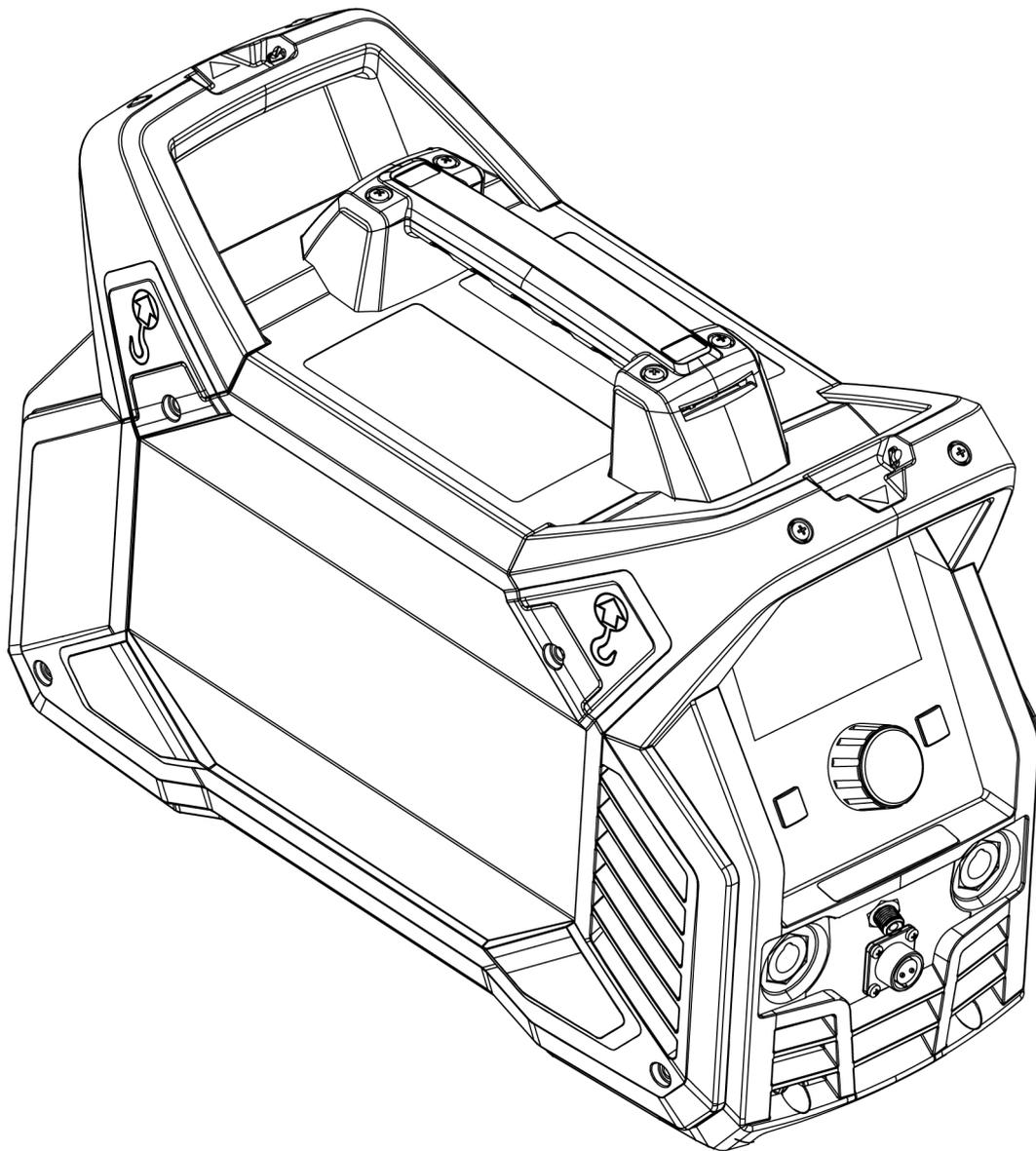




Renegade

ET 210iP Advanced



Instruction manual
Original instructions



EU DECLARATION OF CONFORMITY

According to:

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

Type of equipment

Arc welding power source

Type designation

ET 180iP from serial number OP204 YY XX XXXX
ET 210iP from serial number OP205 YY XX XXXX
ET 210iP Advanced from serial number OP241 YY XX XXXX
X and Y represents digits, 0 to 9 in the serial number, where YY indicates year of production.

Brand name or trademark

ESAB

Manufacturer or his authorised representative established within the EEA

ESAB AB
Lindholmsallén 9, Box 8004, SE-402 77 Göteborg, Sweden
Phone: +46 31 50 90 00, www.esab.com

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

EN IEC 60974-1:2018/A1:2019	Arc Welding Equipment - Part 1: Welding power sources
EN 60974-3:2014	Arc Welding Equipment - Part 3: Arc striking and stabilizing devices
EU reg. no. 2019/1784	Ecodesign requirements for welding equipment pursuant to Directive 2009/125/EC
EN 60974-10:2014	Arc Welding Equipment - Part 10: Electromagnetic compatibility (EMC) requirements

Additional Information:

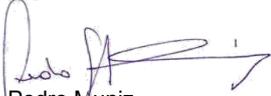
Restrictive use, Class A equipment, intended for use in locations other than residential.
The ET 180iP, ET 210iP and ET 210iP Advanced are part of the ESAB Renegade product family.

By signing this document, the undersigned declares as manufacturer, or the manufacturer's authorised representative established within the EEA, that the equipment in question complies with the safety and environmental requirements stated above.

Place/Date

Gothenburg
2022-12-14

Signature


Pedro Muniz
Standard Equipment Director





UK DECLARATION OF CONFORMITY

According to:

- Electric Equipment (Safety) Regulations 2016;
- Electromagnetic Compatibility Regulations 2016;
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (as amended)
- The Ecodesign for Energy-Related Products and Energy Information Regulations 2021

Type of equipment

Arc welding power source

Type designation

ET 180iP from serial number OP204 YY XX XXXX
ET 210iP from serial number OP205 YY XX XXXX
ET 210iP Advanced from serial number OP241 YY XX XXXX
X and Y represents digits, 0 to 9 in the serial number, where YY indicates year of production.

Brand name or trademark

ESAB

Manufacturer or his authorised representative established within United Kingdom

ESAB Group (UK) Ltd,
322 High Holborn, London, WC1V 7PB, United Kingdom
www.esab.co.uk

The following British Standards and Instruments in force within the United Kingdom has been used in the design:

- EN IEC 60974-1:2018/A1:2019	Arc welding equipment - Part 1: Welding power sources
- EN IEC 60974-3:2019	Arc welding equipment - Part 3: Arc striking and stabilizing devices
- EN 60974-10:2014	Arc welding equipment - Part 10: Electromagnetic compatibility (EMC)
- UK S.I. 2021/745	Requirements for welding equipment pursuant to the Ecodesign for Energy-Related Products and Energy Information Regulations 2021

Additional Information:

Restrictive use, Class A equipment, intended for use in locations other than residential.
The ET 180iP, ET 210iP and ET 210iP Advanced are part of the ESAB Renegade product family.

By signing this document, the undersigned declares as manufacturer, or the manufacturer's authorised representative established within the UK, that the equipment in question complies with the safety and environmental requirements stated above.

Signatures

Gary Kisby
Sales & Marketing Director,
ESAB Group UK & Ireland
London, 2022-12-21

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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

Users of ESAB equipment have the ultimate responsibility for ensuring that anyone who works on or near the equipment observes all the relevant safety precautions. Safety precautions must meet the requirements that apply to this type of equipment. The following recommendations should be observed in addition to the standard regulations that apply to the workplace.

All work must be carried out by trained personnel well-acquainted with the operation of the equipment. Incorrect operation of the equipment may lead to hazardous situations which can result in injury to the operator and damage to the equipment.

1. Anyone who uses the equipment must be familiar with:
 - its operation
 - location of emergency stops
 - its function
 - relevant safety precautions
 - welding and cutting or other applicable operation of the equipment
2. The operator must ensure that:
 - no unauthorised person is stationed within the working area of the equipment when it is started up
 - no-one is unprotected when the arc is struck or work is started with the equipment
3. The workplace must:
 - be suitable for the purpose
 - be free from drafts

4. Personal safety equipment:

- Always wear recommended personal safety equipment, such as safety glasses, flame-proof clothing, safety gloves
- Do not wear loose-fitting items, such as scarves, bracelets, rings, etc., which could become trapped or cause burns

5. General precautions:

- Make sure the return cable is connected securely
- Work on high voltage equipment **may only be carried out by a qualified electrician**
- Appropriate fire extinguishing equipment must be clearly marked and close at hand
- Lubrication and maintenance must **not** be carried out on the equipment during operation

If equipped with ESAB cooler

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

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



WARNING!

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



ELECTRIC SHOCK - Can kill

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



ELECTRIC AND MAGNETIC FIELDS - Can be dangerous to health

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



FUMES AND GASES - Can be dangerous to health

- Keep your head out of the fumes.
- Use ventilation, extraction at the arc, or both, to take fumes and gases away from your breathing zone and the general area.



ARC RAYS - Can injure eyes and burn skin

- Protect your eyes and body. Use the correct welding screen and filter lens and wear protective clothing.
- Protect bystanders with suitable screens or curtains.



NOISE - Excessive noise can damage hearing

Protect your ears. Use earmuffs or other hearing protection.

MOVING PARTS - Can cause injuries



- Keep all doors, panels and covers closed and securely in place. Have only qualified people remove covers for maintenance and troubleshooting as necessary. Reinstall panels or covers and close doors when service is finished and before starting engine.



- Stop engine before installing or connecting unit.
- Keep hands, hair, loose clothing and tools away from moving parts.

FIRE HAZARD



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

HOT SURFACE - Parts can burn



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

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

PROTECT YOURSELF AND OTHERS!



CAUTION!

This product is solely intended for arc welding.



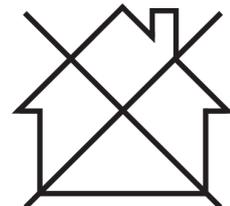
WARNING!

Do not use the power source for thawing frozen pipes.



CAUTION!

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



NOTE!

Dispose of electronic equipment at the recycling facility!

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

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

For further information contact the nearest ESAB dealer.



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

2 INTRODUCTION

Renegade ET 210iP Advanced is an inverter-based power source intended for MMA (Manual Metal Arc), TIG (Tungsten Inert Gas) and HF TIG (High Frequency Tungsten Inert Gas) welding.

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

2.1 Equipment

Renegade ET 210iP Advanced includes:

- Power source
- Work clamp leadset
- Gas hose
- Shoulder strap
- Safety manual
- Quick setup guide

3 TECHNICAL DATA

Renegade ET 210iP Advanced		
Outlet voltage	230 V \pm 15%, 1~ 50/60 Hz	115 V \pm 15%, 1~ 50/60 Hz
Primary current		
I_{max}	26 A	29 A
No-load power demand when in energy-saving mode	27 W	27 W
Setting range		
MMA	5-180 A	5-110 A
TIG	5-210 A	5-140 A
Permissible load at MMA		
25 % duty cycle	180 A / 27.2 V	110 A / 24.4 V
60 % duty cycle	135 A / 25.4 V	71 A / 22.8 V
100% duty cycle	105 A / 24.2 V	55 A / 22.2 V
Permissible load at TIG		
25 % duty cycle	210 A / 18.4 V	140 A / 15.6 V
60 % duty cycle	135 A / 15.4 V	90 A / 13.6 V
100% duty cycle	105 A / 14.2 V	70 A / 12.8 V
Apparent power I₂ at maximum current	6.1 kVA	3.33 kVA
Active power I₂ at maximum current	6 kW	3.3 kW
Power factor at maximum current		
MMA	0.99	
TIG	0.99	
Efficiency at maximum current		
MMA	83%	81%
Open-circuit voltage U₀ max		
VRD 35 V deactivated	78 V	
VRD 35 V activated	<30 V	
Operating temperature	-10 to +40°C (+14 to 104°F)	
Transportation temperature	-20 to +55°C (-4 to +161°F)	
Constant sound pressure when idling	<70 db	
Dimensions l × w × h	460 × 200 × 320 mm (18.1×7.9×12.6 in.)	
Weight	11 kg (24.3 lbs)	
Insulation class	F	
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 40 °C / 104 °F, or below.

Enclosure class

The **IP** code indicates the enclosure class, i.e. the degree of protection against penetration by solid objects or water.

Equipment marked **IP23** is intended for indoor and outdoor use.

Application class

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

3.1 ECO design information

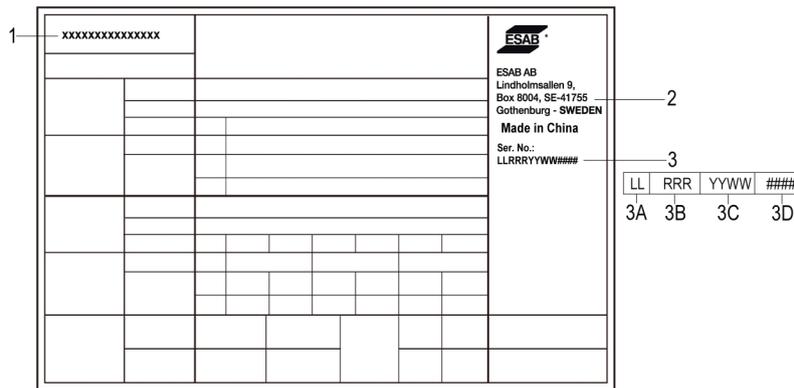
The equipment has been designed in order to be compliant with the Directive 2009/125/EC and the Regulation 2019/1784/EU.

Efficiency and idle power consumption:

Name	Idle power	Efficiency when max power consumption
Renegade ET 210iP Advanced	27 W	83%

The value of efficiency and consumption in idle state have been measured by method and conditions defined in the product standard EN 60974-1:2012.

Manufacturer's name, product name, serial number and date of production can be read from rating plate.



- 1. Product name
- 2. Manufacturer's name and address
- 3. Serial number
 - 3A. Manufacturing location code
 - 3B. Revision level (last digit of year and week number)
 - 3C. Year & week produced (last two digits of year and week number)
 - 3D. Sequential number system (each week starts with 0001)

4 INSTALLATION

The installation must be carried out by a professional.

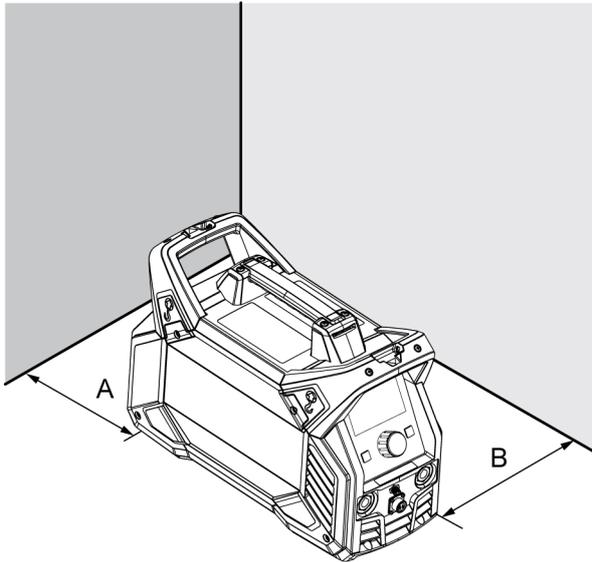


CAUTION!

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

4.1 Location

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



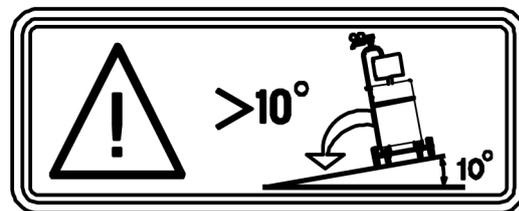
A. Minimum 200 mm (8 in.)

B. Minimum 200 mm (8 in.)



WARNING!

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



4.2 Lifting instructions

These units are equipped with a handle for carrying purposes.



WARNING!

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

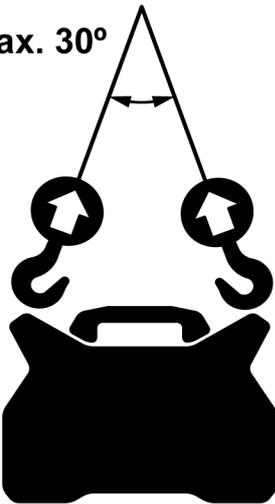


WARNING!

Falling equipment can cause serious personal injury and equipment damage.

Lift the unit with handle on top of case.

Max. 30°



4.3 Mains supply

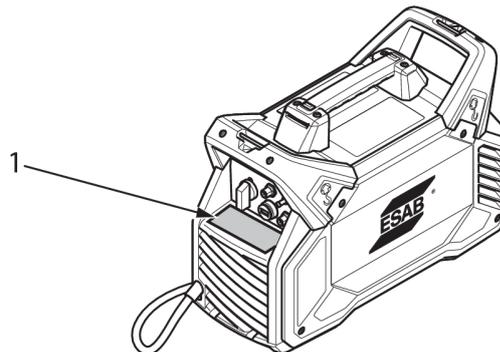


NOTE!

Mains supply requirements

This equipment complies with IEC 61000-3-12 provided that the short-circuit power is greater than or equal to S_{scmin} at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power greater than or equal to S_{scmin} .

1. Rating plate with supply connection data.



Recommended fuse sizes and minimum cable area for the Renegade ET 210iP Advanced		
Supply voltage	230 V AC	115 V AC
Mains cable area	2.5 mm ²	2.5 mm ²
Maximal current rating I_{max} MMA/Stick (SMAW)	26 A	29 A
I_{1eff} MMA/Stick (SMAW)	15.5 A	14.5 A
Fuse anti-surge type D MCB	20 A	20 A
Maximum recommended extension cord length	100 m (328 ft)	100 m (328 ft)
Minimum recommended extension cord size	2.5 mm ²	2.5 mm ²

Supply from power generators

The power source can be supplied from different types of generators. However, some generators may not provide sufficient power for the welding power source to operate correctly. Generators with Automatic Voltage Regulation (AVR) or with equivalent or better type of regulation, with rated power of 7 kW are recommended.



WARNING!

If used under 115 VAC input supply, the supply plug rating must be higher 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!



NOTE!

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



WARNING!

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

5.1 Connections and controls



1. Display
2. Main knob for menu navigation or value adjustments
3. Back button
4. Negative output (-)
5. Gas outlet
6. Torch connection

7. Positive output (+)
8. Menu button
9. Power switch
10. Remote/torch control connection
11. Cooler connection
12. Shield gas inlet

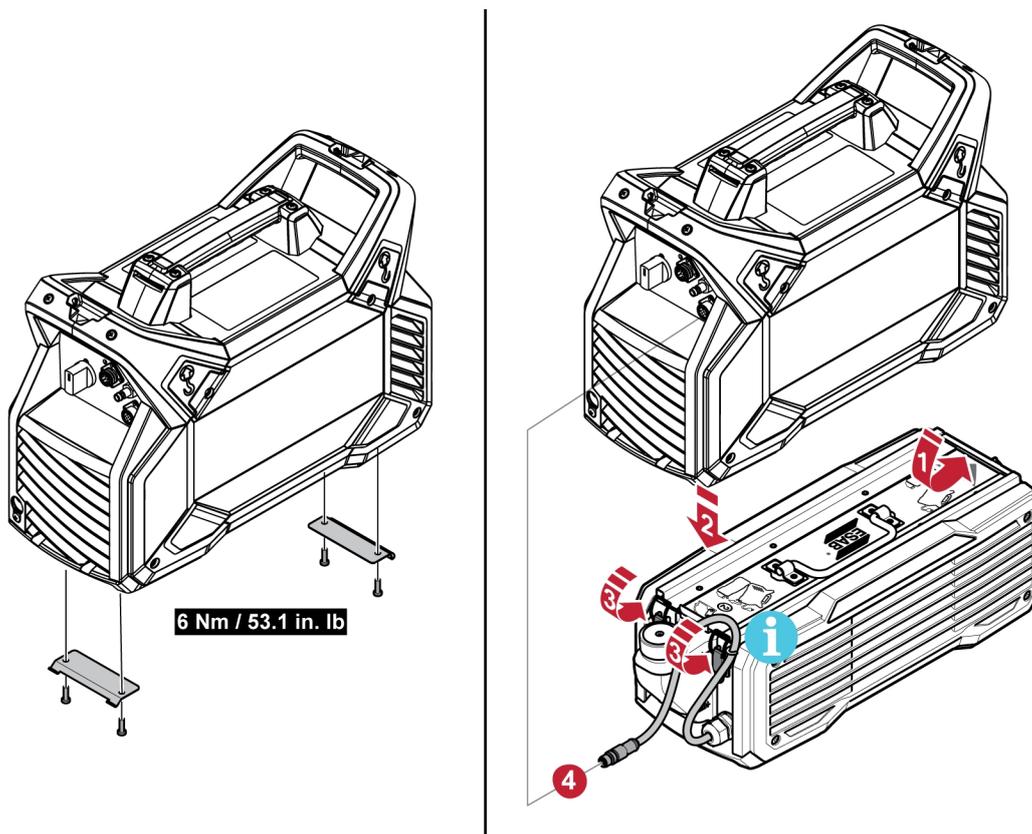
5.2 Connecting welding and return cables

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 method or type of electrode used.

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

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

5.3 Connect to cooler EC 1001



NOTE!

Take care so that the interface cable does not get squeezed between the power source and the cooling unit!



NOTE!

Power supply of the cooling unit is done from the welding power source via the connection cable (for more information, refer to the cooling unit instruction manual).

5.4 Fan control

The ET 210iP Advanced is fitted with a fan as an additional feature. When cooling fan is not in use, the fan will automatically turn off.

This has two advantages:

1. To minimize power consumption,
2. To minimize the amount of pollutants absorbed into the power source, such as dust.



NOTE!

When cooling requires, the fan will operate otherwise it will automatically turn off.

5.5 Thermal protection



The power source includes thermal protection against overheating. When overheating occurs the welding is stopped and an error message Error 206 shows in the display. The protection is automatically reset when the temperature has been sufficiently reduced.

5.6 Control panel

General safety regulations for handling the equipment can be found in the "Safety precautions" section in the "SAFETY" chapter of this manual.

General information about operation can be found in the "OPERATION" chapter of this manual.

Read and follow your employer's safety practices before installing, operating, or servicing this equipment



NOTE!

After power-ON has completed the main menu appears on the control panel.

5.6.1 How to navigate

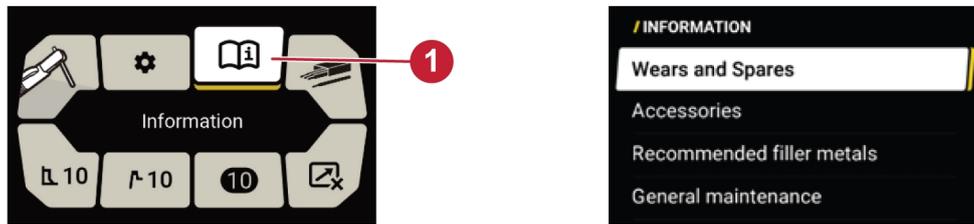


1. Left button switch (Back button)
 - a) Press Back button to return to previous screen
 - b) Press and hold for 3s to delete jobs (on Jobs screen)
2. Menu navigation: turn and push to select or change values
3. Right button switch (Menu button)

Press Menu button to direct return to menu screen

5.7 Information screen

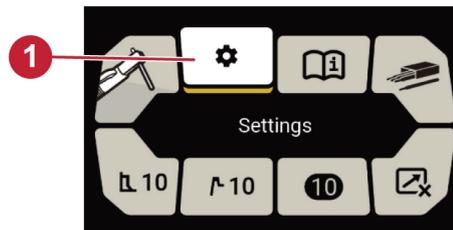
In Information menu user can find information about wears and spares, accessories, recommended filler metals, general maintenance and user manual QR code.



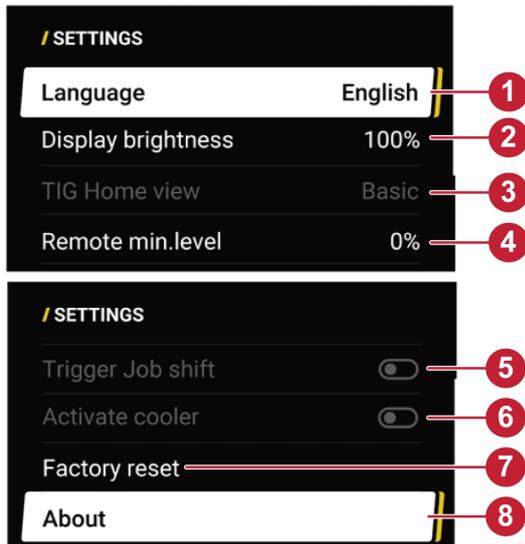
1. Information

5.8 Settings screen

Press Menu button to enter Menu screen. Turn main knob to Settings icon and press main knob to enter settings menu screen.



1. Settings screen



1. Language settings
2. Brightness settings
3. Basic/Advanced (Only TIG)

This item can be used to select basic view or advanced view of TIG welding sequencer in Home screen. Enter selection screen by turn main knob and press when TIG Home view is highlighted. Navigate between Basic and Advanced options and confirm selection by pressing main knob. Display will return to menu screen.

4. Remote min. settings (the percentage of setting Amps)

This is used to set the minimum current for the foot pedal. It is set in % of the set current in the range from 0–99% in steps of 1%.

For example: If the current is set to 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.

Enter adjustment screen by pressing main knob when Remote min. level is highlighted and turn main knob to adjustment percentage value as displayed. Confirm settings by pressing main knob and display will return to menu screen.

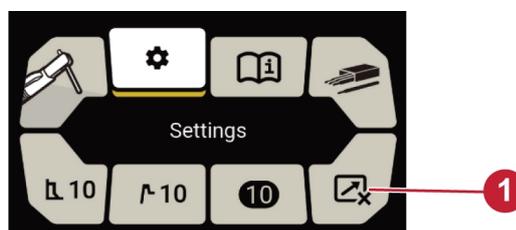
5. Trigger job shift ON/OFF (Only TIG)

Trigger job setting is used to recall stored jobs when machine is on, but arc is not ignited. This function permits changing between different welding data memories by pressing the trigger of the welding torch. User can select one of the first three jobs positions and to recall, trigger needs to be pressed number of times equal to job location (example to recall job #2 quick press trigger twice).

User can turn ON or OFF trigger job shift function by pressing main knob when this item is highlighted.

6. Cooler ON/OFF (Only TIG)
7. Reset setting
8. About (software version)

5.9 Remote screen



1. Remote screen

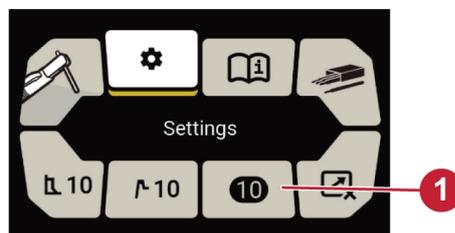
Connect the remote control on the rear side of the power source and activate the remote control on the Menu screen. When the remote control is activated the control panel is locked for interaction but displays welding data.

Should a remote device be connected the maximum output current of the power source will be determined by the front panel control knob, irrespective of the remote control device setting. See Section 5.14 "Foot pedal functions explanation", page 31.

When no remote device is connected to the power source, display shows "No remote detected". When a remote device (see options in Accessories screen under Information menu) is connected, turn it ON or OFF by turning main knob. Confirm selection by press main knob and display returns to menu screen.

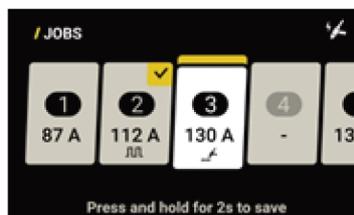


5.10 Jobs screen



1. Jobs screen

Renegade ET 210iP Advanced power source enables the user to store 10 jobs for each welding process. Critical welding data can be previewed in Jobs menu for easier selection.



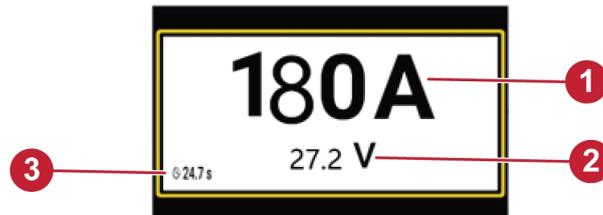
To save current welding data, enter Jobs screen to find an available job position or a job position to be replaced, press main knob and hold for 2 seconds.

To recall a job, enter Jobs screen under corresponding welding process menu screen, scroll through Jobs list by rotating main knob, and confirm selection by pressing main knob.

To remove a job, rotate main knob to scroll to the job position, press and hold Back Button until the screen displays "Clear this Job position", confirm by pressing main knob.



5.11 Welding screen



1. Momentary current value during welding, or average current of last weld after welding.
2. Momentary voltage value during welding, or average voltage of last weld after welding.
3. Arc-on time of last weld will be displayed after welding.

Parameters of last weld will be displayed for 10 seconds after welding. When the 10 seconds are ended and there is no interaction with the user interface, display returns to previous view before welding.

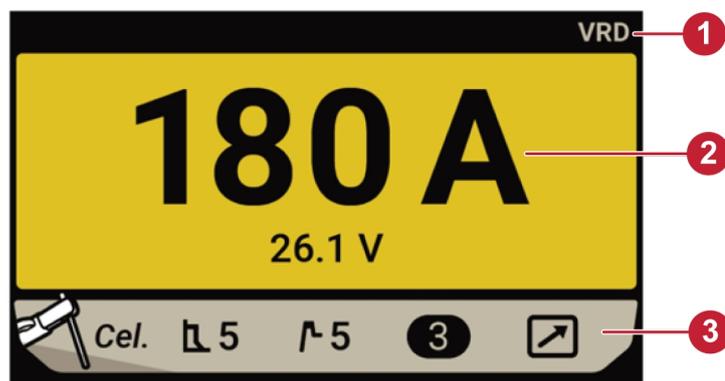
5.12 MMA welding

MMA MMA welding may also be referred to as welding with covered electrodes. The arc melts the electrode as well as a local part of the workpiece. The coverage, when melting, forms a protective slag and creates a shielding gas to protect the weld pool from atmospheric contamination.

For MMA welding the power source shall be supplemented with:

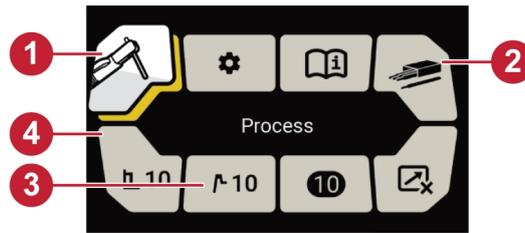
- welding cable with electrode holder
- return cable with clamp

5.12.1 MMA/Stick Home screen

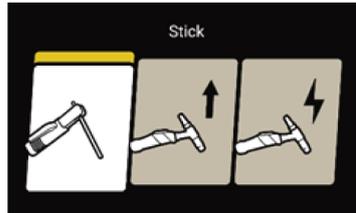


1. VRD: The VRD function ensures that the open-circuit voltage does not exceed 35 V when welding is not being carried out. When VRD is ON "VRD" is displayed in status bar of home screen. Factory default is VRD OFF (except for Australia). Contact an authorized ESAB service technician to activate this function.
2. Preset welding current: rotate main knob clockwise to increase preset welding current or anti-clockwise to decrease preset welding current.
3. Bottom bar of home screen displays status of welding process, arc force level, hot start level, job selection and remote connection. To make any change or adjustment, press menu button to enter menu screen and navigate by turning main knob. See detailed introduction of each function in Section 5.12.2 "MMA/Stick Menu screen", page 22.

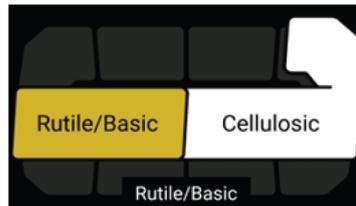
5.12.2 MMA/Stick Menu screen



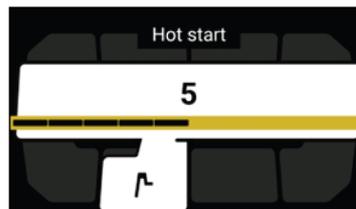
1. Process selection icon: press main knob to enter process selection screen and select Stick (MMA) function by press main knob again.



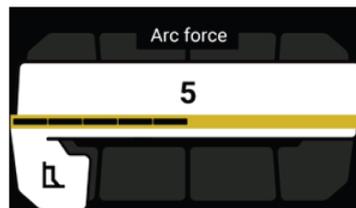
2. Electrode type: select between rutile/basic electrode and cellulosic electrode by turning main knob and confirm selection by pressing main knob.



3. Hot start: The hot start function temporarily increases the current in the beginning of the weld, thus reducing the risk of lack of fusion in the starting point. Turn main knob to adjust hot start level on a scale of 1 to 10 in hot start screen. Confirm adjustment by pressing main knob and adjusted hot start level will be displayed in menu screen.



4. Arc force: The arc force function determines how the current changes in response to variations in arc length during welding. Use a low value of arc force to get a calm arc with little spatter and use a high value to get a hot and digging arc. Turn main knob to adjust arc force level on a scale of 1 to 10 in arc force screen. Confirm adjustment by pressing main knob and adjusted arc force level will be displayed in menu screen.



5.13 TIG welding



TIG 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 welding, the welding power source shall be supplemented with:

- a TIG torch
- a gas hose connected to the gas supply input (using a hose clamp)
- an argon gas cylinder
- an argon gas regulator
- a tungsten electrode
- a return cable (with clamp)

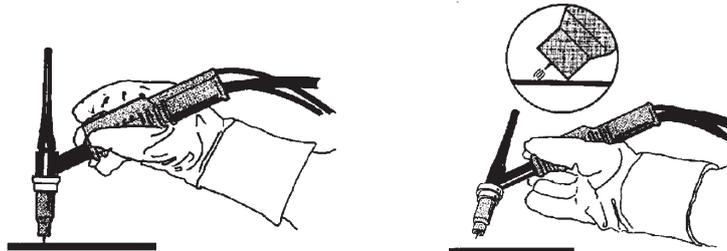
This power source performs **Lift Arc TIG** start and **TIG HF start**.



Lift Arc TIG start

The LiftArc™ function initiates the arc when the tungsten electrode is brought into contact with the workpiece, the trigger switch is pressed, and the tungsten electrode is lifted away from the workpiece. In order to minimize the risk of tungsten contaminations the start current is very low and will slope up to the set current (controlled by the slope up function).

The tungsten electrode is placed against the workpiece and press the torch trigger. When lifted away from workpiece the arc is struck at a limited current level.



TIG HF start

The HF start function initiates the arc by using a high frequency voltage pilot arc. This will reduce the risk of tungsten contamination in the starts. The high frequency voltage might disturb other electrical equipment in the surrounding area.

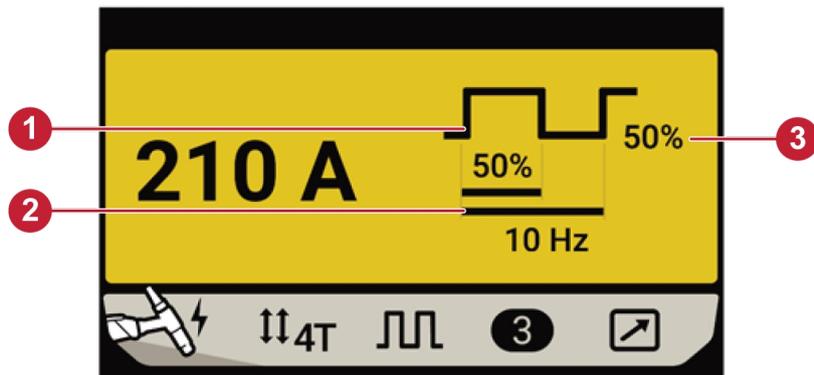
The HF (High Frequency) start function strikes the arc by means of a spark from the tungsten electrode to the workpiece as the electrode is brought closer to the workpiece and the trigger on the TIG torch is pressed.

5.13.1 TIG Home screen



1. Water cooler connection: water cooling symbol is display in status bar when water cooler is connected and activated.
2. Preset welding current: rotate main knob clockwise to increase preset welding current or anti-clockwise to decrease preset welding current.
3. TIG welding sequencer displays adjusted value of DC TIG process when sequencer view is activated or DC TIG pulse welding process when pulse and sequencer/pulse view is activated. DC TIG Pulse welding is used mainly on thin metals but can also be used on thicker material based on the application. Pulsing allows the user to control the amount of heat applied to the work piece. Pulse setting gives user far more control over the welding process without compromising the strength and integrity of the weld and helps in having a smooth and clean weld. To activate pulse or adjust value of each process, see introduction in XXX. To change among basic view, sequencer view or sequencer / pulse view, press menu button and enter Settings menu.
4. Bottom bar of TIG home screen displays status of welding process selection, trigger mode, pulse, job selection and remote connection. To make any change or adjustment, press menu button and navigate through each function by rotating main knob. See detailed introduction in XXX.

Sequencer/Pulse TIG home view



1. Peak time view
2. Frequency view
3. Background current view

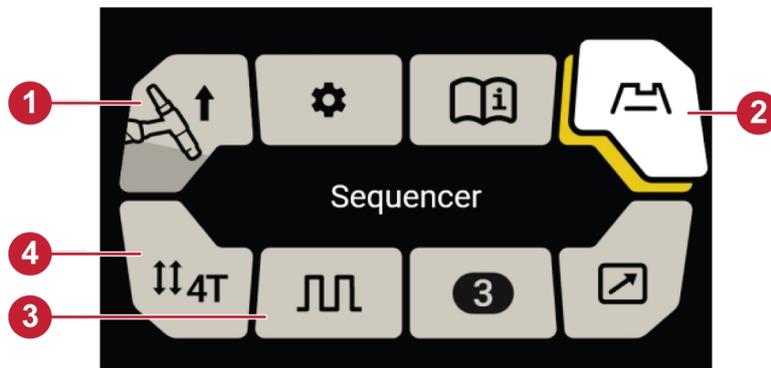
Sequencer TIG home view



- 1. Gas pre-flow view
- 2. Start current view
- 3. Slope up view
- 4. Slope down view
- 5. Final current view
- 6. Gas post-flow view

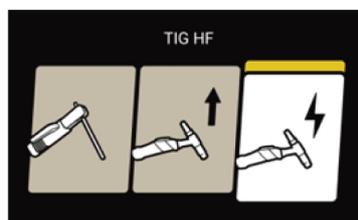
5.13.2 TIG Menu screen

When Lift TIG or TIG HF is selected, press menu button to enter TIG menu screen.



1. Process selection

To press main knob to enter process selection screen and select between Lift TIG or TIG HF when this icon is highlighted.



2. Sequencer settings

Enter sequencer settings screen by pressing main knob when Sequencer icon is highlighted, and navigate through the sequencer by rotating main knob. To make adjustment of any process, press main knob when the process to adjust is displayed in yellow and rotate main knob to adjust value as displayed. Press main knob again to confirm value and exit adjustment mode.





Gas pre flow

The gas pre flow function controls the time during which shielding gas flows before the arc is initiated. Setting range is 0.0-25.0 seconds. Factory default is 1.0 second.



Gas post flow

The gas post flow function controls the time during which shielding gas flows after the arc is terminated. Setting range is 0.0-25.0 seconds. Factory default is 7.0 seconds.

Slope up

The slope up function is used to control the time of the current increase in the weld initiation process to avoid any possible damage to the tungsten electrode. Setting range is 0.0-25.0 seconds. Factory default is 1.5 seconds.

Slope down

The slope down function is used to control the time of the current decrease in the weld termination process to avoid any pipes and/or cracks. Setting range is 0.0-25.0 seconds. Factory default is 3.0 second.

3. Pulse settings

In order to set a pulsed current, four parameters are required: pulse current, background current, pulse balance and pulse frequency.

Pulse current

The higher of the two current values when using a pulsed current. Setting range is 10 to 210 A.

Pulse background current

The lower of the two current values when using a pulsed current. Setting range is between 10 to 210 A. Factory default is 80 A.

Pulse balance

Pulse balance is the ratio between pulse current and background current in a pulse cycle. In order to control the energy of the arc and the size of the weld pool, pulse balance is adjustable by setting the percentage of the pulse current in a pulse cycle. Setting range is 10-90%, and increment value of each rotation of main knob is 5%. Factory default is 50%.

For example: If the pulse balance is set to 50%, the time of the pulse current and the background current will be distributed equally in the pulse cycle. If the pulse balance is set to 90%, the time of the pulse current will be 90% of the pulse cycle and the background current will only be 10%.

Pulse frequency

The amount of pulse cycles in a time period. The higher the frequency, the more pulse cycles per time period. When the pulse frequency is set low, the weld pool will have time to partially solidify between each pulse. If the frequency is set high, a more focused arc can be obtained.

Setting range is 0.01-999 Hz. Increment value at each rotation of main knob changes as listed below. Factory default setting is 100 Hz.

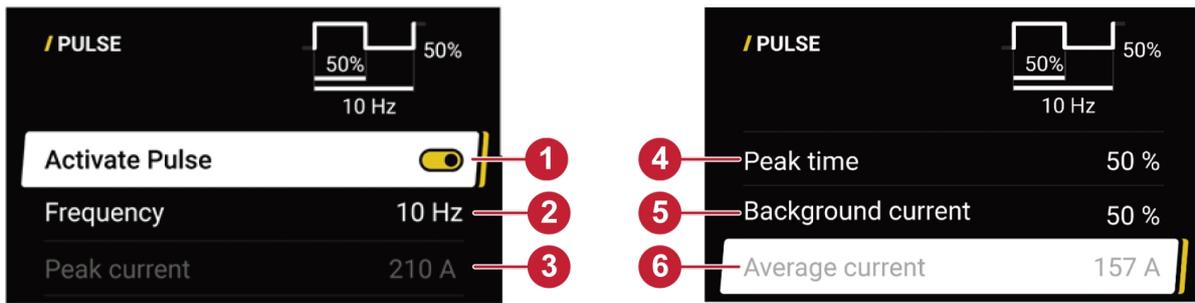
0.01-0.99: 0.01

1.0-9.9: 0.1

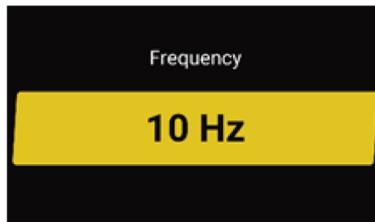
10-100: 1

100-300: 10

300-999: 100



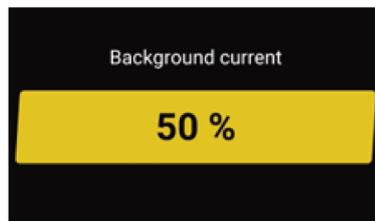
1. Pulse ON/OFF (push main knob to switch between ON and OFF)
2. Frequency settings (push main knob and rotate to adjust)



3. Peak current (read only)
4. Peak time setting (push main knob and rotate to adjust)

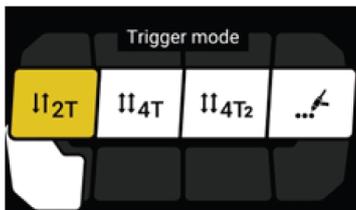


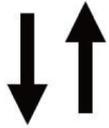
5. Background current setting (push main knob and rotate to adjust)



6. Average current (read only)

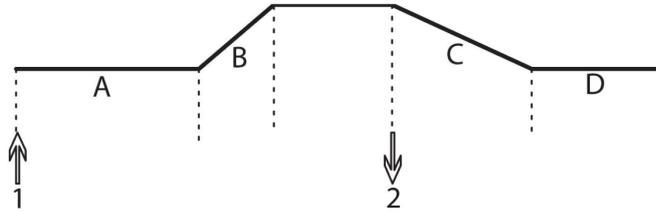
4. Trigger mode





2-stroke

In 2-stroke mode, press the TIG torch trigger switch (1) to start the shielding gas flow and initiate the arc. The current slopes up to the set current value. Release the trigger switch (2) to start to slope down the current and terminate the arc. The shielding gas will continue to flow in order to protect the weld and the tungsten electrode.

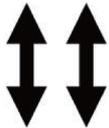


A = Gas pre flow

B = Slope up

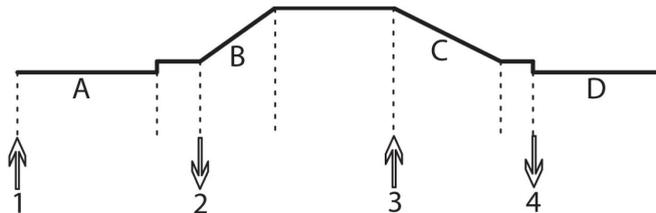
C = Slope down

D = Gas post flow



4-stroke

In 4-stroke mode, press the TIG torch trigger switch (1) to start shielding gas flow and initiate the arc at a pilot level. Release the trigger switch (2) to slope up the current to the set current value. To stop the welding, press the trigger switch again (3). The current will slope down to the pilot level again. Release the trigger switch (4) to terminate the arc. The shielding gas will continue to flow in order to protect the weld and the tungsten electrode.



A = Gas pre flow

B = Slope up

C = Slope down

D = Gas post flow

4T₂

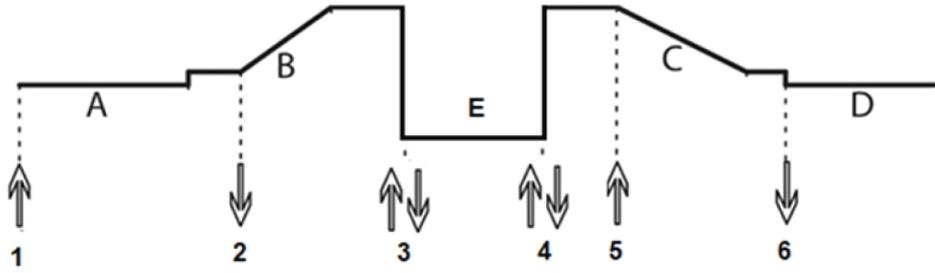


4T₂ changes the value of secondary current that needs to be adjusted in sequencer after 4T₂ activation. 4T₂ current feature lets the user to switch to lower current during welding the corners or edges without stopping the weld.

4T₂ operation is available only in trigger mode when 4T₂ is enabled.

When 4T₂ mode is enabled, it can be activated by quick trigger tap action during welding. One quick tap on trigger (push and release) will switch the output weld current from "Main current" to "Secondary Current"; another quick tap on trigger will switch the current from "Secondary Current" to "Main Current".

See below picture.



A = Gas pre flow

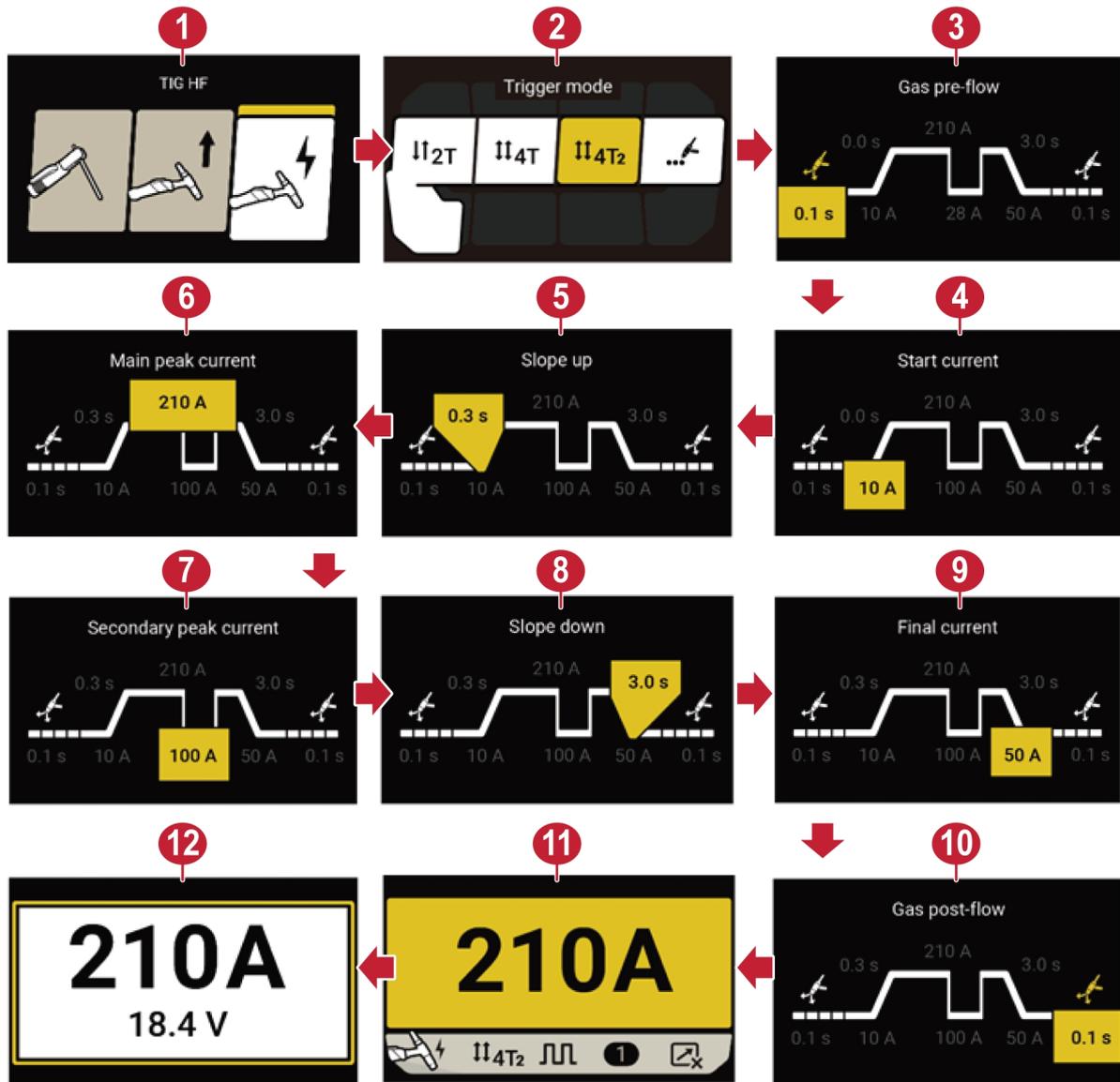
B = Slope up

C = Slope down

D = Gas post flow

E = Secondary current

Below illustration shows the navigation or setup of 4T2 Pulse in the Pulse screen.



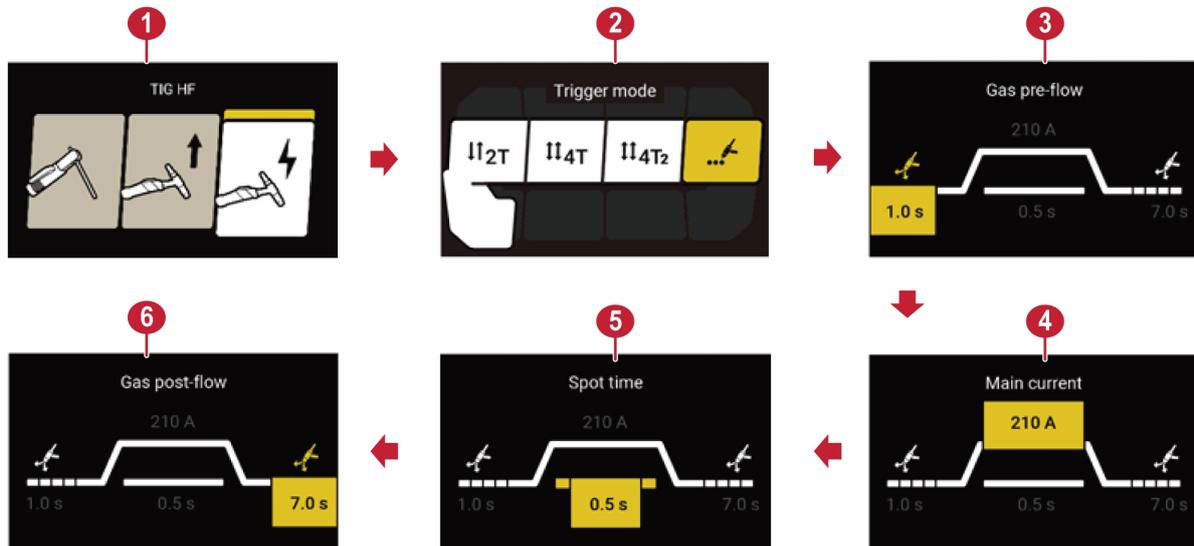
- | | |
|--|--|
| 1. Weld mode selection (Lift TIG/HF TIG) | 7. Secondary current setting (Current B) |
| 2. Select 4T2 mode | 8. Slope down setting |
| 3. Pre-flow gas setting | 9. Final current setting |
| 4. Start current setting | 10. Post-flow gas setting |
| 5. Slope up setting | 11. Current setting and review |
| 6. Main current setting (Current A) | 12. Welding screen |



Spot Mode

Spot welding is used to weld two thin plates together at a desired location by melting the top and bottom plates together to form a nugget between them. The spot time can be adjusted in the sequencer menu once spot mode active

Below illustration shows the spot operation.

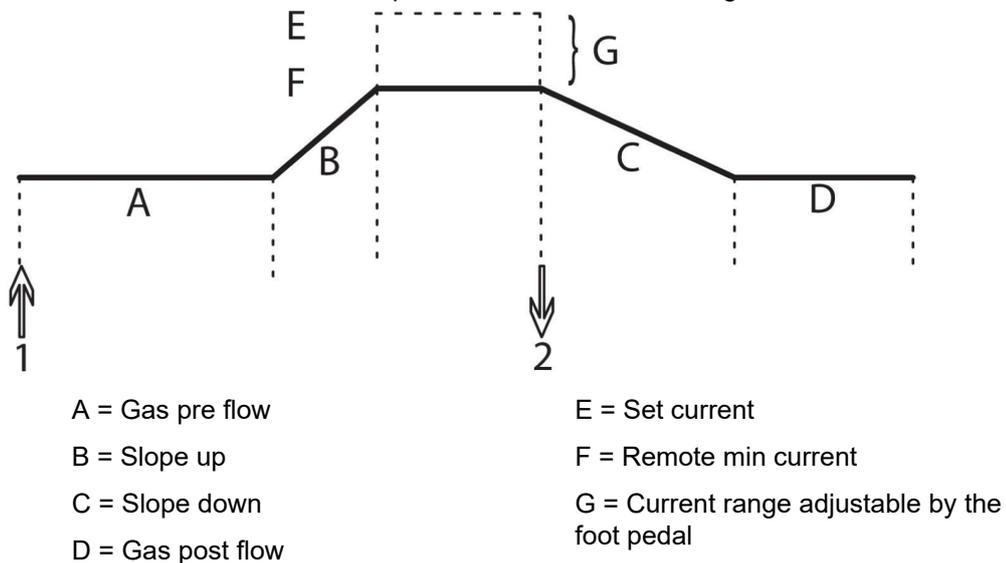


1. Weld mode selection (Lift TIG/HF TIG)
2. Select Spot mode
3. Pre-flow gas setting
4. Welding current setting
5. Spot time setting
6. Post-flow gas setting

5.14 Foot pedal functions explanation

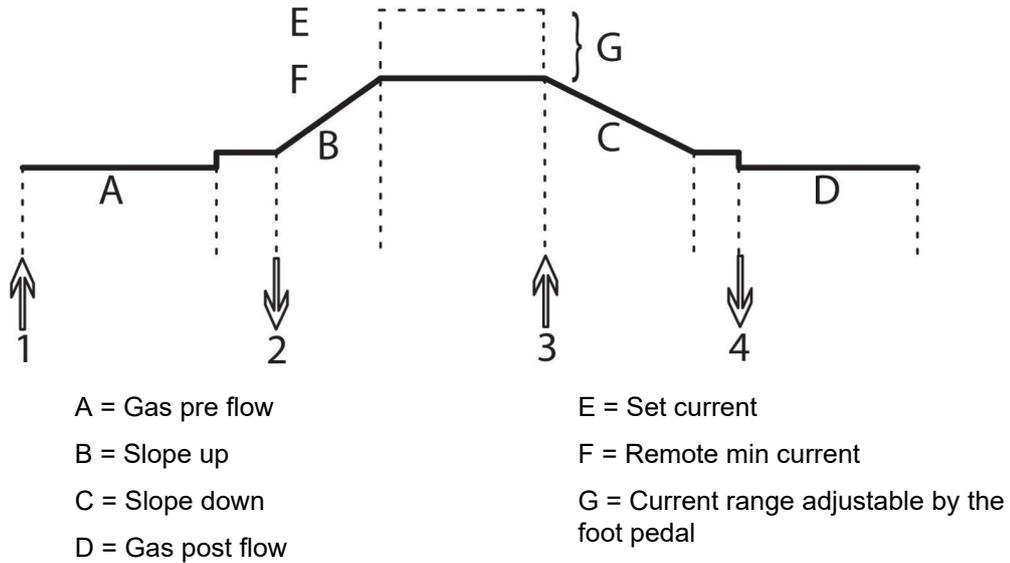
Foot pedal with 2-stroke using TIG torch trigger

In 2-stroke mode, with the foot pedal activated, press the TIG torch trigger switch (1) to start the shielding gas flow and initiate the arc. The current slopes up to the set remote min current. Use the foot pedal to adjust the current between the remote min current and the set current value. Release the TIG torch trigger switch (2) to start to slope down the current and terminate the arc. The shielding gas will continue to flow in order to protect the weld and the tungsten electrode.



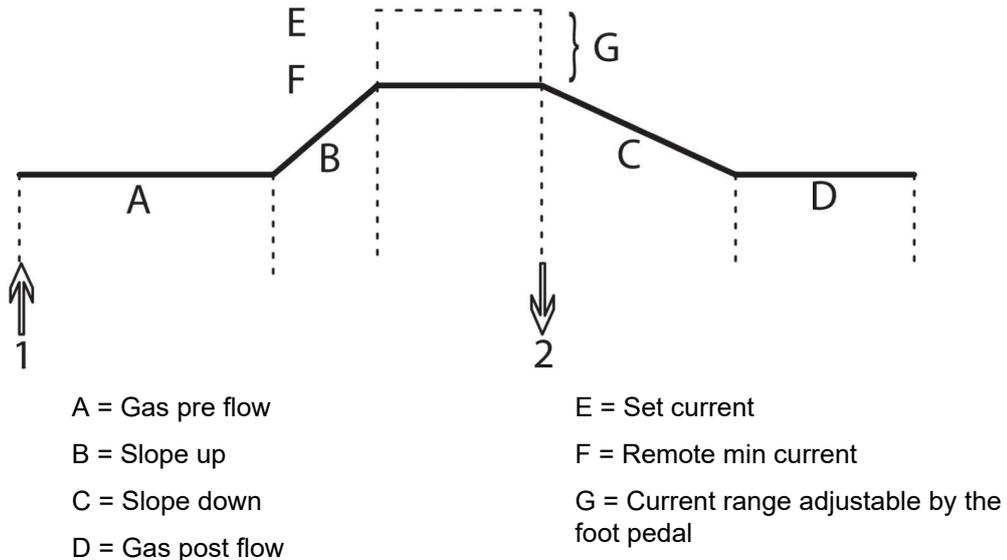
Foot pedal with 4-stroke using TIG torch trigger

In 4-stroke mode, with the foot pedal activated, press the TIG torch trigger switch (1) to start the shielding gas flow and initiate the arc at a pilot level. Release the trigger switch (2) to slope up the current to the remote min current. Use the foot pedal to adjust the current between the remote min current and the set current value. To stop the welding, press the trigger switch again (3). The current will slope down to the pilot level again. Release the trigger switch (4) to terminate the arc. The shielding gas will continue to flow in order to protect the weld and the tungsten electrode.



Foot pedal

Press down the foot pedal (1) to start the shielding gas flow and initiate the arc. The current slopes up to the set remote min current. Use the foot pedal to adjust the current between the remote min current and the set current value. Release the foot pedal to start to slope down the current and to terminate the arc. The shielding gas will continue to flow in order to protect the weld and the tungsten electrode.



6 MAINTENANCE

**WARNING!**

The mains supply must be disconnected during cleaning and maintenance.

**CAUTION!**

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

**CAUTION!**

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

**NOTE!**

Regular maintenance is important for safe and reliable operation.

**NOTE!**

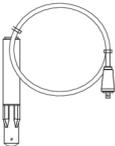
Perform maintenance more often during severe dusty conditions.

Before each use - make sure that:

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

6.1 Routine maintenance

Maintenance schedule during normal conditions. Check equipment prior to every use.

Interval	Area to maintain		
Every 3 months	 Clean or replace unreadable labels.	 Clean weld terminals.	 Check or replace weld cables.
Every 6 months	 Clean inside equipment. Use dry compressed air with 4 bar pressure.		

6.2 Cleaning instruction

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
- the working environment

**CAUTION!**

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

**CAUTION!**

During cleaning, always wear recommended personal safety equipment, such as ear plugs, safety glasses, masks, gloves and safety shoes.

**CAUTION!**

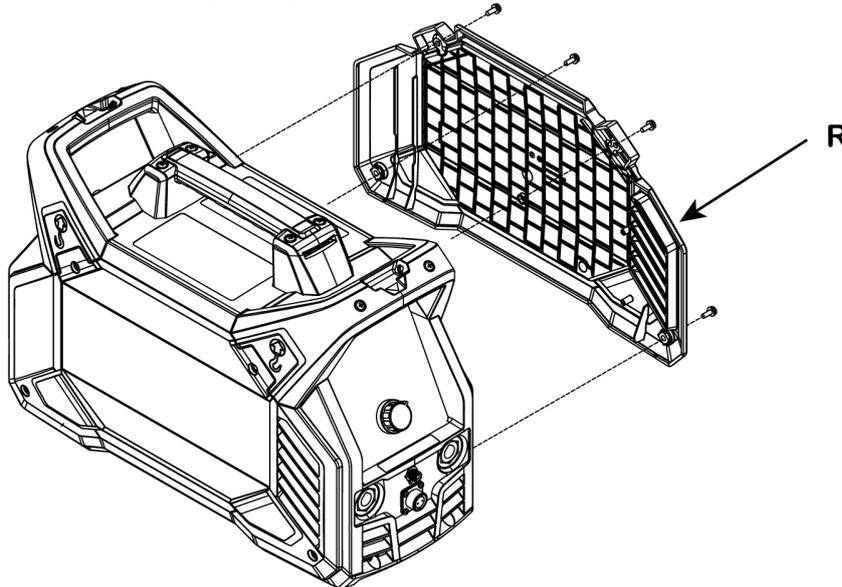
The cleaning procedure should be carried out by authorised service technician.

1. Disconnect the power source from the mains supply.

**WARNING!**

Wait at least 30 seconds for the capacitors to discharge before continuing.

2. Remove the four screws holding the right side panel (**R**) and remove the panel.

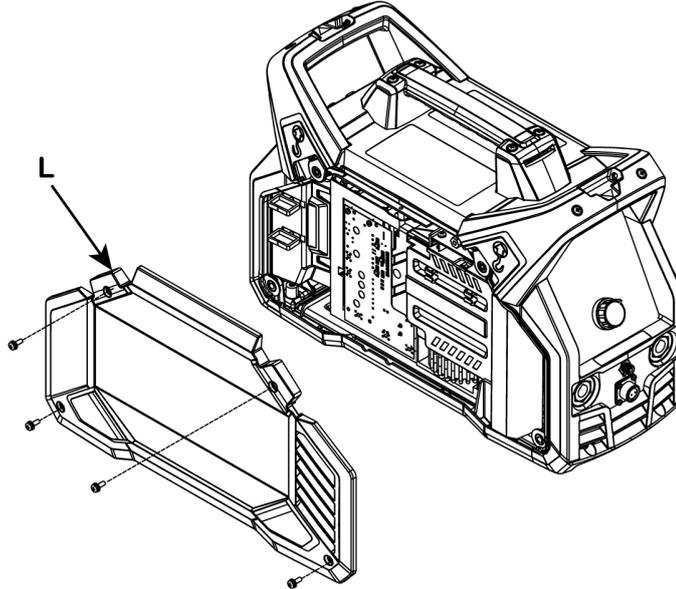


3. Clean the right side of the power source, using dry compressed air with reduced pressure.

**NOTE!**

Since the power source contains one "dirty side" (the right side) and one "clean side" (the left side), it is important that you do not remove **the left** side panel before cleaning the right side of the power source.

4. Remove the four screws holding the left side panel (**L**) and remove the panel.



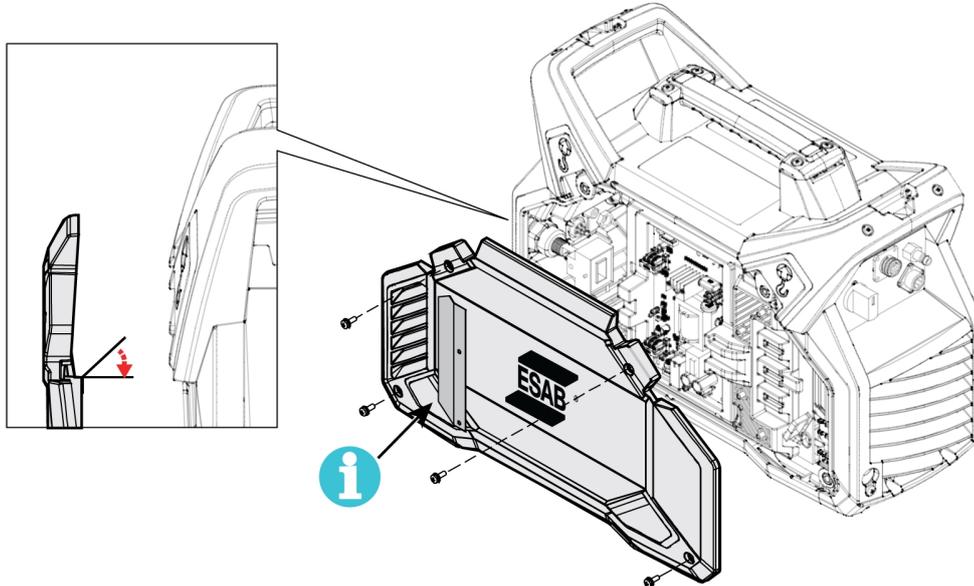
5. Clean the left side of the power source, using dry compressed air with reduced pressure.
6. Make sure that there is no dust left on any part of the power source.

7. Reassemble the power source after cleaning and perform testing according to IEC 60974-4. Follow the procedure in section "After repair, inspection and test" in the Service manual.

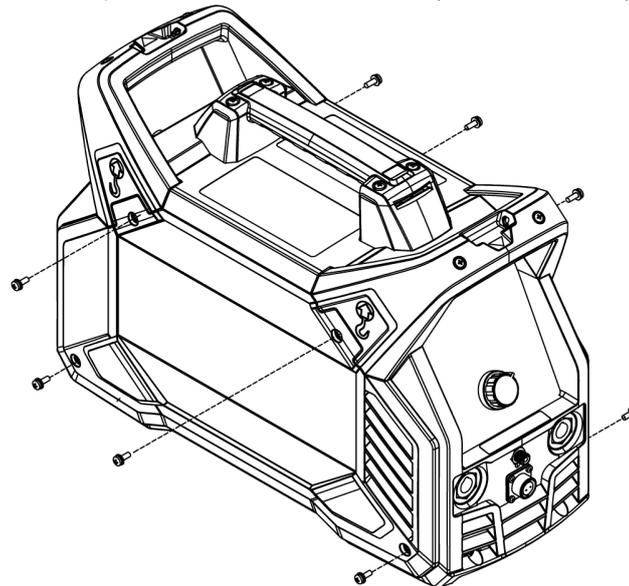


NOTE!

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 should be angled approximately 90° into the power source, so that it is positioned between the welding outlet connector and the transformer outlets.



8. Tighten the screws on the side panels with $3 \text{ Nm} \pm 0.3 \text{ Nm}$ (26.6 in lb. \pm 2.6).



7 TROUBLESHOOTING

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

- Check that the mains voltage is disconnected before starting any type of repair action.

Type of fault	Corrective action
MMA welding problems	Check that the welding process is set to MMA.
	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 welding problems	Check the welding process is set for Lift TIG as necessary.
	Check that the TIG 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 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 correct values.
	Check that welding and return cables are correctly connected.
	Check the electrical power supply fuses.
Welding current is interrupted during welding	Check whether the Over Temperature LED (Thermal Protection) on the setting panel is on.
	Continue with fault type "No Arc".
The thermal protection trips frequently	Make sure the recommended duty cycle for the weld current has not been exceeded.
	See section "Duty cycle" in the TECHNICAL DATA chapter.
	Make sure the air inlets or outlets are not clogged.
	Clean inside machine according to routine maintenance.

8 CALIBRATION AND VALIATION



WARNING!

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

8.1 Measurement methods and tolerances

When calibrating and validating, the reference measuring instrument must use the same measuring method in the DC range (averaging and rectification of the measured values). A number of measurement methods are used for reference instruments, e.g. TRMS (True Root Mean Square), RMS (Root-Mean-Square) and rectified arithmetic mean. Renegade ET 210i Advanced uses the rectified arithmetic mean value and should therefore be calibrated against a reference instrument using the rectified arithmetic mean value.

In the field application it will occur that a measuring device and a Renegade ET 210i Advanced may display different values even though both systems are validated and calibrated. This is due to the measurement tolerances and the method of measurement of the two measurement systems. This can result in a total deviation up to the sum of both measurement tolerances. If the measurement method differ (TRMS, RMS or rectified arithmetic mean), significantly larger deviations are to be expected!

The ESAB Renegade ET 210i Advanced welding power source presents the measured value in rectified arithmetic mean and should therefore not show any significant differences compared to other ESAB welding equipment, due to the measurement method.

8.2 Requirements specifications and standards

Renegade ET 210i Advanced is designed to meet the accuracy for indication and meters required by IEC/EN 60974-14, by definition Standard grade.

Calibration accuracies of displayed value

Arc voltage	$\pm 1.5 \text{ V}$ ($U_{\min}-U_2$) under load, resolution 0.25 V (Theoretical measuring range in a Renegade ET 210i Advanced system is 0.25-199 V.)
Welding current	$\pm 2.5\%$ of I_2 max according to rating plate of the unit under test, resolution 1 A. The measuring range is specified by the rating plate on the used Renegade ET 210i Advanced welding power source.

Recommended method and applicable standard

ESAB recommend calibration and validation to be executed according to IEC/EN 60974-14(:2018) or EN 50504:2008 (unless another way of execution is communicated from ESAB).

9 ERROR CODES

The error code is used to 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 several errors have been 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 authorised ESAB service technician.

Error code	Description
Error206	<p><i>Temperature fault</i></p> <p>The temperature of the power source is too high. A LED indicating temperature fault is also lit on the panel. A temperature fault is indicated by the overheating indicator on the control panel.</p> <p>Action: The error code will automatically disappear and the LED 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>
Error406	<p><i>Coolant fault</i></p> <p>The temperature of the coolant fluid is too high.</p> <p>Action: Make sure that there is sufficient coolant fluid in the cooler. The error code will automatically disappear when the coolant has cooled down and is ready for use again. If the error persists, contact a service technician.</p>
Error429	<p><i>Water cooling disabled</i></p> <p>The hose from the torch is not connected to the cooling unit.</p> <p>Action: If a water cooled torch is used make sure it is connected to the cooling unit. If a water cooled torch is not used, press a button on the control panel to cancel the error. If the error persists, contact a service technician.</p>

10 ORDERING SPARE PARTS



CAUTION!

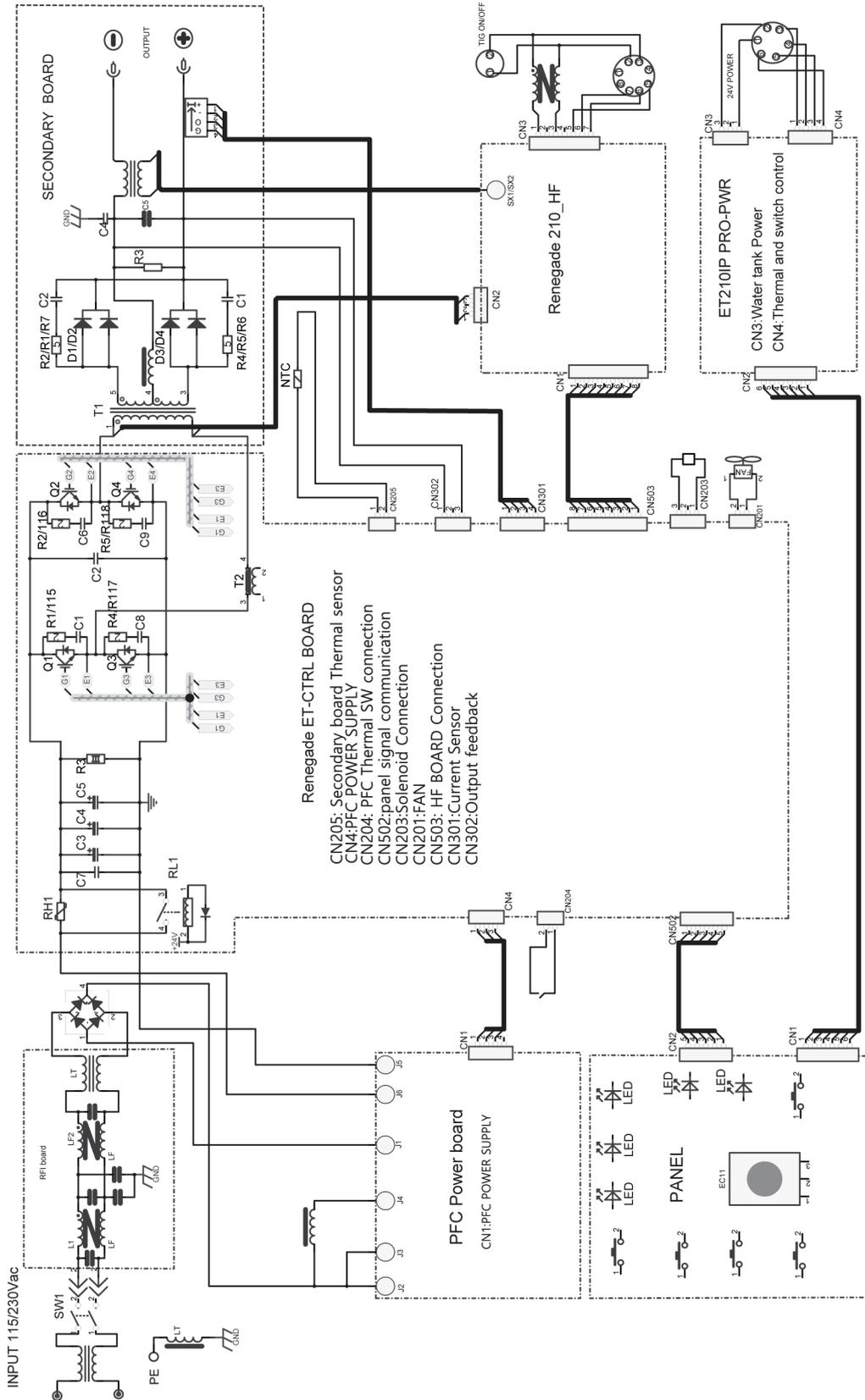
Repair and electrical work should be performed by an authorised ESAB service technician.
Use only ESAB original spare and wear parts.

Renegade ET 210iP Advanced is designed and tested in accordance with the international and European standards **EN60974-1** and **EN60974-10**. On completion of service or repair work, it is the responsibility of the person(s) performing the work to ensure that the product still complies with the requirements of the above standards.

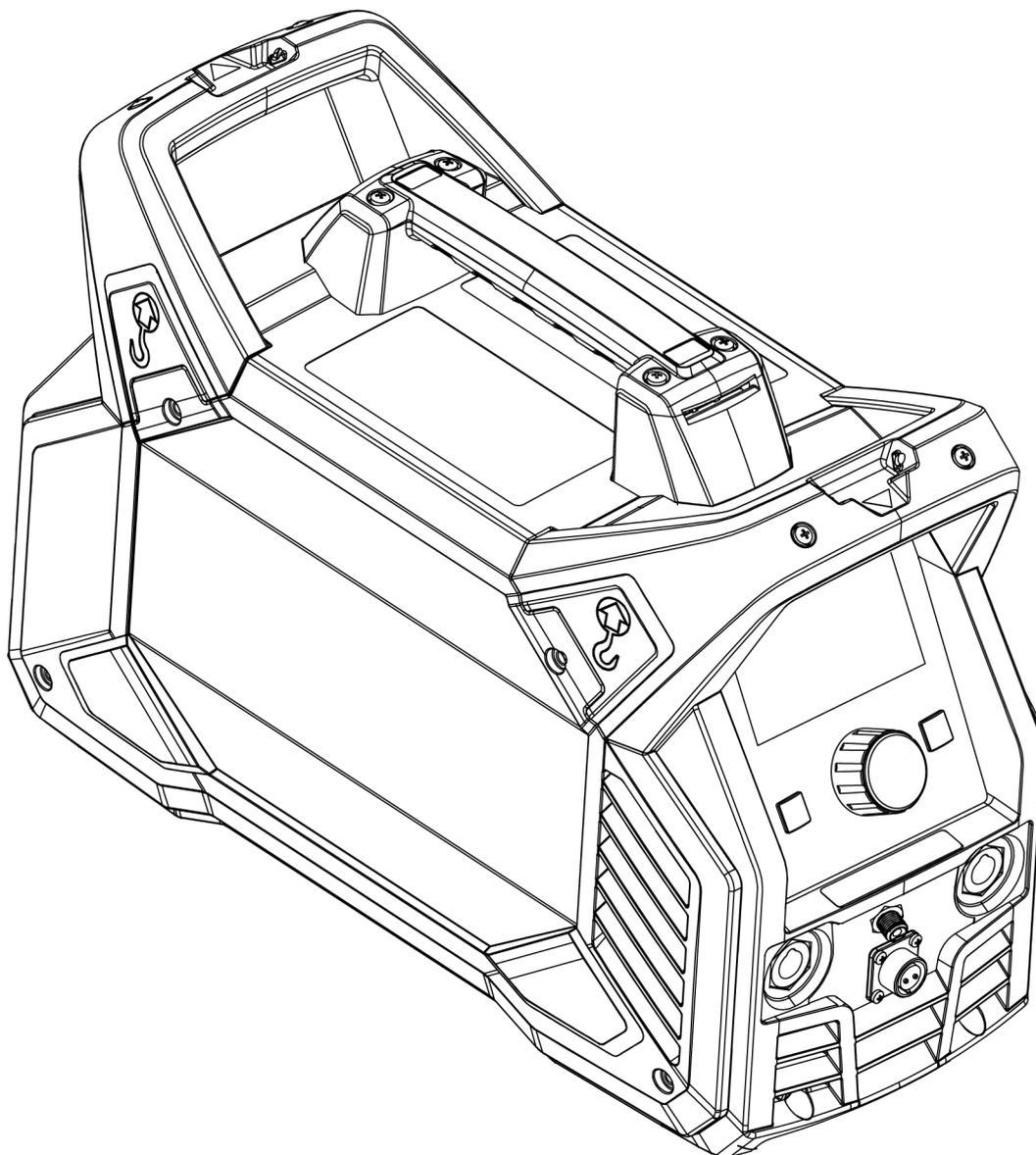
Spare parts and wear parts can be ordered through your nearest ESAB dealer, see [esab.com](https://www.esab.com). When ordering, please state product type, serial number, designation and spare part number in accordance with the spare parts list. This facilitates dispatch and ensures correct delivery.

APPENDIX

WIRING DIAGRAM



ORDERING NUMBERS

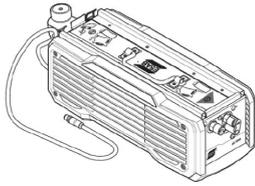
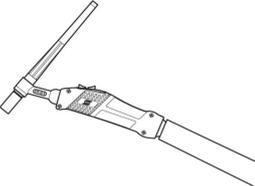
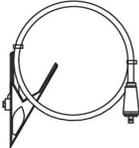
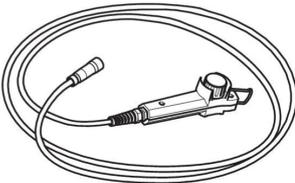
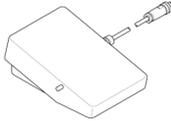
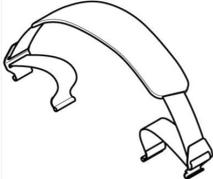


Ordering number	Denomination	Type
0447 750 890	Renegade ET 210iP Advanced and Exeor TIG SR 17 torch	Renegade ET 210iP Advanced
0447 750 891	Renegade ET 210iP W Advanced, Cooling unit EC 1001 and Exeor TIG SR 21 torch	Renegade ET 210iP Advanced
0463 859 *	Instruction Manual	
0463 881 *	Spare parts list	
0463 880 *	Service manual	

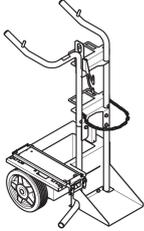
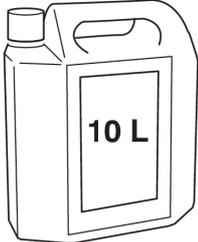
The three last digits in the document number of the manual show the version of the manual. Therefore they are replaced with * here. Make sure to use a manual with a serial number or software version that corresponds with the product, see the front page of the manual.

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

ACCESSORIES

0445 045 881	Water Cooler EC 1001	
0700 026 220	Exeor TIG SR 17 torch, Air , 4 m	
0700 026 221	Exeor TIG SR 17 torch, Air , 8 m	
0700 026 234	Exeor TIG SR 17-R torch, Air , 4 m	
0700 026 235	Exeor TIG SR 17-R torch, Air , 8 m	
0700 026 290	Exeor TIG SR 21 torch, Water, 4 m	
0700 026 291	Exeor TIG SR 21 torch, Water, 8 m	
0700 026 294	Exeor TIG SR 21-R torch, Water, 4 m	
0700 026 295	Exeor TIG SR 21-R torch, Water, 8 m	
Return cable kits		
0700 006 901	Return cable kit, OKC 50, 3 m	
0700 006 889	Return cable kit, OKC 50, 5 m	
0700 006 900	Electrode holder Handy, 200 A with 25 mm ² , 3 m, OKC 50	
0700 500 084	Remote control, MMA 4	
W4014450	Foot pedal with 4.5 m (15 ft) cable, 8 PIN	
0445 197 880	Shoulder strap	

APPENDIX

0460 330 881	Trolley	 A line drawing of a trolley, which is a metal frame with a single large wheel at the front and a handle on top. It appears to be designed for carrying a large piece of equipment.
0465 720 002	ESAB coolant	 A line drawing of a 10-liter coolant can. The can is rectangular with a handle on top and a cap on the left side. The text "10 L" is printed on the front of the can.



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