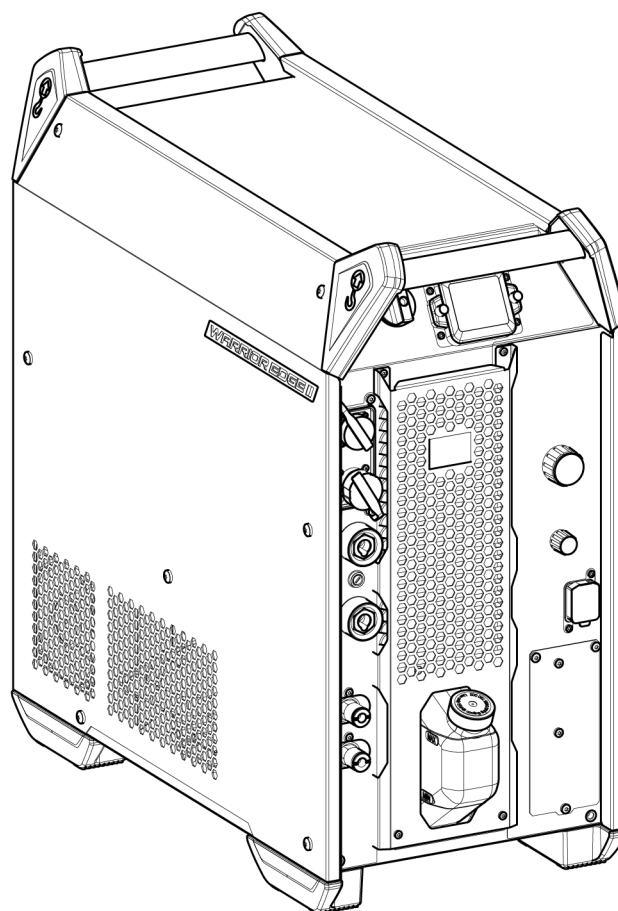


WARRIOR EDGE 500



Instruction manual

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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



WARNING!

These Safety Precautions are for your protection. They summarize precautionary information from the references listed in the Additional Safety Information section. Before performing any installation or operating procedures, be sure to read and follow the safety precautions listed below as well as all other manuals, material safety data sheets, labels, etc. Failure to observe Safety Precautions can result in injury or death.



PROTECT YOURSELF AND OTHERS

Some welding, cutting and gouging processes are noisy and require ear protection. The arc, like the sun, emits ultraviolet (UV) and other radiation and can injure the skin and eyes. Hot metal can cause burns. Training in the proper use of the processes and equipment is essential to prevent accidents. Therefore:

1. Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching.
2. Always wear safety glasses with side shields in any work area, even if welding helmets, face shields and goggles are also required.
3. Use a face shield fitted with the correct filter and cover plates to protect your eyes, face, neck and ears from sparks and rays of the arc when operating or observing operations. Warn bystanders not to look at the arc and not to expose themselves to the rays of the electric-arc or hot metal.
4. Wear flameproof gauntlet-type gloves, heavy long-sleeve shirt, cuffless pants, high-topped shoes, and a welding helmet or cap for protection, to protect against arc rays and hot sparks or hot metal. A flameproof apron may also be desirable as protection against radiated heat and sparks.
5. Hot sparks or metal can lodge in rolled up sleeves, trouser cuffs, or pockets. Sleeves and collars should be kept buttoned and open pockets eliminated from the front of the clothing.

6. Protect other personnel from arc rays and hot sparks with a suitable non-flammable partition or curtains.
7. Use goggles over safety glasses when chipping slag or grinding. Chipped slag may be hot and can fly for long distances. Bystanders should also wear goggles over safety glasses.



FIRES AND EXPLOSIONS

Heat from flames and arcs can start fires. Hot slag or sparks can also cause fires and explosions. Therefore:

1. Protect yourself and others from flying sparks and hot metal.
2. Move all combustible materials well away from the work area or cover the materials with a protective non-flammable covering. Combustible materials include wood, cloth, sawdust, liquid and gas fuels, solvents, paints, and coating paper, etc.
3. Hot sparks or hot metal can fall through cracks or crevices in floors or wall openings and cause a hidden smoldering fire or fires on the floor below. Make certain that such openings are protected from hot sparks and metal.
4. Do not weld, cut, or perform other hot work until the work piece has been completely cleaned so that there are no substances on the work piece which might produce flammable or toxic vapors. Do not perform hot work on closed containers, they may explode.
5. Have fire extinguishing equipment handy for instant use, such as a garden hose, water pail, sand bucket, or portable fire extinguisher. Be sure you are trained in its use.
6. Do not use equipment beyond its ratings. For example, an overloaded welding cable can overheat and create a fire hazard.
7. After completing work, inspect the work area to make sure there are no hot sparks or hot metal that could cause a fire later. Use fire watchers when necessary.



ELECTRICAL SHOCK

Contact with live electrical parts and ground can cause severe injury or death. DO NOT use AC welding current in damp areas, if movement is confined, or if there is danger of falling. Therefore:

1. Be sure the power source frame (chassis) is connected to the earth system of the input power.
2. Connect the workpiece to a good electrical earth.
3. Connect the work cable to the workpiece. A poor or missing connection can expose you or others to a fatal shock.
4. Use well-maintained equipment. Replace worn or damaged cables.
5. Keep everything dry, including clothing, work area, cables, torch/electrode holder and power source.
6. Make sure that all parts of your body are insulated from both the work piece and from the ground.
7. Do not stand directly on metal or the ground while working in tight quarters or a damp area; stand on dry boards or an insulating platform and wear rubber-soled shoes.
8. Put on dry, hole-free gloves before turning on the power.
9. Turn off the power, before removing your gloves.
10. Refer to ANSI/ASC Standard Z49.1 for specific grounding recommendations. Do not mistake the work lead for a earth cable.



ELECTRIC AND MAGNETIC FIELDS

May be dangerous. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding and cutting current creates EMF around welding cables and welding machines. Therefore:

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



FUMES AND GASES

Fumes and gases, can cause discomfort or harm, particularly in confined spaces. Shielding gases can cause asphyxiation. Therefore:

1. Keep your head out of the fumes. Do not breathe the fumes and gases.
2. Always provide adequate ventilation in the work area by natural or mechanical means. Do not weld, cut or gouge on materials such as galvanized steel, stainless steel, copper, zinc, lead beryllium or cadmium unless positive mechanical ventilation is provided. Do not breathe in the fumes from these materials.
3. Do not operate near degreasing and spraying operations. The heat or arc can react with chlorinated hydrocarbon vapors to form phosgene, a highly toxic gas, and other irritant gases.
4. If you develop momentary eye, nose or throat irritation while operating, this is an indication that the ventilation is not adequate. Stop work and take the necessary steps to improve ventilation in the work area. Do not continue to operate if physical discomfort persists.
5. Refer to ANSI/ASC Standard Z49.1 for specific ventilation recommendations.
6. **WARNING:** This product when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and in some cases cancer (California Health & Safety Code §25249.5 et seq.)



CYLINDER HANDLING

Cylinders, if mishandled, can rupture and violently release gas. A sudden rupture of cylinder valve or relief device can injure or kill. Therefore:

1. Locate cylinders away from heat, sparks and flames. Never strike an arc on a cylinder.
2. Use the proper gas for the process and use the proper pressure reducing regulator designed to operate from the compressed gas cylinder. Do not use adapters. Maintain hoses and fittings in good condition. Follow the manufacturer's operating instructions for mounting a regulator to a compressed gas cylinder.
3. Always secure cylinders in an upright position, by chain or strap, to suitable hand trucks, undercarriages, benches, wall, post or racks. Never secure cylinders to work tables or fixtures where they may become part of an electrical circuit.
4. When not in use, keep cylinder valves closed. Have valve protection cap in place if regulator is not connected. Secure and move cylinders by using suitable hand trucks.



MOVING PARTS

Moving parts, such as fans, rotors and belts can cause injury. Therefore:

1. Keep all doors, panels, guards, and covers closed and securely in place.
2. Stop the engine or drive systems before installing or connecting a unit.
3. Have only qualified people remove covers for maintenance and troubleshooting as necessary
4. To prevent accidental starting of equipment during service, disconnect negative (-) battery cable from battery.
5. Keep hands, hair, loose clothing and tools away from moving parts.
6. Reinstall panels or covers and close doors when service is finished and before starting engine.



WARNING! FALLING EQUIPMENT CAN INJURE

- Only use lifting eye to lift unit. Do NOT use running gear, gas cylinders or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Keep cables and cords away from moving vehicles when working from an aerial location.



WARNING! EQUIPMENT MAINTENANCE

Faulty or improperly maintained equipment can cause injury or death. Therefore:

1. Always have qualified personnel perform the installation, troubleshooting and maintenance work. Do not perform any electrical work unless you are qualified to perform such work.
2. Before performing any maintenance work inside a power source, disconnect the power source from the incoming electrical power.
3. Maintain cables, earthing wire, connections, power cord and power supply in safe working order. Do not operate any equipment in faulty condition.
4. Do not abuse any equipment or accessories. Keep equipment away from heat sources such as furnaces, wet conditions such as water puddles, oil or grease, corrosive atmospheres and inclement weather.
5. Keep all safety devices and cabinet covers in position and in good repair.
6. Use equipment only for its intended purpose. Do not modify it in any manner.

**CAUTION!
ADDITIONAL SAFETY INFORMATION**

For more information on safe practices for electric arc welding and cutting equipment, ask your supplier for a copy of “Precautions and Safe Practices for Arc Welding, Cutting and Gouging,” Form 52-529.

The following publications are recommended:

- ANSI/ASC Z49.1 - “Safety in Welding and Cutting”
- AWS C5.5 - “Recommended Practices for Gas Tungsten Arc Welding”
- AWS C5.6 - “Recommended Practices for Gas Metal Arc welding”
- AWS SP - “Safe practices” - Reprint, Welding Handbook
- ANSI/AWS F4.1 - “Recommended Safe Practices for Welding and Cutting of Containers That Have Held Hazardous Substances”
- OSHA 29 CFR 1910 - "Safety and health standards"
- CSA W117.2 - "Code for safety in welding and cutting"
- NFPA Standard 51B, “Fire Prevention During Welding, Cutting, and Other Hot Work”
- CGA Standard P-1, “Precautions for Safe Handling of Compressed Gases in Cylinders”
- ANSI Z87.1, "Occupational and Educational Personal Eye and Face Protection Devices"

1.3 User responsibility

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 could result in injury to the operator and damage to the equipment.

1. Anyone who uses the equipment must be familiar with:
 - its operation
 - the location of emergency stops
 - its function
 - the relevant safety precautions
 - welding and cutting or other applicable operation of the equipment
2. The operator must ensure that:
 - no unauthorized person is 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

If equipped with ESAB cooler

Use ESAB approved coolant only. Non-approved coolant might damage the equipment and jeopardize product safety. In case of such damage, all warranty undertakings from ESAB cease to apply.

For ordering information, see the "ACCESSORIES" chapter in the instruction manual.



WARNING!

Arc welding and cutting may cause injury 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 with pacemakers fitted should consult their doctor 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 the 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 ear defenders 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 a fire. Make sure there are no inflammable materials nearby.
- Do not use on closed containers.

**HOT SURFACE - Parts can burn**

- Do not touch parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or insulated welding gloves to prevent burns.

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

PROTECT YOURSELF AND OTHERS!

**WARNING!**

Do not use the power source for thawing frozen pipes.

**CAUTION!**

This product is solely intended for arc welding.

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.

1.4 California proposition 65 warning

**WARNING!**

Welding or cutting equipment produces fumes or gases which contain chemicals known in the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

**WARNING!**

This product can expose you to chemicals including lead, which are known to the state of California to cause cancer and birth defects or other reproductive harm. Wash hands after use.

For more information, go to www.P65Warnings.ca.gov.

2 INTRODUCTION

The **Warrior Edge 500** is integrated with a cooling unit and offers a complete multi-process package supporting GMAW, SMAW, Live GTAW and gouging. It is intended for use in combination with **RobustFeed Edge**.

The power source is equipped with gateway to connect to the **WeldCloud** suite of applications, including **WeldCloud** Productivity for production monitoring and **WeldCloud** Fleet for managing your fleet of welding equipment.

For more information about the wire feed units, refer to the Instruction manual 0463 773 001.

For more information about WeldCloud, refer to the Quick start guide 0463 778 001.

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

2.1 Equipment

The power source is supplied with:

- 16 ft (5 m) 95 mm² return cable with ground clamp
- 16 ft. (5 m) mains cable
- Instruction manual
- Quick start guide
- Safety instruction

3 TECHNICAL DATA

WARRIOR EDGE 500				
Mains voltage	380–575 V, $\pm 10\%$, 3~ 50/60 Hz			
Mains supply S_{scmin}	6.8 MVA			
Primary current I_{max}	380 V	400 V	460 V	575 V
GMAW	36 A	36 A	31 A	26 A
SMAW	38 A	37 A	31 A	26 A
GTAW	29 A	29 A	25 A	21 A
Idle power with fans OFF	41 W	43 W	43 W	46 W
Setting range (DC)				
GMAW	16 A/14.8 V – 500 A/39 V			
SMAW	16 A/20.6 V – 500 A/40 V			
GTAW	4 A/10.2 V – 500 A/30 V			
Permissible load at GMAW				
60% duty cycle	500 A/39 V			
100% duty cycle	400 A/34 V			
Permissible load at SMAW				
60% duty cycle	500 A/40 V			
100% duty cycle	400 A/36 V			
Permissible load at GTAW				
60% duty cycle	500 A/30 V			
100% duty cycle	400 A/26 V			
Power factor				
at maximum current (SMAW)	0.91			
GMA welding	0.93			
Efficiency				
at maximum current (SMAW)	89%			
GMA welding	88%			
Open-circuit voltage	55 V			
Operating temperature	-4 to 131 °F (-20 to +55 °C)			
Transportation temperature	-40 to 176 °F (-40 to +80 °C)			
Constant sound pressure when idling	< 70 dB (A)			
Dimensions l × w × h	27.5×12.8×26.8 in. (700×325×680 mm)			
Weight	187.4 lbs (85 kg, including cooler)			
Insulation class	H			
Enclosure class	IP23			
Application class	S			
Coolant	ESAB's coolant (0465 720 002)			

WARRIOR EDGE 500	
Cooling power	1.4 kW
Cooling volume	1.2 gal (4.7 l)
Maximum flow	0.5 gal/min (2 l/min)
Maximum pressure	65.2 PSI (4.5 bar)

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 at a certain load without overloading.

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 indoors and may be used outdoors if sheltered during precipitation.

Application class

The symbol **S** indicates that the power source is suitable for welding in an environment with an increased risk of electric shock.

4 INSTALLATION

The installation must be carried out by a professional.



CAUTION!

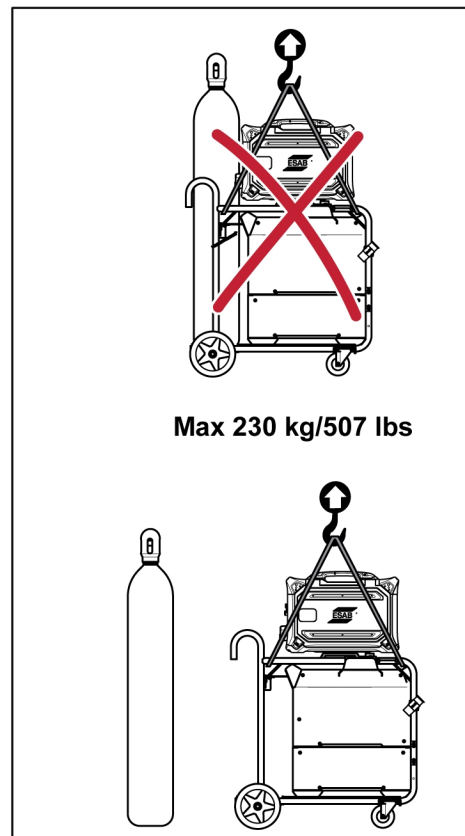
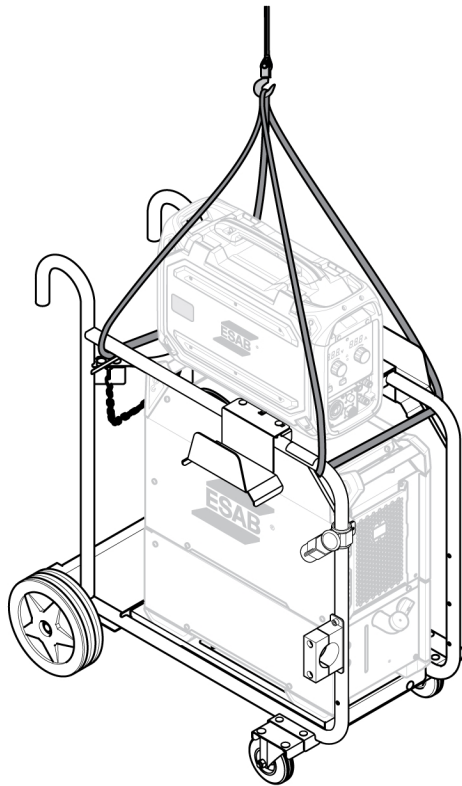
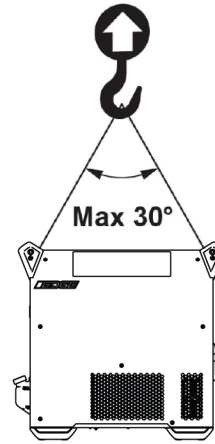
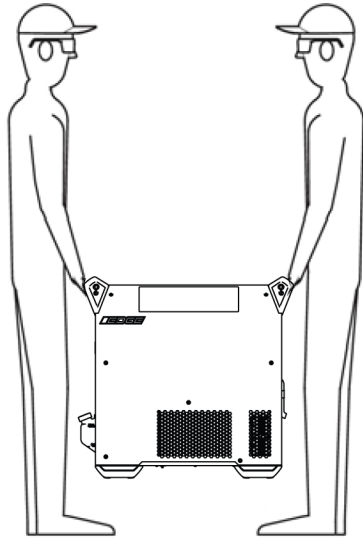
This product is intended for industrial use. In a domestic environment, this product may cause radio interference. It is the user's responsibility to take adequate precautions.

4.1 Location

Position the welding power source in such a way that its cooling air inlets and outlets are not obstructed.

4.2 Lifting instructions

Mechanical lifting must be done with both outer handles.

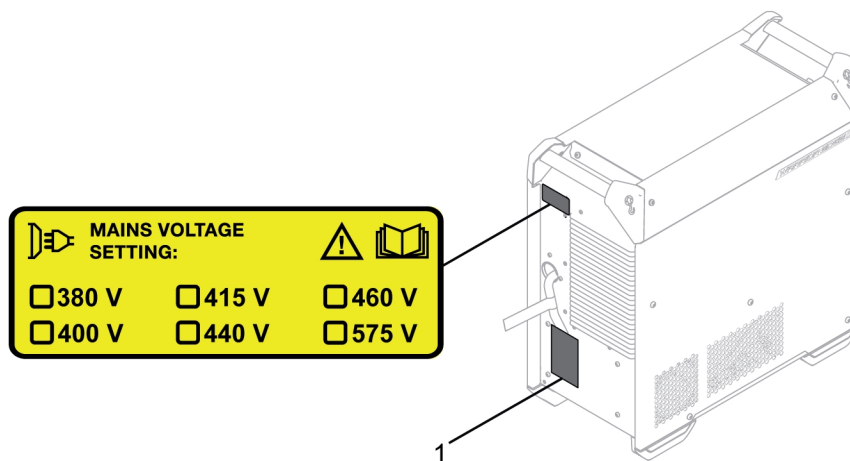


4.3 Main supply



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.



1. Rating plate with supply connection data.

4.4 Recommended fuse sizes and minimum cable area

WARRIOR EDGE 500				
Mains voltage	380 V, 3~ 50/60 Hz	400 V, 3~ 50/60 Hz	460 V, 3~ 50/60 Hz	575 V, 3~ 50/60 Hz
Mains cable area	4×10 AWG	4×10 AWG	4×10 AWG	4×10 AWG
Maximal current I_{max}	38 A	37 A	32 A	26 A
I_{1eff}				
GMAW	29 A	28 A	24 A	20 A
SMAW	30 A	29 A	24 A	20 A
GTAW	24 A	22 A	19 A	17 A
Fuse				
Anti-surge	35 A	35 A	35 A	35 A
Type C MCB	32 A	32 A	32 A	32 A



NOTE!
The power 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.

Supply from power generators

The power source can be supplied from different types of generators. However, some generators may not provide sufficient power for the welding power source to operate correctly. Generators with Automatic Voltage Regulation (AVR) or with an equivalent or better type of regulation, with rated power ≥ 40 kW, are recommended.

Connection instruction

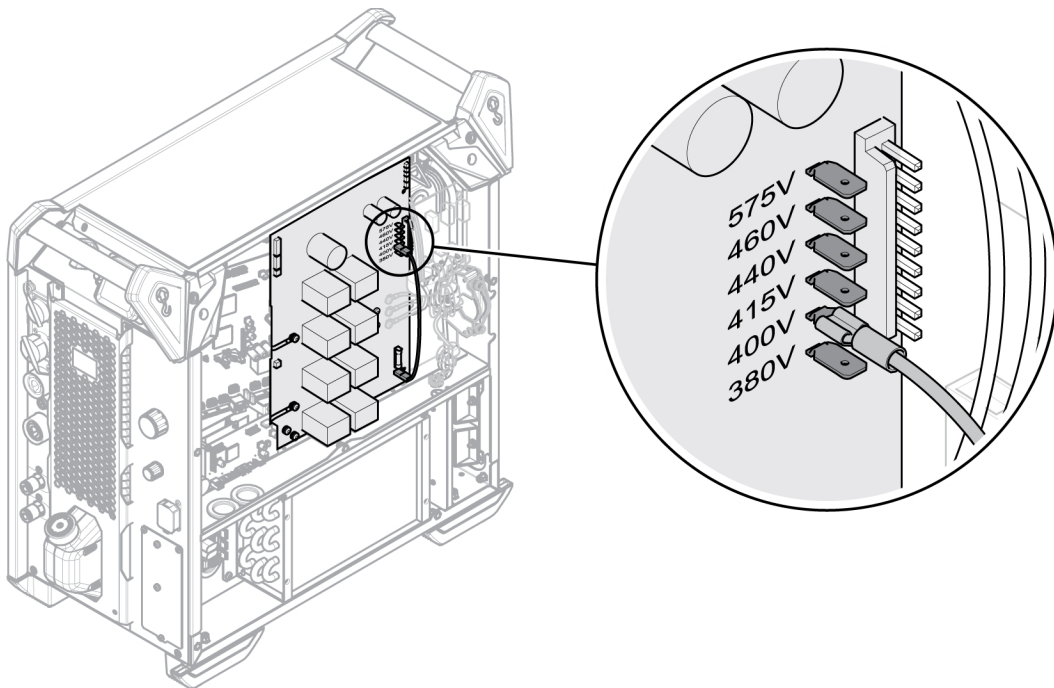
**WARNING!**

The mains supply must be disconnected during installation.

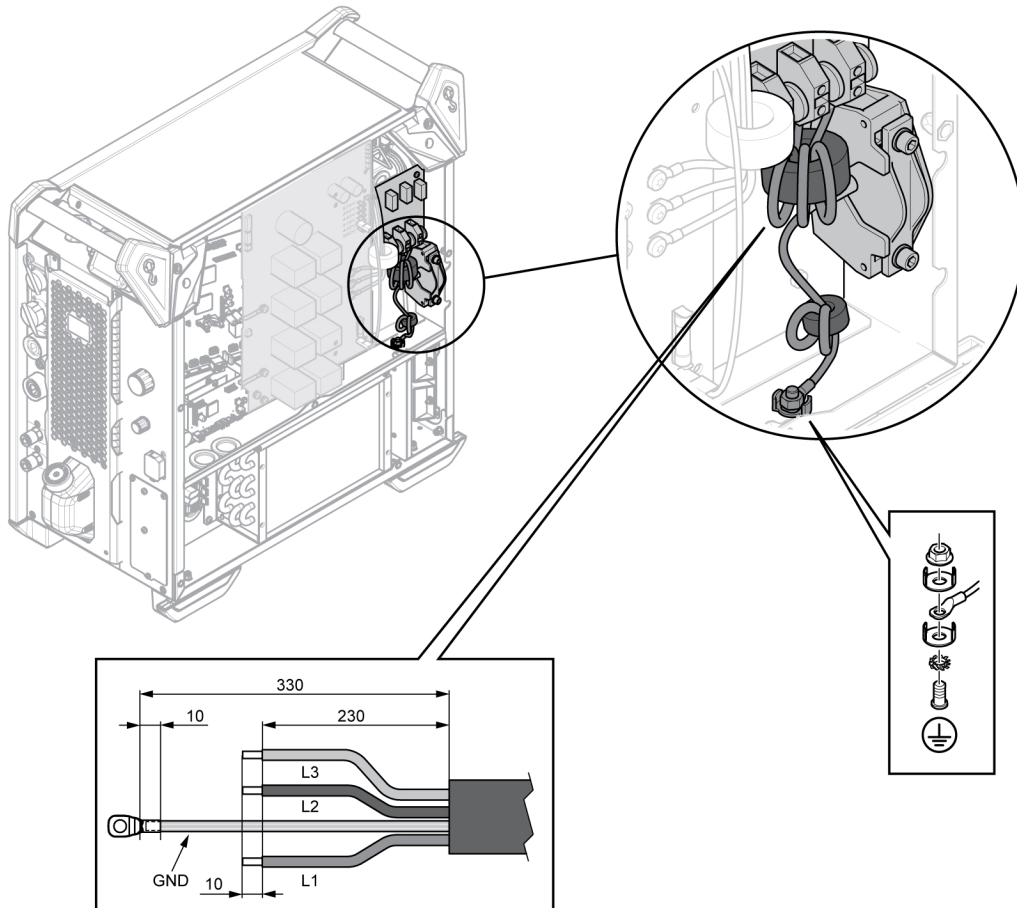
**WARNING!**

Wait until the DC bus capacitors are discharged. The DC bus capacitor discharge time is at least 2 minutes!

The power source is factory set to 400 V AC. If another mains voltage setting is required, the cable on the printed circuit board has to be moved and put in the correct position. Also, the label at the rear of the power source, marked with the mains voltage setting must be updated. This operation must be done by a person who has the appropriate electrical knowledge.



If the mains cable needs to be changed, the ground connection to the bottom plate and the ferrites must be installed correctly. See the picture below for the installation order of the ferrites, washers, nuts and screws.



Connections	Cable color (CSA)
L1	Red
L2	Black
L3	White
GND	Green

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!



NOTE!

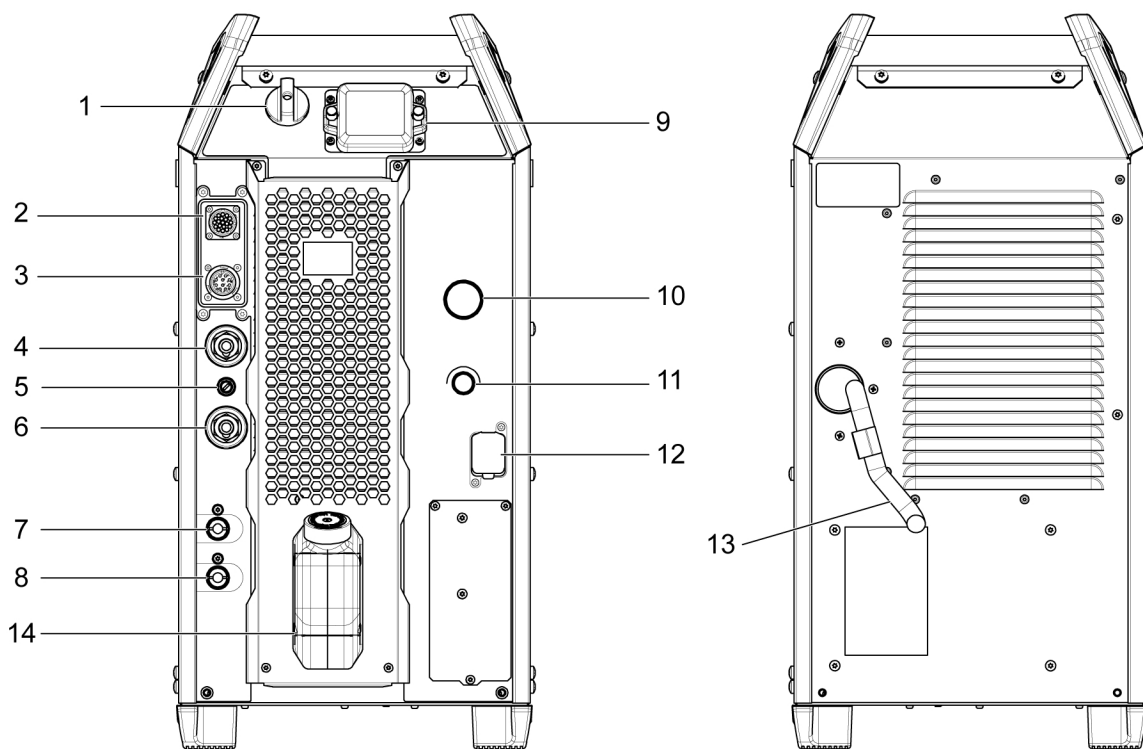
When moving the equipment, use the handle. Never pull the cables.



WARNING!





Electric shock! Do not touch the workpiece or the welding head during operation!

5.1 Connections and control devices



- | | |
|--|--|
| 1. Mains power supply switch, I/O | 8. Connection BLUE for coolant from cooling unit |
| 2. Connection for remote control unit | 9. USB connection ports |
| 3. Power connection to wire feed unit | 10. Current/Voltage encoder knob |
| 4. Negative welding terminal: Return cable | 11. Process selection knob |
| 5. Fuse (10 A) for supply voltage for wire feeder unit | 12. WeldCloud Ethernet connection |
| 6. Positive welding terminal: Welding cable | 13. Power cable |
| 7. Connection RED for coolant (return) to cooling unit | 14. Coolant tank unit |

5.2 Symbols

	WeldCloud connection		USB connection
	Protective ground		Position for mechanized lifting

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.

Connect the return cable to the negative terminal on the power source. Secure the return cable's contact clamp to the workpiece, and make sure that there is a good contact between the workpiece and the output for the return cable on the power source.

Recommended maximum current values for connection set cables

At an ambient temperature of 77 °F (+25 °C) and a normal 10-minute cycle:

Cable area	Duty cycle		Voltage loss / 10 m
	100%	60%	
50 mm ²	290	320	0.35 V / 100 A
70 mm ²	360	400	0.25 V / 100 A
95 mm ²	430	500	0.19 V / 100 A

At an ambient temperature of 104 °F (+40 °C) and a normal 10-minute cycle:

Cable area	Duty cycle		Voltage loss / 10 m
	100%	60%	
50 mm ²	250	280	0.37 V / 100 A
70 mm ²	310	350	0.27 V / 100 A
95 mm ²	370	430	0.20 V / 100 A

Duty cycle

The duty cycle refers to the time as a percentage of a ten-minute period that you can weld at a certain load without overloading.

5.4 Turning the mains power ON/OFF

Turn ON the mains power by turning the switch to the "I" position.

Turn the power source OFF by turning the switch to the "O" position.

Regardless of whether the mains supply is interrupted abnormally, or the power source is switched off in the normal manner, the welding data will be stored, so it will be available next time the unit is turned on.

5.5 Fan control

The power source has a time control that means that the fans continue to run for 4 minutes after welding has stopped. The fans start again when welding restarts.

5.6 Usage of cooling unit

ELP (ESAB Logic Pump)

The cooling unit is equipped with a detection system called ELP (ESAB Logic Pump) which checks that the coolant hoses are connected. When connecting a liquid-cooled torch, cooling starts.

**WARNING!**

The cooling unit starts as soon as the ELP is activated!

For liquid-cooled torches, the cooling unit will start only if the torch cooling hoses are connected to the wire feeder.

When the cooling hoses are disconnected from the wire feeder, the cooling stops immediately.

**NOTE!**

The cooling unit will be applicable only for GMA welding.

The power source automatically detects the need for the cooling unit based on welding applications and operates the cooling unit accordingly.

When a liquid-cooled torch is connected, if the coolant temperature exceeds 113 °F (45 °C), the cooler fan and pump will start even if there is no welding operation.

5.6.1 Operation of cooling unit after welding

If the coolant temperature is below 131 °F (55 °C), the cooler fan and pump will continue to run for three minutes and then stop.

If the coolant temperature is at 149 °F (65 °C) or above, the cooler fan and pump will continue to run for seven minutes and then stop.

In a long weld, if the coolant temperature has not decreased to 131 °F (55 °C) within seven minutes, the cooler fan and pump will continue to run for another three minutes and then stop.

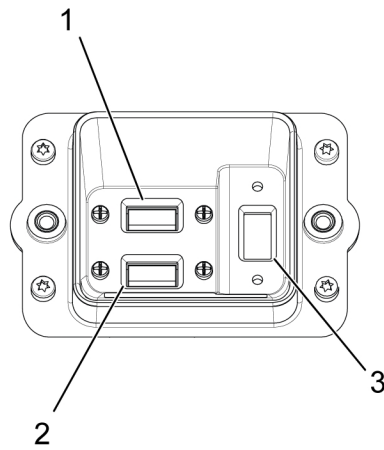
5.7 Cooling unit connection

For problem free operation, it is recommended that the height from the cooling unit to the liquid-cooled torch is a maximum of 82 ft (25 m) or less.

5.8 Cooling unit pressure controller

The pump has an enclosed pressure relief valve. The valve opens gradually when the pressure is too high. This can occur if a hose is folded, which causes the flow to fail or stop.

5.9 USB Connection



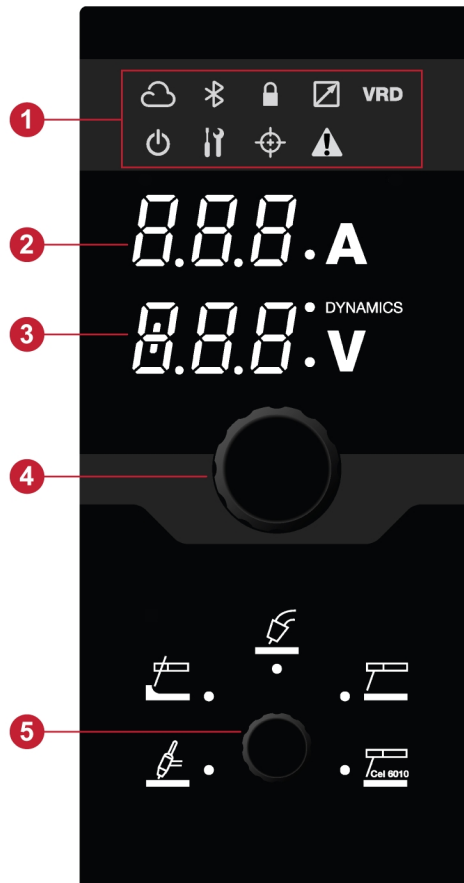
1. IoT Gateway USB port 1

2. IoT Gateway USB port 2

3. USB port 3, which enables the user to upgrade the software and to export the error log report.





6 CONTROL PANEL

6.1 Overview



- 1. LED Indicators
- 2. Display, shows set or measured current
- 3. Display, shows set or measured voltage/dynamics
- 4. Current/voltage encoder knob
- 5. Application selection knob

6.2 LED indicators description

Indicator	Description
	<p>WeldCloud</p> <p>An online management system that connects welding power supplies to a software platform that manages data to be analyzed for maximum productivity.</p> <p>WeldCloud productivity provides the production manager tools to improve welding productivity and increase traceability by keeping track of each weld, operator, part number and more.</p> <p>The indicator is lit in green when it is connected.</p>
<p>VRD</p>	<p>VRD (Voltage Reducing Device)</p> <p>The VRD function ensures that the open-circuit voltage does not exceed 35 V when welding is not being carried out. The VRD function must be activated by a qualified service technician, by means of Edge ESAT (ESAB Software Administration Tool, a kit for technical service including software to manage settings, update software etc.).</p> <p>The VRD function is blocked when the system senses that welding has started.</p> <p>When the VRD function is active, the indicator is lit in green.</p>
	<p>TRUEARC compensate</p> <p>To achieve a good welding result, the arc voltage is a crucial factor. In GMA welding, the power source is prepared to sense the arc voltage in the wire feeder. Prerequisite for this functionality is that an ESAB wire feeder and an ESAB interconnection cable is used.</p> <p>In compensation mode, when the torch is triggered on the workpiece (avoid wire contact), it measures the inductance and resistance to compensate for the voltage drop in the interconnection cable, torch and return cable.</p> <p>The indicator is lit in yellow when compensation is required and it blinks during the compensation process. If the compensation process is a success, the indicator is lit in green.</p>
	<p>Warning/Error</p> <ul style="list-style-type: none"> • Warning The indicator is lit in yellow and displays an "Err" message. If a warning occurs, completion of an ongoing weld is possible, but the start of a new weld is prevented as long as the warning remains. • Error The indicator is lit in red and displays an "Err" message. The ongoing welding is stopped as long as the error remains.
	<p>Lock</p> <p>Green - This indicates when the system has limited access or Job limits are active.</p> <p>Red - This indicates the system is locked, and to be able to use the system, it is required to unlock.</p> <p>Red (blink) - This indicates when the user is trying to access the restricted features.</p>

6.3 Functions and symbols

6.3.1 GTAW welding



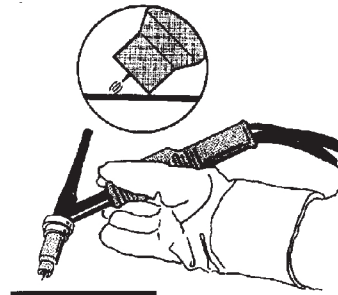
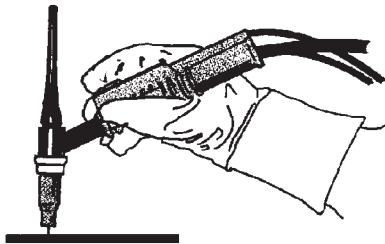
GTAW welding melts the metal of the workpiece, with an arc initiated from a non-consuming tungsten electrode. The weld pool and electrode are protected by shielding gas.

For GTAW welding, the welding power source shall be supplemented with:

- a GTAW torch with gas valve
- Argon gas cylinder
- Argon gas regulator
- Tungsten electrode

This power source performs **Live GTAW start (GTAW Live)**.

The tungsten electrode is placed against the workpiece. When lifted from workpiece, the arc is struck at a limited current level.



6.3.2 Arc air gouging



For arc air gouging, a special electrode is used comprised of a carbon rod with a copper casing.

An arc is formed between the carbon rod and the workpiece, which melts the material. Compressed air is supplied, so the melted material is blown away.

For arc air gouging the power source must be supplemented with:

- ARCAIR torches
- Return cable with clamp
- air pressure

Recommended voltage setting for ARCAIR gouging electrodes

Electrode size	in	1/8	5/32	3/16	1/4	5/16	3/8
	mm	3.2	4.0	4.8	6.4	7.9	9.5
Voltage	V	35–38	36–40	38–42	40–46	44–50	46–54



NOTE!

The minimum and maximum settings are starting points for the rods indicated; with relatively clean metal, an acceptable gouge groove should be expected. These specific recommendations are based on the result of tests carried out on A36/ASME mild steel.

For different types of metal, adjust the volt setting and air flow for better performance.

For any gouging issues other than performance, see the TROUBLESHOOTING section.

6.3.3 SMAW



SMAW may also be referred to as welding with coated electrodes. Striking the arc melts the electrode, and its coating forms protective slag.

For SMAW the power source shall be supplemented with:

- Welding cable with electrode holder
- Return cable with clamp

6.3.4 SMAW cel 6010



Optimized arc characteristic for cellulosic electrodes such as 6010 and similar.

6.3.5 GMAW



An arc melts a continuously supplied wire. The weld pool is protected by shielding gas.

For GMA welding, the power source shall be supplemented with:

- wire feed unit
- welding torch
- connection cable between power source and wire feed unit
- gas cylinder
- Return cable with clamp

6.4 Measured or set values

V

Measured or set voltage

Measured or set value in the display for arc voltage V is an average arithmetic value.

A

Measured or set amperage

Measured or set value in the display for welding current A is an average arithmetic value.

7 MAINTENANCE

**WARNING!**

The mains supply must be disconnected during cleaning and maintenance.

**CAUTION!**

Only persons with appropriate electrical knowledge (authorized personnel) may remove the safety plates.

**CAUTION!**

The product is covered by a manufacturer's warranty. Any attempt to carry out repair work by unauthorized service centers or personnel will invalidate the warranty.

**NOTE!**

Regular maintenance is important for safe and reliable operation.

**NOTE!**



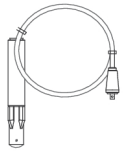

Perform maintenance more often during severe dusty conditions.

Before each use, make sure that the:

- Product and cables are not damaged
- The torch is clean and not damaged

7.1 Routine maintenance

Maintenance schedule during normal conditions. Check equipment before every use.

Interval	Area to maintain		
Every 3 months	 Clean or replace unreadable labels.	 Clean weld terminals.	 Check or replace weld cables.
Every 12 months or depending on environmental conditions (by authorized service technician)	 Clean inside equipment. Use dry compressed air with 4 bar pressure.		

7.1.1 Cleaning procedure

To maintain the performance and increase the lifetime of the power source it is mandatory to clean the product regularly. How often depends on:

- The welding process,
- The arc time, and
- The working environment.
- the surrounding environment, that is grinding etc.

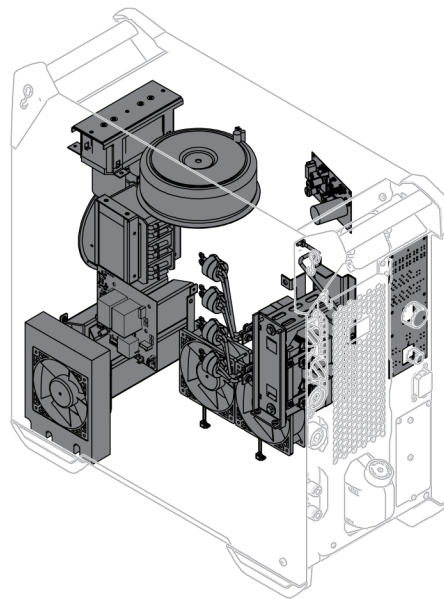
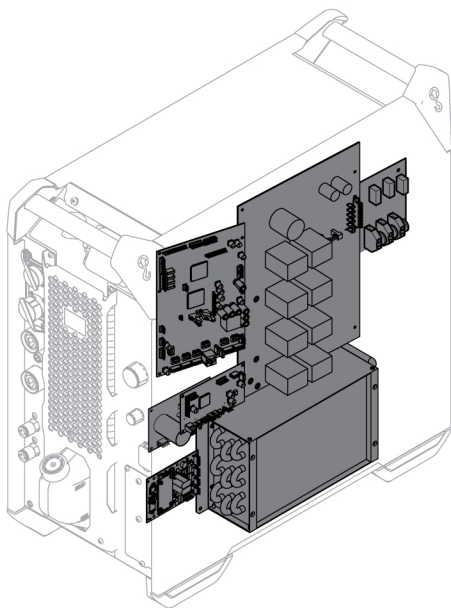
Tools needed for the cleaning procedure:

- torx screwdriver, T25 and T30
- dry compressed air at a pressure of 4 bar
- protective equipment like earplugs, safety glasses, masks, gloves, and safety shoes



CAUTION!

Make sure that the cleaning procedure is done in a suitable prepared workspace.



CAUTION!

The cleaning procedure should be carried out by an authorized service technician.

1. Disconnect the power source from the power supply.



WARNING!

Wait until the DC bus capacitors are discharged. The DC bus capacitor discharge time is at least 2 minutes!

2. Remove the side panels on the power source.
3. Remove the top panel on the power source.
4. Remove the plastic cover between the heat sink and fan.

5. Clean the power source with dry compressed air (4 bar) as follows:
 - The upper rear part.
 - From the rear panel through the secondary heat sink.
 - The inductor, transformer, and current sensor.
 - The power components side, from the rear side behind PCB 15AP1.
 - The PCBs at both sides.
 - Current brake resistors
 - Radiator and fans
6. Make sure that no dust remains on any part of the power source.
7. Install the plastic cover between the heat sink and the fan and make sure it is correctly fitted against the heat sink.
8. Reassemble the power source after cleaning and perform testing according to IEC 60974-4.
Follow the procedure in the section "After repair, inspection and test" in the Service manual.

7.2 Cooling unit

Dust, grinding, swarf etc.

The airstream through the cooling unit carries particles that become trapped in the cooling element, particularly in dirty working environments. This results in reduced cooling capacity.

The coolant system

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

7.2.1 Filling with coolant

Use only ESAB's ready mixed coolant. See "ACCESSORIES" chapter.

- Fill with coolant. (The fluid level must not exceed the upper marking, nor must it be below the lower marking.)



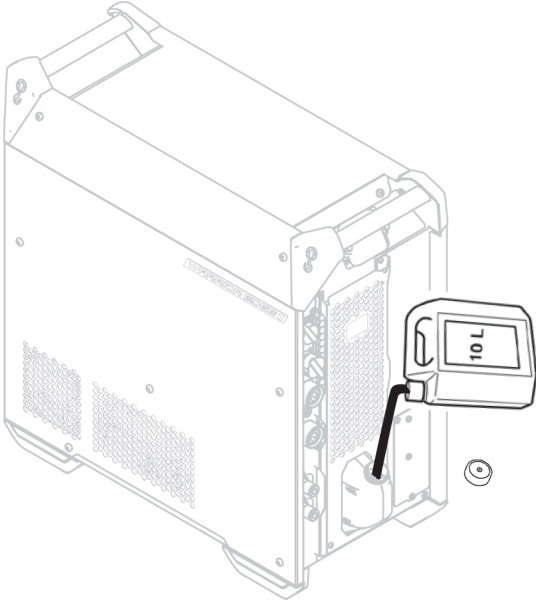
CAUTION!

The coolant must be handled as chemical waste.



NOTE!

Coolant must be topped up if connecting a welding torch or coolant hose 5 m in length or longer. When adjusting the coolant level by topping up, the coolant hoses do not need to be disconnected.



8 EVENT CODES

Event codes are used in order to indicate and identify an error in the equipment. Event codes provide information about the equipment.

Fault log

All faults that occur when using the welding equipment are documented as error messages in the fault log. When the fault log is full, the oldest message will automatically be erased when the next fault occurs.

The most recent fault message is displayed on the control panel. The entire fault log as well as corrective action can be read on the internal control panel.

List of event codes

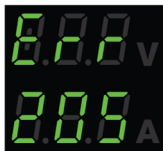
The control panel displays an event code with three digits and the first digit indicates the type of event. The type of event (first digit of the event code) are as follows:

0 = System	1 = Communication	2 = Power source
3 = Wire feed unit	4 = Cooling unit	6 = Gas unit
7 = External		



NOTE!

The last two digits indicate the event description at which the user can take corrective action. If the error code persists or any other code is shown, contact a service technician.



The example presented in the graphic to the left indicates a Supply voltage fault in the power source.

x01 Application fault

This event code is displayed due to one of the following:

- 001 - Application checksum error.
1. Acknowledge by pressing any buttons on the control panel.
 2. Restart the system.

x05 Supply voltage fault

This event code is displayed due to one of the following:

- 205 - Mains over/under voltage or phase error.
1. Make sure that the supply voltage is stable.
 2. Restart the system.

x06 Temperature fault

This event code is displayed due to one of the following:

- 406 - Return coolant temperature warning/error.
- 206 - Overtemperature.
- 306 - High wire motor temperature warning/error.

For 406 and 206 - Return coolant temperature warning/error and Overtemperature, perform the following actions:

1. Make sure that the cooling air inlets or outlets are not blocked or clogged by dirt.
2. Check the duty cycle being used to make sure that the equipment is not overloaded.
3. Wait until the temperature cools down.

For 306 - High wire motor temperature warning/error, perform the following actions:

4. Check the liner, clean using pressurized air. Replace the liner if damaged or worn out.
5. Check the wire pressure setting and adjust if needed.
6. Check the drive rolls for wear and replace if needed.
7. Make sure the filler metal spool can rotate without much resistance. Adjust the brake hub if needed.
8. Restart the system.
9. If the error persists, check the liner, clean using pressurized air and replace the liner if damaged or worn out.
10. If the error persists despite performing these actions, try replacing the torch.

x08 Battery warning

This event code is displayed due to one of the following:

- 208 - RTC/SRAM battery low warning.
1. Make sure that the polarity (+, - terminals) of the battery is right.
 2. Contact an authorized service technician to replace the battery.

x09 Internal voltage error

This event code is displayed due to one of the following:

- 209 - Internal over/under voltage error.
1. Restart the system.
 2. Contact an authorized person to check the main inputs.

x11 Wire feed speed fault

This event code is displayed due to one of the following:

- 311 - Wire saturation warning/error.
 - 311 - Wire motor start/work current error.
1. Check the correct liners/contact tip/torch used for types of welding wires.
 2. Check the torque tension in the break hub.
 3. Make sure that the wire feed speed control is dust free and rotate.
 4. Acknowledge by pressing any buttons on the control panel.
 5. Contact service technician to check drive motor.

x14 **Communication fault**

This event code is displayed due to one of the following:

- 114 - Weld control communication error.
 - 114 - Internal communication warning.
 - 114 - Connection to main control lost.
 - 114 - Fieldbus interface lost.
1. Check that all the equipment is correctly connected.
 2. Acknowledge by pressing any buttons on the control panel.
 3. Do not turn OFF the system and contact service technician.

x15 **Short circuit detected**

This event code is displayed due to one of the following:

- 215 - Weld contact detected at startup.
1. Make sure that the welding cables are properly installed on the weld terminals.
 2. Acknowledge by pressing any buttons on the control panel.
 3. Contact service technician.

x16 **High open circuit voltage fault**

This event code is displayed due to one of the following:

- 216 - Voltage sensor lost.
 - 216 - OCV level is too high.
 - 216 - Current brake module lost.
 - 216 - Current brake function error.
1. In case of voltage sensor lost, contact service technician. Otherwise restart the system.

x17 **Lost contact with another unit**

This event code is displayed due to one of the following:

- 017 - Mandatory node missing.
 - 017 - Critical node lost.
1. Check the cable connections between the subsystem (wire feeder and power source).
 2. Acknowledge by pressing any buttons on the control panel.
 3. Contact service technician.

x18 **Internal memory fault**

This event code is displayed due to one of the following:

- 018 - Partition data storage warning.
1. Make sure that network connection is stable with WeldCloud and acknowledge.

x19 Memory fault

This event code is displayed due to one of the following:

- 019 - Parameter memory read/write error.
- 019 - Log read/write error.

1. Restart the system.
2. Contact service technician.

x20 User management fault

This event code is displayed due to one of the following:

- 020 - No valid job available.

1. Make sure that the predefined jobs are saved by admin.

x25 Incompatible units

This event code is displayed due to one of the following:

- 025 - System communication version mismatch warning/error.
- 025 - Power converter control module version not valid.
- 025 - Power converter control module power capacity unknown.

1. Contact service technician.
2. Make sure that the software version is the same for each connected node.
3. Connect the correct wire feed unit and restart.

x26 Timing fault

This event code is displayed due to one of the following:

- 026 - Watchdog timeout.
- 026 - Process control error.

1. Restart the system (recycle power).
2. Acknowledge by pressing any buttons on the control panel.
3. Contact service technician.

x29 No coolant flow

This event code is displayed due to one of the following:

- 429 - ELP off during welding.

1. Check the coolant hose connections and acknowledge.

x31 Gas pressure fault

This event code is displayed due to one of the following:

- 631 - Gas input pressure warning/error.

1. Check gas input pressure.

2. Select the appropriate setting of gas flow in the control panel.
3. Acknowledge by pressing any buttons on the control panel.
4. Contact service technician.

x32 Gas flow fault

This event code is displayed due to one of the following:

- 632 - Gas saturation warning/error.
 - 632 - No gas out error.
1. Check gas input pressure.
 2. Check the gas hoses, gas pressure regulator and connectors and acknowledge.
 3. Select the appropriate setting of gas flow in the control panel.

x33 USB fault

This event code is displayed due to one of the following:

- 033 - USB high current.
 - 033 - USB read/write error.
1. Make sure that the USB is in good working condition and configured properly.
 2. Contact service technician.

x35 Software runtime fault

This event code is displayed due to one of the following:

- 035 - Message allocation error.
 - 035 - Driver message allocation error.
 - 035 - Event queue overflow.
 - 035 - Failed to start microservices.
1. Restart the system.
 2. Contact service technician.

x36 External stop

This event code is displayed due to one of the following:

- 736 - Fieldbus quickstop.
 - 736 - Fieldbus superquickstop.
1. Acknowledge by pressing any buttons on the control panel.
 2. Restart.

9 TROUBLESHOOTING

Perform these checks and inspections before contacting an authorized service technician.

Check that power is disconnected before starting any type of repair action.

Type of fault	Corrective action
No arc	Check that the mains power supply switch is turned ON.
	Check that the mains, welding, and return cables are correctly connected.
	Check that the correct current value is set.
	Check the electrical power supply fuses.
The welding current is interrupted during welding	Check whether the thermal protection trip has operated (indicated by LED on Overtemperature indicator in control panel).
	Check the mains supply fuses.
Thermal protection trips frequently	Make sure that you are not exceeding the rated data for the power source (i.e. that the unit is not being overloaded).
	Check that the ambient temperature is not above the one for the rated duty cycle 104 °F/40 °C.
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 welding wires are being used.
	Check the main power supply fuses.
Poor cooling effect	Clean the cooling element using compressed air.
	Check the coolant level.
	Check that the ambient temperature is not above the one for the rated duty cycle 104 °F/40 °C.
Intermittent gouging stops or contact between carbon and metal lost	Air pressure is too high. Reduce the air pressure.
	Check whether the air pressure is set to the recommended value. Check the manual for the torch used.
Carbon deposit on the gouge metal	Air pressure is too low. Turn on the air before striking the arc; air should flow between the electrode and the workpiece.
	Check whether the air pressure is set to the recommended value. Check the manual for the torch used.
No arc during start or erratic arc during gouging	Check whether the voltage is set to the recommended value.
Intermittent arc action resulting in an irregular grooved surface or copper deposition on the metal plate	Check whether the voltage is set to the recommended value.

10 ORDERING SPARE PARTS



CAUTION!

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

Warrior Edge 500 is designed and tested in accordance with the international and European standards **EN IEC 60974-1**, **EN IEC 60974-2** and **EN IEC 60974-10 Class A**, Canadian standards **CAN/CSA 60974-1**, **CAN/CSA 60974-2** and US standards **ANSI/IEC 60974-1**, **ANSI/IEC 60974-2**. Upon 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 standards.

Spare parts and wear parts can be ordered through your nearest ESAB dealer, see the back cover of this document. 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.

11 CALIBRATION AND VALIDATION

**WARNING!**

Calibration and validation should be performed by a trained service technician with sufficient training in welding and measurement technology. The technician should have knowledge of hazards that may occur during welding and measurement and should take necessary protective actions!

11.1 Measurement methods and tolerances

When calibrating and validating, the reference measuring instrument must use the same measuring method in the DC range (averaging and rectification of the measured values). A number of measurement methods are used for reference instruments, e.g. TRMS (True Root Mean Square), RMS (Root-Mean-Square) and rectified arithmetic mean. Warrior Edge 500 uses the rectified arithmetic mean value and should therefore be calibrated against a reference instrument using the rectified arithmetic mean value.

In the field application it will occur that a measuring device and a Warrior Edge 500 may display different values even though both systems are validated and calibrated. This is due to the measurement tolerances and the method of measurement of the two measurement systems. This can result in a total deviation up to the sum of both measurement tolerances. If the measurement method differ (TRMS, RMS or rectified arithmetic mean), significantly larger deviations are to be expected!

The ESAB Warrior Edge 500 welding power source presents the measured value in rectified arithmetic mean and should therefore not show any significant differences compared to other ESAB welding equipment, due to the measurement method.

11.2 Requirements, specifications and standards

Warrior Edge 500 is designed to meet the accuracy for indication and meters required by IEC/EN 60974-14, by definition Standard grade.

Calibration accuracies of displayed value

Arc voltage $\pm 1.5 \text{ V}$ ($U_{\text{min}}-U_2$) under load, resolution 0.25 V (Theoretical measuring range in a Warrior Edge 500 system is 0.25–199 V.)

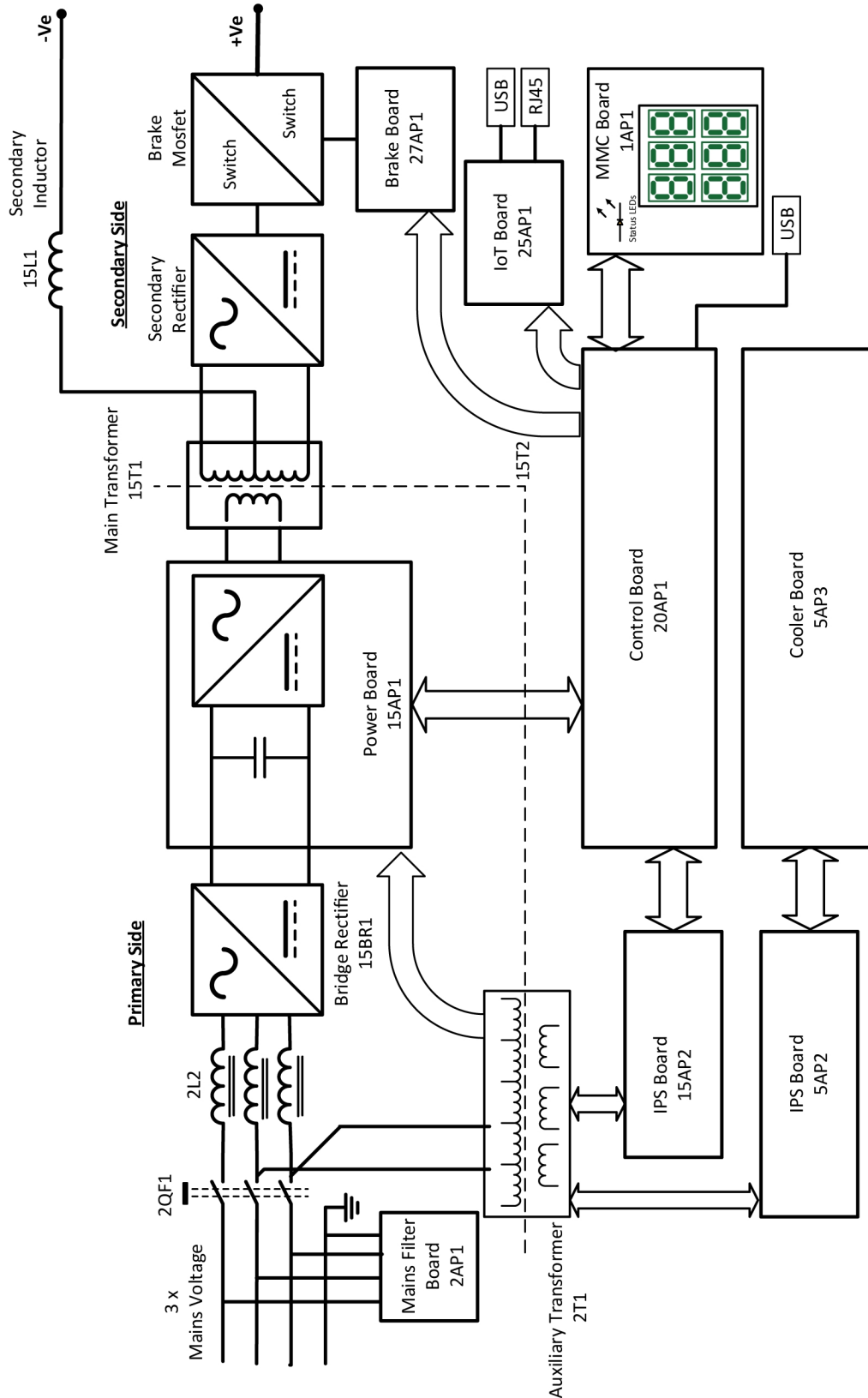
Welding current $\pm 2.5\%$ of I_2 max according to rating plate of the unit under test, resolution 1 A. The measuring range is specified by the rating plate on the used Warrior Edge 500 welding power source.

Recommended method and applicable standard

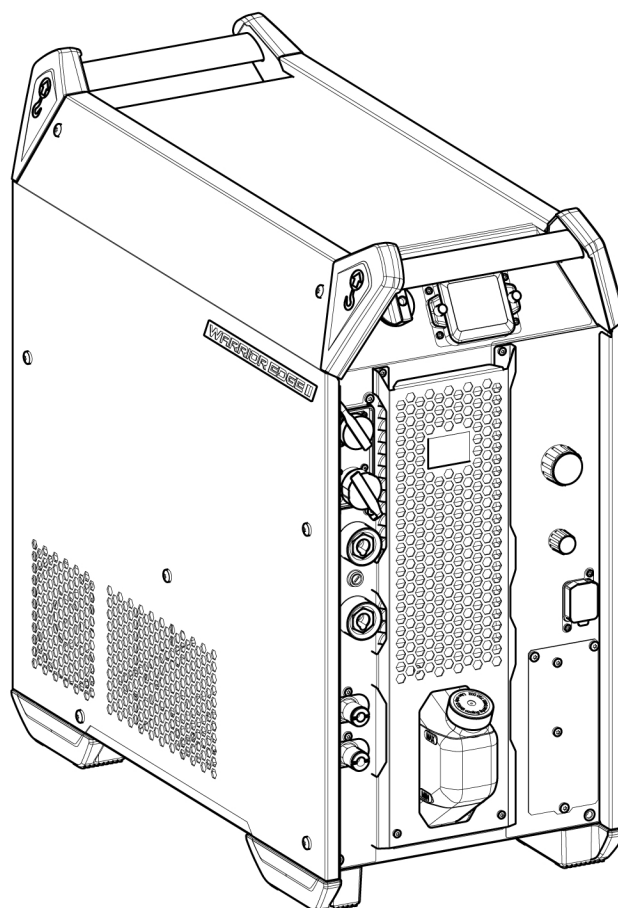
ESAB recommend calibration and validation to be executed according to IEC/EN 60974-14 (unless another way of execution is communicated from ESAB).

APPENDIX

WIRING DIAGRAM



ORDERING NUMBERS

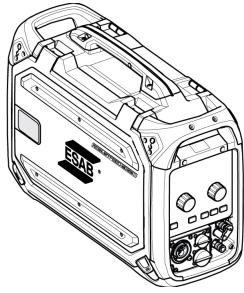
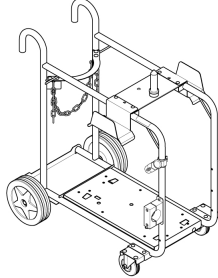

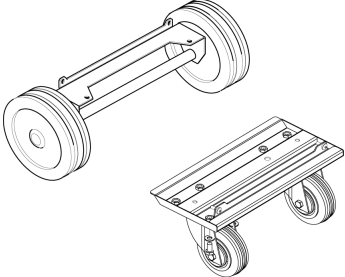


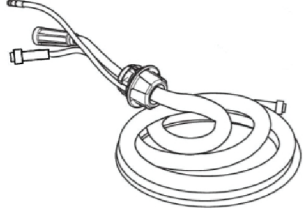
Ordering number	Denomination	Type	Notes
0446 300 881	Power source	Warrior Edge 500 CX I	380-575 V, CSA
0446 300 887	Power source	Warrior Edge 500 CX II	380-575 V, CSA Including SPEED
0463 775 *	Instruction manual		
0463 844 001	Service manual		
0463 843 001	Spare parts list		

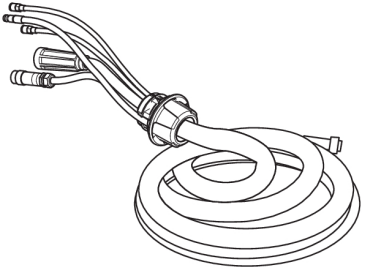
The three last digits in the document number of the manual show the version of the manual. Therefore they are replaced with * here. Make sure to use a manual with a serial number that corresponds with the product, see the front page of the manual.

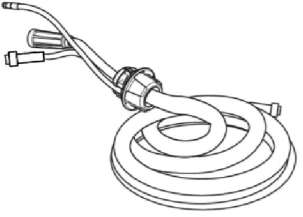
Technical documentation is available on the Internet at: www.esab.com

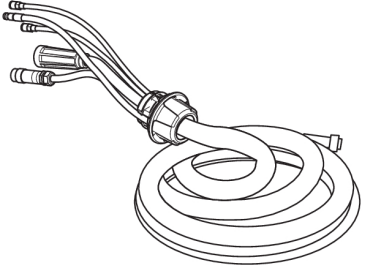
ACCESSORIES

0446 600 880	RobustFeed Edge BX with EURO connector, torch cooling system and NFC.	
0446 600 881	RobustFeed Edge CX with EURO connector, torch cooling system, NFC, heater and digital gas control.	
0446 600 885	RobustFeed Edge DX Tweco with Tweco connector, torch cooling system, NFC, heater, digital gas control and MMA outlet	
0349 313 450	Trolley , compatible with RobustFeed Edge and Warrior Edge 500 For assembly instruction, refer to document 0463 357 102	
0465 720 002	ESAB ready mixed coolant (10 l / 2.64 gal) Use of any other cooling liquid than the prescribed one might damage the equipment. In case of such damage, all warranty undertakings from ESAB cease to apply.	
0465 416 880	Edge wheel kit For assembly instruction, refer to document 0463 360 101	

Interconnection cable with pre-assembled strain relief, Air cooled, 70 mm²		
0446 310 880	2.3 m (7 ft)	
0446 310 881	5 m (16 ft)	
0446 310 882	10 m (33 ft)	
0446 310 883	15 m (49 ft)	
0446 310 884	20 m (66 ft)	
0446 310 885	25 m (82 ft)	
0446 310 886	35 m (115 ft)	
0446 310 887	50 m (164 ft)	

Interconnection cable with pre-assembled strain relief, Liquid cooled, 70 mm²		
0446 310 890	2.3 m (7 ft)	
0446 310 891	5 m (16 ft)	
0446 310 892	10 m (33 ft)	
0446 310 893	15 m (49 ft)	
0446 310 894	20 m (66 ft)	
0446 310 895	25 m (82 ft)	
0446 310 896	35 m (115 ft)	

Interconnection cable with pre-assembled strain relief, Air cooled, 95 mm²		
0446 310 980	2.3 m (7 ft)	
0446 310 981	5 m (16 ft)	
0446 310 982	10 m (33 ft)	
0446 310 983	15 m (49 ft)	
0446 310 984	20 m (66 ft)	
0446 310 985	25 m (82 ft)	
0446 310 986	35 m (115 ft)	
0446 310 987	50 m (164 ft)	

Interconnection cable with pre-assembled strain relief, Liquid cooled, 95 mm²		
0446 310 990	2.3 m (7 ft)	
0446 310 991	5 m (16 ft)	
0446 310 992	10 m (33 ft)	
0446 310 993	15 m (49 ft)	
0446 310 994	20 m (66 ft)	
0446 310 995	25 m (82 ft)	
0446 310 996	35 m (115 ft)	



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