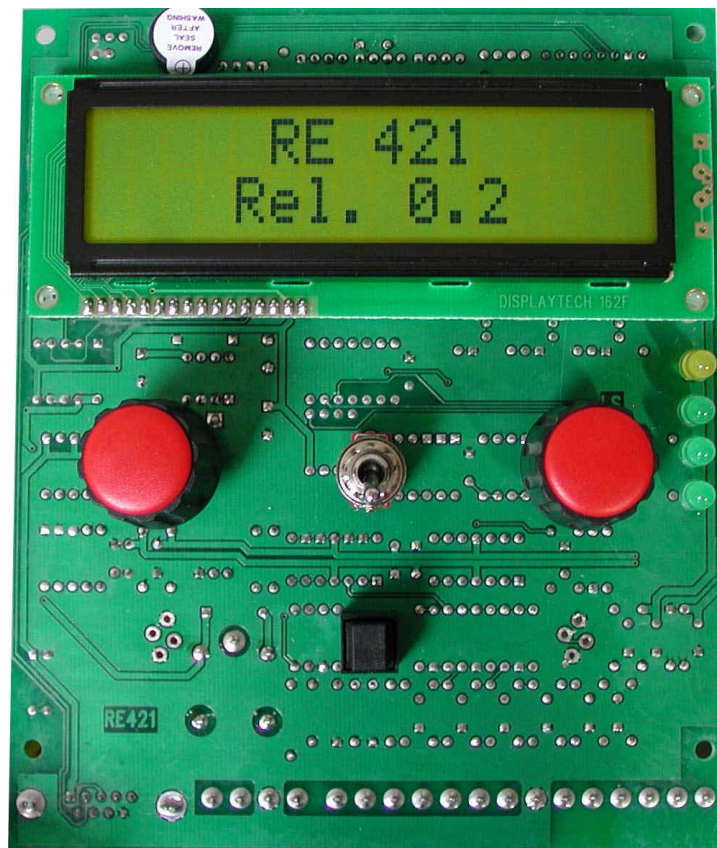
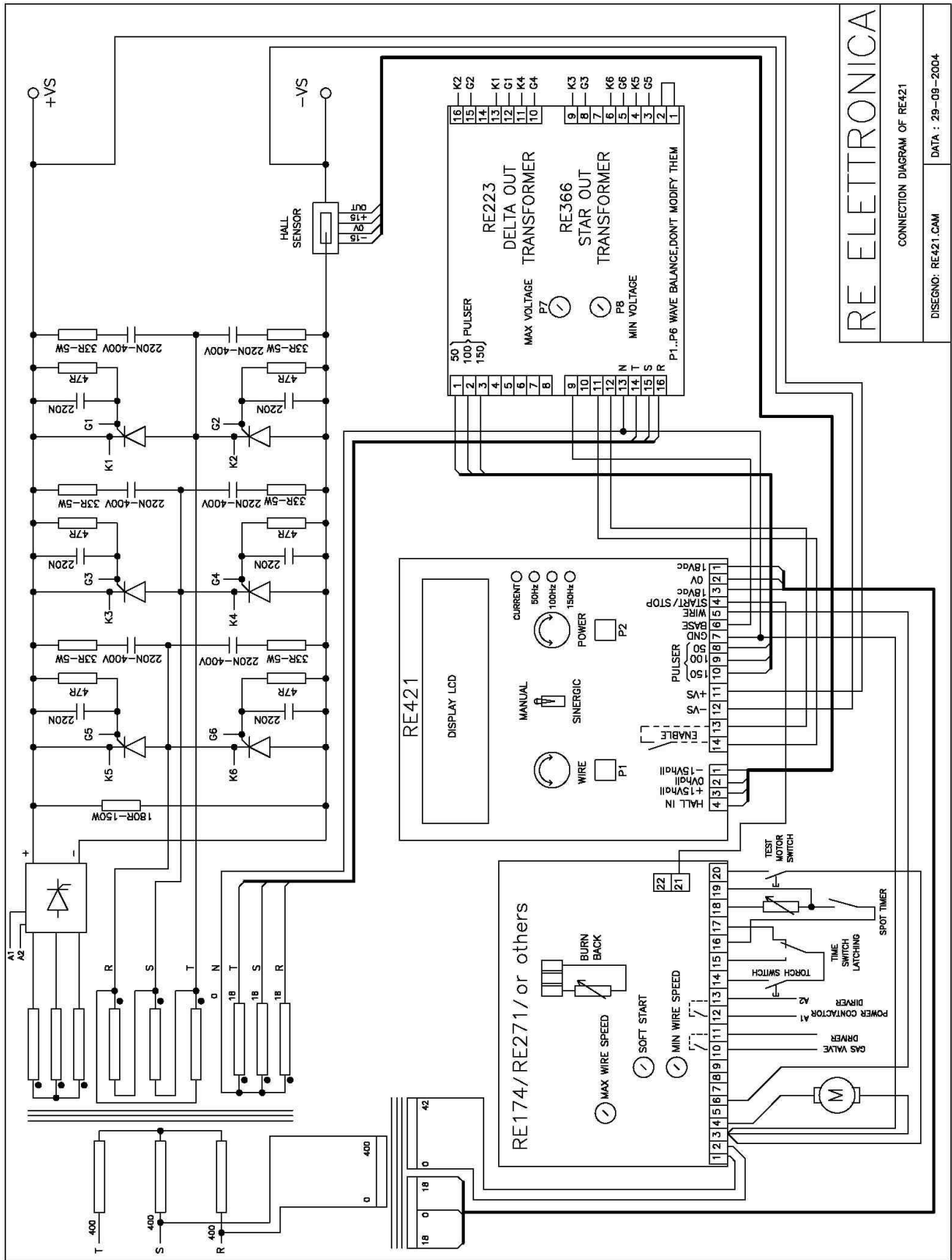


***MICROPROCESSOR CONTROL BOARD FOR  
SYNERGIC WELDING MACHINE***



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RE ELETTRONICA

CONNECTION DIAGRAM OF RE421

DISEIGNO: RE421.CAM DATA : 29-09-2004

RE421  
DISPLAY LCD

RE174/RE271/ or others

RE223  
DELTA OUT  
TRANSFORMER

RE366  
STAR OUT  
TRANSFORMER

MAX VOLTAGE P7  
MIN VOLTAGE P8

P1..P6 WAVE BALANCE.DONT MODIFY THEM

MANUAL  
SINERGIC  
WIRE P1

CURRENT  
80Hz  
100Hz  
150Hz  
POWER P2

PULSER  
START/STOP  
PULSE  
GND  
+VS  
-VS  
ENABLE

HALL IN  
+15Vhall  
0Vhall  
15Vhall

TEST MOTOR SWITCH

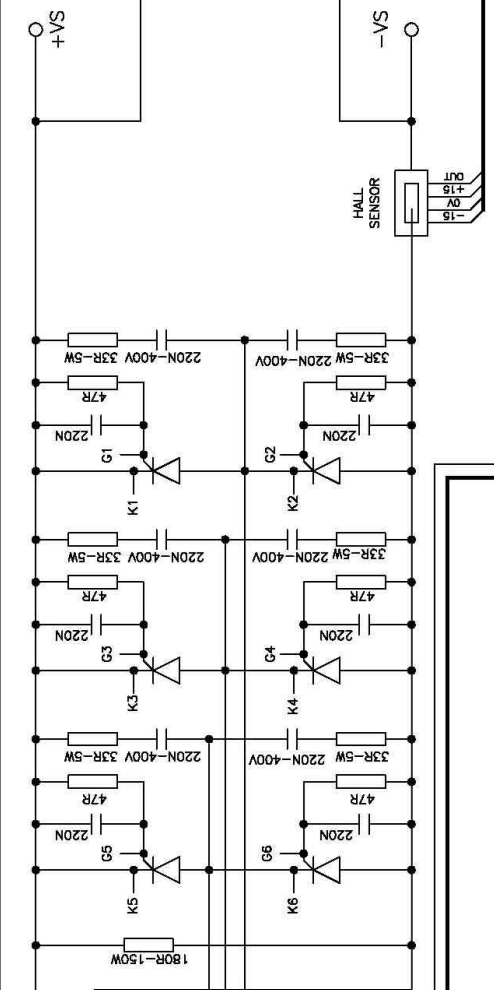
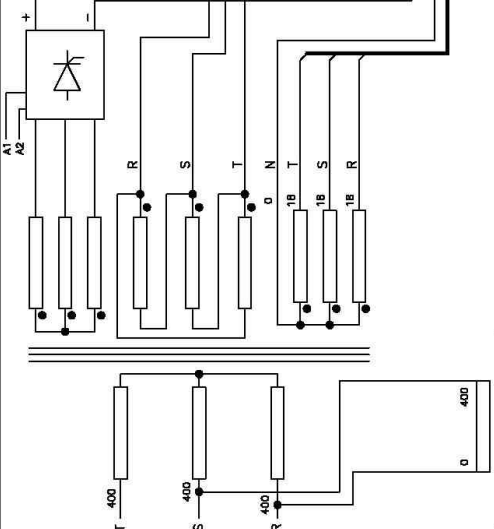
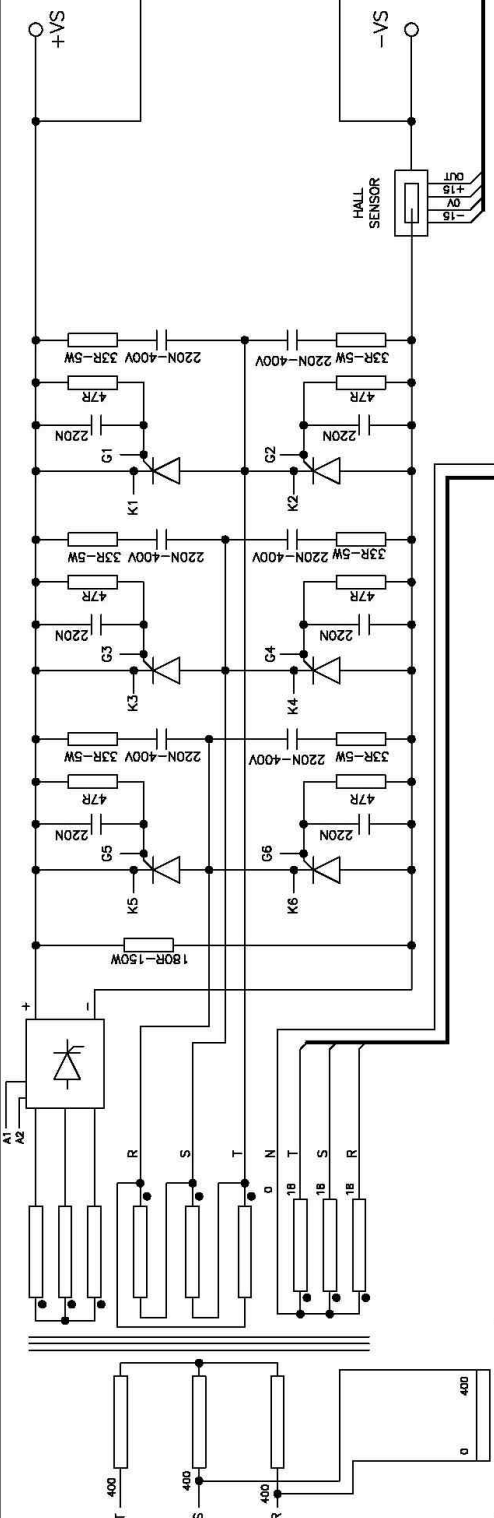
SPOT TIMER

TIME SWITCH LATCHING

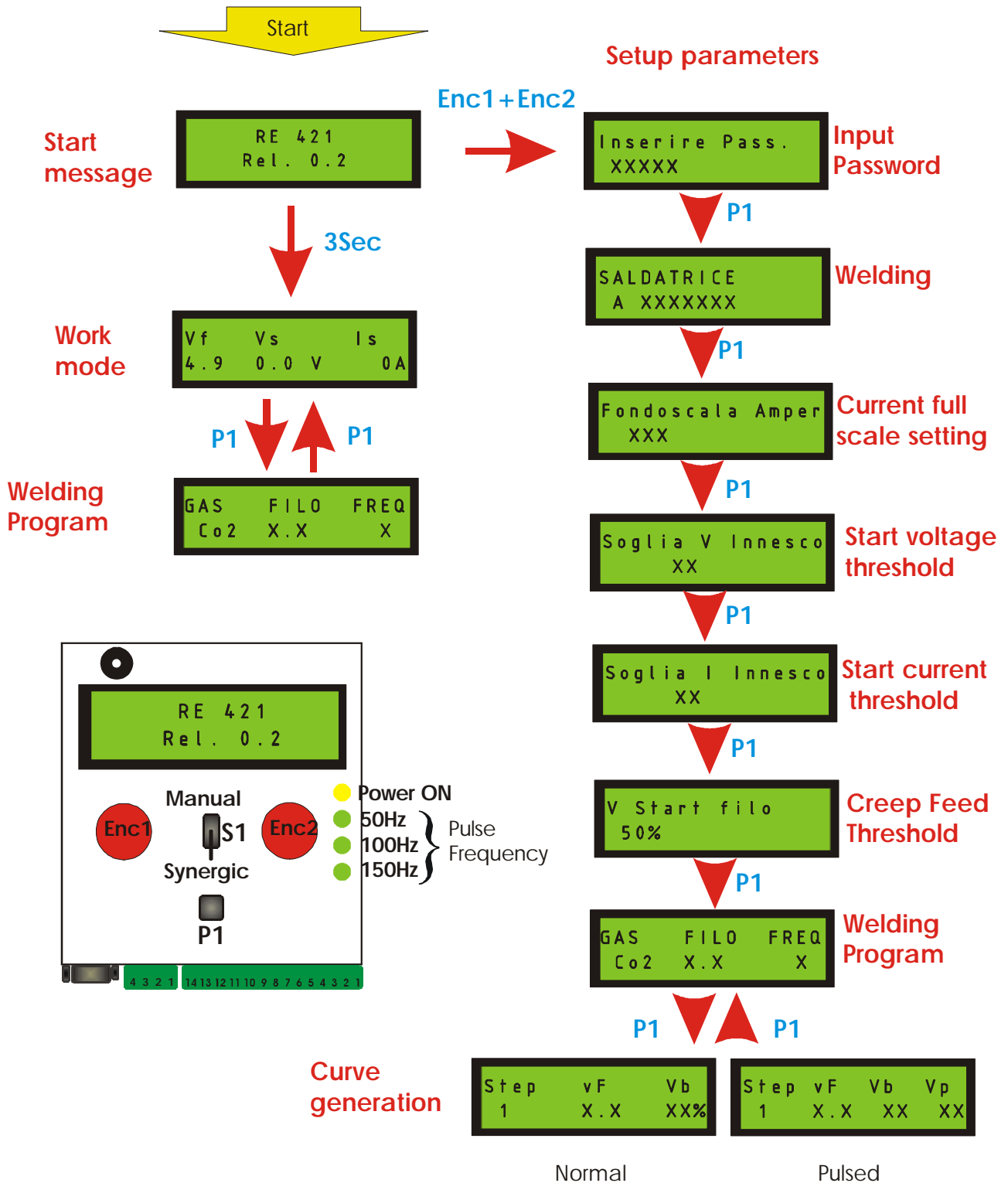
TORCH SWITCH

POWER CONTRACTOR A1  
DRIVER

GAS VALVE DRIVER



# Menu



The control board is supplied with programs for stepper or thyristor power sources and settings with default parameters.

The parameter values can be easily adjusted for different characteristics of welding machines and wire and gas types. They can be permanently stored on internal eeprom memory for recall and use at any time.

## Welding modes

After 3 seconds from turning on the power source, the control board automatically starts in the welding mode, using the same parameters from before.

**Work  
mode**

V <sub>f</sub>	V <sub>s</sub>	I <sub>s</sub>
4.9	0.0 V	0 A

In the welding mode, voltage and current are displayed and the reading is held at the end of welding.

## Switch Mig machine

### Synergic mode

When the torch button is pushed, the control circuitry detects the welding voltage (without a load), and sets the wire speed, according with the table selected.

For each table the wire speed is tied to the arc voltage following a specified curve.

Through front panel control “Enc1” the wire speed can be changed by +/-10%.

### To change the table:

Push **P1** to enter the page of “Welding Program”

**Welding  
Program**

GAS	FILO	FREQ
Co2	X.X	X

In this menu the front panel control “Enc1” allows you to change parameters in the table.

Turn “Enc1” to select the gas type, push “Enc1” and turn to select the wire diameter.

Push **P1** to save in memory and return to work mode

### Manual mode

“Enc1” regulates the wire speed from 0 to 100%.

## Thyristor machine

### Synergic mode

For each table the wire speed is tied to the arc voltage following a specified curve.

Front panel control “Enc1” controls the wire speed .

Front panel control “Enc2” controls the arc voltage about +/-10%.

### To change the table:

Push **P1** to enter inside the page : “Welding Program”.

**Welding  
Program**

GAS	FILO	FREQ
Co2	X.X	X

In this menu the front panel control “Enc1” allows you to change parameters in the table.

Turn “Enc1” to select the gas type, push “Enc1” and turn to select the wire diameter.

With Frequency parameters is possible select normal or pulsed welding modes.

To load the table for normal welding, turn the “Enc1” anticlockwise, so the displayed reads “0”.

To load the table for pulsed welding, turn the “Enc1” clockwise, so the displayed reads the frequency of this table.

Push **P1** to save in memory and return to work mode

### Manual mode

In this menu the front panel controls “Enc1” and “Enc2” allow the wire speed and the arc voltage to be altered independently.

“Enc1” adjusts the wire speed.

“Enc2” adjusts the arc voltage.

Push **P1** to change the pulse frequency.

## Initial setup

After turning on the machine the “welcome screen” is displayed for 3 seconds. During this time pushing the two front panel controls “Enc1” and “Enc2” allow you to enter the initial setup screen. This lets the controller know the available out capacity from the power source being used.



Inserire Pass.  
XXXXX

### Input Password

Turn “Enc1” to enter the correct password and push **P1** to confirm.

If the password is correct, the control goes to the next page, otherwise the display shows “Password error”.

Turn off the machine and restart, to try again.



SALDATRICE  
A XXXXXXX

### Welding

SCATTI = Switch Mig Machine

SCR = Thyristors Machine

In this page, the front panel control “Enc1” selects the type of machine in which the control board is installed: Switch Mig or Thyristor Mig.

Push **P1** to save in memory and go to the next page.



Fondoscala Amper  
XXX

### Current full scale setting

Instruments calibration

Using a resistive load, load the machine for maximum output current. Adjust the full scale indication by turning front panel control “Enc1”.

Warning!

The current signal on terminal #4 of hall sensor connector must not exceed 5V.(Default 5V=500A)

The control board can also work with Hall sensor with a current output. For this sensor type, the pcb has available 3 burden resistors R55-R56-R57.

Push **P1** to save in memory and go to the next page.



Soglia V Innesco  
XX

### Start voltage threshold

This threshold sets the presence of welding voltage (5 Volt). Turn front panel control “Enc1” if an adjustment is necessary.

Push **P1** to save in memory and go to the next page.



Soglia I Innesco  
XX

### Start current threshold

This threshold sets the presence of welding current (10Amps). Turn front panel control “Enc1” if an adjustment is necessary.

Push **P1** to save in memory and go to the next page.



V Start filo  
50%

### Creep Feed Threshold

This parameter indicates the creep wire feed speed before the arc initiates, and is a percentage of rated speed. Turn front panel control “Enc1” if an adjustment is necessary.

Push **P1** to save in memory and go to the next page.

In this page it is possible to generate or modify the welding program tables.

**Switch Mig Machine**

**Welding Program**

G A S    F I L O  
C o 2    X . X

There are 24 tables available. These set the Gas type and wire diameter.

In this menu the front panel control “Enc1” allows you to change parameters in the table

Turn “Enc1” to adjust the flashing parameter, push “Enc1” to set the parameter and move to set the next parameter.

GAS	Wire diameter					
	0.6	0.8	1.0	1.2	1.4	1.6
80/20	Table 1	Table 2	Table 3	Table 4	Table 5	Table 6
98/2	Table 7	Table 8	Table 9	Table 10	Table 11	Table 12
Argon	Table 13	Table 14	Table 15	Table 16	Table 17	Table 18
Co2	Table 19	Table 20	Table 21	Table 22	Table 23	Table 24

Push **P1** to enter in the page “Curve generation”.

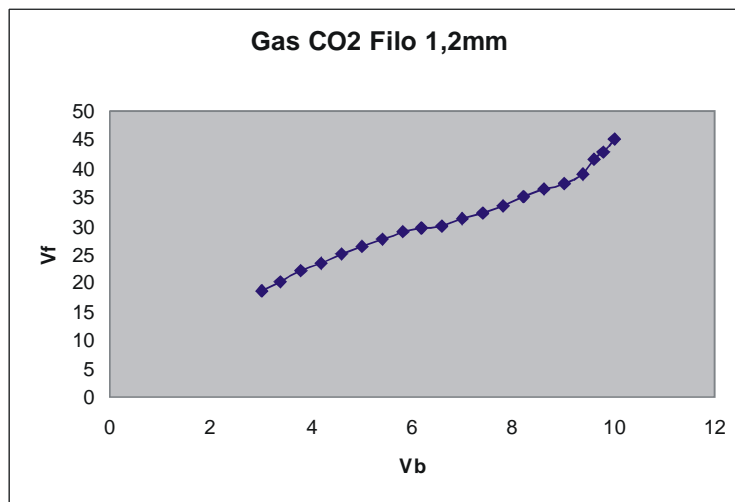
**Curve generation**

S t e p    v F    V b  
1            X . X    X X %

In every table there are 20 Steps available.

For example:

Step	vF	Vb
1	3	18,5
2	3,4	20
3	3,8	22
4	4,2	23,5
5	4,6	25
6	5	26,4
7	5,4	27,6
8	5,8	28,8
9	6,2	29,5
10	6,6	30
11	7	31,2
12	7,4	32
13	7,8	33,5
14	8,2	35
15	8,6	36,5
16	9	37,5
17	9,4	39
18	9,6	41,5
19	9,8	43
20	10	45



The user can associate wire speed to the welding voltage set through source commutator.

When the writing ”step” is flashing, turn “Enc1” to the desired step number, push “Enc1” and move to adjust wire speed parameter.

Push the torch trigger button, and the control board displays the actual welding voltage (no load).

While welding, turn “Enc1” to the best wire feed speed setting.

Push “Enc1” to save parameters and exit the menu, or press **P1** to exit without saving.

## Thyristor machine

There are 24 tables available . These set the Gas type, wire diameter and pulse frequency. In this menu the front panel control “Enc1” allows you to change parameters in the table Turn “Enc1” to adjust the flashing parameter, push “Enc1” to set the parameter and move to set the next parameter.

**Mode**  
**Welding Program**

### Normal

GAS	FILO	FREQ
Co2	1.2	0

To make a table for normal welding , set the frequency to 0

### Pulsar

GAS	FILO	FREQ
CO2	0.6	50

To make a table for pulse welding, specify the frequency.

Push **P1** to enter in the ”Curve generation” page.

**Mode**  
**Curve generation**

### Normal

Step	vF	Vb
1	2.5	15%

Every table has available 20 Steps with 20 different wire speeds (vF) with associated arc voltage (Vb).

### Pulse

Step	vF	Vb	Vp
1	2.5	15	30

Every table has available 12 Steps with 12 different wire speeds (vF) with associated base voltage (Vb) and peak voltage (Vp).

The voltages, Vb (base voltage) and Vp (peak voltage), are expressed as a percentage of maximum arc voltage.

When the writing ”step” is flashing, turn “Enc1” to the desired step number, push “Enc1” to set the step number and move to set the parameters. There are 20 steps in Normal Mode and 12 steps in Pulse Mode.

Turn “Enc1” to the desired wire feed speed (vF) and turn “Enc2” to the desired base voltage (Vb).

In Pulse Mode, push “Enc2” to toggle between setting base voltage (Vb) and peak voltage (Vp).

In the setting mode it is possible to test weld, while entering parameters to confirm their suitability. Push “Enc1” to save parameters and exit the menu, or press **P1** to exit without saving.

The Power Source must then be turned off, and then back on to start up the control board in welding mode.