Temperature controller
For injection moulding systems
AK300

The AK300 model is a low cost temperature control unit for hot runner injection moulding systems . The unit is based on the AK70 controller and a 5,7" colour touch-screen as operator interface.

General description

The AK300 is the result of years of experience in the injection moulding applications. Based on the AK70, it has the advange of the proven pre-heat and control algorithm. The number of zones and the power of each zone can be combined from 1000W to 5500W to match your requirements. The user interface is an "easy to understand" colour touchscreen very simple to configure.

The electric actuator is a well cooled solid state relay with a PWM output specifically designed by SENSO for the temperature control of hot runner systems and to assure a proper and efficient dehumidifying process.

NO SPARE FUSES NEEDED. The front switch breaker eliminates the need of spare fuses which simplifies the system maintenance.

Specifications

Power supply
380 VCA + N + E 50/60Hz with 1500mm supply cables

Thermocouple input
Standard: J : 0..600° C (Fe-CuNi , IEC584)
Cold junction compensation accuracy: better than 0,5° C after 30 minutes.
Measuring units: °C or F
Measurement Accuracy: better than+/- 0,25% FSV

Control output
Through multipole connector, 4000mm cable length as standard

Alarms
The model AK300 includes a security device that switches off the output power to prevent damages in the heaters when an overtemperature is detected.

Operator Interface
Menu based, 640x480 dots colour Touchscreen

Room conditions
Working: 0..50°C
Storage: -10..60°C
Humidity: 0..95 % HR non condensing.

Dimensions
430 x 140 x 280 mm

CE conformity (in industrial and commercial environment)
Safety: EN61010
Immunity EMI: EN50082-1
- EN61000-4-2, electrostatic discharges
- EN61000-4-3, radiated fields
- EN61000-4-4, burst
- EN61000-4-5, surge
- EN61000-4-6, injected currents
- EN61000-4-8, magnetic field
- EN61000-4-11, PQT

EMI emission: EN50081-1
- EN55022-b, conducted
- EN55022-b, radiated

Individual protection switch

Beside the general switch in the back of the controller, the system has a protection breaker switch at the front which eliminates the need of spare fuses. This clever design simplifies the maintenance procedures. This can be very usefull -during the set up of the mould and the control system- for the detection of eventual wiring mistakes.

Auto / Manual

Switching to manual mode can be very helpful when the thermocouple is broken. Also during the mould setup, switching to manual can help in checking the wiring.

Control

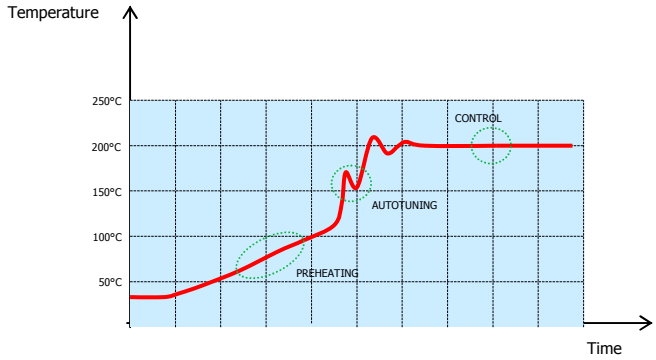
PID control
The temperature control is performed by the AK70 controller through DC pulses which are only 10 ms in duration.

This ensures that during the preheating phase only half periods are applied to the load. On the PID control mode, the controller output is the result of the three control actions added: Proporcional, Integral and Derivative. The controller output will vary from 0 to 100% as a result of this combination.

Preheating

Preheating for injection moulding systems

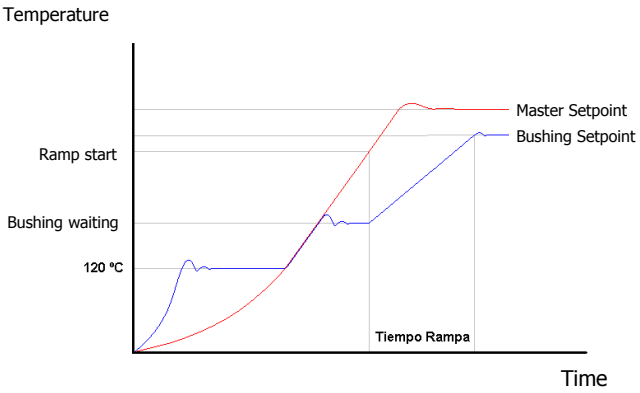
The **AK70** which is the control module for the **AK300** has an advanced and well proven automatic pre-heating algorithm whose aim is the elimination of the humidity absorbed by the heating elements. The controller doses the output power in order to slowly increase the process temperature without harming the heating element.



Preheating with Master Control

This functions allows the activation of a special preheating mode. Usually, the fast zones (bushings) reach the working temperature much faster that the slow zones (manifold).

This special preheating mode allows the user to define a manifold zone as a preheating master for the bushing zones in such a way that the temperature in the bushing zones never go above the temperature in the manifold zones. In this way all the temperatures reach the working temperature almost at the same time.



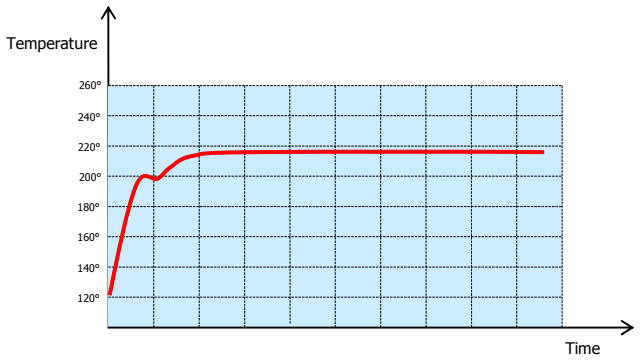
Autotuning

The AK300 has two different autotuning algorithms which can be choosed as the best for each application.

Step Response autotuning

It is performed when the process is below the set point value and can only be activated when the process is under the 50% of this set point.

This tuning consist on increasing the process value with an output of 100% and when it reaches the 80% of the set point, the output falls down to 0%. Then the controller, will calculate the optimum Pb, Ti and Td parameters, the PID parameters by measuring the overshoot and the response time.



Relay Feedback autotuning

This type of autotuning has the advantage that is performed on the set point thus can be activated at any time.

However, to perform the autotuning, the controller will create some overshoots and this might not be aceptable by the process.

Consumption measurement

As an option, the AK300 can include current measurement modules for detecting current errors in the heating elements such as heater burnout, or heater overcurrent by means of current transformers.

The collected information can be given in current (A) or in power (W).

Energy control

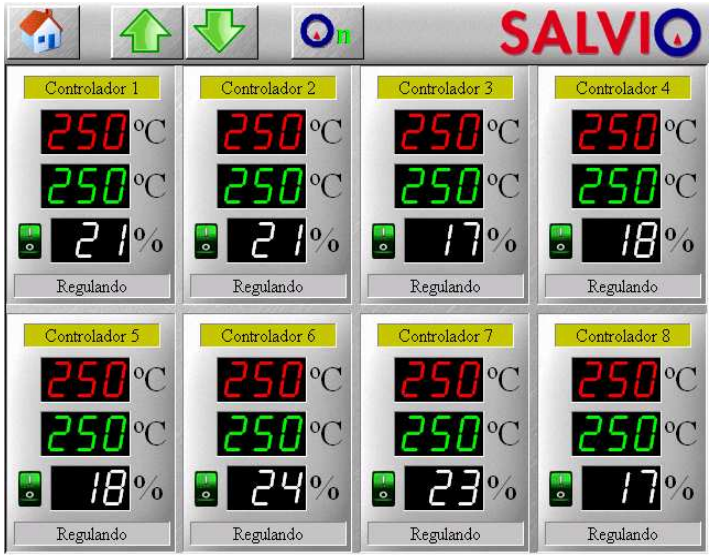
More and more, energy saving is important in the efficiency of the processes. With the energy measurement, it is possible not only control the absorved power but also the consumed energy along the time.

Control panel

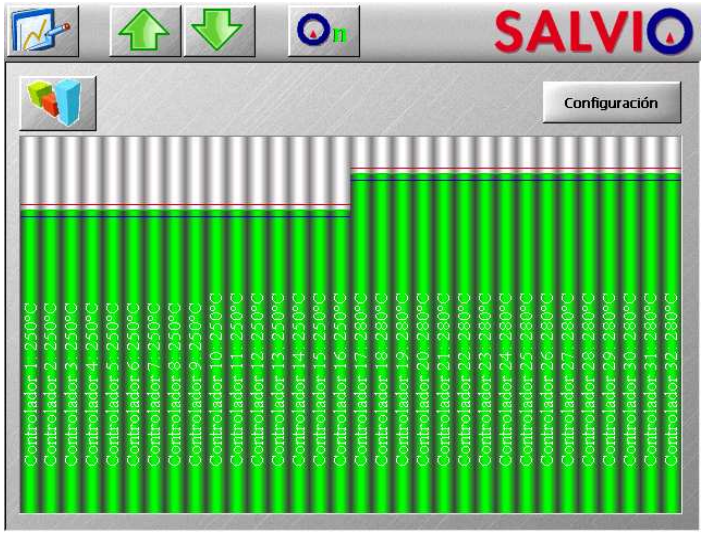
All the interaction between the operator and the AK300 is done through the Touchscreen. By means of the functions, the user can change the alarms configuration, enable/disable zones, save/load working configurations, etc…

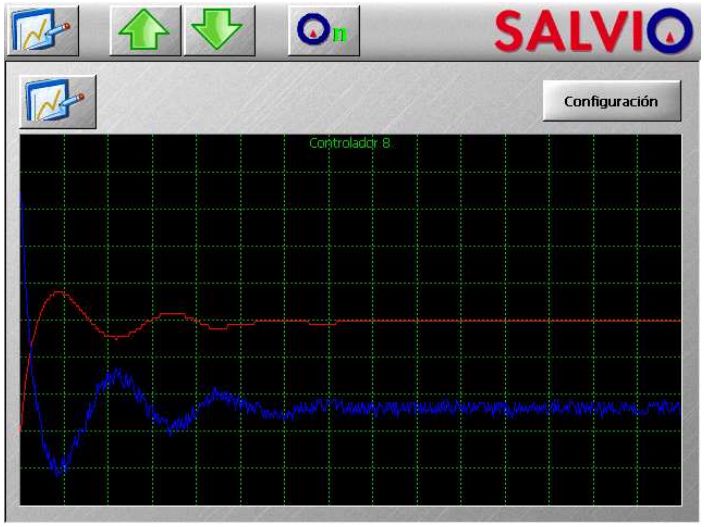
Among the most advanced features, the user can link a zone with the thermocouple input broken to an equivalent zone in such a way that the output of this controller actuates also in the one with the defective thermocouple.

Other functions, as the Master Preheating, Password protection, global parameter change in a selected number of zones, programming of a security temperature, etc... make the AK300 an advanced equipment for the temperature control of thermoplastic injection moulding systems.



The AK300 interface software is user friendly and intuitive. The text and graphic information is presented in a pleasant looking way thus allowing the user to learn very quickly the operation of the software.





USB Port - Software

The USB port at the front panel can be used for two different purposes.

File management

In the controller memory different mould and processes data can be stored. This information can be exported to an USB memory stick to be uploaded to another controller.

Software update

Our engineering team works continuosly to keep up to date the software and all the different options. In addition to that, some customers ask for special and specific applications.

By means of the USB port, the software can be updated anytime.

Ordering code

Model	Number of zones	Power per zone	Options
AK300	06 a 12	**1:** 1000W **2:** 2200W **3:** 3500W **4:** 5500W **9:** combination	**0:** none **1:** Current measurement
AK300	12	3	0

Example: AK300-12-3-0

AK300, 12 zones of 3500W without current measurement

Where to find us ?

Few words about us

SENSO, Milpunts S.L. is a company based in Cabrera de Mar at 25 Km. North of the Barcelona area.

Our activity is electronic instrumentation and sensors for temperature measurement and control. Our 60% of turnover is on the plastic injection moulding industry. In this field we have the knowledge to design and manufacture hot runner systems, hot halves, of course hot runner temperature controllers but we also offer a full manitenance service for the electrical side of the mould: mould cleaning, rewiring, spare parts replacement etc...

You will find us at:

http://www.senso.es

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