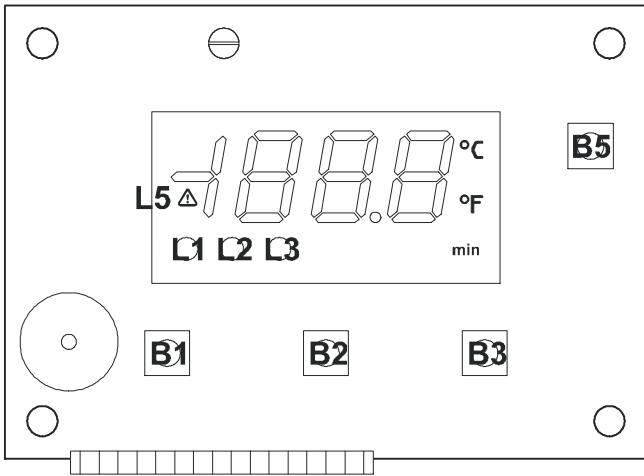


***DEEP FRYER WITH TIMER
AND
DIGITAL INPUTS
OPERATING SPECIFICATIONS***

REV1.3

1. USER INTERFACE



FUNCTION KEY	FUNCTION
B1	START
B2	MELT
B3	DISPLAY
B4	NOT PRES.
B5	TIMER

LED	FUNCTION
L1	START LED
L2	MELT LED
L3	DISPLAY LED
L5	ALARM LED
°C	Celsius LED
°F	Fahrenheit LED
min	TIMER LED

1.1. Setting the set-point

To access the procedure

- Press the [ENCODER] button, LED L3 flashes.

To modify the value

- Turn the encoder within 15 seconds

To exit the procedure

- Press the [ENCODER] button or do not operate on the keyboard for 15 seconds

1.2. Setting the timer

The value of the timer can be set within 0 and 99 minutes.

To access the procedure

- Make sure the timer is in the stop status.
- Press the [B5] key, the min LED flashes, the value on the display flashes.

To modify the value

- Turn the encoder within 15 seconds

To exit the procedure

- Press the [ENCODER] button or do not operate on the keyboard for 15 seconds

1.3. Timer start

- Press the [B5] key for at least 1 second, the min LED flashes.

1.4. Timer stop

- Press the [B5] key for at least 1 second.

1.5. Modifying the count

The count value can be set within 0 and 99 minutes. Setting the count value at 0 means putting the timer in the stop status.

To access the procedure

- Make sure the timer is in the start status.
- Press the [B5] key, the min LED flashes, the value on the display flashes.

To modify the value

- Turn the encoder within 15 seconds

To exit the procedure

- Press the [ENCODER] button or do not operate on the keyboard for 15 seconds

1.6. Setting the configuration parameters

To access the procedure

- Make sure that the instrument is in the STOP status.
- Press the [ENCODER] button for 4 seconds, the PA label appears on the display.
- Press the [ENCODER] button to display the corresponding value
- Turn the encoder within 15 seconds to set the value at -19.
- Press the [ENCODER] button or do not operate on the keyboard for 15 seconds
- Press the [ENCODER] button for 4 seconds, the first parameter label appears on the display.

To modify a parameter:

- Turn the encoder within 60 seconds to select a parameter.
- Press the [ENCODER] button to display the corresponding value
- Turn the encoder within 15 seconds to set the desired value.
- Press the [ENCODER] button or do not operate on the keyboard for 15 seconds

To exit the procedure

- Press the [ENCODER] button for 4 seconds or do not operate on the keyboard for 60 seconds

1.7. Restoring the default parameters

- Press the [ENCODER] button for 4 seconds, the PA label appears on the display.
- Press the [ENCODER] button to display the corresponding value
- Turn the encoder within 15 seconds to set the value at 743.
- Press the [ENCODER] button or do not operate on the keyboard for 15 seconds

- Press the [ENCODER] button for 4 seconds, the dEF label appears on the display
- Press the [ENCODER] button to display the corresponding value
- Turn the encoder within 15 seconds to set the 149 value.
- Press the [ENCODER] button or do not operate on the keyboard for 15 seconds. The display will show the flashing dEF message for 4 seconds.

To exit the procedure

- Press the [ENCODER] button for 4 seconds.

1.8. Modification of the magnitude shown on the display

The display can show the value of probe 1, the set-point value or the timer value (setting or count in progress).

To modify the magnitude shown on the display

- Press the [B3] key for 1 second. LED L3 is on if the data shown on the display is the work set-point. The min LED is on if the data shown on the display is the setting of the timer and the timer is in the stop status.

1.9. Silencing the buzzer

Press a key or the [ENCODER] button. The buzzer rings for

- probe 1 error
- probe 2 error
- temperature alarm
- board temperature alarm
- the first time the temperature reaches the set-point
- at the end of timer count
- depending on the status of the digital inputs, further details are seen in the following paragraphs

1.10. Displaying probe 2 temperature

To access the procedure

- Make sure the probe is enabled.
- Press the [B3] key, the Pb2 label will appear on the display.

To display the board temperature value

- Press the [ENCODER] button.

To exit the procedure

- Do not operate on the keyboard for 15 seconds
- or
- Press the [ENCODER] button to go back to display of the Pb2 label.
 - Press the [B3] key or do not operate on the keyboard for 15 seconds

1.11. Displaying board temperature

To access the procedure if probe 2 is enabled

- Press the [B3] key, the Pb2 label will appear on the display.

- Turn the encoder clockwise within 15 seconds in order to select the Pbb label.

To access the procedure if probe 2 is not enabled

- Press the [B3] key, the Pbb label will appear on the display.

To display the board temperature value

- Press the [ENCODER] button.

To exit the procedure

- Do not operate on the keyboard for 15 seconds

or

- Press the [ENCODER] button to go back to display of the Pbb label.
- Press the [B3] key or do not operate on the keyboard for 15 seconds

1.12. *Displaying board temperature alarm*

To access the procedure if probe 2 is enabled

- Press the [B3] key, the Pb2 label will appear on the display.
- Turn the encoder clockwise within 15 seconds in order to select the Ht label. If no temperature is recorded, the label is not present.

To access the procedure if probe 2 is not enabled

- Press the [B3] key, the Pbb label will appear on the display.
- Turn the encoder clockwise within 15 seconds in order to select the Ht label. If no temperature is recorded, the label is not present.

To display the board temperature alarm maximum value

- Press the [ENCODER] button.

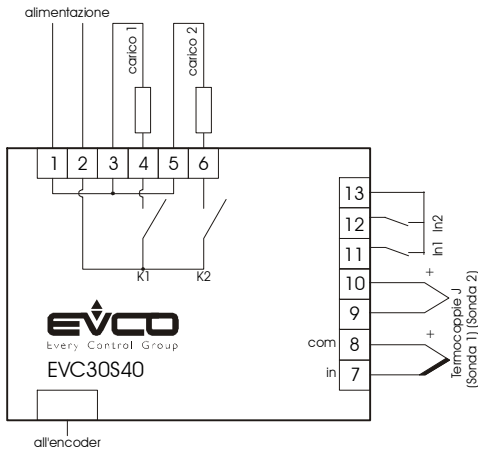
To exit the procedure

- Do not operate on the keyboard for 15 seconds

or

- Press the [ENCODER] button to go back to display of the Ht label.
- Press the [B3] key or do not operate on the keyboard for 15 seconds

2. *CONNECTIONS LAYOUT*



Features

NAME	TYPE
POWER SUPPLY	230VAC +10/-15% 50/60Hz
LOAD 1 (REGULATION)	SPST (5A AC1)
LOAD 2 (FANS)	SPST (5A AC1)
PROBE 1	TC J [-20°C, +500°C]
PROBE 2	TC J [-20°C, +500°C]
DIGITAL INPUT 1 (Peak cut)	Potential-free contact
DIGITAL INPUT 2 (Overheating Limiter)	Potential-free contact

3. PARAMETERS

PAR.	MIN.	MAX.	U.M.	DEF	WORK SET-POINT
------	------	------	------	-----	----------------

P0	0	1	---	0	temperature unit of measurement 0 = °C 1 = °F
P1	-25/-50	25/50	°C/°F	0	probe 1 offset
P2	P3	P4	°C/°F	185	work set-point
P3	0	P4	°C/°F	0	set-point minimum
P4	P3	999	°C/°F	195	set-point maximum
P5	0	1	---	1	pre-heat enabling from start
P6	1	99	°C/°F	5	temperature differential in range
P7	0	120	sec	20	temperature timeout in range
P8	P3	P4	°C/°F	100	pre-heat/preservation set-point
P9	1	240	sec	40	pre-heat cycle time
P10	0	100	---	30	on percentage during pre-heat
P11	-99	99	°C/°F	0	band offset
P12	1	250	°C/°F	18	proportional band
P13	0	999	sec	300	integral action time (0 = no action)
P14	0	240	sec	40	derivative action time (0 = no action)
P15	1	240	sec	70	cycle time
P16	0	120	sec	0	output minimum switch-over time
P17	1	99	°C/°F	1	maximum alarm differential ("AL" code)
P18	0	999	°C/°F	15	maximum alarm threshold ("AL" code)
P19	0	240	min	2	maximum alarm delay ("AL" code)
P20	0	2	---	2	maximum alarm type (AL) 0 = no alarm 1 = absolute (i.e. P18) 2 = relative to the work set-point (P2+P18)
P21	-1	120	sec	15	buzzer on time when work set-point P2 is reached for the first time 0 = function disabled -1 = sound active until silenced manually
P22	0	80/175	°C/°F	70	board temperature alarm threshold
P23	5	240	sec		sampling time
P24	0	1	---	0	enabling of cycle synchronisation
P25	85	100	---	90	minimum percentage requested to re-synchronise the cycle if the output is not active
P26	20/65	65/150	°C/°F	50	fans set
P27	-1	120	sec	15	buzzer on duration o expiry of timer 0 = function disabled -1 = sound active until silenced manually
P28	0	1	---	0	digital input 1 polarity (Peak cut) 0=N.O.
P29	0	1	---	0	digital input 2 polarity (Overheating limiter) 0=N.O.
P30	0	1	---	0	enabling of probe 2
P31	-25/-50	25/50	°C/°F	0	probe 2 offset

4. REGULATION

4.1. Stop

The display is on, LED L1 is off; the outputs are off, temperature regulation is not active. The temperature alarm is disabled.

4.2. Pre-heat

The output is activated cyclically during pre-heat mode (parameters P9, P10) in order to prevent sudden temperature increases. Pre-heating ends at first time the threshold established with parameter P8 is reached. LED 1 is flashing, LED 2 is only flashing if the instrument is set-up to pass to preservation mode at the end of pre-heat mode, L2 is off otherwise.

To activate the function

- If the instrument is in the STOP status and $P5 = 1$, press the [START] key for 1 second. At the end of pre-heating, in automatic mode, regulation on the work set-point SP will be the P.I.D. type. If the temperature is equal to or over P8 at the time of START, the instrument passes directly to main regulation.
- If the instrument is in the STOP status, press the [MELT] key for 1 second before pressing the [START] key. The instrument passes to preservation mode at the end of pre-heat mode. If the temperature is equal to or over P8 at the time of START, the instrument passes directly to preservation mode.
- If the instrument is in start status, but has not yet reached the threshold established with parameter P8, press the [MELT] key for 1 second. The instrument passes to preservation mode at the end of pre-heat mode.

4.3. Preservation

Regulation on the threshold established with the parameter P8 is the P.I.D. type. To exit preservation mode and pass to main regulation mode, just press the [MELT] key for 1 second.

LED L2 is on, LED L1 is on when the temperature is within the $[P8-P6, P8+P6]$ range, flashing when the temperature is out of this range for a time equal to P7.

4.4. Main regulation

It is the P.I.D. type. When passing to main regulation, LED L2 switches off, LED L1 is on when the temperature is within the $[SP-P6, SP+P6]$ range, flashing when the temperature remains outside this range for a time period equal to P7.

Main regulation occurs when:

- Pass from the STOP status to the START status with $P5 = 0$ and preservation is not selected by pressing the [MELT] key for 1 second.
- Pass from the STOP status to the START status with $P5 = 1$ and preservation is not selected by pressing the [MELT] key for 1 second and the temperature reaches the P8 threshold.
- In pre-heat or preservation mode, press the [MELT] key

By pressing the [MELT] key, pass to

- pre-heat mode, if the threshold P8 has still to be exceeded

- preservation mode if threshold P8 has already been exceeded

When the temperature reaches the work set-point P2 for the first time, the buzzer rings for the time established with parameter P21. Signalling is re-enabled at every start and every SP modification.

4.5. Minimum times for outputs switch-over

During P.I.D. type regulation, minimum times are envisioned for outputs switch-over:

- Output activation: if the time calculated for output activation is lower than P5, the output is not activated.
- Output deactivation: if the time calculated for output activation is over P4-P9, the output is deactivated.

4.6. Timer

The timer setting can vary between 0 min and 99 min. When the count is in progress, the min LED flashes. The count is displayed in minutes. When 1 minute is missing to the end, the count is displayed in seconds.

Ten seconds before the end of the count if P24 is not null, the buzzer is activated for a time period equal to P24 and the display shows the residual time in seconds, until the count expires and the buzzer no longer rings. When both of these conditions are satisfied, the display goes back to being that pre-defined (e.g. probe 1)

The buzzer can be silenced by pressing a key. If P24=0 the buzzer is not activated. If P24= -1 the buzzer is activated until silenced manually.

4.7. Fans

If the temperature detected by the board probe exceeds the threshold established with parameter P23, output 2 is activated. The hysteresis is equal to 2°C/4°F.

If the probe on the board is in error conditions, the output is always active

4.8. Board temperature alarm memorisation

If the temperature detected by the board probe exceeds the threshold established with parameter P22, the buzzer rings, the L5 alarm LED switches on and the Ht message appears on the display alternating with the default display. The board memorises the maximum value reached by the probe in alarm situation. The data memorised cannot be deleted in any way.

If the alarm is in progress, pressing any key allows to silence the buzzer, the Ht message disappears as soon as the temperature drops below P22.

If the temperature drops below P22, pressing any key allows to silence the buzzer and make the HT message disappear.

4.9. Peak Cut Input (In1)

Input for the management of the maximum system power. Parameter P28 allows to configure the input polarity.

In std-by

If the input is active

- the display shows "Pic" alternating with the default display, the alarm LED L5 is on
- the buzzer rings and can be silenced
- it is possible to pass to start status, but the outputs remain not active until the input goes back to not active

Visual and acoustic signal disappear if the input is no longer active.

On pre-heat mode

If the input is active

- the display shows "Pic" alternating with the default display, the alarm LED L5 is on
- the buzzer rings and can be silenced
- the outputs are deactivated

If the input is no longer active

- the buzzer rings if it has not been previously silenced, the display shows "Pic" alternating with the default display, the alarm LED L5 is on; pressing any key silences the buzzer and makes the "Pic" label disappear. The visual and acoustic signals disappear automatically as soon as the probe reaches the P8 value.
- the buzzer does not ring if it has been previously silenced, the display shows "Pic" alternating with the default display, the alarm LED L5 is off; pressing any key makes the display disappear. The visual signal disappears automatically as soon as the probe 1 reaches the P8 value.
- the outputs can be re-activated, more precisely
 - o the fans output can be reactivated immediately
 - o if the input becomes non active in the same cycle (with duration of P9) in which activation took place or in the successive, then the regulation output can be activated at the start of the cycle following deactivation.
 - o if the input remains active over the same cycle (with duration of P9) in which activation took place or in the successive, then the regulation output can be activated as soon as the input is deactivated.

In preservation or main regulation mode

If the input is active

- the display shows "Pic" alternating with the default display, the alarm LED L5 is on
- the buzzer rings and can be silenced
- the outputs are deactivated

If the input is no longer active

- the buzzer rings if it has not been previously silenced, the display shows "Pic" alternating with the default display, the alarm LED L5 is on; pressing any key silences the buzzer and makes the "Pic" label disappear. The visual and acoustic signals disappear automatically as soon as the probe 1 reaches the P2 value.
- the buzzer does not ring if it has been previously silenced, the display shows "Pic" alternating with the default display, the alarm LED L5 is off; pressing any key makes the display disappear. . The visual signal disappears automatically as soon as the probe 1 reaches the P2 value.

- the outputs can be re-activated, more precisely
 - o the fans output can be reactivated immediately
 - o if the input becomes non active in the same cycle (with duration of P15) in which activation took place or in the successive, then the regulation output can be activated at the start of the cycle following deactivation.
 - o if the input remains active over the same cycle (with duration of P15) in which activation took place or in the successive, then the regulation output can be activated as soon as the input is deactivated.

4.10. Overheating limiter input (In2)

Overheating management input. Parameter P29 allows to configure the input polarity.

In std-by

If the input is active

- the display shows "ALH" alternating with the default display, the alarm LED L5 is on
- the buzzer rings and can be silenced
- it is not possible to pass to start mode

If the input, having become active in std-by, is no longer active, the visual and acoustic signals disappear. Also see that written below.

On pre-heat mode

In preservation or main regulation mode

If the input is active

- the display shows "ALH" alternating with the default display, the alarm LED L5 is on
- the buzzer rings and can be silenced
- the outputs are deactivated
- if the input remains active over the same cycle (with duration of P9 for pre-heat and P15 for preservation and main regulation) in which activation took place and the successive, then pass to std-by mode. There are two possible situations
 - the buzzer has already been silenced: on deactivation of the input the "ALH" message disappears and the L5 alarm LED switches off
 - the buzzer has not yet been silenced: on deactivation of the input, the L5 alarm LED switches off, the ALH message remains until a key is pressed to silence the buzzer

If the input is no longer active

- the visual and acoustic signals disappear
- the outputs can be re-activated, more precisely
 - the fans output can be reactivated immediately
 - if the input becomes non active in the same cycle (with duration of P9) in which activation took place or in the successive, then the regulation output can be activated at the start of the cycle following deactivation of the input.

4.11. Some regulation times

4.11.1. Example 1

Initial conditions

P5=0

Preservation not selected from key

Operation

P.I.D. regulation on P2 (dedicated parameters P11...P15)

LED

L1 on if probe 1 in [P2-P6,P2+P6]

L1 flashing if probe 1 is outside [P2-P6,P2+P6] range for time P7

L2 off

What can I do?

Press the [MELT] key for 1 second and pass to pre-heat mode if probe 1 <P8

Press the [MELT] key for 1 second and pass to preservation mode if probe 1 ≥P8

4.11.2. Example 2

Initial conditions

P5=1

Preservation not selected from key

Operation

Pre-heat mode until probe 1 reaches P8 for the **first** time

P.I.D. regulation on P2 (dedicated parameters P11...P15) once pre-heating has ended

LED

L1 flashing during pre-heat

L1 on if pre-heat ended and probe 1 in [P2-P6,P2+P6]

L1 flashing pre-heat terminated and if probe 1 is outside [P2-P6,P2+P6] range for time P7

L2 off

What can I do?

Press the [MELT] key for 1 second to pass to preservation mode

4.11.3. Example 3

Initial conditions

Preservation selected by pressing the key [MELT] before Start.

Operation

Pre-heat mode until probe 1 reaches P8 for the **first** time

Preservation i.e. P.I.D. regulation on P8 (dedicated parameters P11...P15) once pre-heating has ended

LED

L1 flashing during pre-heat

L1 on if pre-heat ended and probe 1 in [P8-P6,P8+P6]

L1 flashing pre-heat terminated and if probe 1 is outside [P8-P6,P8+P6] range for time P7

L2 flashing during pre-heat

L2 on during preservation

What can I do?

Press the [MELT] key for 1 second to pass to P.I.D. regulation on P2