

OPERATING INSTRUCTIONS

FOR MODELS:

TIG250



IMPORTANT OPERATING INSTRUCTIONS
SAVE THESE INSTRUCTIONS

INSTRUCTION MANUAL FOR ARC WELDING MACHINE

IMPORTANT: BEFORE STARTING THE EQUIPMENT, READ THE CONTENTS OF THIS MANUAL, WHICH MUST BE STORED IN A PLACE FAMILIAR TO ALL USERS FOR THE ENTIRE OPERATIVE LIFE-SPAN OF THE MACHINE. THIS EQUIPMENT MUST BE USED SOLELY FOR WELDING OPERATIONS.

1 SAFETY PRECAUTIONS

WELDING AND ARC CUTTING CAN BE HARMFUL TO YOURSELF AND OTHERS. The user must therefore be educated against the hazards, summarized below, deriving from welding operations. For more detailed information, order the manual code 3.300.758

ELECTRIC SHOCK - May be fatal.



- Install and earth the welding machine according to the applicable regulations.
- Do not touch live electrical parts or electrodes with bare skin, gloves or wet clothing.
- Isolate yourselves from both the earth and the workpiece.
- Make sure your working position is safe.

FUMES AND GASES - May be hazardous to your health.



- Keep your head away from fumes.
- Work in the presence of adequate ventilation, and use ventilators around the arc to prevent gases from forming in the work area.

ARC RAYS - May injure the eyes and burn the skin.



- Protect your eyes with welding masks fitted with filtered lenses, and protect your body with appropriate safety garments.
- Protect others by installing adequate shields or curtains.

RISK OF FIRE AND BURNS



- Sparks (sprays) may cause fires and burn the skin; you should therefore make sure there are no flammable materials in the area, and wear appropriate protective garments.

NOISE



- This machine does not directly produce noise exceeding 80dB. The plasma cutting/welding procedure may produce noise levels beyond said limit; users must therefore implement all precautions required by law.

PACEMAKERS

- The magnetic fields created by high currents may affect the operation of pacemakers. Wearers of vital electronic equipment (pacemakers) should consult their physician before beginning any arc welding, cutting, gouging or spot welding operations.

EXPLOSIONS



- Do not weld in the vicinity of containers under pressure, or in the presence of explosive dust, gases or fumes.
- All cylinders and pressure regulators used in welding operations should be handled with care.

ELECTROMAGNETIC COMPATIBILITY

This machine is manufactured in compliance with the instructions contained in the harmonized standard EN50199,

and must be used solely for professional purposes in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in non-industrial environments.

IN CASE OF MALFUNCTIONS, REQUEST ASSISTANCE FROM QUALIFIED PERSONNEL.

2 DESCRIPTION OF THE EQUIPMENT

Led Mode



These LEDs show the welding mode selected by the AC/DC switch **AF**



Mode key E.

When selected, one of the following LEDs lights: **F, G, H, L, M** or **N**.

In TIG mode there will always be two LEDs lit: one indicating HF or striking start mode, and the other indicating continuous or pulse mode with 2- or 4-stage command. The selection changes each time the button is pressed.

The LEDs light alongside the various symbols to display your choice:



F - LED. TIG welding with arc started without high frequency.

To light the arc, press the torch trigger or foot switch and touch the tungsten electrode to the workpiece, then lift it. This move must be quick and decisive (0.3 sec.).



L - LED. TIG welding with arc started with high frequency.

To light the arc, press the torch trigger or foot switch: a high voltage/frequency pilot spark will light the arc.



G - LED. Continuous 2-stage TIG welding (manual).

When the torch trigger or foot switch is pressed, the current begins to increase over the previously set "slope up" time, until it reaches the value set by means of the knob **AA**. When the switch is released, the current begins to drop over the previously set "SLOPE DOWN" time, until it returns to zero.

IN THIS POSITION, YOU MAY CONNECT THE PEDAL CONTROL ACCESSORY TIG250FP.



H - LED. Continuous 4-stage TIG welding (automatic).

This program differs from the previous one in that the arc is both started and shut off by pressing and releasing the torch trigger or foot switch.



M - LED. Pulsed 2-stage TIG welding (manual).

When the torch trigger or foot switch is pressed, the current begins to increase over the previously set "slope up" time, until it reaches the value set by means of the knob **AA**. When the trigger is released, the current begins to drop over the previously set "SLOPE DOWN" time, until it returns to zero.

IN THIS POSITION, YOU CANNOT CONNECT THE PEDAL CONTROL ACCESSORY TIG250FP.

N - LED. Pulsed 4-stage TIG welding (automatic).

This program differs from the previous one in that the arc is both started and shut off by pressing and releasing the torch trigger or foot switch.

J - LED - THERMAL PROTECTION

Lights when the operator exceeds the duty cycle or percentage intermittence admissible for the machine, and simultaneously blocks the current output.

NOTE: In this condition the fan continues cooling the power source.

AC <48V Y - LED

This LED never be lit to ensure safe welding conditions in AC mode.

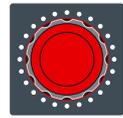


A - BALANCE CONTROL

This knob makes it possible to vary the half-periods of the square wave when working in TIG AC, welding aluminium. The point where the two half-waves meet is zero.

This position will give you less current absorption, reduced electrode consumption and an ideal ratio between the width and depth of the bead. If you wish to increase penetration, turn the knob counter-clockwise; for a cleaner weld with less penetration, turn the knob clockwise.

THIS FUNCTION IS ENABLED ONLY WHEN TIG WELDING IS SELECTED IN AC.



AA - KNOB

Adjusts the welding current **T**.

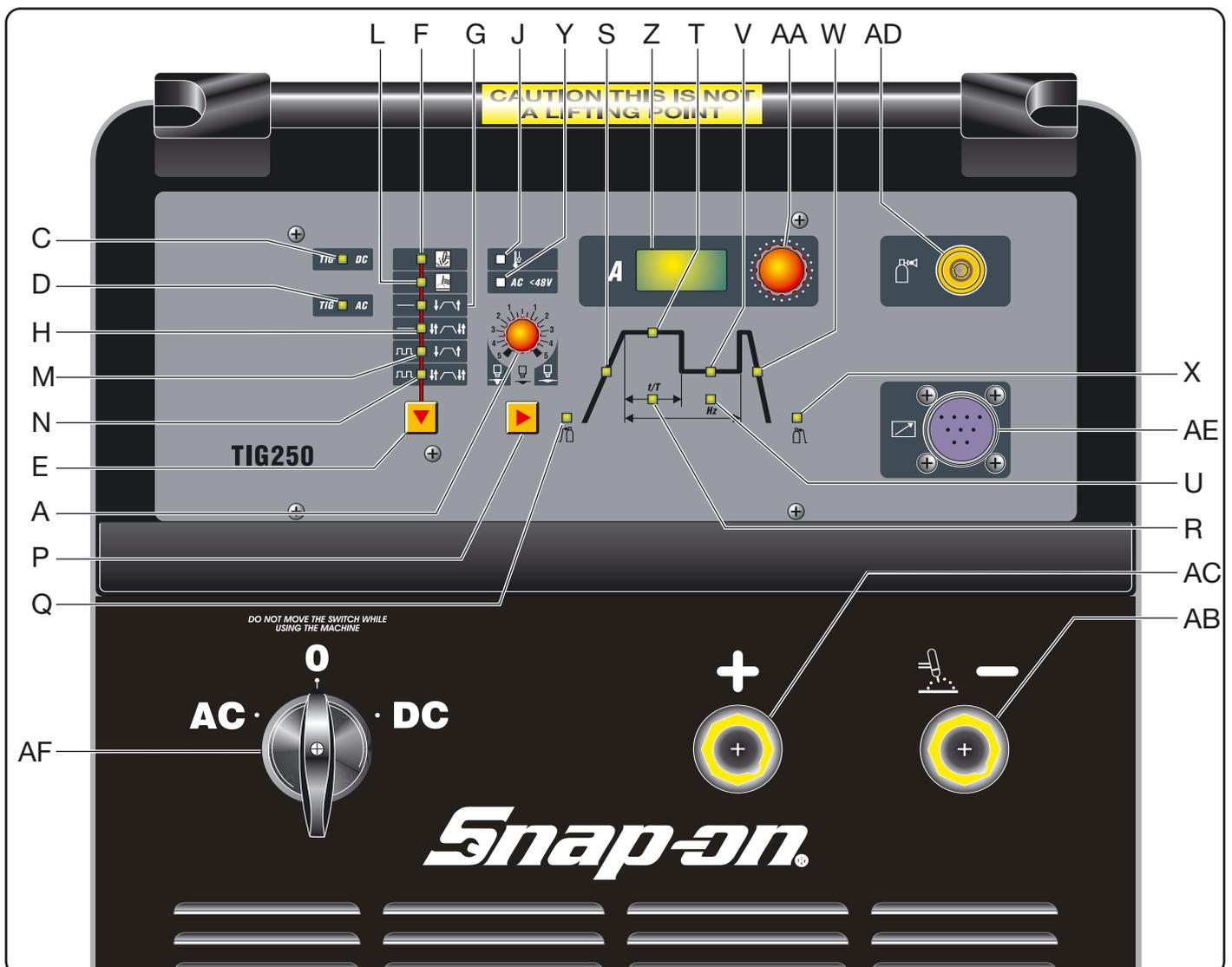
Also, in combination with the push-button **P**, you may:

- adjust the pre gas **Q**
- adjust the second level of current **V**
- adjust the "slope up" **S**
- adjust the "slope down" **W**
- adjust the pulse frequency **U**
- adjust the post gas **X**
- adjust the t/T ratio **R**



Z - Display

Displays the welding current and the settings selected by means of the push-button **P** and adjusted via the knob **AA**.





P - SELECTOR

When this button is pressed, the LEDs light in succession:

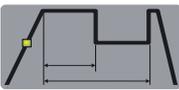
Warning: only those LEDs that refer to the chosen welding mode will light; i.e., in continuous TIG welding the LED **U**, representing the pulse frequency, will not light.

Each LED indicates the parameter that may be adjusted by means of the knob **AA** while the LED itself is lit. Five seconds after the last variation, the LED involved will shut off; the main welding current will be displayed, and the corresponding LED **T** lights.



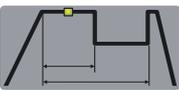
Q - Led

Pre gas. this LED lights on when the pre-gas function is active (0,05-3 sec.).



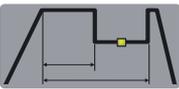
S - LED

Slope up. This is the time in which the current, starting from the minimum, reaches the set current value. (0-10 sec.)



T - LED

Main welding current.



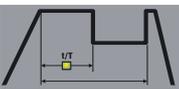
V - LED

Second level of welding or base current. Can not exceed main welding current value.



U - LED

Pulse frequency (0.5-20 Hz). This is the number of times per second that the welding current achieves main welding current value.



Led R.

t/T ratio (see fig. 2).

The **t** time may vary from 40 to 60 % of the **T** total time. It controls how long the main welding current level is maintained before it drops to the base current value - 40 to 60% of total time T.

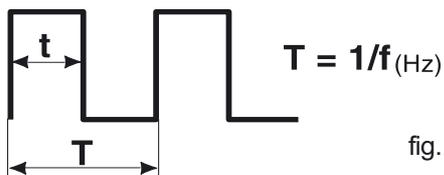
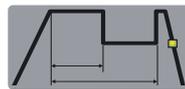
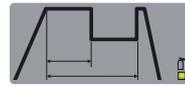


fig. 2



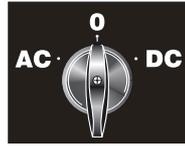
W - LED

Slope down. This is the time in which the current reaches the minimum value and the arc shuts off. (0-10 sec.)

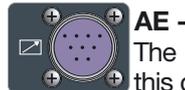


X - LED

Post gas. Adjusts the time gas flows after welding ends. (0-30 sec.)



AF - AC/DC SELECTOR SWITCH



AE - 14-PIN CONNECTOR

The following remote controls are connected to this connector:

- a) foot control
- b) torch with start button

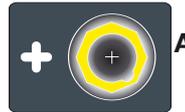


AD - GAS FITTING

This is where the gas hose of the TIG welding torch is to be connected.



AB - Negative output terminal (-)



AC - Positive output terminal (+)

3 TIG WELDING

By selecting, by means of the AC/DC switch, TIG AC welding mode **TIG AC** you may weld aluminium, aluminium alloys, brass and magnesium, while selecting TIG DC **TIG DC** allows you to weld stainless steel, iron and copper. This welding machine is suitable for welding stainless steel, iron, or copper using the TIG procedure.

Connect the earth cable connector to the positive pole (+) of the welding machine, and the clamp to the workpiece as close as possible to the welding point, making sure there is good electrical contact.

Connect the power connector of the TIG torch to the negative pole (-) of the welding machine.

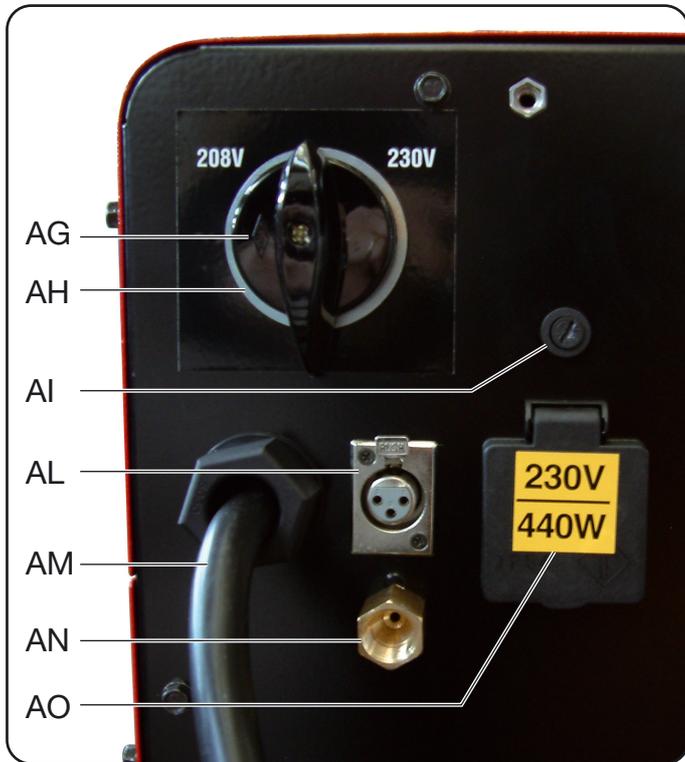
	D.C.	A.C. (frequency 60 Hz)					
		Pos. Max Penetration		Pos. Balanced zero		Pos. Max Cleaning	
Electrode Type ▶	Tungsten Thorium 2% Red	Tungsten Pure Green	Tungsten Zr 0,8% White	Tungsten Pure Green	Tungsten Zr 0,8% White	Tungsten Pure Green	Tungsten Zr 0,8% White
ø ▼ in							
1.0 - 0,040"	5A - 80A	20A - 60A	20A - 80A	20A - 30A	20A - 50A	20A - 30A	20A - 40A
1.6 - 1/16"	70A - 150A	50A - 100A	70A - 150A	30A - 60A	50A - 80A	20A - 40A	30A - 60A
2.4 - 3/32"	150A - 250A	100A - 160A	140A - 235A	60A - 120A	80A - 140A	40A - 100A	60A - 120A
3.2 - 1/8"	200A - 350A	150A - 210A	225A - 325A	80A - 160A	100A - 180A	60A - 140A	80A - 160A
4 - 5/32"	300A - 400A	200A - 275A	300A - 400A	100A - 240A	150A - 280A	80A - 200A	150A - 250A

Table A

Connect the torch connector to the welding machine connector **AE**.

Connect the torch gas hose fitting to the fitting **AD** on the machine, and the gas hose from the cylinder pressure regulator to the gas fitting **AN** on the rear panel.

DESCRIPTION OF EQUIPMENT (REAR PANEL).



AG - 208/230 Selector Switch - used for selecting the input supply voltage and for turning the machine on. "ON" is towards the selected voltage. "OFF" is at the 12 o'clock position.

AH - Voltage Change Disc - to lock the selector switch in the desired voltage position.

AI - Fuse - 2Amp - 250Volt - slow blow.

AL - Socket - for connecting the safety cable of the cooling unit (TIG 250 H2O Only) TIG 250 GAS requires the installation of the TIG 250JP Jumper Plug.

AM - Power Input Cord.

AN - Gas Inlet Fitting - This is where the gas hose from the cylinder regulator attaches.

AO - Socket - for Cooling Unit (230 Volts - max 400W). Do NOT connect other power tools.

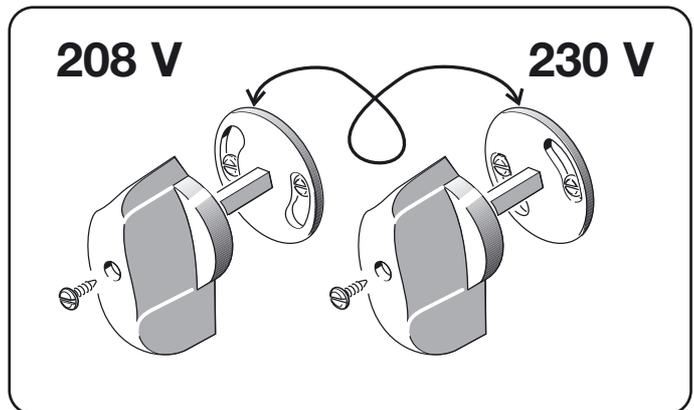
3.1 PRIMARY CIRCUIT CONNECTIONS

• After final inspection, the welding machine is connected to the voltage indicated on the rear panel-230V Factory pre-set.

• If you wish to change the supply voltage:
 - Set the knob **AG** to the 12 o'clock position (machine OFF).
 - Remove the knob **AG** of the selector switch by unscrewing the holding screw.

- Position the voltage change disc **AH** so that the knob can only turn towards the desired voltage, indicated on the rear panel.
 - Insert the knob and lock it in place with the screw.

• Connect the power cord **AM**: the yellow-green wire of the cord must be connected to an efficient grounding socket.



the remaining wires must be connected to the power supply line through an isolator switch, located near the area if possible, to allow rapid shut-off in case of emergency.

The capacity of the overload cut-out switch or fuses installed in a serial connection with the switch must be the same as the current I_1 absorbed by the machine.

The absorbed current I_1 can be determined by reading the technical specifications indicated on the machine, in regards to the supply voltage U_1 available.

Any extension cords must be sized appropriately for the absorbed current I_1 .

How to turn the machine on.

Use switch **AG** - turn switch towards the selected input voltage (230V factory pre-set).

Do not touch live parts and output terminals while the machine is powered.

The first time the machine is turned on, select the mode using the push-button **E**, and the welding parameters by means of the key **P** and the knob **AA** as described in paragraph 2.

The type and diameter of the electrode to be used must be selected according to table A:

The flow of inert gas must be set to 30 CFH.

If you are using gas-lens type accessories, the gas throughput may be reduced to approximately 15 CFH. The diameter of the ceramic nozzle must be 4 to 6 times the diameter of the electrode.

Use D.I.N. 10 protective glasses for up to 75A, and D.I.N. 11 from 75A up.

3.1.1 Connections for cooling unit.

AI - Fuse 2A-250V slow blow.

AL - Socket for connecting the safety cable of the cooling unit.

AO - Socket for cooling unit (230 Volts-max. 440 W).

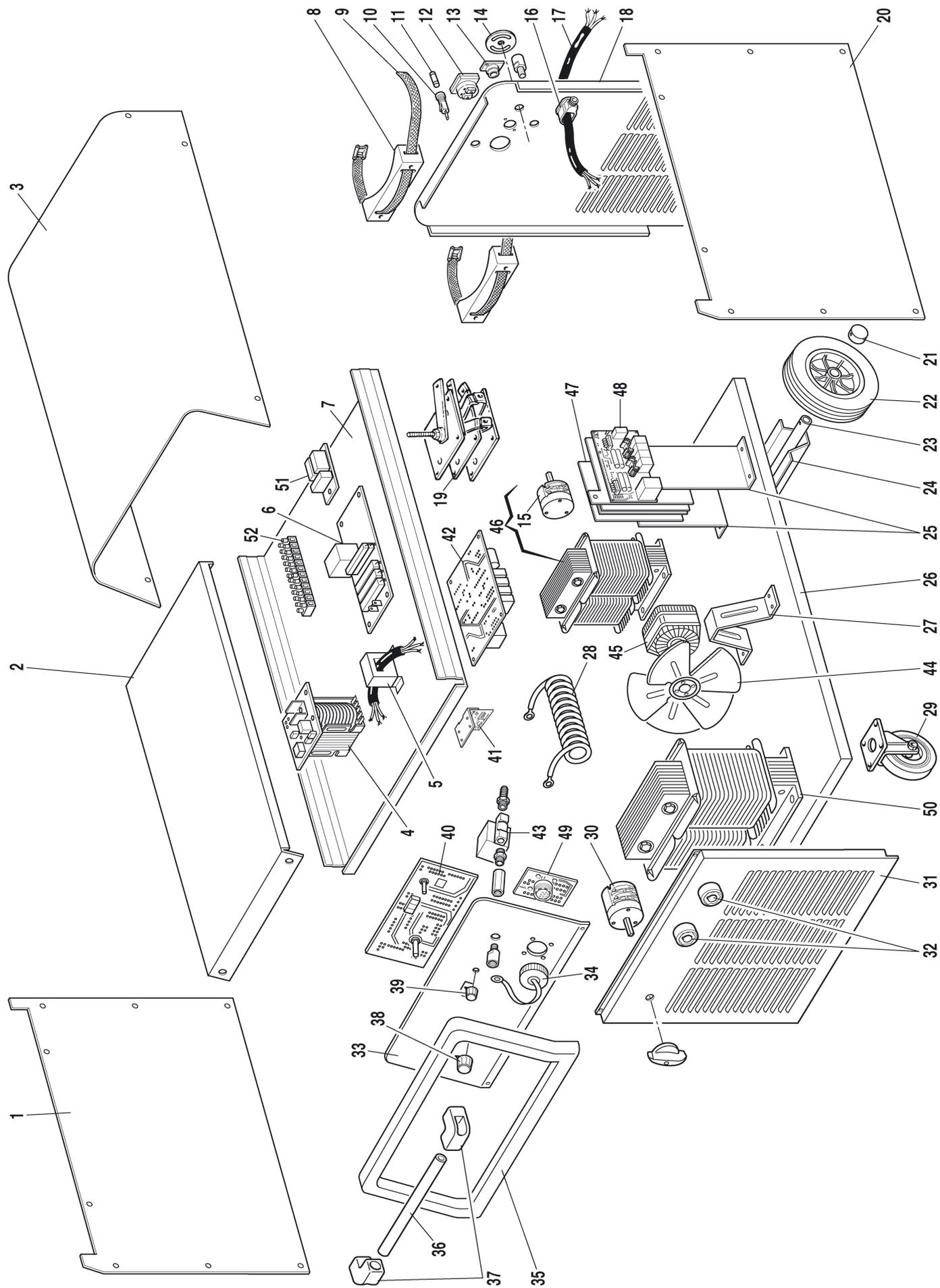
Do not connect other power tools.

3.2 CHOOSING THE ELECTRODE DIAMETER FOR A CORRECT ARC IGNITION EITHER IN DC OR IN AC (HOT START).

To allow the setting up of the welding machine, a submenu is available to adjust some parameters.

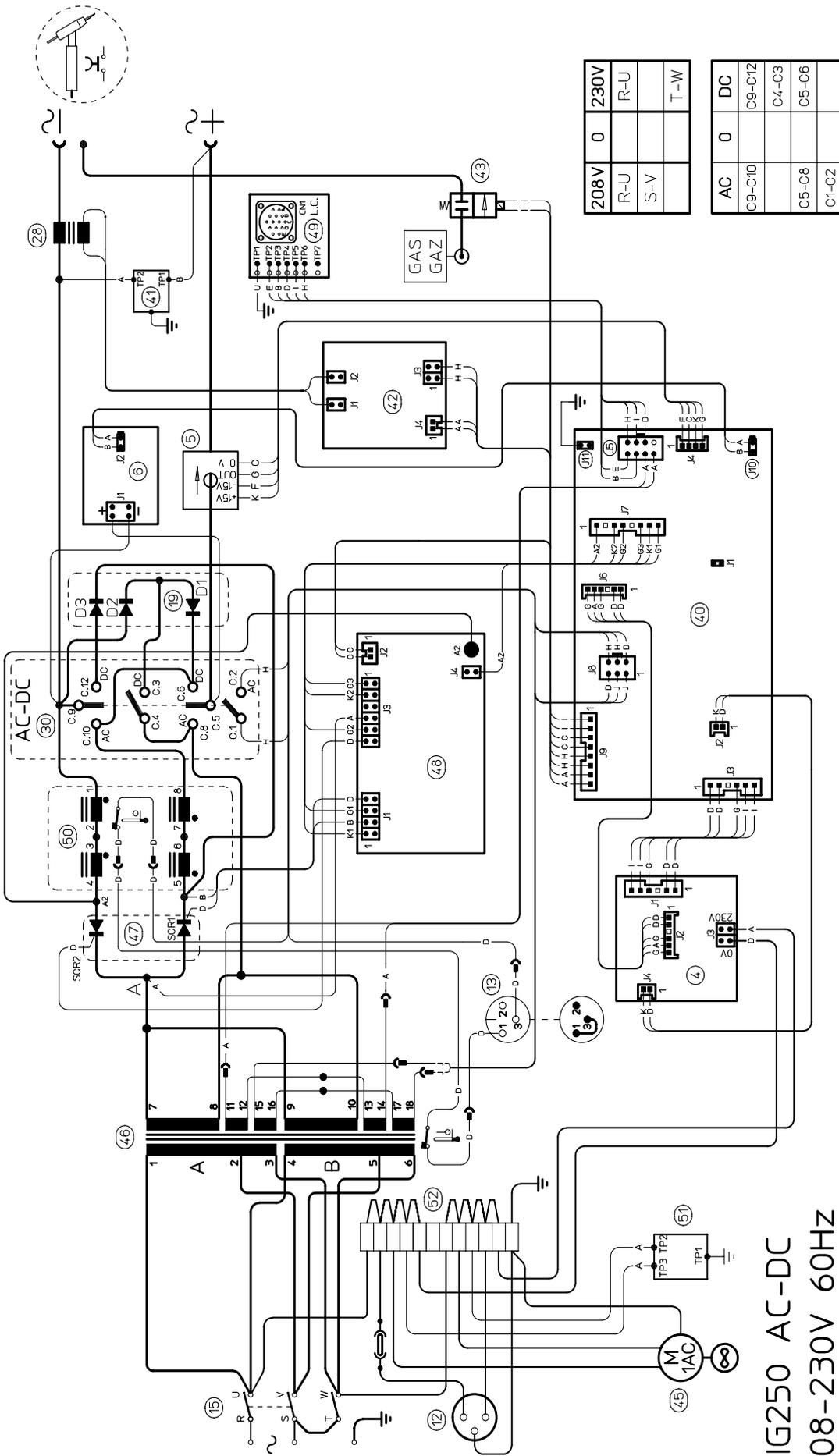
To enter the submenu, press at the same time for 3 seconds the keys **E** and **P**.

By means of the encoder **AA**, when selecting the wanted electrode 0.040" - 1/16" - 3/32" - 1/8" - 5/32", the automatic Hot Start function is activated. To confirm the electrode diameter, press and release the key **E**.



Ref. #	Part # Model TIG250	Description
1	5801298	LEFT SIDE PANEL
2	5803803	SUPPORT
3	5803775	COVER
4	5610097	AUXILIARY TRANSFORMER
5	5710307	TRANSDUCER
6	5602294	SNUBBER CIRCUIT
7	5802855	CENTER DEVIDER
8	5803876	GAS CYLINDER SUPPORT
9	CKS251028	BELT
10	3175603	FUSE HOLDER
11	3175563	FUSE
12	3175370	SOCKET
13	3170235	CONNECTOR
14	3060431	SUPPORT
15	3190132	SWITCH
16	CKS250874	STRAIN RELIEF
17	CKS251110	INPUT CABLE
18	5802477	BACK PANEL
19	3200090	RECTIFIER
20	5801297	RIGHT SIDE PANEL
21	CKS251094	CAP
22	CKS251098	FIXED WHEEL
23	3080052	AXLE
24	5803804	SUPPORT
25	5803805	SUPPORT
26	5801773	BOTTOM
27	5800527	SUPPORT
28	5610055	HF TRANSFORMER
29	3130079	WHEEL
30	3190517	SWITCH
31	5802183	FRONT PANEL
32	3175354	CONNECTOR
33	5802184	FRONT PANEL
34	3070015	PROTECTION
35	3070336	FRAME
36	5803956	HANDLE
37	3060247	SUPPORT
38	CKS250920	KNOB
39	CKS251089	KNOB
40	5602293	MICRO CIRCUIT
41	5602291	FILTER CIRCUIT
42	5602290	HF CIRCUIT
43	CKSB7105370	SOLENOID VALVE
44	3065118	FAN
45	3165051	MOTOR
46	5610096	TRANSFORMER
47	5605539	SCR. GROUP
48	5602289	CIRCUIT
49	5602292	CONNECTOR CIRCUIT
50	3205314	INDUCTOR
51	5600993	FILTER CIRCUIT
52	3170068	TERMINAL BOARD

ALL CONSUMABLES AND REPAIR PARTS SHOULD BE ORDERED THROUGH YOUR SNAP-ON DEALER.



208V	0	230V
R-U		R-U
S-V		T-W

AC	0	DC
C9-C10		C9-C12
C5-C8		C4-C3
C1-C2		C5-C6

TIG250 AC-DC
208-230V 60HZ

WIRING DIAGRAM COLOR CODE			
A	BLACK	S	WHITE-BLUE
B	RED	T	BLACK-BLUE
C	GREY	U	YELLOW-GREEN
D	WHITE	V	BLUE
E	GREEN		
F	PURPLE		
G	YELLOW	M	GREY-PURPLE
H	BLUE	N	WHITE-PURPLE
K	BROWN	O	WHITE-BLACK
J	ORANGE	P	GREY-BLUE
I	PINK	Q	WHITE-RED
L	PINK-BLACK	R	GREY-RED