



## R38

### “Entry-level” controller with super-simplified programming

#### APPLICATION SECTORS

- Soldering/sealing
- Glueing (hot glue)
- Packaging and blister packing machines
- T-shirt print
- Maintening Ovens
- Thermostatic Baths

- Very few parameters
- Input for **TC, J or K, RTD, PTC, NTC**
- **Resolution 0.1°C** with automatic scale change (auto-ranging)
- “**Sensitive Touch**” keyboard
- Up to 2 SPDT relay outputs
- Switching Power Supply 100... 240 VAC
- Control:
  - **PID** single action with **Autotuning**
  - ON/OFF single action
  - ON/OFF double action (H/C) (neutral zone)
  - ON/OFF SP1 drives Out 1 - SP2 drives Out 2
- Parameters protection with **programmable password** or “**Keyboard Lock**”
- Soft start or Start up delay (od) function
- Automatic or stand-by Mode
- Compressor protection time
- Direct access to the Set Point

## SENSITIVE TOUCH

Innovative solution for the programming through an ergonomic keyboard which uses the technology “Sensitive Touch”.

This system is constituted by a e-fied sensor keyboard that guarantees a complete protection from dust and liquids in every critical environmental situations.

## START UP DELAY

The most common application of this function is aimed at avoiding, at system start up, that total consumption of the current exceeds the amount foreseen in the contract with the energy provider. The aim, therefore, is to avoid the overcurrent protective device from being activated.

At start up all machines are at room temperature and therefore require the maximum voltage for a period of time that can be quite long.

By setting the delay in such a way that some machines start immediately while others activate the control only when the first gear is up to speed (i.e. when there required voltage has decreased to the lowest values), the request for energy of the various machines is obtained over time considerably reducing the maximum voltage consumed in this phase.

## SOFT START

This function makes it possible to eliminate thermal shock and mechanical stress (due to dilatation) that a system undergoes during start up.

In other cases the aim is that of slowing down the increase in temperature in such a way that this can spread itself out evenly inside the material, especially when the machine is equipped with ‘stirrers’ that cannot be started up at room temperature.

## COMPRESSOR PROTECTION TIME

Some actuators, for example compressors, pumps, some burners, etc., cannot be turned off or turned back on too quickly for their constructive characteristics. In other words after a start up period they must be kept turned off for a minimum amount of time to allow the system to recover the conditions necessary for it to be turned back on.

To protect the working life of the actuator it therefore becomes essential to be able to activate a timer that guarantees the minimum time between the switching off of the machine and the following start up.

## ON/OFF SP1 DRIVES OUT 1 - SP2 DRIVES OUT 2

In some systems with an ON/OFF control 2 different actuators are used for carrying out the same action.

A typical example is that of two stage burners, but applications using a rejection element (e.g. hot water or vapour) as a “resource” for a second process are not rare.

In this case one of the 2 actuators is used just for integrating the energy produced from the first and therefore accelerate the regulating action when the measurement is far off from the set point (machine start up, strong variations in charge, etc.).

In these cases it is preferable to keep the set points (the working points) of the two actuators separate for better control of the system.

### Example: Oven with two-stage burner

SP1 activates the first stage while SP2 activates the second stage.

SP1 = 300°C

SP2 = 250°C

- When the measurement is lower than 250°C the instrument activates both stages.
- When the measurement exceeds 250°C, the instrument will only use the first stage.

## “KEYBOARD LOCK” FUNCTION

In many places and above all in “public places” such as bars, small supermarkets, etc., the final user is not management but rather the customer. However, the instrument must be available to the manager so the correct functioning of the machine can be checked and any modifications made to its settings.

In these cases it is essential that the working of the keyboard can be inhibited thus preventing the machine from being tampered with by an unauthorized person.

It is however, still possible for the manager to reactivate the keyboard for the time necessary for carrying out modifications.

## ACCESSORIES

### A01 - Programming key

Makes it possible to:

- Store the configuration of an instrument to transfer it to other instruments
- Transfer a configuration to a PC
- Memorize a configuration recorded in a PC
- Let the instrument “converse” directly with a PC.



# “Entry-level” controller



## TECHNICAL FEATURES

### ELECTRICAL DATA

**Power supply:** See “How to order”

**Power consumption:** max. 6 VA

**Device Class:** Class II

**Nominal pulse voltage:** 2.5 kV

**Category of overvoltage:** II

**Isolation:** reinforced isolation between low voltage (input and output relay) and frontal parts. Reinforced isolation between low voltage and very low voltage parts (inputs, static outputs)

### THERMOCOUPLE INPUT

**Type:** J, K programmable

**Resolution:** 0.1°C with automatic scale change

**Unit of measurement:** °C or °F programmable

**Cold junction:** automatic compensation 0... +50 °C

**Cold junction accuracy:** 0.1°C/°C @ 25°C after a warm-up (instrument switch-on) of 20 minutes

**Calibration:** according to EN 60584-1

**Burn-out:** at the end of scale

TC Type	Range	
J	-40... 999°C	-40... 999°F
K	-40... 999°C	-40... 999°F

### THERMORESISTANCE INPUT (RTD)

**Type:** Pt 100 and Pt 1000 with 2 wires technology

**Resolution:** 0.1°C with automatic scale change

**Unit of measurement:** °C or °F programmable

**Burn-out:** at the end of scale

**Calibration:** according to EN 60751-A2

RTD Type	Range	
PT100/PT1000 2 wires	-50... 850	-58... 999°F
	-50.0... 99.9	-58.0... 99.9°F

### THERMISTOR INPUT

**Type:** PTC KTY 81-121 (990 Ω @ 25°C) and NTC 103AT-2 (10 kΩ @ 25°C)

**Unit of measurement:** °C or °F programmable

Model	Range	
PTC (KTY 81-121)	-50...150°C	-67... 302°F
	-50.0... 99.9°C	-67.0...99.9°F
NTC (103 AT-2)	-50... 110°C	-58... 230°F
	-50.0... 99.9°C	-58.0... 99.9°F

### OUTPUTS

#### Output 1

**Function:** control output

**Output action:** direct/reverse, programmable

**Type:** a) Relay output

**Contact:** SPDT

**Contact Load:** • Out 1 - 8A/250 VAC on resistive load  
- 3 A/250 V cosφ = 0.4

**Relay electric life:** 100000 operations

b) Logic tension to drive a solid state relay

**Isolation:** output NOT isolated as regard the very low voltage parts

**Logic state 1:** 12 V ±20% @ 1 mA  
10 V ±20% @ 20 mA

**Logic state 0:** <0.5 V

#### Output 2

**Function:** programmable

**Output action:** direct/reverse, programmable

**Function:** control output

**Output action:** direct/reverse, programmable

**Type:** a) Relay output

**Contact:** SPDT

**Contact Load:** • Out 2 - 8A/250 VAC on resistive load  
- 3 A/250 V cosφ = 0.4

**Relay electric life:** 100000 operations

b) Logic tension to drive a solid state relay

**Isolation:** output NOT isolated as regard the very low voltage parts

**Logic state 1:** 12 V ±20% @ 1 mA  
10 V ±20% @ 20 mA

**Logic state 0:** <0.5 V

### COMMUNICATION

**Type:** TTL Modbus

**Isolation:** output NOT isolated as regard the very low voltage parts

**Protocol:** Modbus RTU

**Electrical levels:** TTL

**Baud rate:** 9600 baud

**Parity:** none

**Data formed:** 8 bit + 1 start bit + 1 stop bit

### MECHANICAL DATA

**Mounting:** flush in panel

**Dimensions:** 78 x 35 mm, depth 64 mm

**Panel cut-out:** 71 (-0... +0.5 mm) x 29 (-0... +0.5 mm)

**Display:** 3 Digit single display, red, h 12 mm

**Weight:** 180 g approx.

**Screw terminals:** 11 screw terminals (screw M3 for cables 0.25... 2.5 mm<sup>2</sup> or AWG 22... AWG 14)

**Protection Degree:**

- Front Protection: IP 65 (with gasket) according to EN60070-1 for indoor use
- Screw terminal: IP20

### ENVIRONMENTAL DATA

**Pollution category:** 2

**Installation category:** II

**Operating temperature:** 0... 50°C

**Operating humidity:** < 95 RH% without condensation

**Storage temperature:** -25... 60°C

### FUNCTIONAL DATA

- Control:**
- Single action PID with Autotuning
  - ON/OFF single action
  - ON/OFF double action (Neutral Zone)
  - SP1 drives Out 1 - SP2 drives Out 2

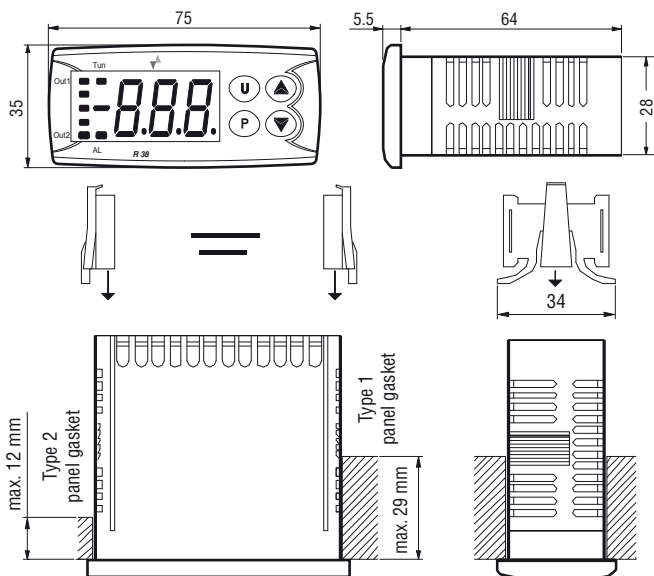
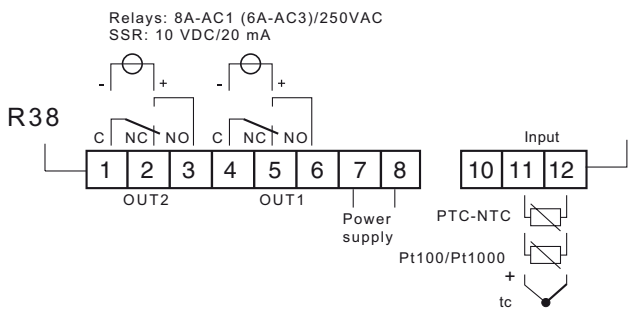
**Overall accuracy:** ±(0.5% span ±1 digit @25 °C)

**Sampling rate:** 1 s

**Display updating time:** 1 s

**Conformity:** EMC 2004/108/CE (EN 61326-1) Directive,  
LV 2006/95/CE (EN 61010-1) Directive.

**R38 - 78 x 35 mm**
**Single display controller**

**DIMENSIONS (mm)**

**CONNECTIONS**

**BRANCHES**

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**HOW TO ORDER**
**Keyboard**

R38 = Standard keyboard (mechanical)  
R38S = S-touch keyboard

**Power supply**

F = 12 VAC/DC not isolated  
L = 24 VAC/DC  
H = 100... 240 VAC

**Input**

F = TC (J, K)  
A = PT100 (2 wires)  
T = PTC/NTC/PT1000 (2 wires)

**Out 1**

R = SPDT 8A-AC1 Relay  
O = VDC for SSR

**Out 2**

R = SPDT 8A-AC1 Relay  
O = VDC for SSR  
- = Not available



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SYSTEM CERTIFIED BY DNV  
= ISO 9001:2008 =