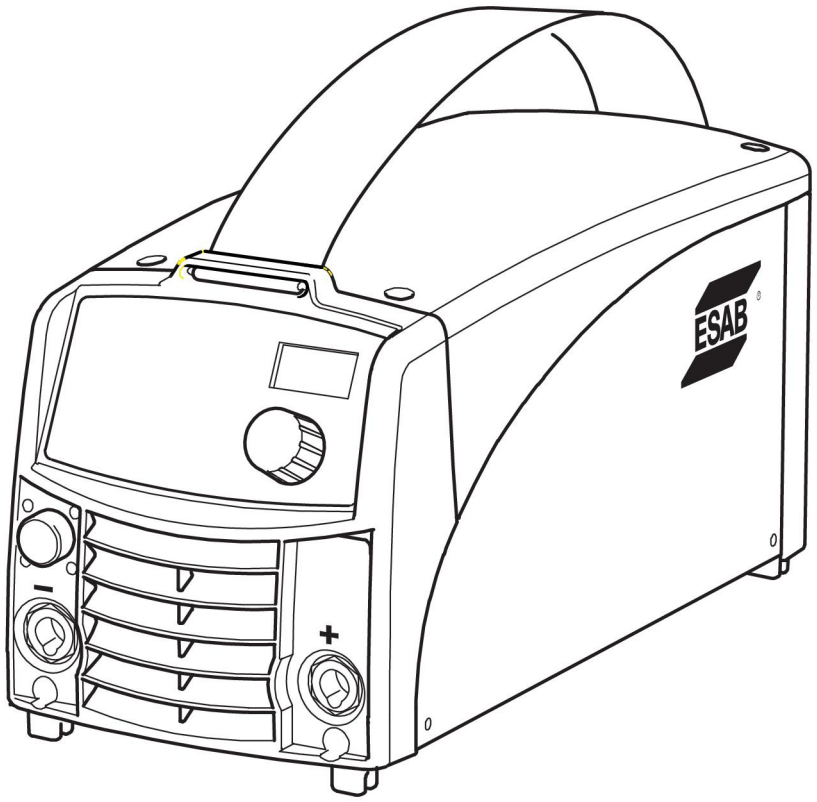
Caddy®

Arc 251i



Instruction manual

0460 324 101 GB 20210831

Valid for: from serial no. 112-xxx-xxxx

EU DECLARATION OF CONFORMITY

According to:
The Low Voltage Directive 2014/35/EU;
The EMC Directive 2014/30/EU;
The RoHS Directive 2011/65/EU;
The Ecodesign Directive 2009/125/EC

Type of equipment
Arc welding power source

Type designation
Caddy Arc 251i with serial number from 112 xxx xxxx (2021 w12)

Brand name or trademark
ESAB

Manufacturer or his authorised representative established within the EEA
ESAB AB
Lindholmsallén 9, Box 8004, SE-402 77 Göteborg, Sweden
Phone: +46 31 50 90 00, www.esab.com

The following EN standards and regulations in force within the EEA has been used in the design:

EN IEC 60974-1:2018/A1:2019	Arc welding equipment - Part 1: Welding power sources
EN 60974-10:2014/A1:2015	Arc welding equipment - Part 10: Electromagnetic compatibility (EMC)
EU no. 2019/1784	Ecodesign requirements for welding equipment pursuant to Directive 2009/125/EC

Additional Information:
Restrictive use, Class A equipment, intended for use in locations other than residential.
IEC EN draft standard 26/708/CDV have been used to establish EU no. 2019/1784 data.

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 and environmental requirements stated above.

Place/Date
Göteborg
2021-04-08

Signature
Pedro Muniz
Standard Equipment Director

CE

1 SAFETY

1.1 Meaning of symbols

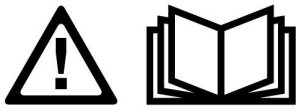
As used throughout this manual: Means Attention! Be Alert!

DANGER!
Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.

WARNING!
Means potential hazards which could result in personal injury or loss of life.

CAUTION!
Means hazards which could result in minor personal injury.

WARNING!
Before use, read and understand the instruction manual and follow all labels, employer´s safety practices and Safety Data Sheets (SDSs).



1.2 Safety precautions

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 or other applicable operation of the equipment
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 or work is started with the equipment
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 extinguishing equipment must be clearly marked and close at hand
   - Lubrication and maintenance must **not** be carried out on the equipment during operation

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

ELECTRIC SHOCK - Can kill

- Install and ground the unit in accordance with instruction manual.
- Do not touch live electrical parts or electrodes with bare skin, wet gloves or wet clothing.
- Insulate yourself from work and ground.
- Ensure your working position is safe

ELECTRIC AND MAGNETIC FIELDS - Can be dangerous to health

- Welders having pacemakers should consult their physician before welding. EMF may interfere with some pacemakers.
- Exposure to EMF may have other health effects which are unknown.
- Welders should use the following procedures to minimize exposure to EMF:
  - Route the electrode and work cables together on the same side of your body. Secure them with tape when possible. Do not place your body between the torch and work cables. Never coil the torch or work cable around your body. Keep welding power source and cables as far away from your body as possible.
  - Connect the work cable to the workpiece as close as possible to the area being welded.

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.

NOISE - Excessive noise can damage hearing

Protect your ears. Use earmuffs or other hearing protection.

MOVING PARTS - Can cause injuries

- Keep all doors, panels and covers closed and securely in place. Have only qualified people remove covers for maintenance and troubleshooting as necessary. Reinstall panels or covers and close doors when service is finished and before starting engine.
- Stop engine before installing or connecting unit.
- Keep hands, hair, loose clothing and tools away from moving parts.

FIRE HAZARD

- Sparks (spatter) can cause fire. Make sure that there are no inflammable materials nearby.
- Do not use on closed containers.

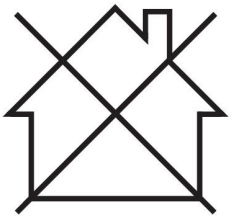
MALFUNCTION - Call for expert assistance in the event of malfunction.

PROTECT YOURSELF AND OTHERS!

CAUTION!
This product is solely intended for arc welding.

WARNING!
Do not use the power source for thawing frozen pipes.

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.



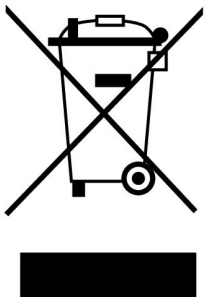
NOTE!

Dispose of electronic equipment at the recycling facility!

In observance of European Directive 2012/19/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 has an assortment of welding accessories and personal protection equipment for purchase. For ordering information contact your local ESAB dealer or visit us on our website.

2 INTRODUCTION

Arc 251i is a welding current power source intended for use with coated electrodes (MMA welding) and TIG welding.

ESAB accessories for the product can be found in the "ACCESSORIES" chapter of this manual.

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 Internet: 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 (+14 to +104 °F)
Transportation temperature	-20 to +55 °C (-4 to +131 °F)
Continual sound pressure at no-load	<70 db (A)
Dimensions lxwxh	418 × 188 × 208 mm (16.5 × 7.4 × 8.2 in.)
Weight	10.5 kg (23.1 lb)
Insulation class transformer	H
Enclosure class	IP23
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 / 104 °F, or below.

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 intended 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

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

4.2 Mains supply

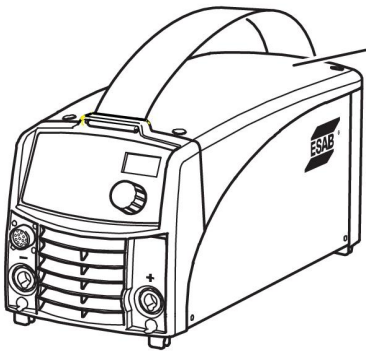
NOTE!

Mains supply requirements

This equipment complies with IEC 61000-3-12 provided that the short-circuit power is greater than or equal to S_{scmin} at the interface point between the user's supply and the public system. 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 is connected only to a supply with a short-circuit power greater than or equal to S_{scmin}. Refer to the technical data in the TECHNICAL DATA chapter.

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	400 V
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 mains cable areas and fuse sizes as shown above are in accordance with Swedish regulations. For other regions, supply cables must be suitable for the application and meet local and national regulations.

5 OPERATION

General safety regulations for handling the equipment can be found in the "SAFETY" chapter of this manual. Read it through before you start using the equipment!

5.1 Connections and control devices

1 Mains voltage switch

2 Connection (+)
TIG: return cable

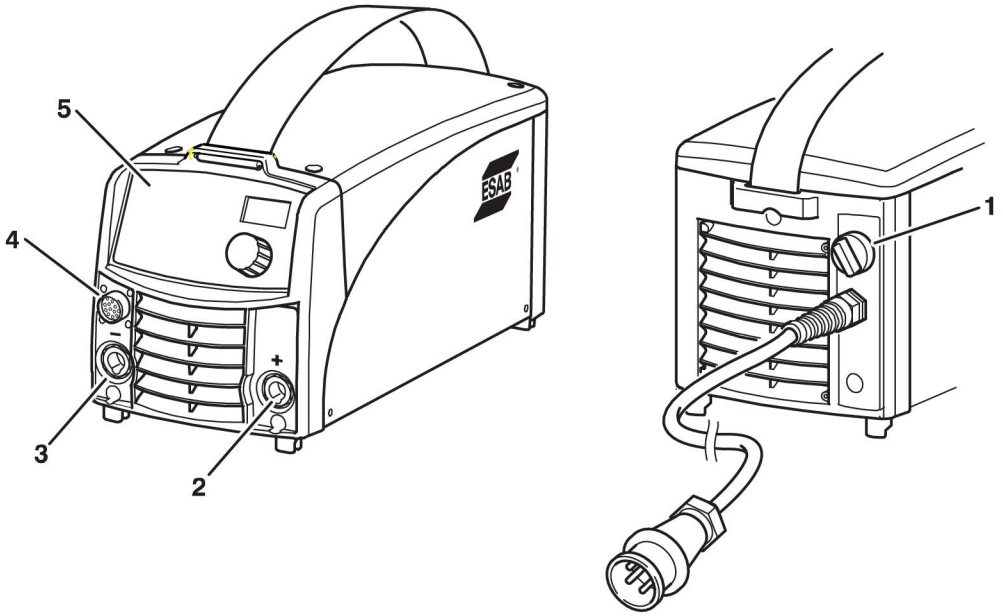
MMA: welding cable or return cable

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

NOTE!
Regular maintenance is important for safe and reliable operation.

CAUTION!
Only persons with the appropriate electrical knowledge (authorised personnel) may remove the safety plates.

CAUTION!
All warranty undertakings from the supplier cease to apply if the customer attempts any work to rectify any faults in the product during the warranty 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
- positioning of welding power source
- 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 TROUBLESHOOTING

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

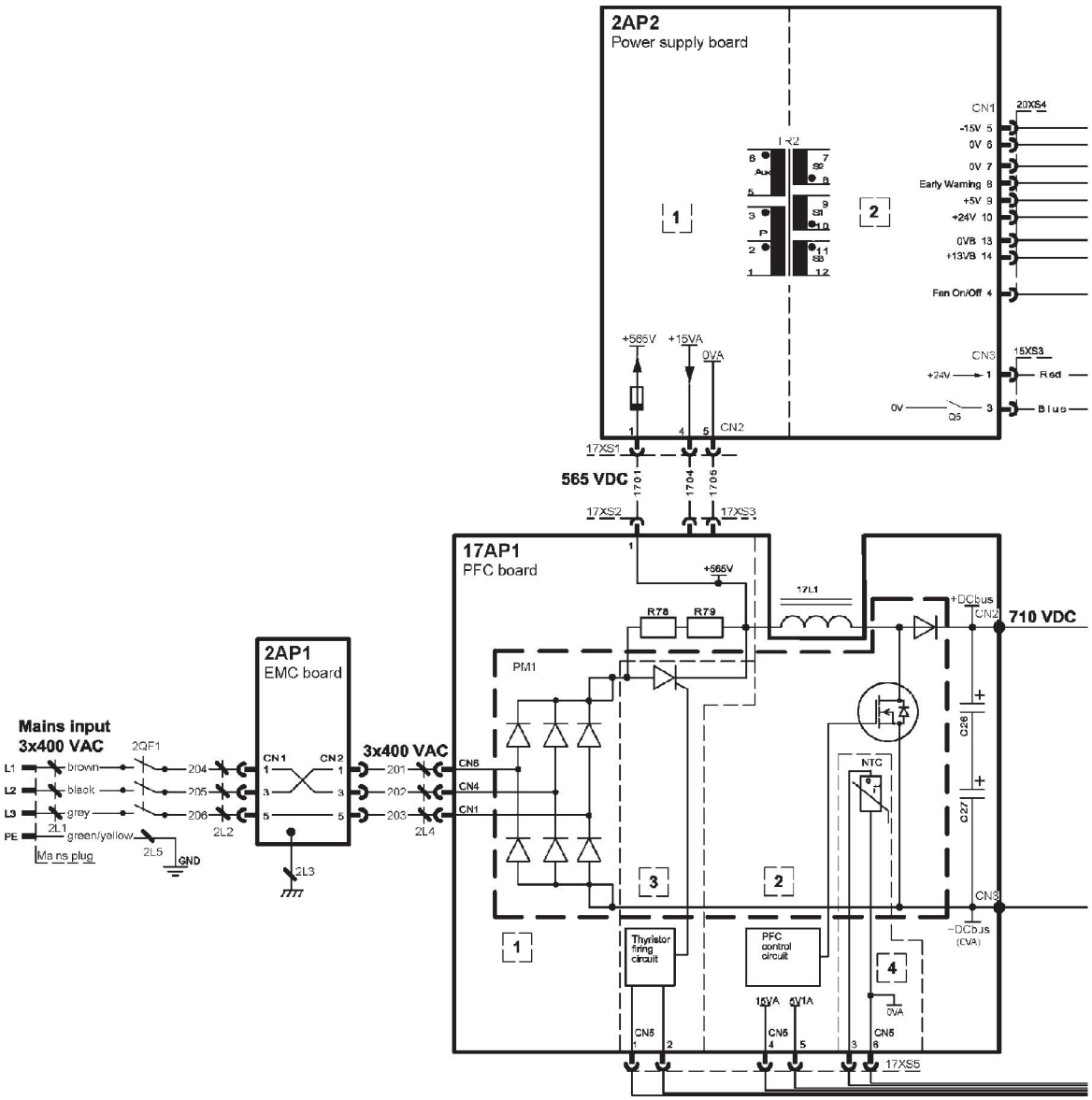
Type of fault	Corrective actions
No arc.	• Check that the mains power supply switch is turned on. • Check that the welding current supply and return cables are correctly connected. • Check that the correct current value is set. • Check the mains power supply fuses.
The welding current is interrupted during welding.	• Check whether the thermal overload protections have tripped (a fault code is displayed on the control panel). • Check the mains power supply fuses.
The thermal overload protection 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.

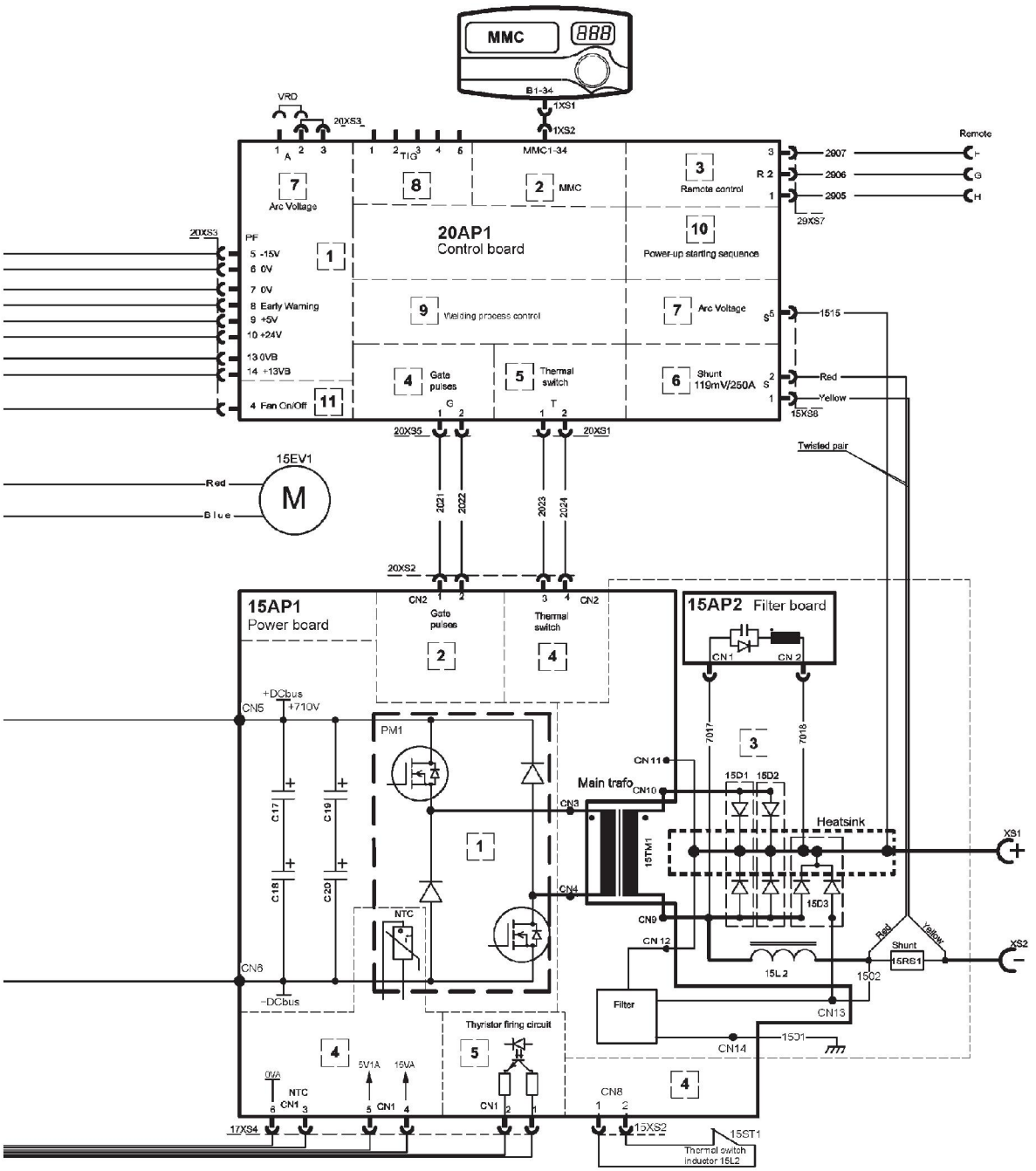
8 ORDERING SPARE PARTS

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 mentioned standard.

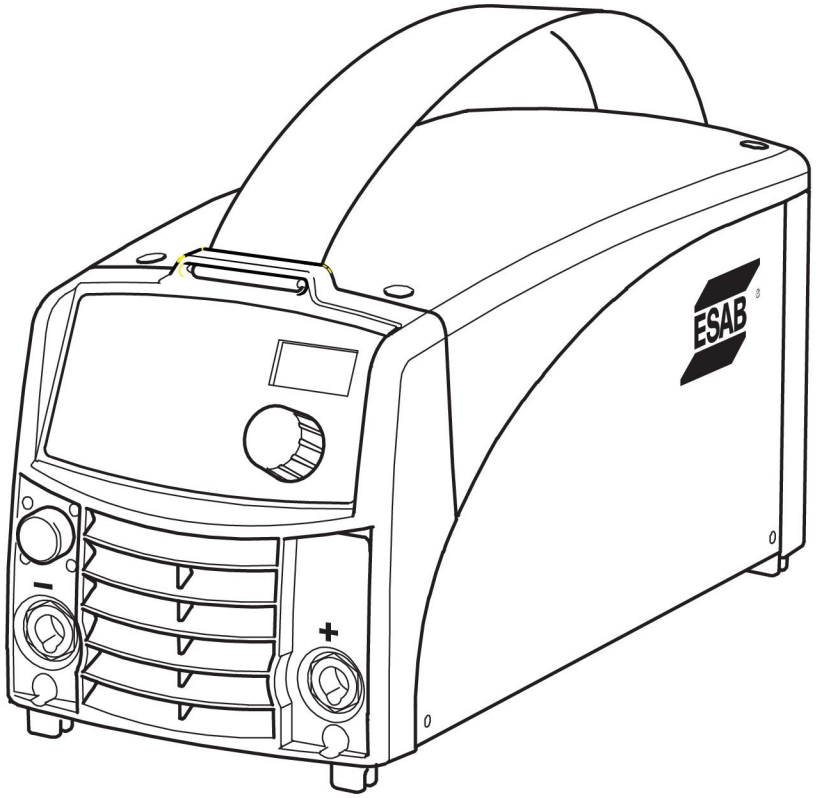
Spare parts and wear parts can be ordered through your nearest ESAB dealer, see esab.com. When ordering, please state product type, serial number, designation and spare part number in accordance with the spare parts list. This facilitates dispatch and ensures correct delivery.

DIAGRAM




MMC
B1-34
1XS1
1XS2
VRD
20XS3
MMC1-34
7 Arc Voltage
8
2 MMC
3 Remote control
10 Power-up starting sequence
20AP1
Control board
1
9 Welding process control
7 Arc Voltage
4 Gate pulses
5 Thermal switch
6 Shunt 119mV/250A
11 Fan On/Off
Remote
2907
2906
2905
29XS7
1515
Red
Yellow
15XS6
20XS5
20XS1
Twisted pair
15EV1
Red
Blue
M
2021
2022
2023
2024
20XS2
15AP1
Power board
2
4
15AP2 Filter board
CN1
CN2
+DCbus
+710V
CN5
PM1
C17
C19
C18
C20
CN6
-DCbus
NTC
Thyristor firing circuit
5
0VA
5V1A
15VA
17XS4
CN8
15XS2
15ST1
Thermal switch inductor 15L2
7017
7018
3
CN11
Main trafo
CN10
CN3
15TM1
15D1
15D2
15D3
Heatsink
XS1
CN4
CN9
CN12
15L2
Red
Yellow
Shunt
15RS1
XS2
1502
Filter
CN13
CN14
15D1

ORDERING NUMBERS

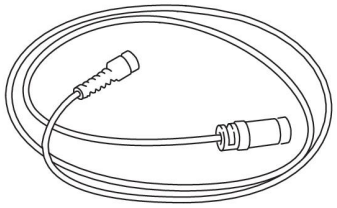
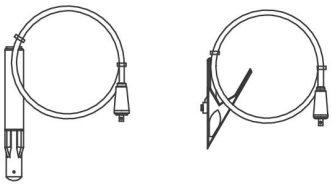
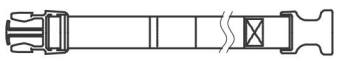
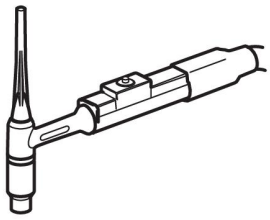


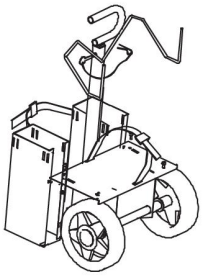
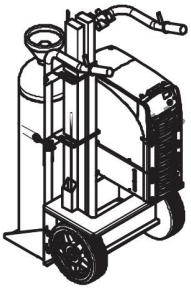
Ordering no.	Denomination	Type
0460 300 880	Welding power source	Caddy® Arc 251i, A32
0460 300 881	Welding power source	Caddy® Arc 251i, A34
0459 839 021	Spare parts list	Arc 251i
0460 449 *	Instruction manual	Control panel Caddy® A32, A34

The three last digits in the document number of the manual show the version of the manual. Therefore they are replaced with * here. Make sure to use a manual with a serial number or software version that corresponds with the product, see the front page of the manual.

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

ACCESSORIES

0459 491 896	Remote control unit AT1 MMA and TIG: setting of current	
0459 491 897	Remote control unit AT1 CF MMA and TIG: rough and fine setting of current	
0349 090 886	Foot pedal FS002 with 5 m cable	
0459 552 880 0459 552 881 0459 552 882 0459 552 883	Remote cable 12 pole - 8 pole 5 m 10 m 15 m 25 m	
0700 006 902 0700 006 903	Welding cable kit Return cable kit	
0460 265 002	Cable holder	
0460 265 003	Shoulder strap	
0700 300 539 0700 300 545 0700 300 553 0700 300 556	Tig torch TXH 151V 4 m Tig torch TXH 151V 8 m Tig torch TXH 201V 4 m Tig torch TXH 201V 8 m	

0459 366 885	Trolley for 5-10 litre gascylinder	
0459 366 886	Trolley for 20-50 litre gascylinder	
0460 330 880	Trolley for 20-50 litre gascylinder	

A **WORLD** OF **PRODUCTS** AND **SOLUTIONS.**

For contact information visit esab.com

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http://manuals.esab.com