PREDATOR
POWER PRODUCTS

# BATTERY POWERED INVERTER WELDER
# PCW-23
# USER MANUAL


- Before use, please read this User Manual carefully.
- This User Manual is used for operation and maintenance of this battery welder only.
- In case of any questions, please contact your dealer.

- Please hand this User Manual to the welder operator.

- In case of any questions, contact the branches or dealers.
- Or directly contact the User Service Department of the Head Office.

Unit 32 Northpoint Business Park, New Mallow Road,
Cork, Ireland T23XV76
Tel. +353 214500051

**NOTES**:

**EN** **CONTENTS.**

## 1. GENERAL DESCRIPTION. TECHNICAL CHARACTERISTICS.

New and innovative stand-alone, battery powered, coated electrode welding equipment.
Ideal for those jobs where portability is essential and no power supply is available in the work area.

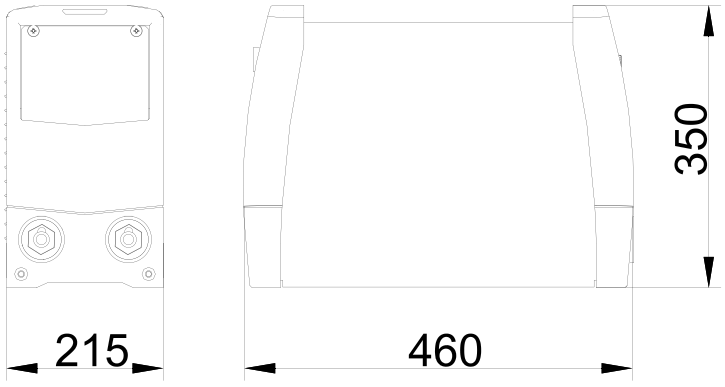
Advantages:

- Electrode welding, normal, basic and stainless steel.
- High capacity battery and short charging time.
- Portable design with great ease of transport.
- Protection against overheating
- Easy to read battery level indicator
- Arc force and hot-start
- Intelligent fan cooling system (ecofan)

| TECHNICAL SPECIFICATIONS | Battery Powered Welder PCW-23 |
|---|---|
| Welding process | Electrodo Revestido MMA |
| Battery | Lithium battery |
| Loading system | 230 V connection charger (included) |
| Rated power | 3.7 KW |
| Welding intensity | 10-150A |
| Type of welding electrodes | Rutile Electrodes E-6013 – Inox 316L Basic E-7018 |
| Welding capacity | Φ 2,5 mm 85 Electrodos<br>Φ 3,25 mm 41 Electrodos |
| Battery capacity | 48V / 2400Wh |
| Charging time | 3.5 hours (15 A) |
| Battery Cycles | 1500 cycles – 5,5 years |
| Weight | 22.3 Kg |
| Dimensions | 460x215x350mm |

**NEVER USE THESE WELDING MACHINES TO DEFROST PIPES.**

Overall dimensions of the PCW-23 battery powered welder



## 2. ACCESORIES.

1 Piece of 15A battery charger
1 Piece of charging cable
1 Pair of welding connectors
1 Piece of user manaul
1 Piece of warranty card

USE ONLY THE RECOMMENDED SPARE PARTS AND ACCESSORIES.

## 3. TRANSPORT AND INSTALLATION.

### 3.1 . TRANSPORT AND PACKAGIN.

Knocks and sudden movements must be avoided when transporting the equipment. In any case, the packaging must be protected from water.

**HANDLE THE EQUIPMENT CAREFULLY, IT WILL LAST LONGER !**

### 3.2. ELECTRICAL SUPPLY INSTALLATION

When a long output cable is used, in order to reduce the voltage drop, the cable with a larger section area is recommended; if the cable is too long, it will have great impacts on the arcing performance, or even other performance of the system.

- Input connecting cable

This welder is a cordless li-ion battery welder, which can be used for welding without AC.

- Output connecting cable

Insert the quick plug of the electrode holder cable into the positive welding connector "+", tighten it tightly in a clockwise direction. Connect the ground clamp to the negative "-" weld connector in the same way. The ground clamp should grip the workpiece or welding table.

### 3.3 BATTERY CHARGE CYLCE.

To charge the battery, connect the charger to the battery charge connector and to the mains. The charger will start the charge cycle whenever it detects that the battery is not at its maximum level. During charging, several red LEDs light up on the charger grids. When the battery is full, the cycle ends, and only the green LEDs light up on the charger.

Normally we recommend charging the battery with the machine off. But, if necessary, the equipment can charge and weld at the same time, as long as the battery is not at the minimum level. In this last case, the low battery voltage indicator will light up when trying to weld. Note that the charging time will increase, or even drain the battery on average, depending on the duty cycle of the weld.

To find out the current charge level of the battery, turn on the main switch of the equipment and press the button of the battery charge meter. The battery charge level indicator will activate, showing the percentage of charge available.

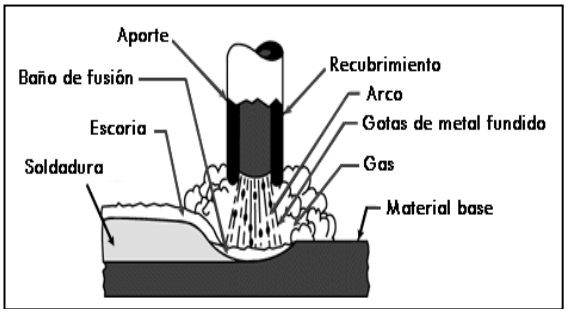
## 4. START-UP. ADJUSTMENT AND OPERATION CONTROLS.

### 4.1. OPERATION CONTROLS.


| Mark | Symbol/Text | Description |
|---|---|---|
| A | - | Negative welding connector |
| B | + | Positive welding connector |
| C | CURRENT | Welding current adjustment knob |
| D | ARC FORCE | Arc Force Function |
| E | HOT START | Hot start function |
| F | A | Amp display panel |
| G | O | Battery level indicator |
| H | POWER | Power on indicator |
| I | O.H | Overheating indicator |
| J | L.V | Low battery voltage indicator |

## 5. MMA PROCESS.

Welding with coated electrode, also known as MMA (Manual Metal Arc), SMAW or 111 process, forms part of the welding processes by electric arc. Therefore, before starting the requested welding jobs, we must bear in mind the basic principles of the process.




Electric arc welding with coated electrode is a process whereby the metal between the part and a coated metal electrode is melted.

As the electrical current circulates through the electrode, heat increases at the end of the electrode that produces an arc that melts the core or rod of the electrode, burning its coating. Thus obtaining the appropriate atmosphere to transfer the molten metal from the core of the electrode to the melt bath in the base material.

These drops of molten metal fall coated with molten slag from the melting of the arc coating. The slag floats on the surface and forms, above the welding bead, a protective layer of cast metal, controlling the bead cooling speed and avoiding the oxidation of the filler metal.

### APPLICATIONS

This welding process is especially recommended for repair and maintenance welding, manufacture and installation of pipes, as well as outdoor assembly work. Production and repair welding in naval construction, storage tanks, structures, pressure containers, oil refineries, boilers and any type of piping, are some of its application sectors.

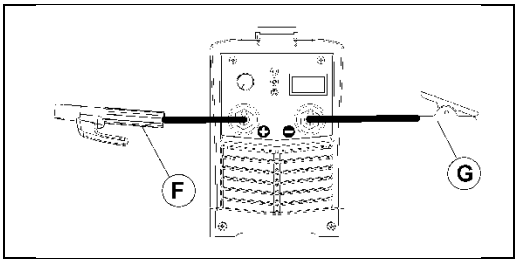
The main characteristics of the process are its simplicity and its low price, making it a practical and excellent procedure for offshore use or outdoor work.

However, the welding procedure with coated electrode is not suitable for its automation or semi-automation; its application is essentially manual.

If electrodes are used in less favourable conditions (with humidity, with no preheating, etc.) we can improve the welding features by adjusting the control parameters in manual process.

## 5.1. MMA SYSTEM INSTALLATION.

When welding with coated electrode we must connect the electrode-holder clamp (F) and the earth clamp (G) according to the polarity advised by the electrode manufacturer.
Normally, the majority of the electrodes must be placed with straight polarity; that is, the welding electrode-holder clamp in the negative pole and the earth clamp in the positive pole. However, welding with basic or special electrodes is usually carried out with reverse polarity; that is, the electrode-holder clamp in positive pole and the earth clamp in negative pole. We will follow the electrode manufactuer's instructions in each case. Equipment preparation for the working mode is drawn in the figure; in this case, observe that the polarity used is inverse, meaning that the welding electrode-holder is connected to the positive pole.




**Installation for COATED ELECTRODE welding.**

## 5.2. WELDING PARAMETERS.

| Selection of manual arc welding parameters | | | | | |
|---|---|---|---|---|---|
| SN. | Thickness/mm. | Welding rod diameter /mm. | Welding rod diameter /mm. | Welding current /A | Remarks. |
| 1. | | | 1.6 | 25-40 | |
| 2. | <4 | 2.0-3.2 | 2.0 | 40-65 | |
| | | | 2.5 | 50-80 | Usually used |
| | | | 3.2 | 100-130 | Usually used |
| 3. | 4-12 | 3.2-4 | 3.2 | 100-130 | Usually used |
| | | | 4.0 | 160-210 | Usually used |
| 4. | >12 | >4 | 4.0 | 160-210 | |
| | | | 5.0 | 200-270 | |
| | | | 6.0 | 260-300 | |

We must assure a good heart connection, because a bad contact of the mass will cause this to heat up, the current passage will be interrupted and the arc will disappear.

It is advisable for this cable to be as short as possible. We will thus reduce the electromagnetic disturbances.

Whenever electric current circulates, a circular magnetic field is generated around the conductor. This magnetic field is generated from the connection of the negative pole to the positive pole. This phenomenon produces deviation of the electric arc that is called magnetic blow out.

This phenomenon occurs at the ends of the parts and will appear in applications with direct currents. In welding with alternating current, this is overridden in each cycle as there is a change in direction of the current.

TO MINIMISE THE EFFECT OF THE MAGNETIC BLOW-OUT:

- Welding must be carried out as far away as possible from the mass.
- Place tabs at the ends of pieces.
- Reduce arc length.
- Incline the torch in the opposite direction to the field.
- Reduce the current intensity to a minimum, as the magnetic field intensity is directly proportional to the circulating current.

## 6. MAINTENANCE OPERATIONS. RECOMMENDATIONS.

In order for the equipment to have a long life we must follow some essential rules for maintenance and use. Abide by these recommendations.

CORRECT MAINTENANCE OF THE EQUIPMENT WILL AVOID A GREAT PERCENTAGE OF FAULTS.

### 6.1 MACHINE MAINTENANCE. GENERAL RECOMMENDATIONS.

Before carrying out any operation on the machine or welding cables, we must place the switch of the equipment in position of machine disconnected.

Specialized personnel must handle the machine to carry out maintenance and repair operations.

A- BLOW THE INSIDE OF THE MACHINE WITH COMPRESSED AIR FROM TIME TO TIME.

The accumulation of metal dust on the inside is one of the main causes of breakdowns in this type of equipment as they are subject to a great amount of pollution. As an essential measure, the equipment must be kept separate from the welding place, not placing it a short distance away. Keeping the machine clean and dry is essential. The inside must be blown as required. We must avoid any anomaly or deterioration due to the accumulation of dust. Blow the inside of the equipment with clean dry compressed air. As routine to guarantee that the equipment works correctly, check that once the machine has been blown the electrical connections are still properly tightened.

WARNING!: SEPARATE THE MACHINE SUFFICIENTLY FROM THE WORKSTATION.

PREVENT METAL DUST ENTERING THE EQUIPMENT.

B- LOCATE THE EQUIPMENT IN A PLACE WHERE CLEAN AIR IS CONSTANTLY REPLACED.

The machine ventilations must be kept free. It must be located in a place where clean air is renewed.

C- THE MACHINE MUST ALWAYS BE OPERATED WITH THE HOUSING ON.

D- DO NOT DISCONNECT THE MACHINE IF IT IS HOT.

If you have finished the work do not disconnect the machine immediately, wait until the inner cooling system has totally cooled it.

E- KEEP THE WELDING ACCESSORIES IN GOOD CONDITIONS FOR USE.

F- ONCE THE WELDING OPERATION HAS FINISHED AVOID DIRECT CONTACT OF THE ELECTRODE-HOLDER CLAMP WITH THE WELDING EARTH CLAMP AND THE OTHER PARTS CONNECTED TO IT.

### 6.2 RECOMMENDATIONS FOR REDUCING ELECTROMAGNETIC COMPATIBILITY (CEM) PROBLEMS.

The user is responsible for the installation and use of the welding material according to the instructions in this manual and the following recommendations.

Before installing the welding material, the presence of the following in the surrounding area must be kept in mind:

- Wiring for power, control, signalling, and telephones.
- Radio and television receivers and transmitters.
- Computers and other control equipment.
- Critical security equipment.
- People with pace makers or hearing aids.
- Measurement and calibration equipment.

In order to reduce EMC problems, keep in mind the time of day when welding or other activities will be carried out. Move possible interference victims away from the welding installation.

ALWAYS CONNECT THE CHARGER TO POWER USING AN EFFICIENT EARTH TAP.

PERFORM THE MAINTENANCE OPERATIONS DESCRIBED IN THIS MANUAL.

USE THE SHORTEST WELDING WIRES POSSIBLE AND KEEP THEM PLACED NEXT TO EACH OTHER NEAR THE FLOOR.

## 7. ANOMALIES. PROBABLE CAUSES. POSSIBLE SOLUTIONS.

| SYMPTOM. ANOMALY. | PROBABLE CAUSE. | POSSIBLE SOLUTION. |
|---|---|---|
| **GENERAL PROBLEM. NOTHING WORKS ON THE MACHINE.** | The battery is flat. | Perform a full charge cycle (see 3.3). |
| | The battery is faulty. | Contact the technical service. |
| | Mains switch (M) defective. | Contact the technical service. |
| **GENERAL PROBLEM. NOTHING WORKS IN THE CHARGER.** | The socket outlet used is disconnected or faulty. | Check the socket you are using is working and has the proper voltage. Check the electrical panel of the installation. Try other socket outlets. |
| **CHARGER LIGHTS UP BUT THE EQUIPMENT DOES NOT CHARGE.** | The charger LEDs are green: the battery is full or the charger does not detect the battery. | Charging cable or connector fault. Contact the technical service. |
| | Some LEDs on the charger are red, but the battery is not charging. | Defective battery. Contact the technical service for its replacement. |
| **LIMITADOR TRIPS.** | The charger may absorb a high peak current when connected. | Connect the charger a second time. It will consume less and the limiter may not trip. Replace the limiter with a larger gauge. |
| | There may be a short circuit that causes the limiter to trip. | Contact the technical service. |
| **IT MAKES NOISE** | Loose metal casing. | Review and screw casing. |
| | Defective electrical connections. | Correctly tighten the connections. |
| | Damaged or poorly attached fan. | Examine the fan. |
| **THE EQUIPMENT IS ON BUT THE EQUIPMENT DOES NOT WELD** | Active protection system. Illuminated overheating led (J). | Overheated equipment, wait for it to cool down. |
| | | Possible fault in the power circuit. |
| **WHEN CHARGING, "INVERSION" LED (I) LITS** | The polarity of the charging voltage is reversed. | Defective charging cable or connector. Contact the technical service. |
| **ABNORMAL HEATING IN THE EQUIPMENT. THERMAL PROTECTION WORKS QUICKLY** | The equipment is positioned so that it prevents correct ventilation. | Place the equipment in an area where the air is constantly replaced. |
| | The fan does not work. | Replace the fan. |
| | The equipment is located in a very hot environment. | Avoid positioning where there is direct exposure to the sun. |
| | There is a loose connection inside the equipment. | Review the power electrical connections. |

SPECIALIZED PERSONNEL MUST CARRY OUT ANY WORK ON THE EQUIPMENT.

BOTH AT THE BEGINNING AND END OF A REPAIR CHECK THE EQUIPMENT INSULATION LEVELS. DISCONNECT THE ELECTRONIC BOARDS WHEN MEASURING THE INSULATION.
BLOW THE INSIDE OF THE EQUIPMENT WITH COMPRESSED AIR.

The insulation-measuring device will have 500 V D.C. and will be applied to the following points of the circuit:

- Supply-Earth: Ra > 50 Mohms.
- Welding-Earth: Ra > 50 Mohms.
- Supply-Welding: Ra > 50 Mohms.

BEFORE TURNING THE EQUIPMENT ON, ENSURE THAT IT IS OFF LOAD.

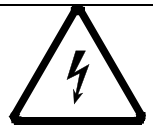
DO NOT OPERATE THE ON/OFF SWITCH WITH AN ELECTRICAL LOAD CONNECTED TO THE WELDING CONNECTORS.

## 8. SAFETY MEASURES.

The use of this equipment requires a maximum amount of responsibility with respect to their use and maintenance. Read this safety chapter carefully as well as the rest of the instructions manual. The correct use of the equipment will depend on this.

For your safety and that of others, remember that:

ANY PRECAUTION MAY BE INSUFFICIENT!



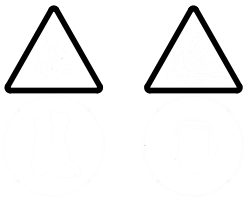
The welding equipment referred to in this manual are electrical. It is important therefore to observe the following safety measures.

- Any work on the equipment must only be carried out by specialists.
- The equipment must be connected to the earth connection and this must always be effective.
- The equipment must not be located in a damp place.
- Do not use the equipment if the welding or supply cables are damaged. Use original spares.
- Make sure that the part to be welded makes perfect electrical contact with the equipment earth.
- During any maintenance operations or when dismantling any element from the inside of the machine, this must be disconnected from the electricity supply.
- Do not touch the equipment switches when carrying out a welding operation.
- Never lean directly on the work part. We will always work with protection gloves.
- Any work on the welding guns and earth clamps will be done with the equipment disconnected (OFF Position (O) on the on/off switch). Do not touch the electrically active parts (electrode-holder clamp, earth clamp, etc.) with your bare hand.

The part to be worked on should be cleaned from possible grease or solvents as these may decompose during the welding process giving off fumes which could be very toxic. This can also occur with those materials which have some kind of surface coating (zinc-plated, galvanised, etc.). Avoid inhaling the fumes given off in the process at all times. Protect yourself from the fumes and metal dust which can be given off. Use quality approved anti-fume goggles. Work with this equipment must be carried out in places or working posts where there is suitable air renewal. If welding processes are carried out in closed places the use of suitable fume extractors is recommended.



In welding processes, the electric arc formed gives off infrared and ultraviolet type irradiations: these are harmful for the eyes and skin, so these areas must be suitably protected with gloves and suitable clothing. The eyes must be protected with goggles with an quality approved protection system with a protection index of at least 11. With electric arc welding machines use protection shield for the eyes and face. With electric cutting machine use protection goggles. Always use quality approved protection elements. Never use contact lenses. They may adhere to the cornea due to the great heat given off during the process. Bear in mind that the arc is considered to be dangerous within a 15-metre radius.



Cast material projections are given off during the welding process so due precautions must be taken. There must be a fire-extinguisher near to the working area. Do not keep inflammable material or explosives near to the working post. Prevent fire caused by sparks or slag. Use quality approved footwear for this type of operations. Use approved auditive protectors in case of too high noise.

Never direct the path of an electrode-holder clamp towards people.
In environments with a high risk of electrical shock, fire, proximity of inflammable products or height, observe relative national and international provisions.

## 9. RECICLAJE DE LA BATERÍA / BATTERY RECYCLING.

Reciclaje correcto del producto. Esta marca indica que este producto no debe desecharse con otros desechos domésticos en toda la UE. Para evitar posibles daños al medioambiente o a la salud humana provocados por la eliminación incontrolada de residuos, recíclelo responsablemente para fomentar la reutilización sostenible de los recursos materiales. Para desechar de forma segura su dispositivo, utilice los sistemas de recolección y devolución correspondientes