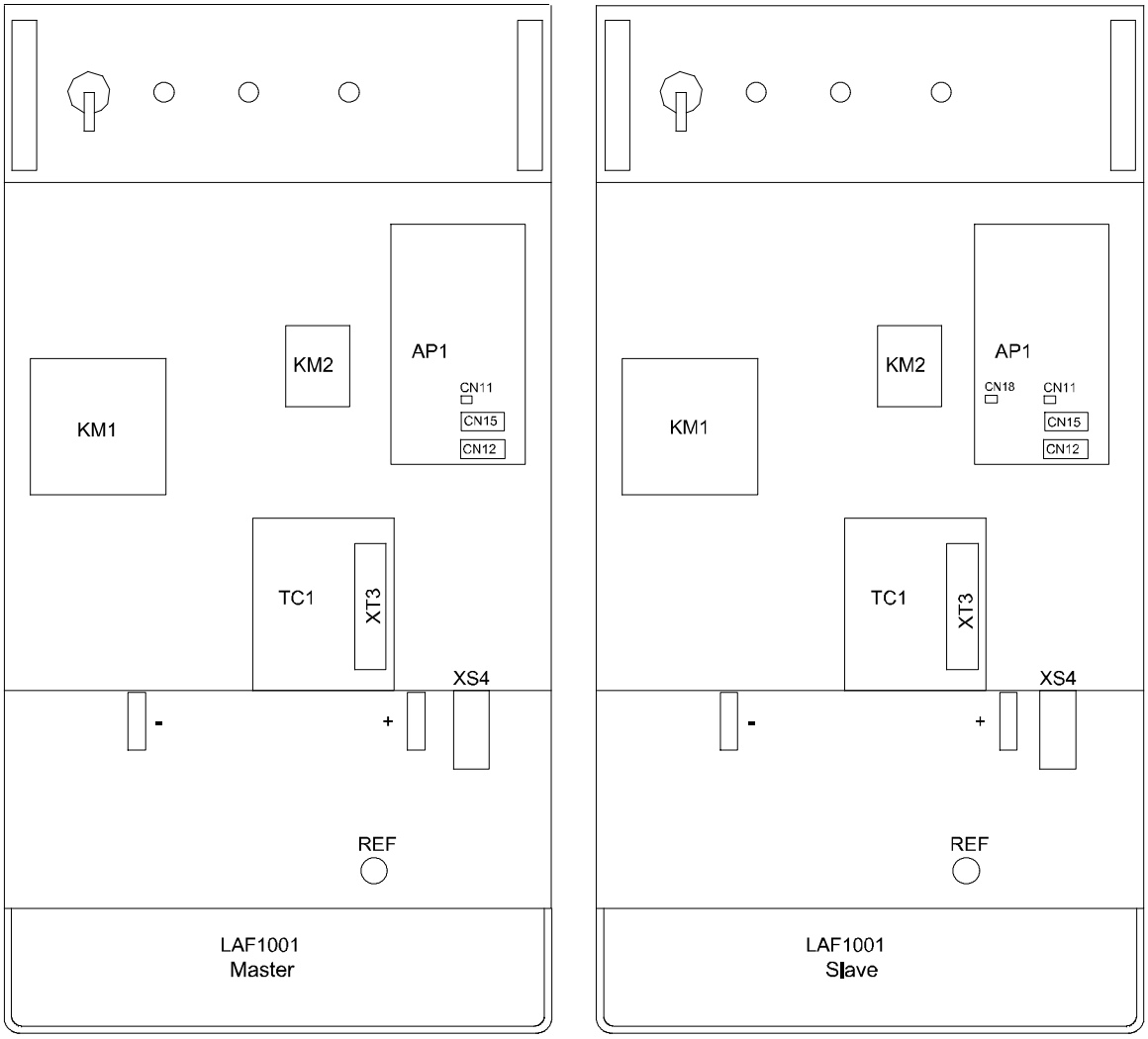
3 Location Drawing

3.1 Location drawing - Welding Power Source LAF 631



GB

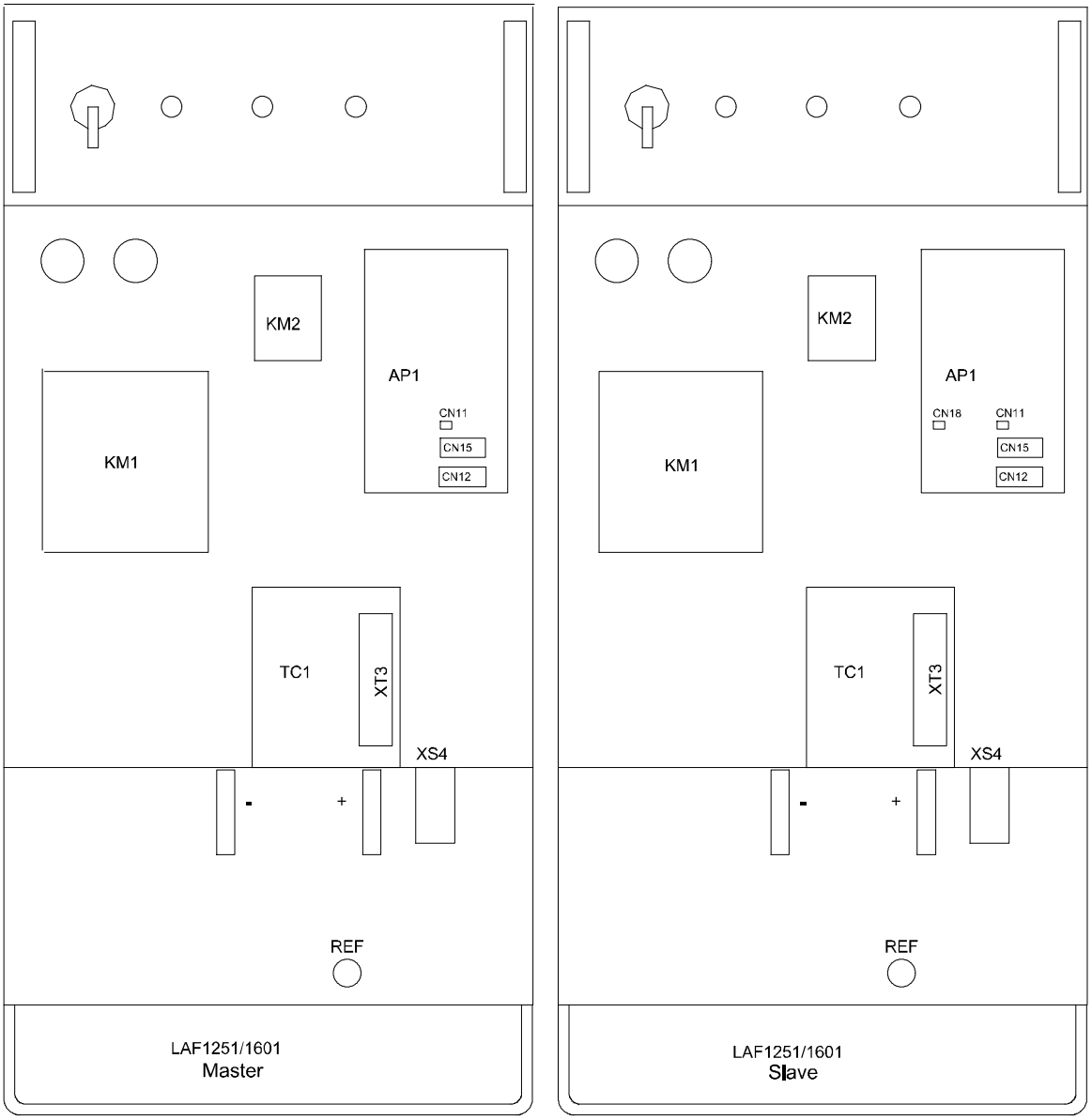
3.2 Location drawing - Welding Power Source LAF 1001



hga7d2ea

GB

3.3 Location drawing - Welding Power Source LAF 1251/1601

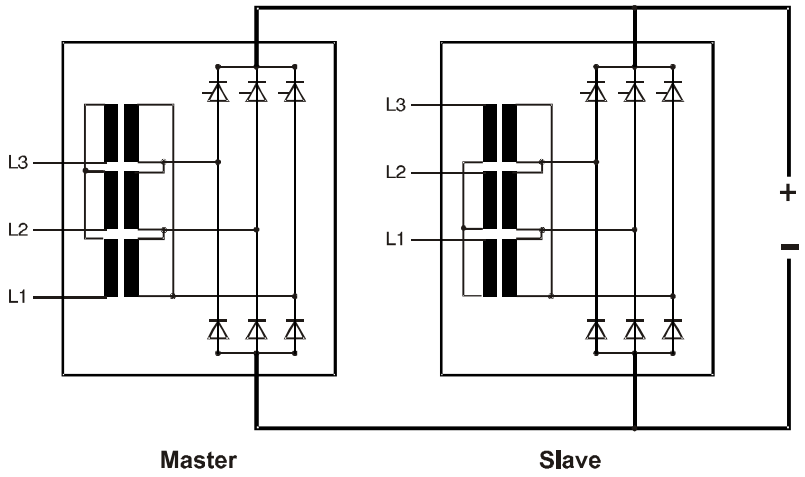


hga7d2ea

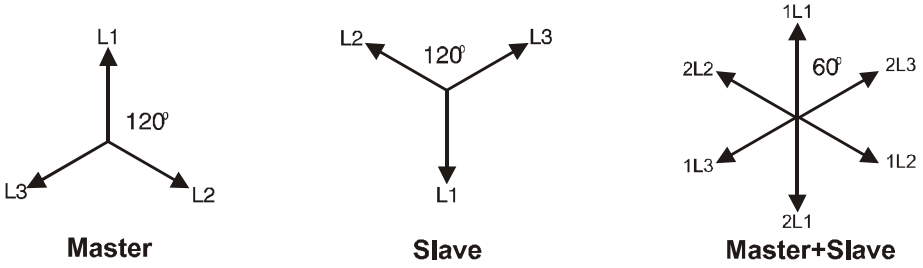
4 Connection in Parallel Using Six-Thyristor Operation

In this case the Master/Slave welding power sources are connected to the mains by way of six thyristors (three in each welding power source). This results in softer welding current as the phase shift is 60° instead of 120°.

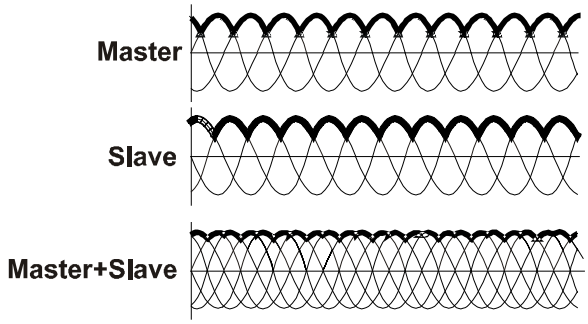
- Connection of Master+Slave using the six-thyristor effect. Note that the primary winding of the Slave is reversed.



- The phase shift goes down from 120° to 60°, see the diagrams below.



- The following sine-wave diagram shows the equalising effect obtained when using inversion of the Slave transformer.



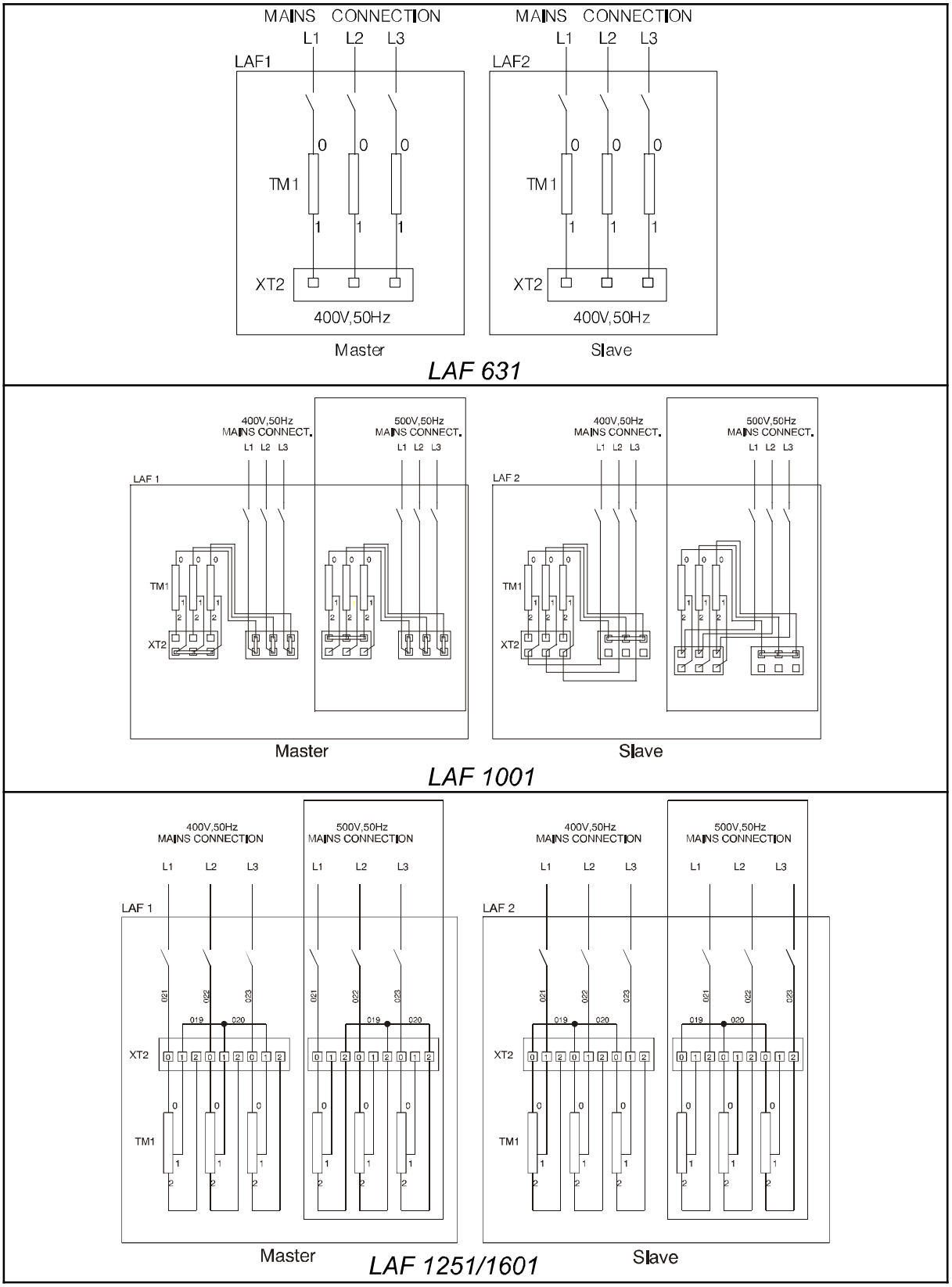
The requirement is that the welding power sources are of the same size, and that it is possible to shift the input and output on the primary side of the main transformer. This is easily done on LAF 1001, 1251 and 1601, whereas it is more complicated on LAF 631, as the winding of the transformer is connected directly to the main contactor.

GB

IMPORTANT!

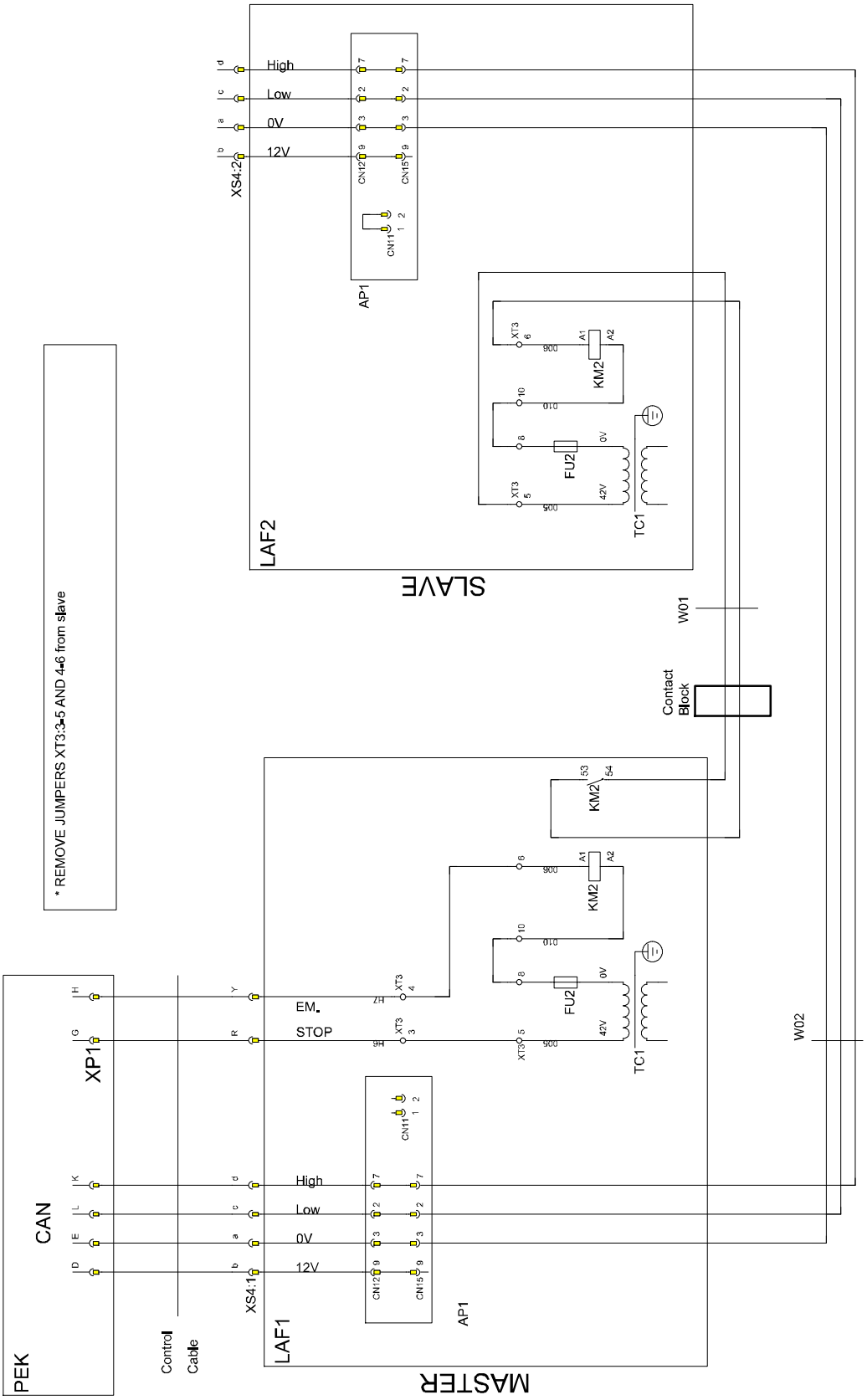
Connect the right winding. Most power sources have more than one mains voltage. This applies particularly to machines designed for different mains voltages.

Below you find examples how to connect master and slave to the mains when using power sources without multivoltage connections.



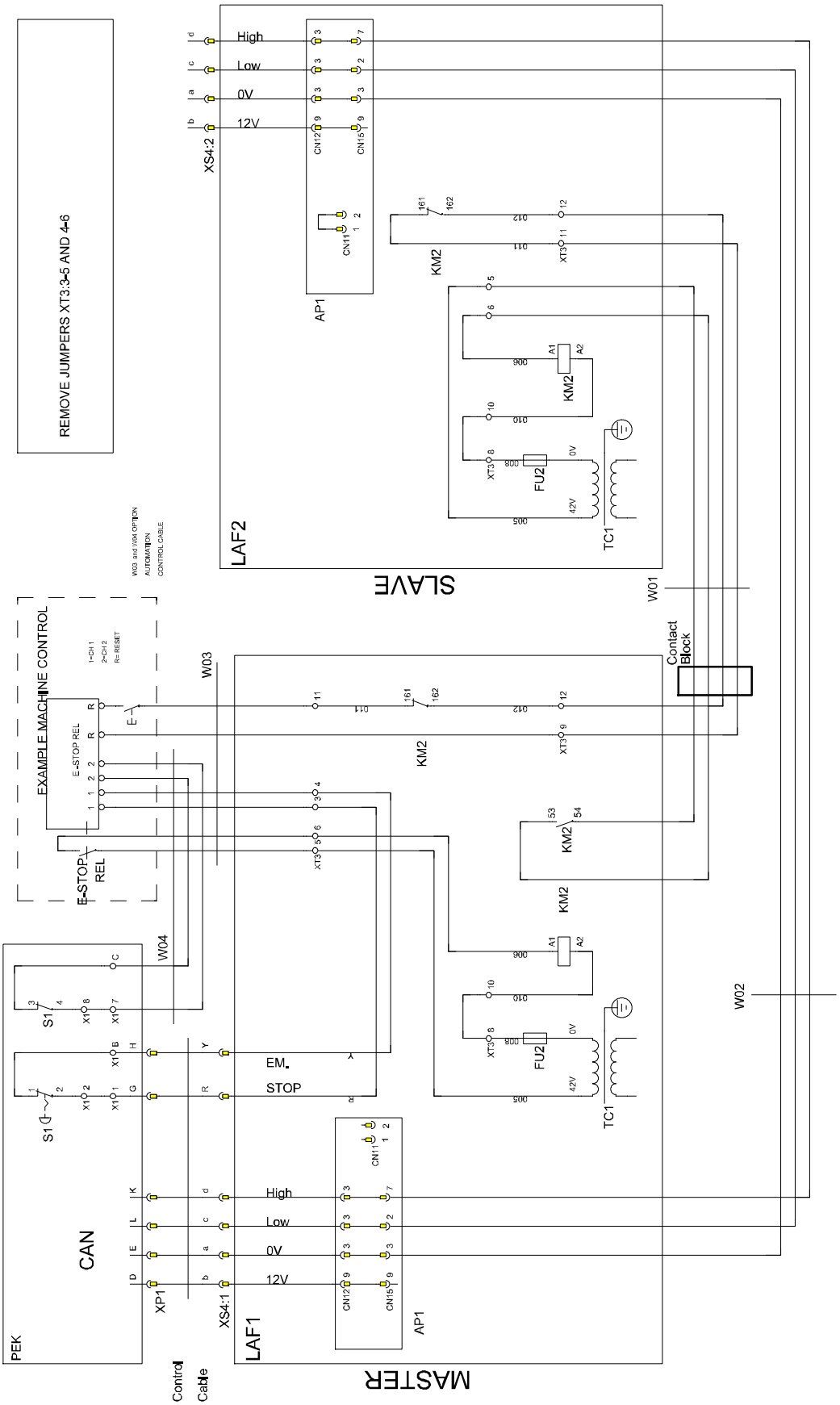
DIAGRAM

Tractor variant



hga7diag

Automation variant



hga7diag

sida

Edition 101001

Ordering no.	Denomination	Notes
0808573882	Parallel connection kit	

Item no.	Qty	Ordering no.	Denomination	Notes
		0808573882	**Parallel connection kit**	**LAF-PEK**
W01	4	0801389053	Cable	4x2x0.5, liycy
W02	1	0458681908	Cable	L=4 m
	1	0436919007	Auxillary contact block	

ESAB subsidiaries and representative offices

Europe

AUSTRIA
ESAB Ges.m.b.H
Vienna-Liesing
Tel: +43 1 888 25 11
Fax: +43 1 888 25 11 85

BELGIUM
S.A. ESAB N.V.
Brussels
Tel: +32 2 745 11 00
Fax: +32 2 745 11 28

BULGARIA
ESAB Kft Representative Office
Sofia
Tel/Fax: +359 2 974 42 88

THE CZECH REPUBLIC
ESAB VAMBERK s.r.o.
Vamberk
Tel: +420 2 819 40 885
Fax: +420 2 819 40 120

DENMARK
Aktieselskabet ESAB
Herlev
Tel: +45 36 30 01 11
Fax: +45 36 30 40 03

FINLAND
ESAB Oy
Helsinki
Tel: +358 9 547 761
Fax: +358 9 547 77 71

FRANCE
ESAB France S.A.
Cergy Pontoise
Tel: +33 1 30 75 55 00
Fax: +33 1 30 75 55 24

GERMANY
ESAB GmbH
Solingen
Tel: +49 212 298 0
Fax: +49 212 298 218

GREAT BRITAIN
ESAB Group (UK) Ltd
Waltham Cross
Tel: +44 1992 76 85 15
Fax: +44 1992 71 58 03

ESAB Automation Ltd
Andover
Tel: +44 1264 33 22 33
Fax: +44 1264 33 20 74

HUNGARY
ESAB Kft
Budapest
Tel: +36 1 20 44 182
Fax: +36 1 20 44 186

ITALY
ESAB Saldatura S.p.A.
Bareggio (Mi)
Tel: +39 02 97 96 8.1
Fax: +39 02 97 96 87 01

THE NETHERLANDS
ESAB Nederland B.V.
Amersfoort
Tel: +31 33 422 35 55
Fax: +31 33 422 35 44

NORWAY
AS ESAB
Larvik
Tel: +47 33 12 10 00
Fax: +47 33 11 52 03

POLAND
ESAB Sp.zo.o.
Katowice
Tel: +48 32 351 11 00
Fax: +48 32 351 11 20

PORTUGAL
ESAB Lda
Lisbon
Tel: +351 8 310 960
Fax: +351 1 859 1277

ROMANIA
ESAB Romania Trading SRL
Bucharest
Tel: +40 316 900 600
Fax: +40 316 900 601

RUSSIA
LLC ESAB
Moscow
Tel: +7 (495) 663 20 08
Fax: +7 (495) 663 20 09

SLOVAKIA
ESAB Slovakia s.r.o.
Bratislava
Tel: +421 7 44 88 24 26
Fax: +421 7 44 88 87 41

SPAIN
ESAB Ibérica S.A.
Alcalá de Henares (MADRID)
Tel: +34 91 878 3600
Fax: +34 91 802 3461

SWEDEN
ESAB Sverige AB
Gothenburg
Tel: +46 31 50 95 00
Fax: +46 31 50 92 22

ESAB international AB
Gothenburg
Tel: +46 31 50 90 00
Fax: +46 31 50 93 60

SWITZERLAND
ESAB AG
Dietikon
Tel: +41 1 741 25 25
Fax: +41 1 740 30 55

UKRAINE
ESAB Ukraine LLC
Kiev
Tel: +38 (044) 501 23 24
Fax: +38 (044) 575 21 88

North and South America

ARGENTINA
CONARCO
Buenos Aires
Tel: +54 11 4 753 4039
Fax: +54 11 4 753 6313

BRAZIL
ESAB S.A.
Contagem-MG
Tel: +55 31 2191 4333
Fax: +55 31 2191 4440

CANADA
ESAB Group Canada Inc.
Missisauga, Ontario
Tel: +1 905 670 02 20
Fax: +1 905 670 48 79

MEXICO
ESAB Mexico S.A.
Monterrey
Tel: +52 8 350 5959
Fax: +52 8 350 7554

USA
ESAB Welding & Cutting Products
Florence, SC
Tel: +1 843 669 44 11
Fax: +1 843 664 57 48

Asia/Pacific

CHINA
Shanghai ESAB A/P
Shanghai
Tel: +86 21 2326 3000
Fax: +86 21 6566 6622

INDIA
ESAB India Ltd
Calcutta
Tel: +91 33 478 45 17
Fax: +91 33 468 18 80

INDONESIA
P.T. ESABindo Pratama
Jakarta
Tel: +62 21 460 0188
Fax: +62 21 461 2929

JAPAN
ESAB Japan
Tokyo
Tel: +81 45 670 7073
Fax: +81 45 670 7001

MALAYSIA
ESAB (Malaysia) Snd Bhd
USJ
Tel: +603 8023 7835
Fax: +603 8023 0225

SINGAPORE
ESAB Asia/Pacific Pte Ltd
Singapore
Tel: +65 6861 43 22
Fax: +65 6861 31 95

SOUTH KOREA
ESAB SeAH Corporation
Kyungnam
Tel: +82 55 269 8170
Fax: +82 55 289 8864

UNITED ARAB EMIRATES
ESAB Middle East FZE
Dubai
Tel: +971 4 887 21 11
Fax: +971 4 887 22 63

Africa

EGYPT
ESAB Egypt
Dokki-Cairo
Tel: +20 2 390 96 69
Fax: +20 2 393 32 13

SOUTH AFRICA
ESAB Africa Welding & Cutting Ltd
Durbanvill 7570 - Cape Town
Tel: +27 (0)21 975 8924

Distributors

For addresses and phone numbers to our distributors in other countries, please visit our home page

www.esab.com

ESAB AB
SE-695 81 LAXÅ
SWEDEN
Phone +46 584 81 000

www.esab.com

110210