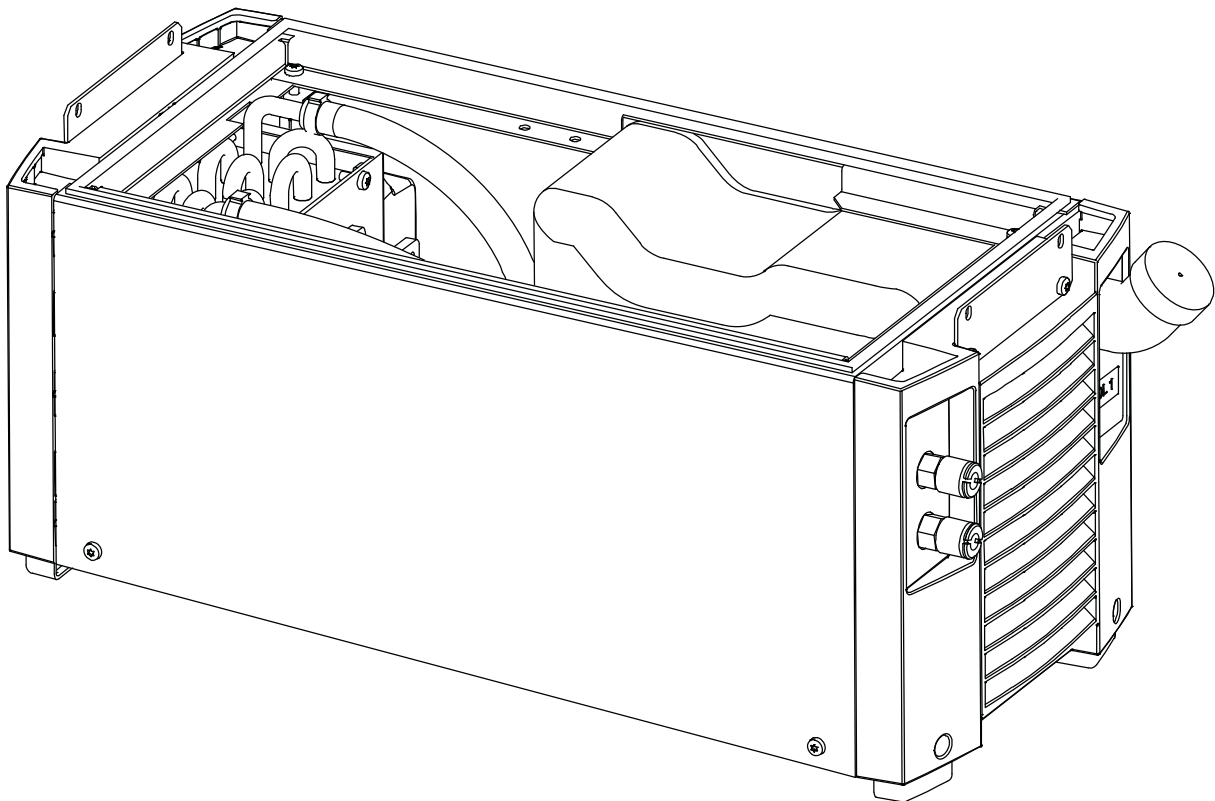


COOL 1



Service manual

READ THIS FIRST	3
TECHNICAL DATA	4
WIRING DIAGRAM	4
Component description	4
COOL1	5
DESCRIPTION OF OPERATION	6
5 Cooling unit	6
5AP1:1 Monitoring the coolant flow	6
5AP1:2 Pump motor and fan ON/OFF	6
5AP1 Component positions	8
SERVICE INSTRUCTIONS	9
What is ESD?	9
Service aid	9
INSTRUCTIONS	10
SAFETY	10
INSTALLATION	10
Installing to welding equipment	10
Assembly instructions	11
OPERATION	13
Connections and control devices	13
Coolant connection	13
Water flow guard	13
MAINTENANCE	13
Inspection and cleaning	14
Filling the coolant	14
Characteristics	15
SPARE PARTS	16
NOTES	17

READ THIS FIRST

Maintenance and repair work should be performed by an experienced person, and electrical work only by a trained electrician. Use only recommended replacement parts.

This service manual is intended for use by technicians with electrical/electronic training for help in connection with fault-tracing and repair.

Use the wiring diagram as a form of index for the description of operation. The circuit boards are divided into numbered blocks, which are described individually in more detail in the description of operation. Component names in the wiring diagram are listed in the component description.

Use the spare parts list as a guide to where the components are located in the equipment. The spare parts list is published as a separate document, see page 16.

This manual contains details of design changes that have been made up to and including October 2010.

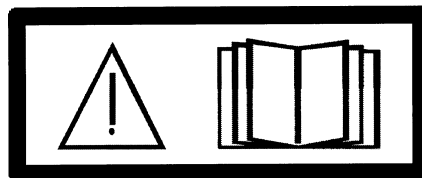
The manual is valid for COOL 1 with serial no. 033-xxx-xxxx

**The COOL 1 is designed and tested in accordance with international and European standards IEC/EN 60974.
On completion of service or repair work, it is the responsibility of the person(s) performing the work to ensure that the product still complies with the requirements of the above standard.**



CAUTION!

Read and understand the instruction manual before installing or operating.



ESD

CAUTION !

STATIC ELECTRICITY can damage circuit boards and electronic components.

- Observe precautions for handling electrostatic-sensitive devices.
- Use proper static-proof bags and boxes.

TECHNICAL DATA

COOL 1	
Power consumption	24V DC / 2A
Cooling power	1.3 kW (Rating at 40 K and 1 l/min)
Equivalent continuous A-weighted sound pressure level	< 70 dB (A)
Coolant	Ready mixed (50% water and 50% mono-ethylene glycol)
Coolant quantity	4.5 l
Maximum flow	2.0 l/min
Maximum pressure	4 bar
Operating temperature	-10° to +40°C
Transportation temperature	-20° to +55°C
Dimensions l x w x h	610 x 256 x 256 mm
Weight empty	12 kg
Enclosure class	IP23

Enclosure class

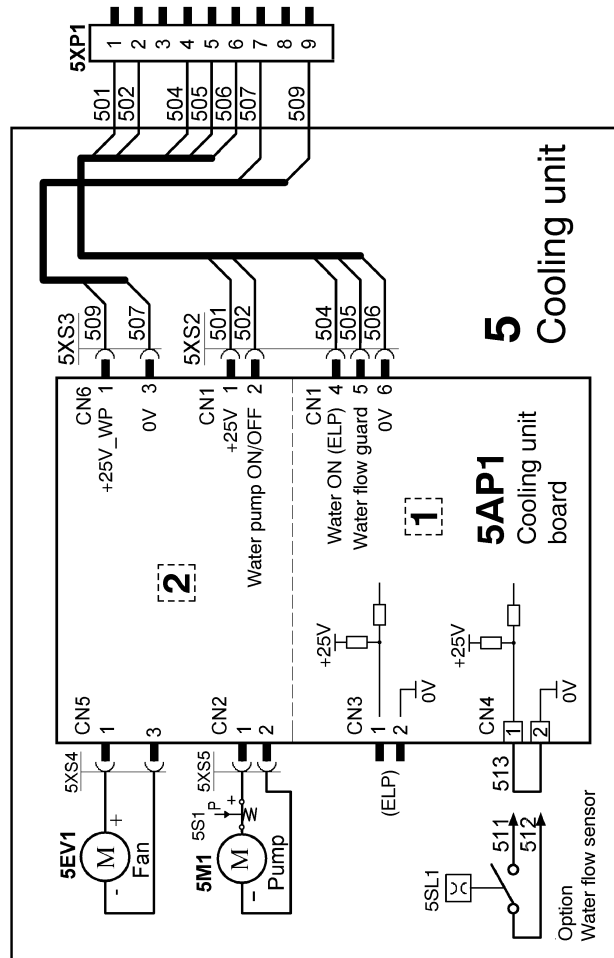
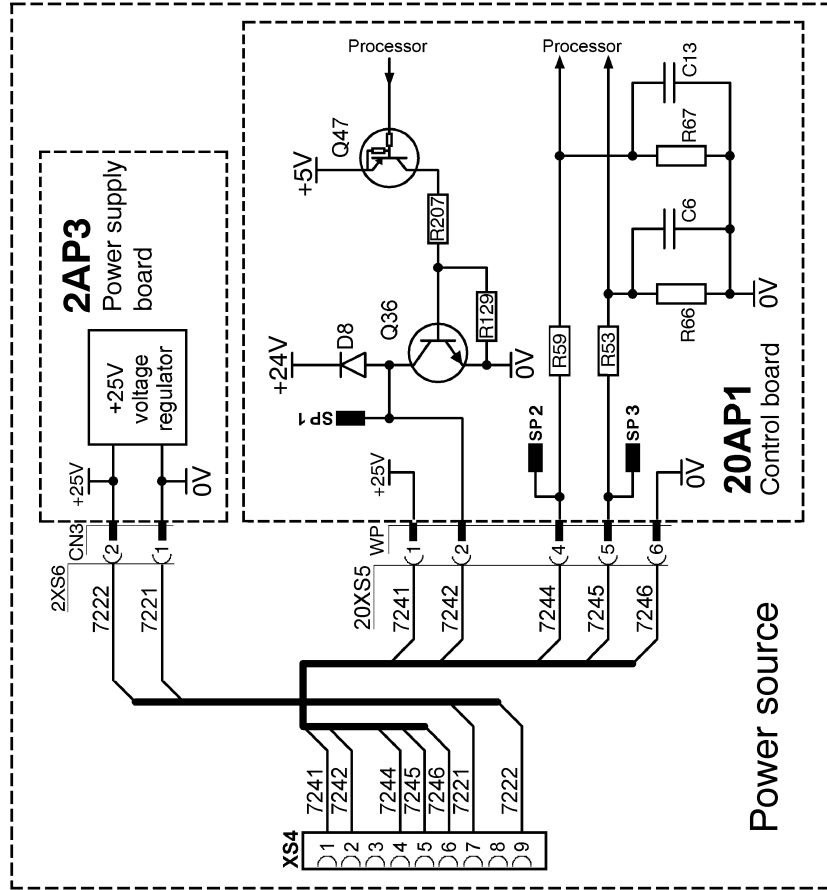
The IP code indicates the enclosure class, i. e. the degree of protection against penetration by solid objects or water. Equipment marked **IP23** is designed for indoor and outdoor use.

WIRING DIAGRAM

Component description

Component	Description
5	Cooling unit
5AP1	Circuit board with control electronics
5M1	Pump with motor, 24V DC
5S1	Coolant pressure switch (enclosed in pump 5M1)
5EV1	Cooling fan, 24V DC
5SL1	Flow guard. Monitoring coolant flow (option)
5XP..	Plug connector (Pin)
5XS..	Socket connector (Sleeve)
5XT..	Terminal block

COOL1

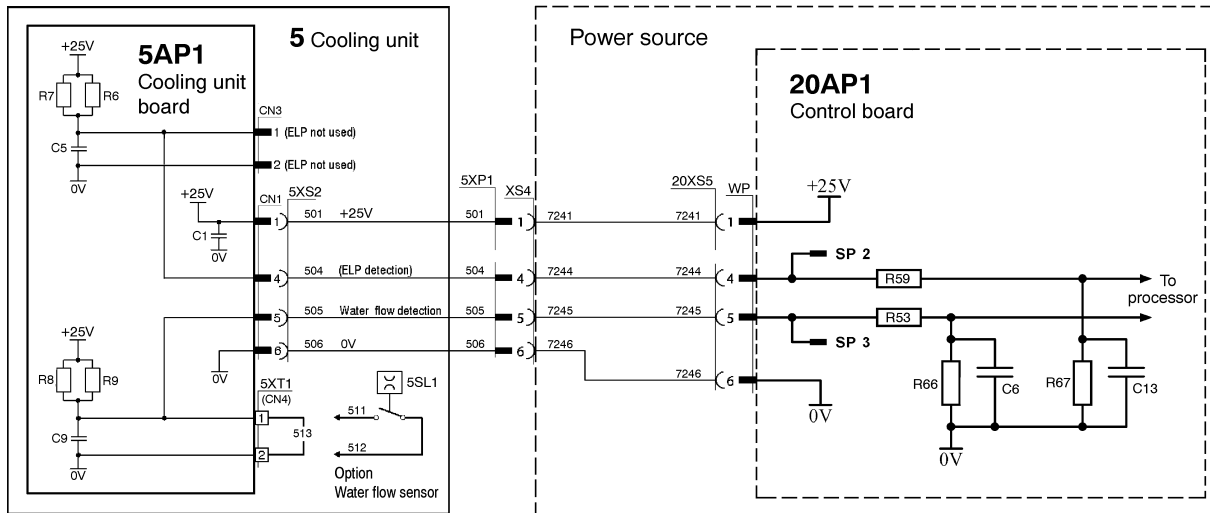


DESCRIPTION OF OPERATION

This description of operation describes the function of circuit boards and other components in the equipment.

5 Cooling unit

5AP1:1 Monitoring the coolant flow



Circuit diagram for coolant flow guard

COOL1 is prepared for optional coolant flow monitoring. Replace the jumper cable 513 with the flow guard sensor, 5SL1, and connect it to terminal block 5XT1 (CN4) on cooling unit board, 5AP1. The sensor switch opens at flow rate < 0.7 l/min. The MMC panel of the system displays fault code 29 ,(no cooling water flow), if the input to the processor is high. (Measure at point SP3 on 20AP1)

Supervision of hoses connection, ELP (ESAB Logic Pump) is not installed in COOL1.

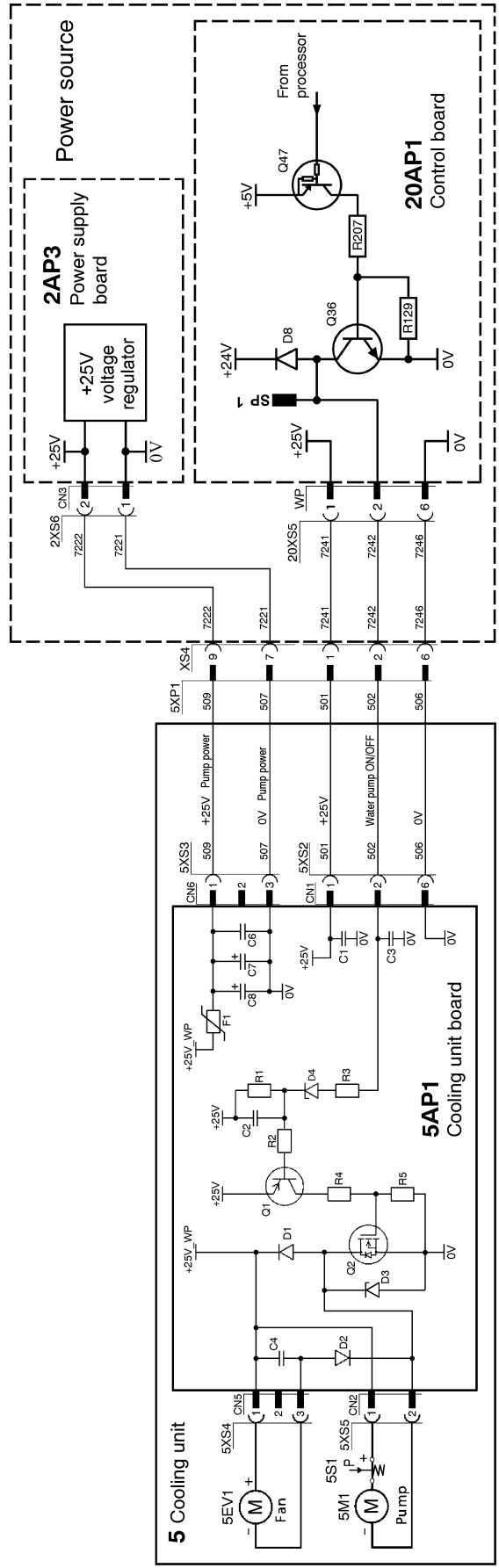
5AP1:2 Pump motor and fan ON/OFF

The pump motor, 5M1, and cooling fan, 5EV1, are connected in parallel and powered from the power supply board, 2AP3, in the power source. The power is 25V DC and named 25V_WP in the cooling unit board, 5AP1.

An output from the processor on control board 20AP1 connects input 20XS5:2 (WP2) to 0V. (Measure at point SP1 on 20AP1). Transistor Q2 in cooling unit board, 5AP1, connects pump motor and fan to 0V, and the pump and fan start.

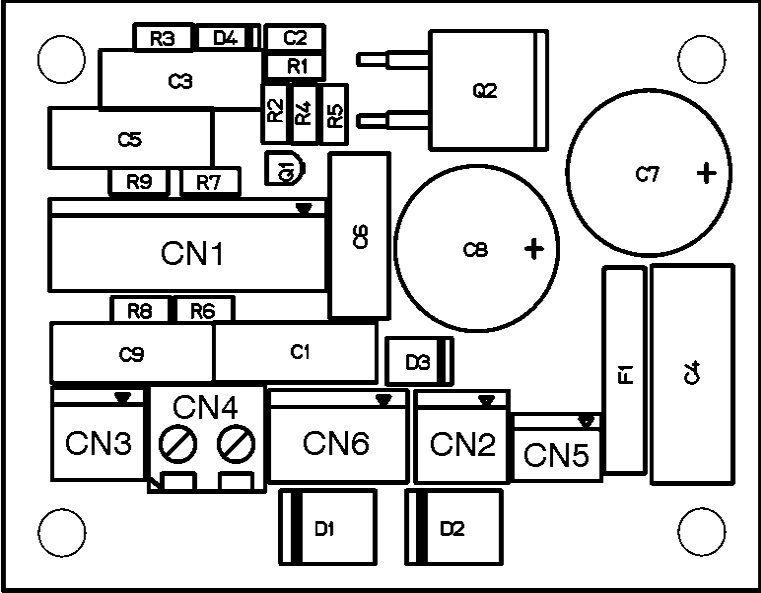
The pump, 5M1, has an enclosed coolant pressure switch, 5S1, which switches off the power to the pump motor if the coolant pressure is too high. This can occur if a hose is folded which make flow to fail or stop. The cooling fan however is still powered and running.

Pump motor and fan ON/OFF



Circuit diagram for pump motor and cooling fan

5AP1 Component positions



Component positions on the cooling unit board, 5AP1.

Terminal block CN4 is also named 5XT1 in the diagram.

SERVICE INSTRUCTIONS



CAUTION !

STATIC ELECTRICITY can damage circuit boards and electronic components.

- Observe precautions for handling electrostatic-sensitive devices.
- Use proper static-proof bags and boxes.

What is ESD?

A sudden transfer or discharge of static electricity from one object to another. ESD stands for Electrostatic Discharge.

How does ESD damage occur?

ESD can cause damage to sensitive electrical components, but is not dangerous to people. ESD damage occurs when an ungrounded person or object with a static charge comes into contact with a component or assembly that is grounded. A rapid discharge can occur, causing damage. This damage can take the form of immediate failure, but it is more likely that system performance will be affected and the component will fail prematurely.

How do we prevent ESD damage?

ESD damage can be prevented by awareness. If static electricity is prevented from building up on you or on anything at your work station, then there cannot be any static discharges. Nonconductive materials (e.g. fabrics), or insulators (e.g. plastics) generate and hold static charge, so you should not bring unnecessary nonconductive items into the work area. It is obviously difficult to avoid all such items, so various means are used to drain off any static discharge from persons to prevent the risk of ESD damage. This is done by simple devices: wrist straps, connected to ground, and conductive shoes.

Work surfaces, carts and containers must be conductive and grounded. Use only antistatic packaging materials. Overall, handling of ESD-sensitive devices should be minimized to prevent damage.

Service aid

Antistatic service kit

Ordering no. 0740 511 001

The kit makes it easier to protect sensitive components from electrostatic discharge.

Contents:

- A conductive mat (size 610 x 610 mm)
- A 1.5 metre long ground cable with a crocodile clip
- An adjustable wrist strap and cable with an inbuilt protective resistor



Antistatic service kit

INSTRUCTIONS

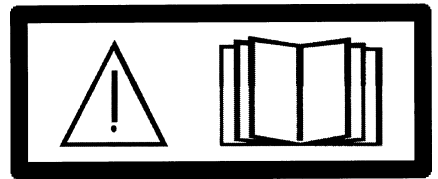
This chapter is an extract from the instruction manual for the COOL1.

SAFETY



CAUTION!

Read and understand the instruction manual before installing or operating.



INSTALLATION

The installation must be executed by a professional.

Location

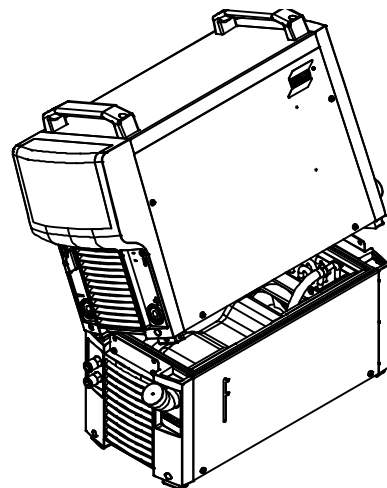
Position the cooling unit such that its air inlets and outlets are not obstructed.

Power supply and control

COOL1 is powered and controlled from the power source via socket connector XS4 in the bottom of the power source. The plug connector 5XP1 on top of the cooler is connected to XS4.

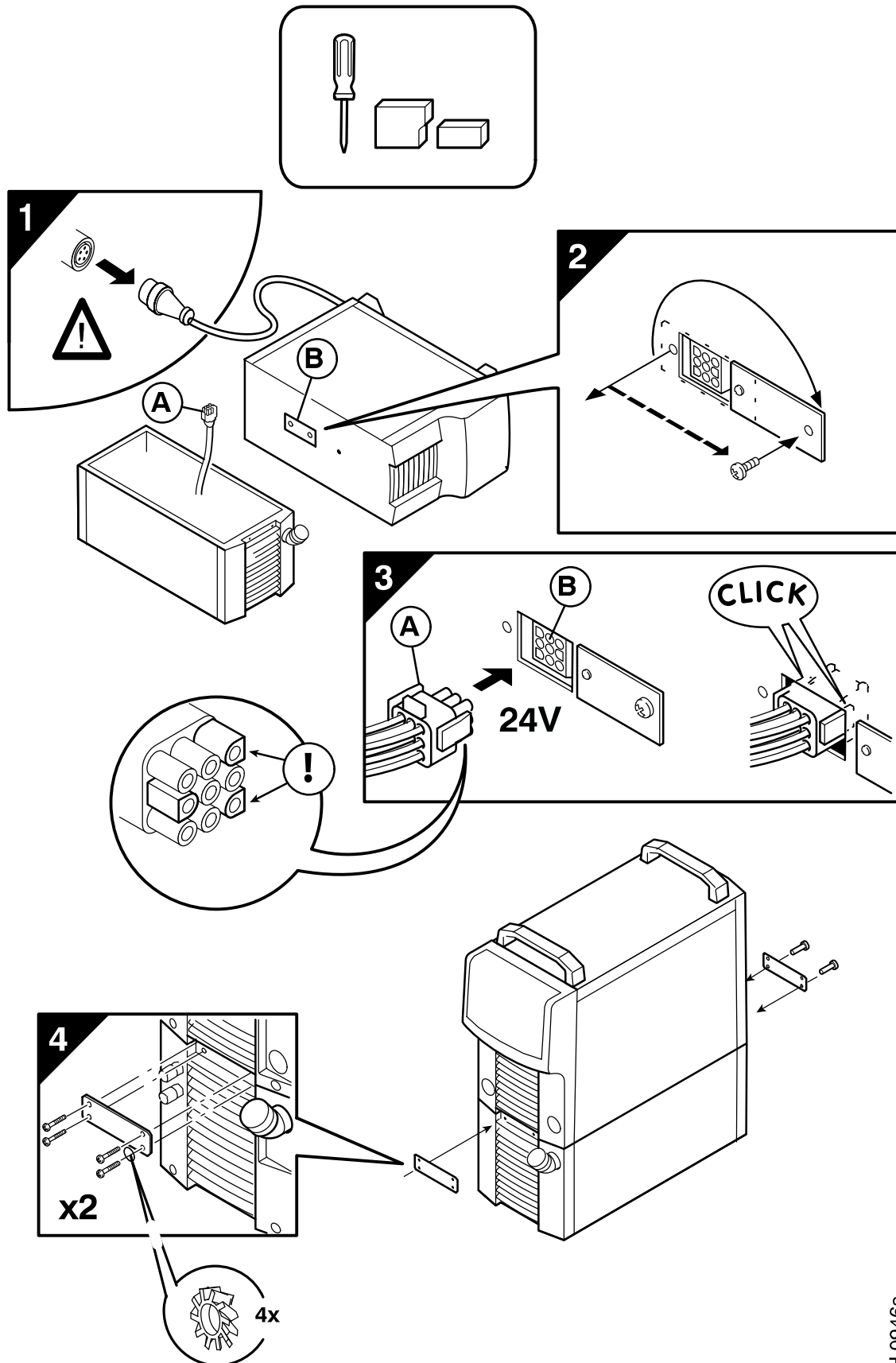
Installing to welding equipment

See assembly instructions on page 11.



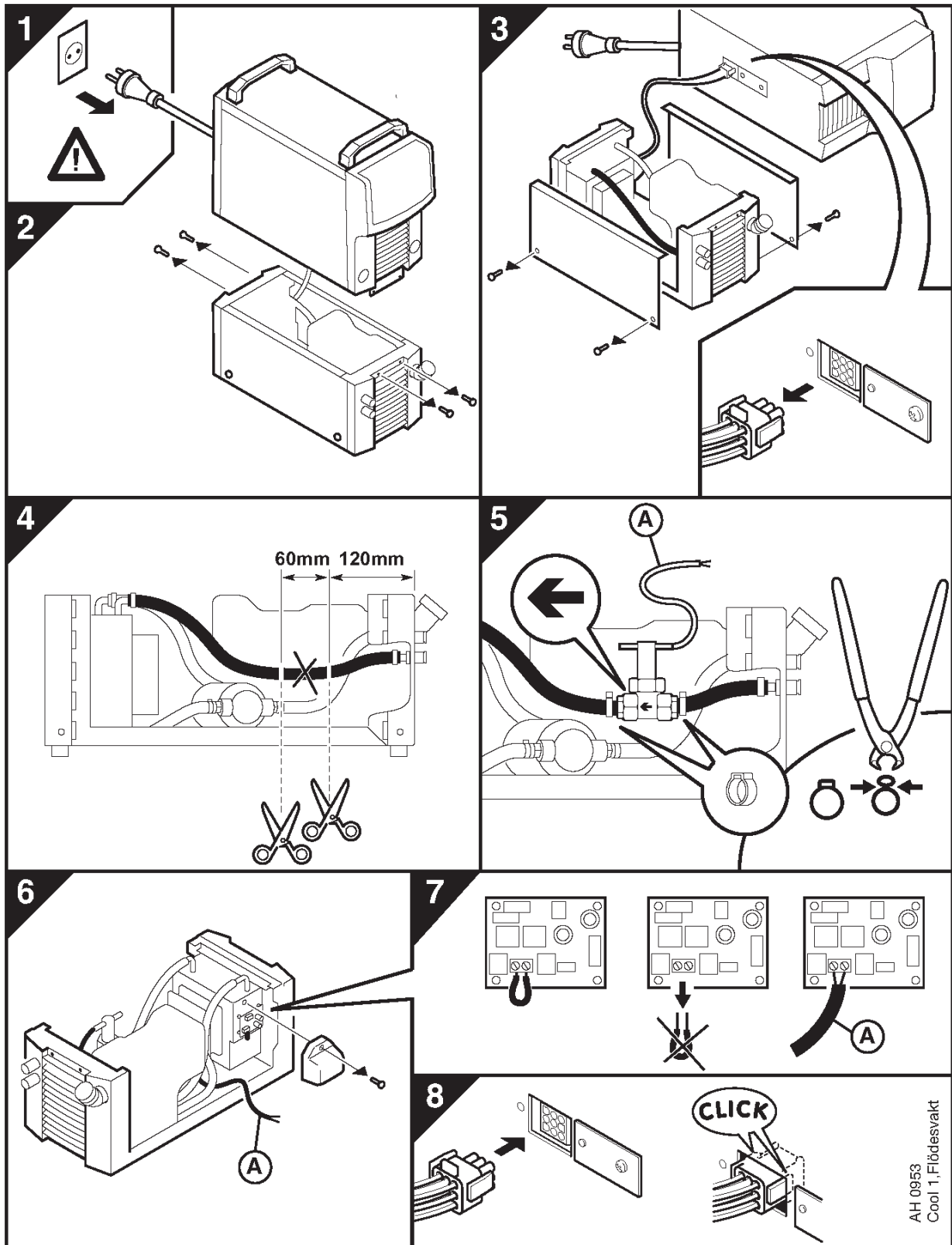
Assembly instructions

COOL1 + Aristo 300, Aristo 400 or Aristo 500



AH 0946a

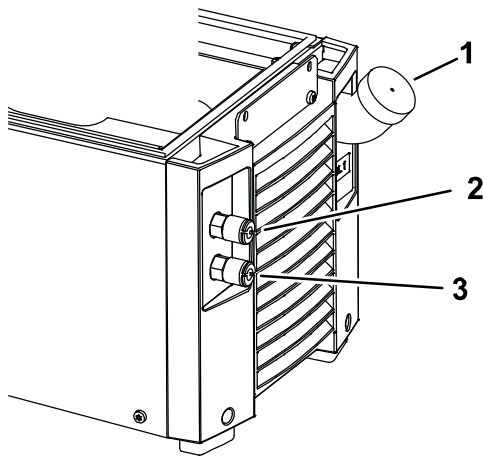
Water flow guard (Option)



OPERATION

General safety regulations for the handling of the equipment can be found in the instruction manual. Read through before you start using the equipment!

Connections and control devices



- 1 Filling the coolant
- 2 BLUE connection for coolant from cooling unit
- 3 Connection RED for coolant (return) to cooling unit.

Coolant connection

For problem free operation it is recommended that the height from the cooling unit to the water-cooled MIG/MAG gun is maximum 8.5 m.

Water flow guard

The water flow guard blocks the power source if the coolant stops flowing (< 0.7 l/min.). The water flow guard is an accessory.

MAINTENANCE

Regular maintenance is important for safe, reliable operation.

Only those persons who have appropriate electrical knowledge (authorized personnel) may remove the safety plates.



CAUTION!

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

Inspection and cleaning



WARNING!

The mains supply must be disconnected before cleaning!

Dust, grinding swarf etc The air stream through the cooling unit carries particles that become trapped in the cooling element, particularly in dirty working environments. This results in reduced cooling capacity. For this reason, blow clean using compressed air at regular intervals.

The coolant system - The recommended coolant must be used in the system otherwise clumps can be created that block the pump, water connections or elements. Flushing can only be performed via red water connection. Then drain the tank manually, i.e. empty via the tank's filling hole.

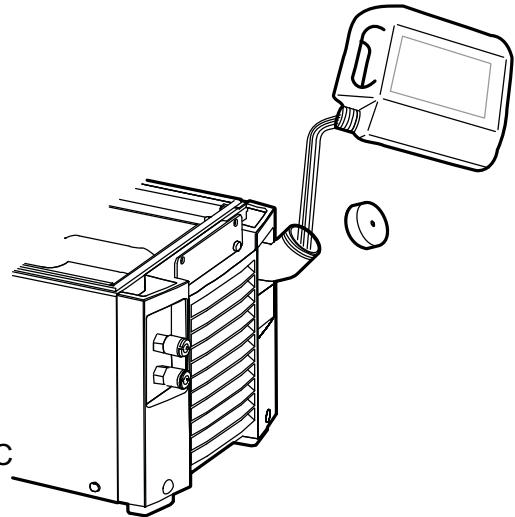
Filling the coolant

ESAB's coolant is recommended for use. See accessories in instruction manual.

- Fill with coolant.
(The fluid level must not exceed the upper marking but neither must it be below the lower marking)

Note! Coolant must be topped up if connecting a welding gun or coolant hoses that are 5 metres in length or longer. When adjusting the water level by topping up, the coolant hoses do not need to be disconnected.

The temperature of the coolant must not exceed 70° C

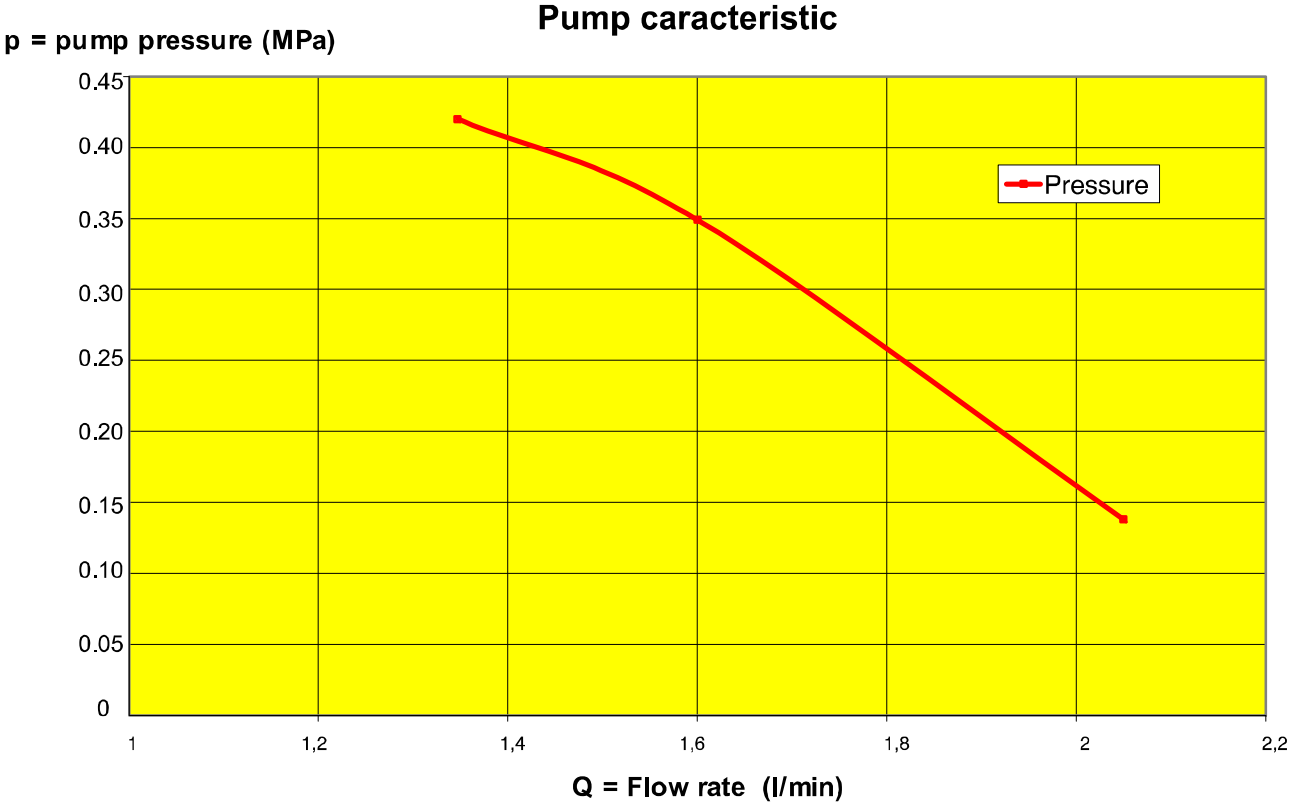


CAUTION!

The coolant must be handled as chemical waste.

Characteristics

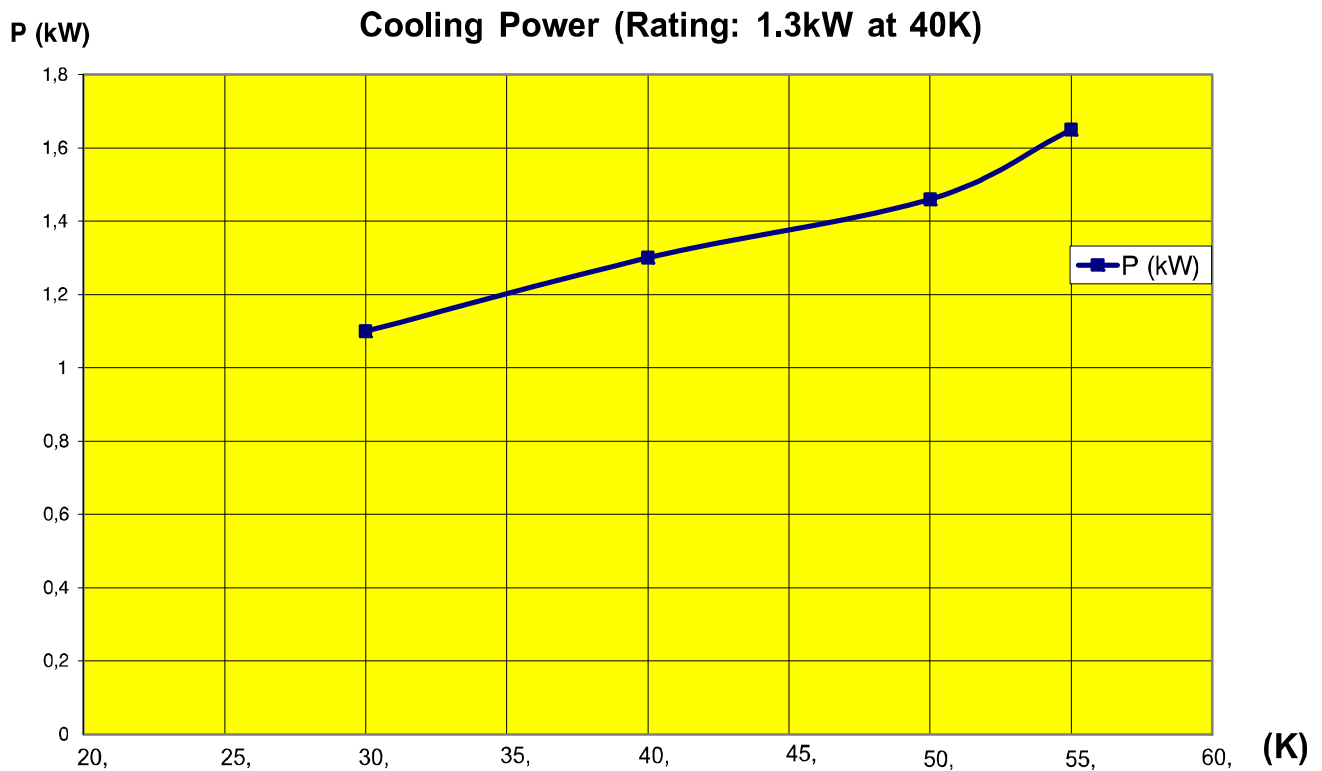
Pump data



p = Pump pressure (MPa)

Q = Flow rate (l/min)

Cooling characteristic (at 1 l/min)



K = The temperature difference between inlet water temperature and ambient temperature (K)

P = Power (kW)

K = Temperature difference between inlet water temperature and ambient temperature (K)

SPARE PARTS

The spare parts list is published in a separate document that can be downloaded from the internet: www.esab.com

Filename	Product
0459 839 048	COOL 1

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

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.
Mesero (Mi)
Tel: +39 02 97 96 81
Fax: +39 02 97 28 91 81

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

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

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.
Mississauga, 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

Representative offices

BULGARIA

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

EGYPT

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

ROMANIA

ESAB Representative Office
Bucharest
Tel/Fax: +40 1 322 36 74

RUSSIA

LLC ESAB
Moscow
Tel: +7 095 543 9281
Fax: +7 095 543 9280

LLC ESAB

St Petersburg
Tel: +7 812 336 7080
Fax: +7 812 336 7060

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 LAXA
SWEDEN
Phone +46 584 81 000



www.esab.com