

Castolin Eutectic®  
Eutectic Castolin

**GSI 850**



Manual /  
**TÉCNICO**

**DOC  
PLACEHOLDER**

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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 summarise precautionary information from the references listed in 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 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 watch 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, cuff less trousers, 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 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 far. 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. Remove 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 coatings 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 do 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 operations, inspect the work area to make certain there are no hot sparks or hot metal which could cause a later fire. 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 ground system of the input power.
2. Connect the workpiece to a good electrical ground.
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 earth 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 ground 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 having pacemakers should consult their physician 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 minimise 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 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 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 ventilation is not adequate. Stop work and take 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 adaptors. Maintain hoses and fittings in good condition. Follow manufacturer's operating instructions for mounting 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 engine or drive systems before installing or connecting 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 to you:

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

### 1.3 User responsibility

Users of Eutectic 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

### If equipped with Eutectic cooler

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

Recommended Eutectic coolant ordering number: 0465 720 002.

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



#### 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.



**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.

**Eutectic has an assortment of welding accessories and personal protection equipment for purchase. For ordering information contact your local Eutectic 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](http://www.P65Warnings.ca.gov).

## 2 INTRODUCTION

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### 2.1 Overview

The **GSI 850** is a welding power source intended for GMAW welding, as well as for welding with powder filled cored wire (FCAW-S), for GTAW welding, for welding with coated electrodes (SMAW) and arc air gouging.

The power sources are intended for use with the following wire feed units:

- SmartFeed 400
- ArcWeld 484
- ArcWeld 420 ST
- ArcWeld 404HD

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

### 2.2 Equipment

The power source is supplied with:

- 5 m return cable with earth clamp
- instruction manual

### 3 TECHNICAL DATA

For 460 V variants:

<b>GSI 850</b>			
<b>Working voltage</b>	380-460 V, $\pm 10\%$ , 3~50/60 Hz		
<b>Primary current</b>	380 V	400 V	460 V
$I_{max}$ . GMAW - MIG	70 A	66 A	58 A
$I_{max}$ . GTAW - TIG	55 A	52 A	45 A
$I_{max}$ . SMAW - MMA	70 A	66 A	58 A
$I_{max}$ . Gouging	70 A	66 A	58 A
<b>No load power</b> in energy-saving mode 6.5 min. after welding	31 W		
<b>Setting range for all modes</b>			
GMAW - MIG flat characteristic	16A/15V – 820 A/44V		
GTAW - TIG drooping characteristic	10A/10V – 820A/34V		
SMAW - MMA drooping characteristic	16A/15V – 820A/44V		
Gouging	100A/18V – 820A/44V		
<b>Permissible load at GMAW</b>			
60% duty cycle	820A / 44V		
100% duty cycle	750A / 44V		
<b>Permissible load at GTAW</b>			
60% duty cycle	820A / 34V		
100% duty cycle	750A / 34V		
<b>Permissible load at SMAW</b>			
60% duty cycle	820A / 44V		
100% duty cycle	750A / 44V		
<b>Gouging</b>			
60% duty cycle	820A / 44V		
100% duty cycle	750A / 44V		
<b>Power factor at maximum current</b>			
GMAW	0.91		
GTAW			
SMAW			
Gouging			
<b>Efficiency at maximum current</b>			
GMAW	91%		
GTAW			
SMAW			
Gouging			
<b>Open-circuit voltage without VRD function</b>	72V DC		

<b>GSI 850</b>	
<b>Operating temperature</b>	-10 – 40 C° (14 – 104 F°)
<b>Transport temperature</b>	-20 – 55 C° (-4 – □ 131 F°)
<b>Constant sound pressure when idling</b>	<70 dB (A)
<b>Dimensions l × w × h</b>	32.7 x 16.2 x 24.8 in. (832 x 413 x 630 mm)
<b>Weight (welding power source)</b>	227 lb (103 kg)
<b>Insulation class</b>	H
<b>Enclosure class</b>	IP 23
<b>Application class</b>	S

**For 575 V variants:**

<b>GSI 850</b>				
<b>Working voltage</b>	380-460 V, ±10%, 3~50/60 Hz			
<b>Primary current</b>	380 V	400 V	460 V	575 V
$I_{max}$ . GMAW - MIG	70 A	66 A	58 A	46 A
$I_{max}$ . GTAW - TIG	55 A	52 A	45 A	36 A
$I_{max}$ . SMAW - MMA	70 A	66 A	58 A	46 A
$I_{max}$ . Gouging	70 A	66 A	58 A	46 A
<b>No load power</b> in energy-saving mode 6.5 min. after welding	31 W			
<b>Setting range for all modes</b>				
GMAW - MIG flat characteristic	16A/15V – 820 A/44V			
GTAW - TIG drooping characteristic	10A/10V – 820A/34V			
SMAW - MMA drooping characteristic	16A/15V – 820A/44V			
Gouging	100A/18V – 820A/44V			
<b>Permissible load at GMAW</b>				
60% duty cycle	820A / 44V			
100% duty cycle	750A / 44V			
<b>Permissible load at GTAW</b>				
60% duty cycle	820A / 34V			
100% duty cycle	750A / 34V			
<b>Permissible load at SMAW</b>				
60% duty cycle	820A / 44V			
100% duty cycle	750A / 44V			
<b>Gouging</b>				
60% duty cycle	820A / 44V			
100% duty cycle	750A / 44V			
<b>Power factor at maximum current</b>				

<b>GSI 850</b>	
GMAW	0.91
GTAW	
SMAW	
Gouging	
<b>Efficiency at maximum current</b>	
GMAW	91%
GTAW	
SMAW	
Gouging	
<b>Open-circuit voltage without VRD function</b>	72V DC
<b>Operating temperature</b>	-10 – 40 C° (14 – 104 F°)
<b>Transport temperature</b>	-20 – 55 C° (-4 – 131 F°)
<b>Constant sound pressure when idling</b>	<70 dB (A)
<b>Dimensions l × w × h</b>	32.7 x 16.2 x 24.8 in. (832 x 413 x 630 mm)
<b>Weight (welding power source)</b>	227 lb (103 kg)
<b>Insulation class</b>	H
<b>Enclosure class</b>	IP 23
<b>Application class</b>	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

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### 4.1 General

**The installation must be carried out by a professional.**

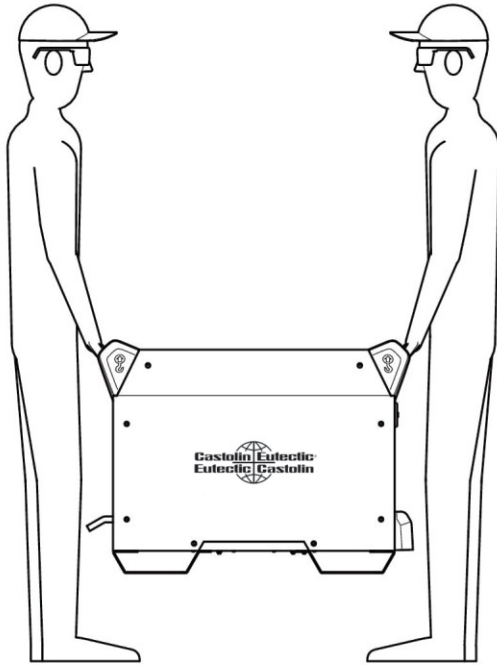


**CAUTION!**

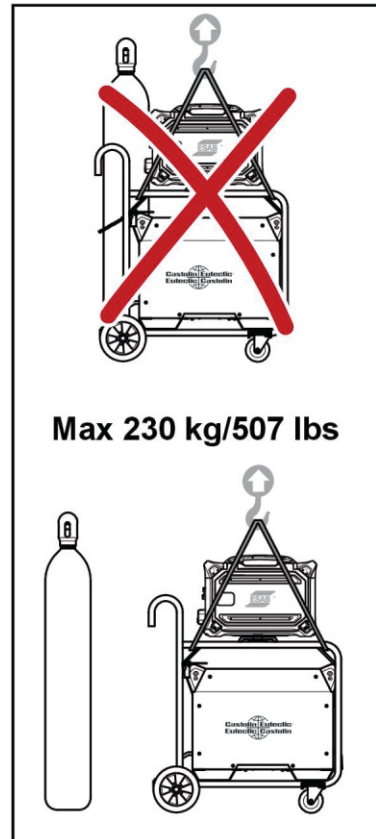
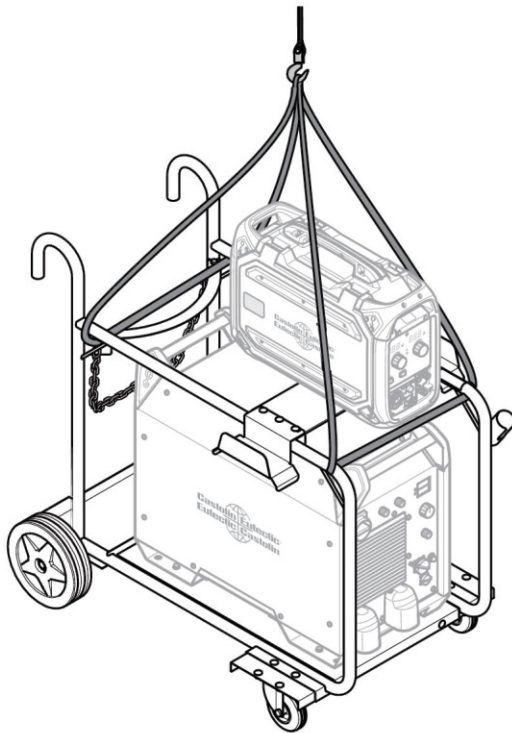
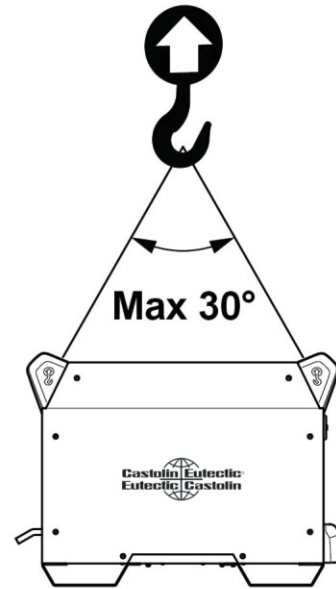
This product is intended for industrial use. In a domestic environment this product may cause radio interference. It is the user's responsibility to take adequate precautions.



## 4.2 Lifting instructions



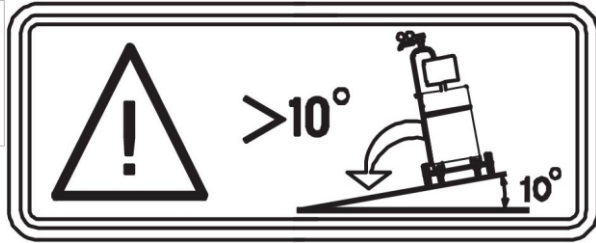
**Max 103 kg/227 lbs**





**WARNING!**

Secure the equipment - particularly if the ground is uneven or sloping.



### 4.3 Location

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

### 4.4 Mains supply

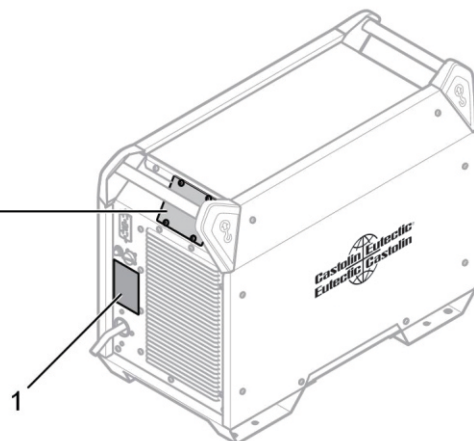
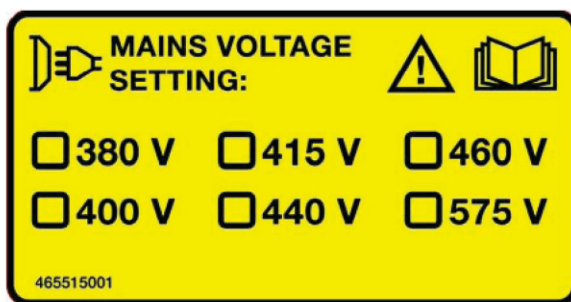


**NOTE!**

**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.

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.



1. Rating plate with supply connection data

*Recommended fuse sizes and minimum cable area GSI 850*

GSI 850		
<b>Mains voltage</b>	380V 3~ 50/60 Hz	400V 3~ 50/60 Hz
<b>Mains cable area</b>	4x16 mm <sup>2</sup>	4x16 mm <sup>2</sup>

GSI 850		
<b>Phase current <math>I_{\text{eff}}</math></b>	65 A	62 A
<b>Fuse</b> anti-surge type C MCB	70 A	66 A

GSI 850		
<b>Mains voltage</b>	415V 3~ 50/60 Hz	440V 3~ 50/60 Hz
<b>Mains cable area</b>	4x16 mm <sup>2</sup>	4x12 mm <sup>2</sup>
<b>Phase current <math>I_{\text{eff}}</math></b>	60 A	56 A
<b>Fuse</b> anti-surge type C MCB	64 A	60 A

GSI 850		
<b>Mains voltage</b>	460V 3~ 50/60 Hz	575V 3~ 50/60 Hz
<b>Mains cable area</b>	4x12 mm <sup>2</sup>	4x8 mm <sup>2</sup>
<b>Phase current <math>I_{\text{eff}}</math></b>	54 A	43 A
<b>Fuse</b> anti-surge type C MCB	58 A	46 A

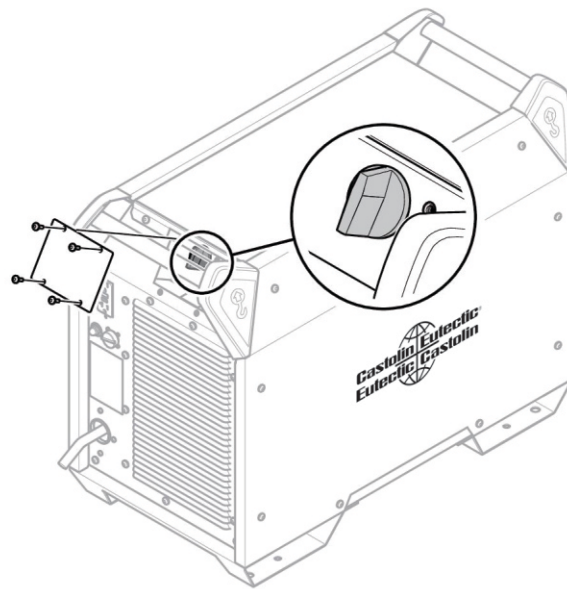
**NOTE!**

*The mains cable areas and fuse sizes as shown above are in accordance with Swedish regulations. Use the power source in accordance with the relevant 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 equivalent or better type of regulation, with rated power  $\geq 75$  kW, are recommended.

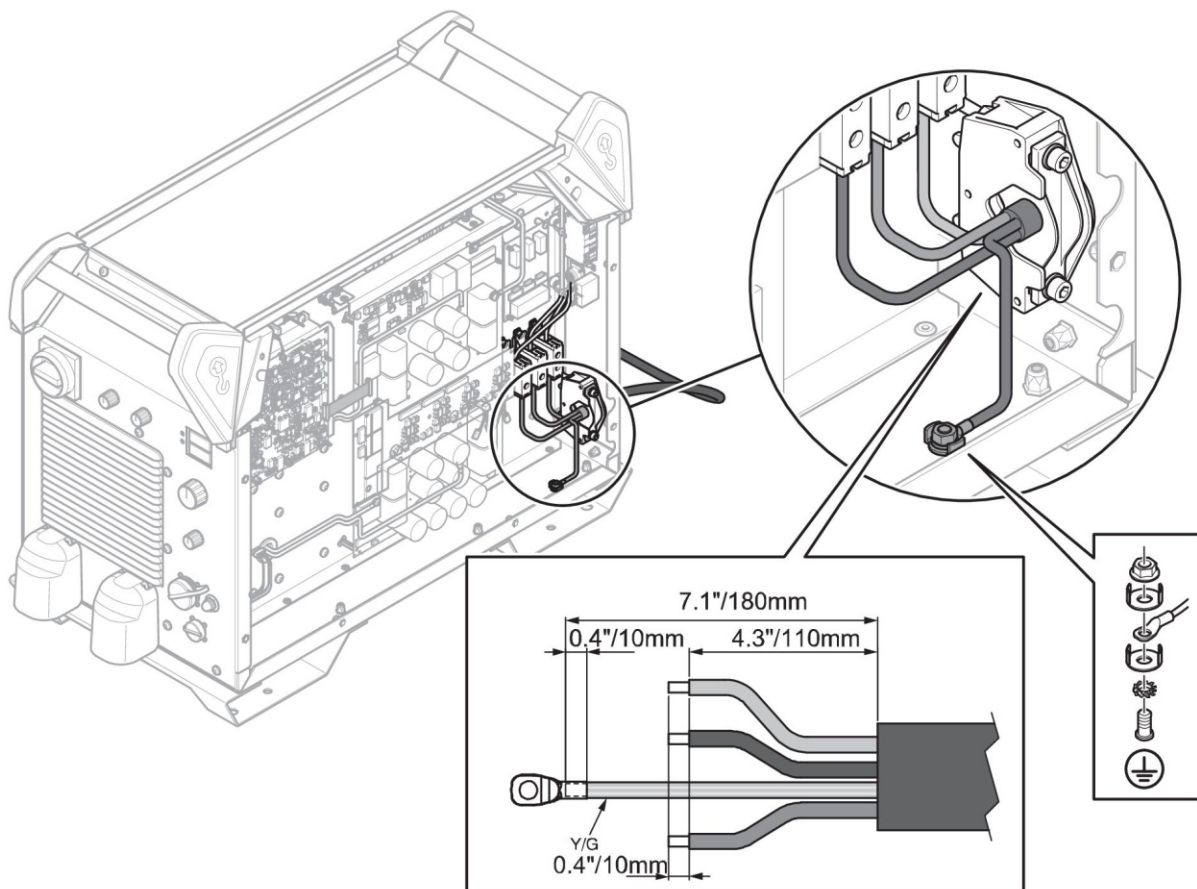
**Connection instruction**



The power source GSI 850 CC/CV (0445 555 881) for North America is connected to 460 V from the factory.

If a different mains voltage is required, the cover plate has to be removed and switch can be positioned for the required voltage.

**Installation of mains cable**

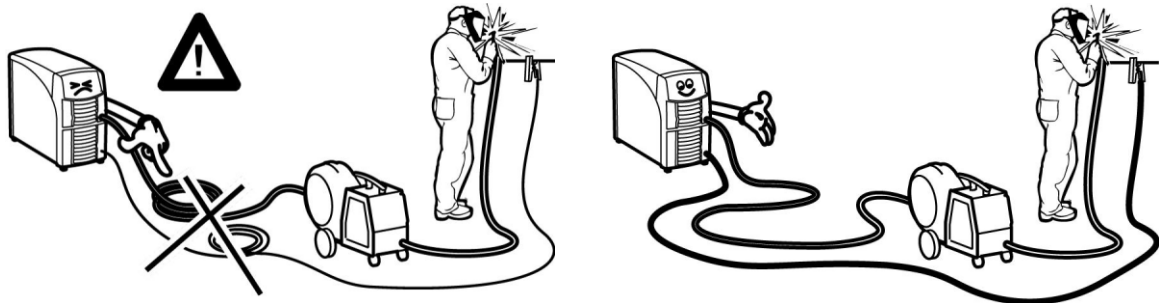


A mains cable needs to be installed. It is then important that the earth connection to the bottom plate must be made in a correct way. See the picture above for the order in which the washers, nuts and screws are placed.

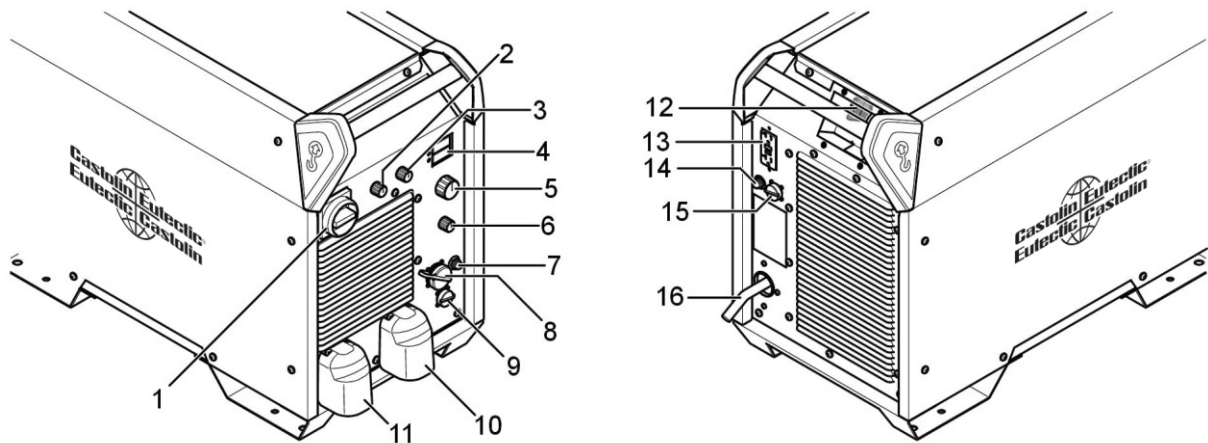
## 5 OPERATION

### 5.1 Overview

General safety regulations for handling the equipment can be found in the chapter "Safety". Read it through before you start the equipment.



### 5.2 Connections and control devices



- |                                                                      |                                                                                                                              |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 1. Mains power supply switch, O/I                                    | 9. Connection for remote control unit (option)                                                                               |
| 2. Knob for selecting electrode type                                 | 10. Connection (-): MIG/MAG: Return cable<br>TiG: Welding torch MMA: Welding cable or return cable<br>Gouging: Return cable  |
| 3. Knob for inductance (MIG/MAG) and arc force (MMA)                 | 11. Connection (+): MIG/MAG: Welding cable<br>TiG: return cable MMA: Welding cable or return cable<br>Gouging: Welding torch |
| 4. Display, current (A) and voltage (V)                              | 12. Voltage selector switch                                                                                                  |
| 5. Knob for setting: SMAW/GTAW: current (A) and Gouging: voltage (V) | 13. Power socket for grinding machine, CO2 heater, lighting                                                                  |
| 6. Process selection knob (SMAW, GMAW, GTAW, Mobile feed, Gouging)   | 14. Circuit breaker, 20 A, 115/230 VAC                                                                                       |
| 7. Circuit breaker, 10 A, 42 V                                       | 15. Connection for cooler power supply                                                                                       |
| 8. Connection for wire feed unit                                     | 16. Connection for mains power supply                                                                                        |

### 5.3 Connection of welding and return cables

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



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

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

#### Recommended maximum current values for connection set cables

$I_{max}$	Cable area	Cable length	Note
820 A (60% duty cycle)	2×120 mm <sup>2</sup>	6.6 ft – 114.8 ft (2 – 35 m)	19 pole
750 A (100% duty cycle)			
600 A (60% duty cycle)	120 mm <sup>2</sup>	6.6 ft – 114.8 ft (2 – 35 m)	19 pole
500 A (100% duty cycle)			
550 A (60% duty cycle)	95 mm <sup>2</sup>	6.6 ft – 114.8 ft (2 – 35 m)	19 pole
450 A (100% duty cycle)			

#### 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 104°F (40°C).

## 5.4 Turning the mains power on/off

Turn on the mains power by turning switch to the "I" position, see 1 on the picture above.

Turn the unit off by turning the switch to the "O" position.

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





#### CAUTION!









Do not turn off the power source during welding (with load).

## 5.5 Fan control

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

## 5.6 Symbols and functions

	Placement of lifting eye	VRD	Voltage Reducing Device
	Overheating protection	Basic	Basic electrode

Rutile	Rutile electrode	Cel	Cellulosic electrode
	Arc force		Inductance
	TIG welding (Live TIG)		Arc air gouging
	MMA welding		MIG/MAG welding
 Mobile Feed CV	Wire feed unit Mobile feed CV (Constant voltage)		Protective earth

### 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 an overheating indication lamp is lit.

The overheating protection resets automatically when the temperature has fallen, within normal working temperature.

### Arc force

The arc force is important in determining how the current changes in response to a change in the arc length. A lower value gives a calmer arc with less spatter.

*It only applies to SMAW welding.*

### Inductance

Higher inductance results in a wider weld pool and less spatter. Lower inductance produces a harsher sound but a stable, concentrated arc.

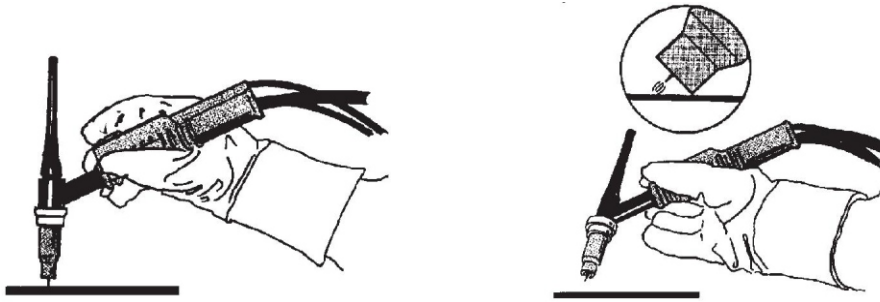
*It only applies to GMAW welding.*

### GTAW welding

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

#### "Live TIG-start"

At a "Live TIG-start" the tungsten electrode is placed against the workpiece. When the electrode is lifted away from workpiece, the arc is struck at a limited current level.



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

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

### Arc air gouging

With arc air gouging, a special electrode comprising a carbon rod with a copper casing is used.

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

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

- arc air torches
- compressed air
- return cable with clamp

*Recommended for gouging*

Electrode	Voltage min.	Voltage max.	Electrode Extension
6 mm (1/4")	36 V	49 V	50 – 76 mm (2 – 3")
8 mm (5/16")	39 V	52 V	
10 mm (3/8")	43 V	52 V	
13 mm (1/2")	44 V	55 V	

### SMAW welding

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

For SMAW welding the power source shall be supplemented with:

- welding cable with electrode holder
- return cable with clamp

### GMAW and self shielded cored wire welding

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

For GMAW and self shielded core wire 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 MAINTENANCE

### 6.1 Overview

Regular maintenance is important for safe, reliable operation.

Only personnel with the appropriate electrical skills (authorized staff) may remove 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.

### 6.2 Power source

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
- the working environment
- the surrounding environment, that is grinding etc.

Tools needed for the cleaning procedure:

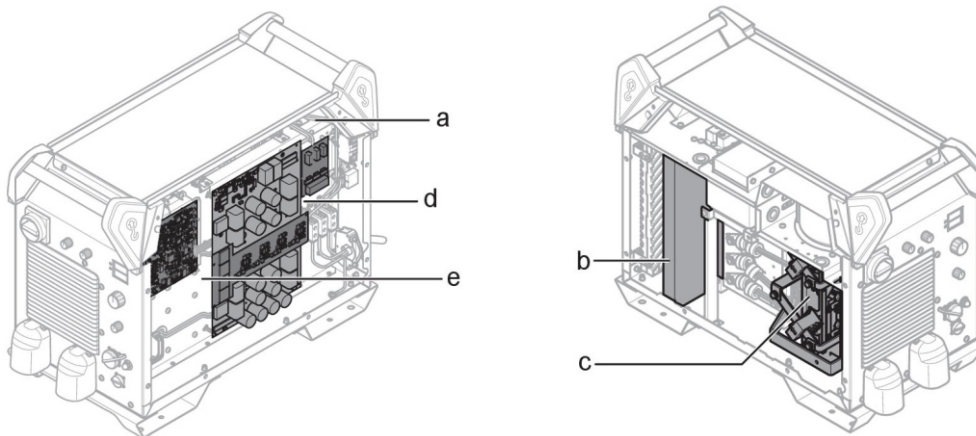
- torx screwdriver, T25 and T30
- dry compressed air at a pressure of 4 bar
- protective equipment like ear plugs, safety glasses, masks, gloves and safety shoes



#### CAUTION!

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

#### Cleaning procedure



1. Disconnect the mains supply.
2. Wait for 4 minutes to discharge the capacitors.
3. Remove the side panels on the power source.
4. Remove the top panel on the power source.
5. Remove the plastic cover between the heat sink and fan (b).

6. Clean the power source with dry compressed air (4 bar) as follows:
  - a) The upper rear part.
  - b) From the rear panel through the secondary heat sink.
  - c) The inductor, transformer and current sensor.
  - d) The power components side, from the rear side behind PCB 15AP1.
  - e) The PCBs at both sides.
7. Make sure that there is no dust left on any part.
8. Install the plastic cover between the heat sink and the fan (b) and make sure it is correctly fitted against the heat sink.
9. Do a test of the power source according to IEC 60974-4, follow the procedure in section "After repair, inspection and test" in the Service manual.
10. Install the top panel on the power source.
11. Install the side panels on the power source.
12. Connect the mains supply.

### **6.3 Welding torch**

A regular programme of care and maintenance reduces unnecessary and expensive downtime.

Each time a wire bobbin is changed, the welding torch should be removed from the power source and blown clean with compressed air.

The wire end must not have sharp edges when inserted into the wire liner.

For detailed information see instruction manuals for welding torches.

## 7 TROUBLESHOOTING

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

Type of fault	Corrective action
No arc.	<ul style="list-style-type: none"> <li>• Check that the mains power supply switch is turned on.</li> <li>• Check that the mains, welding and return cables are correctly connected.</li> <li>• Check that the correct current value is set.</li> <li>• Check the mains power supply fuses.</li> </ul>
The welding current is interrupted during welding.	<ul style="list-style-type: none"> <li>• Check whether the overloading protection has deployed (indicated on the front).</li> <li>• Check the mains power supply fuses.</li> <li>• Check that the return cable is correctly fastened.</li> </ul>
The overheating protection trips frequently.	<ul style="list-style-type: none"> <li>• Make sure that you are not exceeding the rated data for the power source (i.e. that the unit is not being overloaded).</li> </ul>
Poor welding performance.	<ul style="list-style-type: none"> <li>• Check that the welding and return cables are correctly connected.</li> <li>• Check that the correct current value is set.</li> <li>• Check that the correct wire or electrode is used.</li> <li>• Check the mains power supply fuses.</li> <li>• Check the gas pressure in the equipment connected to the power source.</li> </ul>
"Err" on display in open circuit mode	<ul style="list-style-type: none"> <li>• Check the mains power supply fuses.</li> <li>• Check that the voltage on the voltage selection label on the rear of the power source is equal to the nominal mains voltage.</li> <li>• Restart the power source with the main switch.</li> </ul>

## 8 ORDERING SPARE PARTS

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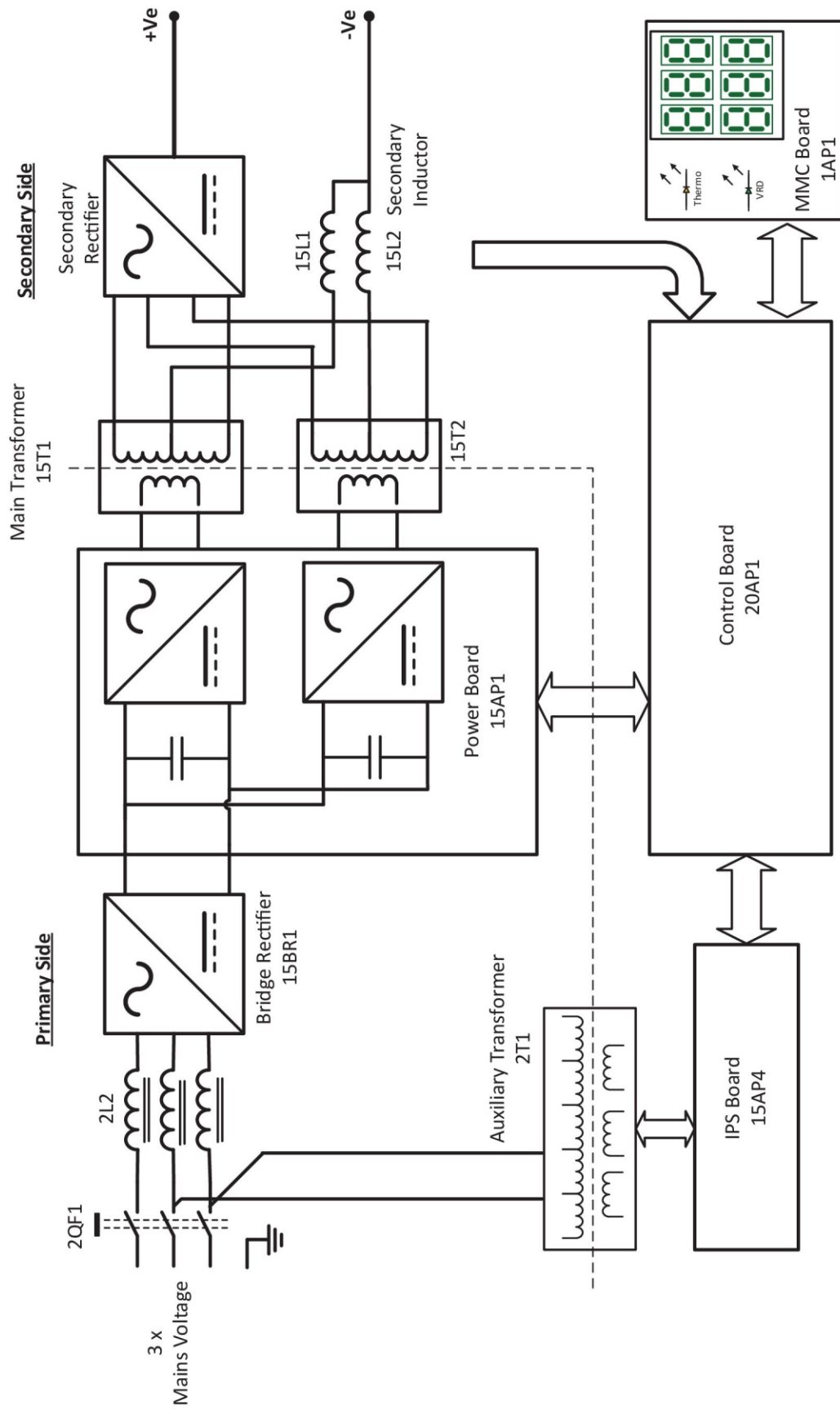
### CAUTION!

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

GSI 850 is designed and tested in accordance with the international standards **IEC 60974-1**, Canadian standards **CAN/CSA E60974-1:11** and US standards **ANSI/IEC 60974-1:2008**. On completion of service or repair work, it is the responsibility of the person(s) performing the work to ensure that the product still complies with the requirements of the above standards.

Spare parts and wear parts can be ordered through your nearest Eutectic dealer, see [Eutectic.com](http://Eutectic.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.

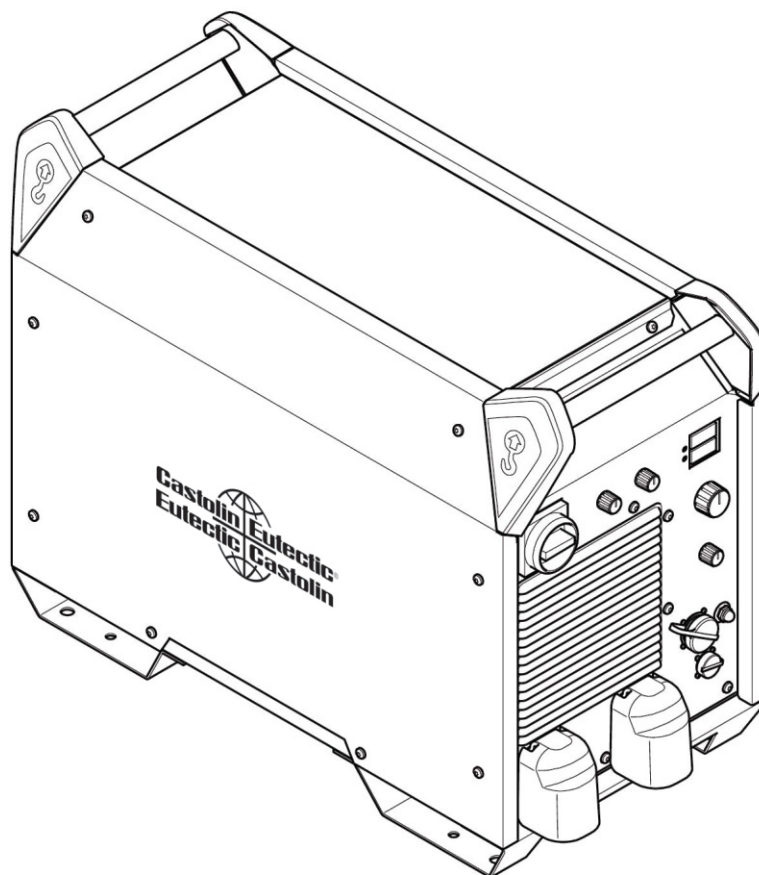
# DIAGRAM



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**ORDERING NUMBERS**

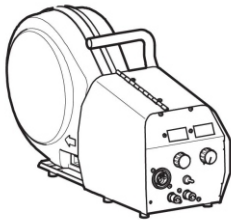

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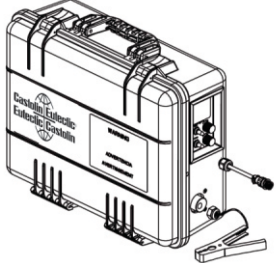
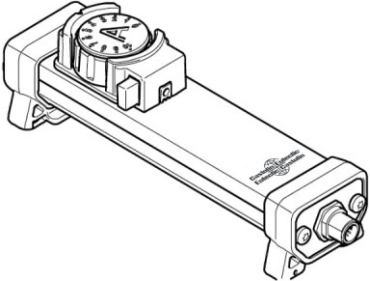

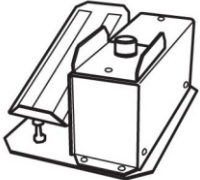
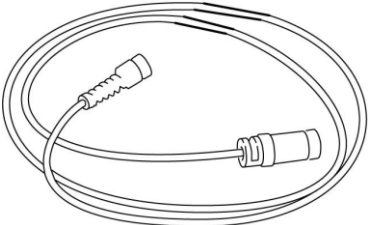
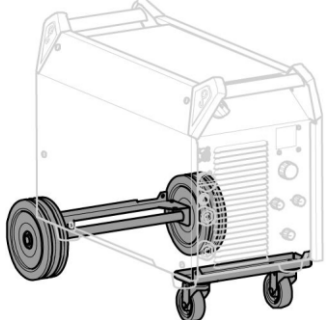


Ordering number	Denomination	Type	Notes
	Welding power source	GSI 850	575 V Canada
	Spare parts list		
	Service manual		

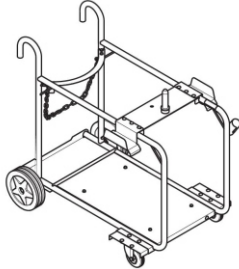
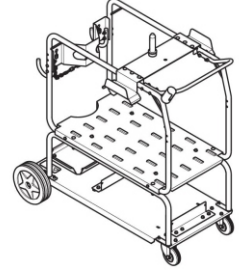
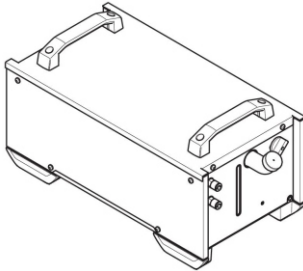
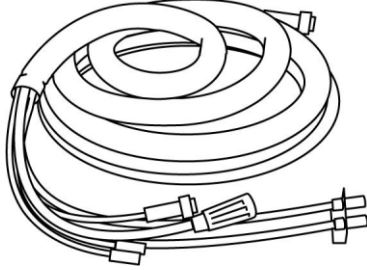
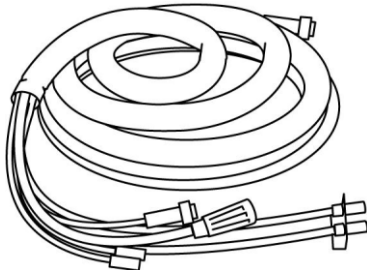
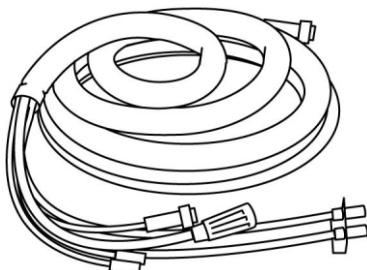
Technical documentation is available on the Internet at: <http://www.eutectic.com.br/manuais>

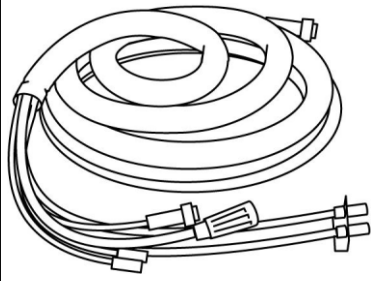
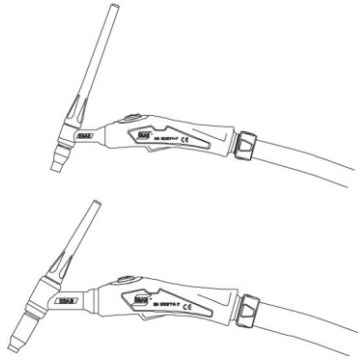


## ACCESSORIES

	<p><b>SmartWeld</b></p>	
	<p><b>SmartWeld with water cooling</b></p>	
	<p><b>ArcWeld 404 HD</b></p>	
	<p><b>SmartFeed 400</b></p>	
	<p><b>MobileFeed</b></p>	

	<p><b>MobileFeed</b></p>	
	<p><b>Remote control unit AT1</b> SMAW and GTAW current</p>	
	<p><b>Remote control unit AT1 CF</b> SMAW and GTAW: course and fine setting of current</p>	
	<p><b>Foot control FS002</b> MMA and TIG: current</p>	
<p><b>Remote control cable 12 pole - 8 pole</b></p>		
	<p>5 m 10 m 15 m 25 m</p>	
	<p><b>Wheel kit</b></p>	



	<b>Trolley (Air cooled)</b>	
	<b>Trolley (Water cooled)</b>	
	<b>Cooling unit</b>	
<b>Connection set, 70 mm<sup>2</sup>, 19 poles</b>		
	2 m 5 m 10 m 15 m 25 m 35 m	
<b>Connection set water, 70 mm<sup>2</sup>, 19 poles</b>		
	2 m 5 m 10 m 15 m 25 m 35 m	
<b>Connection set, 95 mm<sup>2</sup>, 19 poles</b>		
	2 m 5 m 10 m 15 m 25 m 35 m	

<b>Connection set water, 95 mm<sup>2</sup>, 19 poles</b>		
	2 m 5 m 10 m 15 m 25 m 35 m	
<b>GTAW torches</b>		
	TXH™ 151 V, OKC 50, 4 m TXH™ 151 V, OKC 50, 8 m TXH™ 201 V, OKC 50, 4 m TXH™ 201 V, OKC 50, 8 m	
<b>Arc air torches</b>		
	K4000 Gouging torch	
	Flair 600 incl monocable 2.5 m Torch only Monocable only Flair 1600 incl monocable 2.5 m Torch only Monocable only	





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**Internet:** <http://www.eutectic.com.br>