

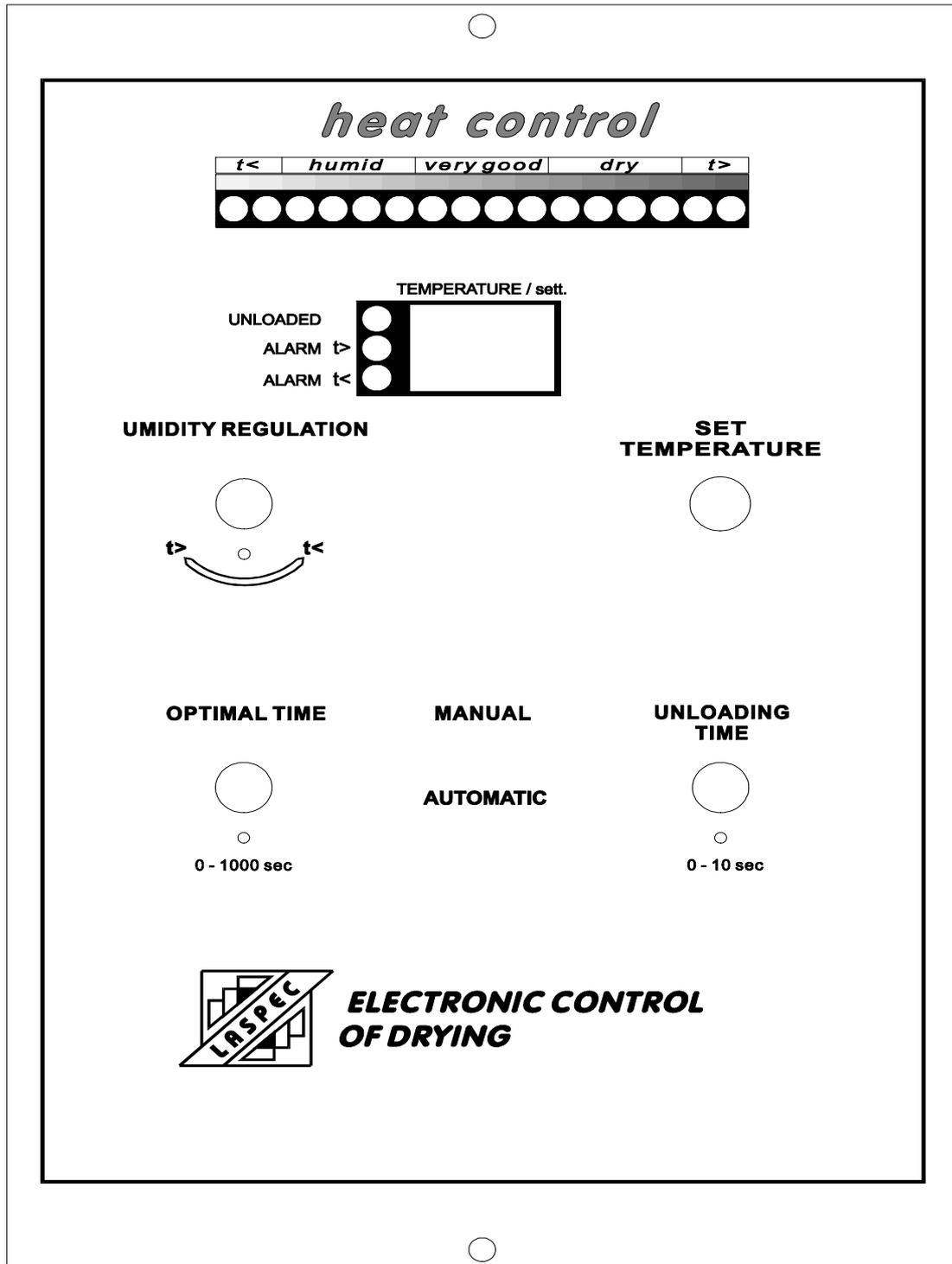
AUTOMAZIONE INDUSTRIALE  
SISTEMI  
PROGETTAZIONE  
ELETTRONICA  
CONTROLLO DI PROCESSO

di LOCATELLI GIAMPAOLO

# HEAT CONTROL

vers. 1.6

## ELECTRONIC SYSTEM CONTROL OF DRYING



# INSTRUCTION MANUAL

The system is indicated for control of drying plant: control the internal temperature and command the time of unloading. The system is an electronic card with microcontroller.

## TECHNICAL DETAILS:

The electronic card have details:

- power: **230Vac** ±10%
- input for termic sensor: PT100 (x1 or x4)
- output relay for UNLOADING : n°1 exchange contact (250V~ 10A)
- output relay for ALLARM: n°1 exchange contact (250V~ 10A)
- dimension 240x160x100mm

## PANEL COMMAND AND SIGNAL:

- signal temperature**: with display 2 number (0-76 °C)
  - signaling is always active
- signal setting temperature**: with display 2 number (0-76 °C)
  - for displaying the setting temperature, press the button *set temperature*
- signal temperature difference**: with 16 led
  - is the difference within external termic sensor and the temperature setting with trimmer *optimal time* (±13% of setting temperature)
- signal unloading**: with led
  - unloading relay active
- signal low temperature alarm**: with led (ALARM t<)
  - alarm relay active, for temperature << setting temperature
- signal high temperature alarm**: with led (ALARM t>)
  - alarm relay active, for temperature >> setting temperature
- setting scale factor**: n°5 scale with dip switch **SW2**

<u>scale n°1</u>	<u>scale n°2</u>	<u>scale n°3</u>	<u>scale n°4</u>	<u>scale n°5</u>
1=on	1=off	1=off	1=off	1=off
2=off	2=on	2=off	2=off	2=off
3=off	3=off	3=on	3=off	3=off
4=off	4=off	4=off	4=on	4=off

Setting the correction factor for calculating the pause time for automatic function:

- scale 1 low: correction factor low, low correction for all the differences (1- >5°C)
- scale 2 normal: correction factor normal, major correction of low differences (1-2°C)
- scale 3 middle: correction factor middle, major correction for all the differences (1- >5°C)
- scale 4 high: correction factor high, high correction for high differences (3- >5°C)
- scale 5 high speed middle: correction factor high for low differences (1-2°C) and middle of high differences (3- >5°C)

**All the time the correction factor is proportional of setting temperature differences and setting pause time.**

- setting unloading time**: 0÷10 sec with trimmer 10 turn
  - setting the time of unloading relay active
- setting optimal time within unloading**: 0÷10 min with trimmer 10 turn
  - setting the optimal pause time within unloadings.
- setting optimal time (umidity regulation)**: 0÷76 °C with trimmer 10 turn
  - setting the optimal temperature for one specific umidity of outputting cereales
- setting manual/automatic: two way switch**
  - setting the function type of device

### **FUNCTIONING DESCRIPTION**

The drying control has two type of function: *automatic* and *manual* selectable with switch.

#### **FUNCTIONING MANUAL CYCLE:**

With this type of function the temperature is not remark and the times of unloading and pause of unloading are regulated only with regulation trimmers. The alarms are not remark.

#### **FUNCTIONING AUTOMATIC CYCLE:**

With this type of function the temperature (humidity regulation) and the optimal time must setting. The temperature of thermic sensor is remark with setting temperature; the difference, with scale factor, change the optimal pause time.

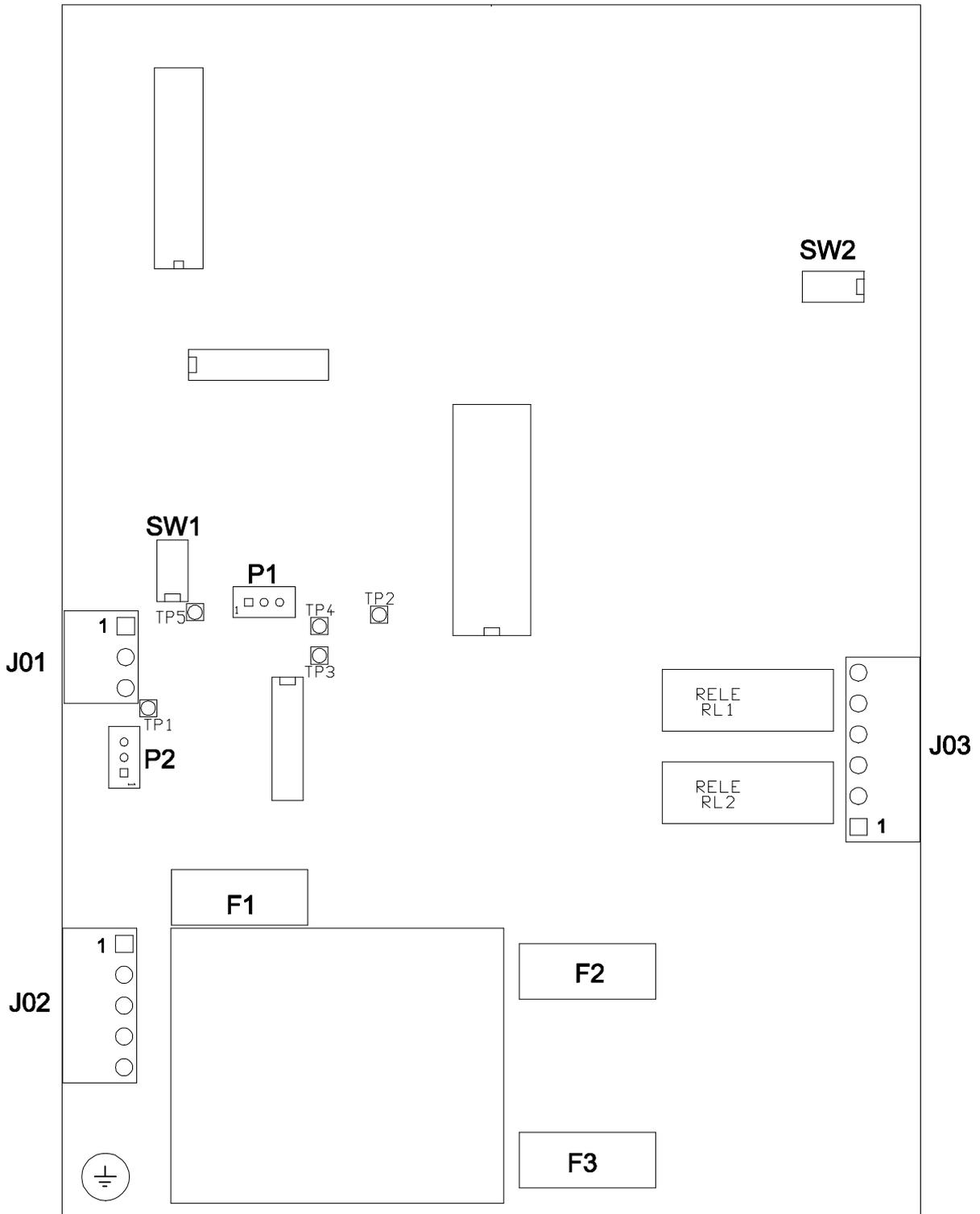
The led bar signaling the difference between the setting temperature and the real; the alarms are activated at the top and the bottom of the led bar.

Is possible change the scale factor of optimal time corrections with the dip switch in the rear of device; it has 5 correction scale.

The pause time correction is made:

**pause time correction% = temperature difference% x correction scale factor**

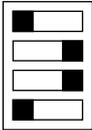
LAYOUT ELECTRONIC CARD HEAT vers. 1.6



**CARD COMPONENTS:****Dip switch SW1:** setting functioning

Dip switch for setting “0” analogic circuit of termic sensor.

on off



4  
3  
2  
1

setting  
**normal function:**  
external sensor PT100  
plugged.

on off



4  
3  
2  
1

**setting “0”:**  
external sensor PT100  
unplugged.

**Trimmer P1:** regulation “0”

Trimmer for regulation “zero” of termic sensor: is effected only with dip switch SW1.

Turn the trimmer “umidity regulation” totalling anticlockwise(=0) and turn the switch of “automatic”, turn the trimmer P1 for displaying “0” and activate the central led of the led bar.

**Trimmer P2:** proportional temperature regulation

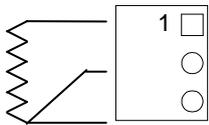
Trimmer for the top scale regulation of the termic sensor: factory regulation.

**Fuse F1:** supply protection 220V~

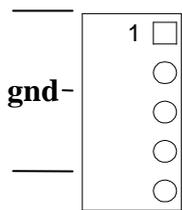
Fuse 315mA 250V~ size 5x20 line supply protection 220V~

**Fuses F2-F3:** internal supply protection

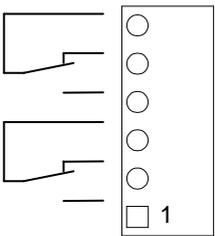
Fuses 1A 250V~ size 5x20 internal supply protection

**EXTERNAL CONNECTIONS:****Connector J01:** termic sensor PT100 input

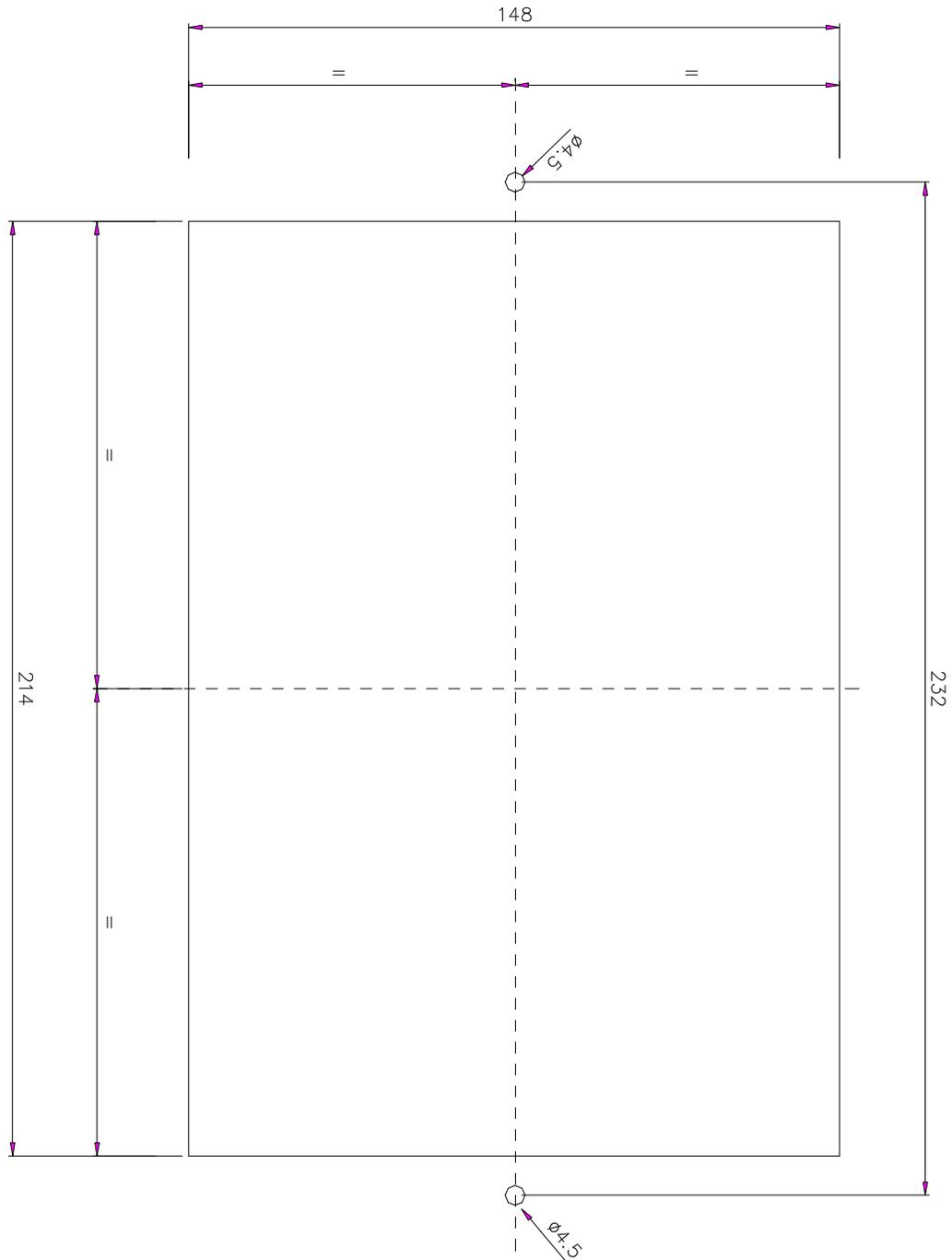
- 1) **signal +**
- 2) **signal -**
- 3) **supply -**

**Connector J02:** supply input, one phase AC 230V

- 1) **230V~**
- 2)
- 3) **ground (G/V)**
- 4)
- 5) **0V~**

**Connector J03:** output: unloading and alarm

- 6) **COM unloading**
- 5) **NC unloading**
- 4) **NA unloading**
- 3) **COM alarm**
- 2) **NC alarm**
- 1) **NA alarm**

**DRILL DRAW**

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