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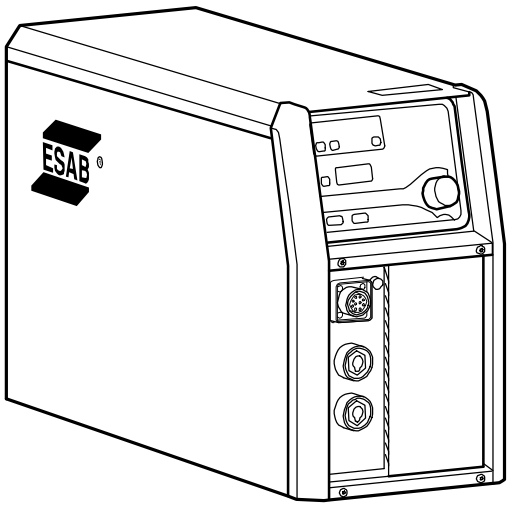
Origo™

Arc 4001i



Instruction manual

0460 741 001 GB 20121105

Valid for serial no. 833-xxx-xxxx, 852-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
Arc welding power source

Type designation
Arc 4001i, from serial number 833 xxx xxxx (2008 w.33)
Arc 4001i is member of the ESAB Origo™ product family

Brand name or trade mark
ESAB

Manufacturer or his authorized representative established within the EEA:
Name, address, phone, website:
ESAB AB
Lindholmsallén 9
Box 8004, 402 77 GÖTEBORG, Sweden
Phone: +46 31 509 000
Website: www.esab.com

The following harmonized standards, 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 authorized representative established within EEA, that the equipment in question complies with the safety requirements stated above.

Date
2012-09-27

Signature

Jerker Funnemark
Clarification

Position
Managing Director
Equipment & Automation

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.

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WARNING

Arc welding and cutting can be injurious to yourself and others. Take precautions 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.

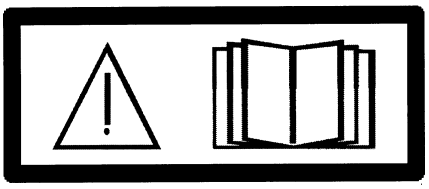
PROTECT YOURSELF AND OTHERS!

WARNING

Do not use the power source for thawing frozen pipes.

CAUTION

Read and understand the instruction manual before installing or operating.

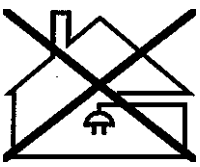


CAUTION

This product is solely intended for arc welding.

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.



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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

Arc 4001i is a welding power source intended for welding with coated electrodes (MMA welding) and TIG welding (Live TIG-start). Further, the power source with the control panel A24 can be used together with the wire feed unit MobilFeed. The wire feed unit uses the arc voltage as control voltage.

ESAB's accessories for the product can be found on page 20.

2.1 Equipment

The power source is supplied with:

- Instruction manual for the welding power source
- Instruction manual for the control panel in English.
  Instruction manuals in other languages can be downloaded from internet www.esab.com.

2.2 Control panel A22, A24

Welding process parameters are controlled via the control panel.

See the separate instruction manual for a detailed description of the control panels.

3 TECHNICAL DATA

Arc 4001i	
Mains voltage	400 V ± 10%, 3~ 50/60 Hz
Mains supply	$S_{sc\ min}$ 2.2 MVA
Primary current	
I_{max} MMA	27 A
I_{max} TIG	20 A
I_{max} MIG/MAG	26 A
No-load power demand when in the energy-saving mode, 6.5 min. after welding	60 W
Setting range	
MMA	16 A / 21 V - 400 A / 36 V
TIG	4 A / 10 V - 400 A / 26 V
MIG/MAG	20 A / 15 V - 400 A / 34 V
Permissible load at MMA	
30 % duty cycle	400 A / 36 V
60 % duty cycle	320 A / 33 V
100% duty cycle	250 A / 30 V
Permissible load at TIG	
30 % duty cycle	400 A / 26 V
60 % duty cycle	320 A / 23 V
100% duty cycle	250 A / 20 V
Permissible load at MIG/MAG	
30 % duty cycle	400 A / 34 V
60 % duty cycle	320 A / 30 V
100% duty cycle	250 A / 27 V
Power factor at maximum current	
MMA	0.89
TIG	0.91
MIG/MAG	0.89
Efficiency at maximum current	
MMA	85 %
TIG	81 %
MIG/MAG	85 %
Open-circuit voltage without VRD function [1]	91 V DC
VRD function deactivated [2]	58 V DC
VRD function activated [2]	< 35 V
Operating temperature	-10 to +40° C
Transportation temperature	-20 to +55° C
Constant sound pressure at no-load	<70 db (A)
Dimensions lxwxh	652 x 249 x 423 mm
Weight	40 kg
Insulation class transformer	H
Enclosure class	IP 23
Application class	S

1) Valid for power sources without VRD specification on the rating plate.

2) Valid for power sources with VRD specification on the rating plate. The VRD function is explained in the instruction manual for the control panel.

Mains supply, $S_{sc\ min}$
Minimum short circuit power on the network in accordance with IEC 61000-3-12

Duty cycle

The duty cycle refers to the time as a percentage of a ten-minute period that you can weld or cut at a certain load without overloading. The duty cycle is valid for 40°C.

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.

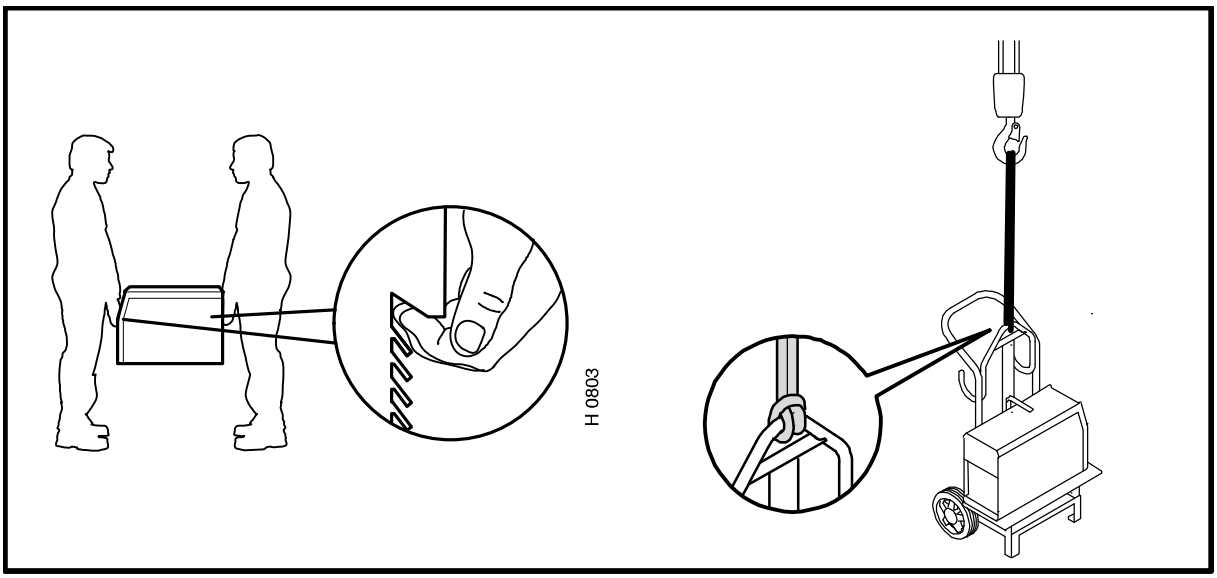
Application class

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

4 INSTALLATION

The installation must be carried out by a professional.

4.1 Lifting instructions



4.2 Location

Place the power source so that its cooling air inlets and outlets are not obstructed.

4.3 Mains supply

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 distribution network operator if necessary, that the equipment may be connected.

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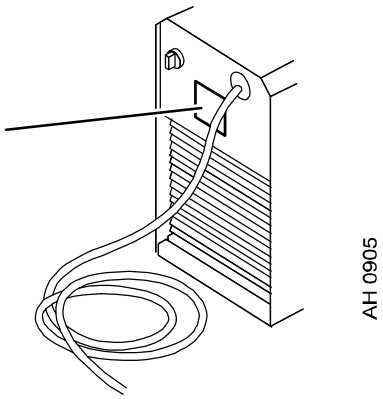
Make sure that the welding power source is connected to the correct supply voltage and that it is protected by the correct fuse rating. A protective earth connection must be made in accordance with regulations.

Rating plate with supply connection data



AH 0905

Note! *The welding power source is designed for connection to a 400 volt system with four conductors. If the power source is to be used in countries with a higher or lower supply voltage, the power source must be connected via a safety transformer.*

4.3.1 Recommended fuse sizes and minimum cable area

Arc 4001i	
Mains voltage	400V ±10% 3~
Mains cable area mm^2	4 G 4
Phase current I_{1eff}	16 A
Fuse	
anti-surge	20 A
type C MCB	20 A

NOTE!

Cable size and fuse rating complies to Swedish electrical regulations. Use the welding power source in accordance 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!

5.1 Connections and control devices

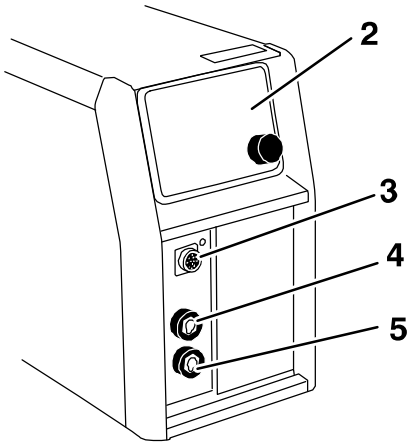
1 Mains power supply switch, 0 / 1 / Start

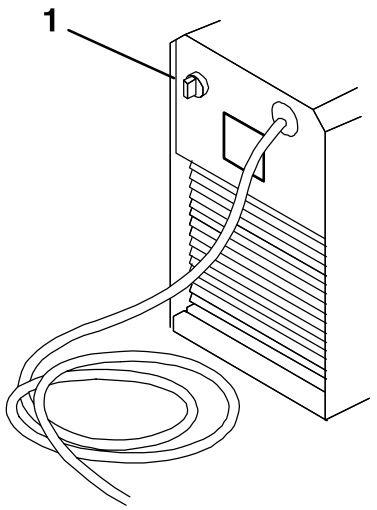
2 Control panel,
see separate instruction manual

3 Connection for remote control unit

4 Connection (-)
MMA: return cable or welding cable
TIG: torch
MIG/MAG: return cable

5 Connection (+)
MMA: welding cable or return cable
TIG: return cable
MIG/MAG: welding cable





AH 0905

5.2 Turning on the power source

Turn on the mains power by turning switch (1) to the ”START” position. Release the switch, and it will return to the ”1” position.

If the mains power supply should be interrupted while welding is in progress, and then be restored, the power unit will remain de-energised until the switch is again turned manually to the ”START” position.

Turn the unit off by turning the switch to the ”0” position.

Whether the mains power supply is interrupted or the power unit is switched off in the normal manner, welding data will be stored so that it is available next time the unit is started.

5.3 Connection of welding and return cable

The power source has two outputs, a positive terminal (+) and a negative terminal (-), for connecting welding and return cables. The output to which the welding cable is connected depends on the welding method or type of electrode used.

Connect the return cable to the other output on the power source. Secure the return cable's contact clamp to the work piece and ensure that there is good contact between the work piece and the output for the return cable on the power source.

For MMA welding, the welding cable can be connected to the positive terminal (+) or negative terminal (-) depending on the type of electrode used. The connecting polarity is stated on the electrode packaging.

5.4 Fan control

The power source has a time control that means that the fans continue to run for 6.5 minutes after welding has stopped, and the unit switches to energy-saving mode. The fans start again when welding restarts.

The fans run at reduced speed for welding currents up to 144 A, and at full speed for higher currents.

5.5 Overheating protection

The welding power source has overheating protection that operates if the temperature becomes too high. When this occurs the welding current is interrupted and a fault code is displayed on the control panel.

The overheating protection resets automatically when the temperature has fallen.

5.6 MMA welding

For MMA welding, the welding power source is supplemented with:

- welding cable with electrode clamp
- return cable with contact clamp

5.7 TIG welding

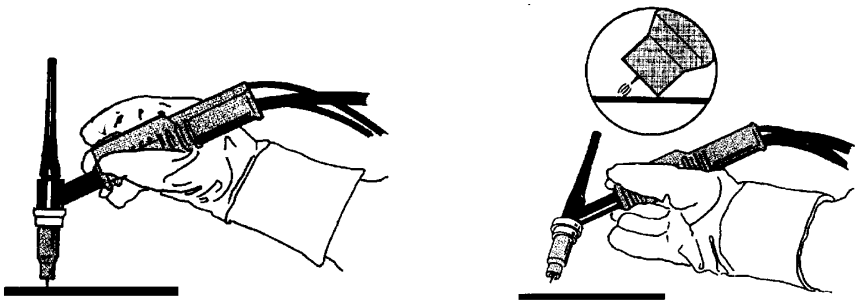
For TIG welding, the welding power source is supplemented with:

- a TIG torch with gas valve
- an argon gas tube
- an argon gas regulator
- tungsten electrode
- return cable with contact clamp

TIG welding melts the metal of the workpiece, using an arc struck from a tungsten electrode, which does not itself melt. The weld pool and the electrode are protected by shielding gas.

”Live TIG-start”

With “Live TIG start” the tungsten electrode is placed against the workpiece, when the electrode is then lifted away from the workpiece again the arc is struck at a limited current level. (12-15 A).



5.8 MIG/MAG and FCAW-S welding

For MIG/MAG welding and FCAW-S the welding power source is supplemented with:

- wire feed unit (MobileFeed)
- welding torch
- connection cable
- return cable with contact clamp

MIG/MAG welding melts a continously supplied filler wire, with the weld pool beeing protected by shielding gas.

During FCAW-S welding, an arc melts a continuously supplied wire. The weld pool is protected by the powder filled cored wire.

6 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 attempts any work to rectify any faults in the product during the guarantee period.

6.1 Power source

Check regularly that the welding power source is not clogged with dirt.

How often and which cleaning methods apply depend on:

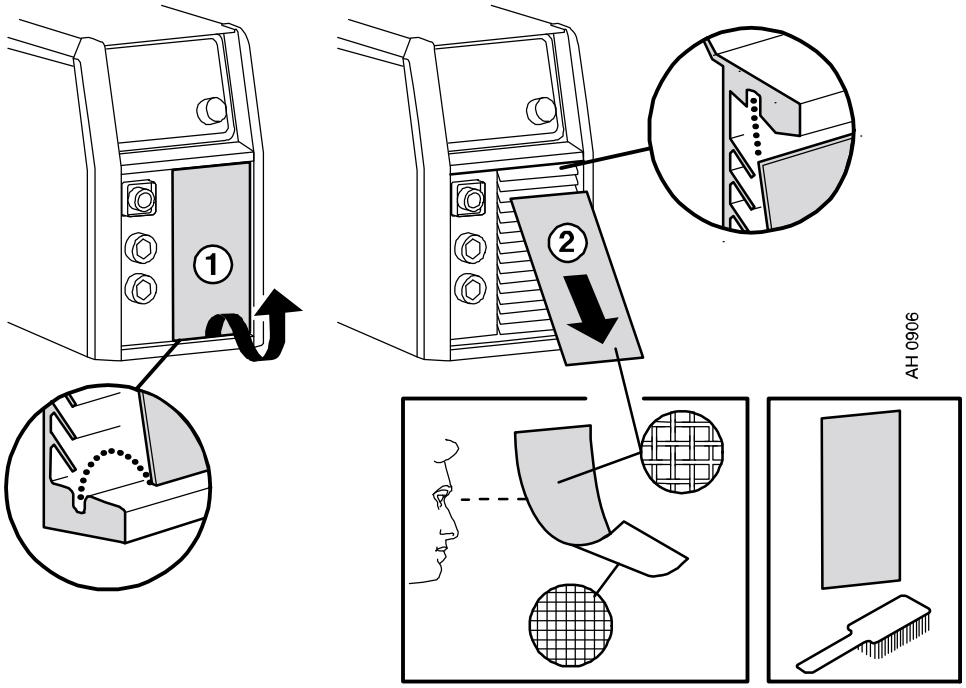
- welding process
- arc time
- placement
- surrounding environment

It is normally sufficient to blow down the power source with dry compressed air (reduced pressure) once a year.

Clogged or blocked air inlets and outlets otherwise result in overheating.

Replacing and cleaning the dust filter

- Release the dust filter according to the figure.
- Blow the filter clean with compressed air (reduced pressure).
- Ensure that the filter with the finest mesh is placed towards the grille.
- Reinstall the filter.



6.2 Welding torch

Wear parts should be cleaned and replaced at regular intervals in order to achieve trouble-free welding.

7 FAULT-TRACING

Try these recommended checks and inspections before sending for an authorized service technician.

Type of fault	Corrective action
No arc.	• Check that the mains power supply switch is turned on. • Check that the welding and return cables are correctly connected. • Check that the correct current value is set. • Check the mains power supply fuses.
The welding current is interrupted during welding.	• Check whether the thermal cut-outs have tripped (a fault code is displayed on the control panel). • Check the mains power supply fuses.
The thermal cut-out trips frequently.	• Check to see whether the dust filter is clogged. • Make sure that you are not exceeding the rated data for the welding power source (i.e. that the unit is not being overloaded). • Check that the welding power source is not clogged with dirt.
Poor welding performance.	• Check that the welding current supply and return cables are correctly connected. • Check that the correct current value is set. • Check that the correct electrodes are being used.

8 ORDERING SPARE PARTS

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

Arc 4001i is designed and tested in accordance with the international and European standards EN 60974-1 and 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 may be ordered through your nearest ESAB dealer, see the last page of this publication.

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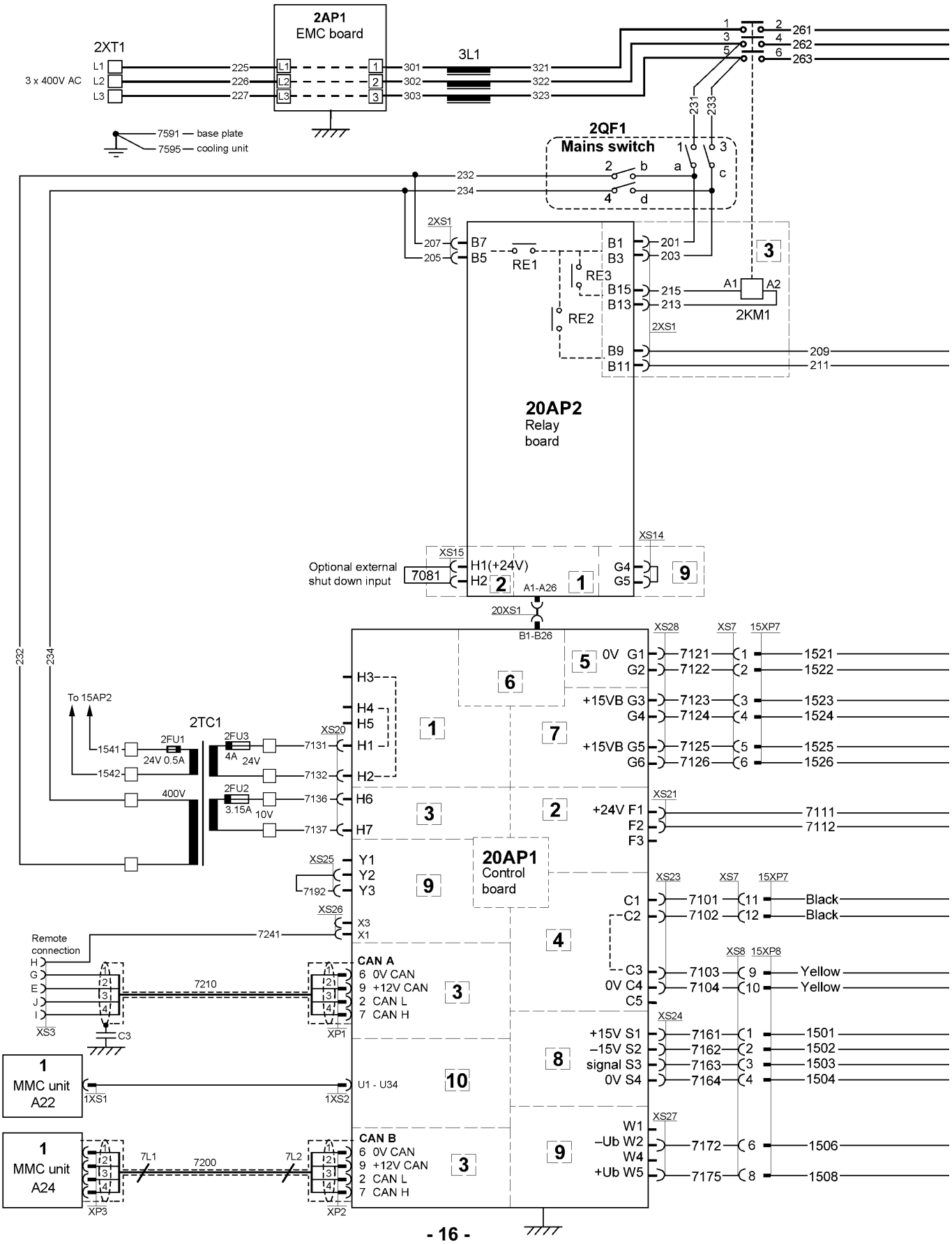
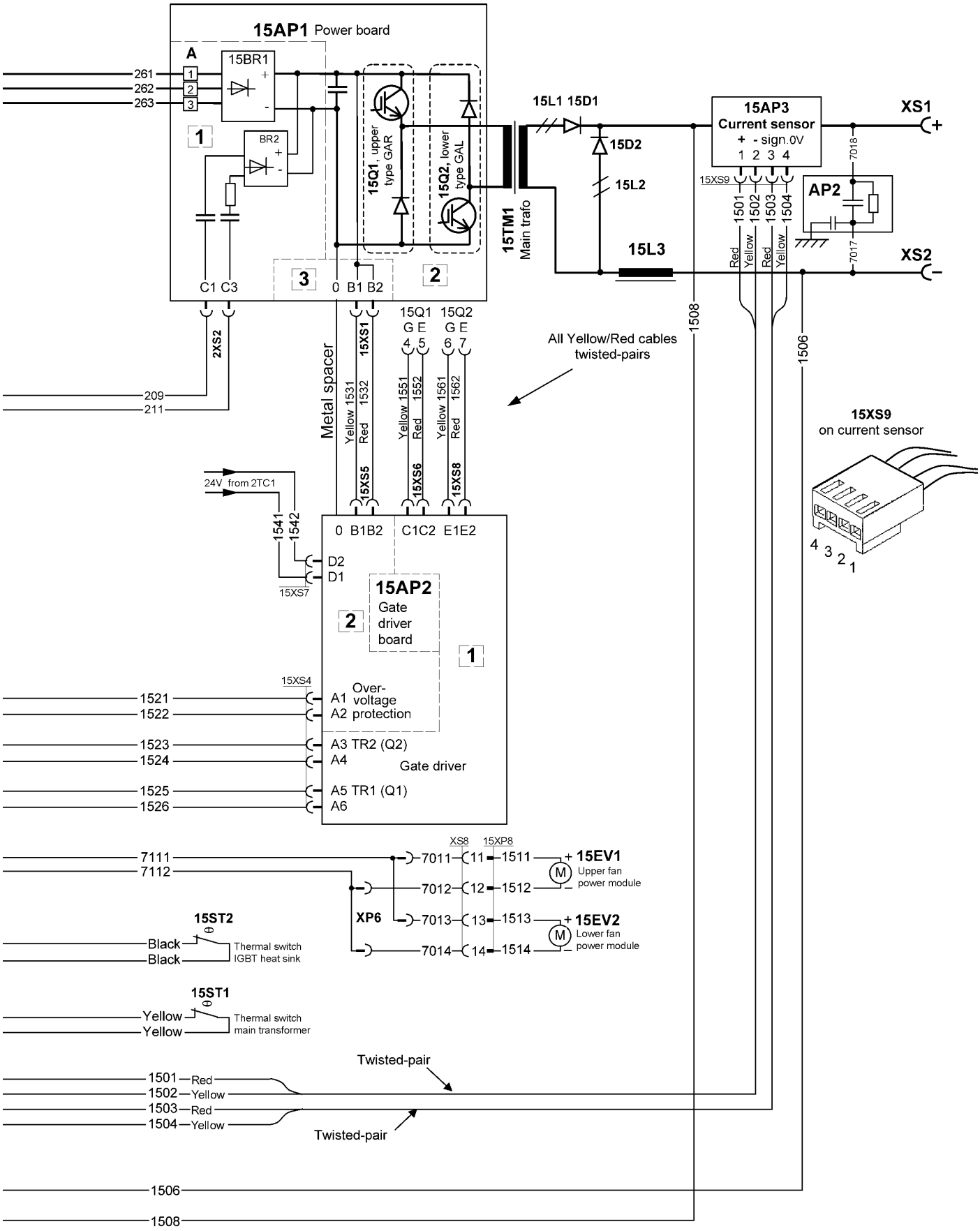
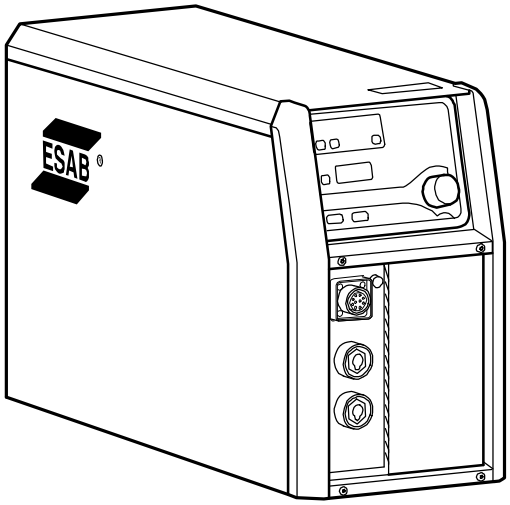
Diagram




15AP1 Power board
A
15BR1
BR2
261
262
263
1
2
3
15Q1, upper type GAR
15Q2, lower type GAL
15TM1 Main trafo
15L1 15D1
15D2
15L2
15L3
15AP3 Current sensor
+ - sign.0V
1 2 3 4
XS1
XS2
15XS9
1501
1502
1503
1504
Red
Yellow
Red
Yellow
AP2
7018
7017
1508
1506
C1 C3
0 B1 B2
15Q1 15Q2
G E G E
4 5 6 7
2XS2
15XS1
209
211
Metal spacer
Yellow 1531
Red 1532
Yellow 1551
Red 1552
Yellow 1561
Red 1562
15XS5
15XS6
15XS8
All Yellow/Red cables twisted-pairs
15XS9
on current sensor
4 3 2 1
24V from 2TC1
1541
1542
15XS7
0 B1B2 C1C2 E1E2
D2
D1
15AP2
Gate driver board
15XS4
A1 Over-voltage
A2 protection
A3 TR2 (Q2)
A4
Gate driver
A5 TR1 (Q1)
A6
1521
1522
1523
1524
1525
1526
XS8
15XP8
7111
7112
7011
7012
7013
7014
11
12
13
14
1511
1512
1513
1514
15EV1
Upper fan power module
15EV2
Lower fan power module
XP6
15ST2
Black
Black
Thermal switch IGBT heat sink
15ST1
Yellow
Yellow
Thermal switch main transformer
Twisted-pair
1501 Red
1502 Yellow
1503 Red
1504 Yellow
Twisted-pair
1506
1508

Order number

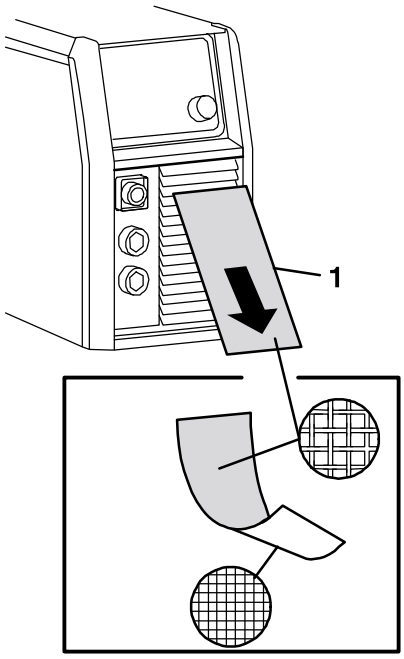


Ordering no.	Denomination	Type
0460 455 880	Welding power source	Origo™ Arc 4001i, A22
0460 455 881	Welding power source	Origo™ Arc 4001i, A24
0459 839 029	Spare parts list	Arc 4001i
0460 737	Instruction manual	Control panel Origo™ A22, A24

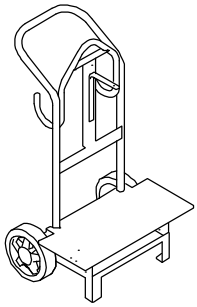
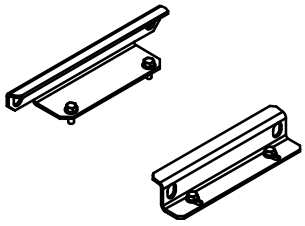
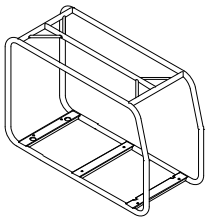
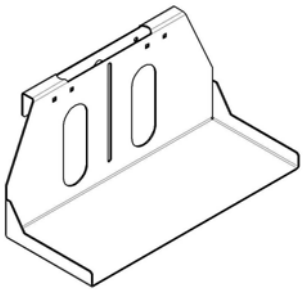
Instruction manuals and the spare parts list are available on the Internet at **www.esab.com**

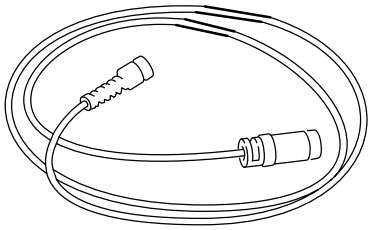
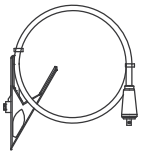
Spare parts list

Item	Qty	Ordering no.	Denomination
1	1	0458 398 002	Dust filter



Accessories

	**Trolley 2 wheel**	0460 564 880
	**Mounting brackets**	0460 911 880
	**Protection frame**	0460 459 880
	**Shelf for feed unit for two wheel trolley**	0460 815 880
	**Remote control unit MTA1 CAN** ..... For setting of wire feed speed, current and arc force.	0459 491 880
	**Remote control unit AT1 CAN** ..... For setting of current.	0459 491 883

	**Remote control unit AT1 CF CAN** . . . . . 0459 491 884 For rough and fine setting of current.
	**Remote control cable 10 pole - 4 pole** 5 m . . . . . 0459 960 880 10 m . . . . . 0459 960 881 25 m 0459 960 882
	**Return cable** 5 m 70 mm^2 . . . . . 0700 006 895

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