GALA SYNERGIC 5000

GB	TECHNICAL INSTRUCTIONS MANUAL. POWER SOURCES. INDUSTRIAL MIG/MAG WELDING EQUIPMENT OF SYNERGIC CONTROL.

☐ ***GALA Synergic 5000***
(3Ph - 230/400V 50/60 Hz)
Ref. 432.00.000

GB	THIS EQUIPMENT MUST BE USED BY PROFESSIONALS. TO HELP YOU IN YOUR WORK CAREFULLY READ THIS MANUAL.

gala gar SOLDADURA

Jaime Ferrán 19 50014 ZARAGOZA (Spain)
TLF.-34/976473410 FAX.-34/976472450

Ref. 43217545/Ed0

GB	CONTENTS	Page

1. GENERAL DESCRIPTION. TECHNICAL CHARACTERISTICS.

This equipment forms part of a modular system (GALA SYNERGIC) that permits electric welding of carbon steels, slightly alloyed steels, stainless steels and aluminium, which are the most commonly used metals in modern industry, by means of the MIG-MAG semiautomatic procedure.

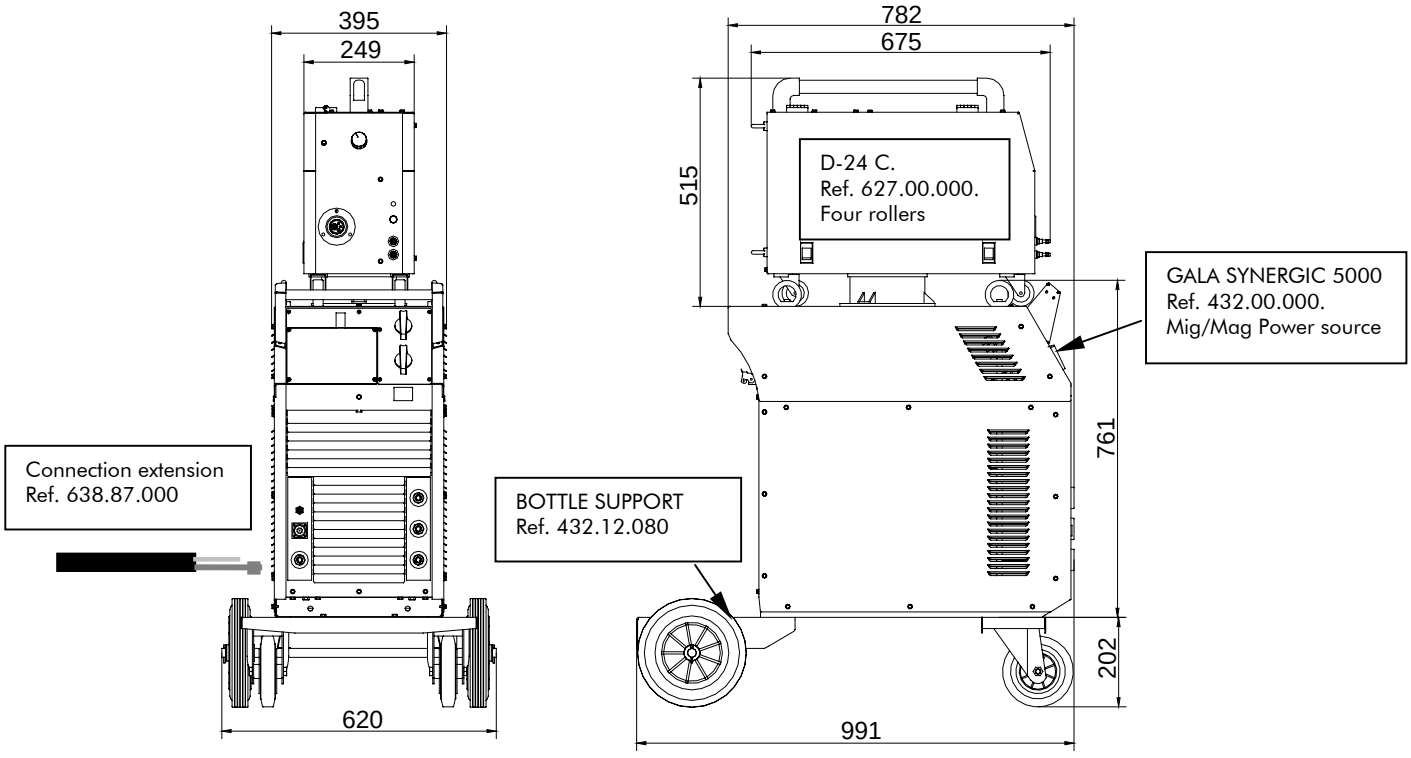
The main characteristic of this equipment is that it incorporates a synergic-digital control system that facilitates operation making it possible for people not trained in manual regulation to use this equipment.

The whole modular system that makes up the installation comprises the following elements:

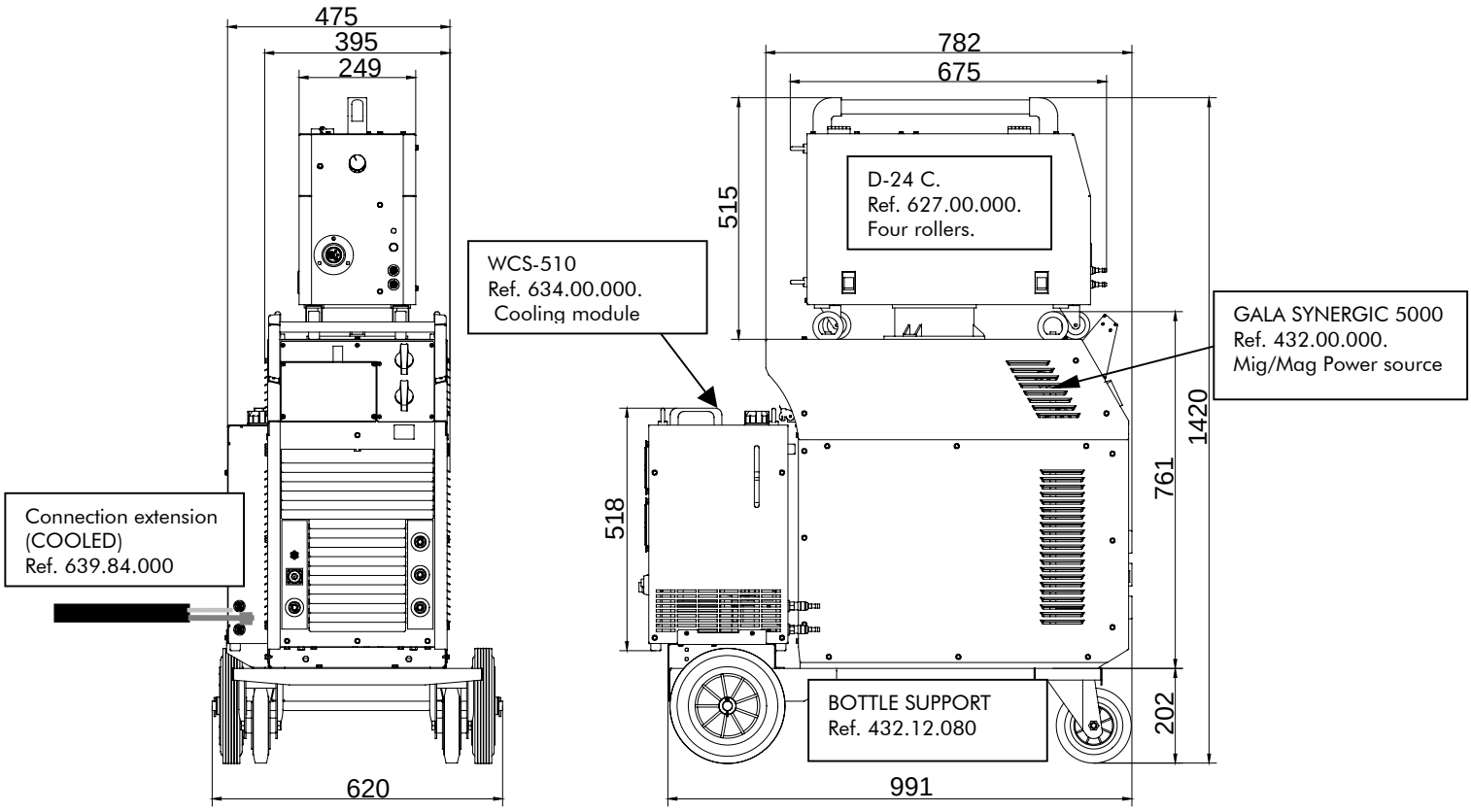
1.1 – Power source. (Earth cable included).
1.2 – Wire-feed unit (Independent from the power source).
1.3 - Connection extension lead between power source and wire-feed unit. Welding torch.
1.4 - Cooling module for cooled welding gun.
1.5 Bottle support.
1.6 - Auxiliary elements: Pressure reducing valve for gas bottle, gas economiser.

1.1. POWER SOURCES: GALA SYNERGIC 5000. MODULAR SYSTEM.

TECHNICAL CHARACTERISTICS	GALA SYNERGIC 5000 Ref. 432.00.00
INPUT VOLTAGE U_1 (THREE-PHASE 50-60 Hz) (1)	230/400 V
MAXIMUM INPUT INTENSITY I_{1max}	47 A / 27 A
EFFECTIVE MAXIMUM INTENSITY I_{1eff}	36 A / 21 A
POWER FACTOR (Cos_{phi})	0.95
CONTINUOUS ADJUSTMENT MARGIN MIG/MAG I_{2min}-I_{2max}	25-400 A
STAGGERED VOLTAGE CONTROL	3 x 10
NUMBER OF MIG REACTANCE TAPS	3
MIG WELDING INTENSITY I2 ED=100%	310 A
MIG WELDING INTENSITY I2 ED=60%	400 A
CONTROL SYSTEM	MANUAL / SYNERGIC
MECHANICAL PROTECTION INDEX (IP class)	IP21
VENTILATION	FORCED
WEIGHT (WITHOUT WIRE-FEED UNIT)	140 kg.
ACCORDING TO UNE-EN 60974. (1) Other power supply voltage values on demand.	



General dimensions of the GALA SYNERGIC equipment. Modular system WITHOUT COOLING.



General dimensions of the GALA SYNERGIC equipment. COOLED modular system.

1.2. WIRE-FEED UNIT D-24C SYNERGIC Ref. 627.00.000

Closed wire-feed unit for wire reels of 15 kg. Drive motor (42V/110W) with FOUR geared 30 mm ϕ rollers. Wire speed control. Wire and gas purge. Cooling circuit incorporated. Refer to the instructions manual of Wire-feed D-24C for more detailed information.

1.3. EXTENSION CORDS. WELDING TORCHES.

	D-24 C (Cooled)	D-24 C (without cooling)
EXTENSION CORDS	Cable of 70 mm^2 (5 m) Ref. 639.84.000	Cable of 50 mm^2 (5 m) Ref. 638.87.000
WELDING TORCH	Water-cooled 500 A/100% CO_2 450 A / 100% Mix	Self-cooled 350 A/60% CO_2 320 A / 60% Mix

1.4. COOLING MODULE WCS 510. Ref. 634.00.000

WCS-510: Modular cooling system (adapted to bottle support, Ref. 432.12.080). It can be installed with any power source. Refer to the instructions manual of WCS for more detailed information.

The electrical connection of the equipment is carried out directly to the power source.

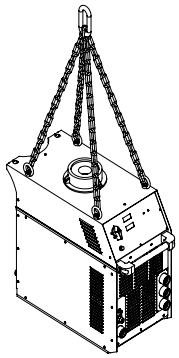
1.5. RECOMMENDED ACCESSORIES.

- Pressure reducing valve for Argon-CO_2, EN2, Ref. 376.00.000
- Pressure reducing valve for Argon CO_2, EN2 WITH ROTAMETER, Ref. 376.00.500
- Shielding gas economiser valve (spotting work), Ref. 355.00.000
- Prof. electronic shield Automatic, Ref. 811104

FOR THE USE OF ANY OTHER ACCESSORY CONSULT THE MANUFACTURER.

2. TRANSPORT AND INSTALLATION.

Elevation system.

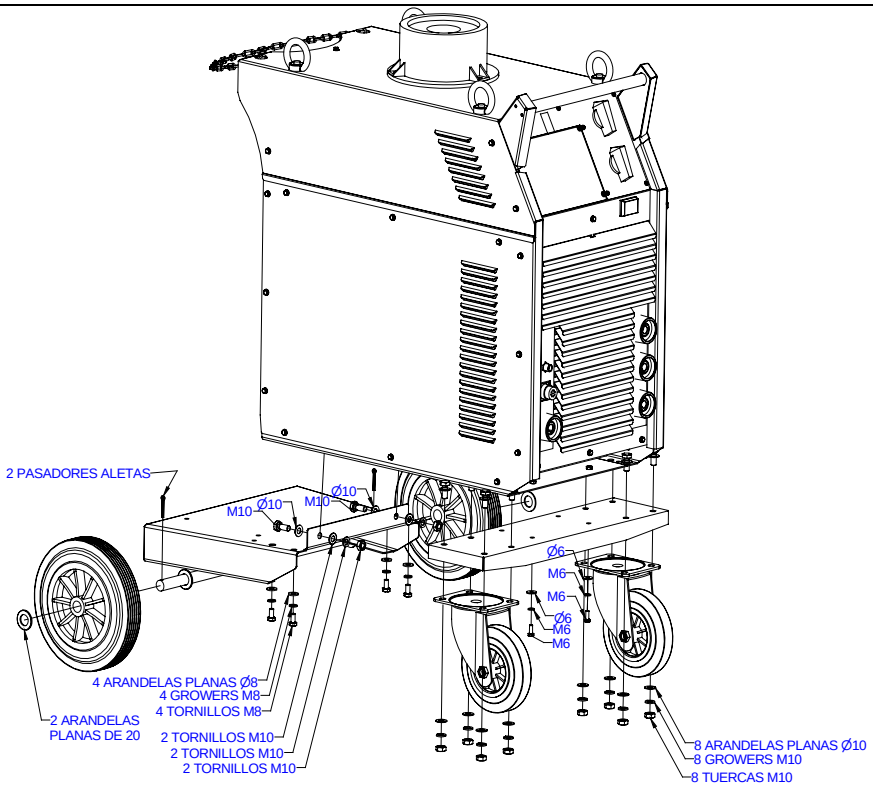


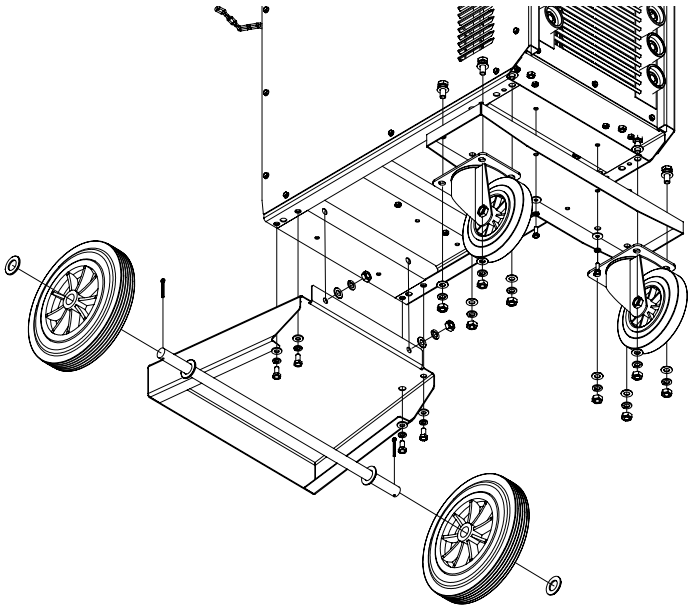
Knocks and sudden movements must be avoided when transporting the equipment. The transport position will be shown by arrows on the packaging. In any case, the packaging must be protected from water.

The power source has some lifting eyes so that it can be lifted with a crane. To assemble the modular system follow the assembly instructions enclosed with the transport trolley or bottle support. The assembly will be carried out by suspending the equipment as shown in figure 2.

DO NOT LIFT EQUIPMENT WITH GAS BOTTLE MOUNTED

ASSEMBLY PLAN FOR GALA SYNERGIC 5000 EQUIPMENT





2.1. ELECTRICAL SUPPLY INSTALLATION.

The electrical installation of the equipment making up the system must be carried out by specialised personnel according to the applicable standards. The location must fulfill the following conditions:

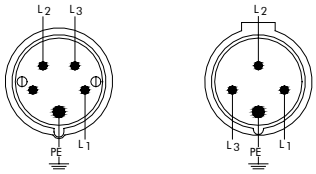
Place: Dry and ventilated, far enough away from the welding area in order to prevent the metal dust caused by the welding process from getting into the equipment. The equipment must not be used in the rain.

⚠ PLACE THE WELDING MACHINE ON A FIRM FLAT SURFACE.
IF EQUIPMENT OF THIS KIND TIPS OVER IT CAN HAVE VERY SERIOUS CONSEQUENCES.

The main switchboard where the machine has to be connected must be comprised of a differential circuit breaker and a magnetothermal switch.

AUTOMATIC CIRCUIT BREAKER (IA): Three-pole or four-pole. The instrument will be chosen according to the characteristics plate. We advise choosing a slow type Intensity-Time characteristic (Curve G), as false tripping could occur due to transitory overloads.

DIFFERENTIAL SWITCH (ID): Four-pole or three-pole with minimum sensitivity of 300 mA. The aim of this switch is to protect the personnel from direct or indirect contact with electrical parts under voltage. The differential circuit breaker is selected with a superior gauge to ID.



The connection to the mains is made from the intake hose. The Figure on the left shows the connection of the intake hose to the two most common types of standardised plug (IEC 309-2). In this figure L1, L2 and L3 show the phase cables and PE represents the earth protection conductor.

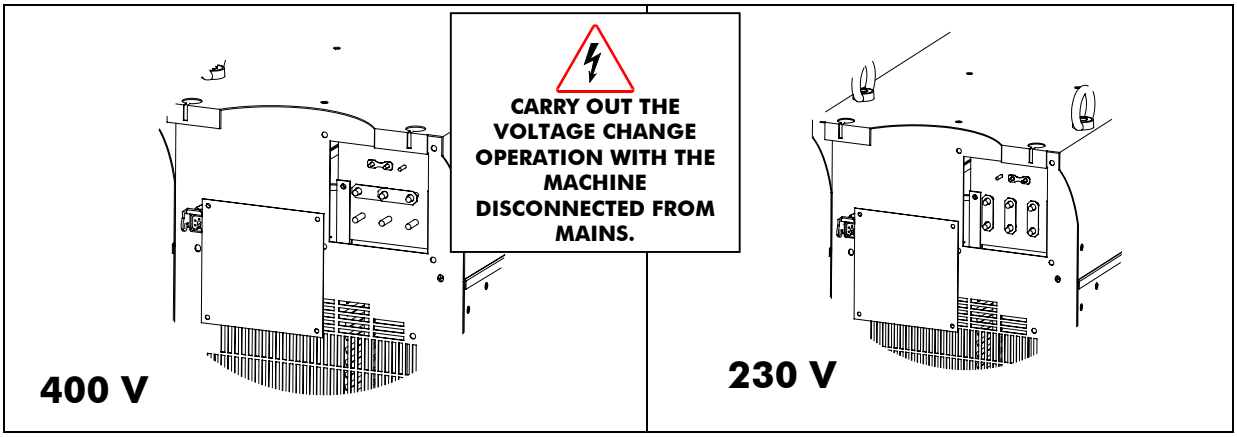
DO NOT FORGET TO FIT THE EARTH CONNECTION INTO THE PLUG.

Electrical data of the installation.

	INPUT SUPPLY HOSE (1KV-RVK)						AUTOMATIC CIRCUIT BREAKER (Slow)	
	CONNECTION AT 230 V			CONNECTION AT 400 V				
EQUIPMENT	10 m	15 m	20 m	10 m	15 m	20 m	230 V	400 V
5000	6 mm^2	6 mm^2	10 mm^2	6 mm^2	6 mm^2	6 mm^2	40 A	25 A

If a supply hose longer than 5 metres should be required, you should replace the existing hose with another one whose section must be chosen according to the preceding table.

VOLTAGE CHANGE

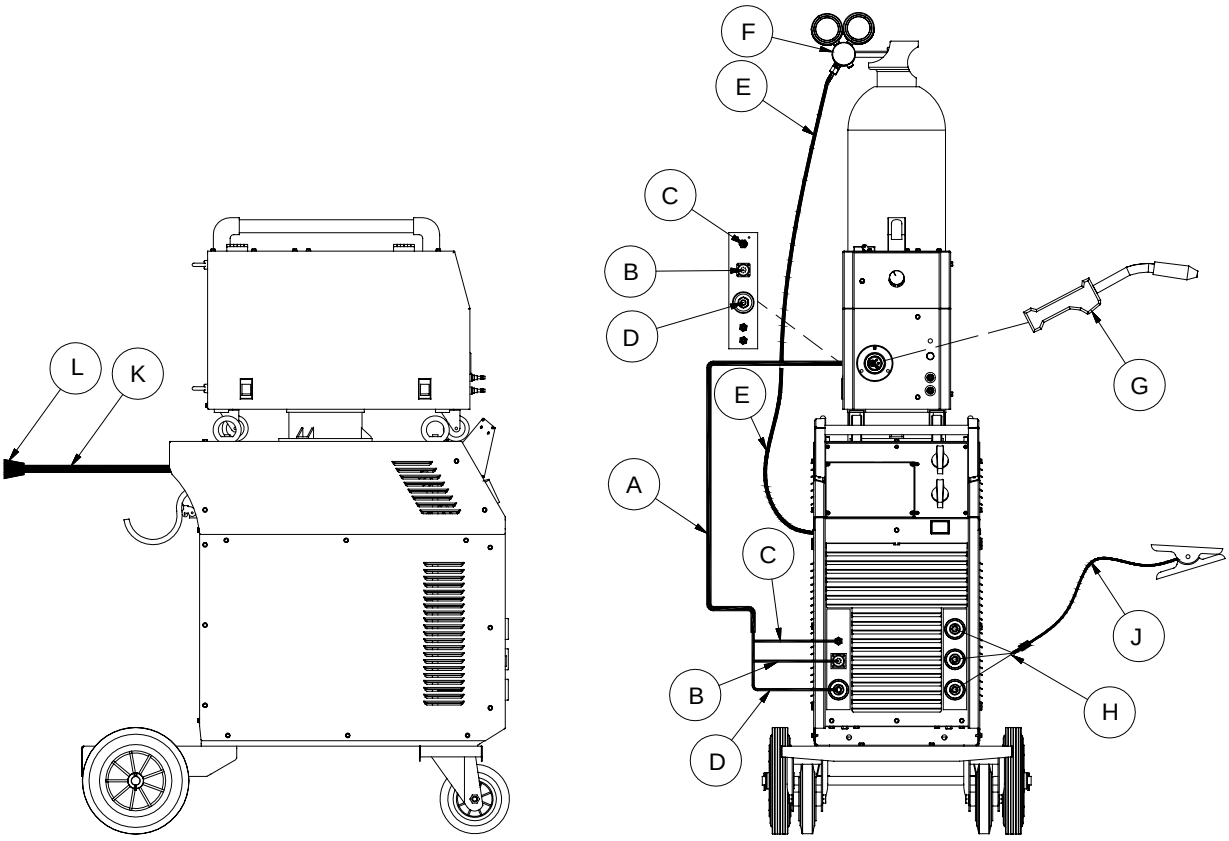


Standard equipment leave the factory with the voltage selected at 400 V. To change to 230V voltage remove the lid on the rear of the equipment, changing the location of the terminals as shown on the upper figure.

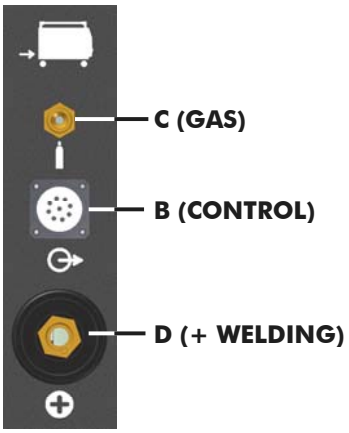
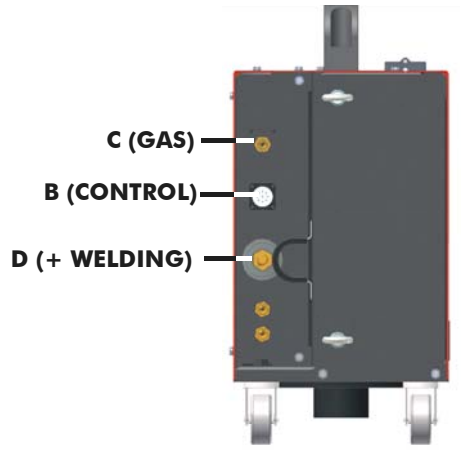
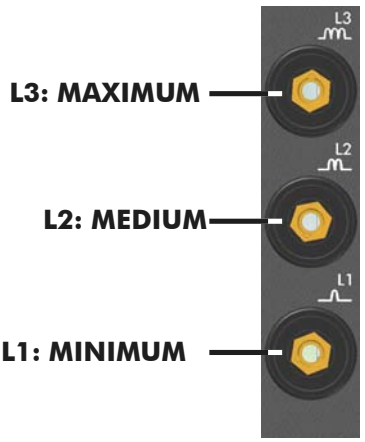
DO NOT FORGET TO FIT THE EARTH CONNECTION INTO THE PLUG.

MAKE SURE THE MAINS VOLTAGE COINCIDES WITH THAT ESTABLISHED IN THE MACHINE.

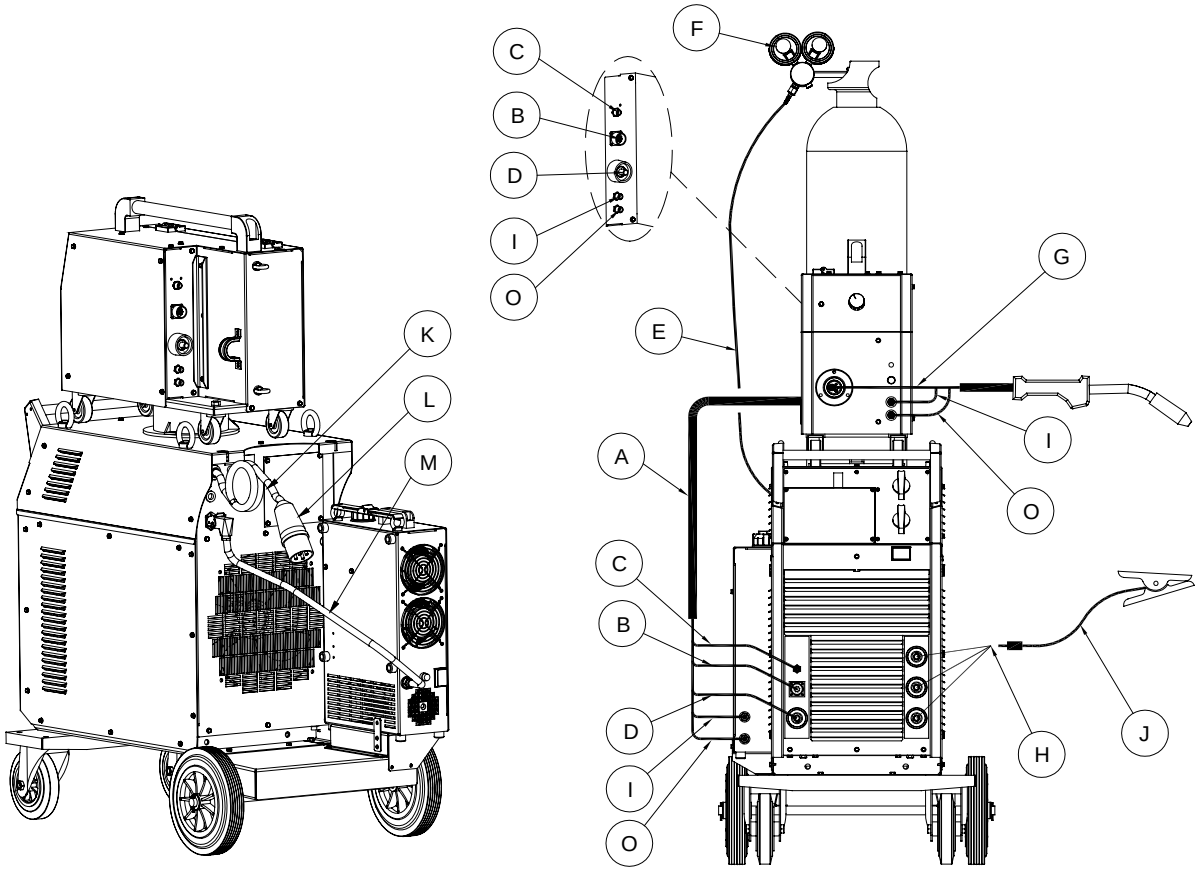
2.2. INSTALLATION OF SELF-COOLED SYNERGIC GALA SYSTEM (WITHOUT COOLING MODULE).



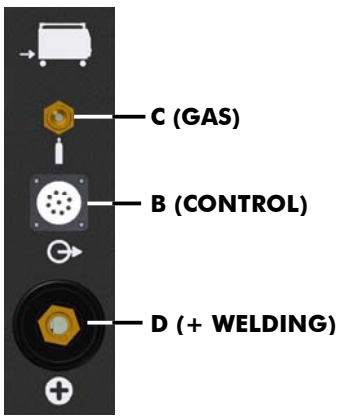
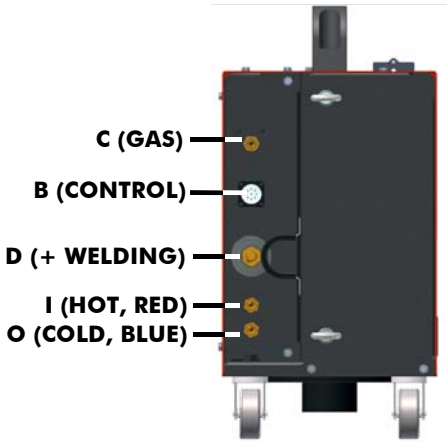
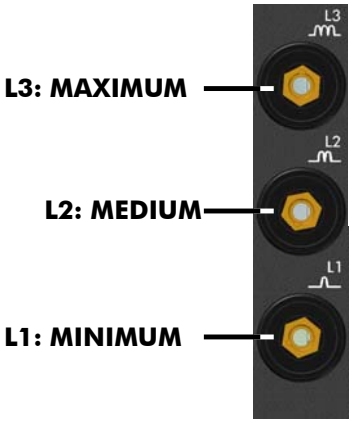
Electrical connection of power source K- Supply hose L- Connection plug.	**Installation of welding shielding gas circuit** E- Gas intake hose to power source. F- Pressure reducing valve of gas flow control.
A- Connection extension lead (without cooling) B- CONTROL hose. C- Shielding GAS. D- POSITIVE supply pole.	**Installation of welding circuit elements.** G- Welding torch. H- Reactance taps. J- Welding earth clamp.

Extension connection to power source.	Extension connection to wire-feed unit.	Earth cable connection (J) to reactance taps (H).
		

2.3. INSTALLATION OF COOLED SYNERGIC GALA SYSTEM.



Electrical connection of power source K- Supply hose L- Connection plug.	**Installation of welding shielding gas circuit** E- Gas intake hose to power source. F- Pressure reducing valve of gas flow control.
A- Connection extension lead (cooled). B- CONTROL hose. C- Shielding GAS. D- POSITIVE supply pole. O- Cold-water pipe (BLUE) I- Hot-water pipe (RED)	**Installation of welding circuit elements.** G- Cooled welding torch. H- Reactance taps. J- Welding earth clamp.
WCS cooling module connection. M- Electrical connection cable of cooling module. O/I- Hot (RED) and cold (BLUE) water pipes.	

Extension connection to power source.	Extension connection to wire-feed unit.	Earth cable connection (J) to reactance taps (H).
		

3. START-UP. ADJUSTMENT AND OPERATION CONTROLS.

3.1 START-UP. PRELIMINARY OPERATIONS.

In principle, the system must be connected as indicated in the previous chapter and before starting the system up definitely, the following steps must be taken:

1)- Make sure the mains voltage is the same as that preselected in the machine.

2)- Connect supply cable K to the relevant three-phase outlet.

3)- Check that the gas bottle is held correctly by the bottle-holder system. Above all check that the safety chain is perfectly fastened.

4)- Install the pressure-reducing valve F and connect gas hose E checking that there are no leakages, throughout the whole circuit.

5)- Fit the relative adapter onto the wire reel and fit this assembly into the wire reel support axle. Please carefully read the wire-feed unit instructions manual.

6)- Depending on the wire diameter, fit the groove of the correct driving roller.

7)- Fit the wire into the driving system. Do not force the wire pressure handle, as if this is too tight, the motor remains on overload and does not reach the maximum speed, and if the handle is too slack, the wire could slip. Once the wire has been fitted, we can then hook up the G torch.

3.2. OPERATION CONTROLS OF THE POWER SOURCE.

MAIN OPERATION CONTROLS OF GALA SYNERGIC 5000

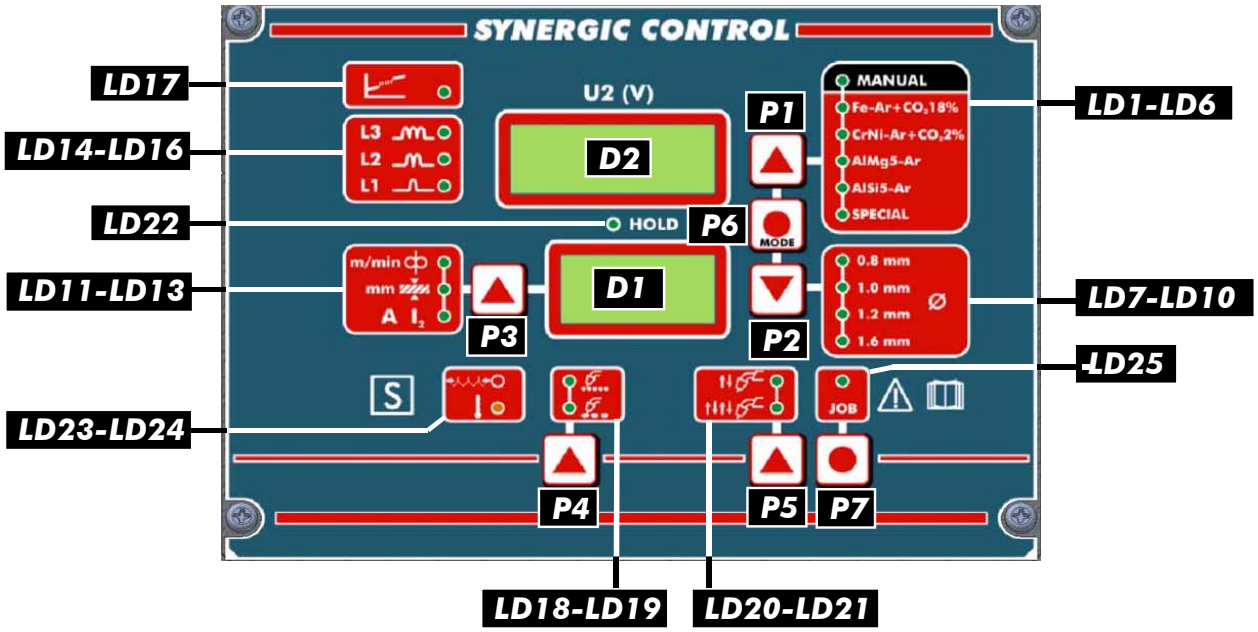
N- General ON/OFF switch.
With this switch we can start up the power source and the wire-feed unit. The switch will remain illuminated in "ON" position.

P- Controls and displays of synergic control.

V- Scale switch.
This enables the welding power range to be selected; we can select three power ranges, A, B and C in the GALA SYNERGIC 5000 equipment.

U- Incremental tap charger.
This enables the correct welding power to be selected within the chosen range. It has 10 selection levels, which will permit the best adjustment for each specific job.

CONTROLS AND DISPLAYS OF SYNERGIC CONTROL PANEL



Welding program, wire diameter and welding power settings. The welding power will be selected with the "V" and "U" switches of the power source.	
P1	Welding program selection pushbutton.
LD1-LD6	Welding program indicators selected with P1.
P2	Welding wire diameter selection pushbutton.
LD7-LD10	Wire diameter indicators selected with P2.
P3	Input indicative parameter selection pushbutton. Wire speed, thickness of material to be welded, welding intensity I2.
LD11-LD13	Indicator led of selected indicative parameter.
D1	Depending on the selected input indicative parameter, D1 will show: - The programmed wire speed (m/min.). - The thickness of material to be welded (indicative) in synergic program (mm). - Welding current as planned (indicative) in synergic program L2 (A).
D2	Indicator display of welding voltage anticipated by synergic program. The special synergic program will show the program N° selected.
LD14-LD16	Indicator led of recommended reactance tap in synergic program (L1, L2 or L3).
LD17	Indicator led of GLOBULAR transfer type in synergic program.

2S / 4S Settings mode and welding mode; continuous, spots or intermittent. .	
P4	Welding mode selection pushbutton: CONTINUOUS/ SPORTS/ INTERMITTENT.
LD18	Indicator led of spot working mode (SPOT).
LD19	Indicator led of INTERVAL working mode.
P5	Selection pushbutton of 2S (2 strokes) or 4S (4 strokes) pulse mode.
LD20	Press the 2S pulse mode indicator is necessary for welding.
LD21	Press the 4S pulse mode indicator is not necessary for welding.

Displays in welding process	
D1	Welding intensity indicator display in process.
D2	Welding voltage indicator display in process.
LD22	Indicator led of memorized welding parameters (HOLD) at the end of process.
D1	Indicator led of memorized welding current at the end of process.
D2	Indicator led of memorized welding voltage at the end of process.

Operating switching-off indicators	
LD23	Operation switching-off indicator LED due to lack of water pressure in the cooling circuit (RED)
LD24	Thermal switching-off indicator LED (AMBER).

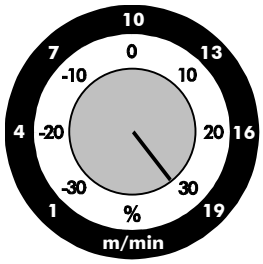
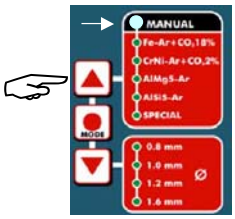
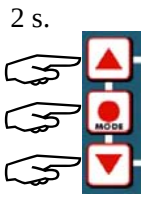
Cycle parameters settings mode (Pre-flow, Post-flow, Cooling...)	
P6	MODE pushbutton with the following functions: 1- By keeping it pressed for 2 seconds it is possible to enter/exit the settings mode. 2- By pressing it in setting mode we can change the cycle variable selected.
D2	Indicator display of cycle variable with P6.
D1	Indicator display of cycle variable value selected.
P1	Increase pushbutton of setting variable value.
P2	Decrease pushbutton of setting variable value.
P1+P2	By keeping P1 + P2 pressed for 2 seconds the "Factory" cycle parameters are reset.

Welding mode by means of user programmes (JOB).	
P7	JOB pushbutton with the following functions: 1- By briefly pressing it we enter/exit the JOB welding mode. 2- By keeping it pressed for 2 seconds in welding mode the JOB is recorded. 3- If we keep P7 pressed when the power source is on, the JOBs will be deleted.
P1/P2	Program user selection pushbutton (JOB N° selection).
D2	Indicator display of user program N° (JOB) selected with P1/P2.
D1	Switches control indicator display in user program mode (JOB).

3.3. FIRST START-UP. STARTING SETTINGS.

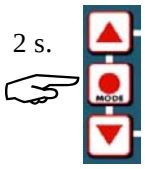
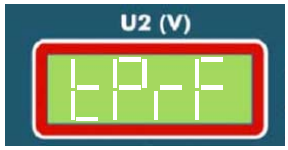
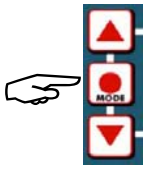
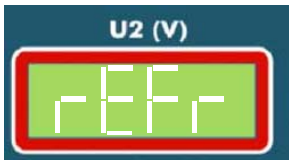
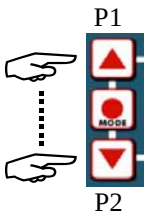
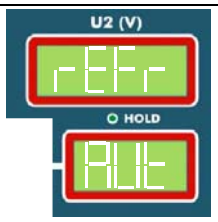
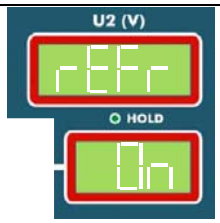
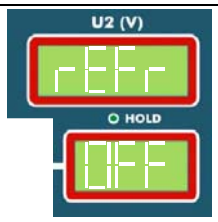
3.3.1. WIRE-FEED SETTING PROCESS.

The adjustment and setting of the D-24C wire-feed must only be carried out during the first start-up or if a change or repair has been carried out to it. Proceed as follows:

1°		Place the wire-feed wire speed regulation potentiometer in maximum speed position (furthest position to the right).
2°	**ON**	Proceed to switch on the power source and wire-feed using the on/off switch (N).
3°		After switching on the synergic control system, select the manual program with P1.
4°		Keep pushbuttons P1, P2 and P6 pressed for 2 seconds.
5°		The self-setting process of the wire-feed takes place when the indication shown in the figure (INIT – REF) appears on displays D1/D2.

3.3.2. COOLING SYSTEM SETTING PROCESS.

Depending on whether the installation is cooled or not, we must set the equipment during the first start-up. Proceed as follows immediately after the previous setting process:

<table>
<tr><td>1º</td><td>2 s.
  </td><td>Keep pushbutton P6 (MODE) pressed for 2 sec. It will enter the cycle variable setting menu. The indication tPrF or ton will appear on display D2:</td><td>  </td></tr>
<tr><td>2º</td><td>  </td><td>Press pushbutton P6 (MODE) successively until the cooling variable (REFR) appears on display D2.</td><td>  </td></tr>
<tr><td>3º</td><td>  </td><td colspan="2">Press pushbuttons P1 or P2 until the desired cooling mode appears on display D1.
<table>
<tr><th>AUTomatic COOLING</th><th>COOLING “ON”</th><th>COOLING “OFF”</th></tr>
<tr><td>  </td><td>  </td><td>  </td></tr>
</table></td></tr>
</table>

AUTOMATIC COOLING: Working mode with cooled torch.
The cooling only works in welding mode and will switch off automatically 2 minutes after carrying out the welding process.

COOLING “ON”: Working mode with cooled torch.
The cooling works permanently after the first welding process starts.

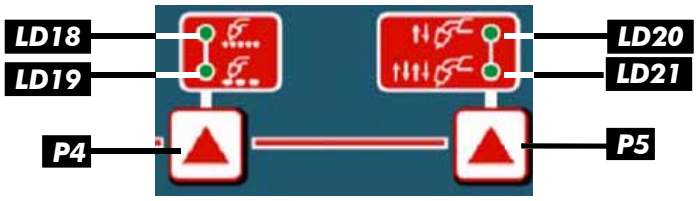
COOLING “OFF”: It permits working with torches without water cooling.
The cooling is deactivated, the protection against lack of water pressure is disabled.

3.4. WELDING MODE BY MEANS OF SYNERGIC PROGRAM.

The welding mode in synergic mode is the most convenient working option for the welder, as by telling the equipment what we want to weld, it will automatically adjust the welding parameters.

Before setting the desired welding program, you must define the working mode (continuous welding, spot or intermittent welding and the pulsation mode on the torch pushbutton).

The welding working mode will programmed as follows:

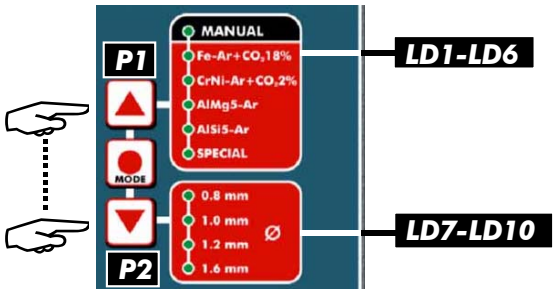
<table>
<tr><td>  </td><td>1st. By means of P4 pushbutton we selected:
LD18/LD19 off: Continuous welding.
LD18 on: Spot welding.
LD19 on: Intermittent (intervals) welding.

2nd. By means of P5 pushbutton we selected:
LD20 on: 2S
(It is necessary to press the pushbutton to weld).

LD21 on: 4S
(It is not necessary to press the pushbutton to weld).</td></tr>
</table>

Once the working mode has been defined, you must carry out the welding works programming:

1st. DETERMINE THE WELDING PROGRAM: MATERIAL TO BE WELDED – SHIELDING GAS
2nd. DETERMINE THE WELDING WIRE DIAMETER TO BE USED.

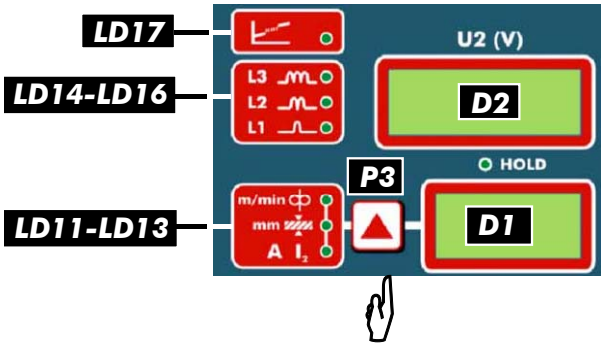


1st. P1 will select the welding program.
The selected program will be indicated in the leds LD1-LD6 (see the table below).
With SPECIAL program, the program N° selected will be indicated in the upper display (D2).

2nd. By means of P2 we will select the wire diameter that is desired to use, which will be indicated in the leds L7 – L10.

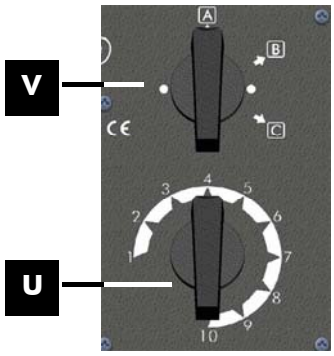
PROGRAM	WELDING WIRE TYPE	Wire diameter	SHIELDING GAS
Fe-Ar+CO_2 18%	SG 3/ SG 4 Si 1: Non-alloy or low alloy wire (SOLID FE)	0.8 – 1.0 – 1.2 – 1.6	Ar 82% +CO_2 (18%÷25%)
CrNi –Ar CO_2 2%	Cr Ni 19-9: Solid stainless steel wire (STAINLESS STEEL)	0.8 – 1.0 – 1.2	Ar 97.5 + CO_2 (2%÷2.5%)
AlMg 5 -Ar	Al Mg 5%: Aluminium wire alloyed with Magnesium. (ALUMINIUM Mg).	1.0 – 1.2	Ar 100%
AlSi 5 -Ar	Al Si 5%: Aluminium wire alloyed with Silicon. (ALUMINIUM Si).	1.0 – 1.2	Ar 100%
SPECIAL Pr01	Rutil FCW: Tubular wire filled with rutile flux.	1.2 – 1.6	Ar 82% +CO_2 18%
SPECIAL Pr02	Cr Ni FCW: Tubular wire filled with stainless steel flux.	1.2 –	Ar 82% +CO_2 18%
SPECIAL Pr03	SG 3/ SG 4 Si 1: Non-alloy or low alloy wire (SOLID FE)	0.8 – 1.0 – 1.2	CO_2
SPECIAL Pr04	SG 3/ SG 4 Si 1: Non-alloy or low alloy wire (SOLID FE)	0.8 – 1.0 – 1.2 – 1.6	Ar 90% +CO_2 5% +O 5%

3rd. SELECT INDICATIVE VARIABLE



With pushbutton P3 we will determine the indicative variable that will guide us (display D1) to adjust the desired power; we have three possibilities:
LD11: Wire speed (m/min.)
LD12: Thickness in mm of piece to be welded in plane.
LD13: Expected welding intensity.

6th. ADJUST THE WELDING POWER



With controls V and U we will proceed to adjust the desired welding power, guided by the indicative value of display D1.
V: Selection switch of 3 power ranges.
U: Incremental tap charger (10 Pos.)

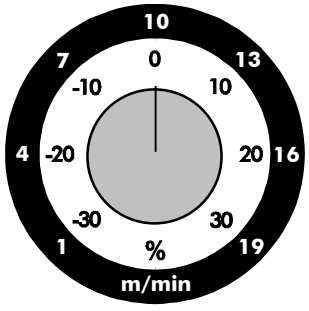
AUXILIARY INDICATIONS, ONCE SELECTED THE WELDING POWER:

Display D2: It will indicate the expected welding voltage.

LD14- LD15- LD16: They indicated the reactance tap in which the mass must be connected.

LD17: It will indicate that the welding arc transfer type is GLOBULAR (heavy welding drops).

7th. REGULATE THE WIRE SPEED ACCORDING TO YOUR REQUIREMENTS.



The wire speed control of the wire-feed must be placed in its intermediate position (point "0" on the inner dial). At this point the synergic control will assign the appropriate wire speed for the program and welding power selected.

Depending on the welding conditions, this wire speed can be adjusted very accurately. Wire speed regulation indicated by means of the INNER dial.

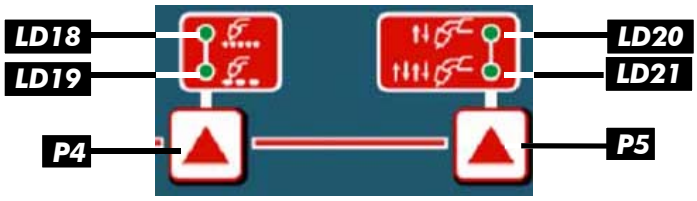
Intermediate position "0": Synergic speed.

Rotation to the RIGHT of position "0": Percentage INCREASE of synergic speed.

Rotation to the LEFT of position "0": Percentage DECREASE of synergic speed.

3.5. WELDING MODE BY MEANS OF MANUAL PROGRAM.

This program enables the parameters to be adjusted manually just like any traditional machine. Firstly, before proceeding to select the manual program you must define the working mode (continuous welding, spot or intermittent welding) and the pulse mode on the torch pushbutton:



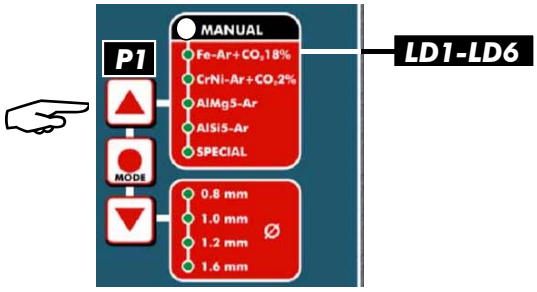
1st. By means of P4 pushbutton we selected:
LD18/LD19 off: Continuous welding.
LD18 on: Spot welding.
LD19 on: Intermittent (intervals) welding.

2nd: By means of P5 pushbutton we selected:
LD20 on: 2S
(It is necessary to press the pushbutton to weld).

LD21 on: 4S
(It is not necessary to press the pushbutton to weld).

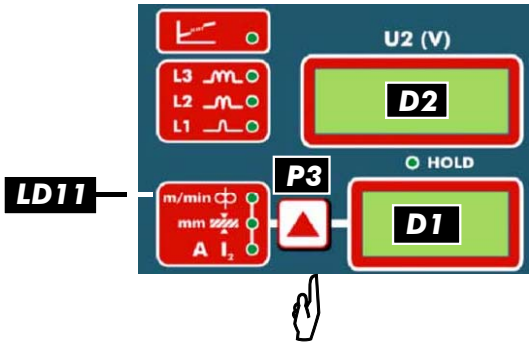
Once the working mode has been defined, you must carry out the following process:

1st. DETERMINE THE MANUAL WELDING PROGRAM.



1st. By means of P1 we will select MANUAL program (LED LD1 comes on).

2nd. SELECT THE WIRE SPEED AS INDICATIVE VARIABLE.

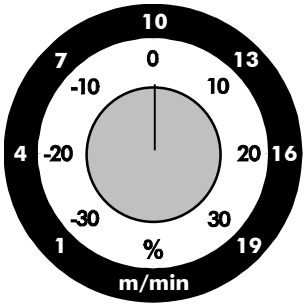


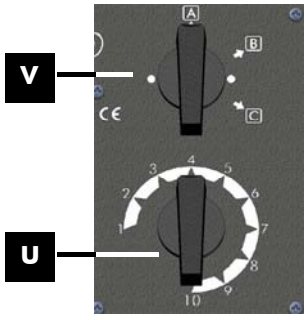
2nd. By means of P3 we will select the wire speed as indicative variable (m/min), LED LD11 will come on.

Display D1: It will indicate the real welding voltage.

Display D2: It will indicate the regulated wire speed, will automatically stop to indicate the welding current at the moment that begins the process.

3rd. REGULATE THE WIRE SPEED AND THE WELDING VOLTAGE.





Adjust the wire speed with the wire-feed potentiometer. The outer dial identifies the manual speed regulated (1-19 m/min), you can read the specific speed set on display D1.

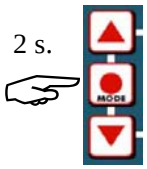
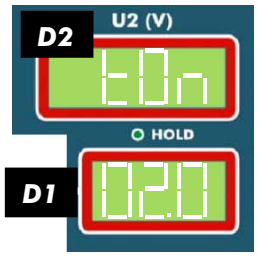
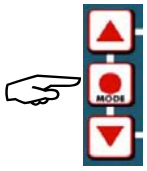
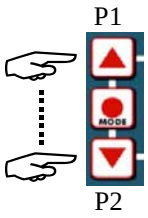
By means of controls V and U you will be able to regulate the welding voltage;
V: 3 adjustment ranges.
U: 10 positions incremental range.

3.6. SETTING MODE OF CYCLE PARAMETERS.

In cycle parameter setting mode we can adapt the most outstanding variables that intervene in the welding cycle to our needs.

3.6.1. OPERATING OF CYCLE PARAMETERS SETTINGS MENU.

The cycle parameter setting process is carried out as follows:

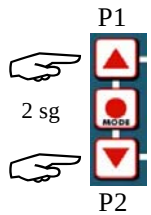
1º			Keep pushbutton P6 (MODE) pressed for 2 sec. You will enter the cycle variables setting menu. The indication "ton" appears on display D2 if it is set at spot or interval welding or "tPrF" (if it is set at continuous welding). The value of the assigned parameter appears on display D, so in the case of the left ton (welding time) a value of 2 sec. is assigned.
2º			By briefly pressing pushbutton P6 (MODE) the variable will be changed on the setting menu; in the case of the left one when pressing mode, we have changed from the "ton" variable to the tPrF (preflow time) variable. The parameter value assigned to this variable is 0.30 sec.
3º			With pushbuttons P1 and P2 we can increase or decrease, respectively, the value of the variable assigned on the setting menu. In the case of the left one, with P1 we can increase the preflow time value "tPrF" from 0.30 to 0.80.

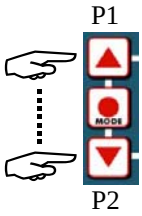
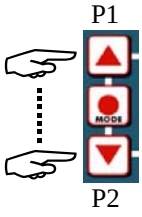
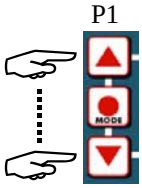
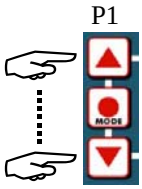
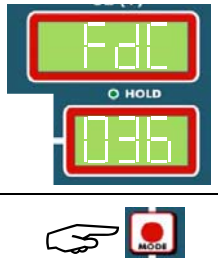
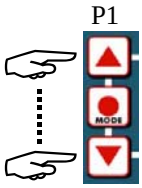
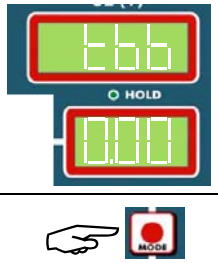
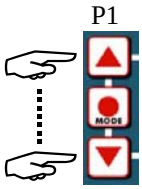
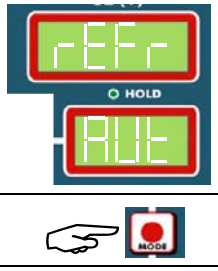
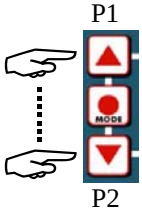
3.6.2. VARIABLES OF CYCLE PARAMETER SETTING MENU.

The table below sums up the variables of the setting mode menu. The Factory value corresponds to the value of the variable when it leaves the factory.

PARAMETER DESCRIPTION	ADJUSTABLE VALUE	FACTORY VALUE
Welding time (sport/ intermittent welding operation)	0.2÷5.0 s.	2 s.
Stop time on intermittent welding.	0.1÷3.0 s.	0.8 s.
Gas pre-flow time.	0÷3.0 s.	0.3 s.
Gas post-flow time.	0÷5.0 s.	0.5 s.
Approach speed.	10 ÷100% Vh	33% vh
After-burning time.	AUT ± 0.2 (s)	AUT
Cooling mode	AUT/ON/OFF	AUT
The time in approach process (Limited).	NOT ADJUSTABLE VALUE	5 s max.
Time of interrupted cycle (Limited)	NOT ADJUSTABLE VALUE	4 s max.
Cooling disconnection time (AUT Mode)	NOT ADJUSTABLE VALUE	120 s.

If you wish to change the factory values of the setting menu;

		A moment may come about when you wish to delete the setting made and recuperate all the factory values of the configuration menu. To do this you must press pushbuttons P1 and P2 for two seconds. The process ends when "FAct" appears on the display. These factory values are only recuperated in manual welding mode and by synergic programme. In JOB mode the setting parameters will preserve the values they were recorded at.

		**tOn**: Welding time in spot and intermittent welding operation. Define the execution time of spot welding. This parameter define the time in which the weld is activated in case of intermittent welding mode. Factory value: 2.0 s. By pressing P1 we increase the value; máximum: 5 s. By pressing P2 we decrease the value; minimum: 0.2 s.
		**tOFF:** Stop time on intermittent welding mode. We use this parameter to define the time of the welding stop cycle. Factory value: 0.8 s. By pressing P1 we increase the value; máximum: 3.0 s. By pressing P2 we decrease the value; minimum: 0.1 s.
		**tPrF**: Gas pre-flow time. We define with this parameter the time in which the shielding gas is flowing by the torch before beginning the welding operation. Factory value: 0.3 s. By pressing P1 we increase the value; máximum: 3.0 s. By pressing P2 we decrease the value; minimum: 0.0 s.
		**tPSF**: Gas pre-flow time. We define with this parameter the time in which the shielding gas is flowing by the torch after finishing the welding operation. Factory value: 0.5 s. By pressing P1 we increase the value; máximum: 5.0 s. By pressing P2 we decrease the value; minimum: 0.0 s.
		**FdC**: Wire approach speed. LIFT-ARC control. This permits defining the approach speed, expressing it in a percentage over the rated welding speed. We determine the lift-arc goodness with the approach speed control. Factory value: 36%. By pressing P1 we increase the value; máximum: 100%. By pressing P2 we decrease the value; minimum: 10%.
		**tbb**: Automatic burn-back time correction. Final wire length control. When welding ends, there is a delay between the braking of the wire drawing motor and the disappearance of the welding voltage (burn-back time). Factory value: 0.0 (Automatic delay time). By pressing P1 we increase the value; máximum: 0.2 s (shorter welding wire) By pressing P2 we decrease the value; minimum: -0.2 s (longer welding wire)
		**rEFr**: Torch cooling mode (see section 3.3.2). It define the cooling mode; AUT: Water cooling mode. The cooling system automatically switching-off 2 minutes after the welding operation. ON: Water cooling mode. Continuous cooling. OFF: Mode without water cooling. Pressure protection disabled.

3.7. WELDING MODE BY MEANS OF USER PROGRAMMES (JOB).

10 user-customised welding programs can be recorded with the JOB mode, which can be reproduced at any time.

3.7.1 USER PROGRAM RECORDING.

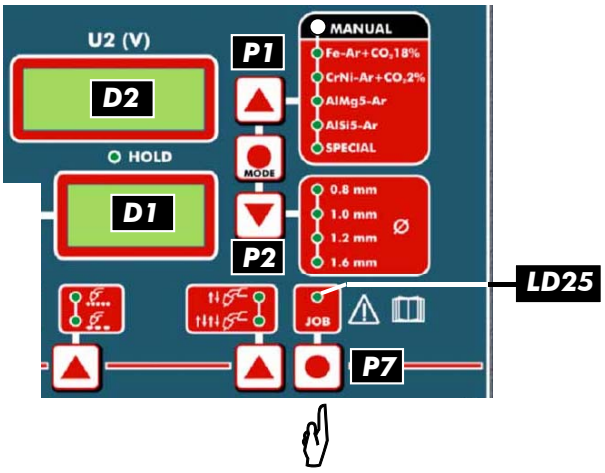
A welding program can be recorded from a manual welding program or from a synergic welding program.

RECORDING OF A MANUAL WELDING PROGRAM (See section 3.5).

Firstly select the working mode (continuous, spot or intermittent) and pulse mode (2S/4S);

1- Select MANUAL program from welding mode.

2- Adjust the desired welding voltage and wire speed for the welding program to be recorded.



3- Press JOB pushbutton (P7) for 2 sec, the LD25 led starts to flash.

4- The JOB program no. consecutive to the last one recorded flashes on and off on the display D2, (Job XX); with pushbuttons P1 and P2 we can assign a different program no. to the one suggested. If a program no. that already exists should be selected during the recording process the latter will be deleted and the new one recorded. The welding voltage regulation made for the recording will be indicated on display D1 (selector switch position, E.g. A-7).

5- After selecting the program no. briefly press the JOB pushbutton, the JOB led (LD25) will stop flashing and will light up continuously; **the program has been recorded**.

6-When LED LD25 lights up this tells us that we are in JOB mode, the program no. will correspond to the one previously recorded. Under these conditions we can enter the parameter setting mode and personalise the variables that we wish for this JOB (see section 3.6).

RECORDING OF A SYNERGIC WELDING PROGRAM (See section 3.4).

Firstly select the working mode (continuous, spot or intermittent) and the pulse mode (2S/4S);

1- From welding mode select the desired synergic program and the wire diameter to be used.

2- Set the desired welding power for the welding program to be recorded.

3- Press JOB pushbutton (P7) for 2 sec; the LD 25 led starts to flash.

4- The JOB program no. consecutive to the last one recorded flashes on and off on the display D2, (Job XX); with pushbuttons P1 and P2 we can assign a different program no. to the one suggested. If a program no. that already exists should be selected during the recording process the latter will be deleted and the new one recorded. The welding voltage regulation made for the recording will be indicated on display D1 (selector switch position, E.g. A-7).

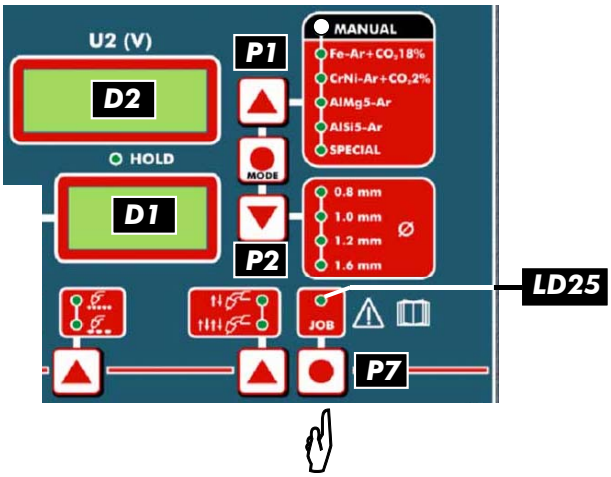
5- After selecting the program no. briefly press the JOB pushbutton, the JOB led (LD25) will stop flashing and will light up continuously; **the program has been recorded**.

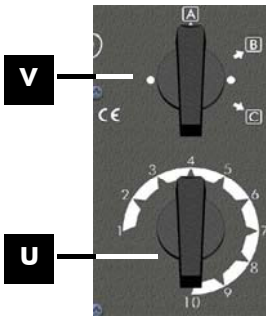
6-When LED LD25 lights up this tells us that we are in JOB mode, the program no. will correspond to the one previously recorded. Under these conditions we can enter the parameter setting mode and personalise the variables that we wish for this JOB (see section 3.6).

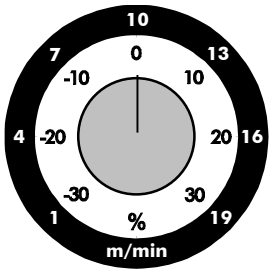
3.7.2. USER PROGRAM JOB REPRODUCTION.

The user program welding situation is identified by LD25 led (JOB) lighting up. If we are in welding mode (LD25 off) proceed to briefly press pushbutton P7, the LD25 led will light up, we are in JOB mode.

USER PROGRAM JOB REPRODUCTION.







1- If LD25 is off, briefly press the JOB pushbutton (P7), the LD25 led lights up, we are in JOB mode.

2- If, after pressing the JOB pushbutton the message "no Job" appears on displays D2 and D1, the system will automatically return to the welding mode as this message is indicative of the fact. that there is no user program recorded.

3- If there are welding programs recorded, the user program no. used the last time will appear on display D2; with pushbuttons P1 and P2 we can access another different program no.

4- After selecting the welding program we will place selector switches V-U as shown in display D1. The welding action will not be possible until the selector switches V-U are positioned as indicated on this display.

5- Place the wire-feed speed control in its intermediate position, (point "0" of the inner dial). At this point the system will assign the appropriate wire speed for the user program no. (JOB) selected.

Depending on the welding conditions, this wire speed can be adjusted very accurately. Wire speed regulation indicated by means of the INNER dial.

Intermediate position "0": Speed recorded in JOB.

Rotation to the RIGHT of position "0": Percentage INCREASE of synergic speed.

Rotation to the LEFT of position "0": Percentage DECREASE of synergic speed.

The exact value of the wire speed can be read on display D2 (Select with P3, m/min).

Notes:

a)- If the JOB no. corresponds to a user program that was recorded based on a synergic program the welding power can be increased or decreased by means of selector switches V-U once the first welding operation has been carried out. The system will assign the appropriate wire speed for the position chosen.

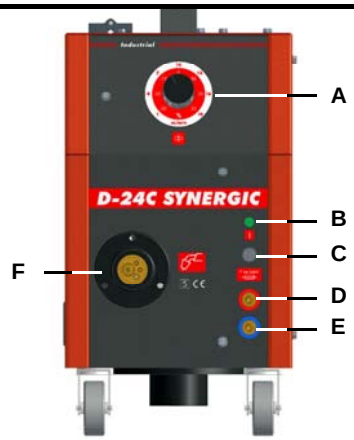
b)- We can change the JOB setting parameters; these are recorded in the user program, (see section 3.6), and are exclusive parameters of the program selected.

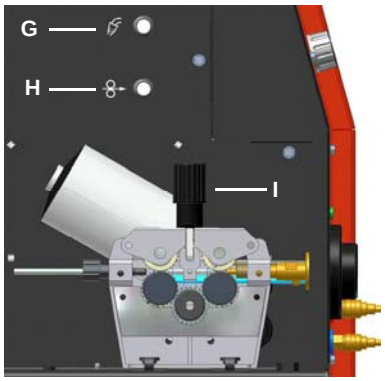
3.7.3. DELETING OF ALL JOB PROGRAMMES.

An existing JOB program can be individually deleted by overwriting a new one over the top of it.

To delete all the user programs recorded in the memory, the equipment must be switched on (using O/I on/off switch) keeping pushbutton P7 JOB) pressed; following the initial check process the message: "no Job" will appear on displays D2/D1, defining that all the user programs have been deleted.

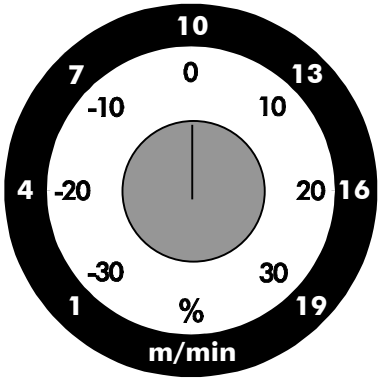
3.8. WIRE-FEED UNITS. OPERATION CONTROLS.





A		Wire speed control.	**F**		Euro-connector for welding torch connection.
B		Warning light ON	**G**		Gas purge pushbutton.
C	T 5A/250V	Protection fuse.	**H**		Wire purge pushbutton.
D		Coupling for hot water inlet connection of welding gun. RED pipe.	**I**	1 2 3 4 5	Control lever of wire feed pressure.
E		Coupling for cold water outlet connection of welding gun. BLUE pipe.			

A



MANUAL MODE:

Wire speed control indicated by the OUTER dial. (1÷19 m/min).

SYNERGIC MODE / JOB MODE:

Wire speed regulation indicated by means of the INNER dial.

Central position "0": Synergic speed.

Rotation to the RIGHT of position "0": Percentage INCREASE of synergic speed.

Rotation to the LEFT of position "0": Percentage DECREASE of synergic speed.

In order to carry out a correct operation, please read the wire-feed units instructions manual.

3.9. WCS COOLING MODULE.

The cooling mode setting is defined in section 3.3.2 of this manual. In AUT/ON cooling mode, the operativeness of the power source will depend upon the existence of water pressure in the cooling pump. If there is no water pressure the welding action will not be possible and the LD23 led will light up, with the indication PrES -E02 appearing on the displays.

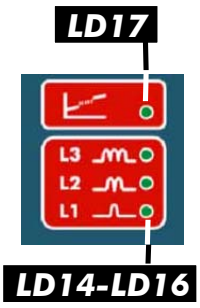
To carry out an operation correctly read the cooling module instructions manual.

3.10. RECOMMENDATIONS FOR THE USE OF THE EQUIPMENT AND WELDING OPERATION. MATERIALS AND GASES.

The adjustment of the welding parameters in the MIG-MAG equipment is a much more sensitive job than in traditional electrode welding equipment. The synergic control will permit easy regulation by informing the control of the welding work you wish to carry out, the welding parameters will be automatically assigned.

The wire speed is synergically assigned (see section 3.4). Depending on the work you are carrying out you can adjust it exactly to your needs using the wire-feed unit wire speed potentiometer. In general, bear in mind the following considerations;

The welding intensity depends on the wire speed. If the wire speed increases, the welding current value will increase resulting in a shorter arc. If you wish maximum penetration, you must weld at the minimum possible voltage (selector switches V-U of the power source). Although it must be taken into account that as the voltage drops, the aspect of the seam will worsen. The correct adjustment of the welding parameters leads to a gentle and smooth development of the welding, with a typical sound during the operation. If the wire speed is high, the wire tends to trip up and the arc becomes unstable. If the speed is low, there can be many splashes or the wire can even burn.



In synergic program, the control indicates the reactance intake to be used with Leds LD13/LD14/LD15; if the reactance connected is lower than that indicated, there will be a lot of splashes; if the reactance is higher, the wire will tend to get stuck.

IMPORTANT : Depending on the welding program and the welding power programmed, the control system will tell us with the LD17 led if we are in globular transfer mode or transition arc. These welding spots are characterised by an unstable arc with very thick spots. Insofar as possible avoid this welding zone. The transition zone is situated between the arc zone in short-circuit (lower power regulations) and the spray zone (higher power regulations).

SOFT AND WEAKLY ALLOYED STEELS WELDING.

We recommend using a gas mixture of Argon + CO_2 (Fe-Ar + CO2 18% Program). Remember there are special mixtures, which will optimise the welding process (SPECIAL program 04 Fe-Ar+CO2 5% +O5%)

Pure CO_2 can be used (SPECIAL program 03 Fe- CO2 100%), although we do not recommend this as, although it provides greater welding penetration, the aspect of the welded seam is worse, and also the number of projections is higher, the correct choice of the reactance tap acquiring great importance in this case. The best gas flows are between 8 and 14 litres, depending on the wire diameter.

In this case the wire to be used will be SG 3/ SG 4 Si 1 type. Preserve the wire from humidity.

STAINLESS STEELS WELDING. CrNi –Ar CO_2 2% Program.

We advise using a mixture of Argon-CO_2 2-2.5%. The best gas flows are between 8 and 14 l/min. The wire reel will be of stainless steel with composition Cr Ni 19-9.

ALUMINIUM WELDING. AlMg 5%-Ar Program / AlSi 5%-Ar Program.

The gas to be used in this case is pure Argon (MIG welding system). The flows will be between 8 and 18 l/min.

We advise using an aluminium wire with a minimum diameter of 1 mm. Aluminium is a soft material, which can cause problems in driving. Follow the recommendations below:

- The torch cable must be of Teflon. Torch neck: Strap cable. The torch length must be shortest possible 1÷ 3 m.
- Remove the brass guide pipe of the wire-feed drive system. The Teflon towrope of torch must be extended up to the driving rollers. Insert a drive roller with "U" type groove. Do not press the driving motor handle too much.

If you wish to weld with aluminium and have doubts, contact us.

4. 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.

4.1 MACHINE MAINTENANCE. GENERAL RECOMMENDATIONS.

Before carrying out any operation on the machine or gun, we must place switch J of the equipment in "O" position of machine disconnected.

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

☞ 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.

☞ 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.

☞ KEEP THE MACHINE PANELS CLOSED.

☞ 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.

☞ KEEP THE WELDING GUN IN GOOD CONDITIONS FOR USE.

A damaged or worn gun can cause inefficient welding.

☞ WHEN FINISHING THE WELDING OPERATION MAKE SURE THAT THE TORCH CATCH IS UNLOCKED. (If mechanical lock guns are used)

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 MACHINE TO POWER USING AN EFFICIENT EARTH TAP.

IF PROTECTIVE DEVICES OR SUPPLEMENTARY ELECTRICAL SYSTEM FILTERS ARE NEEDED, CONSULT OUR TECHNICAL SERVICE.

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.

IF THE WELDING PIECE IS GROUNDED, KEEP IN MIND OPERATOR SAFETY AND NATIONAL REGULATIONS.

5. ANOMALIES. PROBABLE CAUSES. POSSIBLE SOLUTIONS.

SYMPTOM. ANOMALY.	PROBABLE CAUSE.	POSSIBLE SOLUTION.
GENERAL PROBLEM. NOTHING WORKS.	The machine has no voltage in one or all its vital elements.	1. Make sure there is voltage at the entry to the machine, if not the tapping must be changed. It is advisable to see if any magnetothermal has "blown".
		2. Check the power source fuses situated on the rear of the equipment.
		3. The machine panels must be removed testing the logical points of the electrical diagram.
LIMITER TRIPS	Magnetothermal switch has low gauge for the case. There may be a short circuit, which is what causes the limiter to trip.	Change the magnetothermal for another larger gauge one. It is important for the magnetothermal switch to have a characteristic slow type curve. It is important for the magnetothermal switch to have a characteristic slow type curve. In the event that the electrical installation has limited power the welding work must be tested at lower current levels.
ALTHOUGH THE MACHINE IS CONNECTED AND WITH THE SWITCH (N) ON, THERE IS NO REACTION WHEN PRESSED	Problem in the power source-wire feed unit connection.	Check that the electrical connection between the power source and the wire-feed unit is correct. The warning light of the wire-feed unit must be on. Check the wire-feed fuse. Test the wire-feed electrical circuit.
	Failure of the pistol switch which does not make perfect contact.	Change the gun microswitch.
	Main electronic board of wire-feed unit faulty.	Replace the electronic card.
WHEN THE GUN IS PRESSED, ALTHOUGH WIRE COMES OUT, THE CONTACTOR DOES NOT WORK OR/AND THERE IS NO SHIELDING GAS	Voltage does not reach the Contactor or/and solenoid valve.	It must be established whether the fault comes from the electronic board or if it is an electrical connection fault. Check that the contactor coils or/and solenoid valve are not open.
WHEN THE SHIELDING GAS IS RELEASED IT CONTINUES FLOWING.	There is impurity in the inside chamber of the solenoid valve which prevents the piston from closing completely.	Dismantle and clean the electrovalve.
	The configurated value of post-flow is very high.	Change in the settings menu the post-flow time value tPSF (see section 3.6.2).
WHEN FINISHING WELDING THE WIRE REMAINS STUCK TO THE TORCH CONTACT TUBE.	The configurated value of burn-back is very high.	Change in the settings menu the value of the burn-back time correction (see section 3.6.2).
WHEN FINISHING WELDING THE FINAL WIRE LENGTH IS VERY GREAT.	The configurated value of burn-back is too low.	Change in the settings menu the value of the burn-back time correction (see section 3.6.2).
	The torch is withdrawn immediately when torch pushbutton is no longer pressed.	The final wire length control system requires the welding torch not to be immediately withdrawn when the torch pushbutton is no longer pressed.
THE EQUIPMENT DOES NOT WELD CORRECT. "IT ADJUSTS BADLY"	Low effective welding voltage. Output wave not correct.	Check that there is not a phase failure in the supply power. Check that the electrical contact elements of the welding circuit are correct: Welding mass, rusty or very dirty surfaces, contact nozzle with greater diameter than the wire, etc. Test the electrical diagram of the power source: input and output voltages to the rectifier.
	The welding wire has a mechanical resistance at the outlet, which prevents it from having a regular speed.	Examine the welding gun. Blow the inside (cable) with compressed air.
THERE ARE MANY PROJECTIONS IN THE WELDING PROCESS	Reactance chosen low.	Change reactance tap on the power source to a higher value.
	Unsuitable shielding gas.	When welding normal steels we advise the use of a gas mixture Ar-CO2.

SYMPTOM. ANOMALY.	PROBABLE CAUSE.	POSSIBLE SOLUTION.
THE WELDING START IS VERY AGGRESSIVE. THERE ARE MANY PROJECTIONS.	Spotting jobs are being carried out with high inductance intake.	Place the earth tap at the lowest inductance value
	Aluminium is being welded with a drawing problem, which causes incorrect arc ignition as the wire is slowed down on knocking against the piece.	Examine the drawing process. Prevent the gun from making "knots", keeping it in a straight line. The wire must not be slowed down when it knocks against the piece
	The motor acceleration ramp is very low, reaching a high speed in the initial priming process.	Suitably regulate the acceleration ramp potentiometer of the existing motor in the wire-feed unit.
	The wire length at onset of welding process is too long.	Suitably regulate the existing final wire length potentiometer in the wire-feed unit to obtain the LEAST final wire length at the end of the welding process.

ERROR CODES OF SYNERGIC CONTROL. Displays		
Code	**CAUSE**	**SOLUTION**
Term E01	Overheating has occurred in the power source. The thermal protection has disconnected the equipment.	Wait until the machine cools down correctly. Do not switch the equipment off if it is still hot.
Pres E02	Operating in cooled mode, it is detected that there is no pressure in the torch cooling circuit.	1- Check the operation of the cooling pump. If necessary, unblock the pump (see cooling manual) 2- Check that the level of the cooling liquid is sufficient in the cooling tank. 3- If you wish to work without cooling you must set cooling mode OFF (see section 3.3.2). Disconnect and connect the equipment again with the on/off switch (N)
Out E03	It is detected that there is no voltage when starting the welding cycle.	Check the points of the technical diagram of the power source. Contactor, transformer and rectifier.
Comm E04	The power selector switches were activated when the equipment was welding V-U.	All action on the power selector switches must be avoided during welding. Disconnect and connect the equipment again with the on/off switch.

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.

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

- Intake rectifier-Earth : Ra> 50 Mohms
- Outlet rectifier-Earth : Ra> 50 Mohms
- Switch - Outlet rectifier : Ra> 50 Mohms
- Control circuit-Earth : Ra> 50 Mohms

In the event that lack of insulation is observed it is likely that this is due to the accumulation of metal dust on the inside of the equipment.

BOTH AT THE BEGINNING AND END OF A REPAIR, BLOW THE INSIDE OF THE EQUIPMENT WITH COMPRESSED AIR.

6. SAFETY MEASURES.

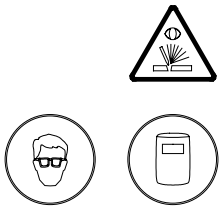
The use of this equipment requires a maximum amount of responsibility with respect to their use and maintenance. Read this safety chapter carefully as well as the rest of the instructions manual. The correct use of the equipment will depend on this.

For your safety and that of others, remember that:
ANY PRECAUTION MAY BE INSUFFICIENT!

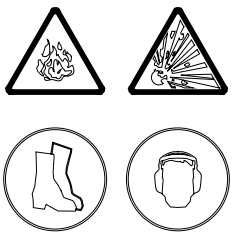
The welding equipment referred to in this manual are electrical. It is important therefore to observe the following safety measures.

- 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 the MIG welding gun towards people. The danger exists of activating the system.

In environments with a high risk of electrical shock, fire, proximity of inflammable products or height, observe relative national and international provisions.

GB APPENDICES. ELECTRICAL DRAWINGS AND REFERENCE PART LISTS.

- DECLARATION OF CONFORMITY & EC MARKING.
- ELECTRICAL DIAGRAMS.
- DETAIL DRAWINGS AND REFERENCE LISTS.

GENERAL GUARANTEE CONDITIONS

GALA GAR, guarantees correct operation against all manufacturing defects of the GAR SYNERGIC 5000 products, as from the purchase date (guarantee period) of:

- 12 MONTHS

This guarantee will not be applied to components with a working life that is less than the guarantee period, such as spares and consumables in general.

In addition, the guarantee does not include the installation, start-up, cleaning or replacement of filters, fuses and cooling or oil refills.

If the product should present any defect during the guarantee period, GALA GAR, undertakes to repair it without any additional charge, unless the damage caused to the product is the result of accidents, improper use, negligence, inappropriate accessories, unauthorized servicing or modifications to product not carried out by GALA GAR.

The decision to repair or replace parts or supply a new appliance will depend on the criterion of GALA GAR. All replaced parts and products will be the property of GALA GAR.

In order for the guarantee to become effective the product and the purchase invoice must be handed over, duly completed and stamped by an authorized Technical Service. Shipping and transport expenses will be on the user's account.

Damage or unforeseen or indirect expenses resulting from an incorrect use will not be the responsibility of GALA GAR.

FORMULA FOR MAKING ORDERS FOR SPARE PARTS:

Indicate:
1st. Machine, Reference and Serial no.
2nd. Supply Voltage / Frequency.
3 - No. of parts, description and reference of it.

EXAMPLE:
GALA SYNERGIC 5000, Ref. 432.00.000 (230/400V-50/60 Hz)
1 U. CONTROL SWITCH, Ref. 43216013

MANUFACTURE AND SALE OF AUTOGENOUS, AND ELECTRIC WELDING APPLIANCES, AND ELECTROMECHANICAL CONSTRUCTIONS.

CENTRAL / HEAD OFFICE:
Jaime Ferrán, 19 – Nave 30
PO Box 5058
50080 ZARAGOZA (Spain)
Tel.: 00 34 976473 410
Fax: 00 34 472 450
E-mail: comercial@galagar.com
Internet: http://www.galagar.com