



# Discovery 200 S



GB

Instruction manual





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## 1 INTRODUCTION



### IMPORTANT!



This handbook must be consigned to the user prior to installation and commissioning of the unit.  
Read the "General prescriptions for use" handbook supplied separately from this handbook before installing and commissioning the unit.  
The meaning of the symbols in this manual and the associated precautionary information are given in the "General prescriptions for use".  
If the "General prescriptions for use" are not present, it is mandatory to request a replacement copy from the manufacturer or from your dealer.  
Retain these documents for future consultation.

### KEY



**DANGER!**

This pictogram warns of danger of death or serious injury.

-  This symbol identifies an action that occurs automatically as a result of a previous action.
-  This symbol identifies additional information or a reference to a different section of the manual containing the associated information.

### NOTES

The figures in this manual are purely guideline and the images may contain differences with respect to the actual equipment to which they refer.

### INTRODUCTION

Discovery 200 S is an inverter DC TIG/MMA portable welding power source.

The solidity of the components of this unit makes it a reliable working companion for workshop and outdoor applications.

The available DC TIG functions and digital control make this unit ideal for maintenance, building construction, and light metalwork.

In MMA welding the Hot Start and Arc Force functions are adjustable and they allow improved arc striking, a flatter bead and more uniform weld.

The Anti Sticking function makes it possible to detach the electrode rapidly from the workpiece in the event of accidental sticking.

Up to 5 mm diameter electrode welding is possible in MMA.

In DC TIG welding the pulse frequency (0.5 Hz-250 Hz) and base current are adjustable by the welder, making it possible to focus the arc, reduce heat transfer and limit deformation of the material.

### Accessories that can be connected to the unit:

- Manual remote controller for remote adjustment of the welding current.
- Power source trolley.

Consult your dealer for an updated list of accessories and the latest available new products.

## 2 INSTALLATION



**DANGER!**  
Lifting and positioning

Read the warnings highlighted by the following symbols in the "General prescriptions for use".



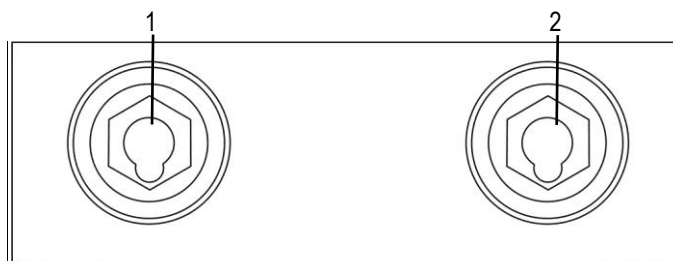
### 2.1 CONNECTIONS TO THE ELECTRICAL MAINS NETWORK

The characteristics of the mains power supply to which the equipment shall be connected are given in the section entitled "Technical data" on page 9.

The machine can be connected to motorgenerators provided their voltage is stabilised.

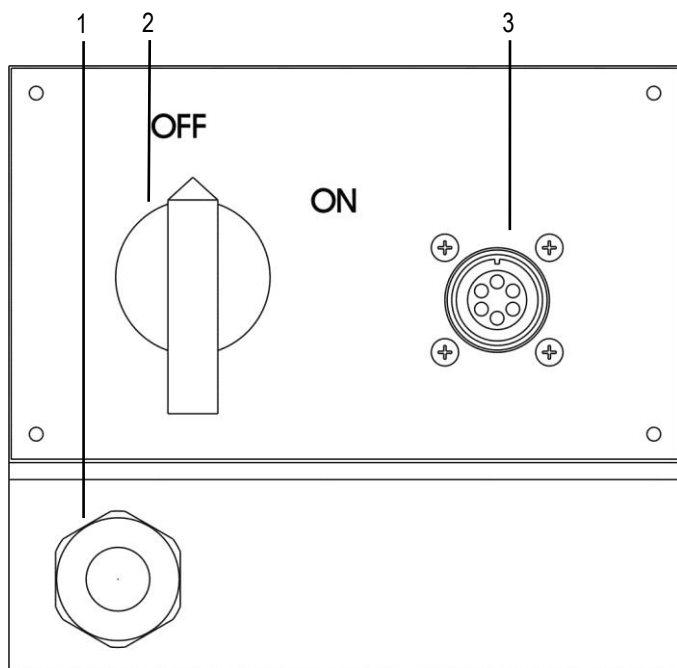
Connect/disconnect the various devices with the machine switched off.

### 2.2 FRONT PANEL



1. Negative pole welding socket.
2. Positive pole welding socket.

## 2.3 REAR PANEL



### 1. Power cable.

Total length (including internal part): 3,5 m

### ① Number and cross section of wires: 4 x 1,5 mm<sup>2</sup>

Power plug type: not supplied

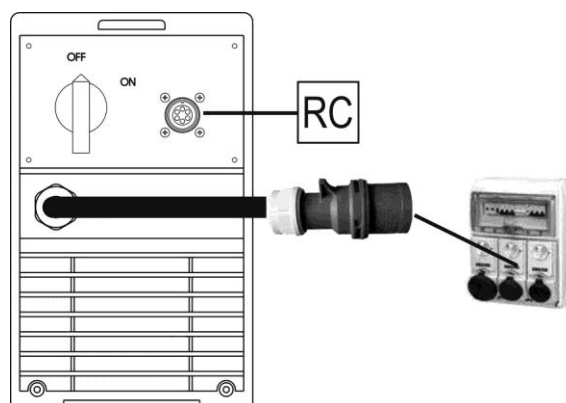
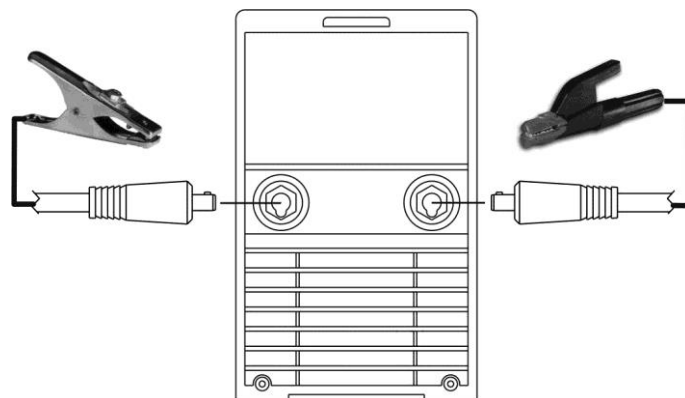
### 2. Welding power source ON/OFF switch.

### 3. Remote controller connector.

① When the remote controller [RC] is connected and the relative locking screw is tightened, welding current can be adjusted using the remote controller.

The system is ready to start welding.

Preparing for MMA (polarity to basic electrode)



## 2.4 PREPARING FOR MMA WELDING

- Set the welding power source ON/OFF switch to "O" (unit de-energized).
- Plug the power cable plug into a mains socket outlet.
- Choose the electrode based on the type of material and thickness of the workpiece to be welded.
- Insert the electrode in the electrode holder.
- Connect the electrode holder cable to the welding socket based on the polarity requested by the type of electrode used.
- Connect the plug of the ground clamp to the welding socket on the basis of the polarity required.
- Connect the earth clamp to the workpiece being processed.

**DANGER!**  
**Electric shock hazard!**

Read the warnings highlighted by the following symbols in the "General prescriptions for use".

- Set the welding power source ON/OFF switch to "I" (unit powered).
- Select the following welding mode on the user interface: MMA
- Set the required welding parameter values on the user interface.

## 2.5 PREPARING FOR TIG WELDING

1. Set the welding power source ON/OFF switch to "O" (unit de-energized).
2. Plug the power cable into a mains socket outlet.
3. Choose the electrode based on the type of material and thickness of the workpiece to be welded.
4. Insert the electrode in the TIG torch.
5. Connect the torch plug to the welding socket on the basis of the polarity required by the type of electrode in question.
6. Connect the plug of the ground clamp to the welding socket on the basis of the polarity required.
7. Connect the earth clamp to the workpiece being processed.
8. Set the welding power source ON/OFF switch to "I" (unit powered).

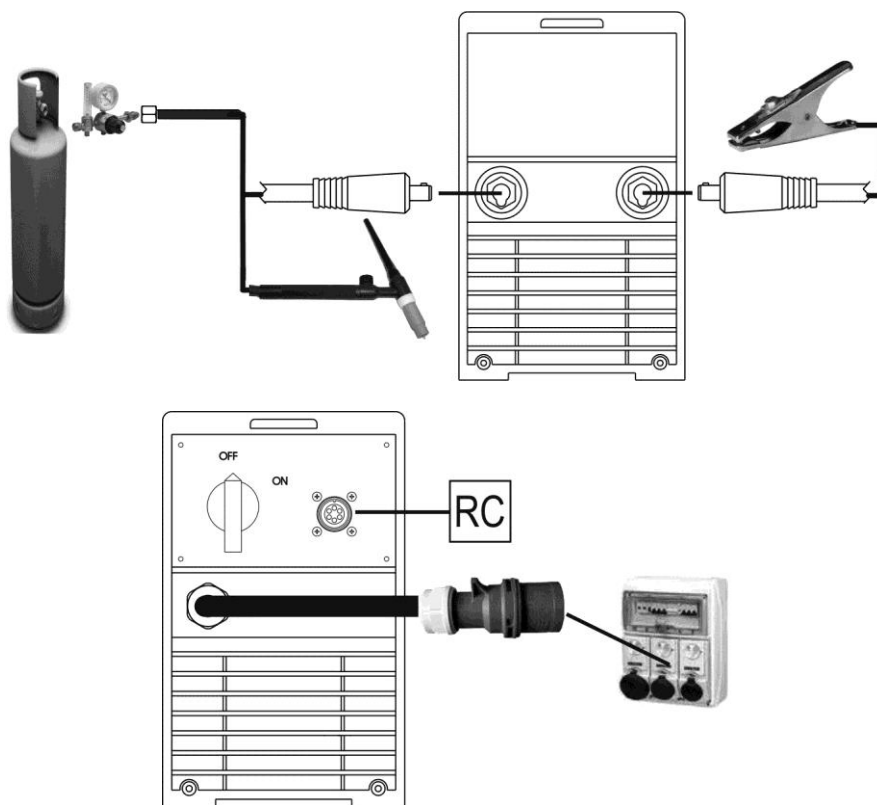
9. Select the following welding mode on the user interface: DC TIG

This model of welding machine has not been provided either with the control for gas flow (solenoid valve) or with the torch button.  
The system is ready to start welding.

### LIFT-ARC WELDING

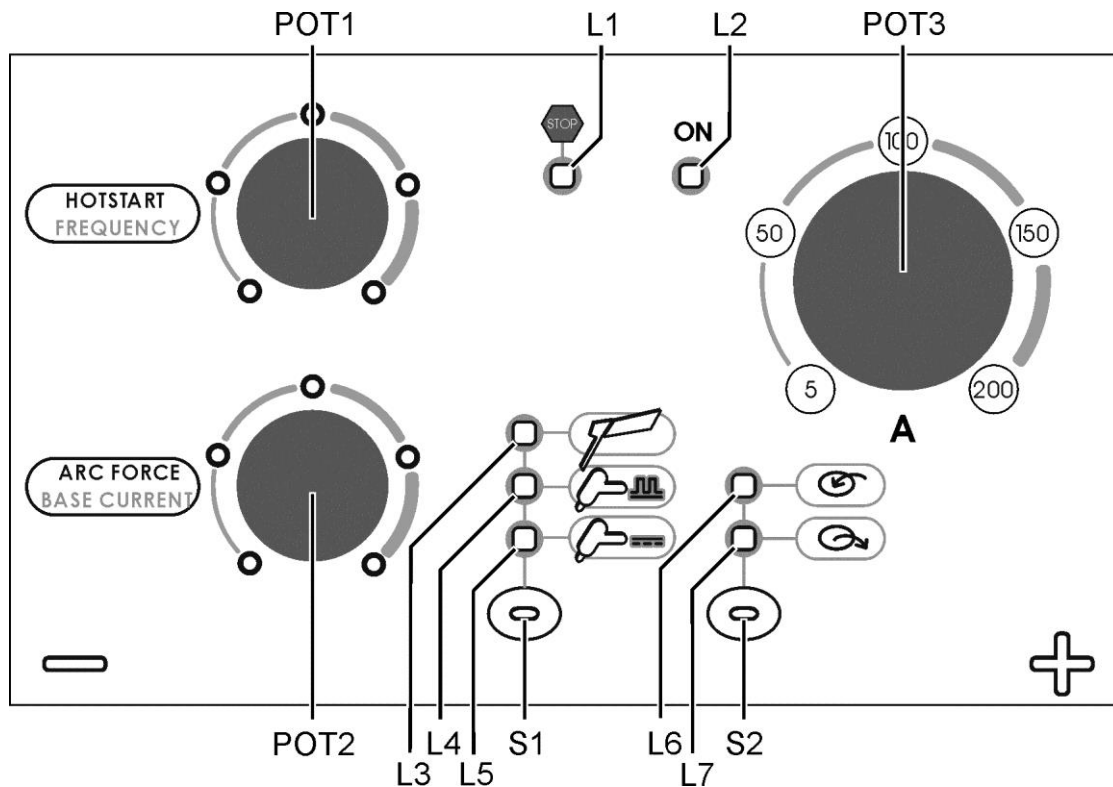
1. Open the torch valve to let the gas out.
2. Touch the workpiece with the torch electrode.
3. Slowly lift the torch to strike the arc.
4. The WELDING CURRENT reaches the preset value.
5. Quickly move the torch clear of the workpiece to extinguish the welding arc.
6. Close the torch valve to interrupt the gas flow.

Preparing for TIG (polarity for tungsten electrode)



### 3 COMMISSIONING

#### 3.1 USER INTERFACE



CODE SYMBOL	DESCRIPTION
L1 <b>ON</b>	This LED illuminates to confirm the presence of power on the output sockets.
L2	<p><b>Overheating alarm</b> Indicates tripping of the welding power source thermal protection. Leave the unit running so that the overheated components cool as rapidly as possible. When the unit has cooled, the welding power source will reset automatically.</p> <ul style="list-style-type: none"> <li>- Make sure that the power required by the welding process is lower than the maximum rated power output.</li> <li>- Check that the operating conditions are in compliance with the welding power source data plate specifications.</li> <li>- Check for the presence of adequate air circulation around the welding power source.</li> </ul>
L3	This LED illuminates to show that the following welding mode is selected: MMA
L4	This LED illuminates to show that the following welding mode is selected: PULSED DC TIG
L5	This LED illuminates to show that the following welding mode is selected: TIG DC CONTINUOUS
L6	This LED indicates that the current reference setting is imposed by the user interface.
L7	This LED indicates that the current reference setting is imposed by the remote controller.
S1	This button selects the welding mode.
S2	The button enables the device to receive the welding current control signal from a remote controller.
POT1	<p><b>MMA:</b> The potentiometer sets the value of the following parameter: HOT START <b>TIG:</b> The potentiometer sets the value of the following parameter: PULSED CURRENT FREQUENCY</p>
POT2	<p><b>MMA:</b> The potentiometer sets the value of the following parameter: ARC FORCE <b>TIG:</b> The potentiometer sets the value of the following parameter: BASE CURRENT</p>
POT3	The potentiometer sets the value of the following parameter: WELDING CURRENT



## 3.2 WELDING PARAMETERS

PARAMETER	MIN	DEFAULT	MAX	NOTES
WELDING CURRENT (MMA)	5 A	-	200 A	
WELDING CURRENT (TIG)	5 A	-	200 A	
PULSED CURRENT FREQUENCY	0.5 Hz	-	250 Hz	
BASE CURRENT	10 %	-	90 %	Percentage of welding current.
HOT-START	0 %	-	100 %	Percentage of welding current.
ARC FORCE	0 %	-	100 %	Percentage of welding current.

### WELDING CURRENT

Output current value during welding.

### HOT-START

This parameter aids electrode melting at the time of arc striking.

Consequences of a higher value:

- Easier arc strike.
- Increased spatter at welding start.
- Increase of strike area.

Consequences of a lower value:

- More difficult arc strike.
- Less spatter at welding start.
- Smaller strike area.

### ARC FORCE

This parameter helps to avoid electrode sticking during welding.

During electrode fusion low conductivity parts of the coating become detached and tend to become interposed between the electrode tip as it is fusing and the workpiece. This condition results in an interruption of the arc. In addition, it may occur that the electrode comes into contact with the workpiece creating a short circuit and consequent quenching of the arc. To avoid arc quenching the power source therefore delivers instantaneous peak currents in correspondence with preset arc voltage thresholds.

Consequences of a higher value:

- Fluidity during welding.
- Welding arc stability.
- Greater electrode fusion in workpiece.
- More welding spatter.

Consequences of a lower value:

- The arc is extinguished more easily.
- Less welding spatter.

### BASE CURRENT

Pulsed wave minimum current.

Consequences of a higher value:

- Faster creation of weld pool.
- Increase of heat-affected zone.







### PULSED CURRENT FREQUENCY

Consequences of a higher value:

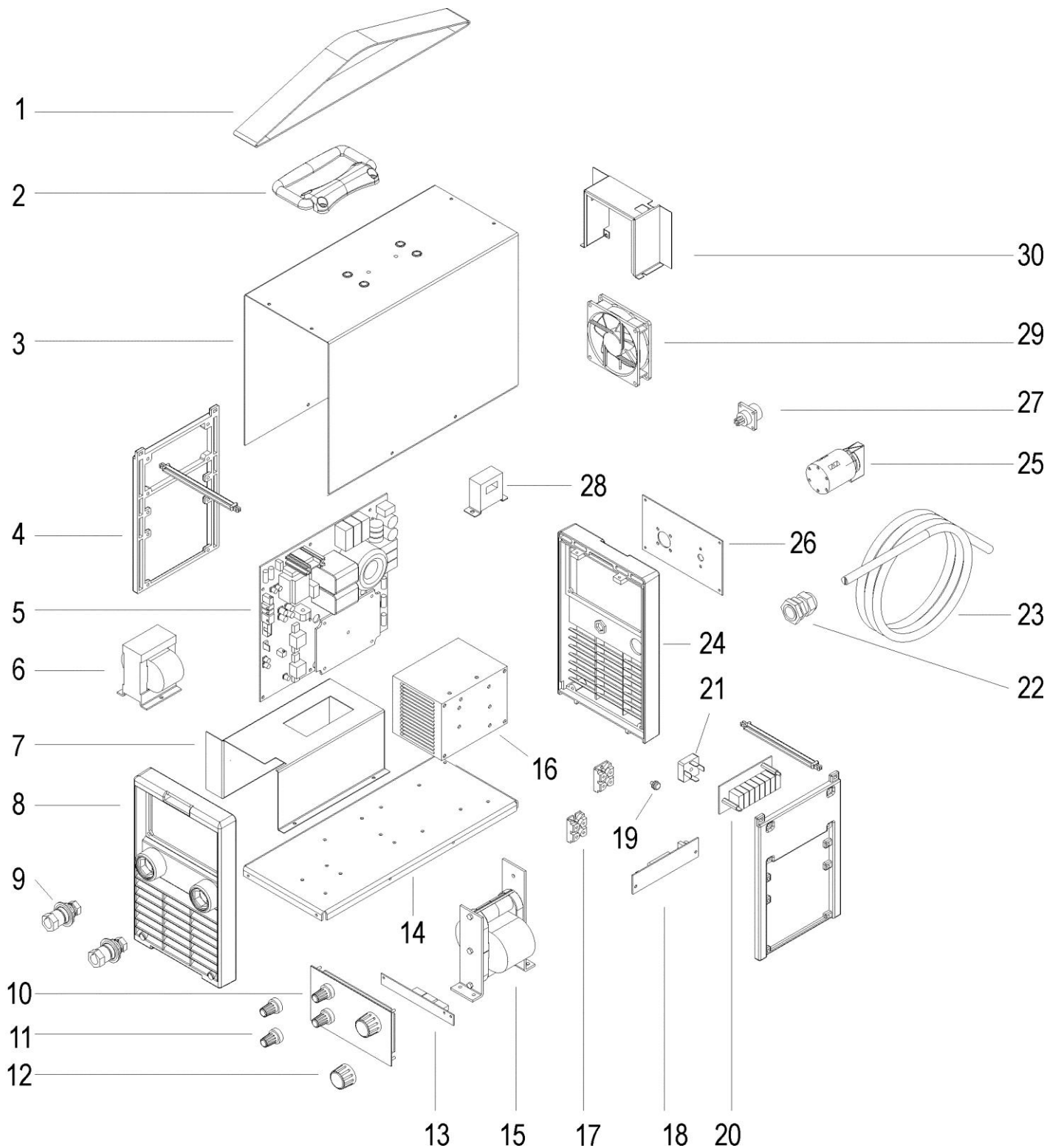
- Slower melt speed.
- Reduction of heat-affected zone.



## 4 TECHNICAL DATA

Directives applied	Waste electrical and electronic equipment (WEEE)	
	Electromagnetic compatibility (EMC)	
	Low voltage (LVD)	
	Restriction of the use of certain hazardous substances (RoHS)	
Construction standards	EN 60974-1; EN 60974-10 Class A	
Conformity markings		Equipment compliant with European directives in force
		Equipment suitable in an environment with increased hazard of electric shock
		Equipment compliant with directive WEEE
		Equipment compliant with directive RoHS
Supply voltage	3 x 400 Va.c. $\pm$ 15 % / 50-60 Hz	
Mains protection	10 A Delayed	
Z <sub>max</sub>	This equipment complies with IEC 61000-3-12 provided that the maximum permissible system impedance is less than or equal to 238 m $\Omega$ 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 maximum permissible system impedance less than or equal to 238 m $\Omega$ .	
Dimensions (L x D x H)	400 x 160 x 260 mm	
Weight	10 kg	
Insulation class	H	
Protection rating	IP23S	
Cooling	AF: Air-over cooling (fan assisted)	
Static characteristic	MMA	 Drooping characteristic
	TIG	 Drooping characteristic
Current and voltage adjustment range	MMA	5 A / 20.2 V - 200 A - 28.0 V
	TIG	5 A / 10.2 V - 200 A - 18.0 V
Welding current / Working voltage	MMA	40 % (40° C) 200 A - 28.0 V
		60 % (40° C) 170 A - 26.8 V
		100 % (40° C) 130 A - 25.2 V
	TIG	40 % (40° C) 200 A - 18.0 V
		60 % (40° C) 170 A - 16.8 V
		100 % (40° C) 130 A - 15.2 V
Maximum input power	MMA	40 % (40° C) 6.7 kVA
		60 % (40° C) 5.7 kVA
		100 % (40° C) 4.1 kVA
	TIG	40 % (40° C) 4.4 kVA
		60 % (40° C) 3.6 kVA
		100 % (40° C) 2.1 kVA
Maximum supply current	MMA	40 % (40° C) 9.6 A
		60 % (40° C) 8.1 A
		100 % (40° C) 5.8 A
	TIG	40 % (40° C) 6.4 A
		60 % (40° C) 5.2 A
		100 % (40° C) 3.1 A
Maximum effective supply current	MMA	40 % (40° C) 6.1 A
		60 % (40° C) 6.3 A
		100 % (40° C) 5.8 A
	TIG	40 % (40° C) 4.0 A
		60 % (40° C) 4.0 A
		100 % (40° C) 3.1 A
No-load voltage (U <sub>0</sub> )	MMA	61 V
	TIG	61 V
Reduced no-load voltage (U <sub>r</sub> )	TIG	13 V

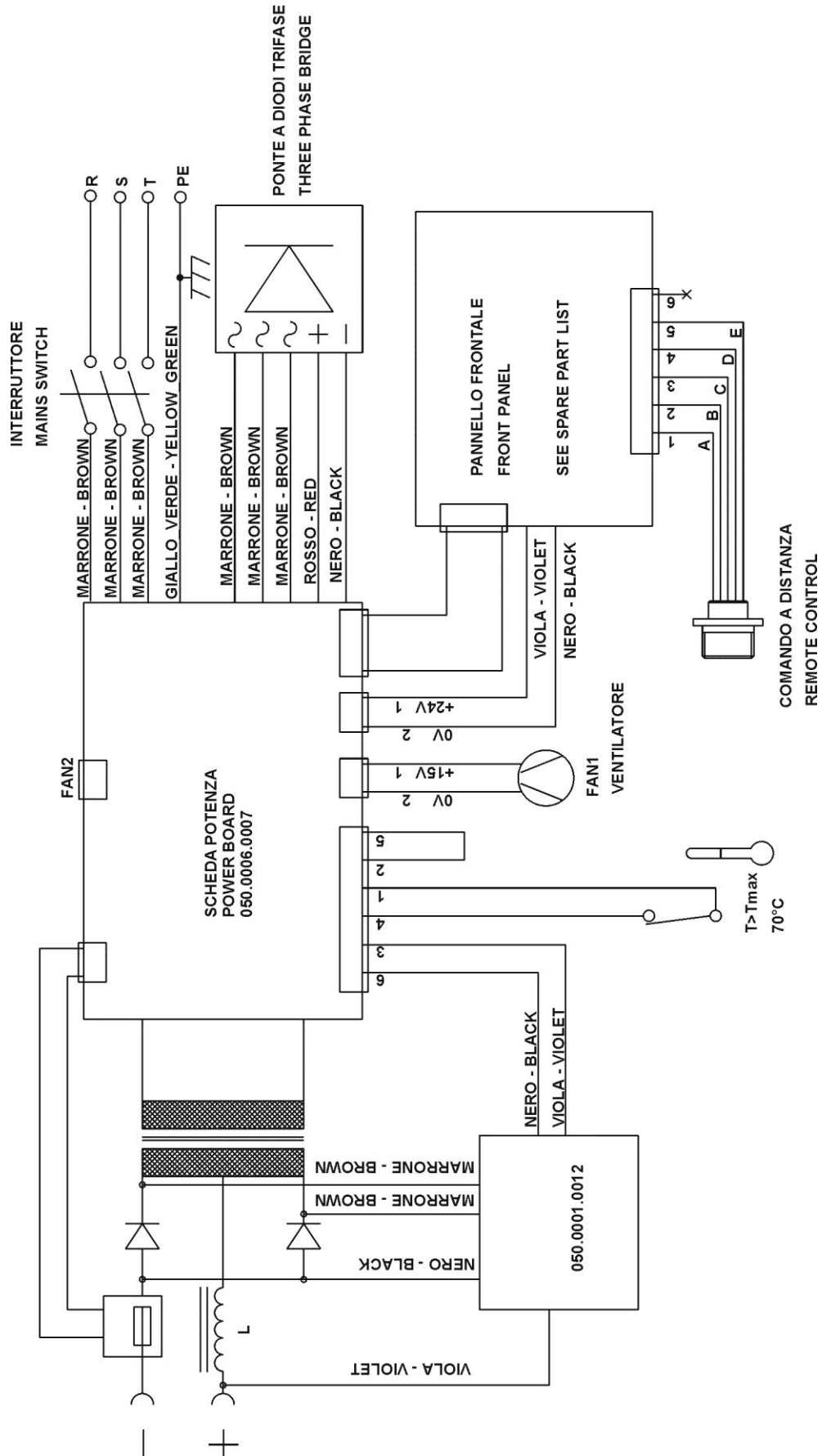
## 5 SPARE PARTS



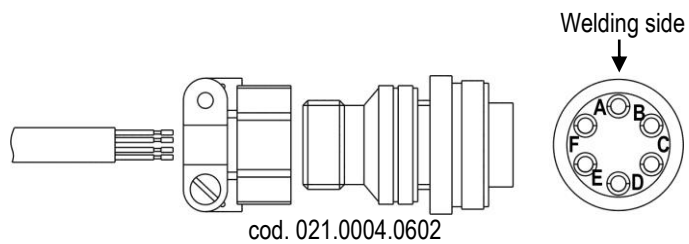
N°	CODE	DESCRIPTION
1	005.0001.0004	BELT
2	011.0006.0031	HANDLE
3	011.0000.0111	COVER PLATE
4	012.0003.0000	INTERNAL FRAMEWORKS
5	050.0013.0091	POWER BOARD
6	044.0004.0001	INDUCTANCE
7	011.0003.0011	DEFLECTOR PLATE
8	010.0006.0041	FRONT PLASTIC
9	021.0001.0260	FIXED SOCKET
10	050.5027.0000	FRONT PANEL
11	014.0002.0006	KNOB WITH CUP WITHOUT INDICATOR
12	014.0002.0004	KNOB WITH CUP WITHOUT INDICATOR
13	050.0004.0013	FILTER BOARD
14	011.0003.0001	LOWER COVER
15	042.0003.0010	POWER TRANSFORMER
16	015.0001.0005	HEAT SINK
17	032.0002.2003	ISOTOP DIODE
18	050.0001.0012	SNUBBER BOARD
19	040.0003.1070	THERMAL CUT-OUT
20	050.0001.0119	CAPACITOR BOARD
21	032.0001.3616	THREE PHASE BRIDGE RECTIFIER
22	045.0000.0007	CABLE CLAMP
23	045.0002.0016	NEOPRENE CABLE
24	010.0006.0009	COMPLETE REAR PLASTIC PANEL
25	040.0001.0015	BI-POLE SWITCH
26	013.0003.0000	REAR PANEL
27	022.0002.0005	REMOTE CONTROL WIRING
28	041.0004.0300	HALL EFFECT SENSOR
29	003.0002.0002	FAN
30	011.0003.0002	FANS SUPPORT

## 6 ELECTRICAL DIAGRAM

### 6.1 DISCOVERY 200 S



**6.2 REMOTE CONTROLLER CONNECTOR**



**Remote Controller**

