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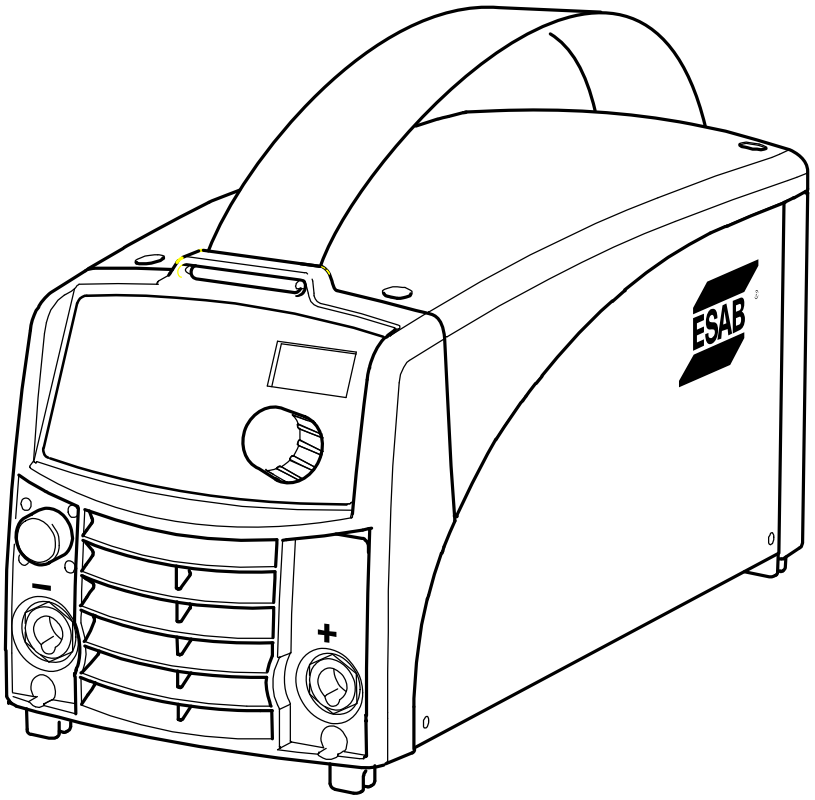
Caddy®

Arc 251i



Instruction manual

0460 324 101 GB 20130322

Valid for serial no. 810-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 of designation etc.
Arc 251i from serial number 810 xxx xxxx (2008 w.10)
Arc 251i is a member of the ESAB product family Caddy®

Brand name or trade mark
ESAB

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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 EEA, that the equipment in question complies with the safety requirements stated above.

Date	**Signature**	**Position**
2012-07-31	Flavio Santos Clarification	Global Director of Marketing and Product Portfolio Equipment

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 25li is a welding current power source intended for use with coated electrodes (MMA welding) and TIG welding.

ESAB's accessories for the product can be found on page 15.

2.1 Equipment

The power source is supplied with:

- Instruction manual for the welding power source
- Instruction manual for the control panel
- 3 m return cable
- 3 m welding cable

Instruction manuals in other languages can be downloaded from the website, www.esab.com.

2.2 Control panel A32, A34

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 251i	
Mains voltage	400 V ±15%, 3 50/60 Hz
Mains supply	$S_{sc\ min}$ 3.3 MVA
Primary current	
I_{max} MMA	14 A
I_{max} TIG	10 A
No-load power demand when in the energy-saving mode, 6.5 min. after welding	30 W
Setting range	
MMA	4 - 250 A
TIG	3 - 250 A
Permissible load at MMA	
30 % duty cycle	250 A / 30 V
60 % duty cycle	190 A / 27.6 V
100% duty cycle	150 A / 26 V
Permissible load at TIG	
30 % duty cycle	250 A / 20 V
60 % duty cycle	190 A / 17.6 V
100% duty cycle	150 A / 16 V
Power factor at maximum current	
MMA	0.94
TIG	0.93
Efficiency at maximum current	
MMA	83 %
TIG	79 %
Open-circuit voltage	
without VRD	65 V
with VRD	< 35 V
Operating temperature	-10 to +40° C
Transportation temperature	-20 to +55° C
Continual sound pressure at no-load	<70 db (A)
Dimensions lxwxh	418 x 188 x 208 mm
Weight	10.5 kg
Insulation class transformer	H
Enclosure class	IP 23
Application class	S

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 Location

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

4.2 Mains supply

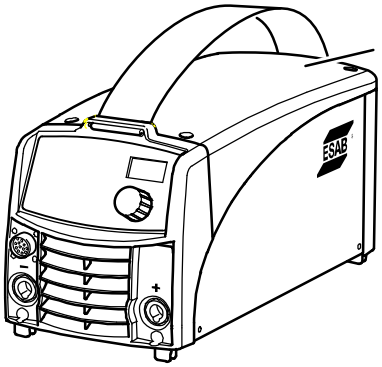
Note

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.

4.3 Mains power supply

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

4.3.1 Recommended fuse sizes and minimum cable area

Arc 251i	
Mains voltage	400V
Mains cable area mm^2	4 G 1.5
Phase current I_{1eff}	8 A
Fuse	
anti-surge	10 A
type C MCB	10 A

NOTE!
The cable area and fuse rating above comply with Swedish 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 5 . Read through before you start using the equipment!

5.1 Connections and control devices

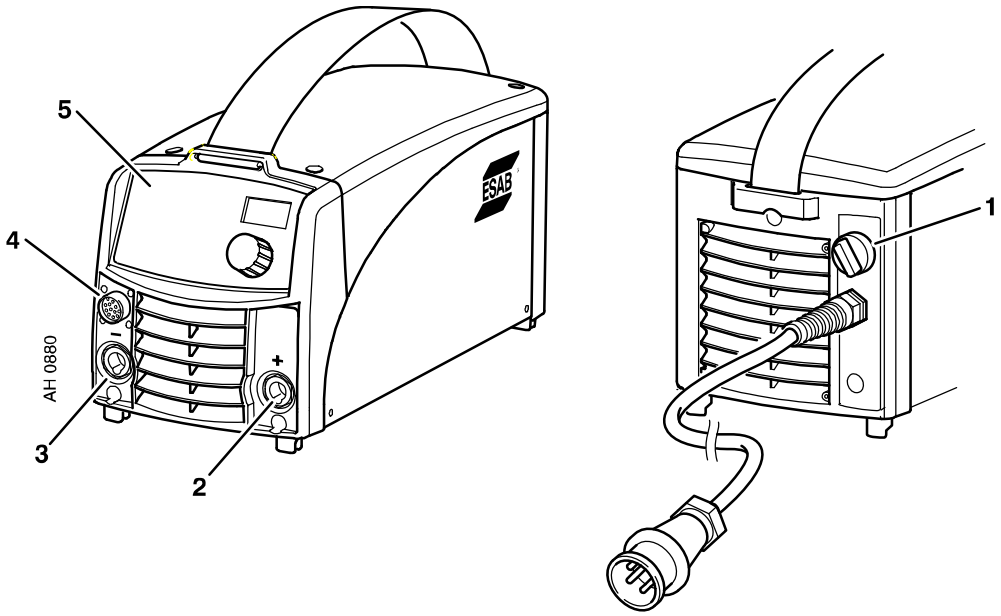
1 Mains voltage switch

2 Connection (+)
TIG: return cable
MMA: welding cable or return cable

3 Connection (-)
TIG: torch
MMA: return cable or welding cable

4 Connection for remote control unit

5 Control panel,
see separate instruction manual



5.2 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 type of electrode used. The connecting polarity is stated on the electrode packaging.

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.

5.3 TIG welding

At TIG-welding complete the power source with:

- a TIG torch with gas valve
- an argon gas tube
- an argon gas regulator
- tungsten electrode

5.4 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.

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:

- the welding process
- arc times
- placement
- the surrounding environment.

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

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

6.2 Welding torch

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

7 FAULT-TRACING

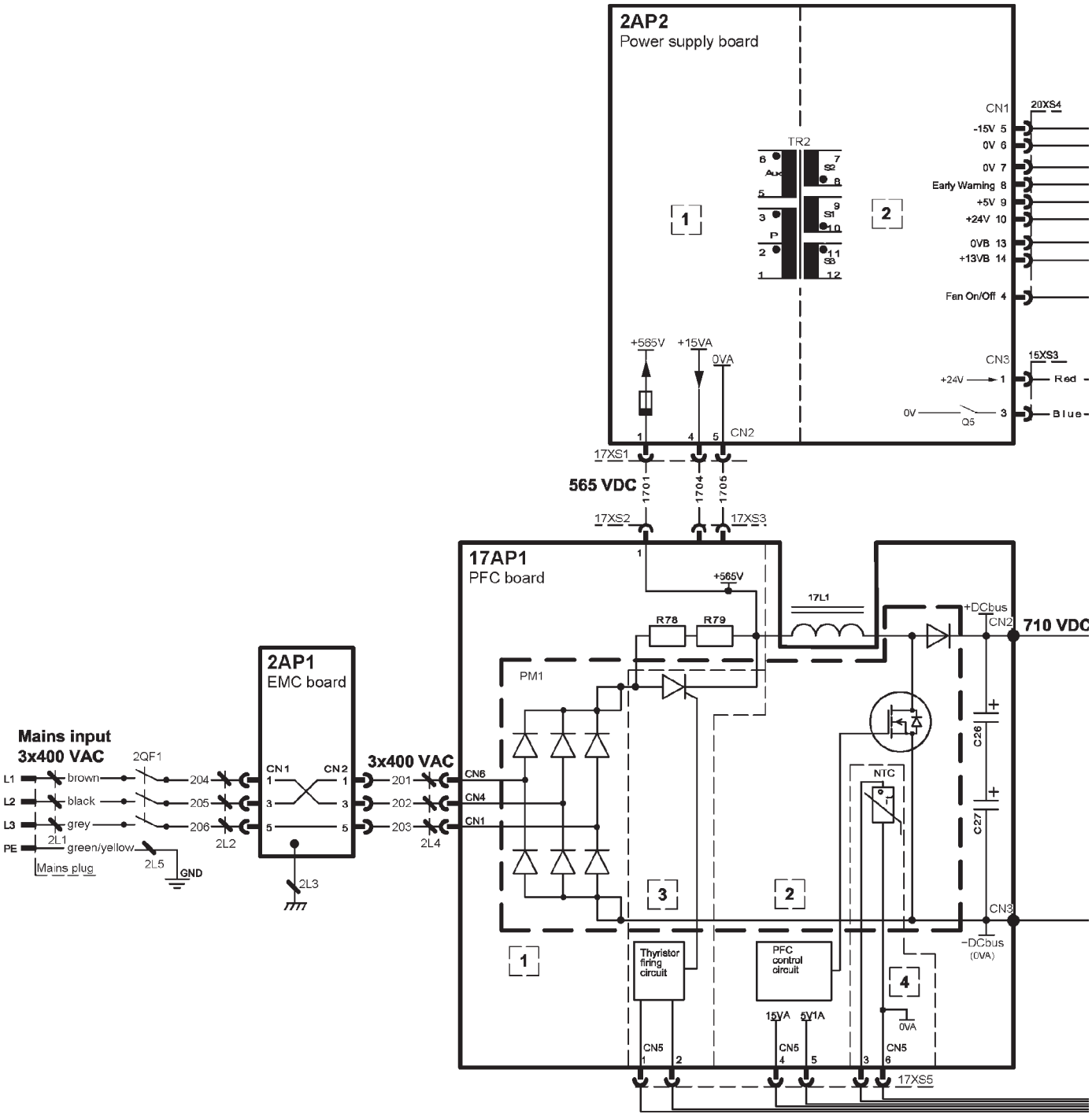
Try these recommended checks and inspections before sending for an authorized service technician.

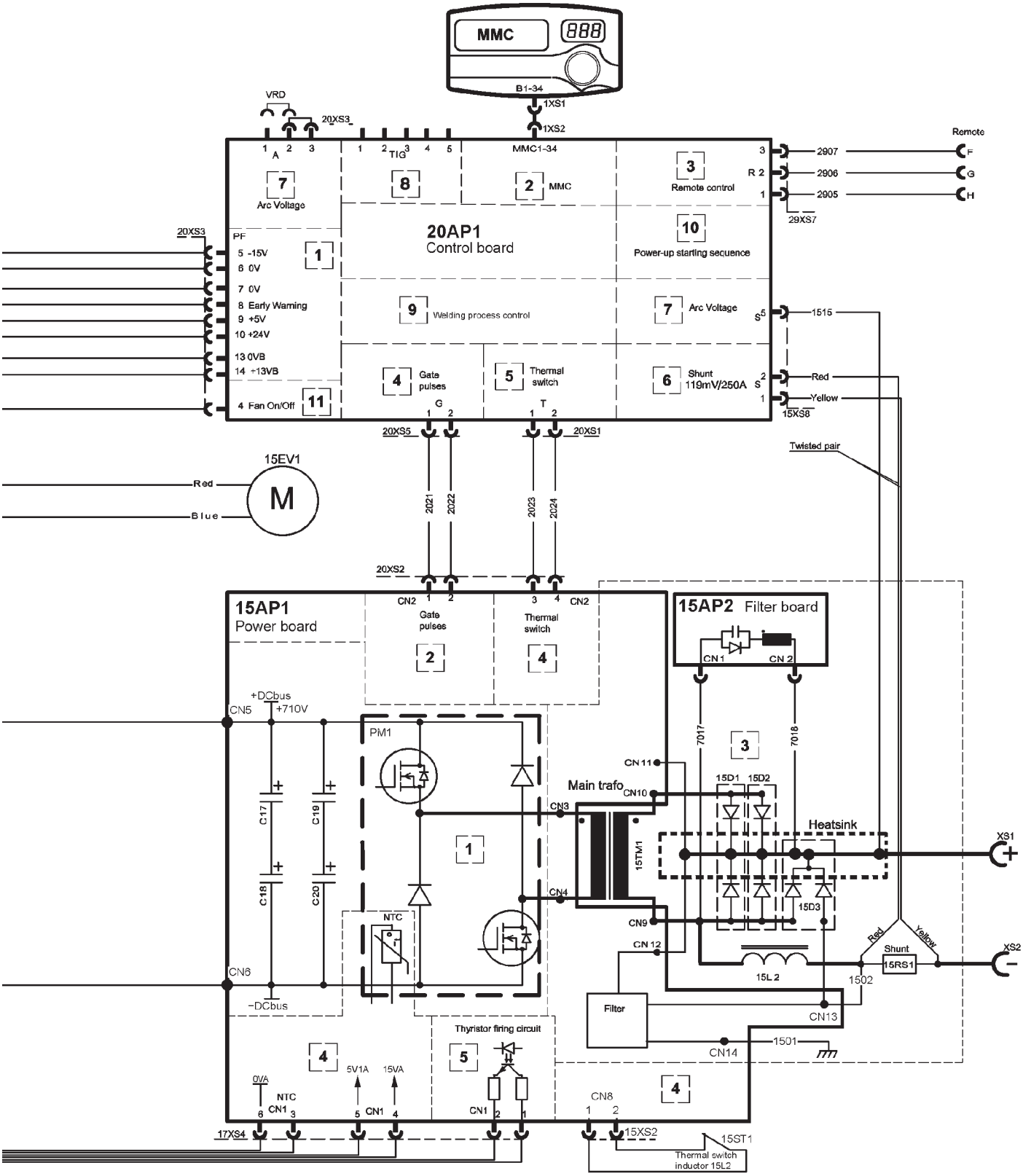
Type of fault	Corrective action
No arc.	• Check that the mains power supply switch is turned on. • Check that the welding current supply and return cables are correctly connected. • Check that the correct current value is set. • Check the mains power supply fuses.
The welding current is interrupted during 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.	• 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

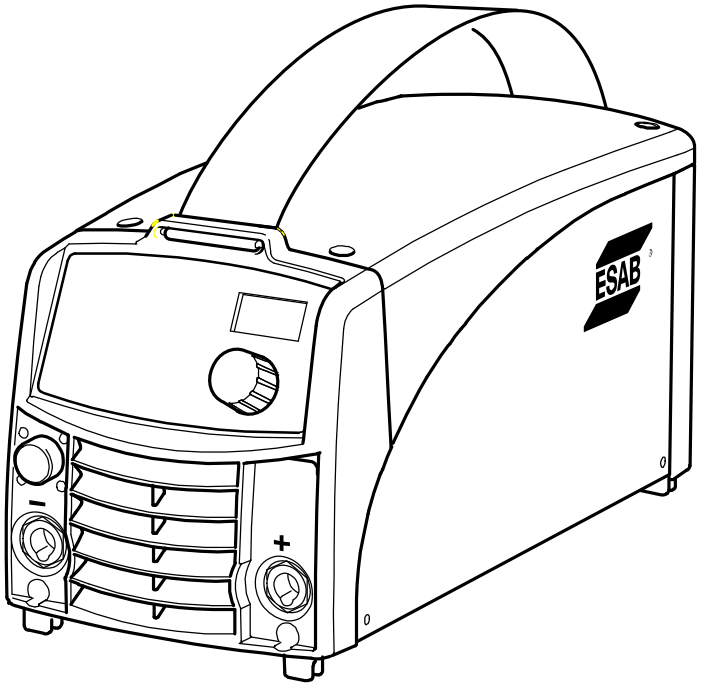
Arc 251i is designed and tested in accordance with the international and European standards EN 60974-1 and EN 60974-10. It is the obligation of the service unit which has carried out the service or repair work to make sure that the product still conforms to the said standard.

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


2AP2
Power supply board
CN1
20XS4
-15V 5
0V 6
0V 7
Early Warning 8
+5V 9
+24V 10
0VB 13
+13VB 14
Fan On/Off 4
TR2
CN3
15XS3
+24V
Red
0V
Blue
Q5
+565V
+15VA
0VA
CN2
17XS1
565 VDC
1701
1704
1705
17XS2
17XS3
17AP1
PFC board
+565V
17L1
+DCbus
CN2
710 VDC
R78
R79
PM1
NTC
C26
C27
CN3
-DCbus
(0VA)
Thyristor firing circuit
PFC control circuit
15VA
5V1A
0VA
CN5
17XS5
2AP1
EMC board
Mains input
3x400 VAC
2QF1
L1
L2
L3
PE
brown
black
grey
green/yellow
Mains plug
2L1
2L2
2L3
2L4
2L5
GND
CN1
CN2
3x400 VAC
CN6
CN4
CN1
204
205
206
201
202
203


MMC
B1-34
1XS1
1XS2
VRD
20XS3
MMC1-34
Remote
2907
2906
2905
29XS7
20AP1
Control board
Arc Voltage
MMC
Remote control
Power-up starting sequence
Welding process control
Arc Voltage
Gate pulses
Thermal switch
Shunt 119mV/250A
1515
Red
Yellow
15XS8
20XS5
20XS1
Twisted pair
15EV1
Red
Blue
2021
2022
2023
2024
20XS2
15AP1
Power board
15AP2 Filter board
CN1
CN2
+DCbus
+710V
CN5
PM1
C17
C18
C19
C20
CN11
Main trafo
CN10
CN3
CN4
15TM1
15D1
15D2
15D3
Heatsink
XS1
CN9
CN12
15L2
Shunt
15RS1
XS2
1502
CN8
-DCbus
NTC
Filter
CN13
CN14
1501
Thyristor firing circuit
0VA
5V1A
15VA
17XS4
15XS2
15ST1
Thermal switch inductor 15L2

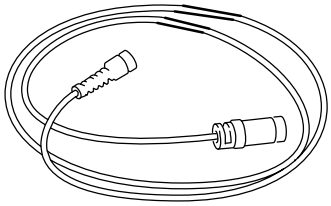
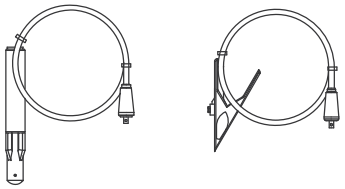
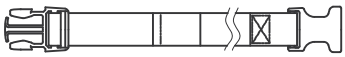
Order number

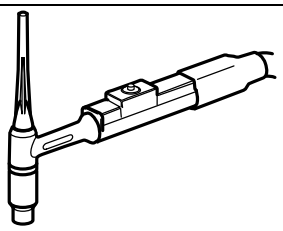
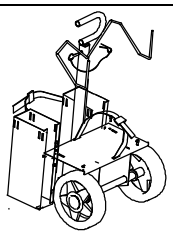
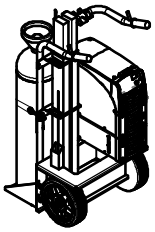


Ordering no.	Denomination	Type
0460 300 880	Welding power source	Caddy® Arc 251i, A32
0460 300 881	Welding power source	Caddy® Arc 251i, A34
0459 839 021	Spare parts list	Arc 251i
0460 449 1	Instruction manual	Control panel Caddy® A32, A34

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

Accessories

	Remote control unit AT1 ..... MMA and TIG: setting of current	0459 491 896
	Remote control unit AT1 CF ..... MMA and TIG: rough and fine setting of current	0459 491 897
	Foot pedal FS002 with 5 m cable	0349 090 886
	Remote cable 12 pole - 8 pole 5 m ..... 10 m ..... 15 m ..... 25 m	 0459 552 880 0459 552 881 0459 552 882 0459 552 883
	Welding cable kit ..... Return cable kit	0700 006 902 0700 006 903
	Cable holder	0460 265 002
	Shoulder strap	0460 265 003

	Tig torch TXH 151V 4 m	0700 300 539
	Tig torch TXH 151V 8 m	0700 300 545
	Tig torch TXH 201V 4 m	0700 300 553
	Tig torch TXH 201V 8 m	0700 300 556
	Trolley for 5-10 litre gascylinder	0459 366 885
	Trolley for 20-50 litre gascylinder	0459 366 886
	Trolley for 20-50 litre gascylinder	0460 330 880

NOTES

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