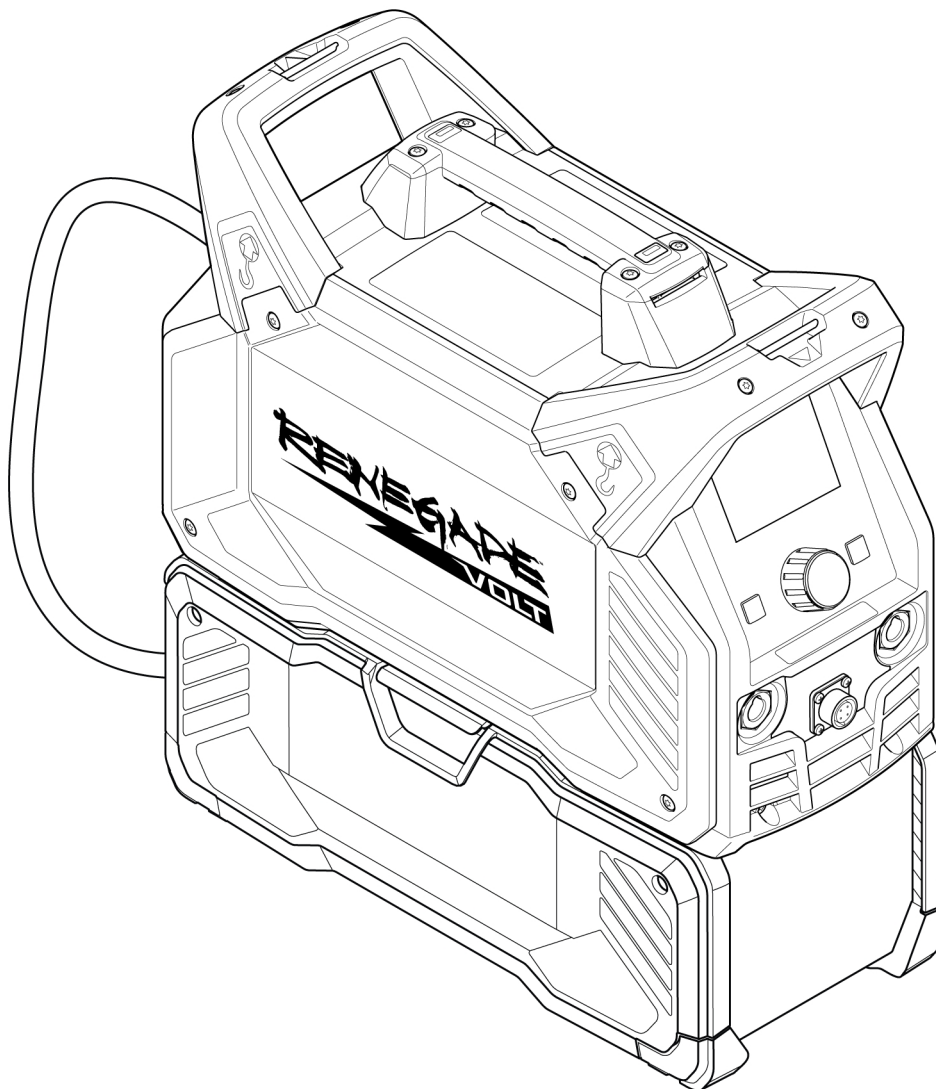




Renegade VOLT ES 200i



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.



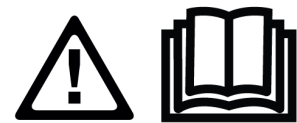
CAUTION!

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.



WARNING!

Shock hazard. Battery voltage class B classification of an electric component or circuit with a maximum Battery Working Voltage between 60 VDC and 1500 VDC.



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, cuffless 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 with 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 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 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.



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 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, can cause injury. Therefore:

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

**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 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 unauthorized person is stationed within the working area of the equipment when it is started up
 - no-one is unprotected when the arc is struck or work is started with the equipment
3. The workplace must:
 - be suitable for the purpose
 - be free from drafts
4. Personal safety equipment:
 - Always wear recommended personal safety equipment, such as safety glasses, flame-proof clothing, safety gloves
 - Do not wear loose-fitting items, such as scarves, bracelets, rings, etc., which could become trapped or cause burns
5. General precautions:
 - Make sure the return cable is connected securely
 - Work on high voltage equipment **may only be carried out by a qualified electrician**
 - Appropriate fire extinguishing equipment must be clearly marked and close at hand
 - Lubrication and maintenance must **not** be carried out on the equipment during operation



WARNING!

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



ELECTRIC SHOCK - Can kill

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



ELECTRIC AND MAGNETIC FIELDS - Can be dangerous to health

- Welders with 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, guards and covers closed and securely in place.
- Have only qualified people remove covers for maintenance and troubleshooting as necessary.
- To prevent accidental starting of equipment during service, disconnect negative (-) battery cable from battery, remove batteries, or unplug from the wall.
- Keep hands, hair, loose clothing and tools away from moving parts.
- Reinstall panels or covers and close doors when service is finished and before starting the unit.

**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.

**CAUTION!**

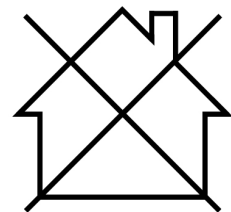
Battery box is recommended only for Renegade VOLT ES 200i power source.

**CAUTION!**

This product is solely intended for arc welding.

**CAUTION!**

Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility of class A equipment in those locations, due to conducted as well as radiated disturbances.

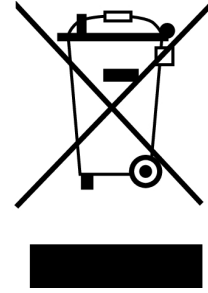


**NOTE!**
Dispose of electronic equipment at the recycling facility!

To conform with the European Directive 2012/19/EC on Waste Electrical and Electronic Equipment and its implementation in accordance with national law, electrical and/or electronic equipment that has reached the end of its life must be disposed of at a recycling facility.

As the person responsible for the equipment, it is your responsibility to obtain information on approved collection stations.

For further information contact the nearest ESAB dealer.



1.4 Precautions for operations

**WARNING!**

Do not remove the batteries from the battery box during the operation.

**CAUTION!**

Turn off the power source before removing the batteries from the battery box.

- Make sure the battery box interface cable is connected to the power source.
- Do not unplug the battery box / DC Interface cable irrespective of any mode.
- Make sure to turn OFF the power source as stated below before unplugging the battery box interface cable,
 - By pressing the ON/OFF Membrane switch in the front panel.
 - By turning OFF the grid power switch (120/230 VAC) in the back panel.
- Make sure to keep the battery box door closed during operation.
- Do not attempt to clean the inside of the battery box while batteries are connected or during operation.
- When the power source and battery box are **transported separately** by any means,
 - Ensure that the battery packs are correctly inserted in their respective slots and firmly seated. The battery box door should always be locked.
 - On the power source, the battery box socket lid should be closed.
- When both the power source and battery box are **connected and transported** by any means,
 - Ensure that the battery packs are correctly inserted in their respective slots and firmly seated. The battery box door should always be locked.
 - Ensure that the DC / battery box interface cable in the battery is connected to the power source.
 - Ensure that the battery box latch is firmly connected to the power source.
 - Ensure that the battery box door latch lock is firmly locked.

1.5 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.

1.6 Safety instructions for battery packs



WARNING!

Read all safety warnings and all instructions for the battery pack, charger, and welding power source. Failure to follow the warnings and instructions may result in electric shock, fire, and/or serious injury.



WARNING!

Burn hazard. Battery liquid may be flammable if exposed to spark or flame.



WARNING!

Never service damaged battery packs. Service of battery packs should only be performed by the manufacturer or authorized service providers.



WARNING!

Fire hazard. Never attempt to open the battery pack for any reason. If the battery pack case is cracked or damaged, do not insert into the charger. Do not crush, drop, or damage the battery pack. Do not use a battery pack or charger that has received a sharp blow, been dropped, run over or damaged in any way (e.g., pierced with a nail, hit with a hammer, stepped on). Damaged battery packs should be returned to the service center for recycling.

- **Do not** charge or use the battery pack in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Inserting or removing the battery pack from the charger may ignite the dust or fumes.
- Never force the battery pack into the charger. **Do not** modify the battery pack in any way to fit into a non-compatible charger as battery pack may rupture causing serious personal injury. Only charge the battery pack with chargers recommended in this manual.
- Charge the battery packs only in designated DeWALT chargers.
- **Do not** splash or immerse in water or other liquids.
- **Do not** store or use the welding power source and battery pack in locations where the temperature may reach or exceed **104 °F (40 °C)** (such as outside sheds or metal buildings in the summer). For best battery life, store battery packs in a cool, dry location.



NOTE!

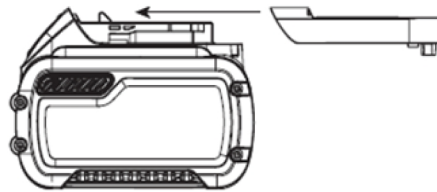
Store the battery packs in a battery box with the interface cables connected to the welding power source.

- **Do not** incinerate the battery pack even if it is severely damaged or is completely worn out. The battery pack can explode in a fire. Toxic fumes and materials are created when lithium-ion battery packs are burned.
- If battery contents come into contact with the skin, immediately wash area with mild soap and water. If battery liquid gets into the eye, rinse water over the open eye for 15 minutes or until irritation ceases. If medical attention is needed, the battery electrolyte is composed of a mixture of liquid organic carbonates and lithium salts
- Contents of opened battery cells may cause respiratory irritation. Provide fresh air. If symptoms persist, seek medical attention.

Transportation

- Fire hazard. **Do not** store or carry the battery pack so that metal objects can contact exposed battery terminals. For example, do not place the battery pack in aprons, pockets, toolboxes, product kit boxes, drawers, etc., with loose nails, screws, keys, etc. Transporting batteries can cause fires if the battery terminals inadvertently come in contact with conductive materials such as keys, coins, hand tools, etc.

- Transporting the DeWALT FLEXVOLT™ battery. The DeWALT FLEXVOLT™ battery has two modes: **Use** and **Transport**.
 - **Use mode:** The FLEXVOLT™ battery can operate as a 20V battery in a DeWALT 20V tool and a 60V battery in a DeWALT 60V tool. Renegade Volt ES 200i can utilize only 20V of the DeWALT FLEXVOLT™ batteries.
 - **Transport mode:** When the cap is attached to the FLEXVOLT™ battery, the battery is in transport mode. Keep the cap for shipping. When in transport mode, strings of cells are electrically disconnected within the pack resulting in three batteries with a lower Watt hour (Wh) rating as compared to one battery with a higher Watt hour rating. This increased quantity of three batteries with the lower Watt hour rating can exempt the pack from certain shipping regulations that are imposed upon the higher Watt hour batteries.



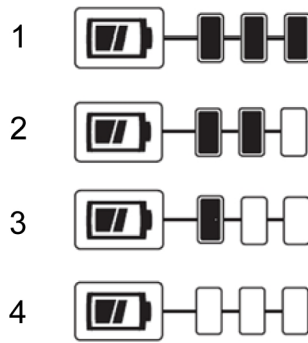
The battery label indicates two Watt hour ratings (refer to following image). For example, the transport Wh rating might indicate 3 x 36 Wh, meaning three batteries of 36 Wh each. The use Wh rating might indicate 108 Wh (one battery implied).

**NOTE!**

Make sure that the protective covers are not disposed of after transportation.

**Charge status gage battery packs**

Some DeWALT battery packs include a charge status gage which consists of three green LED lights that indicate the level of charge remaining in the battery pack. The charge status gage is an indication of approximate levels of charge remaining in the battery pack according to the following indicators:



- 1. 75 - 100% charged
- 2. 51 - 74% charged

- 3. < 50% charged
- 4. Battery needs to be charged

To actuate the charge status gage, press and hold the charge status gage button. A combination of the three green LED lights will illuminate designating the level of charge left. When the level of charge in the battery is below the usable limit, the charge status gage will not illuminate, and the battery will need to be recharged.



NOTE!

The charge status gage is only an indication of the charge left on the battery pack. It does not indicate tool functionality and is subject to variation based on product components, temperature, and end-user application.

For more information regarding charge status gage battery packs, please visit DeWALT www.dewalt.com.

The RBRC® seal



The RBRC® (Rechargeable Battery Recycling Corporation) seal on nickel cadmium, nickel metal hydride, or lithium-ion batteries (or battery packs) indicates that the costs to recycle these batteries (or battery packs) at the end of their useful life have already been paid by DeWALT. In some areas, it is illegal to throw used nickel cadmium, nickel metal hydride or lithium-ion batteries in the trash or

municipal solid waste stream and the Call 2 Recycle® program provides an environmentally conscious alternative.

Call 2 Recycle, Inc., in cooperation with DeWALT and other battery users, has established the program in the United States and Canada to facilitate the collection of used nickel cadmium, nickel metal hydride, or lithium-ion batteries. Help protect our environment and conserve natural resources by returning the spent nickel cadmium, nickel metal hydride, or lithium-ion batteries to an authorized DeWALT service center or to your local retailer for recycling. You may also contact your local recycling center for information on where to drop off the used battery. RBRC® is a registered trademark of Call 2 Recycle, Inc.

1.7 Safety instructions for battery chargers



WARNING!

Read all safety warnings and all instructions for the battery pack, charger, and welding power source. Failure to follow the warnings and instructions may result in electric shock, fire, and/or serious injury.

- **Do not** attempt to charge the battery pack with any chargers other than the ones recommended in this manual. The charger and battery pack are specifically designed to work together.
- These chargers are not intended for any uses other than charging DeWALT rechargeable batteries. Any other uses may result in risk of fire, electric shock, or electrocution.
- **Do not** expose the charger to rain or snow.
- When disconnecting the charger, pull by the plug rather than the cord. This reduces the risk of damage to the electric plug and cord.
- Make sure that the cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
- **Do not** use an extension cord unless it is necessary. Use of improper extension cord could result in fire, electric shock, or electrocution.
- If the plug or power cord is damaged, it must be replaced by the manufacturer or its representative or by an equally qualified person to avoid danger.
- **Do not** place any object on top of the charger or place the charger on a soft surface that might block the ventilation slots and result in excessive internal heat. Place the charger in a position away from any heat source. The charger is ventilated through slots in the top and the bottom of the housing.
- **Do not** operate the charger with a damaged cord or plug.
- **Do not** operate the charger if it has received a sharp blow, been dropped, or otherwise damaged in any way. Take it to an authorized service center.
- **Do not** disassemble the charger; take it to an authorized service center when service or repair is required. Incorrect reassembly may result in electric shock, electrocution, or fire.
- Disconnect the charger from the outlet before attempting any cleaning. This reduces the risk of electric shock. Removing the battery pack will not reduce this risk.
- **Never** attempt to connect two chargers together.
- The charger is designed to operate on standard 120 V household electrical power. **Do not** attempt to use it on any other voltage. This does not apply to the vehicular charger.



WARNING!

Shock hazard. Do not allow any liquid to get inside the charger. This may result in electric shock.



WARNING!

Burn hazard. Do not submerge the battery pack in any liquid or allow any liquid to enter the battery pack. Never attempt to open the battery pack for any reason. If the plastic housing of the battery pack breaks or cracks, return to a service center for recycling.

**CAUTION!**

Burn hazard. To reduce the risk of injury, only charge DeWALT rechargeable battery packs. Other types of batteries may overheat and burst resulting in personal injury and property damage.

**NOTE!**

Under certain conditions, with the charger plugged into the power supply, the charger can be shorted by foreign material. Foreign materials of a conductive nature, such as, but not limited to, grinding dust, metal chips, steel wool, aluminum foil or any buildup of metallic particles should be kept away from the charger cavities. Always unplug the charger from the power supply when there is no battery pack in the cavity. Unplug the charger before attempting to clean.

Operations

- Longest life and best performance can be obtained if the battery pack is charged when the air temperature is between 18 ° – 24 °C. **Do not** charge the battery pack below 4.5 °C or above 40 °C. This is important and prevents serious damage to the battery pack.
- The charger and battery pack may become warm to the touch while charging. This is a normal condition and does not indicate a problem. To facilitate the cooling of the battery pack after use, avoid placing the charger or battery pack in a warm environment such as in a metal shed or an uninsulated trailer.
- The DCB104 battery charger is equipped with an internal fan designed to cool the charger. The fan turns on automatically when the charger needs to be cooled. Never operate the charger if the fan does not operate properly or if ventilation slots are blocked. **Do not** permit foreign objects to enter the interior of the charger.
- If the battery pack does not charge properly:
 - Check operation of socket by plugging in a lamp or other appliance.
 - Move the charger and battery pack to a location where the surrounding air temperature is approximately 18 ° – 24 °C.
 - If charging problems persist, take the welding power source, battery pack, and charger to your local service center.
- The battery pack should be recharged when it fails to produce sufficient power on jobs which were easily done previously. **Do not** continue to use under these conditions. Follow the charging procedure. You may also charge a partially used pack whenever you desire with no adverse effect on the battery pack
- Foreign materials of a conductive nature such as, but not limited to, grinding dust, metal chips, steel wool, aluminum foil, or any build-up of metallic particles should be kept away from charger cavities. Always unplug the charger from the power supply when there is no battery pack in the cavity. Unplug the charger before attempting to clean.
- Do not freeze or immerse the charger in water or any other liquid.

Storage

- The best storage place is one that is cool and dry, away from direct sunlight and excess heat or cold.
- For long storage, it is recommended to store a fully charged battery pack in a cool and dry place out of the charger for optimal results.

**NOTE!**

Battery packs should not be stored completely depleted of charge. The battery pack will need to be recharged before use.

Cleaning



WARNING!

Shock hazard. Disconnect the charger from the AC outlet before cleaning. Dirt and grease may be removed from the exterior of the charger using a cloth or soft non-metallic brush. Do not use water or any cleaning solutions.

ESAB has an assortment of welding accessories and personal protection equipment for purchase. For ordering information contact your local ESAB dealer or visit us on our website.

2 INTRODUCTION

The Renegade VOLT **ES 200i** is an inverter-based power source that can be run on either battery power (DC) or 120/230 VAC. This power source is intended to be used for MMA / Stick / SMAW and TIG / GTAW welding. The power source can be run using either one of the methods below:

- Mains Mode
- Battery Mode
- AMP+ Hybrid Mode

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

2.1 Equipment

The Renegade VOLT **ES 200i (0447 800 880, 0447 800 884)** is supplied with:

- Power source
- Battery box
- DeWALT FLEXVOLT 12AH batteries (4 X)
- DeWALT FLEXVOLT Four-port fast charger
- Electrode holder, 3 m, 16 mm², 50 OKC
- Return cable 200A, 10 ft (3 m)
- Grid power cable, 10 ft (3 m)
- Power adapter, 230 V to 120 V, 15 A
- Shoulder strap kit
- Instruction manual
- Quick start guide

The Renegade VOLT **ES 200i (0448 560 880)** is supplied with:

- Power source
- Battery box
- Electrode holder, 3 m, 16 mm², 50 OKC
- Return cable 200A, 10 ft (3 m)
- Grid power cable, 10 ft (3 m)
- Power adapter, 230 V to 120 V, 15 A
- Shoulder strap kit
- Instruction manual
- Quick start guide

2.2 Batteries and chargers

The battery pack is not fully charged out of the carton. Before using the battery pack and charger, read the safety instructions in the "SAFETY" chapter and then follow the charging procedures outlined. When ordering replacement battery packs, be sure to include the catalog number and voltage.



CAUTION!

Do not use 15AH battery packs for the welding operation.

Only the following battery packs are recommended:

- FLEXVOLT 6AH
- FLEXVOLT 9AH
- FLEXVOLT 12AH

Only use the DeWALT battery back for the DeWALT charger. Be sure to read all safety instructions before using your charger. Consult the represented chart below for compatibility of DeWALT chargers to the respective DeWALT battery packs.

Applicable for NAM: 0447800880 / 0448560880

Batteries required for NAM				Chargers/Charge Times (Minutes)
Catalog number (#)	VDC	Battery capacity (AH)	Weight (kg)	DCB104
DCB606	20/60	6.0/2.0	1.05	60

Batteries required for NAM				Chargers/Charge Times (Minutes)
DCB609	20/60	9.0/3.0	1.46	75
DCB612	20/60	12.0/4.0	1.44	120

Applicable for SAM: 0447800884

Batteries required for SAM				Chargers/Charge Times (Minutes)
Catalog number (#)	VDC	Battery capacity (AH)	Weight (kg)	DCB104
DCB546	18/54	6.0/2.0	1.05	60
DCB547	18/54	9.0/3.0	1.46	75
DCB548	18/54	12.0/4.0	1.44	120

For further information regarding DeWALT batteries and chargers, please call or visit the contact information provided below,

Regions	Contact number
North America	1-800-433-9258
Mexico	01-800-847-2312
Argentina	(011) 4726-4400
Brazil	0800-703-4644
Chile	800-914048
Colombia	(571) 5089100
Costa Rica	0800-5425407
Ecuador	1-800-000910 (5932) 330-3602
El Salvador	2113-3833
Guatemala	2378-4871
Honduras	2540-0269 2263-2422 2263-2432
Nicaragua	001-800-2260574
Panamá	838-5156
Perú	(511) 614-4242
Puerto Rico	787-335-2414
Dominican Republic	829-946-2626

3 TECHNICAL DATA

3.1 Technical data for Mains Mode

Renegade VOLT ES 200i		
Outlet voltage	120 V \pm 15%, 1~ 50/60 Hz	230 V \pm 15%, 1~ 50/60 Hz
Primary current		
I_{1max}	27 A	28 A
I_{1eff}	13.5 A	14 A
No-load power demand when in energy-saving mode	<50 W	<50 W
Setting range		
MMA / Stick / SMAW	10-110 A	10-200 A
TIG / GTAW	10-140 A	10-200 A
Permissible load at MMA / Stick / SMAW		
25% duty cycle	110 A / 24.4	200 A / 28 V
60% duty cycle	70 A / 22.8 V	129 A / 25.2 V
100% duty cycle	55 A / 22.2 V	100 A / 24 V
Permissible load at TIG / GTAW		
25% duty cycle	140 A / 15.6 V	200 A / 18 V
60% duty cycle	90 A / 13.6 V	129 A / 15.2 V
100% duty cycle	70 A / 12.8 V	100 A / 14 V
Apparent power I_2 at maximum current	3.4 kVA	5.8 kVA
Active power I_2 at maximum current	3.3 kW	5.7 kW
Power factor at maximum current		
MMA / Stick / SMAW	0.99	
TIG / GTAW	0.99	
Efficiency at maximum current		
MMA / Stick / SMAW	82%	
TIG / GTAW	82%	
Open-circuit voltage U_0 max		
VRD deactivated	80 V	
VRD activated	<30 V _{peak}	
Operating temperature	+14 to 104°F (-10 to +40°C)	
Transportation temperature	-4 to +161°F (-20 to +55°C)	
Constant sound pressure when idling	<70 dB (A)	

Renegade VOLT ES 200i	
Dimensions l × w × h	
Power source	18.1 × 7.9 × 12.6 in. (460 × 200 × 320 mm)
Power source with battery box	18.9 × 8.7 × 19.1 in. (480 × 220 × 485 mm)
Weight	
Power source	26.5 lbs (12 kg)
Battery box without batteries	15.4 lbs (7 kg)
Battery box with batteries	27.5 lbs (12.5 kg)
System	54.0 lbs (24.5 kg)
Insulation class	H
Enclosure class	IP 23
Application class	S

3.2 Technical data for Battery Mode - 4 DeWALT batteries

Renegade VOLT ES 200i	
Outlet voltage	80 V – 4 DeWALT batteries
Primary current	
$I_{b \max}$	80 A
No-load power demand when in energy-saving mode	<50 W
Setting range	
MMA / Stick / SMAW	10-140 A
TIG / GTAW	10-150 A
Permissible load at MMA / Stick / SMAW	
18% duty cycle	140 A / 25.6 V
25% duty cycle	110 A / 24.4 V
60% duty cycle	80 A / 23.2 V
100% duty cycle	60 A / 22.4 V
Permissible load at TIG / GTAW	
18% duty cycle	150 A / 16 V
25% duty cycle	115 A / 14.6 V
60% duty cycle	90 A / 13.6 V
100% duty cycle	70 A / 12.8 V
Apparent power I_2 at maximum current	N/A
Active power I_2 at maximum current	N/A
Power factor at maximum current	
MMA / Stick / SMAW	N/A
TIG / GTAW	N/A

Renegade VOLT ES 200i	
Efficiency at maximum current	
MMA / Stick / SMAW	80%
TIG / GTAW	80%
Open-circuit voltage U_0 max	
VRD deactivated	68 V
VRD activated	$<30 V_{\text{peak}}$
Operating temperature	+14 to 104°F (-10 to +40°C)
Transportation temperature	-4 to +161°F (-20 to +55°C)
Constant sound pressure when idling	<70 dB (A)
Dimensions l × w × h	
Power source	18.1 × 7.9 × 12.6 in. (460 × 200 × 320 mm)
Power source with battery box	18.9 × 8.7 × 19.1 in. (480 × 220 × 485 mm)
Weight	
Power source	26.5 lbs (12 kg)
Battery box without batteries	15.4 lbs (7 kg)
Battery box with batteries	27.5 lbs (12.5 kg)
System	54.0 lbs (24.5 kg)
Insulation class	H
Enclosure class	IP 23
Application class	S

3.3 Technical data for AMP⁺ Hybrid Mode

Renegade VOLT ES 200i		
Outlet voltage	120 VAC ± 15% + 80 V DC, 1~ 50/60 Hz + DC	230 VAC ± 15% + 80 V DC, 1~ 50/60 Hz + DC
Primary current		
I_{max}	27 A	28 A
No-load power demand when in energy-saving mode	<50 W	<50 W
Setting range		
MMA / Stick / SMAW	10-150 A	10-200 A
TIG / GTAW	10-180 A	10-200 A
Permissible load at MMA / Stick / SMAW		
25% duty cycle	150 A / 26 V	200 A / 28 V
60% duty cycle	90 A / 23.6 V	129 A / 25.2 V
100% duty cycle	70 A / 22.8 V	100 A / 24 V
Permissible load at TIG / GTAW		
25% duty cycle	180 A / 17.2 V	200 A / 18 V

Renegade VOLT ES 200i		
60% duty cycle	130 A / 15.2 V	129 A / 15.2 V
100% duty cycle	100 A / 14 V	100 A / 14 V
Apparent power I₂ at maximum current	3.4 kVA	5.8 kVA
Active power I₂ at maximum current	3.3 kW	5.7 kW
Power factor at maximum current		
MMA / Stick / SMAW	0.99	
TIG / GTAW	0.99	
Efficiency at maximum current		
MMA / Stick / SMAW	82%	
TIG / GTAW	82%	
Open-circuit voltage U₀ max		
VRD deactivated	80 V	
VRD activated	<30 V _{peak}	
Operating temperature	+14 to 104°F (-10 to +40°C)	
Transportation temperature	-4 to +161°F (-20 to +55°C)	
Constant sound pressure when idling	<70 dB (A)	
Dimensions l × w × h		
Power source	18.1 × 7.9 × 12.6 in. (460 × 200 × 320 mm)	
Power source with battery box	18.9 × 8.7 × 19.1 in. (480 × 220 × 485 mm)	
Weight		
Power source	26.5 lbs (12 kg)	
Battery box without batteries	15.4 lbs (7 kg)	
Battery box with batteries	27.5 lbs (12.5 kg)	
System	54.0 lbs (24.5 kg)	
Insulation class	H	
Enclosure class	IP 23	
Application class	S	

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), 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 indoors and may be used outdoors if sheltered during precipitation.

Application class

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

4 INSTALLATION

The installation must be carried out by a professional.



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.



CAUTION!

Remove any packaging material prior to use. Do not block the air vents at the front or rear of the welding power source.

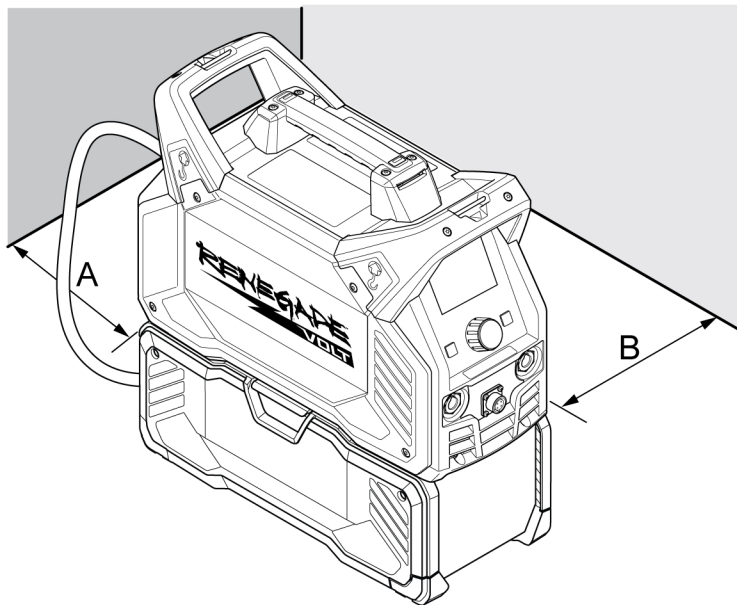


CAUTION!

Loose welding terminal connections can cause overheating and result in the male plug being fused in the terminal.

4.1 Location

Position the power source and battery box in such a way that the cooling air inlets and outlets are not being obstructed.



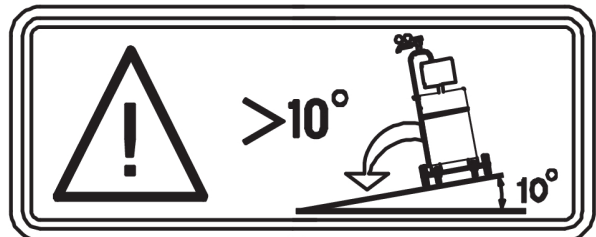
A. Minimum 8 in (200 mm).

B. Minimum 8 in (200 mm).

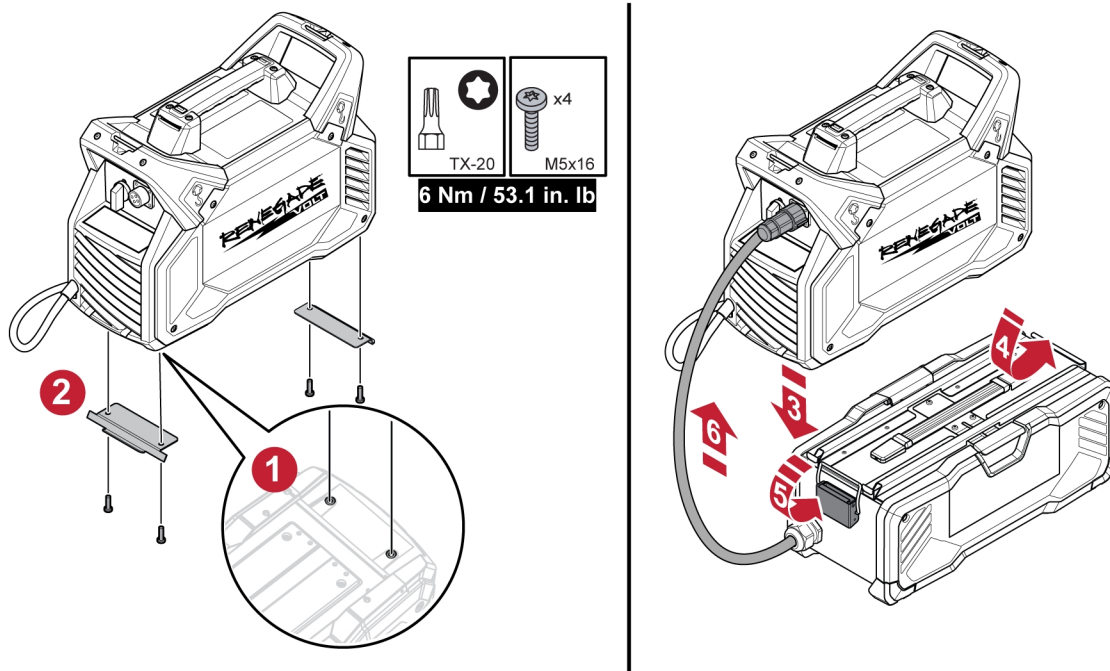


WARNING!

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

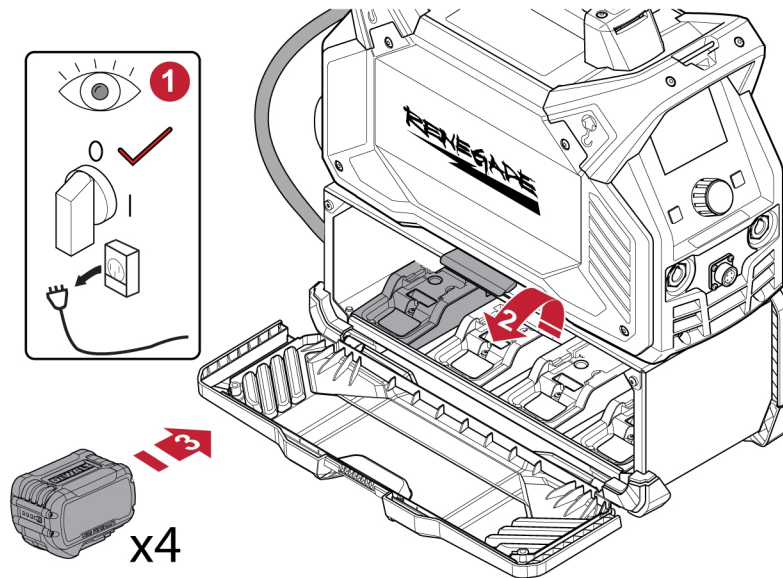


4.2 Connecting battery box to power source



- 1) Invert the power source on a stable surface.
- 2) Place the power source interface mounting kit in location and secure it with the provided hardware. Use 6 Nm/53.1 in.lbs.
- 3) Bring the power source and the battery box together.
- 4) Insert the front power source interface into the battery box front catch.
- 5) Secure the latch on the rear of the battery box on the catches to the rear power interface mounting bracket.
- 6) Connect the battery box interface cable to the receptacle on the rear panel of the power source.

4.3 Installing and removing the battery pack

**CAUTION!**

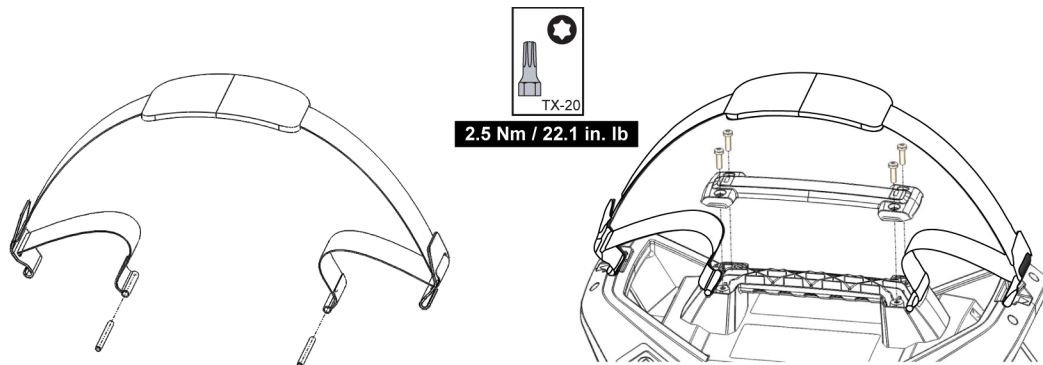
Do not install or remove the battery pack during power ON.

**NOTE!**

Make sure the batteries are fully charged for better performance.

- 1) Make sure that the grid power switch (120/230 VAC) is turned to OFF position and the grid power has been cut off.
- 2) Open the left side panel (L) of the battery box by lifting up the door latch lock.
- 3) To install the battery pack into the battery holder, align the battery pack with slots provided in the battery holder.
- 4) Slide the battery pack gently into the battery holder until the battery pack is firmly seated in their respective slots and ensure that it does not disengage.
- 5) To remove the battery pack from the holder, press the release button provided at the bottom side of the battery and firmly pull the battery pack out of the battery holder.

4.4 Installing shoulder strap



- 1) Insert retention pins into the small loops in the shoulder strap.
- 2) Remove the four screws securing the top handle cover using a TX20 screwdriver.
- 3) Remove handle cover.
- 4) Locate pin retention socket in the handle.
- 5) With pins inserted in the shoulder strap, press each pin into the retention sockets. They will snap into place.
- 6) Reinstall the top handle cover with the four screws using a tightening torque of 2.5 Nm (22.1 in/lbs).
- 7) Use the front and rear handle pins to secure saddle hooks.

4.5 Lifting instructions

The unit is equipped with handles for both mechanical and manual handling means.



WARNING!

Electric shock can kill. Do not touch live electrical parts. Disconnect the input power conductors from the de-energized supply line before moving the welding power source.



WARNING!

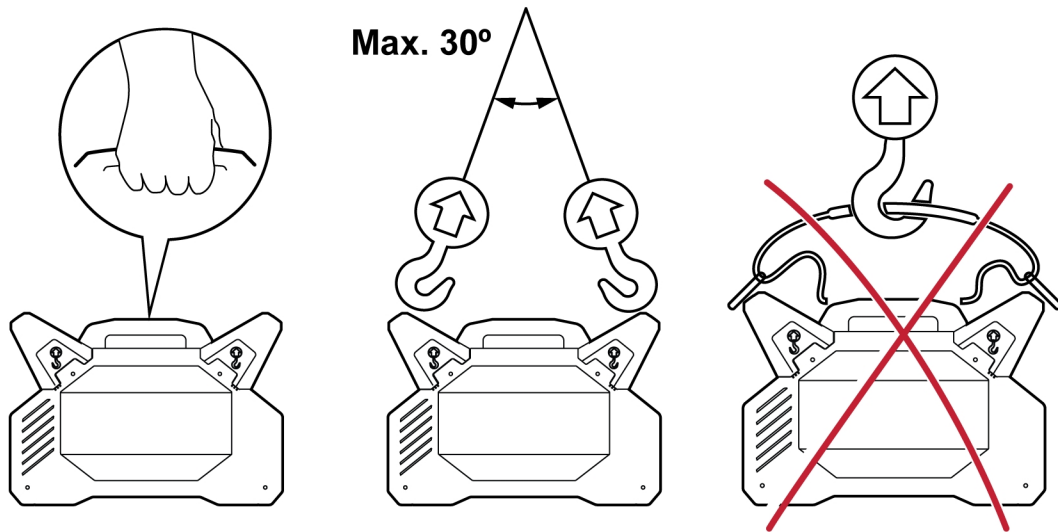
Falling equipment can cause serious personal injury and equipment damage.



WARNING!

Make sure that the hooks are firmly connected before lifting.

Lift the unit with the handle on top of the case.



4.6 Mains supply

The supply voltage should be 230 VAC \pm 15% or 120 VAC \pm 15%. Too low supply voltage may cause poor welding performance. Too high of welding supply voltage will cause components to overheat and possibly fail.



WARNING!

Contact the local electric utility for information about the type of electrical service available, how proper connections should be made, and inspection required.

The welding power source must be:

- Correctly installed, if necessary, by a qualified electrician.
- Correctly earthed (electrically) in accordance with local regulations.
- Connected to the correct size power point and fuse as following table.

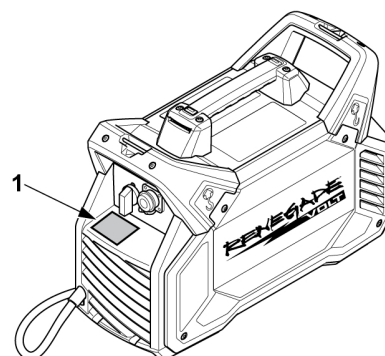


NOTE!

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 when connected through Mains Mode and AMP+ Hybrid Mode. 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} .

1. Rating plate with supply connection data.



Recommended fuse sizes and minimum cable area for the Renegade VOLT ES 200i

	Renegade VOLT ES 200i	
Supply voltage	120 VAC 1P - 50/60 Hz	230 VAC 1P - 50/60 Hz
Maximum current rating (I_{1max}) MMA / SMAW / Stick	27 A	28 A
Maximum effective supply current (I_{1eff}) MMA / SMAW / Stick	13.5 A	14 A
Fuse anti-surge type D MCB or GFCI Outlet Class B	20 A	20 A
Mains supply cable	14 AWG (2.5 mm ²)	14 AWG (2.5 mm ²)
Maximum recommended extension cord length	328 ft (100 m)	328 ft (100 m)
Minimum recommended extension cord size	14 AWG (2.5 mm ²)	14 AWG (2.5 mm ²)

Supply from power generators

The power source can be supplied by 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 of **4 kW for 120 VAC and 7 kW for 230 VAC** are recommended.

**WARNING!**

If used under 115 VAC generator input supply, the supply plug must be greater than 20 A.

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!



WARNING!

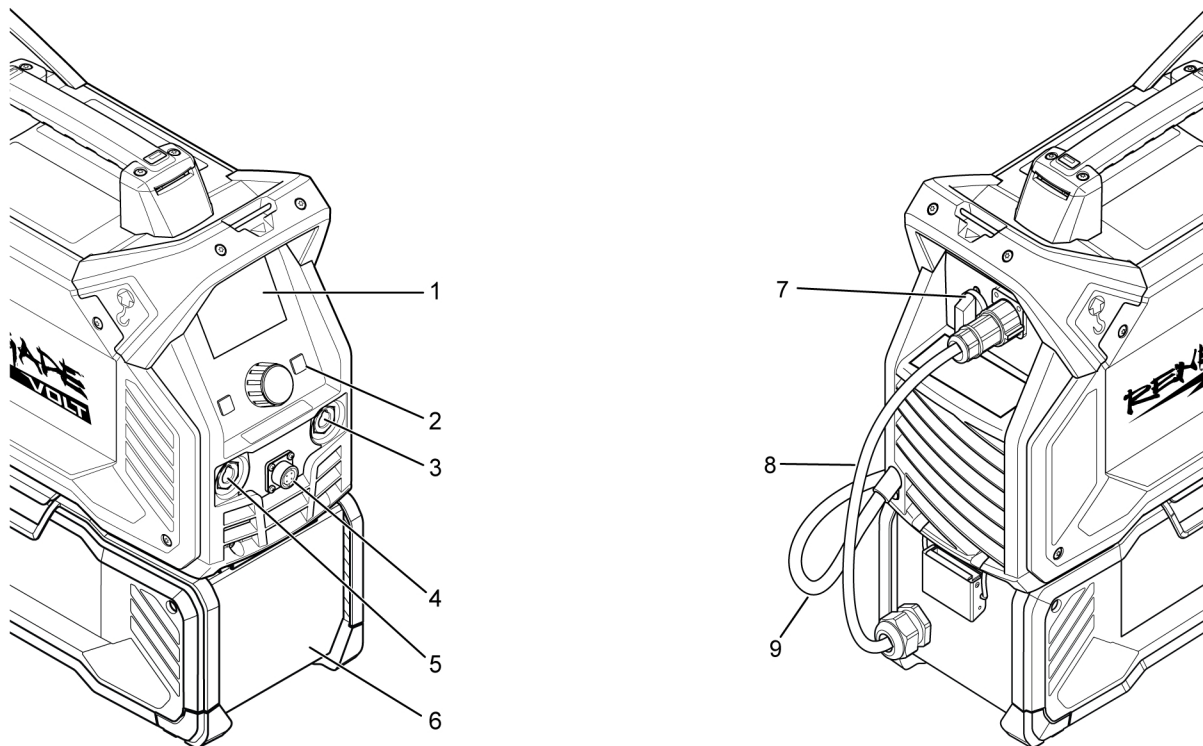
Electric shock! Do not touch the workpiece or the welding head during operation!



NOTE!

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

5.1 Connections



1. Setting panel / TFT display
2. ON/OFF Membrane switch
3. Positive welding terminal
4. Remote socket
5. Negative welding terminal

6. Battery box
7. Grid power switch (120/230 VAC)
8. Battery box / DC interface cable
9. Mains supply cable

5.2 Connecting welding and return cables

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

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

- For TIG / GTAW welding, the negative welding terminal (-) is used for the welding torch and the positive welding terminal (+) is used for the return cable.

- 1) Connect the return cable to the other output on the power source.
- 2) 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.

5.3 MMA / Stick / SMAW welding



MMA / Stick / SMAW welding melts the electrode as well as a local part of the workpiece. The flux, when melting, forms a protective slag and creates a shielding gas to protect the weld pool from atmospheric contamination.

5.4 TIG / GTAW welding



TIG / GTAW welding melts the metal of the workpiece, using an arc initiated from a non-consuming tungsten electrode. The weld pool and electrode are protected by a shielding gas that usually consists of an inert gas.

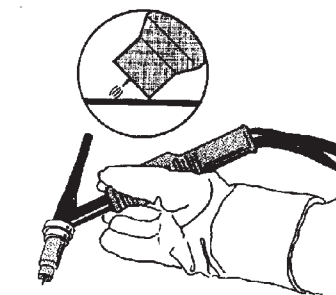
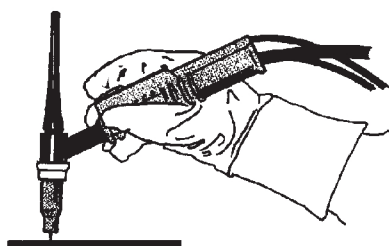
For TIG / GTAW welding, the welding power source shall be supplemented with:

- a TIG / GTAW torch with gas valve and accessories
- a gas hose connected to the gas supply input (threaded fitting 5/8"-18 RH (male))
- Argon gas cylinder
- Argon gas regulator
- a tungsten electrode

This power source performs **Live TIG / GTAW start**.

Live TIG / GTAW arc initiation

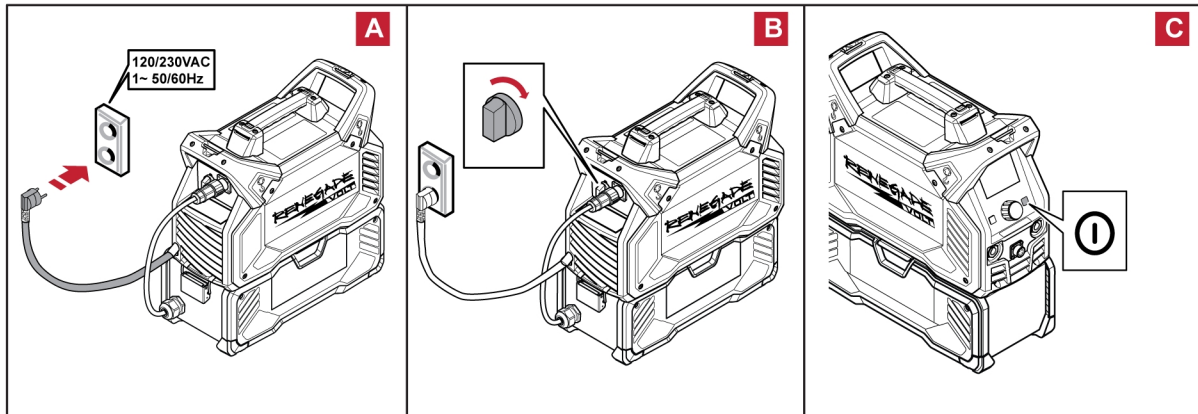
The tungsten electrode is placed against the workpiece. When lifted from workpiece, the arc is struck at a limited current level.



Voltage Reduction Device (VRD)**VRD**

The VRD function ensures that the open-circuit voltage does not exceed 35 V when welding is not being carried out. If the VRD is enabled, it will be indicated on the header bar of the menu screen. Contact an authorized ESAB service technician to activate / deactivate this function.

This function is set to **OFF** by default.

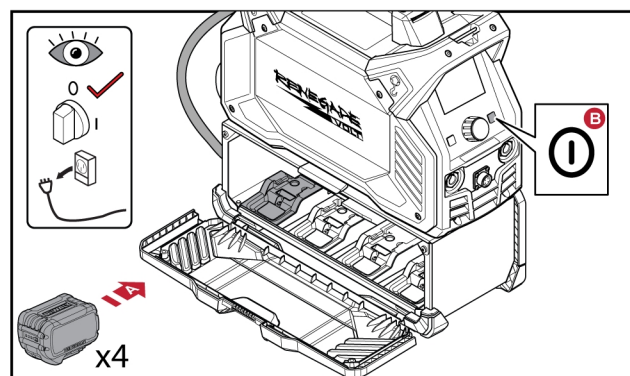
5.5 Turning the power ON/OFF for Mains Mode**CAUTION!**

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

- 1) To turn the unit on:
 - a) Connect the grid power cable to 120V or 230V grid power.
 - b) Rotate the mains switch (120/230 VAC) located on the back panel to the ON (I) position.
 - c) Press the ON/OFF Membrane switch located on the front panel.
- 2) To turn the unit off:
 - a) Press and hold the ON/OFF Membrane switch for 3.0 seconds

**NOTE!**

All weld data will be saved when the power is interrupted or switched off under normal conditions.

5.6 Turning the power ON/OFF for Battery Mode

**CAUTION!**

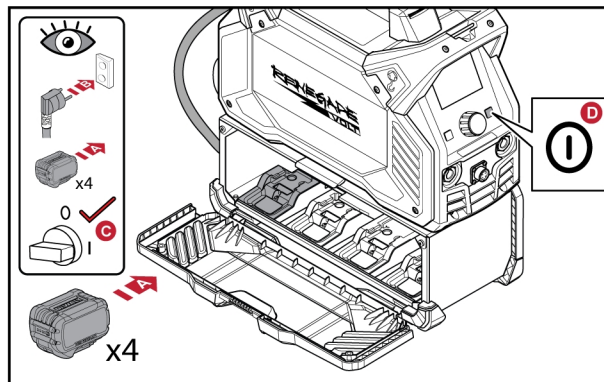
Do not turn off the power source during welding (with load).

- 1) To turn the unit on:
 - a) Install the four batteries.
 - b) Press the ON/OFF Membrane switch on the front of the power source.
- 2) To turn the unit off:
 - a) Press and hold the ON/OFF Membrane switch for 3.0 seconds

**NOTE!**

All weld data will be saved when the power is interrupted or switched off under normal conditions.

5.7 Turning the power ON/OFF for AMP+ Hybrid Mode

**CAUTION!**

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

**CAUTION!**

Do not remove the batteries during welding.

- 1) To turn the unit on:
 - a) Install the four batteries.
 - b) Connect the grid power cable to 120V or 230V grid power.
 - c) Rotate the mains switch (120/230 VAC) located on the back panel to the ON (I) position.
 - d) Press the ON/OFF Membrane switch located on the front panel.
- 2) To turn the unit off:
 - a) Press and hold the ON/OFF Membrane switch for 3.0 seconds

**NOTE!**

All weld data will be saved when the power is interrupted or switched off under normal conditions.

5.8 Fan control

The Renegade VOLT ES 200i is fitted with a cooling fan. When cooling fan is not in use, the fan will automatically turn off.

This functionality has two advantages:

- To minimize power consumption.
- To minimize the number of pollutants into the power source, such as dust.

5.9 Thermal protection



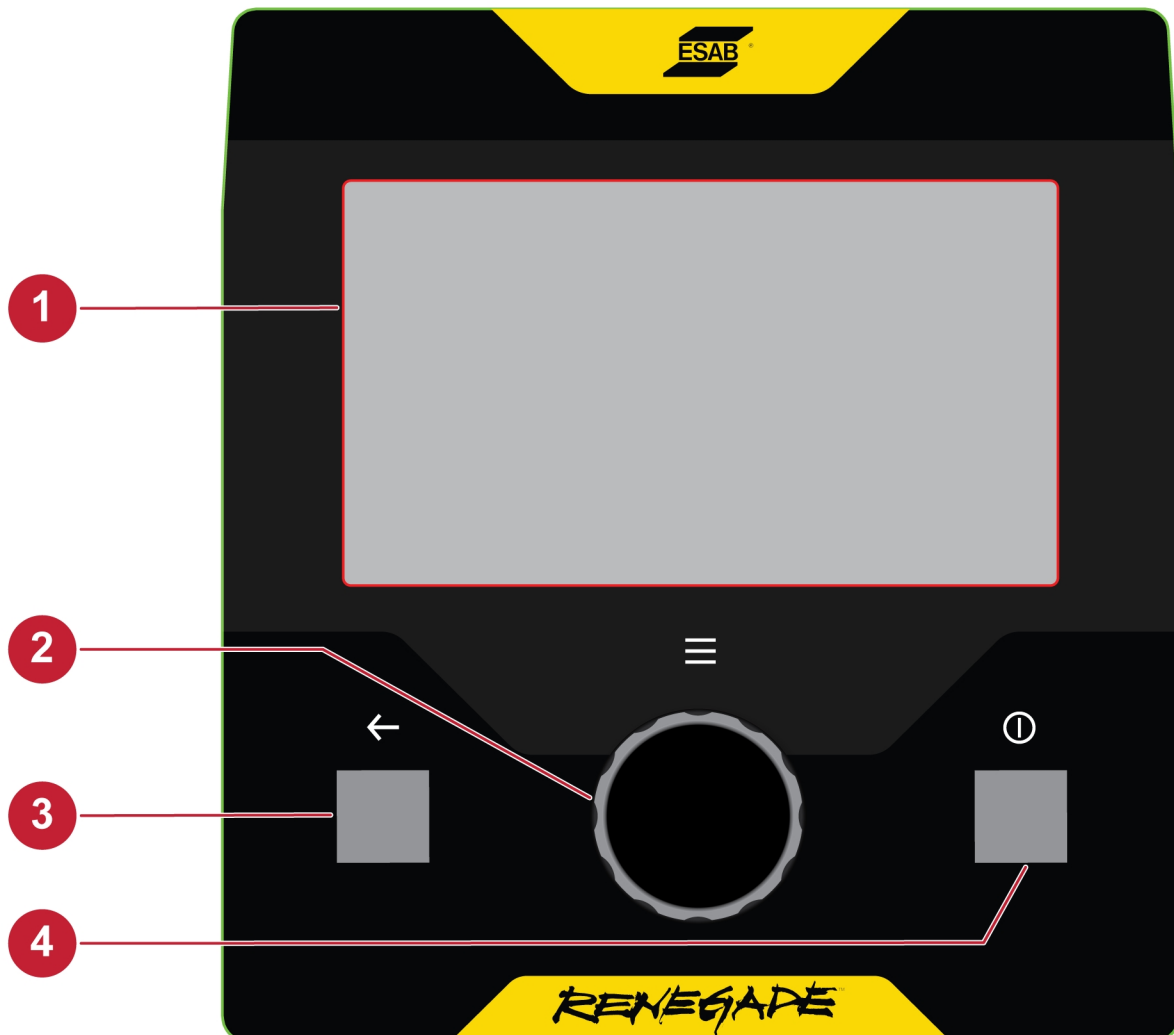
The unit is equipped with thermal protection. When overheating occurs, welding stops and over temperature indication activates on the front panel. The unit automatically resets when normal operating temperature is achieved.

6 USER INTERFACE

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!

General information about operation can be found in the "OPERATION" chapter of this manual. Read it through before you start using the equipment!

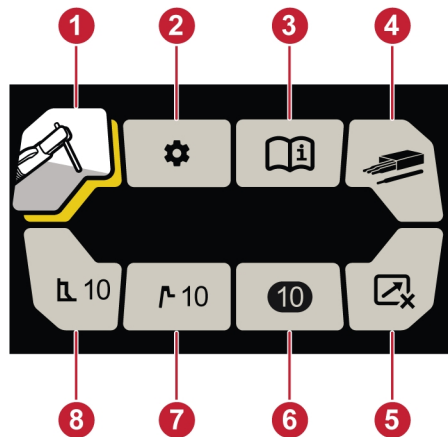
6.1 How to navigate



1. **Display** - shows set and measured values, and it allows for interaction with the unit.
2. **Pushbutton encoder** - used to adjust current, settings, enter menu, navigation, and selecting desired functions and features.
3. **Back button** - used to navigate to the previous screen and erase a saved job operation.
4. **ON/OFF Membrane switch** - used to turn the power source on and off.
 - Single press – used to turn the power source on.
 - Long press (3 seconds) – used to turn the power source off.

6.2 Menu screen

6.2.1 MMA / Stick / SMAW menu overview



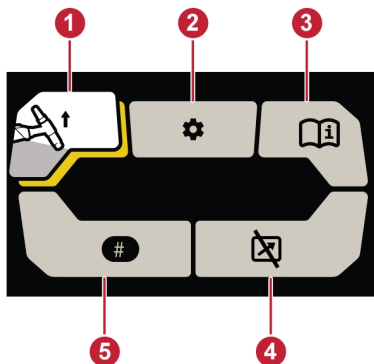
1. Process selection
2. Settings
3. Information
4. Electrode type
5. Remote control
6. Jobs
7. Hot start
8. Arc force

6.2.2 TIG / GTAW menu overview

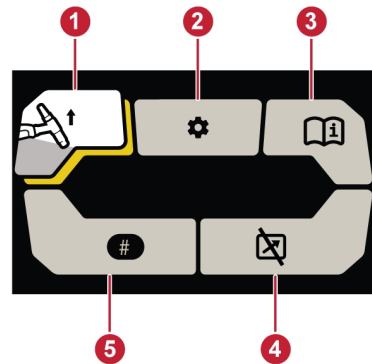


NOTE!

Live-TIG / GTAW mode is enabled when VRD is deactivated and Lift-TIG / GTAW mode is enabled when VRD is activated.



VRD Activated



VRD Deactivated

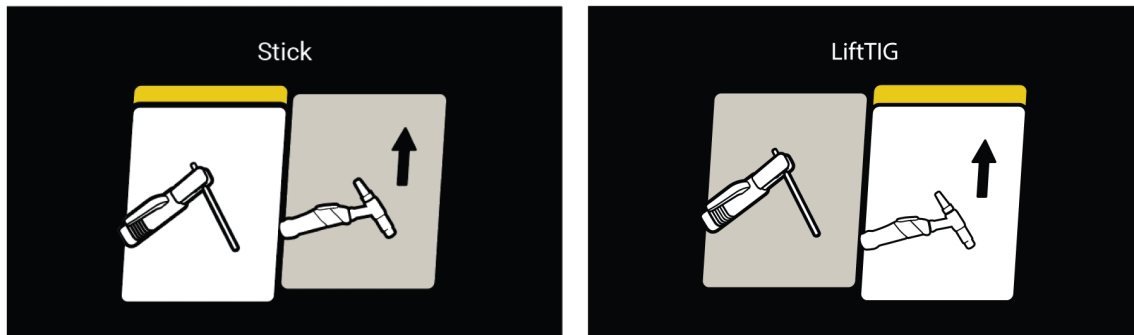
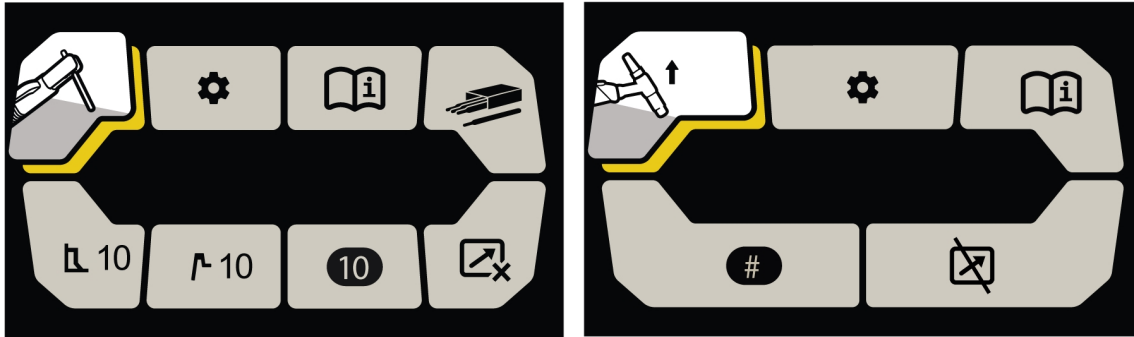
1. Process selection
2. Settings
3. Information
4. Remote control
5. Jobs

6.2.3 Process selection

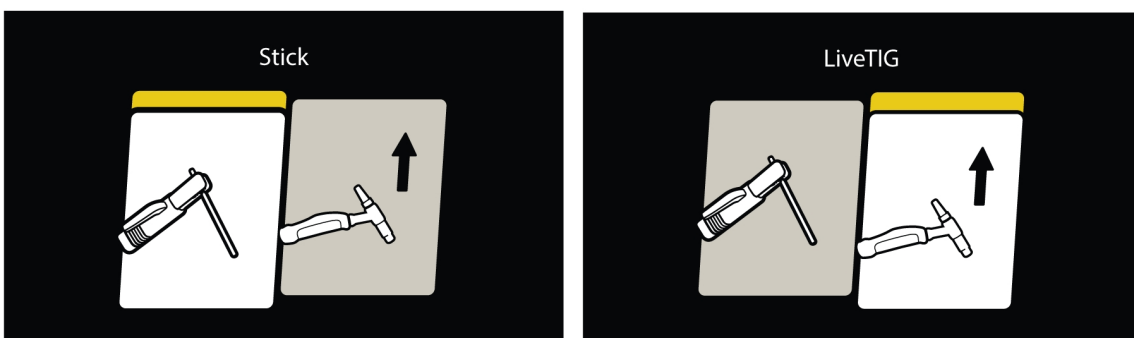
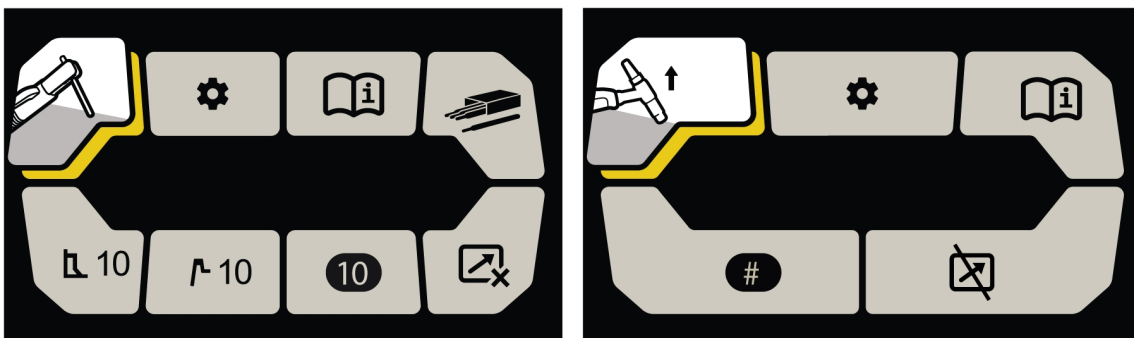
The option of selecting between MMA / Stick / SMAW or Live TIG / GTAW mode.

From the home screen, press the pushbutton encoder to enter the menu screen. Select the desired welding process and press the pushbutton encoder.

When VRD is activated, Lift-TIG / GTAW mode will be enabled.

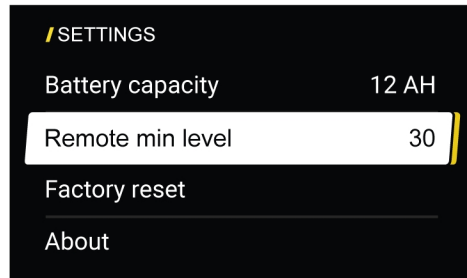
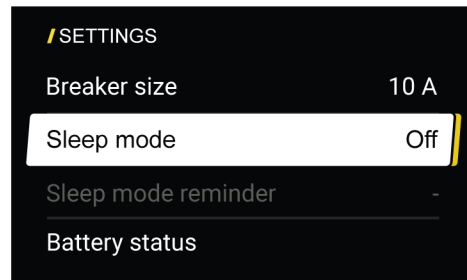
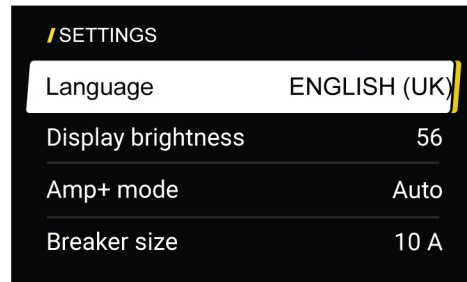


When VRD is deactivated, Live-TIG / GTAW mode will be enabled.



6.2.4 Settings

From the home screen, press the pushbutton encoder to enter the menu screen. Turn the pushbutton encoder to the settings icon and press to enter the settings options.

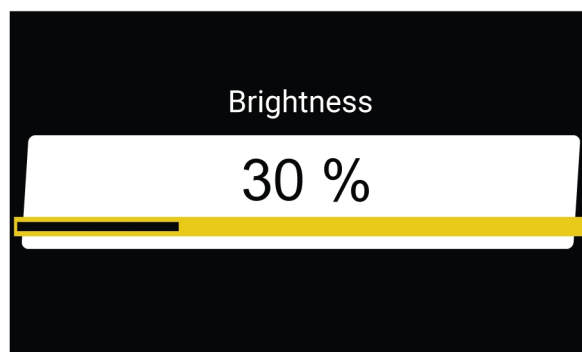


Language

This function enables the user to choose the language of the display. Press the pushbutton encoder, rotate the encoder to the desired language and press the encoder again. Press the back button to confirm the selected language.

Display brightness

This function enables the user to adjust the TFT display brightness from 20% to 100%. Press the pushbutton encoder, rotate the encoder to the desired brightness and press the back button to confirm.



AMP+ Hybrid Mode

AMP+ Hybrid Mode is used only when both mains supply and battery packs are connected by the user. It consists of three modes, **OFF**, **Auto**, and **Extended**. Default mode is **OFF**.

For 120 V mains supply,

- **OFF:** The user cannot make any adjustments corresponding to the AMP+ Hybrid Mode.
- **Auto:**
For MMA / Stick / SMAW operation, the unit will operate in AMP+ Hybrid Mode from a weld current of 110 A to 150 A.
For Live TIG / GTAW operation, the unit will operate in AMP+ Hybrid Mode from a weld current of 140 A to 180 A.
- **Extended:**
For MMA / Stick / SMAW operation, the unit will operate in AMP+ Hybrid Mode from a weld current of 55 A to 150 A.
For Live TIG / GTAW operation, the unit will operate in AMP+ Hybrid Mode from a weld current of 70 A to 180 A.
- **Circuit breaker selection during 120-V operation:**
This function will be enabled when the setting is in either "Auto" or "Extended" under AMP+ Hybrid Mode.
The default circuit breaker setting is 20 A. The user can select the correct circuit breaker size based on the specified breaker size that the unit is connected to.
For example, if the breaker size is selected as 10 A, the effective input current will be limited to 10 A through AMP+ Hybrid Mode.

**NOTE!**

For NAM variants: For 15-A circuit breaker requirements, 16-A circuit breaker can be selected.

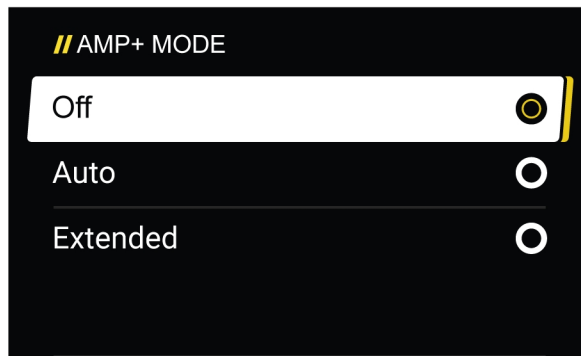
For 230 V mains supply,**NOTE!**

AMP+ Hybrid Mode will work when a circuit breaker setting is done.

- **OFF:** The user cannot make any adjustments corresponding to the AMP+ Hybrid Mode.
- **Auto/Extended:** This function will be enabled when the setting is in either "Auto" or "Extended" under AMP+ Hybrid Mode.
- **Circuit breaker selection during 230-V operation:**
The default circuit breaker setting is 20 A. The user can select the correct circuit breaker size based on the specified breaker size that the unit is connected to.
For example, if the breaker size is selected as 10 A, the effective input current will be limited to 10 A through AMP+ Hybrid Mode.

**NOTE!**

For NAM variants: For 15-A circuit breaker requirements, 16-A circuit breaker can be selected.



Breaker size

This function is accessible when the AMP+ Hybrid Mode is in "ON". The default setting is 20A. The user can select the correct breaker size based on the specified breaker size the unit is connected to.

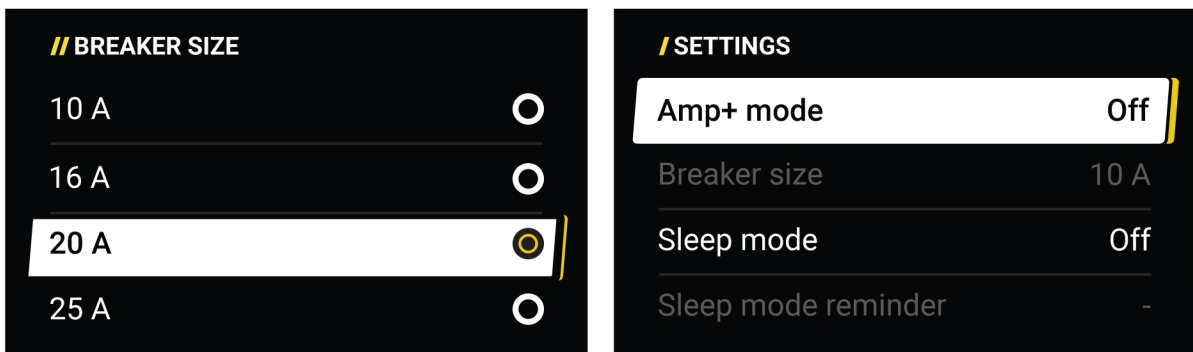


NOTE!

The selected breaker size will reduce the current drawn from the grid power when the power source is connected to grid power with a rating lower than the essential circuit breaker rating demanded by the power source.

The output current delivered from the mains supply will be supplemented by the batteries connected to avoid tripping of the circuit breaker.

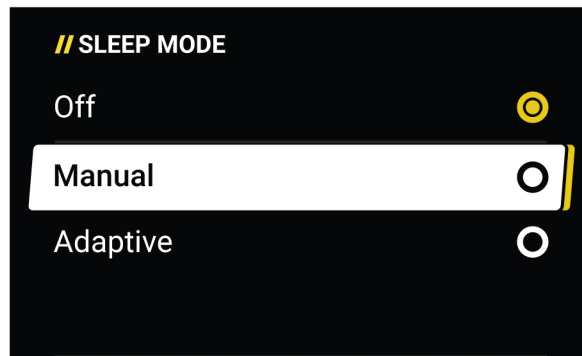
When the AMP+ Hybrid Mode is in "OFF", the breaker size function will be disabled.



Sleep mode

Sleep mode can be configured in three ways,

- **Off:** System will not enter "SLEEP MODE".
- **Manual:** User determines when the sleep mode reminder will be displayed.
- **Adaptive:** Will be activated based on the system temperature.



Sleep mode reminder

When "Manual" sleep mode has been selected, a reminder will be displayed on the user interface that the unit will be entering sleep mode. This reminder time can be selected, 7, 10, or 15 minutes.

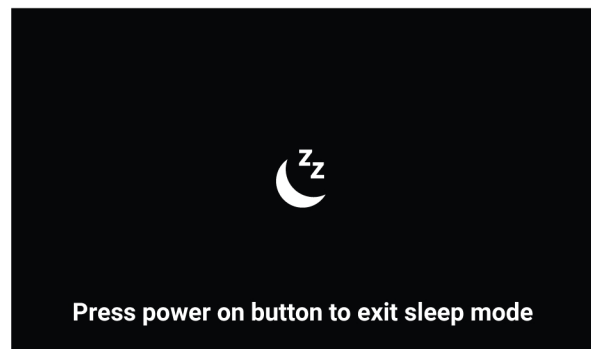
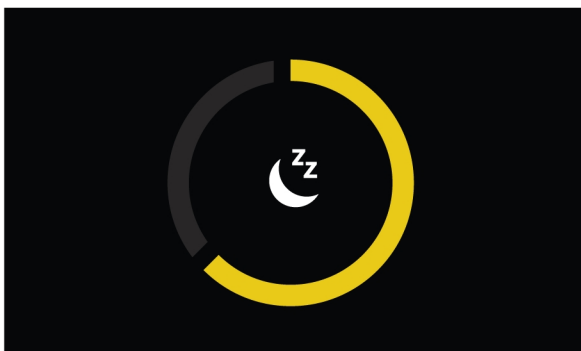
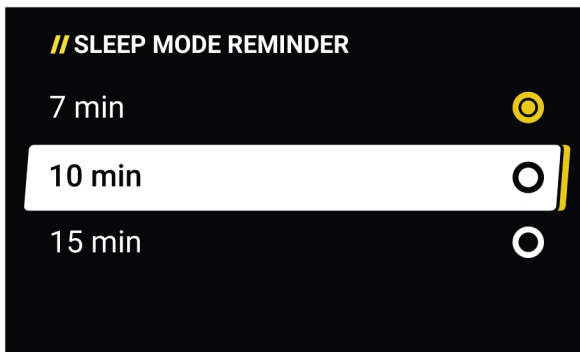
When the unit has been inactive for 3 minutes, a countdown screen will be displayed on the user interface and start the countdown process, for the reminder of the selected time. If 7 minutes has been selected as the countdown reminder time, the countdown screen will be displayed for 4 minutes.

To return to working mode during the countdown time, turn the control knob.

During Mains Mode, if the unit has entered the sleep mode, the user will be prompted to press "ON/OFF Membrane switch" to exit sleep mode.

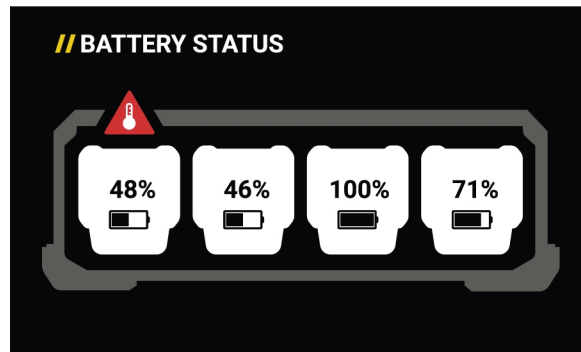
During Battery Mode, if the unit has entered the sleep mode, the unit will turn off. Press the "ON/OFF Membrane switch" to turn on the unit.

During AMP+ Hybrid Mode, if the unit has entered the sleep mode, the user will be prompted to press "ON/OFF Membrane switch" to exit sleep mode.



Battery status

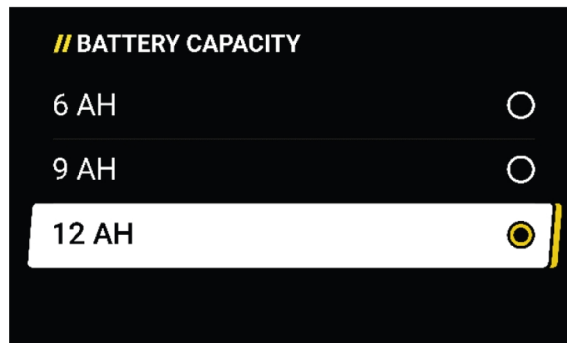
To see the status of the batteries, navigate to the Battery status display. This display provides the status of each battery installed and will indicate high battery temperature.



Battery capacity

The Renegade VOLT can be configured to operate with 6AH, 9AH, or 12AH batteries. Make the correct selection by matching the AH of the battery with one of the options in the display. Default setting is 12AH.

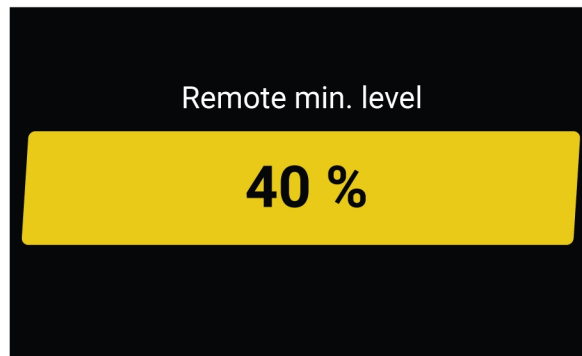
Mixed battery AH combinations are not recommended and will not be displayed.



Remote min level

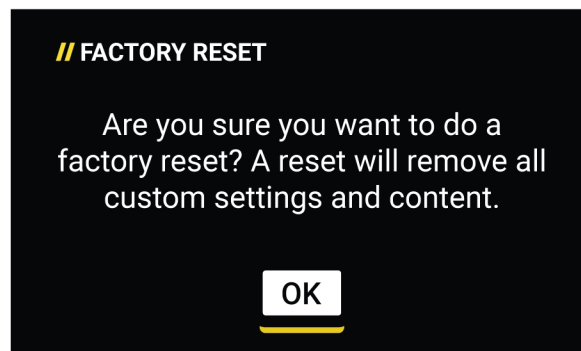
This is used to set the minimum current for the foot control or hand control. It is set in % of the set current value, from 0–99% in steps of 1%.

For example: If the set current value is 100 A and the remote min. current function is set to 20, the remote min. current will be 20 A. If the current is set to 80 A and the remote min current function is set to 50, the remote min current will be 40 A.



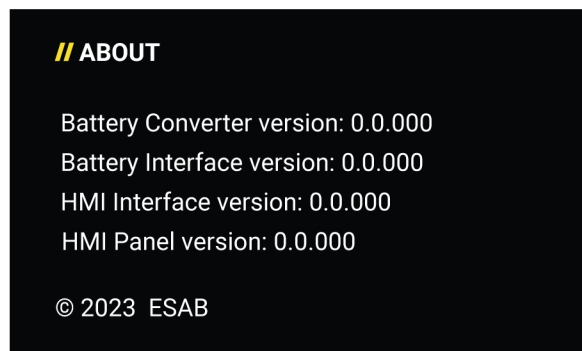
Factory reset

Factory reset will delete all custom configurations and reset the unit to the original factory configuration.



About

Provides the software revision levels of all grid power components of the system, power supply and battery box. This information may be required if the unit ever needs to be serviced.

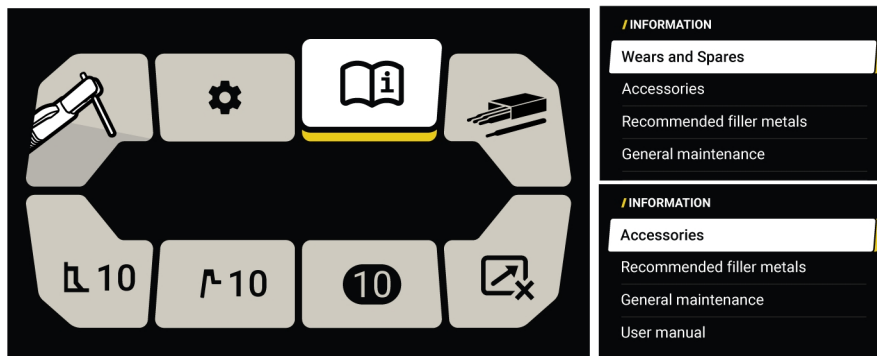


6.2.5 Information

Provides information to the user that can be beneficial and recommended maintenance process.

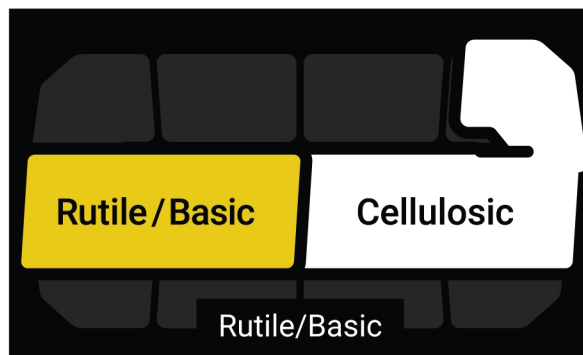
- Wears and spares
- Accessories
- Filler metals

- General maintenance
- User manual

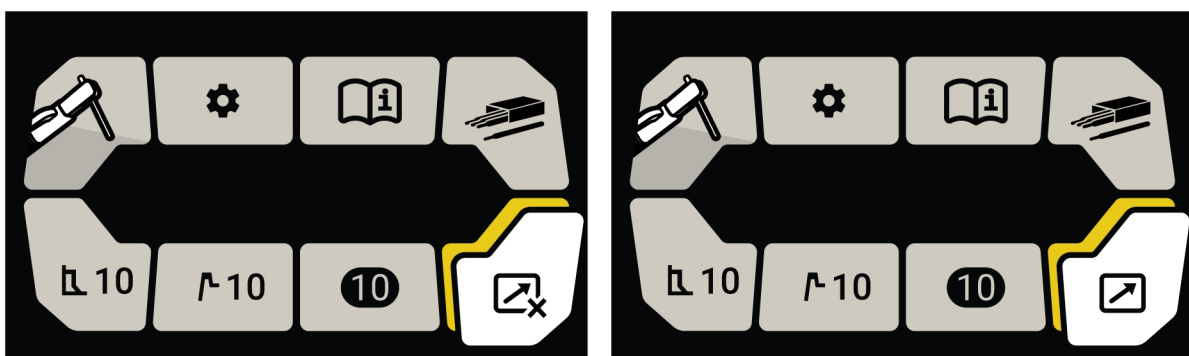


6.2.6 Electrode

Allows the user to select between cellulosic (6010) or basic/rutile electrodes (most others), determining the type of arc characteristic that is best suited to run that type of electrode.



6.2.7 Remote control

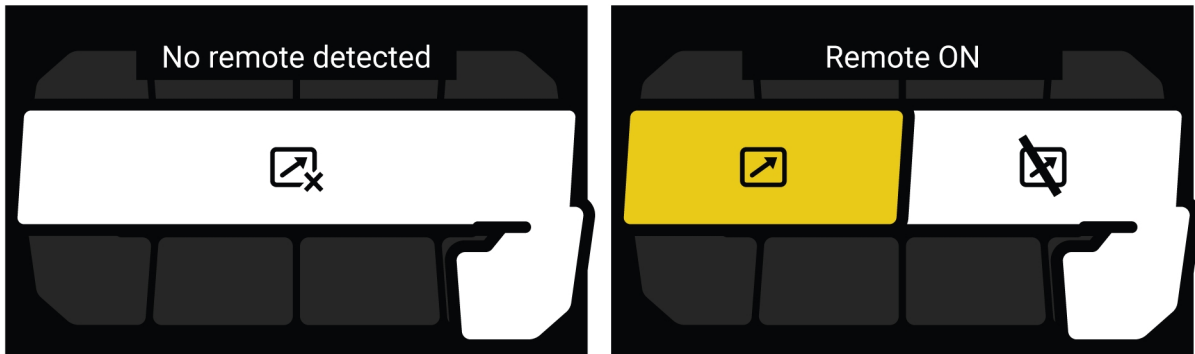


Allows the user to determine how to control the output of the unit, home screen or remotely.

To enable the remote function, connect the remote control to the 8-pin remote control receptacle. The remote control is automatically detected.

When a remote control is not connected, the display shows “No remote detected”. When a remote control is connected, the user can select “Remote ON” or “Remote OFF”.

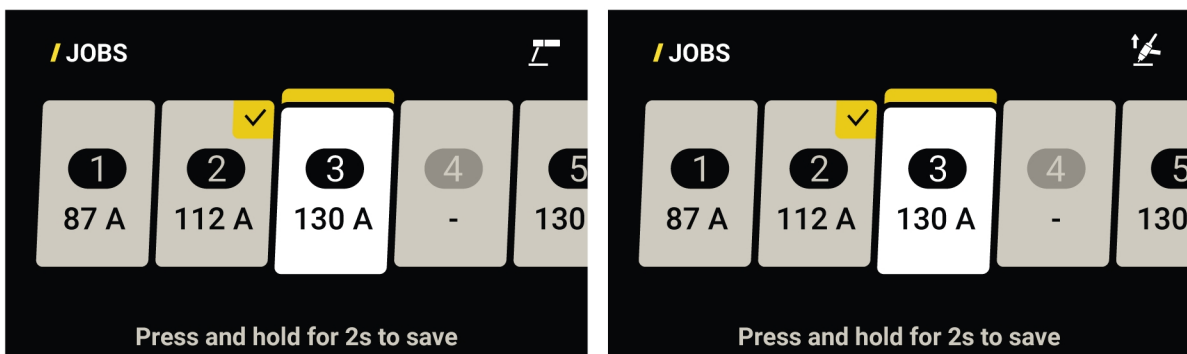
The operating range of the remote is determined by the amperage setting on the main display. The remote control will control the amperage from the minimum of the power source to the maximum current set on the main display.



6.2.8 Jobs



Provides the user the option to easily save and recall specific welding condition that are used on a frequent basis.



To create jobs: It is required to establish specific welding parameters that are desired in MMA / Stick / SMAW or Live TIG / GTAW mode. Ten (10) job operations are available distinctly for each mode (MMA / Stick / SMAW or Live TIG / GTAW).

To save jobs: Initially, to create the welding parameters access the menu and select the Jobs tile. There are 10 individual jobs that can be created for each process setting. Use the push button encoder to select the desired job number. When the desired job number is selected, press, and hold the encoder for 2 seconds. The job is now saved. The parameters that were established are displayed in the job tile and will be the active job. The job number will be displayed on the home screen.

To recall jobs: Access the menu and select the jobs tile under the corresponding weld process. Scroll through the jobs library to find the desired job to recall. Press the rotary encode to load the job.

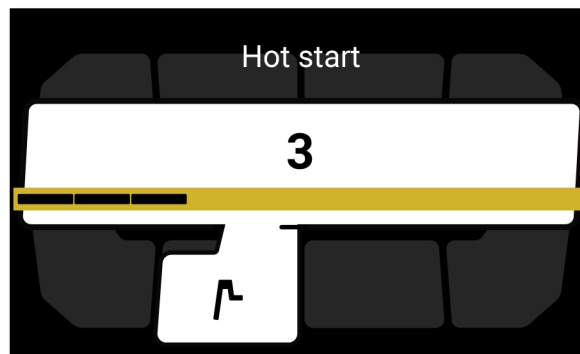


To delete jobs: Access the menu and select the jobs tile. Use the push button encoder to select the desired job number. When the desired job number is selected, press, and hold the back button until the screen displays "Clear this Job position?". Press control knob to confirm. The job is now deleted.

6.2.9 Hot start

Controls the amount of additional amperage at arc initiation to prevent the electrode from sticking to the work piece and preventing a cold start at the beginning of the weld.

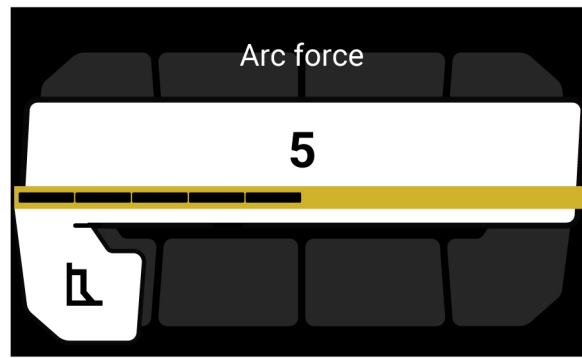
Increase the hot start value if there are difficulties striking the arc or decrease the hot start value if electrode appears to flare excessively at the start of the weld (range 0-10).



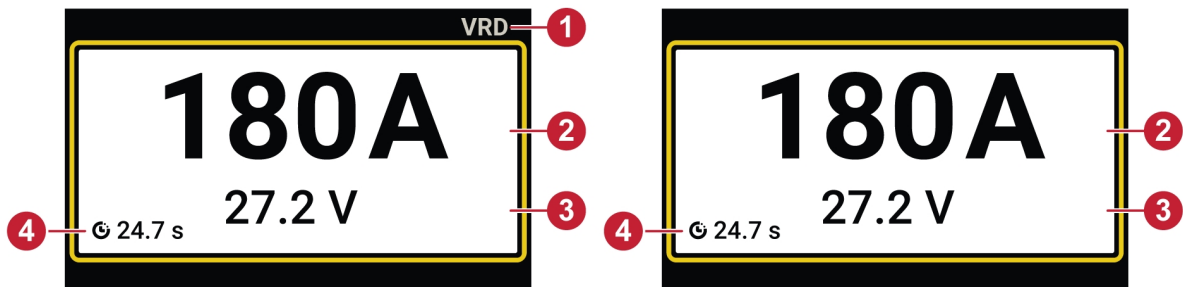
6.2.10 Arc force

Controls the amount of additional amperage when in short arc length condition.

Increase the arc force percentage when in a tight or narrow weld joint or decrease the arc force percentage when welding a normal weld (range 0-10).



6.3 Welding screen



VRD Activated

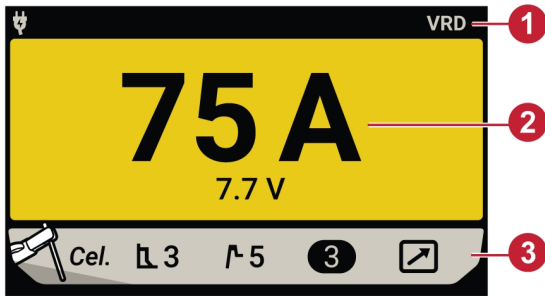
VRD Deactivated

1. Reflects the VRD activated indication.
2. Reflects the preset current value, momentary current value during welding, or average current of the last weld.
3. Reflects the open circuit voltage value when idle, momentary voltage during welding, or the last weld voltage value.
4. Reflects the time duration of the last weld.

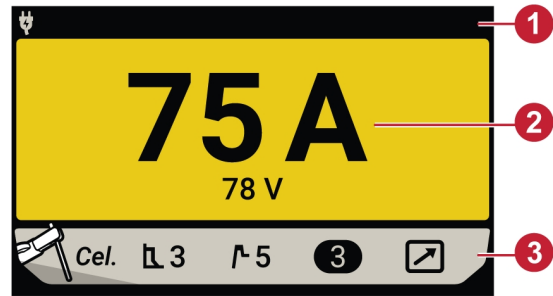
Values of last weld will be displayed for 40 seconds after welding. When time expires, the display will return to the home screen view.

6.4 MMA / Stick / SMAW home screen settings

Mains Mode

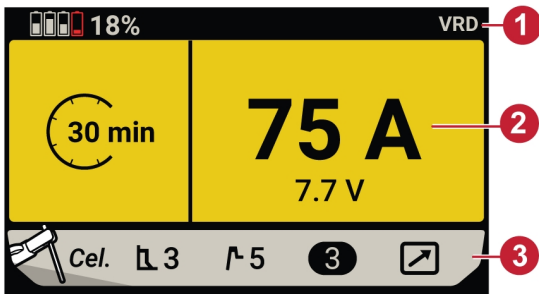


VRD Activated

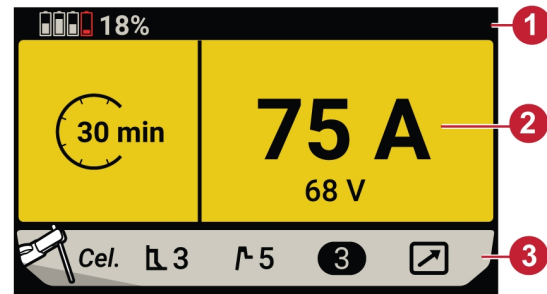


VRD Deactivated

Battery Mode

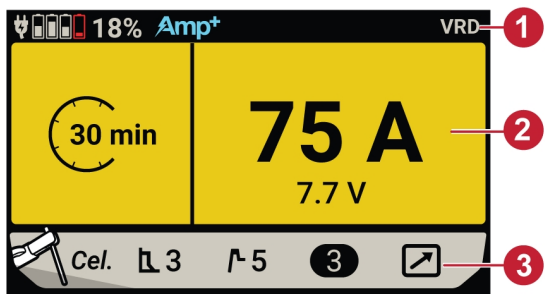


VRD Activated

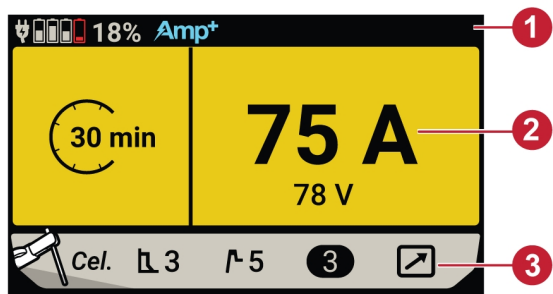


VRD Deactivated

AMP+ Hybrid Mode



VRD Activated



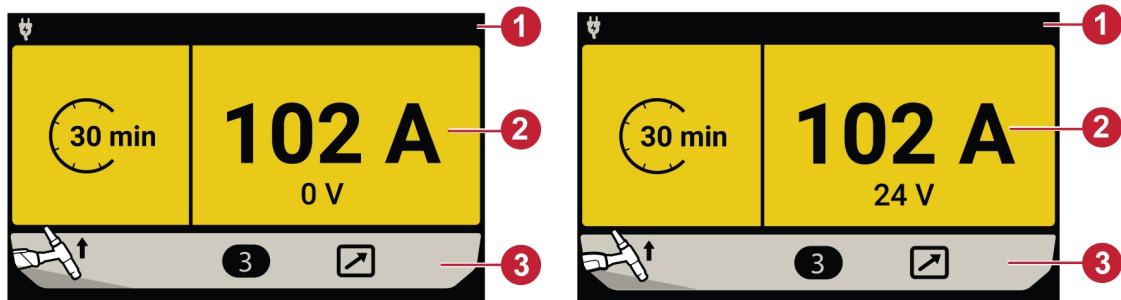
VRD Deactivated

1. When VRD is activated, the header bar of the home screen displays the battery status, mode of power and the VRD indication. When the VRD is deactivated, the VRD indication in the header bar disappears.

2. The home screen preset weld current when operating in “Mains Mode”. When the unit is operating in “Battery Mode” or “AMP+ Hybrid Mode”, the display will show preset weld current and approximate remaining arc-on time.
3. Footer bar of home screen displays the status of the weld process, arc force level, hot start level, job selection and remote connection. To make any adjustment, press pushbutton encoder to enter menu screen, and navigate to the desire variable to be adjusted and select to make adjustment.

6.5 TIG / GTAW home screen settings

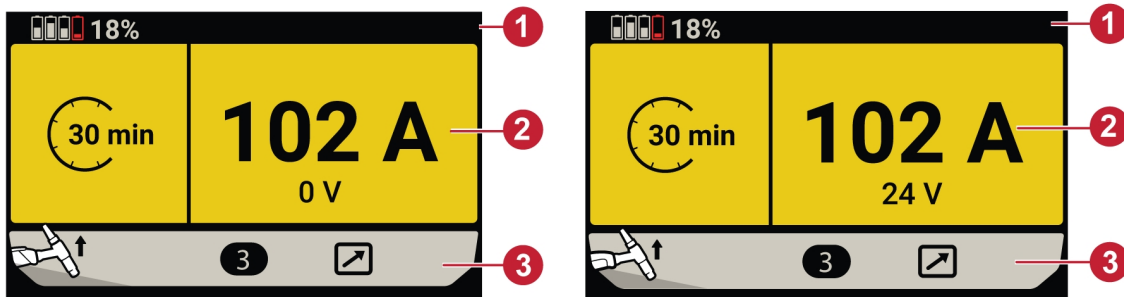
Mains Mode



VRD Activated

VRD Deactivated

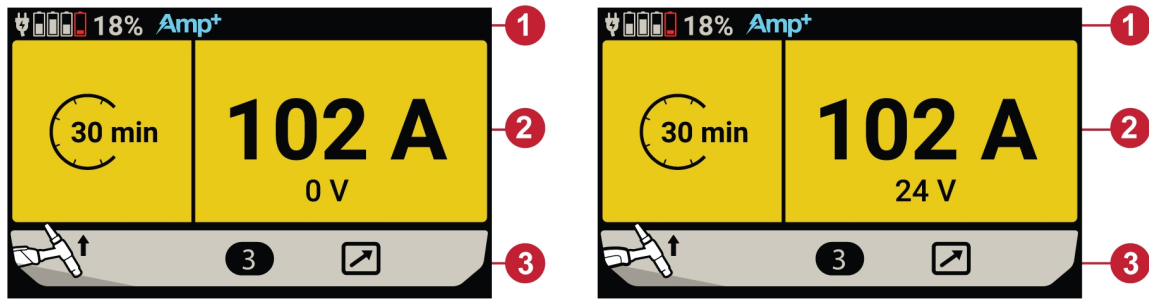
Battery Mode



VRD Activated

VRD Deactivated

AMP+ Hybrid Mode



VRD Activated

VRD Deactivated

**NOTE!**

The above screens represent the static state (i.e., before trigger activation). If the trigger is activated, the OCV is displayed for 3 seconds at 23 V. If no arc is established, it reverts to 0 V.

1. Header bar of home screen displays the battery status and mode of power source.
2. The home screen displays 0 V when VRD is activated (default) and the preset voltage value when the VRD is deactivated. The home screen also shows preset weld current when operating in "Mains Mode". When the unit is operating in "Battery Mode" or "AMP+ Hybrid Mode" the display will show preset weld current and approximate remaining arc-on time.
3. Footer bar of home screen displays the status of the weld process, job selection and remote connection. To make any adjustment, press pushbutton encoder to enter menu screen and navigate to the desired variable to be adjusted and select to make adjustment.

7 MAINTENANCE

**WARNING!**

The mains supply must be disconnected during cleaning and maintenance.

**CAUTION!**

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

**CAUTION!**

The product is covered by manufacturer's warranty. Any attempt to carry out repair work by non-authorized 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.



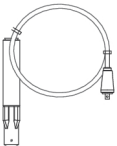

Before each use, make sure that the:

- Product and cables are undamaged, and
- The torch is clean and undamaged.

7.1 Routine maintenance

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

The schedule is valid for both power source and battery box.

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

7.2 Cleaning

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

- The welding process,

- The arc time, and
- The working environment.

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

CAUTION!
During cleaning, always wear the recommended personal protective equipment, such as earplugs, safety glasses, masks, gloves and safety shoes.

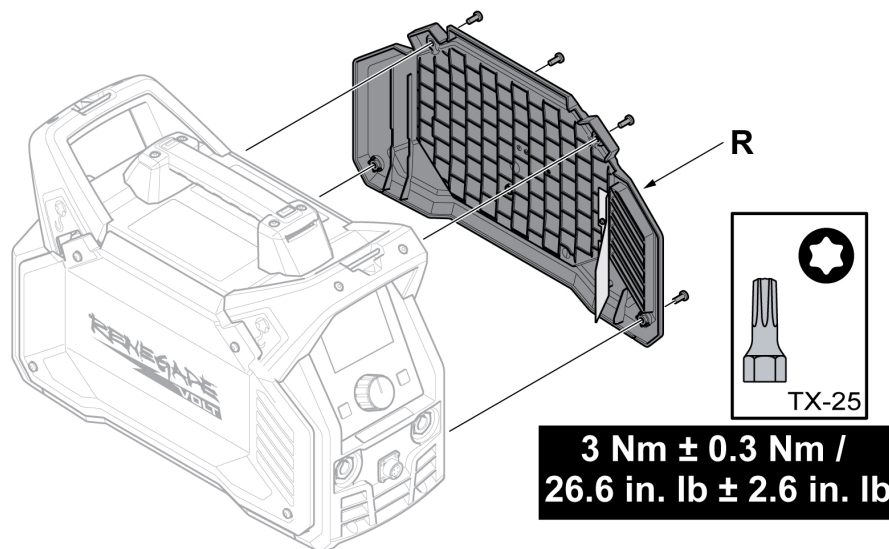
CAUTION!
Repair, cleaning, and electrical work should be performed by an authorized ESAB service technician. Use only ESAB original spare and wear parts.

7.2.1 Cleaning the power source

- 1) Disconnect the power source from the power supply.

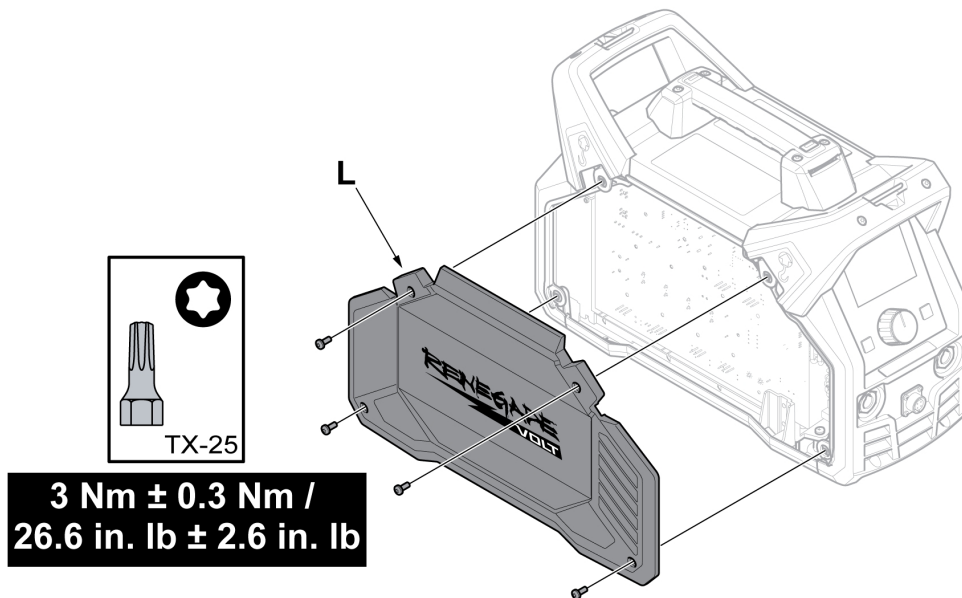
WARNING!
Wait at least 4 minutes for the capacitors to discharge before continuing.

- 2) Disconnect the power source from the battery box.
- 3) Remove the four screws securing the right-side panel (**R**) and remove the panel.



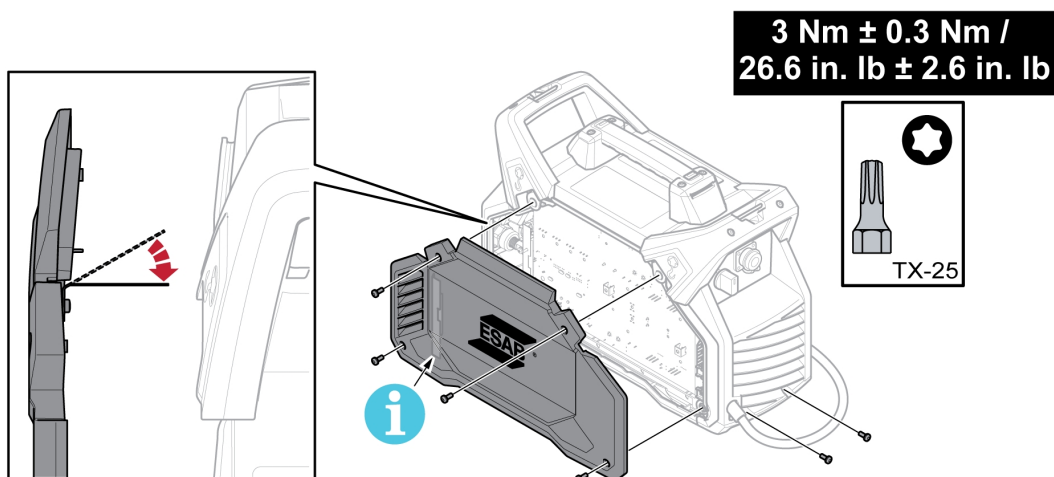
- 4) Clean the right side of the power source, using dry compressed air with reduced pressure of 4 bar (58 psi).

- 5) Remove the four screws securing the left side panel (L) and remove the panel.



- 6) Clean the left side of the power source, using dry compressed air with reduced pressure of 4 bar (58 psi).
- 7) Make sure that no dust remains on any part of the power source.
- 8) Reassemble the power source after cleaning and perform testing according to local standards. Follow the procedure in the section "After repair, inspection and test" in the Service manual.
- 9) Install both the side panels and tighten the screws with a correct tightening torque mentioned in the following illustration.

i NOTE!
When reattaching the right-side panel, make sure the IP shield on the inside of the panel is in the correct position. The IP shield must be angled at about 90° into the power source, so that it is positioned between the welding outlet connector and the transformer outlets.



7.2.2 Cleaning the battery box

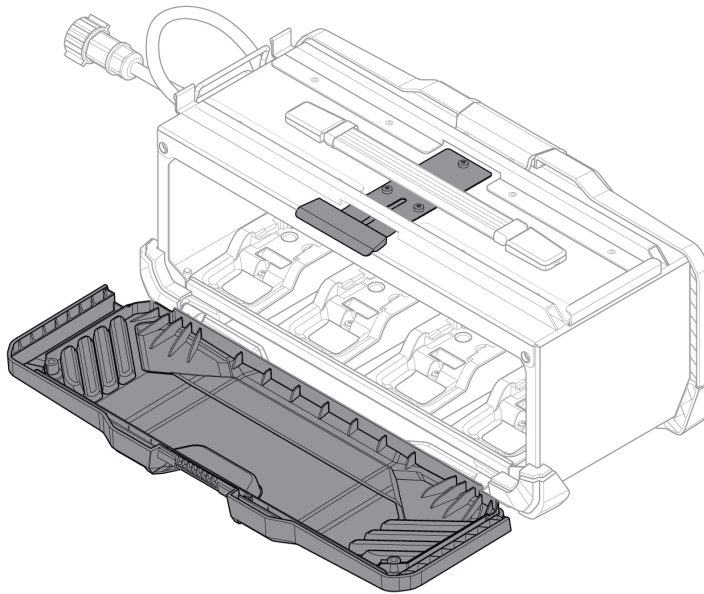
- 1) Disconnect the battery box from the power source.



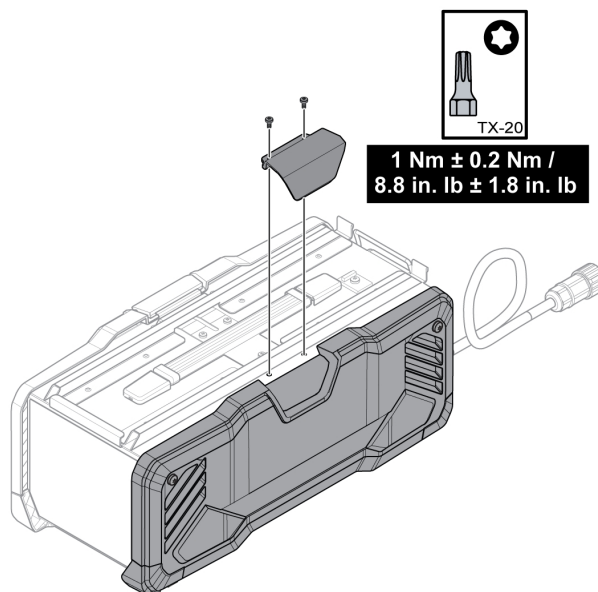
CAUTION!

Ensure that the battery box interface cable is unplugged from the power source and all the batteries are removed before cleaning.

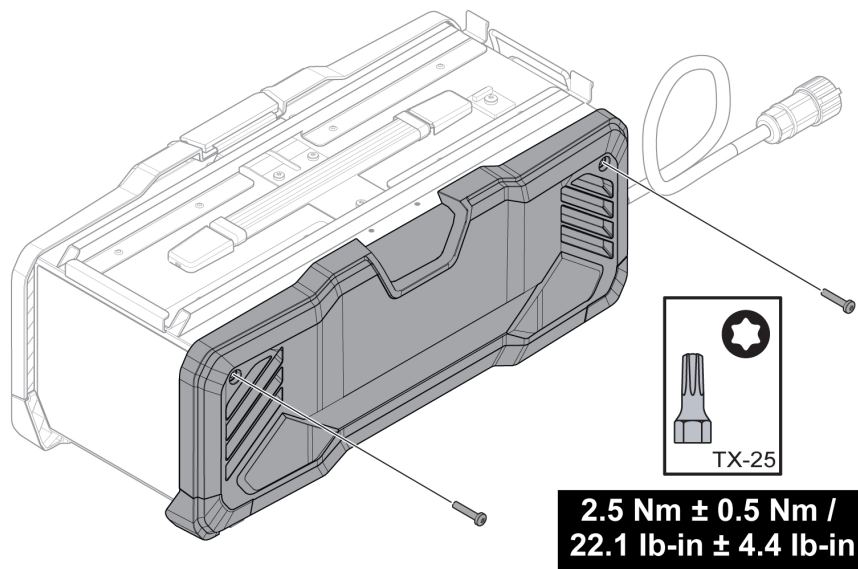
- 2) Open the left side panel by lifting up the door latch lock.



- 3) Clean the battery box, using dry compressed air with reduced pressure of 4 bar (58 psi).
- 4) Gently, close the left side panel.
- 5) To open the right side panel, remove the two screws securing the door latch lock cover.



- 6) Remove the two screws securing the right side panel and open the right side panel.



- 7) Clean the battery box, using dry compressed air with reduced pressure of 4 bar (58 psi).
- 8) Close the right-side panel reassemble the door latch lock cover in the exact reverse order with the correct tightening torque mentioned in the previous illustrations.

8 TROUBLESHOOTING

8.1 Troubleshooting

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

- Check that the grid power cable is disconnected before starting any type of repair action.

Type of fault	Corrective action
MMA / Stick / SMAW welding problems	Check that the welding process is set to MMA / Stick / SMAW.
	Check that the welding and return cables are correctly connected to the power source.
	Make sure that the return clamp has good contact with the workpiece.
	Check that the correct electrodes and polarity are being used. For polarity, check electrode packaging.
	Check that the correct welding current (A) is set.
	Adjust arc force and hot start.
TIG / GTAW welding problems	Check the welding process is set for Live TIG / GTAW as necessary.
	Check that the TIG / GTAW torch and return cables are correctly connected to the power source.
	Make sure that the return clamp has good contact with the workpiece.
	Make sure that the TIG / GTAW torch lead is connected to the negative welding terminal.
	Make sure that the correct shielding gas, gas flow, welding current, filler rod placement, electrode diameter, and welding mode on power source is used.
No arc	Check that the electrical power supply switch is turned on.
	Check that the display is on to verify that the power source has power.
	Check that the setting panel is displaying the correct values.
	Check that the welding and return cables are correctly connected.
	Check the electrical power supply fuses.
Welding current is interrupted during welding	Check whether the over temperature TFT display (thermal protection) on the setting panel is on.
	Continue with fault type "No Arc".
Thermal protection trips frequently	Make sure that the recommended duty cycle for the weld current has not been exceeded.
	See the "Duty cycle" section in the TECHNICAL DATA chapter.
	Make sure that the air inlets and outlets are not clogged.
	Clean inside the power source according to routine maintenance.

9 ERROR CODES

Error codes indicate that a fault has occurred in the equipment. Errors are indicated by the text "ERROR" followed by the error code number shown in the display.

If more than one error was detected, only the code for the last occurring error is displayed.

9.1 Error code descriptions

Error codes that the user can handle are listed below. If any other error code appears, contact an authorized ESAB service technician.

Error code	Description
206.10	<p><i>Temperature fault</i> The temperature of the power source is too high. TFT display will indicate a temperature fault.</p> <p>Action: The error code will automatically disappear and the TFT display indicating temperature fault will be turned OFF when the power source has cooled down and is ready for use again. If the error persists, contact a service technician.</p>
906.07	<p><i>Battery Temperature warning</i> The temperature of the battery is too high. TFT display will indicate a battery temperature warning.</p> <p>Action: The error code indicates that the user needs to remove the battery and allow it to cool down. If the error persists, contact a service technician.</p>
906.08	<p><i>Battery Temperature error</i> The temperature of the battery is too high. TFT display will indicate a battery temperature error.</p> <p>Action: This error code will automatically shut the system down after a few seconds, indicating that the user must remove the battery to cool down. If the error persists, contact a service technician.</p>
937.01	<p><i>Battery under voltage warning</i> The battery is about to drain completely. TFT display will indicate a battery under voltage warning.</p> <p>Action: The error code indicates that the user needs to remove the batteries & charge them immediately. If the error persists, contact a service technician.</p>
937.02	<p><i>Battery under voltage error</i> The battery voltage gets drained completely. TFT display will indicate a battery under voltage error.</p> <p>Action: This error code will automatically shut down the system after a few seconds, indicating that the user needs to remove the batteries & charge them immediately. If the error persists, contact a service technician.</p>
937.05	<p><i>Battery Cell - voltage unbalance error</i> If one of the cells inside the battery gets drained completely. TFT display will indicate a battery cell - voltage unbalance error.</p> <p>Action: This error code will automatically shut down the system after a few seconds, indicating that the user needs to remove the batteries & charge them immediately. If the error persists, contact a service technician.</p>

Error code	Description
937.06	<i>Battery missing</i> If any of the batteries are not connected or if the user did not connect the battery properly into the battery terminal. TFT display will indicate a battery missing error. Action: The error code will automatically disappear when the user connects the batteries properly into the battery terminal. If the error persists, contact a service technician.
937.07	<i>Battery Cell - voltage unbalance warning</i> If one of the cells inside the battery has a low voltage compared to other cells. TFT display will indicate a battery cell - voltage unbalance warning. Action: The error code indicates that the user needs to remove the batteries & charge them immediately. If the error persists, contact a service technician.

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.

Renegade VOLT ES 200i is designed and tested in accordance with the **international standards ANSI/IEC 60974-1 & CSA C22.2 NO. 60974-1**. 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.

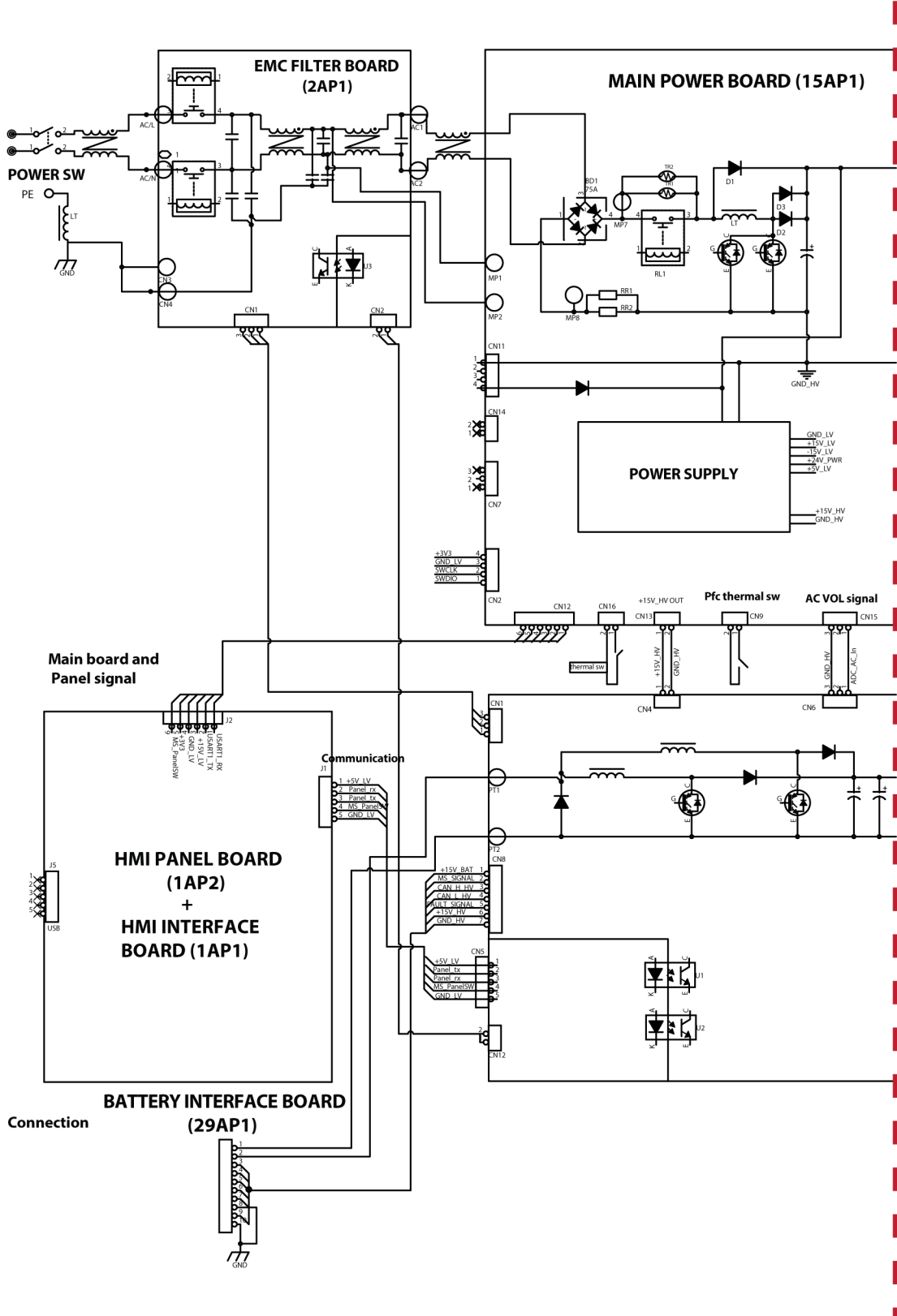
Spare parts and wear parts can be ordered through your nearest ESAB dealer, see esab.com. When ordering, please state product type, serial number, designation and spare part number in accordance with the spare parts list. This facilitates dispatch and ensures correct delivery.

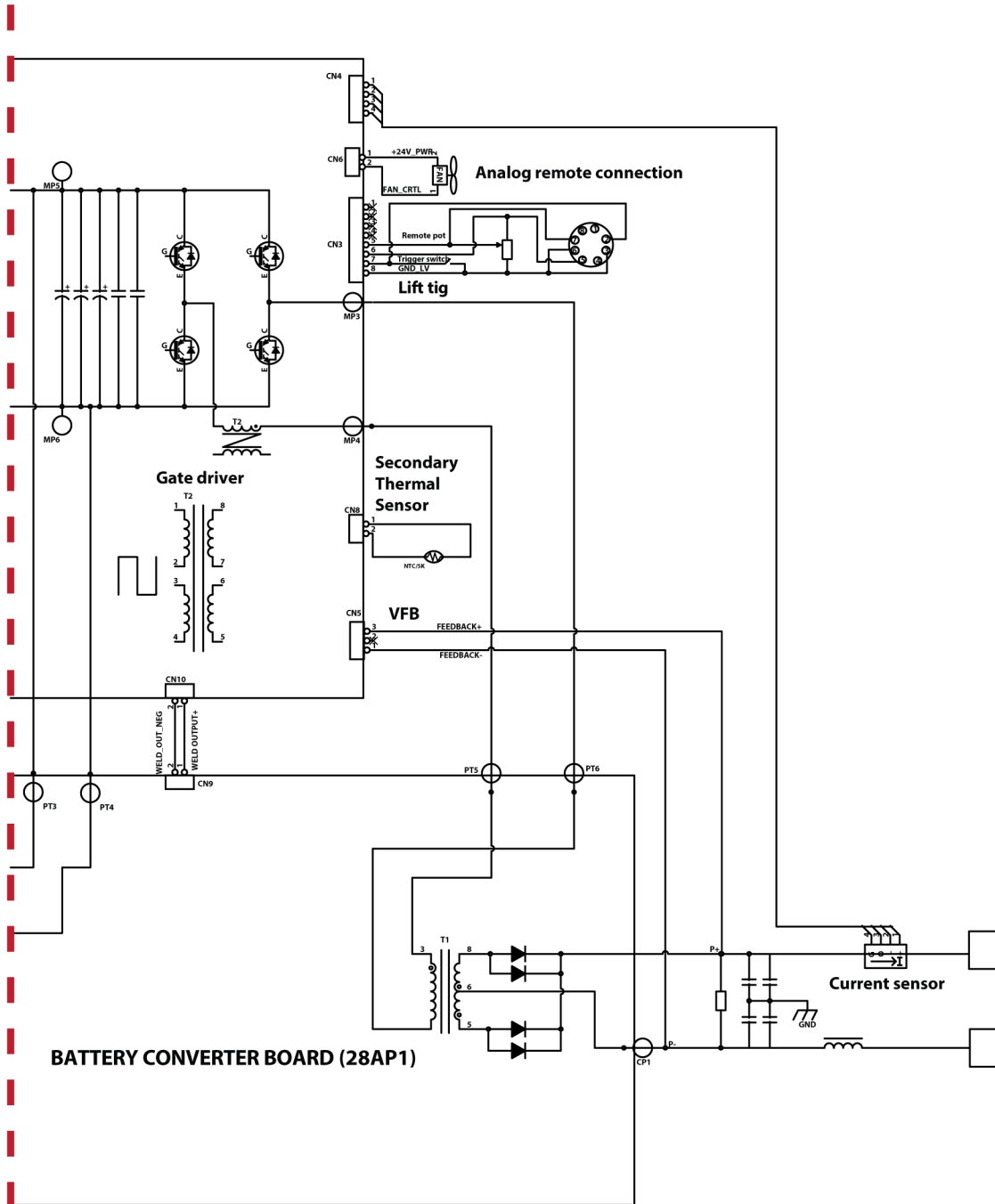
The spare parts list is published in a separate document that can be downloaded from the Internet:
www.esab.com

APPENDIX

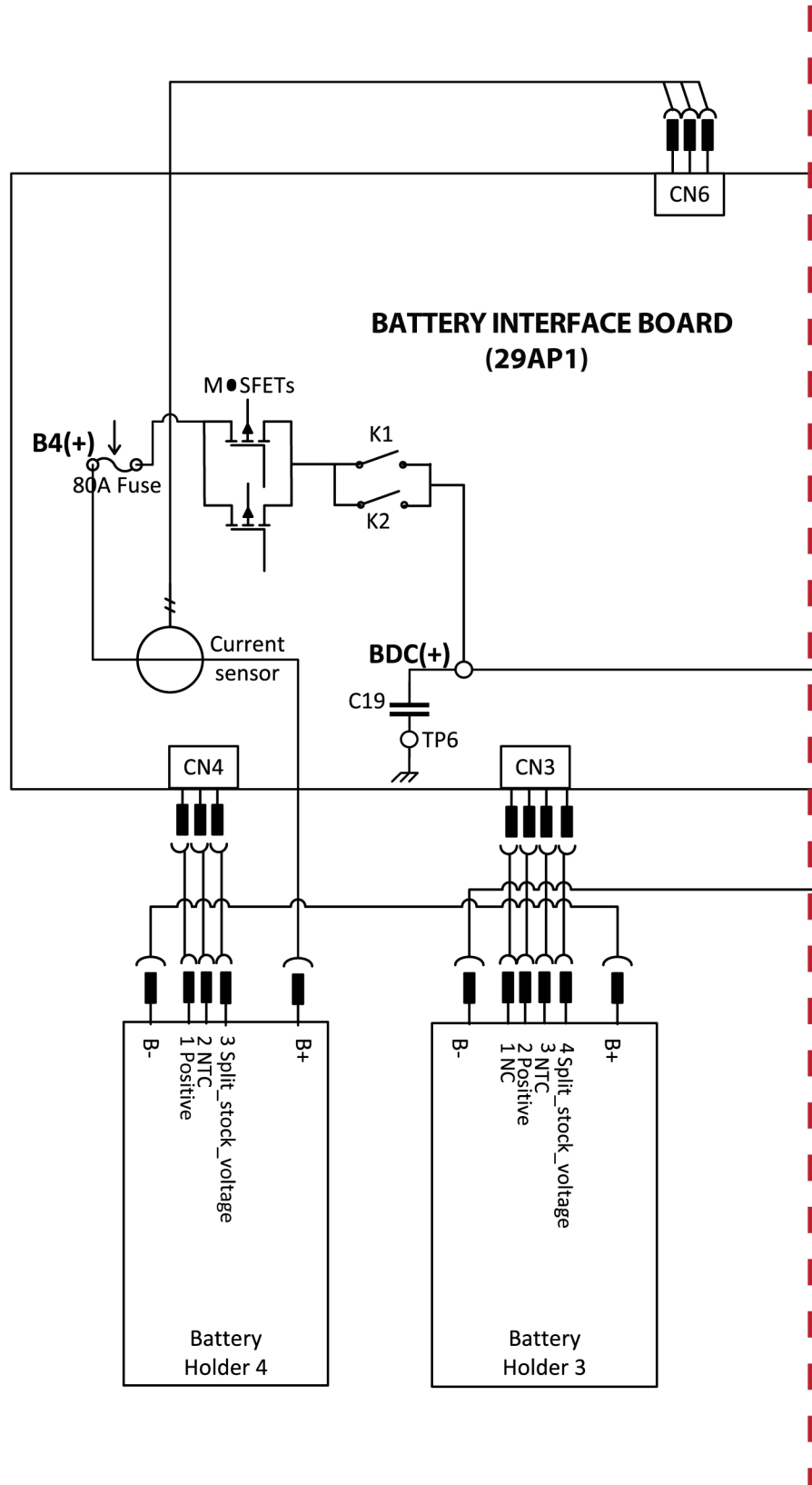
WIRING DIAGRAM

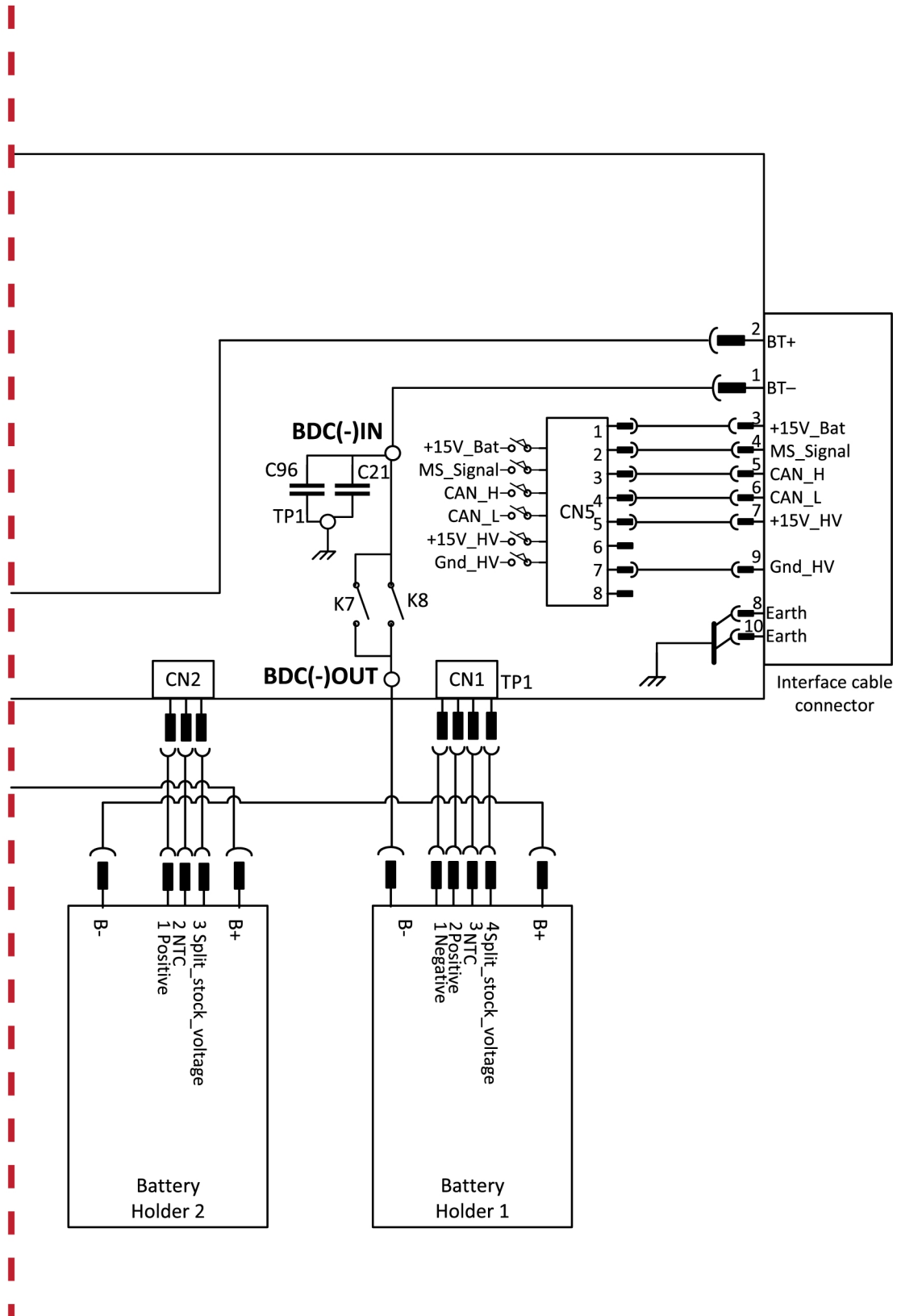
Power source



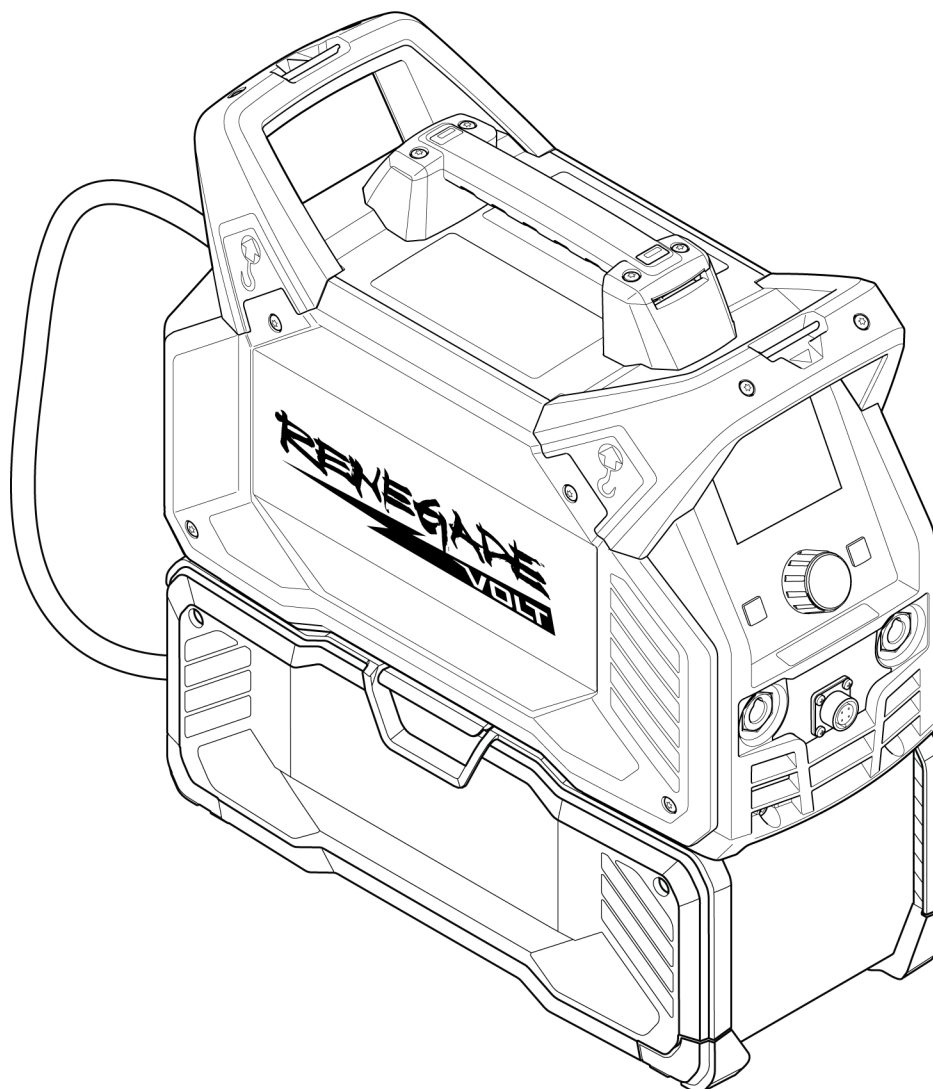


Battery box





ORDERING NUMBERS



Ordering number	Denomination	Notes
0447 800 880	Renegade VOLT ES 200i	Power source with battery box - NAM
0447 800 884	Renegade VOLT ES 200i	Power source with battery box - SAM
0448 560 880	Renegade VOLT ES 200i	Power source with battery box (without batteries & charger) - NAM
0447 820 001	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 or software version that corresponds with the product, see the front page of the manual.

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

ACCESSORIES

0700 026 614 0700 026 624 0700 026 615 0700 026 625	Heliarc SR 17V TIG / GTAW torch, OKC 50, 4 m (12.5 ft) Heliarc SR 26V TIG / GTAW torch, OKC 50, 4 m (12.5 ft) Heliarc SR 17V TIG / GTAW torch, 8 m (25 ft) Heliarc SR 26V TIG / GTAW torch, 8 m (25 ft)	
WS200G10	Return cable 200A, 10 ft. (3 m)	
WS200E13	Electrode Holder 200 A and Lead Assembly, 4 m (13 ft), 50 mm	
0700 500 084	MMA / SMAW / Stick 4 Analogue Remote-Control incl. 10 m cable	
0445 197 880	Shoulder strap	
W4014450	TIG / GTAW foot control, 4.5 m, 8-pin connector	



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