

ATR 902

Controller



User manual

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Introduction

Thanks for choosing a Pixsys device.

The plug-in controller ATR902 is specially dedicated to applications in the glass, metal and pottery industry.

This controller provides high accuracy of the programmed firing cycle and reliable monitoring of the temperature. It can store up to 15 completely configurable programs, each consisting of max. 18 segments. The first 5 cycles can be associated to a mnemonic name (see parameters 48-52). Delayed start is also available as well as other software functions. A relay output can be configured as alarm. All parameters are protected by a password to avoid unauthorized access.

1 Safety guide lines

Read carefully the safety guidelines and programming instructions contained in this manual before using/connecting the device.

Disconnect power supply before proceeding to hardware settings or electrical wirings.

Only qualified personnel should be allowed to use the device and/or service it and in accordance to technical data and environmental conditions listed in this manual.

Do not dispose electric tools together with household waste material.

In observance European Directive 2002/96/EC on waste electrical and electronic equipment and its implementation in accordance with national law, electric tools that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.

2 Model identification

The ATR902 series includes only one version which is described into the following table:

Power supply 230 Vac $\pm 15\%$ 50/60Hz – 3VA

ATR902-12ABC 1 sensor input + 2 relays 1A

3 Technical data

3.1 General features

| | |
|---------|--|
| Display | 4 display 0,50" - 4 display 0,30" - 12 red led |
|---------|--|

| | |
|-----------------------|----------------------------|
| Operating temperature | 0-45°C, humidity 35..95uR% |
|-----------------------|----------------------------|

| | |
|---------|---------------------|
| Sealing | IP54 on front panel |
|---------|---------------------|

| | |
|----------|-----------------------------|
| Material | Shock-resistant polystyrene |
|----------|-----------------------------|

| | |
|--------|---------------|
| Weight | Approx. 400 g |
|--------|---------------|

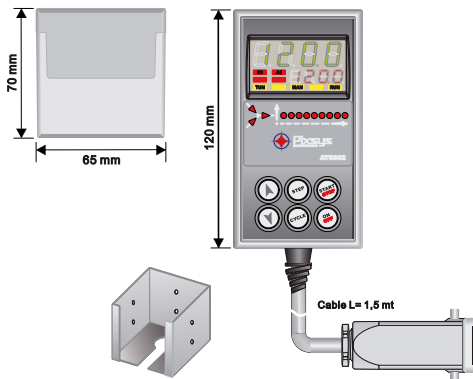
3.2 Hardware features

| | | |
|---------------|---|---|
| Sensor input | AI1 - Configurable for Thermocouple K,S,R,J,T,E,N. Cold junction automatic compensation 0 ... 50°C. | Accuracy (25°C) +/-0.2 % ± 1 digit (full scale). Cold junction accuracy 0.1°C/°C |
| Relay outputs | 2 Relays configurable as control output and alarm relay (safety or auxiliary) | Contacts: 1A-250V~ for resistive charges |

3.3 Software features

| | |
|----------------------|---|
| Regulation | ON-OFF with hysteresis. |
| Algohythm | P, PI, PID, PD proportional time. |
| Proportional band | 0...9999°C or °F |
| Integral time | 0,0...999,9 sec (0 excludes integral function) |
| Derivative time | 0,0...999,9 sec (0 excludes derivative function) |
| Controller functions | Manual or automatic tuning, selectable alarms, Interrupted cycle recovery, Waiting, Delayed start |
| Programmable cycles | 15 (max 18 steps each) + function "simple controller" with programmable setpoint |

4 Size and Installation



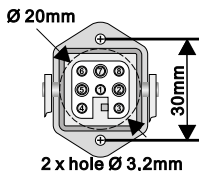
Optional: support for panel-mounting Cod. 1300.20.043

5 Electrical wirings

This device has been designed and manufactured in conformity to Low Voltage Directive 2006/95/EC , 2014/35/EU (LVD) and EMC Directive 2004/108/EC, 2014/30/EU (EMC). For installation in industrial environments please observe following safety guidelines:

- Separate control line from power wires.
- Avoid proximity of remote control switches, electromagnetic contactors, powerful engines and use specific filters.
- Avoid proximity of power groups, especially those with phase control.
- It is strongly recommended to install adequate mains filter on power supply of the machine where the controller is installed, particularly if supplied 230Vac. The controller is designed and conceived to be incorporated into other machines, therefore CE marking on the controller does not exempt the manufacturer of machines from safety and conformity requirements applying to the machine itself.

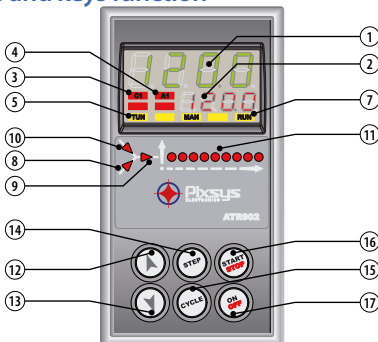
5.1 Wiring diagram





- 1_ Neutral
- 2_ Neutral
- 3_ Thermocouple +
- 4_ Thermocouple -
- 5_ Power supply (phase)
- 6_ Control output (phase)
- 7_ Aux output (phase)
- 8_ Not Connected

Optional: multipolar connector (Cod. 0400.70.001).




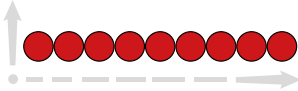
6 Displays and keys function









6.1 Numeric indicators (Display)

| | | |
|---|---|--|
| 1 |  | Usually visualizes measured temperature, it may visualize also (programmed temperature) setpoint value, time elapsed from cycle start, number of operating step or the percentage value of the command output. During configuration it visualizes the value of entering parameter. |
| 2 |  | Visualization can be customized with setpoint, time elapsed from cycle start or number of operating step. During configuration it visualizes the value of entering parameter. |

6.2 Meaning of Status Lights (Led)

| | | |
|----|--|--|
| 3 | C1 | ON when the heating elements are activated. |
| 4 | A1 | ON when alarm 1 is active. |
| 5 | TUN | ON when controller is executing an auto-tuning cycle. |
| 7 | RUN | ON when the device is in START cycle or in "Simple controller" mode. Blinking LED indicates the standby of the controller |
| 8 |  | ON when the programmer is executing a rising step. |
| 9 |  | ON when the programmer is executing a maintenance step. |
| 10 |  | ON when the programmer is executing a falling step. |
| 11 |  | Cycle progress. Flashing Led shows the step being executed; Fixed Led shows the step already done. |

6.3 Keys

- 12  • In configuration allows to scroll and modify parameters
• Scroll cycles to be started or modified.
• In cycle programming allows to modify time and setpoint values.
• Modifies the setpoint during "simple controller" function (tHER).• Allows a fast advancement of the cycle when it is in "START".
-
- 13  • In configuration allows to scroll and modify parameters.
• Scroll cycles to be started or modified.
• In cycle programming allows to modify time and setpoint values.
• Modifies the setpoint during "simple controller" function (tHER).• Allows a fast retrograde of the cycle when it is in "START".
-
- 14  • With controller in STOP allows to visualizes the duration of the last cycle (if chronometer is enabled).
• In programming allows to confirm a value and move to the next one.
• With controller in START allows to visualize cyclically the setpoint and the other process value.
-
- 15  • With controller in STOP allows to select cycles to start or modify and to enter parameters configuration.
• In configuration allows to modify the selected parameter and to confirm the entered value.
• During a cycle, to activate/deactivate HOLD function, press for 1 second.
• In configuration allows to visualize the selected parameter in mnemonic or numeric way.
-
- 16  • Starts a new cycle or Stops the one which is being execute.
• Operates as exit key (ESCAPE) during cycles or parameters configuration.
-
- 17  • Switches the controller OFF (standby) and ON.
-

7 Programming and configuration


There are two programming levels:

1. Cycles programming (for **operator/user**), to enter time/setpoint values for each step of cycle.
2. Configuration (for **manufacturer/installer of plant**), to enter main parameters (sensor type, output type, intervention type alarm/auxiliary ext.).

7.1 Programming (or modifying) cycle data





- **With or without starting setpoint**
- **With or without timed auxiliary outputs¹**

When controller is in **STEP** follow the points below.

| | Press | Display | Do |
|---|---|-------------------------------------|---|
| 1 |  | Red display visualizes 00.01 | At each pression selects the next cycle (00.02 for cycle no.2 up to 00.15 for cycle 15). |







7.1.1 Programming of starting setpoint (if not configured, see par. 6.1.2)

The selection of an initial setpoint (a specific starting temperature of the cycle) grants the correct gradient if the kiln is still heat from a previous process.





| | Press | Display | Do |
|---|--|---|--|
| 2 |  | Red display visualizes 00-5* . Green display shows the "starting setpoint". Otherwise pass to point 4. | At any time press  to exit programming. |
| 3 |   | Increases, decreases value on green display. | Select starting setpoint (starting temperature). |

¹ This section includes all available options for the cycle programming. Some of these steps can be omitted if not all the controller functions are used. We recommend the manufacturer to indicate into the kiln documentation the correct sequence of operations.

7.1.2 Programming of the step (segment)

| | Press | Display | Do |
|---|--|--|--|
| 4 |  | Red display visualizes $\square T-t$. Green display shows step time. | |
| | | Increases, decreases value on green display. | Enter the step duration in hours:minutes. |
| 5 |   | N.B.: Each cycle is composed of max. 18 programmable steps, after those it skips automatically to point 10. | N.B.: Set --- for endless time or E_{nd} for cycle end (if not all steps are used) and skip to point 10. |
| 6 |  | Red display visualizes $\square T-S$. Green display shows the step setpoint (temperature that has to be reached within given time). | With  or  select the setpoint (temperature reached at step end). |

7.1.3 Programming of the alarm/auxiliary (if configured)

| | Press | Display | Do |
|---|--|--|--|
| 7 |  | Red display visualizes $\square T-A$. Green display shows $A_{l-o}F$ or $A_{l-o}n$. | If $A_{L.1}$ is not programmed as auxiliary time ($A_{o.r.S}$) skip to point 10. |
| 8 |   | | Select auxiliary output status during the step: $A_{l-o}n$ for active output and $A_{l-o}F$ for not active output. |
| 9 |  | Back to point 4. | |



7.1.4 End programming

| | Press | Display | Do |
|----|---|--|----|
| 10 |  | The controller backs to STOP mode, saving the cycle. Red display visualizes $S_{t-o}P$. | |







8 Cycle start

8.1 Start of a cycle and setting of delayed start

Red display visualizes $STOP$.



| | Press | Display | Do |
|---|---|---|---|
| 1 |  | Red display visualizes the cycle selection. | Press CYCLE to scroll the cycles (02 for cycle no. 2 - 15 for cycle no. 15) until visualize the chosen cycle. |
| 2 |  | Cycle starts. Buzzer sounds briefly. Green display shows the process while red display shows the setpoint introduced on parameter 14 . | NB: only cycles already programmed can start. |

If delayed start is active (see parameter 15) proceed as follows:

| | Press | Display | Do |
|---|--|---|--|
| 3 |  | Red display visualizes $WAIT$ Green display shows (flashing) the programmed waiting time. | |
| 4 |   | Increases or decreases the initial waiting time (hour:minutes). | |
| 5 |  | Waiting starts. When the programmed time expires, cycle will start. | Press  or  to modify the time. |

8.2 Fast advancement function









During functioning or after a restart it can be useful to move onwards or backwards the cycle in progress, to reach chosen setpoint value.

| | Press | Display | Do |
|---|---|--|---|
| 1 |  | Forwards or backwards (each beep of internal buzzer means one minute). | To end the cycle and $STOP$ the controller before the normal conclusion, press  for a "1". |

8.3 Simple controller function²



When this function is active, the controller cannot manage a step cycle but it regulates according to a single setpoint (programmed temperature) which is selectable by the user.

Press STEP and follow the points below:


| | Press | Display | Do |
|---|--|---|---|
| 1 |  | Red display visualizes the selected cycle. | Increase until visualize HEr . |
| 2 |  | Red display visualizes SP_{U} while green display shows the setpoint. | |
| 3 |   | Increases or decreases the setpoint value. | Enter the chosen setpoint. |
| 4 |  | The controller modulates the command output to keep the programmed temperature. | |
| 5 |  | Visualizes cyclically the controller values. | To modify the setpoint SP_{U} press  and the arrow keys. To exit this function, press  for 1". |

9 Programmer functions

9.1 Hold function

This function allows to interrupt a cycle: red display visualizes hold and cycle is stopped. It is possible to modify setpoint pressing  or .

To start this function proceed as follows:

- Enter configuration and select En on parameter 17 HLd.F .
- With cycle in progress press  for 1": function will be started or stopped.

9.2 Automatic Tuning



This procedure allows the user to have a precise regulation also without knowledge of PID regulation. Selecting AutE on parameter 06 EUnE , controller check process oscillations and modifies PID parameters if the difference between process and setpoint values is greater than value on parameter 53 PiG.Eu .

Parameters 53 PiG.Eu , 54 PiP.b , 55 PiI.P.b and 56 PiI.E can be modified entering the password 5678.

² Access to this function may be enabled on parameter 16 SP.Fu .

9.3 Manual Tuning



This procedure allows user a greater flexibility on deciding when to update PID parameters. To enable this function, select $\overline{P}A_n$ on parameter 06 \underline{t}_{UNE} . To start manual tuning procedure follow the points below (when cycle is running):

| | Press | Display |
|---|---|---|
| 1 |  | Press until red display visualizes \underline{t}_{UNE} . |
| 2 |  | Green display shows \overline{ON} , TUN turns on and procedure starts. |

Controller activates output increasing the process value as indicated on parameter 07 $\underline{S.d.t}_U$.

Then, it turns off the output and calculates the new PID parameters.

It is possible to end this procedure any time, following the points below:

| | Press | Display |
|---|---|--|
| 1 |  | Press until red display visualizes \underline{t}_{UNE} . |
| 2 |  | Green display shows \overline{OFF} , TUN turns off and procedure ends. PID parameters will not be modified. |

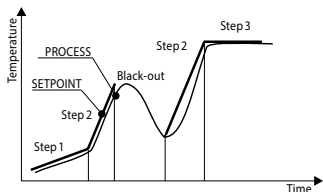
9.4 Recovery of interrupted cycle

Recovery function is particularly useful for kilns temperature regulation. After a power failure, at restarting ATR902 can resume the interrupted cycle. There are two recovery modes:

9.4.1 Recovery with automatic gradient

To enable cycle recovery with automatic gradient, set 1 on parameter 22 $\overline{r. i. c}_U$. At restart, after a power failure, controller will operate like this:

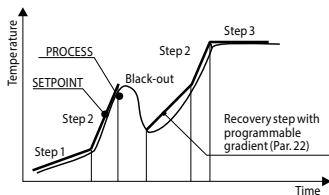
1. If a power failure occurs during a rising step, the gradient will be same as the operating step (setpoint temperature equal to the temperature read by the sensor).
2. If a power failure occurs during a holding step, two options are available: If gap between process and setpoint is limited (not exceeding the value on parameter 21 $\overline{N.E.S.E.}$) cycle will resume from the point of interruption; if the gap is bigger but controller has not yet executed a cooling step, the cycle will go back to the closest rising step and will repeat the procedure as explained on point 1.
3. If a power failure occurs during a cooling step or a holding step, after that a cooling step has already been completed, the setpoint will match the the temperature read by the sensor, without including any rising and even skipping to next step if necessary (this a safety tip particularly for glass working).





NB: After a power-off the chronometer will restart from 00:00.

9.4.2 Recovery with programmable recovery gradient

To enable cycle recovery with a recovery gradient, enter on parameter 22 $r_{r.c.g}$ a value (degrees/hour if temperature) greater than 1. At restarting if the kiln temperature (process) is lower than the setpoint, ATR902 locks the working cycle executing a step with the rising gradient set on parameter 22 $r_{r.c.g}$ to return to the setpoint value entered before the power failure and the cycle restarts from that point. In recovery mode the point on the right of the red display flashes and display shows $r_{r.c.g}$ instead of the cycle number.

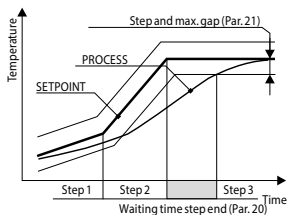



Recovery will start only for holding or rising steps.

To exit manually from recovery mode press  or .

9.5 Waiting step end

This function has been conceived to control kilns working cycles, whenever the kiln cannot follow gradients programmed by the user. If at step end the difference between process and setpoint values is greater than the value on parameter 21 *Π.Δ.Σ.Ε.*, controller starts with the next step only after waiting for the time programmed on parameter 20 *Υ.Ε.Σ.Ε.*, or when this gap becomes lower than parameter 21 *Π.Δ.Σ.Ε.*








To exit manually from this function press . To disable this function fix at 0 end step waiting time *Υ.Ε.Σ.Ε.*. During end step waiting red display shows *ΥΡ,ι* instead of the cycle number.

9.6 Loading default values

This procedure allows to restore all default settings.














Press *5tOP* and follow the points below:

| | Press | Display | Do |
|---|--|--|----------------------------------|
| 1 |  Press for 5". | Green display shows 0000 with 1st digit flashing, red display visualizes <i>PASS</i> . | |
| 2 |    | Flashing digit on green display changes. | Enter the password <i>9999</i> . |
| 3 |  | Device loads default settings. | |

Entering password *9999* all default parameters will be loaded. If it is necessary to cancel and reset also the cycles, enter password *9989*.

Configuration for installer

To enter configuration parameter it is necessary to *STOP* the controller.

| | Press | Display | Do |
|---|--|---|--|
| 1 |  | Press for 5". Green display shows 0000 with 1st digit flashing, red display visualizes <i>PASS</i> . | |
| |  | | |
| 2 |   | Flashing digit on green display changes. | Enter the password <i>1234</i> . |
| 3 |  | On green display appears the first parameter while red display shows the value. | |
| 4 |  | Allows to switch from mnemonic (parameter name) to numeric (parameter number) visualization (and vice versa). | |
| |  | | |
| 5 |  | Scrolls parameters. | Select the parameter to be modified. |
| 6 |  | Allows to modify parameter: red display visualizes (flashing) the value of the selected parameter. | |
| |  | | |
| 7 |  | Increases or decreases the visualized value. | Enter the new data. |
| 8 |  | Confirms data entering (red display stops flashing). | To modify another parameter back to point 5. |
| 9 |  | Configuration ends. The controller is in <i>STOP</i> . | |

Entering password *1234* it is possible to modify the first level parameters.

If it is necessary to modify those of second level, enter password *5678*.

10 Table of configuration parameters

10.1 1st level parameters

1 *SEn.* Sensor

Select type of sensor.

tc. k Thermocouple type K. Range: -260..1360°C > **Default**

tc. s Thermocouple type S. Range: -40...1760°C

tc. r Thermocouple type R. Range: -40...1760°C

tc. j Thermocouple type J. Range: -200...1200°C

tc. t Thermocouple type T. Range: -260...400°C

tc. E Thermocouple type E. Range: -260...1000°C

tc. n Thermocouple type N. Range: -260...1280°C

2 *o.cAL.* Offset Calibration

Number added to visualized process (normally it corrects ambient temperature value).

-99.9...+99.9 tenths of degree. **Default:** 0.0.

3 *G.cAL.* Gain Calibration

Number multiplied with process value to calibrate working point.

-99.9%...+99.9%. **Default:** 0.0.

4 *u.P.L.S.* Upper Limit Setpoint

Setpoint upper limit.

0...+3200 degrees. **Default:** 1250.

5 *dEGr.* Degree

Select type of degree.

Centigrade. > **Default.**

Fahrenheit.

6 *tunE* Tune

Select autotuning type.

d.S. Disabled. > **Default.**

AutO. Automatic. Controller checks constantly the process value and modifies P.I.D. values (if necessary).

MAN. Manual. Started by keys.

7 *S.d.t.u.* Setpoint Deviation Tune

Selects deviation from command setpoint as threshold used by manual tuning to calculate P.I.D. parameters.

0.0...500.0 tenths of degree. > **Default:** 5.0.

8 *c. HY.* **Command Hysteresis**
Hysteresis in ON/OFF or dead band in P.I.D. for command output.
-99.9...+99.9 tenths of degree.> **Default:** 1.0.

9 *P.b.* **Proportional Band**
Process inertia in degrees.
0.0 ON/OFF if also t_i equal to 0. > **Default.**
0.1...999.9 tenths of degree.

10 *t.i.* **Integral Time**
Process inertia in seconds.
0.0...999.9 seconds. Integral 0 disabled. > **Default:** 0.0.

11 *t.d.* **Derivative Time**
Normally ¼ of integral time.
0.0...999.9 seconds. Derivative 0 disabled. > **Default:** 0.0.

12 *t.c.* **Cycle Time**
Cycle time (for P.I.D. on contactor 10"/15", for P.I.D. on SSR 1")
1...300 seconds. > **Default:** 10.

13 *c. S.E.* **Command State Error**
SContact status for command output in case of error.
o.c. Open Contact > **Default**
c.c. Closed Contact

14 *u.i.d.2* **Visualization Display 2**
Set visualization on display 2 during a cycle
E.St.S. (End Step Setpoint) End temperature of operating step
r.SP_u (Real Setpoint) Updated according to the selected gradient
cY.nu. (Cycle Number) Number of operating cycle. > **Default**
St.nu. (Step Number) Number of operating step
t.nE Time elapsed from cycle start

15 *dE.St.* **Delayed Start**
Enables initial waiting for delayed start of cycle
d.S. (Disabled) Initial waiting disabled. > **Default**
E.n. (Enabled) Initial waiting selectable by the user.

16 *SP.F.U.* Special Functions

Enables simple thermoregulator function and manual setting of output percentage.

d.i.S. (Disabled) No function available. > **Default.**

t.H.E.r. (Thermoregulator) Enables simple thermoregulator function.

MAN. (Manual) Enables manual mode.

t.H.M.A. (Thermoregulator and Manual) Enables both simple thermoregulator and manual function.

17 *H.L.d.F.* Hold Function

Enables "Hold" function; allows to hold the cycle and modify setpoint by keyboard.

d.i.S. (Disabled) "Hold" function disabled. > **Default.**

e.n. (Enabled) "Hold" function enabled.

18 *c.Y.A.u.* Cycles Available

Selects number of available cycles.

1...15 cycles. > **Default:** 15.

19 *b.P.r.c.* Block Programming Cycles

Selects number of cycles that the user cannot modify (these can be pre-programmed by the manufacturer/installer to avoid wrong programming).
Ex.: selecting 3 the programming of the first 3 cycles is locked.

0...15 locked cycles. > **Default:** 0.

20 *U.t.S.E.* Waiting Time Step End

Selects time for step end waiting in hh.mm.

00.00 Step end waiting excluded

00.01...24.00 hh.mm. > **Default:** 01.00.

21 *M.G.S.E.* Max. Gap Step End

Selects max. gap for step end waiting activation. When the difference between setpoint and process is lower than this parameter, the controller switches to the next step (also without waiting for the time programmed on parameter 36 *U.t.S.E.*)

0...200 degrees. > **Default:** 5.

22 *r.i.c.Y.* Recovery Interrupted Cycle

Enables the interrupted cycle recovery function.

0 Cycle recovery disabled

1 Cycle recovery enabled with automatic gradient. > **Default.**

2...1000 degrees/hour. Select recovery gradient.

23 *AL. 1* Alarm 1

Alarm 1 selection.

d.S. (Disabled). > **Default**.

R.AL. (Absolute Alarm). referring to the process

b.AL. (Band Alarm). Command setpoint \pm band

u.d.AL. (Upper Deviation Alarm). Command setpoint + deviation

l.d.AL. (Lower Deviation Alarm). Command setpoint - deviation

R.c.S.L. (Absolute Command Setpoint Alarm). Referring to the setpoint

St.AL. (Start Alarm). Active in RUN

End.R. (End Alarm). Active at cycle end

R.o.r.S. (Auxiliary Output Related to the Step). ON/OFF at each step

R.o.r.M. (Auxiliary Output Rising Maintenance). Auxiliary output active for rising and holding steps

R.o.F.R. (Auxiliary Output Falling). Auxiliary output active for falling steps.

24 *R.I.S.o.* Alarm 1 State Output

Selects contact type for alarm 1 output.

n.o. (Normally Open). > **Default**

n.c. (Normally Closed).

25 *R.I.Th.* Alarm 1 Threshold

Selects setpoint value for alarm 1.

-260...+3200 degrees. > **Default: 0.**

26 *R.I.HY.* Alarm 1 Hysteresis

Selects hysteresis for alarm 1.

-99.9...+99.9 tenths of degree. > **Default: 1.0.**

27 *R.I.SE.* Alarm 1 State Error

Contact status for alarm 1 output in case of error

o.c. (Open Contact) > **Default**

c.c. (Closed Contact)

28 *R.I.Ld.* Alarm 1 Led

Defines the status ON of led **A1** in correspondence of the relevant contact.

o.c. (Open Contact)

c.c. (Closed Contact) > **Default**

29 *A.A.E.* Alarm 1 Action Type

Defines alarm action type on operating cycle

no.Ac. (No Action). Changes only output related to the alarm. > **Default.**

E.c.Y.S. (End Cycle Signal). Cycle ends (STOP) with acoustic and visual signalling. Changes output related to the alarm, buzzer sounds and on display flashes *AL* $\bar{1}$, until pressing OK.

A.u.S.i. (Audible Signal), Only acoustic signalling: buzzer sounds.

10.2 2nd level parameters (for expert operators)

40 *c.FLt.* Conversion Filter

Adc filter: number of means on analogue-digital conversions.

1...15 samplings. > **Default:** 10.

41 *S.SP.u.* Starting Setpoint

Enables cycle starting setpoint to guarantee the programmed gradient for the first step.

d.i.S. (Disabled) Cycle starting setpoint disabled.

En. (Enabled) Cycle starting setpoint selectable by the user.

En.A.t. (Enabled Ambient Temperature) Fixed cycle starting setpoint (25°C). > **Default.**

42 *chro.* Chronometer

Enables chronometer: with cycle in execution it shows the time elapsed from cycle start; with cycle in **STOP** it visualizes the duration of the last cycle. At switch-off it is reset to zero.

d.i.S. (Disabled) > **Default**

En. (Enabled)

43 *POU.c.* Power Consumption

This parameter defines the power of the heating group controlled by the device. If the value selected is different from 0.0, pressing STEP (when no cycle is in execution), it is possible to visualize the employed power consumption (Kwatt/hour) of the last cycle. At switch-off value is lost.

0.0...999.9 KWatt/h. > **Default** 0.0.

46 *o.FEY* On/Off Key

Sets ON/OFF key functioning.

d.S. (Disabled). ON/OFF key not working.

cnEd (Countdown). Pressing ON/OFF for 3" the device switches-off visualizing a countdown. The restart is done pressing the key for 1".
> **Default.**

FRSt (Fast). Press ON/OFF for 1" to switch on/off the controller.

47 *LEd.n.* Led Mode

Sets led visualization.

FL.9 (Full 9). Each led corresponds to a step and flashes during its execution. It is lighted for steps already executed. Starting from the ninth step, the last led is always flashing.

FL.18 (Full 18). Each led corresponds to a step and flashes during its execution. It is lighted for steps already executed. Starting from the eighteenth step, the last led is always flashing.

SGL.9 (Single 9). Each led corresponds to a step and it is lighted during its execution. Starting from the tenth step, the last led is always flashing.

48 *cY.1.n.* Cycle 1 Name

Sets name of cycle 1.

49 *cY.2.n.* Cycle 2 Name

Sets name of cycle 2.

50 *cY.3.n.* Cycle 3 Name

Sets name of cycle 3.

51 *cY.4.n.* Cycle 4 Name

Sets name of cycle 4.

52 *cY.5.n.* Cycle 5 Name

Sets name of cycle 5.

cY.01 > **Default.**

b.S.c. Biscuit

ENR.i. email

GrES

FuSE

53 П.Г.Г. Max Gap Tune

Selects the max. process-setpoint gap, beyond which the automatic tune recalculates P.I.D. parameters.

0.1...50.0 tenths of degree. > **Default:** 1.0.

54 П.П.б. Minimum Proportional Band

Selects the proportional band min. value selectable by automatic tune.

0.0...999.9 tenths of degree. > **Default:** 5.0.

55 П.П.б. Maximum Proportional Band

Selects the proportional band max. value selectable by automatic tune.

0.0...999.9 tenths of degree. > **Default:** 50.0.

56 П.И.т. Minimum Integral Time

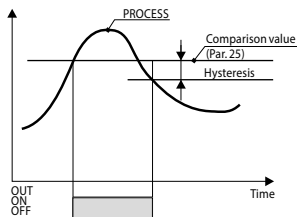
Selects the integral time min. value selectable by automatic tune.

0...999.9 seconds. > **Default:** 10.0.

11 Alarm intervention modes

The ATR902 has the possibility to program an alarm. Into the following table all intervention modes are showed.

11.a Absolute alarmg

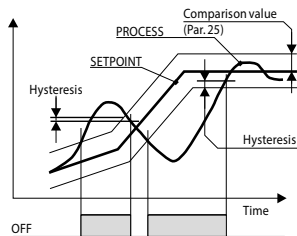


Alarm can be:

- Active over
- Active under

In the figure it is active over.

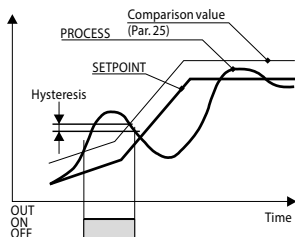
11.b Band alarm (setpoint-process)



- Alarm can be:
- Active outside
 - Active inside

In the figure it is active outside.

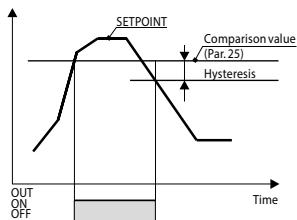
11.c Deviation alarms



- Alarm can be:
- Upper deviation
 - Lower deviation

In the figure it is upper deviation.

11.d Independent alarm referring to the setpoint

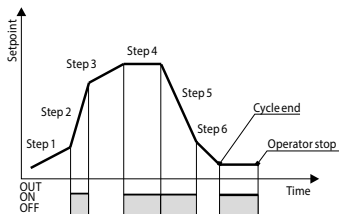


- Alarm can be:
- Active over
 - Active under

In the figure it is active on.

Each intervention can be related to a cycle lock and/or to an acoustic signalling.

11.e Auxiliary output related to the step



ON/OFF status of the auxiliary output is selectable for each step of each cycle. The status can be selected also at cycle end.

12 Table of Anomaly Signals

If installation malfunctions, controller switches off regulation output and reports the anomaly.

For example, controller will report failure of a connected thermocouple visualizing E-05 (flashing) on display. For other signals see table below:

| Cause | How to do |
|--|---|
| E-01 545.E. Error in EEPROM cell programming. | Call Assistance. |
| E-03 EEP.E. Incorrect cycle data. | Riprogrammare il ciclo |
| E-04 545.E. Incorrect configuration data. Possible loss of instrument calibration. | Verify that configuration parameters are correct. |
| E-05 Prb.1 Sensor connected to AI1 broken or temperature out of range. | Control connection with probes and their integrity. |
| E-08 545.E. Missing calibration. | Call Assistance. |
| E-11 545.E. Cold junction sensor failure or room temperature outside of allowed limits. | Call Assistance. |

Table of configuration parameters

| | | | |
|----|-----------------|----------------------------|----|
| 1 | <i>SEn.</i> | Sensor | 23 |
| 2 | <i>o.cAL.</i> | Offset Calibration | 23 |
| 3 | <i>G.cAL.</i> | Gain Calibration | 23 |
| 4 | <i>uPLS.</i> | Upper Limit Setpoint | 23 |
| 5 | <i>dEGr.</i> | Degree | 23 |
| 6 | <i>tunE</i> | Tune | 23 |
| 7 | <i>S.d.t.u.</i> | Setpoint Deviation Tune | 23 |
| 8 | <i>c. HY.</i> | Command Hysteresis | 24 |
| 9 | <i>P.b.</i> | Proportional Band | 24 |
| 10 | <i>t.i.</i> | Integral Time | 24 |
| 11 | <i>t.d.</i> | Derivative Time | 24 |
| 12 | <i>t.c.</i> | Cycle Time | 24 |
| 13 | <i>c. S.E.</i> | Command State Error | 24 |
| 14 | <i>u.i.d.2</i> | Visualization Display 2 | 24 |
| 15 | <i>dE.St.</i> | Delayed Start | 24 |
| 16 | <i>SP.Fu.</i> | Special Functions | 25 |
| 17 | <i>H.Ld.F.</i> | Hold Function | 25 |
| 18 | <i>cY.Av.</i> | Cycles Available | 25 |
| 19 | <i>b.Pr.c.</i> | Block Programming Cycles | 25 |
| 20 | <i>U.t.S.E.</i> | Waiting Time Step End | 25 |
| 21 | <i>M.G.S.E.</i> | Max. Gap Step End | 25 |
| 22 | <i>r.i.cY.</i> | Recovery Interrupted Cycle | 25 |
| 23 | <i>AL. 1</i> | Alarm 1 | 26 |
| 24 | <i>A.1S.o.</i> | Alarm 1 State Output | 26 |
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| 26 | <i>A.1HY.</i> | Alarm 1 Hysteresis | 26 |
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| 28 | <i>A.1Ld.</i> | Alarm 1 Led | 26 |
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| 40 | <i>c.FLE.</i> | Conversion Filter | 27 |
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| 42 | <i>chro.</i> | Chronometer | 27 |
| 43 | <i>POU.c.</i> | Power Consumption | 27 |
| 46 | <i>o.FEY</i> | On/Off Key | 28 |
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| 48 | <i>cY.1.n.</i> | Cycle 1 Name | 28 |

| | | | |
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| 49 | <i>c42.n.</i> | Cycle 2 Name | 28 |
| 50 | <i>c43.n.</i> | Cycle 3 Name | 28 |
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| 53 | <i>n.g.t.u.</i> | Max Gap Tune | 29 |
| 54 | <i>n.p.b.</i> | Minimum Proportional Band | 29 |
| 55 | <i>na.p.b.</i> | Maximum Proportional Band | 29 |
| 56 | <i>n.i.t.</i> | Minimum Integral Time | 29 |



Read carefully the safety guidelines and programming instructions contained in this manual before using/connecting the device.

Prima di utilizzare il dispositivo leggere con attenzione le informazioni di sicurezza e settaggio contenute in questo manuale.

Avant d'utiliser le dispositif lire avec attention les renseignements de sûreté et installation contenus dans ce manuel.

Antes de usar el dispositivo leer con atención las instrucciones y las medidas de seguridad contenidas en este manual.

Vor der Inbetriebnahme/Verwendung dieses Reglers bitte die in dieser Anleitung enthaltenen Sicherheitshinweise und Angaben sorgfältig lesen.



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