



The model AK48 is a 48x48mm process controller with advanced features.

The user can choose among 13 different input probes including linear inputs. The control output can also be selected by the user.

Applications

The **Akros** series is a family of instruments suited for critical applications where control stability is an issue.

Due to its wide range of options, the AK48 becomes an universal process controller for all kind of industrial applications.

General features

Universal input

Fully configurable as thermocouple and RTD. Optionally, can also have current loop or voltage input.

Configurable control output

The control output can be configured by the user as SPDT relay or DC pulses for SSR.

Alarms

One SPST relay alarm as standard and can be equipped with a second relay alarm as an option.

The alarm action is fully configurable.

Operating mode

Automatic or Manual.

Ramp and types of control

The ramp function is a standard feature. On the control side, the user can select among three different control actions: ON/OFF, PID or PI+D (PI with automatic derivative action).

PID and PI+D include two different autotuning algorithms.

Keylock

The instrument provides three levels of protection through the keylock function.

Wiring

The wiring is by screws in the back of the case. The recommended terminal is the fork type.

Optional features

Second alarm

Fully configurable.

Linear control output

Control output : 0..20mA , 4..20mA (máx. 500Ω)
0..5Vdc , 0..10Vdc (máx. 20mA)

Transmitter power supply (TPS)

24 Vdc power supply for current loop or voltage transmitter.

Analog retransmission

Analog output proportional to the measured value: 0..20mA, 4..20mA, 0..5Vdc , 0..10Vdc

Specifications

Housing

1 / 16 DIN 43700 (48x48 mm.), front removeable.

Display

4 red, 7 segment LED display, 10mm for process value
4 green, 7 segment LED display, 7 mm. for set value

Thermocouple input

User configurable:

J : 0..600° C (Fe-CuNi , IEC584)
L : 0..600° C (Fe-CuNi , DIN43710)
K : 0..1200° C (NiCr-NiAl , IEC584)
N : 0..1200° C (NiCrSi-NiSi , IEC584)
T : 0..400° C (Cu-CuNi , IEC584)
R : 0..1600° C (Pt / 13%Rh-Pt , IEC584)
S : 0..1600° C (Pt / 10%Rh-Pt , IEC584)

Cold junction accuracy: better than 0,5°C after 30 minuts

Resolution: 1°C

Accuracy: +/- 1 digit

Units: °C o °F

Accuracy: better than +/- 0,15% FSV

RTD input

Two user configurable ranges: -99,9..200,0°C Pt100 (IEC751)
0..600°C Pt100 (IEC751)

Configuration: 3 wires

Resolution: 1°C

Units: °C o °F

Resolution: 20000 points

Accuracy: better than +/- 0,3°C in the -99..200,0°C scale
and +/-1°C in the 0..600°C scale

Current loop input

Input signal: 0..20mA o 4..20mA , user configurable

Range: Selectable between -999 y 9999

Decimal point: Selectable as XXX.X o XX.XX

Input impedance: 150Ω

Sensor break: full scale

Voltage linear input

Input signal: 0..5Vdc o 0..10Vdc, user configurable
 Range: Selectable between -999 y 9999
 Decimal point: Selectable as XXX.X o XX.XX
 Input impedance: > 1MΩ
 Sensor break: Full scale

Control output

SPDT relay(2A@250 Vac, resistive load) or 9Vdc pulses (open collector, max. 40 mA), user configurable
 - As an option:

Current loop output: 0..20mA , 4..20mA (500Ω max. load)
 0..5 Vdc , 0..10 Vdc (20mA máx. load)

Analog retransmission (opcional)

0..20mA , 4..20mA (máx. 500Ω) user configurable range
 0..5 Vdc , 0..10 Vdc (máx. 20mA) user configurable range

Transmitter power supply, TPS (opcional)

24 Vdc (máx. 22mA).

Alarm relay (2nd alarm as an option)

1 Alarm: SPST relay (1A@250 Vca)
 2 Alarms: 2 SPST relays (1A@250 Vca) with a shared common

Power supply

85..265 Vca, 50/60 Hz
 -Option: 21..53 Vca/Vcc

Consumption

8VA

Room conditions

Operating: 0..50°C
 Storage: -10..60°C
 Humidity: 0..95 % HR without condensation

Protection degree

IP50 in the front

Case

ABS self extinguishing

Dimensions

48 x 48 x 109 mm.

Panel cutout

45,5 x 45,5 mm. (+/- 0,5 mm.)

Weight

140 grs.

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

Armonics: EN61000-3-2

Voltage variations: EN61000-3-3

Ramp + Control types

Ramp+ PID function

The AK48 can run different types of ramps.
 - Initial ramp: Running when the process starts
 - Permanent ramp: The ramp will always be executed on each set point change.
 In addition, the ramp can be configured either up, down or both senses ramp. The configuration is made in units per minute (U/min).

ON / OFF Control

When the controller is configured to work in ON / OFF mode, the controller output only takes two values: 100% when the process is under the setpoint and 0% when the process is over the setpoint. In this working mode, the user must configure the activation-deactivation hysteresis value of the control output.

PID Control

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.

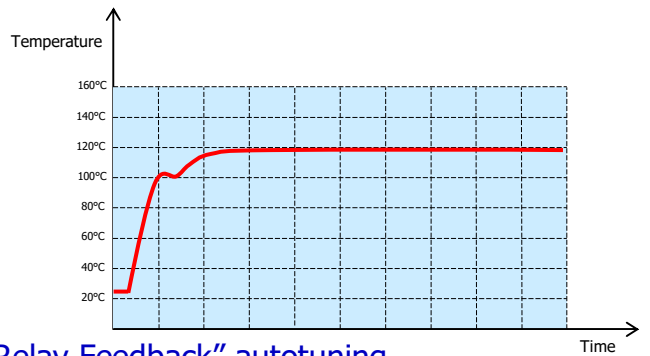
PI+D Control

The PI+D control mode works very similar to the PID but in this case only the Pb (Proporcional Band) and Ti (Integral time) can be modified. The derivative action is automatic. This control action appears to be much more stable when the process is working on the limits of the controller's output variations such as 0..10% or 90..100%.

Autotuning

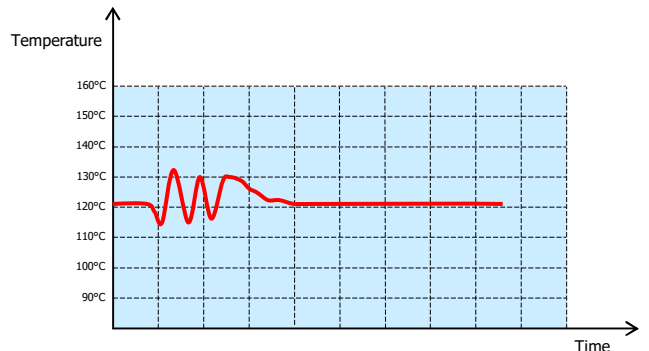
"Step Response" autotuning

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 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 acceptable by the process.

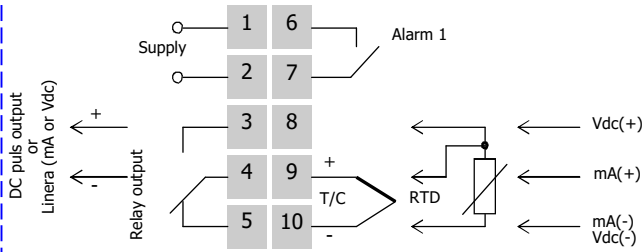


Events

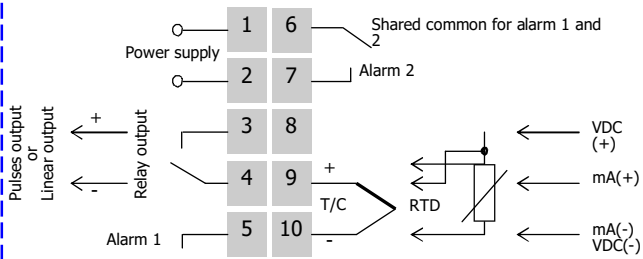
Internal Events can be configured. They can be used for different actions such as: Controller RUN/STOP, to stop a ramp, set point change, AUTO/MAN switch forcing a certain % output value.

Wiring

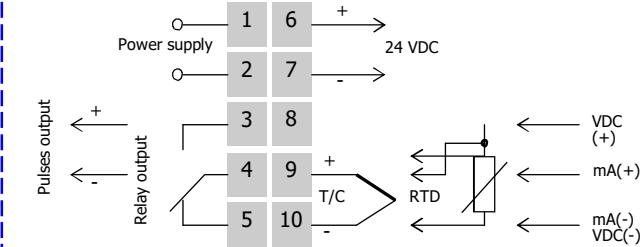
1 alarm configuration wiring



2 alarms configuration wiring



Wiring with transmitter supply



Ordering guide

Model	Input	Control Output	Base Options	Power Supply
	T : Temperature (thermocouple or RTD) U : Universal	1 : Relay or Vdc pulses 3 : 0..20 mA (*) 4 : 4..20 mA (*) 6 : 0..5 Vdc (*) 7 : 0..10 Vdc (*) (*) Only xx1 y xx2	1 : One alarm 2 : Two alarms With shared Common point 9 : 24 Vdc TPS	1 : 85..265 Vac 50/60 Hz 2 : 21..53 Vac/Vdc
AK48	T	1	1	1

Example: AK48-T111

Other SENSO references

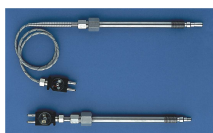
Process indicators



Custom software and electronics



Temperature sensor



Pressure sensors

Where to find us ?

Few words about us

SENSO - MILPUNTS S.L. is a company based in Mataró ar 30Km. North of the Barcelona area.

Our activity is electronic instrumentation and sensors for temperature and pressure measurement and control.

We have also a good reputation on plastic injection moulding systems.

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