ATR244

Controller

User manual

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1   Introduction

The process controller ATR244 stands out for the bright display which ensures optimal visibility and increased level of information for the operator beside a scrolling Help function.

ATR244 relies on Pixsys flagship programming mode by NFC/RFID technology with dedicated App MyPixsys for Android devices (same already used for Pixsys signal converters and STR indicators) not requiring wirings and power supply, allowing quick set-up/updates on site.

Availability include a model with dual analogue input and dual analogue output for maximum flexibility of applications. It is possible to achieve two separate heating/cooling PID control loops in one device or to handle mathematical operations between two process values.

The outputs can be selected as command/multiple alarm modes/analogue retransmission. Serial communication standard is RS485 with Modbus RTU/Slave protocol. Useful power supply with extended range 24 to 230VAC / VDC with galvanic insulation of the net for the single loop version, while the model with double analogue input provides two versions: 115 / 230 VAC or 24 VAC / VDC.

2   Safety guidelines

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

Disconnect power supply before proceeding to hardware settings or electrical wirings to avoid risk of electric shock, fire, malfunction.

Do not install/operate the device in environments with flammable/explosive gases.

This device has been designed and conceived for industrial environments and applications that rely on proper safety conditions in accordance with national and international regulations on labour and personal safety. Any application that might lead to serious physical dama ge/ life risk or involve medical life support devices should be avoided.

Device is not conceived for applications related to nuclear power plants, weapon systems, flight control, mass transportation systems.

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

Do not dismantle/modify/repair any internal component.

Device must be installed and can operate only within the allowed environmental conditions. Overheating may lead to risk of fire and can shorten the lifecycle of electronic components.

2.1   Organization of safety notices

Safety notices in this manual are organized as follows:

Safety notice	Description
Danger!	Disregarding these safety guidelines and notices can be life-threatening.
Warning!	Disregarding these safety guidelines and notices can result in severe injury or substantial damage to property.
Information!	This information is important for preventing errors.

2.2   Safety Precautions

This product is UL listed as open type process control equipment.	Danger!
If the output relays are used past their life expectancy, contact fusing or burning may occasionally occur. Always consider the application conditions and use the output relays within their rated load and electrical life expectancy. The life expectancy of output relays varies considerably with the output load and switching conditions.	Danger!
Loose screws may occasionally result in fire. For screw terminals of relays and of power supply, tighten screws to tightening torque of 0,51 Nm. For other terminals, tightening torque is 0,19 Nm	Warning!

A malfunction in the Digital Controller may occasionally make control operations impossible or prevent alarm outputs, resulting in property damage. To maintain safety in the event of malfunction of the Digital Controller, take appropriate safety measures, such as installing a monitoring device on a separate line.	Warning!

2.3 Precautions for safe use

Be sure to observe the following precautions to prevent operation failure, malfunction, or adverse affects on the performance and functions of the product. Not doing so may occasionally result in unexpected events. Do not handle the Digital Controller in ways that exceed the ratings.

- The product is designed for indoor use only. Do not use or store the product outdoors or in any of the following places.
  - Places directly subject to heat radiated from heating equipment.
  - Places subject to splashing liquid or oil atmosphere.
  - Places subject to direct sunlight.
  - Places subject to dust or corrosive gas (in particular, sulfide gas and ammonia gas).
  - Places subject to intense temperature change.
  - Places subject to icing and condensation.
  - Places subject to vibration and large shocks.
- Installing two or more controllers in close proximity might lead to increased internal temperature and this might shorten the life cycle of electronic components. It is strongly recommended to install cooling fans or other air-conditioning devices inside the control cabinet.
- Always check the terminal names and polarity and be sure to wire properly. Do not wire the terminals that are not used.
- To avoid inductive noise, keep the controller wiring away from power cables that carry high voltages or large currents. Also, do not wire power lines together with or parallel to Digital Controller wiring. Using shielded cables and using separate conduits or ducts is recommended. Attach a surge suppressor or noise filter to peripheral devices that generate noise (in particular motors, transformers, solenoids, magnetic coils or other equipment that have an inductance component). When a noise filter is used at the power supply, first check the voltage or current, and attach the noise filter as close as possible to the Digital Controller. Allow as much space as possible between the Digital Controller and devices that generate powerful high frequencies (high-frequency welders, high-frequency sewing machines, etc.) or surge.
- A switch or circuit breaker must be provided close to device. The switch or circuit breaker must be within easy reach of the operator, and must be marked as a disconnecting means for the controller.
- The device must be protected by a fuse 1A (cl. 9.6.2).
- Wipe off any dirt from the Digital Controller with a soft dry cloth. Never use thinners, benzine, alcohol, or any cleaners that contain these or other organic solvents. Deformation or discoloration may occur.
- The number of non-volatile memory write operations is limited. Therefore, use EEprom write mode when frequently overwriting data, e.g.: through communications.

2.4 Environmental policy / WEEE

Do not dispose electric tools together with household waste material.
According to European Directive 2002/96EC 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.

3   Model Identification

The ATR244 series includes 4 versions:

Models with power supply 24..230 VAC/VDC ±15% 50/60 Hz – 6 Watt/VA	
ATR244-12ABC	1 analogue input + 2 relays 2 A + 2 SSR + 2 D.I. + 1 analogue output V/mA
ATR244-12ABC-T	1 analogue input + 2 relays 2 A + 2 SSR / D.I. + 1 analogue output V/mA + RS485
ATR244-13ABC	1 analogue input + 3 relays 2 A + 2 SSR + 2 D.I. + 1 analogue output V/mA
Model with power supply 24 VAC/VDC ±15% 50/60 Hz – 6 Watt/VA	
ATR244-23A-T	2 analogue input + 3 relays 2 A + 2 SSR + 2/4 D.I. + 2 analogue output V/mA + RS485 + CT
Model with power supply 115..230 VAC ±15% 50/60 Hz – 6 Watt/VA	
ATR244-23BC-T	2 analogue input + 3 relays 2 A + 2 SSR + 2/4 D.I. + 2 analogue output V/mA + RS485 + CT

4   Technical Data
4.1   General Features

Displays	4 digits 0,52'', 5 digits 0,30''
Operating temperature	Temperature: 0-45° C -Humidity 35..95 uR%
Sealing	IP65 front panel (with gasket) - IP20 box and terminals (UL not evaluated)
Material	Box and front panel: PC UL94V2 self-extinguishing
Weight	Approx. 185 g

4.2   Hardware Features

Analogue inputs	**AI1 – AI2:** Configurable via software. **Input**: Thermocouple type K, S, R, J,T,E,N,B. Automatic compensation of cold junction from -25…85° C. **Thermoresistances**: PT100, PT500, PT1000, Ni100, PTC 1K, NTC 10K (β 3435K) **Input V/mA**: 0-1 V, 0-5 V, 0-10 V, 0-20 o 4-20 mA, 0-60 mV. **Pot. Input**: 1...150 KΩ. **CT**: 50 mA.	Tolerance (25° C) ± 0.2% ±1 digit (on F.s.) for thermocouple, thermoresistance and V/mA. Cold junction accuracy 0.1° C/°C. **Impedence**: **0-10 V**: Ri>110 KΩ **0-20 mA**: Ri<5 Ω **0-40 mV**: Ri>1 MΩ
Relay outputs	Configurable as command and alarm output.	Contacts: 2 A - 250 VAC Resistive load.
SSR output	Configurable as command and alarm output.	12/24 V, 25 mA.
Analogue outputs	Configurable as command and alarm output or as retransmission of process / setpoints.	Configurable: **0-10 V** with 40000 points +/-0.2% (on F.s.) **4-20 mA** con 40000 points +/-0.2% (on F.s.)
Power-supply	**For ATR244-12xxx and ATR244-13ABC**: Extended power-supply 24..230 VAC/VDC ±15% 50/60 Hz **For ATR244-23A-T:** 24 VAC/VDC ±15% 50/60 Hz **For ATR244-23BC-T:** 115..230 VAC ±15% 50/60 Hz	**Consumption:** **ATR244-12ABC:** 6 Watt/VA **ATR244-12ABC-T:** 9 Watt/VA **ATR244-13ABC:** 8 Watt/VA **ATR244-23A-T:** 7 Watt/VA **ATR244-23BC-T:** 12 Watt/VA

## 4.3   Software Features

Regulation algorithms	ON-OFF with hysteresis. - P, PI, PID, PD with proportional time
Proportional band	0..9999°C o °F
Integral time	0,0..999,9 sec (0 excludes)
Derivative time	0,0..999,9 sec (0 excludes)
Controller functions	Manual or automatic Tuning, selectable alarm, protection of command and alarm setpoints.

4.4   Programming mode

by keyboard	..see paragraph *12*
software LabSoftview	..on *"Download section"* of official pixsys site: www.pixsys.net
App MyPixsys	..through download the App on Google Play Store®, see paragraph *11*
	When activated by a reader/interrogator supporting NFC-V protocol, controller ATR244 is to be considered a VICC (Vicinity Inductively Coupled Card) according to ISO/IEC 15693 and it operates at a frequency of 13.56 MHz. **The device does not intentionally emit radio waves**.

5   Dimensions and Installation
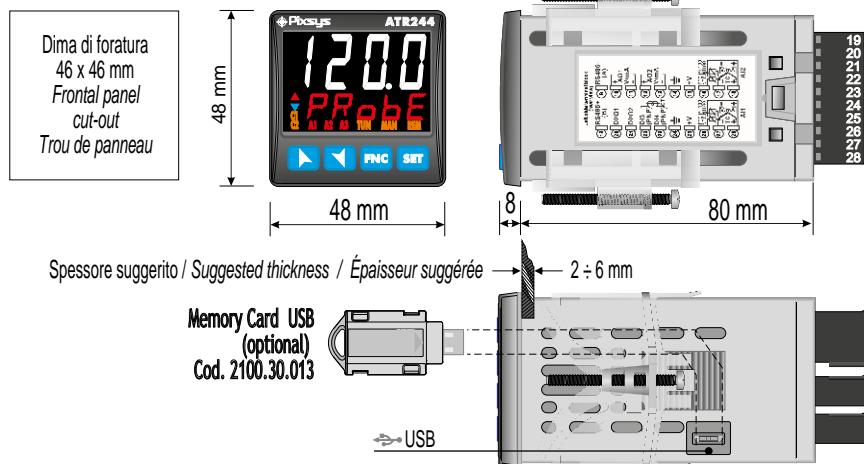
6   Electrical wirings

This controller 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.
• 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.

• Wiring of pins 1...8 on ATR244-12ABC, ATR244-12ABC-T or ATR244-13ABC: use crimped tube terminals or flexible/rigid copper wire with diameter 0.2 to 2.5 mm2 (min. AWG28, max. AWG12, operating temperature: min. 70°C). Cable stripping lenght 7 to 8 mm.

- Wiring of pins 9...19 on ATR244-12ABC, ATR244-12ABC-T or ATR244-13ABC: use crimped tube terminals or flexible/rigid copper wire with diameter 0.2 to 1.5 mm2 (min. AWG28, max. AWG14, operating temperature: min. 70°C). Cable stripping lenght 6 to 7 mm.
- Wiring of pins 1...8 on ATR244-23xx-T: use crimped tube terminals or flexible/rigid copper wire with diameter 0.2 to 2.5 mm² (min. AWG26, max. AWG12, operating temperature: min. 70°C). Cable stripping lenght 10 to 11 mm.
- Wiring of pins 9...28 on ATR244-23xx-T: use crimped tube terminals or flexible/rigid copper wire with diameter 0.5 to 1 mm² (min. AWG24, max. AWG16, operating temperature: min. 70°C). Cable stripping lenght 7 to 8 mm.

6.1 Wiring diagram

6.1.a Power Supply

	For ATR244-12ABC, ATR244-12ABC-T and ATR244-13ABC Switching power supply 24..230 VAC/VDC ±15% 50/60 Hz - 6 Watt/VA. Galvanic insulation (on all versions).
	For ATR244-23A-T Switching power supply 24 VAC/VDC ±15% 50/60 Hz - 6 Watt/VA. Galvanic insulation.
	For ATR244-23BC-T Switching power supply 115..230 VAC ±15% 50/60 Hz - 6 Watt/VA. Galvanic insulation.

6.1.b   Analogue Input AI1

ATR244-12x and ATR244-13
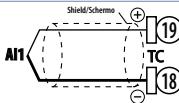
ATR244-23x

For thermocouples K, S, R, J, T, E, N, B.
- Comply with polarity
- For possible extensions, use compensated cable and terminals suitable for the thermocouples used (compensated).
- When shielded cable is used, it should be grounded at one side only.

ATR244-12x and ATR244-13

ATR244-23x
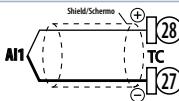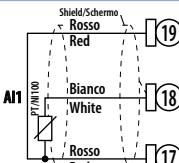
For thermoresistances PT100, Ni100.
- For the three-wire connection use wires with the same section.
- For the two-wire connection short-circuit terminals 17 and 19 (version -12x and -13) or 26 and 28.
- When shielded cable is used, it should be grounded at one side only.
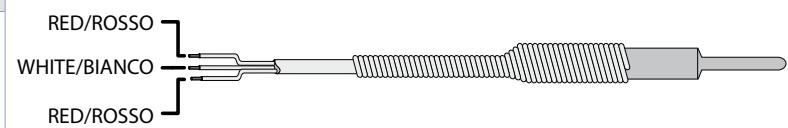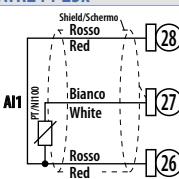
ATR244-12x and ATR244-13
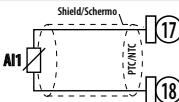
ATR244-23x

For thermoresistances NTC, PTC, PT500, PT1000 and linear potentiometers.
When shielded cable is used, it should be grounded at one side only to avoid ground loop currents.

ATR244-12x and ATR244-13
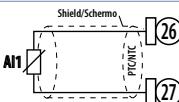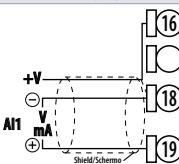
ATR244-23x

For linear signals in Volt and mA
- Comply with polarity
- When shielded cable is used, it should be grounded at one side only to avoid ground loop currents.
- It's possible to select +V at 12Vdc or 24Vdc, by configuring parameter 282 u.out (GROUP R - d iSP. - Display and interface).
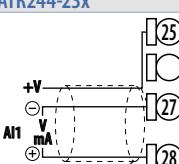
6.1.c	Analogue Input AI2 (only ATR244-23x)

For thermocouples K, S, R, J, T, E, N, B.
- Comply with polarity
- For possible extensions, use compensated cable and terminals suitable for the thermocouples used (compensated).
- When shielded cable is used, it should be grounded at one side only.

For thermoresistances PT100, Ni100.
- For the three-wire connection use wires with the same section.
- For the two-wire connection short-circuit terminals 16 and 18.
- When shielded cable is used, it should be grounded at one side only.

For thermoresistances NTC, PTC, PT500, PT1000 and linear potentiometers.
When shielded cable is used, it should be grounded at one side only to avoid ground loop currents.

For linear signals in Volt and mA
- Comply with polarity
- When shielded cable is used, it should be grounded at one side only to avoid ground loop currents.
- To power the sensor connected to AI2 through +V (terminal 15 or 25), short-circuit 0 V (terminal 14 or 24) with AI2 ground input (terminal 17).
- + V at 12Vdc or 24Vdc can be selected by configuring parameter 282 u.out (GROUP R - d i5P. - Display and interface).

6.1.d	Ingresso CT (only on ATR244-13ABC and 23xx-T)

13ABC	23x	
		To enable CT input, modify parameter 287 ct F. • Input for 50 mA amperometric transformer. • Sampling time 100 ms. • Configurable by parameters.

6.1.e	Digital inputs

12/13 ABC	12ABC-T	23x	
			Digital inputs can be enabled by parameters. Close pin "DIx" on pin "+V" to enable digital input. It is possible to put in parallel the digital inputs of different devices joining togheter the 0V pins (15).

6.1.f	Serial inputs (only ATR244-xxxxx-T)
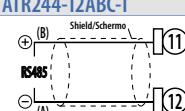
ATR244-12ABC-T	
	Modbus RS485 communication. RTU Slave with galvanic insulation.
ATR244-23x	
	It is recommended to use the twisted and shielded cable for communications.
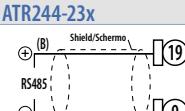
6.1.g Digital outputs
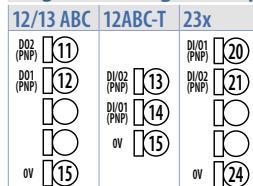
12/13 ABC	12ABC-T	23x	
DO2 (PNP) [11] DO1 (PNP) [12] ○ ○ 0V [15]	DI/O2 (PNP) [13] DI/O1 (PNP) [14] 0V [15]	DI/O1 (PNP) [20] DI/O2 (PNP) [21] ○ ○ 0V [24]	Digital output PNP (including SSR) for command or alarm. Range 12 VDC/25 mA or 24 VDC/15mA selectable by parameter 282 ∪.out.

6.1.h Analogue output AO1

ATR244-12x and ATR244-13 ⊕ —[9] AO1 V/mA ⊖ —[10]	Linear output in **mA** or **V** (galvanically isolated) configurable as command, alarm or retransmission of process-setpoint.
ATR244-23x ⊕ —[10] AO1 V/mA ⊖ —[11]	The selection mA or Volt for the linear output depends on the parameters configuration.

6.1.i Analogue output AO2 (only ATR244-23xx-T)

⊕ —[12] AO2 V/mA ⊖ —[13]	Linear output in **mA** or **V** (galvanically isolated) configurable as command, alarm or retransmission of process-setpoint.
	The selection mA or Volt for the linear output depends on the parameters configuration.

6.1.j Relay output Q1

[3] [4] Q1 2A 230V Resistive [5]	Capacity 2 A / 250 VAC for resistive loads. See chart below.

6.1.k Relay output Q2 (only ATR244-12x)

[7] [8] Q2 2A 230V Resistive	Capacity 2 A / 250 VAC for resistive loads. See chart below.

6.1.l Relays output Q2 - Q3 (only on ATR244-13ABC and ATR244-23xx-T)
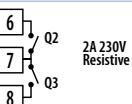
[6] Q2 [7] 2A 230V Resistive [8] Q3	Capacity 2 A / 250 VAC for resistive loads. See chart below.
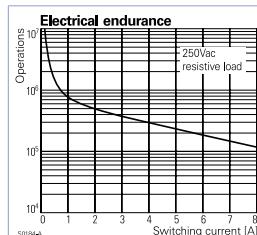
Electrical endurance Q1, Q2 e Q3:
2 A, 250 VAC, resistive loads, 10^5 operations.
20/2 A, 250 VAC, cosφ = 0.3, 10^5 operations.

7 Display and Key Functions

7.1 Numeric Indicators (Display)

1	*1234*	Normally displays the process. During the configuration phase, it displays the parameter being inserted.
2	*ProbE*	Normally displays the setpoint. During the configuration phase, it displays the parameter value being inserted.

7.2 Meaning of Status Lights (Led)

3	C1	ON when the command output 1 is active. In versions with single analog input, it is ON when the valve is opening. In the versions with two analog inputs, in case of command 1 on the motorized valve, it is permanently ON when the valve is opening and flashing during the closing phase.
4	C2	ON when the command output 2 is active. In versions with single analog input, it is ON when the valve is opening. In the versions with two analog inputs, in case of command 2 on the motorized valve, it is permanently ON when the valve is opening and flashing during the closing phase.
5	A1	ON when alarm 1 is active.
6	A2	ON when alarm 2 is active.
7	A3	ON when alarm 3 is active.
8	TUN	ON when the controller is executing an auto-tuning cycle.
9	MAN	ON when "Manual" function is active.
10	REM	ON when the controller communicates through serial. Flashes when the remote setpoint is enabled.

7.3 Keys

11	▲	• Increases the main setpoint. • During configuration allows to scroll the parameters or the groups of parameters. • Increases the setpoints.
12	▼	• Decreases the main setpoint. • During configuration allows to scroll the parameters or the groups of parameters. • Decreases the setpoints.
13	SET	• Allows to visualize command and alarm setpoints. • During configuration allows to enter the parameter to be modified and confirms the variation.
14	FNC	• Allows to enter the Tuning launch function, automatic/manual selection. • During configuration works as exit key (ESCAPE).
15	▲	• ON during the rising phase of the pre-programmed cycle;
	▼	• ON during the falling phase of the pre-programmed cycle;
	▲▼	• Both ON during parameter modification, when this is not a default value.

8 Dual input mode

Each ATR401 model is provided with two analogue inputs: it is possible to do mathematic operations between 2 measured process values, correlating obtained result to the command or alarm outputs, or to give a process value as remote setpoint. It is also possible to use the controller for 2 independent control loops.

8.1 Selection of process value related to the command output and to the alarms

When second analogue input is enabled (par.18 *SEn.2* other than *d iSAb.*) it is possible to choose the process value to be related to command output, to alarms and to retransmission.
Following options are available:
- *A. in.1*: Value read by input AI1;
- *A. in.2*: Value read by input AI2;
- *MEAn*: Mean between inputs AI1 and AI2;
- *d iFF.*: Difference between inputs: AI1-AI2;
- *Ab.d iF*: Difference between inputs as absolute value: AI1-AI2;
- Command 1 process must be selected on parameter 36 *c.Pr.1*
- Command 2 process must be selected on parameter 55 *c.Pr.2*
- The process related to the alarms must be selected on par. 124 *A.1.Pr.* for the alarm 1, on par. 142 *A.2.Pr.* for the alarm 2, on par. 160 *A.3.Pr.* for the alarm 3, and on par. 178 *A.4.Pr.* for the alarm 4, on par. 196 *A.5.Pr.* for the alarm 5 and on par. 214 *A.6.Pr.* for the alarm 6.
- The value to be retransmitted must be selected on par. 299 *rtM.1* and/or on par. 308 *rtM.2*.

It is possible to choose what to visualize on display 2 selecting par. 278 *u i.d.2*.

8.2 Remote setpoint by analogue input

It is possible to enable remote setpoint function setting *EnAb.* or *En.tSt.* on par. 56 *rEM.S.*

The command setpoint is read on the second analog input AI2: on par. 55 *c.Pr.2* set *A. in.2*. The inputs reversal is possible by setting *A. in.1* on par. 55 *c.Pr.2*. Selecting *En.tSt.* on par. 56 *rEM.S.* it is possible to switch from remote to local setpoint pressing **SET** for 1 second. The selection is stored even after the subsequent device restarts. In remote setpoint mode the led **REM** is ON, it flashes when switching to local setpoint mode.

The decimal point setting parameter for the image input (or remote setpoint) is locked and modifies automatically when the command input decimal point is changed.

8.3 Remote setpoint by serial input

It is possible to enable remote setpoint function selecting *En.SEr.* or *En.SE.t.* on par. 56 *rEM.S.* The remote setpoint must be written on the word modbus 1249 for the command 1 and 1250 for the command 2 (with tenth of degree if the command process is a temperature sensor).
It is possible to switch from remote to local sepoint pressing **SET** for 1 second. In remote setpoint mode the led **REM** is ON (if there is serial communication), it flashes when switching to local setpoint mode.
At restarting the controller keeps set in remote setpoint mode (the setpoint value is initialized to 0).

9   Controller Functions
9.1   Modification of main and alarm setpoint value

Setpoint value can be modified from keyboard as follows:

	Press	Display	Do
1	▲▼	Value on display 2 changes.	Increases or decreases the main setpoint value.
2	**SET**	Visualizes the other setpoints on display 1. Display 2 shows the setpoint type.	
3	▲▼	Value on display 1 changes.	Increases or decreases the alarm setpoint value.

9.2   Automatic Tune

Automatic tuning procedure allows a precise regulation without delving into the PID regulation algorithm. Selecting Auto on par. 73 *tun.1* (for the regulation loop 1), or on par. 98 *tun.2* (for the regulation loop 2), the controller analyzes the proces oscillations and optimizes the PID parameters. Led **TUN** flashes.

If the PID parameters are not yet selected, at the device switch-on, it is automatically launched the manual Tuning procedure described into the next paragraph.

9.3   Manual Tune

Manual procedure allows the user greater flexibility to decide when to update
PID algorithm parameters. During the manual tuning, the device generates a step to analyze the system inertia to be regulated and, according to the collected data, modifies PID parameters.
After selecting *MAnu.* on par. 73 *tun.1*, or on par. 98 *tun.2*, the procedure can be activated in three ways:

- **Running Tuning by keyboard:**
  Press **FNC** until display 2 shows tunE with display 1 on dis. and then press **SET**: display 1 shows Enab. Led **TUN** switches ON and the procedure starts.
- **Running Tuning by digital input:**
  Select tunE on par. 231 *d.i1F.* (or on par. 239 *d.i2F.*, par. 247 *d.i3F.*, par. 255 *d.i4F.*). At first activation of digital input (commutation on front panel) led **TUN** led switches on and at second activation switches off.
- **Running Tuning by serial input:**
  Write 1 on word modbus 1216 (command 1) or 1217 (command 2): led **TUN** switches ON and the procedure starts. Write 0 to stop the tuning.

To avoid an overshoot, the treshold where the controller calculates new PID parameters is determined by this operation:
Tune threshold = Setpoint - *"Set Deviation Tune"* (par. 74 *S.d.t.1* or par. 99 *S.d.t.2*)
Ex.: if the sepoint is 100.0∞C and the Par.32 *S.d.t.1* is 20.0∞C the threshold to calculate PID parameters is (100.0 - 20.0) = 80.0∞C.
For a greater precision on PID parameters calculation it is suggested to start the manual tuning procedure when the process deviates from the setpoint.

9.4   Tuning once

Set *oncE* on parameter 73 *tun.1*, or on parameter 98 *tun.2*.
Autotuning procedure is executed only once at next ATR244 restart. If the procedure doesn't work, will be executed at next restart.

9.5 Synchronized tuning

Set 5�ᶰᴄʰ. on parameter 73 ᵗᵘⁿ.ᴵ or on parameter 98 ᵗᵘⁿ.²².
This procedure has been conceived to calculate correct PID values on multi-zone systems, where each temperature is influenced by the adjacent zones.
Writing on word modbus 1216 (for regulation loop 1) or 1217 (for regulation loop 2) the controller works as follows:

Word value	Action
0	Tune off
1	Command output OFF
2	Command output ON
3	Tune active
4	Tune completed: command output OFF (read only)
5	Tune not available: softstart function enabled (only reading)

Here below the functioning for regulation loop 1: the master switches-off or turns-on all zones (value 1 or 2 on word 1216) for a time long enough to create inertia on the system.
At this point the autotuning is launched (value 3 on word 1216). The controller executes the procedure for the calculation of the new PID values. When the procedure ends, the controller switches off the command output and selects the value 4 on word 1216. The master, who will always read the word 1216, will control the various zones and when all will have finished, will bring to 0 the value of word 1216: the various devices will regulate the temperature independently, with the new calculated values.
N.B. The master must read the Index 0x400E at least every 10 seconds or the controller will automatically exit the autotuning procedure.

9.6 Digital input functions

The ATR244 functions related to digital inputs, can be enabled by parameters 231 d.ı.IF., 239 d.ı2F., 247 d.ı3F. and 255 d.ı4F..

- 2ᵗ.5ᵁ.: Two threshold setpoint modification: with digital input active the ATR244 regulates on **SET**2, otherwise reulates on **SET**1;
- 2ᵗ.5ᵁ.ı: Modification of 2 setpoints by digital input with impulse command;
- 3ᵗ.5ᵁ.ı: Modification of 3 setpoints by digital input with impulse command,
- 4ᵗ.5ᵁ.ı: Modification of 4 setpoints by digital input with impulse command,
- 5ᵗ.ᵣ5ᵗ.: Start / Stop of the controller by digital input with impulse command,
- ᵣᵘⁿ.: The regulation is enabled only with digital input active,
- ᴴᵒᴸᵈ: With digital input active the conversion is locked (visualization maintenance function);
- ᵗᵘⁿᴱ: Enables/disables the Tuning if par. 73 ᵗᵘⁿ.ᴵ or par. 98 ᵗᵘⁿ.² is selected as ᴹᴬⁿᵘ.;
- ᴬᵘ.ᴹᴬ.ı: If par. 48 ᴬ.ᴹᴬ.ᴵ or par. 67 ᴬ.ᴹᴬ.² is selected as ᴱⁿᴬᵇ. or ᴱⁿ.5ᵗᵒ. , with impulse command on digital input, the ATR244 switches the related regulation loop, from automatic to manual and vice versa.
- ᴬᵘ.ᴹᴬ.ᶜ: If par. 48 ᴬ.ᴹᴬ.ᴵ or par. 67 ᴬ.ᴹᴬ.² is selected as ᴱⁿᴬᵇ. or ᴱⁿ.5ᵗᵒ. the ATR244 switches to manual the related regulation loop, with digital input active, otherwise the regulation is automatic.
- ᴬᶜᵗ.ᵗᵞ.: On the regulation loop selected for this function (par. 234 d.ı.ır. or 242 d.ı2r. or 250 d.ı3r. or 258 d.ı4r.), the ATR244 execute a cooling type regulation with digital input active, otherwise the regulation is of heating type;
- ᴬ.ᵣ. 0: Zero tare function: brings the related analogue input to 0. The analogue input is selected on par. 233 d.ı.IP. or 241 d.ı2P. or 249 d.ı3P. or 257 d.ı4P.
- ᴹ.ᵣᴱ5.: Allows the reset of the output if manual reset is active for the alarms and for the command outputs selected on par. 234 d.ı.ır. or 242 d.ı2r. or 250 d.ı3r. or 258 d.ı4r;
- ᵗ.ᴵ.ᵣᵘⁿ: If timer 1 is enabled (par. 328 ᵗ̄ᴹᵣ.ᴵ different from dı5ᴬᵇ.), with digital input active, the timer is switched to RUN, otherwise is kept in STOP;
- ᵗ.ᴵ.5.ᴱ.: If timer 1 is enabled (par. 328 ᵗ̄ᴹᵣ.ᴵ different from dı5ᴬᵇ.), acting on the digital input, the status of the timer switches from STOP to RUN e vice versa;• ᵗ.ᴵ5ᵗᴬ.: If il timer 1 is enabled (par. 328 ᵗ̄ᴹᵣ.ᴵ differnet from dı5ᴬᵇ.), acting on the digital input, the timer is switched to RUN;
- ᵗ.ᴵ.ᴱⁿᵈ.: If il timer 1 is enabled (par. 328 ᵗ̄ᴹᵣ.ᴵ differnet from dı5ᴬᵇ.), acting on the digital input, the timer is switched to STOP;

- *t.2.run*: If timer 2 is enabled (par. 331 *tNr.2* different from *diSAb.*), with digital input active, the timer is switched to RUN, otherwise is kept in STOP;
- *t.2S.E.*: If timer 2 is enabled (par. 331 *tNr.2* different from *diSAb.*), acting on the digital input, the status of the timer switches from STOP to RUN e vice versa;
- *t.2StA.*: If timer 2 is enabled (par. 331 *tNr.2* different from *diSAb.*), acting on the digital input, the timer is switched to RUN;
- *t.2.End.*: If timer 2 is enabled (par. 331 *tNr.2* different from *diSAb.*), acting on the digital input, the timer is switched to STOP;
- *Lo.cFG.*: With digital input active, the access to setpoint configuration/modification is locked;
- *rEN.S.E.*: If on par. 56 *rEN.S.* it is selected *EnAb.* or *En.SEr.*), with digital input active the remote setpoint is enabled, otherwise the setpoint is local. On par. 234 *d.i.1.r.* or 242 *d.i.2.r.* or 250 *d.i.3.r.* or 258 *d.i.4.r.* it is necessary to select the reference regulation loop.

9.7 Automatic / Manual regulation for % output control

This function allows to switch from automatic functioning to manual command of the output percentage.

With par. 48 *A.NA.1.* (for regulation loop 1) or par. 67 *A.NA.2.* (for regulation loop 2) it is possible to select two modes.

1 **First selection** (*EnAb.*) allows to eneble with **FNC** the writing *P.---* on display 1, while on display 2 is showed *AutoN.*
   Press **SET** to visualize *NAnu.*; it's now possible, during the process visualization, modify through the keys **∧** and **∨** the output percentage. To back to automatic, with the same procedure, select *AutoN.* on display 2: immediately led **MAN** switches off and functioning backs to automatic.
2 **Second selection** (*En.Sto.*) enables the same functioning but with two important variants:
- If there is a temporary power failure or after switch-off, the manual functioning as well as the previous output percentage value will be maintained at restarting.
- If the sensor breaks during automatic functioning, the controller switches to manual mode while maintaining the output percentage command unchanged as generated by the PID immediately before breakage.
   Ex: on an extruder the command in percentage of the resistance (load) is maintained also in case of input sensor failure.

9.8 Heater Break Alarm on CT (current transformer - only on ATR244-13ABC and 23xx-T)

This function allows to measure load current to manage an alarm during a malfunctioning with power in short circuit, always open or partial break of the charge. To enable this function set *50 Hz* or *60 Hz* on par. 287 *ct F.* and the value of the connected transfomer, on par. 288 *ct u.*.
- Seletct on par. 289 *H.b.A.r.* the regulation loop referred to the current measure and the Heater Break Alarm intervention.
- Select on par. 290 *H.b.A.t.* the Heater Break Alarm intervention threshold in Ampere.
- Select on par. 291 *ocu.t.* the intervention threshold in Ampere to control the overcurrent.
- Select on par. 292 *H.b.A.d.* the delay time in seconds for the Heater Break Alarm intervention.
- It is possible to associate an alarm, selecting *H.b.A.* on par. 123 *AL.1F.* on par. 141 *AL.2F.* or par. 159 *AL.3F.* or par. 177 *AL.4F.* or par. 195 *AL.5F.* or par. 213 *AL.6F.*

It is possible to visualize on display 2 the average current, selecting *ANPEr.* on par. 278 *u.i.d.2.*
Selecting 0 on par. 290 *H.b.A.t.* it is possible to visualize the current consumption without generating an Heater Break Alarm.

9.9   Dual Action (Heating-Cooling)

ATR244 is suitable also for systems requiring a combined heating-cooling action.

The command output has to be configured as PID for Heating (Par. 38 $Ac.t.1$ or Par. 57 $Ac.t.2 = HEAt$ and $P.b.$ 1 or $P.b.$ 2 greater than 0), and one of the alarms ($AL.1F.$, $AL.2F.$, $AL.3.F.$, $AL.4.F.$, $AL.5.F.$ or $AL.5.F.$) has to be configured as $cool.$

The command output must be connected to the actuator responsible for heating, while the alarm will control cooling action.

Parameters to be configured for the heating PID are:

$Ac.t.1$ or $Ac.t.2 = HEAt$ Command output action type (Heating);

$P.b.$ 1 or $P.b.$ 2: Heating proportional band;

$ι.t.$ 1 or $ι.t.$ 2: Integral time of heating and cooling;

$d.t.$ 1 or $d.t.$ 2: Derivative time of heating and cooling;

$c.t.$ 1 or $c.t.$ 2: Heating time cycle.

Parameters to be configured for the cooling PID related to regulation loop 1 and alarm 1 are:

$AL.1F. = cool.$ Alarm 1 selection (Cooling);

$P.b.Π.1$: Proportional band multiplier;

$o.d.b.1$: Overlapping / Dead band;

$c.c.t.1$: Cooling time cycle.

Par. $P.b.Π.1$ (that renges from 1.00 to 5.00) determines the proportional band of cooling action basing on the formula:

Proportional band for cooling action = $P.b.$ 1 x $P.b.Π.1$

This gives a proportional band for cooling which will be the same as heating band if $P.b.Π.1 = 1.00$, or 5 times greater if $P.b.Π.1 = 5.00$.

Integral and derivative time are the same for both actions.

Par. $o.d.b.1$ determines the percentage overlapping between the two actions. For systems in which the heating output and cooling output must never be simultaneously active a Dead Band ($o.d.b.1 \le 0$), must be configured, vice versa you can configure an overlapping ($o.d.b.1 > 0$).

The following figure shows an example of dual action PID (heating-cooling) with $ι.t.$ 1 = 0 e $d.t.$ 1 = 0.
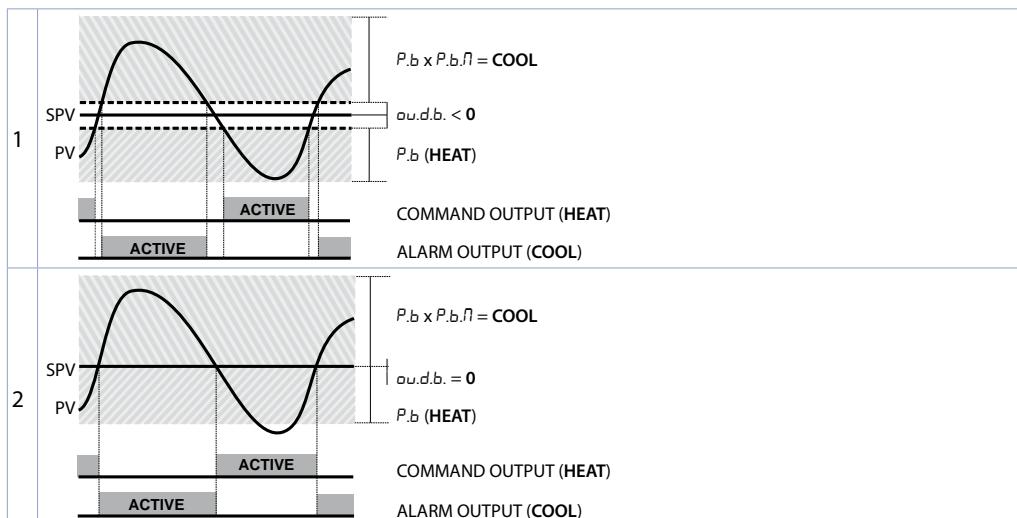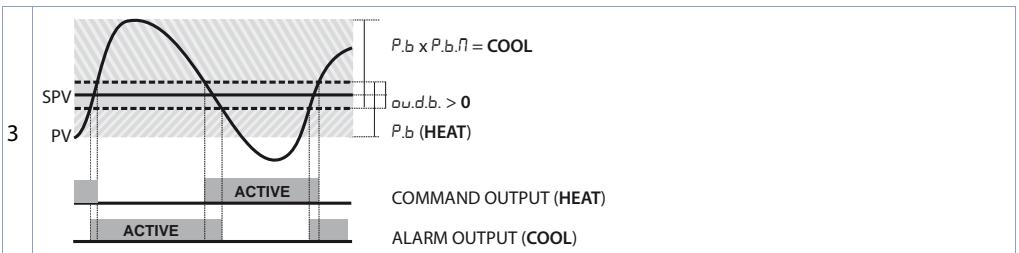
Parameter _c.c.t.1_ has the same meaning of cycle time for heating action _c.t. 1_.
Parameter _co.F.1_ (Cooling Fluid) pre-selects the proportional band multiplier _P.b.Π.1_ and the cooling PID cycle time _c.c.t.1_ according to cooling fluid type:

_co.F.1_	Cooling fluid type	_P.b.Π.1_	_c.c.t.1_
Air	Air	1.00	10
oiL	Oil	1.25	4
_H2o_	Water	2.50	2

Once parameter _co.F.1_ has been selected, the parameters _P.b.Π.1_, _o.d.b.1_ and _c.c.t.1_ can be however modified.

9.10   LATCH ON Function

For use with input _Pot._ and with linear input (0..10 V, 0..40 mV, 0/4..20 mA) t is possible to associate start value of the scale (par. 4 _LL.i.1_ or par. 21 _LL.i.2_) to the minimum position of the sensor and value of the scale end (par. 5 _uL.i.1_ or par. 22 _uL.i.2_) to the maximum position of the sensor (par. 10 _Ltc.1_ or par. 27 _Ltc.2_ configured as _Stndr_).
It is also possible to fi x the point in which the controller will display 0 (however keeping the scale range between _LL.i.1 / LL.i.2_ and _uL.i. 1 / uL.i.2_) using the _"virtual zero"_ option by selectin _u.0.Sto._ or _u.0.t.on._ on par. 10 _Ltc.1_ or 27 _Ltc.2_. Selecting _u.0.t.on._ the virtual zero must be reset at each switching on; selecting _u.0.Sto._ the virtual zero will remain fixed once calibrated. To use the LATCH ON function, configure the par. _Ltc.1_ or27 _Ltc.2_[1]

Then refer to the following table for the calibration procedure:

	Press	Display	Do
1	**FNC**	Exit parameters configuration. Display 2 visualizes writing _LAtc._	Place the sensor on minimum operating value (corresponding to _LL.i.1 / LL.i.2_)
2	▼	Store value on minimum. Display shows _LoU._	Place sensor on maximum operating value (corresponding to _uL.i.1 / uL.i.2_).
3	▲	Store value on max. Display shows _HiGh._	To exit standard proceeding press **SET**. For _"virtual zero"_ setting, place the sensor to zero point.
4	**FNC**	Set virtual zero. Display shows _2Ero._ If _"Virtual zero at start"_ is selected, point 4 must be repeated at each starting.	To exit procedure press **SET**.

---

1 _The tuning procedure starts by exiting the configuration after changing the parameter._

9.11 Soft-Start Function

ATR244 is provided with two types of softstart selectable on parameter 264 𝑆𝑆.𝑡𝑌. ("*Softstart Type*").

1 First selection (𝐺𝑟𝐴𝑑.) enables gradient softstart. AAt starting the controller reaches setpoint basing on the rising gradient set on parameter 266 𝑆𝑆.𝐺𝑟. ("*Softstart Gradient*") in Unit/hour (ex. °C/h). If parameter 269 𝑆𝑆.𝑡ı. ("*Softstart Time*") is diff erent to 0, at starting when the time selected on par. 269 is elapsed, the controller stops to follow the gradient and reaches setpoint with the maximum power.

2 Second selection (𝑃𝐸𝑟𝑐.) abilita enables output percentual softstart. On par. 268 𝑆𝑆.𝑡𝐻. it is possible to set the threshold under which starts the softstart ("*Softstart Threshold*"). On par. 267 𝑆𝑆.𝑃𝐸. ("*Softstart Percentage*") an output percentage is selectable (from 0 to 100), which controller keeps until the process exceeds the threshold set on par. 268 or until the time in minutes set on par. 269 𝑆𝑆.𝑡ı. ("*Softstart Time*" word 2084).

If the Sof-Start function is active the automatic/manual Tuning function cannot be activated.

9.12 Pre-Programmed cycle

Pre-programmed cycle function activates by setting 𝐸𝑁𝐴𝑏. on parameter 263 𝑃𝑟.𝑐𝑌..

Controller reaches setpoint 1 basing on the gradient set on parameter 266 𝑆𝑆.𝐺𝑟., then it reaches max. power up to setpoint 2. When the process reaches max. power, this setpoint is maintained for the time set on parameter 270 𝑀𝐴.𝑡.ı..

At expiry, process will reach ambient temperature according to gradient entered on parameter 271 𝐹𝐴.𝐺𝑟., then command output will be disabled and display will visualize 𝑆𝑡𝑜𝑃.
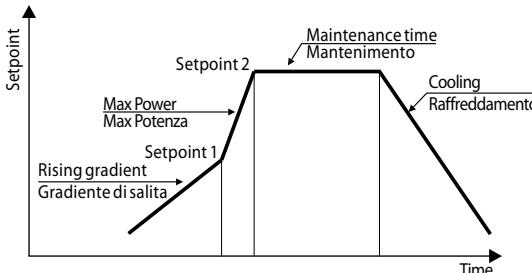
Cycle starts at each activation of the controller, or via digital input if it is enabled for this type of functioning (parameters 231, 239, 247, 255 set as 𝑆𝑡./𝑆𝑡. or 𝑅𝑢𝑁).

9.13 Retransmission function on analogue output

If not used as command, the analogue output can be used to retransmit process/ setpoint/ current read by the C.T. input/ output percentage.

Select on parameter 298 𝑟𝑡𝑁.1 ("*Retransmission 1*") or on parameter 308 𝑟𝑡𝑁2 ("*Retransmission 2*") the value to be retransmitted and on parameter 299 𝑟.1𝑡𝑌. ("*Retransmission 1 Type*") or on parameter 309 𝑟.2𝑡𝑌. ("*Retransmission 2 Type*") the output type.

It is possible also to select on parameters 300 𝑟.1𝐿𝐿. and 301 𝑟.1𝑢𝐿. or 310 𝑟2𝐿𝐿. and 311 𝑟2.𝑢𝐿. the input value rescale limites.

9.14   Timer functions

The ATR244 integrates two timers that can be independent, sequential or looped together.
Timer 1 is enabled on parameter 328 *tNr.1*; timer 2 on parameter 331 *tNr.2*:

ENAb.   the timer starts from the keyboard or digital input (user intervention is required)
EN.StA.   the timer starts counting when the regulator is in RUN.

The timer time-base set in *NN.55* or *hh.NN* by changing parameters 329 *t.b.t.1* for timer 1 and 332 *t.b.t.2* for timer 2.

In parameter 334 *tNrS.* can be define whether the timers should be independent or related to each other.

S.NGL.   The timers work independently of each other.
SEQuE.   When timer 1 ends, timer 2 starts. The sequence is active only by starting timer 1. When timer 2 expires, the sequence is interrupted.
LooP   When a timer ends, another starts: the sequence repeats itself cyclically.

To change the duration of the counting time, follow the steps below:

	Press	Display	Do
1	**SET**	Press until *t.N. 1* or *t.N. 2* visualized on display 1.	
2	**▲ ▼**	Digits on display 1 changes.	Increase or decrease time value for the selected timer.

To start the keyboard count follow the steps below:

	Press	Display	Do
1	**FNC**	Press until *t.N. 1* or *t.N. 2* visualized on display 2. Display 1 shows STOP if the timer is stopped, otherwise it shows the remaining time.	
2	**SET**	The timer stops if active or starts counting if in STOP.	

Start/Stop of Timer is possibile also by digital input (see parameters *d.i.1F ... d.i.4F.*)

The alarm outputs can be associated with the timers (parameters *AL.1F .... AL.6F.*). On parameters 330 *A.tN.1* and 333 *A.tN.2* is possible to select the activation mode. The proposed solutions are as follows:

StARt   Alarm active during timer counting
ENd   Alarm active when the timer expiry
WARN.   Alarm active 5 " before the timer expiry

10   Serial communication

ATR244-xxxxx-T is equipped with RS485 and can receive/broadcast data via serial communication using MODBUS RTU protocol. The device can only be configured as a Slave. This function enables the control of multiple controllers connected to a supervisory system / SCADA.

Each controller responds to a Master query only if the query contains the same address as parameter 318 5L.Ad. ("*Slave Address*").

The addresses permitted range from 1 to 254 and there must not be controllers with the same address on the same line.

Address 255 can be used by the Master to communicate with all the connected equipment (broadcast mode), while with 0 all the devices receive the command, but no response is expected.

The baud rate is selected on parameter 319 bd.rt. ("*Baud Rate*").

ATR244 can introduce a delay (in milliseconds) of the response to the master request. This delay must be set on parameter 321 5E.dE. ("*Serial Delay*").

Each parameter modification is saved by the controller in the EEPROM memory (100000 writing cycles), while the setpoints are saved with a delay of 10 seconds after the last modification.

Changes made to words that are different from those reported in the following table can lead to malfunction.

Modbus RTU protocol features	
Baud-rate	Selectable on parameter 319 bd.rt. 1200bit/s 28800bit/s 2400bit/s 38400bit/s 4800bit/s 57600bit/s 9600bit/s 115200bit/s 19200bit/s
Format	Selectable on parameter 320 5.P.P. 8N1 8N2 8E1 8E2 8O1 8O2
Supported functions	WORD READING (max 50 word) (0x03, 0x04) SINGLE WORD WRITING (0x06) MULTIPLE WORDS WRITING (max 50 word) (0x10)

Here below a list of all available addresses and supported functions:

RO = Read Only	R/W = Read/Write	WO = Write Only

Modbus address	Description	Read Write	Reset value
0	Device type	RO	47x
1	Software version	RO	Flash
2	Boot version	RO	Flash
3	Slave Address	RO	Eepr/dip
6	Baud rate	RO	Eepr/dip
50	Slave address automatic learning	WO	-
51	System code comparison for slave address automatic learning	WO	-
500	Loading default values (write 9999)	RW	0
501	Restart ATR244 (write 9999)	RW	0
502	Setpoint storing delay time	RW	10
503	Parameters storing delay time	RW	1
701	First character of the custom alarm message 1	RW	"u"
...			
723	Last character of the custom alarm message 1	RW	0
751	First character of the custom alarm message 2	RW	"u"
...			

| Modbus address	Description	Read Write	Reset value
773	Last character of the custom alarm message 2	RW	0
801	First character of the custom alarm message 3	RW	"u"
...			
823	Last character of the custom alarm message 3	RW	0
851	First character of the custom alarm message 4	RW	"u"
...			
873	Last character of the custom alarm message 4	RW	0
901	First character of the custom alarm message 5	RW	"u"
...			
923	Last character of the custom alarm message 5	RW	0
951	First character of the custom alarm message 6	RW	"u"
...			
973	Last character of the custom alarm message 6	RW	0
1000	AI1 value (degrees with tenth)	RO	-
1001	AI2 value (degrees with tenth)	RO	-
1002	Average between AI1 and AI2 [(AI1 + AI2) /2] (degrees with tenth)	RO	0
1003	Difference between AI1 and AI2 (AI1 - AI2) (degrees with tenth)	RO	0
1004	Module of the difference between AI1 and AI2 (|AI1 - AI2|) (degrees with tenth)	RO	0
1005	Sum of AI1 and AI2 (AI1 + AI2) (degrees with tenth)	RO	0
1006	Real setpoint (gradient) of the regulation loop 1	RO	0
1007	Real setpoint (gradient) of the regulation loop 2	RO	0
1008	Alarms status (0=absent, 1=present) Bit0 = Alarm 1 Bit3 = Alarm 4 Bit1 = Alarm 2 Bit4 = Alarm 5 Bit2 = Alarm 3 Bit5 = Alarm 6	RO	0
1009	Error flags 1 Bit0 = AI1 process error (sensor 1) Bit1 = AI2 process error (sensor 2) Bit2 = Cold junction error Bit3 = Safety error Bit4 = Generic error Bit5 = Hardware error Bit6 = Error H.B.A. (partial ropture of the load) Bit7 = Error H.B.A. (SSR in short circuit) Bit8 = Overcurrent error Bit9 = Parameters out of range error Bit10= CPU eeprom writing error Bit11= RFid eeprom writing error Bit12= CPU eeprom reading error Bit13= RFid eeprom reading error Bit14= Eeprom calibrations bench corrupted Bit15= Eeprom constants bench corrupted	RO	0
1010	Error flags 2 Bit0 = Missing calibrations error Bit1 = Eeprom CPU bench parameters corrupted Bit2 = Eeprom CPU setpoint bench corrupted Bit3 = RFid memory not formatted Bit4 = Error AI2 disabled	RO	0
1011	Digital inputs status (0=not active, 1=active) Bit0 = Digital inp. 1 Bit2 = Digital inp. 3 Bit1 = Digital inp. 2 Bit3 = Digital inp. 4	RO	0

Modbus address	Description	Read Write	Reset value
1012	Outputs status (0=off, 1=on) Bit 0 = Q1 Bit 3 = DO1 Bit 1 = Q2 Bit 4 = DO2 Bit 2 = Q3	RO	0
1013	Stato led (0=OFF, 1=ON) Bit 0 = Led UP arrow Bit 6 = Led **TUN** Bit 1 = Led C1 Bit 7 = Led point time 2 Bit 2 = Led **C2** Bit 8 = Led **MAN** Bit 3 = Led **A1** Bit 9 = Led **REM** Bit 4 = Led **A2** Bit 10 = Led DOWN arrow Bit 5 = Led **A3** Bit 11 = Led point time 1	RO	0
1014	Key status (0=released, 1=pressed) Bit 0 = Key UP arrow Bit 2 = Key **FNC** Bit 1 = Key DOWN arrow Bit 3 = Key **SET**	RO	0
1015	Cold junction temperature (degrees with tenth)	RO	-
1016	Current CT istantaneous (Ampere with tenth)	RO	0
1017	Current CT average (Ampere with tenth)	RO	0
1018	Current CT ON (Ampere with tenth)	RO	0
1019	Current CT OFF (Ampere with tenth)	RO	0
1100	AI1 value with decimal point selection	RO	-
1101	AI2 value with decimal point selection	RO	-
1102	Average between AI1 and AI2 [(AI1 + AI2) /2] with decimal point selection	RO	0
1103	Difference between AI1 and AI2 (AI1 - AI2) with decimal point selection	RO	0
1104	Module of the difference between AI1 and AI2 (|AI1 - AI2|) with decimal point selection	RO	0
1105	Sum of AI1 and AI2 (AI1 + AI2) with decimal point selection	RO	0
1106	Real setpoint (gradient) of the regulation loop 1 with decimal point selection	RO	0
1107	Real setpoint (gradient) of the regulation loop 2 with decimal point selection	RO	0
1200	Setpoint 1 of regulation loop 1 (degrees with tenth)	R/W	EEPROM
1201	Setpoint 2 of regulation loop 1 (degrees with tenth)	R/W	EEPROM
1202	Setpoint 3 of regulation loop 1 (degrees with tenth)	R/W	EEPROM
1203	Setpoint 4 of regulation loop 1 (degrees with tenth)	R/W	EEPROM
1204	Setpoint 1 of regulation loop 2 (degrees with tenth)	R/W	EEPROM
1205	Setpoint 2 of regulation loop 2 (degrees with tenth)	R/W	EEPROM
1206	Setpoint 3 of regulation loop 2 (degrees with tenth)	R/W	EEPROM
1207	Setpoint 4 of regulation loop 2 (degrees with tenth)	R/W	EEPROM
1208	Alarm 1 setpoint (degrees with tenth) Alarm 1 upper setpoint if Par. 123 AL.1.F. = A.bANd	R/W	EEPROM
1209	Alarm 2 setpoint (degrees with tenth) Alarm 2 upper setpoint if Par. 141 AL.2.F. = A.bANd	R/W	EEPROM
1210	Alarm 3 setpoint (degrees with tenth) Alarm 3 upper setpoint if Par. 159 AL.3.F. = A.bANd	R/W	EEPROM
1211	Alarm 4 setpoint (degrees with tenth) Alarm 4 upper setpoint if Par. 177 AL.4.F. = A.bANd	R/W	EEPROM
1212	Alarm 5 setpoint (degrees with tenth) Alarm 5 upper setpoint if Par. 195 AL.5.F. = A.bANd	R/W	EEPROM
1213	Alarm 6 setpoint (degrees with tenth) Alarm 6 upper setpoint if Par. 213 AL.6.F. = A.bANd	R/W	EEPROM

Modbus address	Description	Read Write	Reset value
1214	Start/Stop 0=controller in STOP 1=controller in START	R/W	0
1215	Hold conversion ON/OFF 0=Hold conversion OFF 1=Hold conversion ON	R/W	0
1216	Tune management for regulation loop 1		
	With automatic Tune (par. 73 ᴛun.1 = ᴀuᴛo): 0=autotunig function OFF 1=autotuning ON	RO	0
	With manual Tune (par. 73 ᴛun.1 = ᴍᴀnu. or ᴏncᴇ): 0=autotunig function OFF 1=autotuning ON	R/W	0
	With synchronized Tune (par. 73 ᴛun.1 = ꜱ�YncH): 0=autotunig function OFF 1=command output OFF (forces the cooling) 2=command output ON (forces the heating) 3=autotuning ON 4=autotuning ended	R/W	0
1217	Tune management for regulation loop 2		
	With automatic Tune (par. 98 ᴛun.2 = ᴀuᴛo): 0=autotunig function OFF 1=autotuning ON	RO	0
	With manual Tune (par. 98 ᴛun.2 = ᴍᴀnu. or ᴏncᴇ): 0=autotunig function OFF 1=autotuning ON	R/W	0
	With synchronized Tune (par. 98 ᴛun.2 = ꜱYncH): 0=autotunig function OFF 1=command output OFF (forces the cooling) 2=command output ON (forces the heating) 3=autotuning ON 4=autotuning ended	R/W	0
1218	Automatic/manual selection for regulation loop 1 0=automatic; 1=manual	R/W	0
1219	Automatic/manual selection for regulation loop 2 0=automatic; 1=manual	R/W	0
1220	Command output percentage for regulation loop 1 (0-10000) Heating output percentage with regulation 1 in double loop (0-10000)	R/W	0
1221	Command output percentage for regulation loop 1 (0-1000) Heating output percentage with regulation 1 in double loop (0-1000)	R/W	0
1222	Command output percentage for regulation loop 1 (0-100) Heating output percentage with regulation 1 in double loop (0-100)	R/W	0
1223	Cooling output percentage with regulation 1 in double loop (0-10000)	RO	0
1224	Cooling output percentage with regulation 1 in double loop (0-1000)	RO	0
1225	Cooling output percentage with regulation 1 in double loop (0-100)	RO	0
1226	Command output percentage for regulation loop 2 (0-10000) Heating output percentage with regulation 2 in double loop (0-10000)	R/W	0
1227	Command output percentage for regulation loop 2 (0-1000) Heating output percentage with regulation 2 in double loop (0-1000)	R/W	0
1228	Command output percentage for regulation loop 2 (0-100) Heating output percentage with regulation 2 in double loop (0-100)	R/W	0

Modbus address	Description	Read Write	Reset value
1229	Cooling output percentage with regulation 2 in double loop (0-10000)	RO	0
1230	Cooling output percentage with regulation 2 in double loop (0-1000)	RO	0
1231	Cooling output percentage with regulation 2 in double loop (0-100)	RO	0
1232	Command output manual reset for regulation loop 1: write 0 to reset the command output. In reading 0=reset not allowed, 1=reset allowed	R/W	0
1233	Alarms manual reset: write 0 to reset all alarms. In reading 0=reset not allowed, 1=reset allowed Bit0 = Alarm 1 Bit3 = Alarm 4 Bit1 = Alarm 2 Bit4 = Alarm 5 Bit2 = Alarm 3 Bit5 = Alarm 6	R/W	0
1234	Command output manual reset for regulation loop 2: write 0 to reset the command output. In reading 0=reset not allowed, 1=reset allowed	R/W	0
1235	Alarm 1 remote stauts (0=absent, 1=present)	R/W	0
1236	Alarm 2 remote stauts (0=absent, 1=present)	R/W	0
1237	Alarm 3 remote stauts (0=absent, 1=present)	R/W	0
1238	Alarm 4 remote stauts (0=absent, 1=present)	R/W	0
1239	Alarm 5 remote stauts (0=absent, 1=present)	R/W	0
1240	Alarm 6 remote stauts (0=absent, 1=present)	R/W	0
1241	Value AO1 by serial (Par. 298 $rtN.1 = Nd.bu5$)	R/W	0
1242	Value AO2 by serial (Par. 308 $rtN.2 = Nd.bu5$)	R/W	0
1243	Tara di zero AI1 (1=tare; 2=reset tare)	R/W	0
1244	Tare of zero AI2 (1=tare; 2=reset tare)	R/W	0
1245	Tare of zero average between AI1 and AI2 [(AI1 + AI2) /2] (1=tare; 2=reset tare)	R/W	0
1246	Tare of zero difference between AI1 and AI2 (AI1 - AI2) (1=tare; 2=reset tare)	R/W	0
1247	Tare of zero module of the difference between AI1 and AI2 (|AI1 - AI2|) (1=tare; 2=reset tare)	R/W	0
1248	Tare of zero sum of AI1 and AI2 (AI1 + AI2) (1=tare; 2=reset tare)	R/W	0
1249	Value of remote setpoint by command 1 serial	R/W	0
1250	Value of remote setpoint by command 2 serial	R/W	0
1251	Alarm 1 lower setpoint if Par. 123 $AL.1.F. = A.bANd$ (degrees with tenth)	R/W	EEPROM
1252	Alarm 2 lower setpoint if Par. 141 $AL.2.F. = A.bANd$ (degrees with tenth)	R/W	EEPROM
1253	Alarm 3 lower setpoint if Par. 159 $AL.3.F. = A.bANd$ (degrees with tenth)	R/W	EEPROM
1254	Alarm 4 lower setpoint if 177 $AL.4.F. = A.bANd$ (degrees with tenth)	R/W	EEPROM
1255	Alarm 5 lower setpoint if Par. 195 $AL.5.F. = A.bANd$ (degrees with tenth)	R/W	EEPROM
1256	Alarm 6 lower setpoint if Par. 213 $AL.6.F. = A.bANd$ (degrees with tenth)	R/W	EEPROM
1300	Setpoint 1 of regulation loop 1, with decimal point selection	R/W	EEPROM
1301	Setpoint 2 of regulation loop 1, with decimal point selection	R/W	EEPROM
1302	Setpoint 3 of regulation loop 1, with decimal point selection	R/W	EEPROM
1303	Setpoint 4 of regulation loop 1, with decimal point selection	R/W	EEPROM
1304	Setpoint 1 of regulation loop 2, with decimal point selection	R/W	EEPROM
1305	Setpoint 2 of regulation loop 2, with decimal point selection	R/W	EEPROM
1306	Setpoint 3 of regulation loop 2, with decimal point selection	R/W	EEPROM
1307	Setpoint 4 of regulation loop 2, with decimal point selection	R/W	EEPROM
1308	Alarm 1 setpoint, with decimal point selection Alarm 1 upper setpoint if Par. 123 $AL.1.F. = A.bANd$	R/W	EEPROM

Modbus address	Description	Read Write	Reset value
1309	Alarm 2 setpoint, with decimal point selection Alarm 2 upper setpoint if Par. 141 AL.2.F. = A.bANd	R/W	EEPROM
1310	Alarm 3 setpoint, with decimal point selection Alarm 3 upper setpoint if Par. 159 AL.3.F. = A.bANd	R/W	EEPROM
1311	Alarm 4 setpoint, with decimal point selection Alarm 4 upper setpoint if Par. 177 AL.4.F. = A.bANd	R/W	EEPROM
1312	Alarm 5 setpoint, with decimal point selection Alarm 5 upper setpoint if Par. 195 AL.5.F. = A.bANd	R/W	EEPROM
1313	Alarm 6 setpoint, with decimal point selection Alarm 6 upper setpoint if Par. 213 AL.6.F. = A.bANd	R/W	EEPROM
1351	Alarm 1 lower setpoint if Par. 123 AL.1.F. = A.bANd, with decimal point selection	R/W	EEPROM
1352	Alarm 2 lower setpoint if Par. 141 AL.2.F. = A.bANd, with decimal point selection	R/W	EEPROM
1353	Alarm 3 lower setpoint if Par. 159 AL.3.F. = A.bANd, with decimal point selection	R/W	EEPROM
1354	Alarm 4 lower setpoint if Par. 177 AL.4.F. = A.bANd, with decimal point selection	R/W	EEPROM
1355	Alarm 5 lower setpoint if Par. 195 AL.5.F. = A.bANd, with decimal point selection	R/W	EEPROM
1356	Alarm 6 lower setpoint if Par. 213 AL.6.F. = A.bANd, with decimal point selection	R/W	EEPROM
2001	Parameter 1	R/W	EEPROM
2002	Parameter 2	R/W	EEPROM
...	Parameter ...	R/W	EEPROM
2366	Parameter 366	R/W	EEPROM

11   Reading and configuration through NFC

Scan the Qr-Code
to download the App
on Google Play Store®

The controller ATR244 is supported by the App MyPixsys: using an ANDROID smartphone with NFC connection it is possible to program the device without using a dedicated equipment. The App allows to read, set and backup all parameters which are stored into the internal memory of Pixsys devices.

Procedure:
- Identify the position of the NFC antenna on the smartphone (usually central, behind the back cover) or to one of the sides in case of metal chassis. The ATR244's antenna is placed on the frontal panel, under the function keys.
- Make sure that the NFC sensor of the phone is enabled or that there are no metal materials between the phone and the device (ex. aluminium cover or with magnetic stand)
- It is useful to eneable the system sounds on the smartphone, as the notification sound confirms that the device has correctly been detected.

The App interface is provided with four tabs: SCAN, DATA, WRITE, EXTRA.

Select the first tab *"SCAN"* to read data stored into the internal memory of the device; place the smartphone in contact with the controller frontal panel, making sure that the phone's antenna matched with that of the controller.
Once detected the device, the App emits a notification sounds and proceeds with the model identification and the reading of the parameters.

The graphic interface shows the advancement and switches to the second tab *"DATA"*. It is now poissbile to move the smartphone away from the controller to make the required modifications more easily.
The device parameters are divided into collapsible groups and are displayed with name, current value and reference index to the manual.
Click on a row to open the setting screen of the related parameter with the detailed view of available options (in case of multiple choice parameters) or of the minimum/maximum/decimals limits (for numeric parameters), included the text description (as per section n. 11 of the user manual). Once selected the chosen value, the related row will be updated and underlined into the tab *"DATA"* (hold down the line to cancel modifications).

To download the new configuration on your device, select the third tab *"WRITE"*, place again the smartphone in contact with the controller and wait for the notification.

The ATR244 will show a restart request, necessary to update the configuration with the new written modifications; if it does not restart, the ATR 244 will continue to work with the previous configuration. In addition to the classic operation of parameters reading->modification->writing, MyPixsys is provided with additional functions which can be accessed by the tab *"EXTRA"*, as save parameters / e-mail loaded values/ restore default values.

12　　Access configuration

	Press	Display	Do
1	**FNC** for 3 sec.	Display 1 shows *PASS.*, while display 2 shows *0000* with the 1st digit flashing.	
2	▲ ▼	Modify fl ashing digit and move to next digit with **SET**.	Enter password *1234*.
3	**FNC** to confirm	Display 1 shows the first parameters group, display 2 shows the description.	
4	▲ or ▼	Scroll parameters groups.	
5	**SET** to confirm	Display 1 shows the first parameter of the group and display 2 shows its value.	Press **FNC** to exit configuration.
6	▲ or ▼	Scroll parameters.	
7	**SET** to confirm	Allows parameter modification (display 2 flashes)	
8	▲ or ▼	Increases or decreases visualized value	Introduce new data
9	**SET**	Confirms and stores the new value. If the value is different from default values, the arrow keys light on.	
10	**FNC**	Backs to parameter groups selection (see point 3).	Press again **FNC** to exit configuration

12.1　　Loading default values
This procedure allows to restore factory settings of the device.

	Press	Display	Do
1	**FNC** for 3 sec	Display 1 shows *PASS.*, while display 2 shows *0000* with the 1st digit flashing.	
2	▲ or ▼	Modify the flashing digit and move to the next one pressing **SET**.	Enter password *9999*.
3	**FNC** to confirm	The device loads default settings and restarts.	

12.2　　Parameters list functioning
The controller ATR244 integrates many features that make the configuration parameters list very long. To make it more functional, the parameters list is dynamics and it changes as the user enables / disables the functions. Practically, using a specific function that occupies a given input (or output), the parameters referred to other functions of that resource are hidden to the user making the parameters list more concise.

To simplify the reading/interpretation of the parameters, pressing **SET** it is possible to visualize a brief description of the selected parameter.

Finally, keeping pressed **FNC**, it is possible to move from the mnemonic visualization of the parameter to the numeric one, and vice versa. Ex. The first parameter can be displayed as *SEn.1* (mnemonic visualization) or as *P.001* (numeric visualization).

Set the product parameters so that they are suitable for the system to be controlled. If they are not suitable, unexpected operations may occasionally cause materials damage or accidents.

13 Table of Configuration Parameters

GROUP A - *A. in.1* - Analogue input 1

1   *SEn.1*   **Sensor AI1**

Analogue input configuration / sensor AI1 selection

tc. K	Tc-K	-260° C..1360° C. (**Default**)
tc. 5	Tc-S	-40° C..1760° C
tc. R	Tc-R	-40° C..1760° C
tc. J	Tc-J	-200° C..1200° C
tc. t	Tc-T	-260° C..400° C
tc. E	Tc-E	-260° C..980° C
tc. N	Tc-N	-260° C..1280° C
tc. b	Tc-B	100° C..1820° C
Pt100	Pt100	-200° C..600° C
Ni100	Ni100	-60° C..180° C
Ntc 1	NTC 10K β3435K	-40° C..125° C
Ptc	PTC 1K	-50° C..150° C
Pt500	Pt500	-200° C..600° C
Pt1K	Pt1000	-200° C..600° C
0-1	0..1 V	
0-5	0..5 V	
0-10	0..10 V	
0-20	0..20 mA	
4-20	4..20 mA	
0-60	0..60 mV	
Pot.	Potentiometer (set the value on parameter 6)	
Ni120	Ni120	-60 °C..240 °C
Ntc 2	NTC 10K β3694K	-40 °C..150 °C
Ntc 3	NTC 2252 β3976K	-40 °C..150 °C

2   *dP. 1*   **Decimal Point 1**

Select number of displayed decimal points for AI1

0	**Default**
0.0	1 decimal
0.00	2 decimals
0.000	3 decimals

3   *dEGr.*   **Degree**

°c	Celsius (**Default**)
°F	Fahrenheit
K	Kelvin

4   *LL. i.1*   **Lower Linear Input AI1**

AI1 lower limit only for linear signals. Ex.: with input 4..20 mA this parameter takes value associated to 4 mA. The value may be greater than the one entered on the next parameter.
-9999..+30000 [digit[1 p. 70]] **Default**: 0.

5   *uL. i.1*   **Upper Linear Input AI1**

AI1 upper limit only for linear signals Ex: with input 4..20 mA this parameter takes value associated to 20 mA.The value may be lower than the one entered on the previous parameter.
-9999..+30000 [digit[1 p. 70]] **Default**:1000

6   *P.uA.1*   **Potentiometer Value AI1**

Selects the value of the potentiometer connected on AI1
1..150 kohm. **Default**: 10kohm

7	ɩ.oL.1	**Linear Input over Limits AI1**

If AI1 is a linear input, allows to the process to overpass the limits (parameters 4 and 5).
d·5Rb. Disabled (**Default**)
ENRb. Enabled

8	o.cR.1	**Offset Calibration AI1**

AI1 Offset calibration. Value added/subtracted to the process value (ex: usually correcting the ambient temperature value).
-9999..+9999 [digit[1 p. 70]] (degrees.tenths for temperature sensors). **Default** 0.

9	G.cR.1	**Gain Calibration AI1**

Value multiplied to the process value to calibrate the working point. Ex: to correct the range from 0..1000°C showing 0..1010°C, set the parameter to -1.0
-100.0%...+100.0%, **Default**: 0.0.

10	Ltc.1	**Latch-On AI1**

Automatic setting of limits for AI1 linear input
d·5Rb. Disabled (**Default**)
5tNRd Standard
V.0.5to. Virtual Zero Stored
V.0.t.oN. Virtual Zero at start

11	cFL.1	**Conversion Filter AI1**

ADC Filter: Number of sensor readings to calculate mean that defines process value. **NB**: When readings increase, control loop speed slows down. 1...15. (**Default**: 10)

12	cFr.1	**Conversion Frequency AI1**

Sampling frequency of digital / analogue converter for AI1. Increasing the conversion speed will slow down reading stability
(example: for fast transients, as the pressure, it is advisable to increase sampling frequency).

4.17.HZ	4.17 Hz (Min. conversion speed)	33.2HZ	33.2 Hz
6.25HZ	6.25 Hz	39.0HZ	39.0 Hz
8.33HZ	8.33 Hz	50.0HZ	50.0 Hz
10.0HZ	10.0 Hz	62.0HZ	62.0 Hz
12.5HZ	12.5 Hz	123HZ	123 Hz
16.7HZ	16.7 Hz (**Default**) Ideal for noises filtering 50 / 60 Hz	242HZ	242 Hz
19.6HZ	19.6 Hz	470HZ	470 Hz (Max. speed conversion)

13	L.c.E.1	**Lower Current Error 1**

If AI1 is a 4-20 mA input, it determines the current value below the probe error E-05 is signaled.

2.0 MA (**Default**)	2.6 MA	3.2 MA	3.8 MA
2.2 MA	2.8 MA	3.4 MA	
2.4 MA	3.0 MA	3.6 MA	

14÷17		**Reserved Parameters - Group A**

Reserved parameters - Group A

GROUP B - A.in.2 - Analogue input 2 *(only on ATR244-23XX-T)*

18 SEn.2 **Sensor AI2**

Analogue input configuration / sensor AI2 selection

d.iSAb.	Disabled	Disabled. (**Default**)
tc. K	Tc-K	-260° C..1360° C.
tc. S	Tc-S	-40° C..1760° C
tc. R	Tc-R	-40° C..1760° C
tc. J	Tc-J	-200° C..1200° C
tc. t	Tc-T	-260° C..400° C
tc. E	Tc-E	-260° C..980° C
tc. N	Tc-N	-260° C..1280° C
tc. b	Tc-B	100° C..1820° C
Pt100	Pt100	-200° C..600° C
Ni100	Ni100	-60° C..180° C
Ntc 1	NTC 10K β3435K	-40 °C..125 °C
Ptc	PTC 1K	-50° C..150° C
Pt500	Pt500	-200° C..600° C
Pt1K	Pt1000	-200° C..600° C
0-1	0..1 V	
0-5	0..5 V	
0-10	0..10 V	
0-20	0..20 mA	
4-20	4..20 mA	
0-60	0..60 mV	
Pot.	PPotentiometer (set the value on parameter 23)	
Ni120	Ni120	-60 °C..240 °C
Ntc 2	NTC 10K β3694K	-40 °C..150 °C
Ntc 3	NTC 2252 β3976K	-40 °C..150 °C

19 d.P. 2 **Decimal Point 2**

Select number of displayed decimal points for AI 2

0	**Default**
0.0	1 decimal
0.00	2 decimals
0.000	3 decimals

20 rES. **Reserved**

Reserved parameter.

21 LL.i2 **Lower Linear Input AI2**

AI2 lower limit only for linear signals. Ex.: with input 4..20 mA this parameter takes value associated to 4 mA. The value may be greater than the one entered on the next parameter.
-9999..+30000 [digit[1 p. 70]] **Default**: 0.

22 uL.i2 **Upper Linear Input AI2**

AI2 upper limit only for linear signals Ex: with input 4..20 mA this parameter takes value associated to 20 mA.The value may be lower than the one entered on the previous parameter..
-9999..+30000 [digit[1 p. 70]] **Default**:1000

23 P.uA2 **Potentiometer Value AI2**

Selects the value of the potentiometer connected on AI2
1..150 kohm. **Default**: 10kohm

| 24 | ı.o.L.2 | **Linear Input over Limits AI2** |

If AI2 is a linear input, allows to the process to overpass the limits (parameters 21 and 22).
d ı.5Ab.   Disabled (**Default**)
ENAb.   Enabled

| 25 | o.cA.2 | **Offset Calibration AI2** |

AI2 Offset calibration. Value added/subtracted to the process value (ex: usually correcting the ambient temperature value).
-9999..+9999 [digit[1 p. 70]] (degrees.tenths for temperature sensors). **Default** 0.

| 26 | G.cA.2 | **Gain Calibration AI2** |

Value multiplied to the process value to calibrate the working point. Ex: to correct the range from 0..1000°C showing 0..1010°C, set the parameter to -1.0
-100.0%...+100.0%, **Default**: 0.0.

| 27 | Ltc.2 | **Latch-On AI2** |

Automatic setting of limits for AI2 linear input
d ı.5Ab.   Disabled (**Default**)
5tNPd   Standard
V.0.5to.   Virtual Zero Stored
V.0.t.oN   Virtual Zero at start

| 28 | c.FL.2 | **Conversion Filter AI2** |

ADC Filter: Number of sensor readings to calculate mean that defi nes
process value.
NB: When readings increase, control loop speed slows down.
1...15. (**Default**: 10)

| 29 | c.Fr.2 | **Conversion Frequency AI2** |

Sampling frequency of digital / analogue converter for AI2.
Increasing the conversion speed will slow down reading stability
(example: for fast transients, as the pressure, it is advisable to increase sampling frequency).

4.17.HZ	4.17 Hz (Min. conversion speed)	33.2HZ	33.2 Hz
6.25HZ	6.25 Hz	39.0HZ	39.0 Hz
8.33HZ	8.33 Hz	50.0HZ	50.0 Hz
10.0HZ	10.0 Hz	62.0HZ	62.0 Hz
12.5HZ	12.5 Hz	123HZ	123 Hz
16.7HZ	16.7 Hz (**Default**) Ideal for filtering noises 50 / 60 Hz	242HZ	242 Hz
19.6HZ	19.6 Hz	470HZ	470 Hz (Max. speed conversion)

| 30 | L.c.E.2 | **Lower Current Error 2** |

If AI2 is a 4-20 mA input, it determines the current value below the probe error E-06 is signaled.

2.0 MA	(**Default**)	2.6 MA	3.2 MA	3.8 MA
2.2 MA		2.8 MA	3.4 MA	
2.4 MA		3.0 MA	3.6 MA	

| 31÷34 | | **Reserved Parameters - Group B** |

Reserved parameters - Group B

GROUP C - c∏d.1 - Outputs and regulation Process 1

35 c.ou.1 **Command Output 1**

Selects the command output related to the process1 and the outputs related to the alarms.

- c. o2 Command on relay output Q2.
- c. o1 Command on relay output Q1. (**Default**)
- c. 55P Command on digital output
- c. VAL. Servo-valve command with open loop on Q1 and Q2 relays
- c.0-10 Command 0-10 V on analogue output AO1.
- c.4-20 Command 4-20 mA on analogue output AO1.
- 0.10.5.P. Command 0-10 V on analogue output AO1 with split-range function: the analogue output sets the cooling action from 0 to 5V and heating action from 5 to 10V.
- 4.20.5.P. Command 4-20 mA on analogue output AO1 with split-range function: the analogue output sets the cooling action from 4 to 12mA and heating action from 12 to 20mA.
- c.VAL.c. Servo-valve command with open loop on Q2 and Q3 relays (not avaiable for -12xxx)

ATR244-12ABC and ATR244-12ABC-T

	Command	AL. 1	AL. 2	AL. 3	AL. 4
c. o2	Q2	Q1	DO1	DO2	AO1
c. o1	Q1	Q2	DO1	DO2	AO1
c. 55P	DO1	Q1	Q2	DO2	AO1
c. VAL.	Q1(open) Q2(close)	DO1	DO2	AO1	-
c.0-10 (0.10.5.P.)	AO1 (0..10 V)	Q1	Q2	DO1	DO2
c.4-20 (4.20.5.P.)	AO1 (4..20 mA)	Q1	Q2	DO1	DO2

ATR244-13ABC

	Command	AL. 1	AL. 2	AL. 3	AL. 4	AL. 5
c. o2	Q2	Q1	Q3	DO1	DO2	AO1
c. o1	Q1	Q2	Q3	DO1	DO2	AO1
c. 55P	DO1	Q1	Q2	Q3	DO2	AO1
c. VAL.	Q1(open) Q2(close)	Q3	DO1	DO2	AO1	-
c.0-10 (0.10.5.P.)	AO1 (0..10 V)	Q1	Q2	Q3	DO1	DO2
c.4-20 (4.20.5.P.)	AO1 (4..20 mA)	Q1	Q2	Q3	DO1	DO2
c. VAL.c.	Q2(open) Q3(close)	Q1	DO1	DO2	AO1	-

ATR244-23A-T and ATR244-23BC-T

	Command	AL. 1	AL. 2	AL. 3	AL. 4	AL. 5	AL. 6
c. o2	Q2	Q1	Q3	DO1	DO2	AO1	AO2
c. o1	Q1	Q2	Q3	DO1	DO2	AO1	AO2
c. 55P	DO1	Q1	Q2	Q3	DO2	AO1	AO2
c. VAL.	Q1(open) Q2(close)	Q3	DO1	DO2	AO1	AO2	-
c.0-10 (0.10.5.P.)	AO1 (0..10 V)	Q1	Q2	Q3	DO1	DO2	AO2
c.4-20 (4.20.5.P.)	AO1 (4..20 mA)	Q1	Q2	Q3	DO1	DO2	AO2
c. VAL.c.	Q2(open) Q3(close)	Q1	DO1	DO2	AO1	AO2	-

NB: if an output is used for functions other than alarms (for example retransmission or command n° 2), this resource will no longer be available as an alarm and the related group will be hidden from the parameter list. The correspondence of the functions/outputs remains however that indicated in the tables above.

36 c.Pr.1 **Command Process 1** *(only on ATR244-23XX-T)*

Selects process value related to process 1 and to command output 1.

- A.iN.1 Value read on input AI1. (**Default**)
- A.iN.2 Value read on input AI2.
- MEAN Arithmetic average of the value read on inputs AI1 and AI2 [(AI1-AI2)/2].
- d.FF. Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
- Ab.d.F. Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|).
- 5uM Sum of values read on inputs AI1 and AI2 (AI1+AI2).

37 rES. **Reserved**

Reserved parameter.

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38 Ac.t.1 **Action type 1**

Action type to control process 1.
HEAt   Heating (N.A.) (**Default**)
cooL   Cooling (N.C.)

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39 c.HY.1 **Command Hysteresis 1**

Hysteresis to control process 1 in ON/OFF.
-9999..+9999 [digit[1 p. 70]] (degrees.tenths for temperature sensors). **Default** 0.2.

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40 LLS.1 **Lower Limit Setpoint 1**

Lower limit setpoint selectable for command setpoint 1.
-9999..+30000 [digit[1 p. 70]] (degrees.tenths for temperature sensors). **Default** 0.

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41 uLS.1 **Upper Limit Setpoint 1**

Uower limit setpoint selectable for command setpoint 1.
-9999..+30000 [digit[1 p. 70]] (degrees for temperature sensors). **Default** 1750.

---

42 c.rE.1 **Command Reset 1**

Type of reset for command contact 1 (always automatic in P.I.D. functioning)
A. RES.   Automatic Reset (**Default**)
M. RES.   Manual Reset (by keyboard or by digital input)
M.RES.S.   Manual Reset Stored (keeps relay status also after an eventual power failure)
A.RES.t.   Automatic reset with timed activation. The command remains active for the time set on the parameter 45 c.dE.1., even if the conditions generating it are missing. To be able to act again, the conditions for activating the command must disappear.

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43 c.S.E.1 **Command State Error 1**

State of contact for command 1 output in case of error.
If the command output 1 (Par. 35 c.ou.1) **is relay or valve:**
oPEN   Contact or valve open. **Default**
cLoSE   Contact or valve closed.
If the command output 1 is digital output (SSR):
oFF   Digital output OFF. **Default**
oN   Digital output ON.
If the command output 1 is 0-10V:
0 V   0 V. **Default**
10 V   10 V.
If the command output 1 is 0-20 mA or 4-20 mA:
0 MA   0 mA. **Default**
4 MA   4 mA.
20 MA   20 mA.
21.5MA 21.5 mA.

---

44 c.Ld.1 **Command Led 1**

Defines led C1 state corresponding to the relevant output. If the valve command is selected, this parameter is not managed.
o.c.   ON with open contact or SSR switched off. If command AO1, ON with output 0%, OFF if 100% and flashing between 1% and 99%.
c.c.   ON with closed contact or SSR switched on. If command AO1 ON with output 100%, OFF if 0% and flashing between 1% and 99%. (**Default**)

| 45 | c.dE.1 | **Command Delay 1** |

Command 1 delay (only in ON / OFF functioning).
-60:00..60:00 mm:ss. **Default**: 00:00.
Negative: delay when turning off output.
Positive: delay when turning on output.

| 46 | c5.P.1 | **Command Setpoint Protection 1** |

Allows or not to modify command setpoint 1 value
FREE   Modification allowed (**Default**)
Lock   Protected

| 47 | uA.t.1 | **Valve Time 1** |

Valve time related to command 1 (declared by the manufacturer of the valve)
1...300 seconds. **Default**: 60.

| 48 | A.NA.1 | **Automatic / Manual 1** |

Enables the automatic/manual selection for command 1
di5Ab.   Disabled (**Default**)
ENRb.   Enabled
EN.5to.   Enabled with memory

| 49 | in i5. | **Initial State** |

Choose the state of the controller when turning it on. This only works on the RS485 version or by
enabling the Start/Stop from digital input or **SET** button.
5tAPt   Start (**Default**)
5toP   Stop
5toPE.   Stored. State of Start/Stop prior to switching off.

| 50 | 5.uA5. | **State Valve Saturation** |

Select the valve status when the output percentage is 100%
PERc.   The valve opening relay is activated for a time equal to 5% of the valve time
FiXEd   The valve opening relay is always active

| 51÷53 | | **Reserved Parameters - Group C** |

Reserved parameters - Group C

GROUP D - cNd.2 - **Outputs and regul. Process 2** *(only on ATR244-23XX-T)*

| 54 | c.ou.2 | **Command Output 2** |

Selects the command output related to the process 2
NB: refer to the function/output table of parameter 35 c.ou.1 to check which resources will remain
available after changing this parameter (eg: setting c.ou.2 as c.55P, it will no longer be possible to
enable the alarm associated with the DO2 output).
di5Ab.   Command disabled. (**Default**)
c. o3   Command on relay output Q3
c. 55P   Command on digital output DO2
c. VAL.   Sevo-valve command with open loop on DO1 (open) and DO2 (close)
c.0.-10   Command 0-10 V on analogue output AO2
c.4-20   Command 4-20 mA on analogue output AO2
0.10.5.P.   Command 0-10 V on analogue output AO2 with split-range function: the analogue
             output sets the cooling action from 0 to 5V and heating action from 5 to 10V.
4.20.5.P.   Command 4-20 mA on analogue output AO2 with split-range function: the analogue
             output sets the cooling action from 4 to 12mA and heating action from 12 to 20mA.

55   *c.Pr.2*   **Command Process 2**

Selects process value related to process 2 and to command output 2.

A.iN.1   Value read on input AI1. (**Default**)
A.iN.2   Value read on input AI2.
MEAN   Arithmetic average of the value read on inputs AI1 and AI2 [(AI1-AI2)/2].
diFF.   Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
Ab.diF.   Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|).
SuM   Sum of values read on inputs AI1 and AI2 (AI1+AI2).

56   *rEMS.*   **Remote Setpoint**

Enables remote setpoint. The control setpoint is sent by another device and is received by a second analogue input (it is necessary to select on parameter *c.Pr.2* the selections *Ai. 1* or *Ai. 2*) or through serial.

di.SAb.   Disabled. (**Default**)
ENAb.   Enables remote setpoint by process 2. Remote/local selection can be done by digital input.
EN.tSt.   Remote setpoint by process 2, Remoto/local selection only by keyboard (not allowed by digital input)
EN.SEr.   Enables remote setpoint by serial input. Remote/local selection can be done by digital input.
EN.SE.t.   Remote setpoint by serial, Remote/local selection only by keyboard (not allowed by digital input).
cMd. 1   The reference setpoint of command 2 is the same of command 1.

57   *Ac.t.2*   **Action type 2**

Action type to control process 2.
HEAt   Heating (N.A.) (**Default**)
cooL   Cooling (N.C.)

58   *c.HY.2*   **Command Hysteresis 2**

Hysteresis to control process 2 in ON/OFF.
-9999..+9999 [digit[1 p. 70]] (degrees.tenths for temperature sensors). **Default** 0.2.

59   *LL.S.2*   **Lower Limit Setpoint 2**

Lower limit setpoint selectable for command setpoint 2.
-9999..+30000 [digit[1 p. 70]] (degrees for temperature sensors). **Default** 0.

60   *uL.S.2*   **Upper Limit Setpoint 2**

Uower limit setpoint selectable for command setpoint 2.
-9999..+30000 [digit[1 p. 70]] (degrees for temperature sensors). **Default** 1750.

61   *c.rE.2*   **Command Reset 2**

Type of reset for command contact 2 (always automatic in P.I.D. functioning)
A. RES.   Automatic Reset (**Default**)
M. RES.   Manual Reset (by keyboard or by digital input)
M.RES.S.   Manual Reset Stored (keeps relay status also after an eventual power failure)
A.RES.t.   Automatic reset with timed activation. The command remains active for the time set on the parameter 64 c.de.2., even if the conditions generating it are missing. To be able to act again, the conditions for activating the command must disappear.

62   *c.S.E.2*   **Command State Error 2**

State of contact for command 2output in case of error.
If the command output 2 (Par. 54 *c.ou.2*) **is relay or valve:**
oPEN   Contact or valve open. **Default**
cLoSE   Contact or valve closed.
If the command output 2 is digital output (SSR):
oFF   Digital output OFF. **Default**

oN	Digital output ON.	

If the command output 2 is 0-10V:

0 V	0 V. **Default**	
10 V	10 V.	

If the command output 2 is 0-20 mA or 4-20 mA:

0 MA	0 mA. **Default**	
4 MA	4 mA.	
20 MA	20 mA.	
21.5MA	21.5 mA.	

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63 *c.Ld.2* **Command Led 2**

Defines led **C2** state corresponding to the relevant output. If the valve command is selected, this parameter is not managed.

o.c. ON with open contact or SSR switched off. If command AO2, ON with output 0%, OFF if 100% and flashing between 1% and 99%.

c.c. ON with closed contact or SSR switched on. If command AO2 ON with output 100%, OFF if 0% and flashing between 1% and 99%. (**Default**)

---

64 *c.dE.2* **Command Delay 2**

Command 2 delay (only in ON / OFF functioning).
-60:00..60:00 mm:ss. **Default**: 00:00.
Negative: delay when turning off output.
Positive: delay when turning on output.

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65 *c.S.P.2* **Command Setpoint Protection 2**

Allows or not to modify command setpoint 2 value

FrEE Modification allowed (**Default**)
Lock Protected

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66 *uA.t.2* **Valve Time 2**

Valve time related to command 2 (declared by the manufacturer of the valve)
1...300 seconds. **Default**: 60.

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67 *A.MA.2* **Automatic / Manual 2**

Enables the automatic/manual selection for command 2

diSAb. Disabled (**Default**)
ENAb. Enabled
EN.Sto. Enabled with memory

68÷72 **Reserved Parameters - Group D**

Reserved parameters - Group D

GROUP E - *rEG.1* - Autotuning and PID 1

73 *tun.1* **Tune 1**

Selects autotuning type for command 1

diSAb. Disabled. If proportional band and integral time paramters are to selected to zero, the regulation is ON/OFF type.. (**Default**)
Auto Automatic (Automatic P.I.D. parameters calculation)
MANu. Manual (launch by keyboards or by digital input)
oNcE Once (P.I.D. parameters calculation only at first start)
SYNcH. Synchronized (Autotuning managed by serial)

74 5.d.t.1 **Setpoint Deviation Tune 1**
Selects deviation from command setpoint 1 as threshold used by autotuning to calculate P.I.D. parameters
0-10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors). **Default**: 30.0.

75 P.b. 1 **Proportional Band 1**
Proportional band or process 1 P.I.D. regulation (Process inertia).
0 ON / OFF if t.i. equal to 0 (**Default**)
1...10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors).

76 i.t. 1 **Integral Time 1**
Integral time for process 1 P.I.D. regulation (process intertia duration).
0.0...2000.0 secondi (0.0 = integral disabled), **Default** 0.0

77 d.t. 1 **Derivative Time 1**
Derivative time for process 1 P.I.D. regulation (Normally ¼ of integral time).
0.0...1000.0 secondi (0.0 = derivative disabled), **Default** 0

78 d.b. 1 **Dead Band 1**
Dead band of process 1 P.I.D..
0...10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors) (**Default**: 0)

79 P.b.c.1 **Proportional Band Centered 1**
Defines if the proportional band 1 must be centered or not on the setpoint. In double loop functioning (heating/cooling), always disabled.
d.5Rb. Disabled. Band under (heating) or over (cooling)(**Default**)
ENRb. Centered band

80 o.o.5.1 **Off Over Setpoint 1**
In P.I.D. enables the command output 1 switching off, when a certain threshold is exceeded (setpoint + Par.81)
d.5Rb. Disabled (**Default**)
ENRb. Enabled

81 o.d.t.1 **Off Deviation Threshold 1**
Selects deviation from command setpoint 1, to calculate the intervention threshold of "Off Over Setpoint 1" function.
-9999...+9999 [digit[1 p. 70]] (degrees.tenths for temp. sensors) (**Default**: 0)

82 c.t. 1 **Cycle Time 1**
Cycle time for P.I.D. regulation of process 1 (for P.I.D. on remote control switch 15 s; for PID on SSR 2s). For valve refer to parameter 47 uR.t.1
1-300 seconds (**Default**:15 s)

83 co.F.1 **Cooling Fluid 1**
Type of refrigerant fl uid for heating / cooling P.I.D. for process 1. Enable the cooling output on parameter AL.1... AL.6.
R.iP Air (**Default**)
o.iL Oil
WRtER Water

84 P.b.Π.1 **Proportional Band Multiplier 1**
Proportional band multiplier for heating/cooling P.I.D. for process 1. Proportional band for cooling action is given by parameter P.b. 1 multiplied for this value
1.00...5.00. **Default**: 1.00

85 o.d.b.1 **Overlap / Dead Band 1**
Dead band combination for heating / cooling P.I.D. (double action) for process 1.
-20.0%...50.0%
Negative: Dead band.
Positive: overlap. **Default**: 0.0%

86 c.c.t.1 **Cooling Cycle Time 1**
Cycle time for cooling output in hating/cooling P.I.D. mode for process 1.
1-300 seconds (**Default**:10 s)

87 L.L.P.1 **Lower Limit Output Percentage 1**
Selects min. value for command output 1 percentage.
0%...100%, **Default**: 0%.

88 u.L.P.1 **Upper Limit Output Percentage 1**
Selects max. value for command output 1 percentage.
0%...100%, **Default**: 100%.

89 M.G.t.1 **Max Gap Tune 1**
Selects the max. process-setpoint gap beyond which the automatic tune recalculates PID parameters of process 1.
0-10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors). **Default**: 2.0

90 Mn.P.1 **Minimum Proportional Band 1**
Selects the min. proportional band 1 value selectable by the automatic tune for the P.I.D. regulation of process 1.
0-10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors). **Default**: 3.0

91 MA.P.1 **Maximum Proportional Band 1**
Selects the max. proportional band 1 value selectable by the automatic tune for the P.I.D. regulation of process 1.
0-10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors). **Default**: 80.0

92 Mn.i.1 **Minimum Integral Time 1**
Selects the min. integral time 1 value selectable by the automatic tune for the P.I.D. regulation of process 1.
0.0...1000.0 seconds. **Default**: 30.0 s.

93 o.c.L.1 **Overshoot Control Level 1**
The overshoot control function prevents this event during device switching on or when the setpoint is modified.
Setting a too low value the overshoot may not be fully absorbed, while with high values the process could reach the setpoint more slowly.

Disab.	Lev. 3	Lev. 6	Lev. 9
Lev. 1	Lev. 4	Lev. 7	Lev. 10
Lev. 2	Lev. 5 (**Default**)	Lev. 8	

94÷97 **Reserved Parameters - Group E**
Reserved parameters - Group E

GROUP F - *rEG.2* - Autotuning and PID 2 *(only on ATR244-23XX-T)*

98 *tun.2*   **Tune 2**

Selects autotuning type for command 2
diSAb.	Disabled. If proportional band and integral time paramters are to selected to zero, the regulation is ON/OFF type. (**Default**)
Auto	Automatic (Automatic P.I.D. parameters calculation)
MANu.	Manual (launch by keyboards or by digital input)
oNcE	Once (P.I.D. parameters calculation only at first start)
SYNcH.	Synchronized (Autotuning managed by serial)

99 *S.d.t.2*   **Setpoint Deviation Tune 2**

Selects deviation from command setpoint 2 as threshold used by autotuning to calculate P.I.D. parameters.
0-10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors). **Default**: 30.0.

100 *P.b. 2*   **Proportional Band 2**

Proportional band or process 2 P.I.D. regulation (Process inertia).
0 ON / OFF if t.i. equal to 0 (**Default**)
1...10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors).

101 *i.t. 2*   **Integral Time 2**

Integral time for process 2 P.I.D. regulation (process intertia duration).
0.0...2000.0 seconds (0.0 = integral disabled), **Default** 0.0

102 *d.t. 2*   **Derivative Time 2**

Derivative time for process 2 P.I.D. regulation (Normally ¼ of integral time).
0.0...1000.0 seconds (0.0 = derivative disabled), **Default** 0

103 *d.b. 2*   **Dead Band 2**

Dead band of process 2 P.I.D.
0...10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors) (**Default**: 0)

104 *P.b.c.2*   **Proportional Band Centered 2**

Defines if the proportional band 2 must be centered or not on the setpoint. In double loop functioning (heating/cooling), always disabled.
diSAb.	Disabled. Band under (heating) or over (cooling) (**Default**)
ENAb.	Centered band

105 *o.o.S.2*   **Off Over Setpoint 2**

In P.I.D. enables the command output 2 switching off, when a certain threshold is exceeded (setpoint + Par.106)
diSAb.	Disabled (**Default**)
ENAb.	Enabled

106 *o.d.t.2*   **Off Deviation Threshold 2**

Selects deviation from command setpoint 2, to calculate the intervention threshold of "Off Over Setpoint 2" function.
-9999...+9999 [digit[1 p. 70]] (degrees.tenths for temp. sensors) (**Default**: 0)

107 *c.t. 2*   **Cycle Time 2**

Cycle time for P.I.D. regulation of process 2 (for P.I.D. on remote control switch 15 s; for PID on SSR 2s). For valve refer to parameter 66 *vA.t.2*
1-300 seconds (**Default**:15 s)

108 $co.F.2$ **Cooling Fluid 2**

Type of refrigerant fluid for heating / cooling P.I.D. for process 2. Enable the cooling output on parameter AL.1... AL.6.

$A.iR$	Air (**Default**)	$o.iL$	Oil	$WAtER$	Water

109 $P.b.\Pi.2$ **Proportional Band Multiplier 2**

Proportional band multiplier for heating/cooling P.I.D. for process 2. Proportional band for cooling action is given by parameter $P.b.\ 2$ multiplied for this value.

1.00..5.00. **Default**: 1.00

110 $o.d.b.2$ **Overlap / Dead Band 2**

Dead band combination for heating / cooling P.I.D. (double action) for process 2. -20.0..50.0%
Negative: Dead band.   Positive: overlap. **Default**: 0.0%

111 $c.c.t.2$ **Cooling Cycle Time 2**

Cycle time for cooling output in hating/cooling P.I.D. mode for process 2.
1-300 seconds (**Default**:10 s)

112 $LL.P.2$ **Lower Limit Output Percentage 2**

Selects min. value for command output 2 percentage.
0%...100%, **Default**: 0%.

113 $uL.P.2$ **Upper Limit Output Percentage 2**

Selects max. value for command output 2 percentage.
0%...100%, **Default**: 100%.

114 $\Pi.G.t.2$ **Max Gap Tune 2**

Selects the max. process-setpoint gap beyond which the automatic tune recalculates PID parameters of process 2.
0-10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors). **Default**: 2.0

115 $\Pi n.P.2$ **Minimum Proportional Band 2**

Selects the min. proportional band value selectable by the automatic tune for the P.I.D. regulation of process 2.
0-10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors). **Default**: 3.0

116 $\Pi A.P.2$ **Maximum Proportional Band 2**

Selects the max. proportional band 2 value selectable by the automatic tune for the P.I.D. regulation of process 2.
0-10000 [digit[1 p. 70]] (degrees.tenths for temp. sensors). **Default**: 80.0

117 $\Pi n.i.2$ **Minimum Integral Time 2**

Selects the min. integral time 2 value selectable by the automatic tune for the P.I.D. regulation of process 2.
0.0...1000.0 secondS. **Default**: 30.0 secondi.

118 $o.c.L.2$ **Overshoot Control Level 2**

The overshoot control function prevents this event during device switching on or when the setpoint is modified. Setting a too low value the overshoot may not be fully absorbed, while with high values the process could reach the setpoint more slowly.

Disab.	Lev. 3	Lev. 6	Lev. 9
Lev. 1	Lev. 4	Lev. 7	Lev. 10
Lev. 2	Lev. 5 (**Default**)	Lev. 8	

119÷122   **Reserved Parameters - Group F**

Reserved parameters - Group F

GROUP G - $RL.\ l$ - ALARM 1

123 $RL.l.F.$ **Alarm 1 Function**

Alarm 1 selection.

di$5Rb$.	Disabled (**Default**)
$Rb.uP.R$.	Absolute Upper Activation. Absolute referred to the process, active over
$Rb.Lo.R$.	Absolute Lower Activation. Absolute referred to the process, active under
$bRNd$	Band alarm (command setpoint ± alarm setpoint)
$uP.dEV$.	Upper Deviation alarm
$Lo.dEV$.	Lower Deviation alarm
$Rb.c.u.R$.	Absolute Command Upper Activation. Absolute alarm referred to the command setpoint, active over
$Rb.c.L.R$.	Absolute Command Lower Activation. Absolute alarm referred to the command setpoint, active under
RuN	Status alarm (active in RUN/START)
$cooL$	Cold actuator auxiliary (Cold action in double loop)
$PRb.ER$.	Probe error. Alarm active in case of sensor ropture.
$tMR.l$	Related to timer 1
$tMR.2$	Related to timer 2
$tMR.l.2$	Related to both timers
REM.	Remote. The alarm is enabled by the word 1235
di$.\ l$	Digital Input 1. Active when digital input 1 is active.
di$.\ 2$	Digital Input 2. Active when digital input 2 is active.
di$.\ 3$	Digital Input 3. Active when digital input 3 is active.
di$.\ 4$	Digital Input 4. Active when digital input 4 is active.
$H.b.R$.	Heater Break Alarm and Overcurrent Alarm
$R.bRNd$	Asymmetric band alarm (command setpoint + alarm setpoint 1 H and command setpoint - alarm setpoint 1 L).
$c.\ Rux$	Auxiliary for job distribution on the command output. It cyclically replaces the command output for the time set on the parameter 134 $R.l.dE$.. Se $R.l.dE$. $= 0$, it is activated parallel to the command output. It does not work in case of valve control and can only be activated on an alarm if A.1.de. is different from 0.

124 $R.lP$r.   **Alarm 1 Process** *(only on ATR244-23XX-T)*

Selects the size related to alarm 1.

Ri$N.l$	Value read on input AI1. (**Default**)
Ri$N.2$	Value read on input AI2.
$MERN$	Arithmetic average of the value read on inputs AI1 and AI2 [(AI1+AI2)/2].
diFF.	Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
$Rb.d$iF.	Module of the difference of the values read on inputs AI1 and AI2(|AI1-AI2|).
$5uM$	Sum of values read on inputs AI1 and AI2 (AI1+AI2).

125 $R.l.r.c.$ **Alarm 1 Reference Command** *(only on ATR244-23XX-T)*

Selects alarm 1 reference command

$cMd.\ l$	Alarm referred to command 1. (**Default**)
$cMd.\ 2$	Alarm referred to command 2.

126 $R.l.5.o.$ **Alarm 1 State Output**

Alarm 1 output contact and intervention type.

$N.o.\ 5t$.	(N.O. Start) Normally open, active at start (**Default**)
$N.c.\ 5t$.	(N.C. Start) Normally closed, active at start
$N.o.\ tH$.	(N.O. Threshold) Normally open, active on reaching alarm[2 p. 70]
$N.c.\ tH$.	(N.C. Threshold) Normally closed, active on reaching alarm[2 p. 70]
$N.o.tH.V$.	(N.O. Threshold Variation) disabled after changing control setpoint[3 p. 70]
$N.c.tH.V$.	(N.C. Threshold Variation) disabled after changing control setpoint[3 p. 70]

127 $rE5$.   **Reserved**

Reserved parameter.

128 *A.1HY.*   **Alarm 1 Hysteresis**
Alarm 1 hysteresis
-9999..+9999 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 0.5.

129 *A.1LL.*   **Alarm 1 Lower Limit**
Lower limit selectable for the alarm 1 setpoint.
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 0.

130 *A.1uL.*   **Alarm 1 Upper Limit**
Upper limit selectable for the alarm 1 setpoint
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 1750.

131 *A.1rE.*   **Alarm 1 Reset**
Alarm 1 contact reset type (always automatic if AL.1.F. = c. Aux).
A. RES.   Automatic reset (**Default**)
M. RES.   Manual reset (manual reset by keyboard or by digital input)
M.RES.S.   Stored manual reset (keeps the output status also after a power failure)
A. RES.t.   Automatic reset with timed activation. The alarm remains active for the time set on the parameter 134 a.1.de., even if the conditions generating it are missing. To be able to act again, the alarm conditions must disappear.

132 *A.1S.E.*   **Alarm 1 State Error**
Alarm 1 output status in case of error.
oPEN   Open contact. **Default**
cLoSE   Closed contact.

133 *A.1Ld.*   **Alarm 1 Led**
Defines the status of the led **A1** in correspondence of the relevant output
o.c.   ON with open contact or DO switched off.
c.c.   ON with closed contact or DO switched on. (**Default**)

134 *A.1dE.*   **Alarm 1 Delay**
Alarm 1 Delay.
-60:00..60:00 mm:ss (hh:mm if AL.1.F. = c. Aux). **Default**: 00:00.
Negative value: delay when exit alarm status.
Positive value: delay when enter alarm status.

135 *A.1S.P.*   **Alarm 1 Setpoint Protection**
Allows or not to change the alarm 1 setpoint
FREE   Editable by the user (**Default**)
Lock   Protected
HidE   Protected and not visualized

136 *A.1Lb.*   **Alarm 1 Label**
Selects the message displayed in case of alarm 1 intervention.
diSAb.   Disabled. (**Default**) 0.
Lb. 01   Message 1 (see table on paragraph *14.1*)
..
Lb. 16   Message 16 (see table on paragraph *14.1*)
uSER.L.   Custom message (modifiable by the user through the App or via modbus)

137÷140   **Reserved Parameters - Group G**
Reserved parameters - Group G

GRUPPO H - *AL. 2* - **Alarm 2**

141 *AL.2.F.* **Alarm 2 Function**

Alarm 2 selection.

d.5Ab.	Disabled (**Default**)
Ab.uP.A.	Absolute Upper Activation. Absolute referred to the process, active over
Ab.Lo.A.	Absolute Lower Activation. Absolute referred to the process, active under
bANd	Band alarm (command setpoint ± alarm setpoint)
uP.dEV.	Upper Deviation alarm
Lo.dEV.	Lower Deviation alarm
Ab.c.u.A.	Absolute Command Upper Activation. Absolute alarm referred to the command setpoint, active over
Ab.c.L.A.	Absolute Command Lower Activation. Absolute alarm referred to the command setpoint, active under
RuN	Status alarm (active in RUN/START)
cooL	Cold actuator auxiliary (Cold action in double loop)
PRb.ER.	Probe error. Alarm active in case of sensor ropture.
tMR.1	Related to timer 1
tMR.2	Related to timer 2
tMR.1.2	Related to both timers
REM.	Remote. The alarm is enabled by the word 1236
d.i. 1	Digital Input 1. Active when digital input 1 is active.
d.i. 2	Digital Input 2. Active when digital input 2 is active.
d.i. 3	Digital Input 3. Active when digital input 3 is active.
d.i. 4	Digital Input 4. Active when digital input 4 is active.
H.b.A.	Heater Break Alarm and Overcurrent Alarm
A.bANd	Asymmetric band alarm (command setpoint + alarm setpoint 2 H and command setpoint - alarm setpoint 2 L).
c. Aux	Auxiliary for job distribution on the command output. It cyclically replaces the command output for the time set on the parameter 152 *A.2.dE.*. If *A.2.dE.* = 0, it is activated parallel to the command output. It does not work in case of valve control and can only be activated on an alarm if *A.2.dE.* is different from 0.

142 *A.2Pr.* **Alarm 2 Process** *(only on ATR244-23XX-T)*

Selects the size related to alarm 2.

A.iN.1	Value read on input AI1. (**Default**)
A.iN.2	Value read on input AI2.
MEAN	Arithmetic average of the value read on inputs AI1 and AI2 [(AI1+AI2)/2].
d.FF.	Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
Ab.d.F.	Module of the difference of the values read on inputs AI1 and AI2(|AI1-AI2|).
5uM	Sum of values read on inputs AI1 and AI (AI1+AI2).

143 *A.2.r.c.* **Alarm 2 Reference Command** *(only on ATR244-23XX-T)*

Selects alarm 2 reference command

cMd. 1	Alarm referred to command 1. (**Default**)
cMd. 2	Alarm referred to command 2.

144 *A.2S.o.* **Alarm 2 State Output**

Alarm 2 output contact and intervention type.

N.o. 5t.	(N.O. Start) Normally open, active at start (**Default**)
N.c. 5t.	(N.C. Start) Normally closed, active at start
N.o. tH.	(N.O. Threshold) Normally open, active on reaching alarm[2 p. 70]
N.c. tH.	(N.C. Threshold) Normally closed, active on reaching alarm[2 p. 70]
N.o.tH.V.	(N.O. Threshold Variation) disabled after changing control setpoint[3 p. 70]
N.c.tH.V.	(N.C. Threshold Variation) disabled after changing control setpoint[3 p. 70]

145 *rES.* **Reserved**

Reserved parameter.

146 *A.2HY.*   **Alarm 2 Hysteresis**

Alarm 2 hysteresis
-9999..+9999 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 0.5.

147 *A.2LL.*   **Alarm 2 Lower Limit**

Lower limit selectable for the alarm 2 setpoint.
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 0.

148 *A.2.u.L.*   **Alarm 2 Upper Limit**

Upper limit selectable for the alarm 2 setpoint
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 1750.

149 *A.2.rE.*   **Alarm 2 Reset**

Alarm 2 contact reset type (always automatic if *AL.2.F. = c. Aux*).
A. RES.   Automatic reset (**Default**)
M. RES.   Manual reset (manual reset by keyboard or by digital input)
M.RES.S.   Stored manual reset (keeps the output status also after a power failure)
A. RES.t.   Automatic reset with timed activation. The alarm remains active for the time set on the parameter 152 *A.2.dE.*, even if the conditions generating it are missing. To be able to act again, the alarm conditions must disappear.

150 *A.2S.E.*   **Alarm 2 State Error**

Alarm 2 output status in case of error
If the alarm output is relay
oPEN   Contact or open valve. **Default**   *cLoSE*   Contact or closed valve.
If the alarm output is digital (SSR):
oFF   Digital output OFF. **Default**   *oN*   Digital output ON.

151 *A.2Ld.*   **Alarm 2 Led**

Defines the status of the led **A2** in correspondence of the relevant output.
o.c.   ON with open contact or DO switched off.
c.c.   ON with closed contact or DO switched on. (**Default**)

152 *A.2.dE.*   **Alarm 2 Delay**

Alarm 2 Delay. -60:00..60:00 mm:ss (hh:mm if *AL.2.F. = c. Aux*). **Default**: 00:00.
Negative value: delay when exit alarm status.
Positive value: delay when enter alarm status

153 *A.2S.P.*   **Alarm 2 Setpoint Protection**

Allows or not to change the alarm 2 setpoint
FREE   Editable by the user (**Default**)
Lock   Protected
HidE   Protected and not visualized

154 *A.2Lb.*   **Alarm 2 Label**

Selects the message displayed in case of alarm 2 intervention.
diSAb.   Disabled. (**Default**) 0.
Lb. 01   Message 1 (see table on paragraph *14.1*)
..
Lb. 20   Message 20 (see table on paragraph *14.1*)
uSER.L.   Custom message (modifiable by the user through the App or via modbus)

155÷158   **Reserved Parameters - Group H**

Reserved parameters - Group H

GROUP I - AL. 3 - Alarm 3

159 AL.3.F.   **Alarm 3 Function**

Alarm 3 selection.

d.SAb.	Disabled (**Default**)
Ab.uP.A.	Absolute Upper Activation. Absolute referred to the process, active over
Ab.Lo.A.	Absolute Lower Activation. Absolute referred to the process, active under
bANd	Band alarm (command setpoint ± alarm setpoint)
uP.dEV.	Upper Deviation alarm
Lo.dEV.	Lower Deviation alarm
Ab.c.u.A.	Absolute Command Upper Activation. Absolute alarm referred to the command setpoint, active over
Ab.c.L.A.	Absolute Command Lower Activation. Absolute alarm referred to the command setpoint, active under
RuN	Status alarm (active in RUN/START)
cooL	Cold actuator auxiliary (Cold action in double loop)
PRb.ER.	Probe error. Alarm active in case of sensor ropture.
tMR.1	Related to timer 1
tMR.2	Related to timer 2
tMR.1.2	Related to both timers
REM.	Remote. The alarm is enabled by the word 1237
d.i. 1	Digital Input 1. Active when digital input 1 is active.
d.i. 2	Digital Input 2. Active when digital input 2 is active.
d.i. 3	Digital Input 3. Active when digital input 3 is active.
d.i. 4	Digital Input 4. Active when digital input 4 is active.
H.b.A.	Heater Break Alarm e Overcurrent Alarm
A.bANd	Asymmetric band alarm (command setpoint + alarm setpoint 3 H and command setpoint - alarm setpoint 3 L).
c. Aux	Auxiliary for job distribution on the command output. It cyclically replaces the command output for the time set on the parameter 170 A.3.dE. If A.3.dE. = 0, it is activated parallel to the command output. It does not work in case of valve control and can only be activated on an alarm if A.3.dE. is different from 0.

160 A3.Pr.   **Alarm 3 Process** *(only on ATR244-23XX-T)*

Selects the size related to alarm 3.

A.iN.1	Value read on input AI1. (**Default**)
A.iN.2	Value read on input AI2.
MEAN	Arithmetic average of the value read on inputs AI1 and AI2 [(AI1+AI2)/2].
d.FF.	Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
Ab.d.F.	Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|).
SuM	Sum of values read on inputs AI1 and AI2 (AI1+AI2).

161 A3.r.c.   **Alarm 3 Reference Command** *(only on ATR244-23XX-T)*

Selects alarm 3 reference command

cMd. 1	Alarm referred to command 1. (**Default**)
cMd. 2	Alarm referred to command 2.

162 A3.S.o.   **Alarm 3 State Output**

Alarm 3 output contact and intervention type..

N.o. St.	(N.O. Start) Normally open, active at start (**Default**)
N.c. St.	(N.C. Start) Normally closed, active at start
N.o. tH.	(N.O. Threshold) Normally open, active on reaching alarm[2 p. 70]
N.c. tH.	(N.C. Threshold) Normally closed, active on reaching alarm[2 p. 70]
N.o.tH.V.	(N.O. Threshold Variation) disabled after changing control setpoint[3 p. 70]
N.c.tH.V.	(N.C. Threshold Variation) disabled after changing control setpoint[3 p. 70]

163 A3.o.t.   **Alarm 3 Output Type**

Defines the output type if the alarm 3 is analogue.
0.10 V   Output 0...10 V. **Default**
4.20MA   Output 4...20 mA.

164 A.3HY.   **Alarm 3 Hysteresis**

Alarm 3 hysteresis.
-9999..+9999 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 0.5.

165 A3.LL   **Alarm 3 Lower Limit**

Lower limit selectable for the alarm 3 setpoint.
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 0.

166 A3.u.L.   **Alarm 3 Upper Limit**

Upper limit selectable for the alarm 3 setpoint
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 1750.

167 A.3.rE.   **Alarm 3 Reset**

Alarm 3 contact reset type (always automatic if AL.3.F. = c. Aux).
A. RES.   Automatic reset (**Default**)
M. RES.   Manual reset (manual reset by keyboard or by digital input)
M.RES.S.   Stored manual reset (keeps the output status also after a power failure)
A. RES.t.   Automatic reset with timed activation. The alarm remains active for the time set on the parameter 170 A.3.dE., even if the conditions generating it are missing. To be able to act again, the alarm conditions must disappear.

168 A3S.E.   **Alarm 3 State Error**

Alarm 3 output status in case of error.
If the alarm output is relay
oPEN   Contact or open valve. **Default**   cLoSE   Contact or closed valve.
If the alarm output is digital (SSR):
oFF   Digital output OFF. **Default**   oN   Digital output ON.
If the alarm output is 0-10V:
0 V   0 V. **Default**   10 V   10 V.
If the alarm output is 0-20 mA or 4-20 mA:
0 MA   0 mA. **Default**   20 MA   20 mA.
4 MA   4 mA.   21.5MA   21.5 mA.

169 A3.Ld.   **Alarm 3 Led**

Defines the status of the led **A3** in correspondence of the relevant output.
o.c.   ON with open contact, DO switched off or AO deactivated.
c.c.   ON with closed contact, DO switched on or AO activated. (**Default**)

170 A.3.dE.   **Alarm 3 Delay**

Alarm 3 Delay.
-60:00..60:00 mm:ss (hh:mm if AL.3.F. = c. Aux). **Default**: 00:00.
Negative value: delay when exit alarm status.
Positive value: delay when enter alarm status

171 A3S.P.   **Alarm 3 Setpoint Protection**

Allows or not to change the alarm 3 setpoint.
FREE   Editable by the user (**Default**)
LocK   Protected
HidE   Protected and not visualized

172 `A3.Lb.`   **Alarm 3 Label**

Selects the message displayed in case of alarm 3 intervention.

`di5Rb.`	Disabled. (**Default**) 0.
`Lb. 01`	Message 1 (see table on paragraph *14.1*)
..	
`Lb. 20`	Message 20 (see table on paragraph *14.1*)
`u5EP.L.`	Custom message (modifiable by the user through the App or via modbus)

173÷176   **Reserved Parameters - Group I**

Reserved parameters - Group I

GROUP J - `AL 4` - Alarm 4
177 `AL4.F.`   **Alarm 4 Function**

Alarm 4 selection.

`di5Rb.`	Disabled (**Default**)
`Rb.uP.R.`	Absolute Upper Activation. Absolute referred to the process, active over
`Rb.Lo.R.`	Absolute Lower Activation. Absolute referred to the process, active under
`bRNd`	Band alarm (command setpoint ± alarm setpoint)
`uP.dEV.`	Upper Deviation alarm
`Lo.dEV.`	Lower Deviation alarm
`Rb.c.u.R.`	Absolute Command Upper Activation. Absolute alarm referred to the command setpoint, active over
`Rb.c.L.R.`	Absolute Command Lower Activation. Absolute alarm referred to the command setpoint, active under.
`RuN`	Status alarm (active in RUN/START)
`cooL`	Cold actuator auxiliary (Cold action in double loop)
`PRb.ER.`	Probe error. Alarm active in case of sensor ropture.
`EMR.1`	Related to timer 1
`EMR.2`	Related to timer 2
`EMR.1.2`	Related to both timers
`REM.`	Remote. The alarm is enabled by the word 1238
`d.i. 1`	Digital Input 1. Active when digital input 1 is active.
`d.i. 2`	Digital Input 2. Active when digital input 2 is active.
`d.i. 3`	Digital Input 3. Active when digital input 3 is active.
`d.i. 4`	Digital Input 4. Active when digital input 4 is active.
`H.b.R.`	Heater Break Alarm and Overcurrent Alarm
`R.bRNd`	Asymmetric band alarm (command setpoint + alarm setpoint 4 H and command setpoint - alarm setpoint 4 L).
`c. Rux`	Auxiliary for job distribution on the command output. It cyclically replaces the command output for the time set on the parameter 188 `A.4.dE.`. If `A.4.dE.` = 0, it is activated parallel to the command output. It does not work in case of valve control and can only be activated on an alarm if `A.4.dE.` is different from 0.

178 `A4.Pr.`   **Alarm 4 Process** *(only on ATR244-23XX-T)*

Selects the size related to alarm 4.

`R.iN.1`	Value read on input AI1. (**Default**)
`R.iN.2`	Value read on input AI2.
`MERN`	Arithmetic average of the value read on inputs AI1 and AI2 [(AI1+AI2)/2].
`diFF.`	Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
`Rb.diF.`	Module of the difference of the values read on inputs AI1 and AI2(|AI1-AI2|).
`5uM`	Sum of values read on inputs AI1 and AI2 (AI1+AI2).

179 `A4.r.c.`   **Alarm 4 Reference Command**

Selects alarm 4 reference command

`cMd. 1`	Alarm referred to command 1. (**Default**)
`cMd. 2`	Alarm referred to command 2.

180 $R4.5.o.$ **Alarm 4 State Output**

Alarm 4 output contact and intervention type.
$N.o.\ 5E.$ (N.O. Start) Normally open, active at start (**Default**)
$N.c.\ 5E.$ (N.C. Start) Normally closed, active at start
$N.o.\ EH.$ (N.O. Threshold) Normally open, active on reaching alarm[2 p. 70]
$N.c.\ EH.$ (N.C. Threshold) Normally closed, active on reaching alarm[2 p. 70]
$N.o.EH.V.$ (N.O. Threshold Variation) disabled after changing control setpoint[3 p. 70]
$N.c.EH.V.$ (N.C. Threshold Variation) disabled after changing control setpoint[3 p. 70]

181 $R4.o.E.$ **Alarm 4 Output Type**

Defines the output type if the alarm 4 is analogue.
$0.10\ V$ Output 0...10 V. **Default**
$4.20MR$ Output 4...20 mA.

182 $R4.HY.$ **Alarm 4 Hysteresis**

Alarm 4 hysteresis.
-9999..+9999 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 0.5.

183 $R4.LL$ **Alarm 4 Lower Limit**

Lower limit selectable for the alarm 4 setpoint.
-9999..+30000 [digit[1 p. 70]] (gradi per sensori di temperatura). **Default** 0.

184 $R4.u.L.$ **Alarm 4 Upper Limit**

Upper limit selectable for the alarm 4 setpoint.
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 1750.

185 $R4.rE.$ **Alarm 4 Reset**

Alarm 4 contact reset type (always automatic if $RL.4.F. = c.\ Ru\overset{x}{.}$).
$R.\ rE5.$ Automatic reset (**Default**)
$M.\ rE5.$ Manual reset (manual reset by keyboard or by digital input)
$M.rE5.5.$ Stored manual reset (keeps the output status also after a power failure)
$R.\ rE5.E.$ Automatic reset with timed activation. The alarm remains active for the time set on the parameter 188 $R4.dE.$, even if the conditions generating it are missing. To be able to act again, the alarm conditions must disappear.

186 $R4.5.E.$ **Alarm 4 State Error**

Alarm 4 output status in case of error.
If the alarm output is digital (SSR):

oFF	Digital output OFF. **Default**	oN	Digital output ON.

If the alarm output is 0-10V:

$0\ V$	0 V. **Default**	$10\ V$	10 V.

If the alarm output is 0-20 mA or 4-20 mA:

$0\ MR$	0 mA. **Default**	$20\ MR$	20 mA.
$4\ MR$	4 mA.	$21.5MR$	21.5 mA.

187 $rE5.$ **Reserved**

Reserved parmeter

188 $R4.dE.$ **Alarm 4 Delay**

Alarm 4 Delay.
-60:00..60:00 mm:ss (hh:mm if $RL.4.F. = c.\ Ru\overset{x}{.}$). **Default**: 00:00.
Negative value: delay when exit alarm status.
Positive value: delay when enter alarm status

189 $R\,H.5.P.$ **Alarm 4 Setpoint Protection**

Allows or not to change the alarm 4 setpoint.
$FREE$ Editable by the user (**Default**)
$Lock$ Protected
$H\,dE$ Protected and not visualized

190 $R\,H.Lb.$ **Alarm 4 Label**

Selects the message displayed in case of alarm 4 intervention.
$d\,5Rb.$ Disabled. (**Default**) 0.
$Lb.\ \ 01$ Message 1 (see table on paragraph *14.1*)
..
$Lb.\ \ 20$ Message 20 (see table on paragraph *14.1*)
$uSER.L.$ Custom message (modifiable by the user through the App or via modbus)

191÷194   **Reserved Parameters - Group J**

Reserved parameters - Group J

GROUP K - $RL.\ 5$ - Alarm 5 *(only on ATR244-13ABC and ATR244-23XX-T)*

195 $RL.5.F.$ **Alarm 5 Function**

Alarm 5 selection 5.
$d\,5Rb.$ Disabled (**Default**)
$Rb.uP.R.$ Absolute Upper Activation. Absolute referred to the process, active over
$Rb.Lo.R.$ Absolute Lower Activation. Absolute referred to the process, active under
$bRNd$ Band alarm (command setpoint ± alarm setpoint)
$uP.dEV.$ Upper Deviation. alarm
$Lo.dEV.$ Lower Deviation alarm
$Rb.c.u.R.$ Absolute Command Upper Activation. Absolute alarm referred to the command setpoint, active over.
$Rb.c.L.R.$ Absolute Command Lower Activation. Absolute alarm referred to the command setpoint, active under
RuN Status alarm (active in RUN/START)
$cooL$ Cold actuator auxiliary (Cold action in double loop)
$PRb.ER.$ Probe error. Alarm active in case of sensor ropture.
$tMR.1$ Related to timer 1
$tMR.2$ Related to timer 2
$tMR.1.2$ Related to both timers
$REM.$ Remote. The alarm is enabled by the word 1239
$d\,\iota.\ \ 1$ Digital Input 1. Active when digital input 1 is active.
$d\,\iota.\ \ 2$ Digital Input 2. Active when digital input 2 is active.
$d\,\iota.\ \ 3$ Digital Input 3. Active when digital input 3 is active.
$d\,\iota.\ \ 4$ Digital Input 4. Active when digital input 4 is active.
$H.b.R.$ Heater Break Alarm and Overcurrent Alarm
$R.bRNd$ Asymmetric band alarm (command setpoint + alarm setpoint 5 H and command setpoint - alarm setpoint 5 L).
$c.\ Rux$ Auxiliary for job distribution on the command output. It cyclically replaces the command output for the time set on the parameter 206 $R.5.dE.$ If $R.5.dE. = 0$, it is activated parallel to the command output. It does not work in case of valve control and can only be activated on an alarm if $R.5.dE.$ is different from 0.

196 $R5.Pr.$ **Alarm 5 Process** *(only on ATR244-23XX-T)*

Selects the size related to alarm 5.
$R\,\iota N.1$ Value read on input AI1. (**Default**)
$R\,\iota N.2$ Value read on input AI2.
$MERN$ Arithmetic average of the value read on inputs AI1 and AI2 [(AI1+AI2)/2].
$d\,FF.$ Difference of the values read on inputs AI1 and AI2 AI1-AI2).
$Rb.d\,F.$ Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|).
$5uM$ Sum of values read on inputs AI1 and AI2 (AI1+AI2).

197 *R5.r.c.* **Alarm 5 Reference Command** *(only on ATR244-23XX-T)*
Selects alarm 5 reference command
cMd. 1 Alarm referred to command 1. (**Default**)
cMd. 2 Alarm referred to command 2.

198 *R55.o.* **Alarm 5 State Output**
Contatto uscita allarme 5 e tipo intervento.
N.o. 5t. (N.O. Start) Normally open, active at start (**Default**)
N.c. 5t. (N.C. Start) Normally closed, active at start
N.o. tH. (N.O. Threshold) Normally open, active on reaching alarm[2 p. 70]
N.c. tH. (N.C. Threshold) Normally closed, active on reaching alarm[2 p. 70]
N.o.tH.V. (N.O. Threshold Variation) disabled after changing control setpoint[3 p. 70]
N.c.tH.V. (N.C. Threshold Variation) disabled after changing control setpoint[3 p. 70]

199 *R5.o.t.* **Alarm 5 Output Type**
Defines the output type if the alarm 5 is analogue.
0.10 V Output 0...10 V. **Default**
4.20MR Output 4...20 mA.

200 *R5.HY.* **Alarm 5 Hysteresis**
Alarm 5 hysteresis.
-9999..+9999 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 0.5.

201 *R5.LL.* **Alarm 5 Lower Limit**
Lower limit selectable for the alarm 5 setpoint.
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 0.

202 *R5.uL.* **Alarm 5 Upper Limit**
Upper limit selectable for the alarm 5 setpoint.
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 1750.

203 *R5.rE.* **Alarm 5 Reset**
Alarm 5 contact reset type (always automatic if *RL.5.F. = c. Rux*).
R. RES. Automatic reset (**Default**)
M. RES. Manual reset (manual reset by keyboard or by digital input)
M.RES.5. Stored manual reset (keeps the output status also after a power failure)
R. RES.t. Automatic reset with timed activation. The alarm remains active for the time set on the parameter 206 *R.5.dE.*, even if the conditions generating it are missing. To be able to act again, the alarm conditions must disappear.

204 *R5.5.E.* **Alarm 5 State Error**
Alarm 5 output status in case of error.
If the alarm output is digital (SSR):
oFF Digital output OFF. **Default**   *oN*   Digital ouput ON.
If the alarm output is 0-10V:
0 V 0 V. **Default**   *10 V*   10 V.
If the alarm output is 0-20 mA or 4-20 mA:
0 MR 0 mA. **Default**   *20 MR*   20 mA.
4 MR 4 mA.   *21.5MR*   21.5 mA.

205 *rE5.* **Reserved**
Reserved parmeter

206 A.5.dE.   **Alarm 5 Delay**

Alarm 5 Delay.
-60:00..60:00 mm:ss (hh:mm if AL.5.F. = c. Aux). **Default**: 00:00.
Negative value: delay when exit alarm status.
Positive value: delay when enter alarm status

207 A.5.5.P.   **Alarm 5 Setpoint Protection**

Allows or not to change the alarm 5 setpoint.
FREE   Editable by the user (**Default**)
Lock   Protected
HidE   Protected and not visualized

208 A5.Lb.   **Alarm 5 Label**

Selects the message displayed in case of alarm 5 intervention.
diSAb.   Disabled. (**Default**) 0.
Lb. 01   Message 1 (see table on paragraph *14.1*)
..
Lb. 20   Message 20 (see table on paragraph *14.1*)
uSER.L.   Custom message (modifiable by the user through the App or via modbus)

209÷212   **Reserved Parameters - Group K**

Reserved parameters - Group K

GROUP L - AL. 6 - Alarm 6 *(only on ATR244-23XX-T)*
213 AL.6.F.   **Alarm 6 Function**

Alarm 6 selection.
diSAb.   Disabled (**Default**)
Ab.uP.A. Absolute Upper Activation. Absolute referred to the process, active over
Ab.Lo.A. Absolute Lower Activation. Absolute referred to the process, active under
bAnd   Band alarm (command setpoint ± alarm setpoint)
uP.dEV.   Upper Deviation alarm
Lo.dEV.   Lower Deviation alarm
Ab.c.u.A. Absolute Command Upper Activation. Absolute alarm referred to the command setpoint, active over.
Ab.c.L.A. Absolute Command Lower Activation. Absolute alarm referred to the command setpoint, active under.
RuN   Status alarm (active in RUN/START)
cooL   Cold actuator auxiliary (Cold action in double loop)
PRb.ER.   Probe error. Alarm active in case of sensor ropture.
tMR.1   Related to timer 1
tMR.2   Related to timer 2
tMR.1.2   Related to both timers
REM.   Remote. The alarm is enabled by the word 1240
d.i. 1   Digital Input 1. Active when digital input 1 is active.
d.i. 2   Digital Input 2. Active when digital input 2 is active.
d.i. 3   Digital Input 3. Active when digital input 3 is active.
d.i. 4   Digital Input 4. Active when digital input 4 is active.
H.b.A.   Heater Break Alarm and Overcurrent Alarm
A.bAnd   Asymmetric band alarm (command setpoint + alarm setpoint 6 H and command setpoint - alarm setpoint 6 L).
c. Aux   Auxiliary for job distribution on the command output. It cyclically replaces the command output for the time set on the parameter 224 A.6.dE.. If A.6.dE. = 0, it is activated parallel to the command output. It does not work in case of valve control and can only be activated on an alarm if A.6.dE. is different from 0.

214	A.6.Pr.	**Alarm 6 Process**

Selects the size related to alarm 6.

A..IN.1	Value read on input AI1. (**Default**)
A..IN.2	Value read on input AI2.
MEAN	Arithmetic average of the value read on inputs AI1 and AI2 [(AI1+AI2)/2].
d.FF.	Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
Ab.d.F.	Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|).
SuM	Sum of values read on inputs AI1 and AI2 (AI1+AI2).

215	A.6.r.c.	**Alarm 6 Reference Command**

Selects alarm 6 reference command

cMd. 1	Alarm referred to command 1. (**Default**)
cMd. 2	Alarm referred to command 2.

216	A.6.S.o.	**Alarm 6 State Output**

Alarm 6 output contact and intervention type.

N.o. St.	(N.O. Start) Normally open, active at start (**Default**)
N.c. St.	(N.C. Start) Normally closed, active at start
N.o. tH.	(N.O. Threshold) Normally open, active on reaching alarm[2 p. 70]
N.c. tH.	(N.C. Threshold) Normally closed, active on reaching alarm[2 p. 70]
N.o.tH.V.	(N.O. Threshold Variation) disabled after changing control setpoint[3 p. 70]
N.c.tH.V.	(N.C. Threshold Variation) disabled after changing control setpoint[3 p. 70]

217	A.6.o.t.	**Alarm 6 Output Type**

Defines the output type if the alarm 6 is analogue.

0.10 V	Output 0...10 V. **Default**
4.20MA	Output 4...20 mA.

218	A.6.HY.	**Alarm 6 Hysteresis**

Alarm 6 hysteresis
-9999..+9999 [digit[1 p. 70]] (degrees.tenths for temp. sensors). **Default** 0.5.

219	A.6.L.L.	**Alarm 6 Lower Limit**

Lower limit selectable for the alarm 6 setpoint.
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 0.

220	A.6.u.L.	**Alarm 6 Upper Limit**

Upper limit selectable for the alarm 6 setpoint.
-9999..+30000 [digit[1 p. 70]] (degrees for temp. sensors). **Default** 1750.

221	A.6.r.E.	**Alarm 6 Reset**

Alarm 6 contact reset type (always automatic if AL.6.F. = c. Aux).

A. RES.	Automatic reset (**Default**)
M. RES.	Manual reset (manual reset by keyboard or by digital input)
M.RES.S.	Stored manual reset (keeps the output status also after a power failure)
A. RES.t.	Automatic reset with timed activation. The alarm remains active for the time set on the parameter 224 A.6.dE., even if the conditions generating it are missing. To be able to act again, the alarm conditions must disappear.

222	A.6.S.E.	**Alarm 6 State Error**

Alarm 6 output status in case of error.

If the alarm output is 0-10V:

0 V	0 V. **Default**	10 V	10 V.

If the alarm output is 0-20 mA or 4-20 mA:

0 MA	0 mA. **Default**	20 MA	20 mA.
4 MA	4 mA.	21.5MA	21.5 mA.

223 rES.   **Reserved**

Reserved parmeter

224 A.6.dE.   **Alarm 6 Delay**

Alarm 6 Delay.
-60:00..60:00 mm:ss (hh:mm if AL.6.F. = c. Aux). **Default**: 00:00.
Negative value: delay when exit alarm status
Positive value: delay when enter alarm status

225 A.6.5.P.   **Alarm 6 Setpoint Protection**

Allows or not to change the alarm 6 setpoint.
FREE   Editable by the user (**Default**)
Lock   Protected
HidE   Protected and not visualized

226 A.6.Lb.   **Alarm 6 Label**

Selects the message displayed in case of alarm 6 intervention.
diSAb.   Disabled. (**Default**) 0.
Lb. 01   Message 1 (see table on paragraph *14.1*)
..
Lb. 20   Message 20 (see table on paragraph *14.1*)
uSER.L.   Custom message (modifiable by the user through the App or via modbus)

227÷230   **Reserved Parameters - Group L**

Reserved parameters - Group L

GROUP M - *d.i.1* - Digital input 1

231 *d.i.1.F.*   **Digital Input 1 Function**

Digital input 1 functioning.
d.5Rb.   Disabled (**Default**)
2t. 5W.   2 Setpoints Switch
2t.5W.i.   2 Setpoints Switch Impulsive
3t.5W.i.   3 Setpoints Switch Impulsive
4t.5W.i.   4 Setpoints Switch Impulsive
5t./5t.   Start / Stop
RuN   Run
HoLd   Lock conversion (stop all conversions and display values)
tuNE   Performing manual tune
Ru.MR.i.   Automatic / Manual Impulse (if enabled on parameter 48 or 67)
Ru.MR.c.   Automatic / Manual Contact (if enabled on parameter 48 or 67)
Rct.tY.   Action Type. Cooling regulat. if D.I. is active, otherwise heating reg.
R.i. 0   Analogue Input 0. Set AI to zero
M. RES.   Manual reset. Reset the outputs if selected as manual reset.
t.1.RuN   Timer 1 run. The timer 1 count with activated D.I.
t.1. 5.E.   Timer 1 Start End. D.I. starts and stops the timer 1(impulsive)
t.1.5tR.   Timer 1 Start. D.I. starts the timer 1(impulsive)
t.1.ENd   Timer 1 End. D.I. stops the timer 1(impulsive)
t.2.RuN   Timer 2 run. The timer 2 count with activated D.I.
t.2. 5.E.   Timer 2 Start End. D.I. starts and stops the timer 2(impulsive)
t.2.5tR.   Timer 2 Start. D.I. starts the timer 2(impulsive)
t.2.ENd   Timer 2 End. D.I. stops the timer 2(impulsive)
Lo.cFG.   Lock configuration and setpoints.
uP.KEY   Simulates the functioning of up key.
doWN.K.   Simulates the functioning of down key.
FNc. K.   Simulates the functioning of fnd key.
5Et. K.   Simulates the functioning of set key.
REM.5.E.   Remote setpoint enabling. Enables Remote setpoint with activated D.I. Local setpoint with deactivated D.I. (remote setpoint must be enabled on parameter 56 *rEM.5.*)
Ext.RL.   External alarm. The controller goes on STOP and the alarms will be disabled. The controller does not return to START automatically: for this operation, the user's intervention is required.

232 *d.i.1c.*   **Digital Input 1 Contact**

Defines the resting contact of the digital input 1.
N.oPEN   Normally open (**Default**)
N.cLo5.   Normally closed

233 *d.i.1P.*   **Digital Input 1 Process** *(only on ATR244-23XX-T)*

Select the size related to the digital input 1.
R.iN.1   Value read on input AI1. (**Default**)
R.iN.2   Value read on input AI2.
MERN   Arithmetic average of the value read on inputs AI1 and AI2 [(AI1-AI2)/2].
d.iFF.   Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
Rb.d.F.   Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|).
5uM   Sum of values read on inputs AI1 and AI2 (AI1+AI2).

234 *d.i.1r.*   **Digital Input 1 Reference Command**

Defines the resting contact of the digital input 1.
cMd. 1   Command 1 (**Default**)
cMd. 2   Command 2
cMd.1.2   Command 1 and 2

235÷238   **Reserved Parameters - Group M**

Reserved parameters - Group M

GROUP N - d.ı.2 - Digital input 2

239 d.ı2F.   **Digital Input 2 Function**

Digital input 2 functioning.

dı5Ab.	Disabled (**Default**)
2t. 5W.	2 Setpoints Switch
2t.5W.ı.	2 Setpoints Switch Impulsive
3t.5W.ı.	3 Setpoints Switch Impulsive
4t.5W.ı.	4 Setpoints Switch Impulsive
5t./5t.	Start / Stop
RuN	Run
Hold	Lock conversion (stop all conversions and display values)
tuNE	Performing manual tune
Ru.MR.ı.	Automatic / Manual Impulse (if enabled on parameter 48 or 67)
Ru.MR.c.	Automatic / Manual Contact (if enabled on parameter 48 or 67)
Rct.tY.	Action Type. Cooling regulation if D.I. is active, otherwise heating reg.
R.ı. 0	Analogue Input 0. Set AI to zero
M. PE5.	Manual reset. Reset the outputs if selected as manual reset.
t.1.RuN	Timer 1 run. The timer 1 count with activated D.I.
t.1. 5.E.	Timer 1 Start End. D.I. starts and stops the timer 1(impulsive)
t.1.5tR.	Timer 1 Start. D.I. starts the timer 1(impulsive)
t.1.ENd	Timer 1 End. D.I. stops the timer 1(impulsive)
t.2.RuN	Timer 2 run. The timer 2 count with activated D.I.
t.2. 5.E.	Timer 2 Start End. D.I. starts and stops the timer 2(impulsive)
t.2.5tR.	Timer 2 Start. D.I. starts the timer 2(impulsive)
t.2.ENd	Timer 2 End. D.I. stops the timer 2(impulsive)
Lo.cFG.	Lock configuration and setpoints.
uP.KEY	Simulates the functioning of up key.
doWN.K.	Simulates the functioning of down key.
FNc. K.	Simulates the functioning of fnc key.
5Et. K.	Simulates the functioning of set key.
REM.5.E.	Remote setpoint enabling. Enables Remote setpoint with activated D.I. Local setpoint with deactivated D.I. (remote setpoint must be enabled on parameter 56 rEM.5.)
EXt.RL.	External alarm. The controller goes on STOP and the alarms will be disabled. The controller does not return to START automatically: for this operation, the user's intervention is required.

240 d.ı2.c.   **Digital Input 2 Contact**

Defines the resting contact of the digital input 2.

N.oPEN	Normally open (**Default**)
N.cLo5.	Normally closed

241 d.ı2P.   **Digital Input 2 Process** *(only on ATR244-23XX-T)*

Select the size related to the digital input 2.

R.ıN.1	Value read on input AI1. (**Default**)
R.ıN.2	Value read on input AI2.
MERN	Arithmetic average of the value read on inputs AI1 and AI2 [(AI1-AI2)/2].
dıFF.	Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
Rb.dıF.	Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|).
5uM	Sum of values read on inputs AI1 and AI2 (AI1+AI2).

242 d.ı2.r.   **Digital Input 2 Reference Command**

Defines the resting contact of the digital input 2.

cMd. 1	Command 1 (**Default**)
cMd. 2	Command 2
cMd.1.2	Command 1 and 2

243÷246   **Reserved Parameters - Group N**

Reserved parameters - Group N

GROUP O - d.i.3 - Digital input 3 *(only on ATR244-23XX-T)*

247 *d.i3.F.*   **Digital Input 3 Function**

Digital input 3 functioning.

diSAb.	Disabled (**Default**)
2t. SW.	2 Setpoints Switch
2t.SW.i.	2 Setpoints Switch Impulsive
3t.SW.i.	3 Setpoints Switch Impulsive
4t.SW.i.	4 Setpoints Switch Impulsive
St./St.	Start / Stop
RuN	Run
Hold	Lock conversion (stop all conversions and display values)
tuNE	Performing manual tune
Au.MA.i.	Automatic / Manual Impulse (if enabled on parameter 48 or 67)
Au.MA.c.	Automatic / Manual Contact (if enabled on parameter 48 or 67)
Act.tY.	Action Type. Cooling regulation if D.I. is active, otherwise heating reg.
A.i. 0	Analogue Input 0. Set AI to zero
M. RES.	Manual reset. Reset the outputs if selected as manual reset.
t.1.RuN	Timer 1 run. The timer 1 count with activated D.I.
t.1. S.E.	Timer 1 Start End. D.I. starts and stops the timer 1(impulsive)
t.1.StR.	Timer 1 Start. D.I. starts the timer 1(impulsive)
t.1.ENd	Timer 1 End. D.I. stops the timer 1(impulsive)
t.2.RuN	Timer 2 run. The timer 2 count with activated D.I.
t.2. S.E.	Timer 2 Start End. D.I. starts and stops the timer 2(impulsive)
t.2.StR.	Timer 2 Start. D.I. starts the timer 2(impulsive)
t.2.ENd	Timer 2 End. D.I. stops the timer 2(impulsive)
Lo.cFG.	Lock configuration and setpoints.
uP.KEY	Simulates the functioning of up key.
doWN.K.	Simulates the functioning of down key.
FNc. K.	Simulates the functioning of fnc key.
SEt. K.	Simulates the functioning of set key.
REM.S.E.	Remote setpoint enabling. Enables Remote setpoint with activated D.I. Local setpoint with deactivated D.I. (remote setpoint must be enabled on parameter 56 *rEM.S.*)
Ext.AL.	External alarm. The controller goes on STOP and the alarms will be disabled. The controller does not return to START automatically: for this operation, the user's intervention is required.

248 *d.i3.c.*   **Digital Input 3 Contact**

Defines the resting contact of the digital input 3.

N.oPEN	Normally open (**Default**)
N.cLoS.	Normally closed

249 *d.i3.P.*   **Digital Input 3 Process**

Select the size related to the digital input 3.

A.iN.1	Value read on input AI1. (**Default**)
A.iN.2	Value read on input AI2.
MEAN	Arithmetic average of the value read on inputs AI1 and AI2 [(AI1-AI2)/2].
diFF.	Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
Ab.diF.	Module of the difference of the values read on inputs AI1 and AI2(|AI1-AI2|).
SuM	Sum of values read on inputs AI1 and AI2 (AI1+AI2).

250 *d.i3.r.*   **Digital Input 3 Reference Command**

Defines the reference command for the digital input 3 functions.

cMd. 1	Command 1 (**Default**)
cMd. 2	Command 2
cMd.1.2	Command 1 and 2

251÷254   **Reserved Parameters - Group O**

Reserved parameters - Group O

GROUP P - d.ı.4 - Digital input 4 *(only on ATR244-23XX-T)*

255 *d.ı4.F.*   **Digital Input 4 Function**

Digital input 4 functioning.

d.SAb.	Disabled (**Default**)
2t. SW.	2 Setpoints Switch
2t.SW.ı.	2 Setpoints Switch Impulsive
3t.SW.ı.	3 Setpoints Switch Impulsive
4t.SW.ı.	4 Setpoints Switch Impulsive
St./St.	Start / Stop
RuN	Run
HoLd	Lock conversion (stop all conversions and display values)
tuNE	Performing manual tune
Ru.MR.ı.	Automatic / Manual Impulse (if enabled on parameter 48 or 67)
Ru.MR.c.	Automatic / Manual Contact (if enabled on parameter 48 or 67)
Rct.tY.	Action Type. Cooling regulation if D.I. is active, otherwise heating reg.
R.ı. 0	Analogue Input 0. Set AI to zero
M. RES.	Manual reset. Reset the outputs if selected as manual reset.
t.1.RuN	Timer 1 run. The timer 1 count with activated D.I.
t.1. S.E.	Timer 1 Start End. D.I. starts and stops the timer 1(impulsive)
t.1.StR.	Timer 1 Start. D.I. starts the timer 1(impulsive)
t.1.ENd	Timer 1 End. D.I. stops the timer 1(impulsive)
t.2.RuN	Timer 2 run. The timer 2 count with activated D.I.
t.2. S.E.	Timer 2 Start End. D.I. starts and stops the timer 2(impulsive)
t.2.StR.	Timer 2 Start. D.I. starts the timer 2(impulsive)
t.2.ENd	Timer 2 End. D.I. stops the timer 2(impulsive)
Lo.cFG.	Lock configuration and setpoints.
uP.KEY	Simulates the functioning of up key.
doWN.K.	Simulates the functioning of down key.
FNc. K.	Simulates the functioning of fnc key.
SEt. K.	Simulates the functioning of set key.
REM.S.E.	Remote setpoint enabling. Enables Remote setpoint with activated D.I. Local setpoint with deactivated D.I. (remote setpoint must be enabled on parameter 56 *rEM.S.*)
EXt.RL.	External alarm. The controller goes on STOP and the alarms will be disabled. The controller does not return to START automatically: for this operation, the user's intervention is required.

256 *d.ı4.c.*   **Digital Input 4 Contact**

Defines the resting contact of the digital input 4.

N.oPEN	Normally open (**Default**)
N.cLoS.	Normally closed

257 *d.ı4.P.*   **Digital Input 4 Process**

Select the size related to the digital input 4.

R.ıN.1	Value read on input AI1. (**Default**)
R.ıN.2	Value read on input AI2.
MERN	Arithmetic average of the value read on inputs AI1 and AI2 [(AI1-AI2)/2].
d.ıFF.	Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
Rb.d.ıF.	Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|).
SuM	Sum of values read on inputs AI1 and AI2 (AI1+AI2).

258 *d.ı4.r.*   **Digital Input 4 Reference Command**

Defines the reference command for the digital input 4 functions.

cMd. 1	Command 1 (**Default**)
cMd. 2	Command 2
cMd.1.2	Command 1 and 2

259÷262   **Reserved Parameters - Group P**

Reserved parameters - Group P

GROUP Q - 5Ft.5 - Soft-start and mini cycle

263 Pr.cy. **Pre-programmed Cycle**

Enables special functionings.
d.5Rb.   Disabled (**Default**)
ENRb.   Enabled (all remote sepoint functions are inhibited)

264 55.ty. **Soft-Start Type**

Enables and selects the soft-start type
d.5Rb.   Disabled (**Default**)
GRRd.   Gradient
PERc.   Percentage (only with pre-programmed cycle disabled)

265 55.r.c. **Soft-Start Reference Command** *(only on ATR244-23XX-T)*

Defines the reference command for the Soft-Start and the pre-programmed cycle.
cMd. 1   Command 1 (**Default**)
cMd. 2   Command 2
cMd.1.2   Command 1 and 2

266 55.Gr. **Soft-Start Gradient**

Rising/falling gradient for soft-start and pre-programmed cycle.
0..20000 Digit/ora (gradi.decimo/ora se temperatura). (**Default**: 100.0)

267 55.PE. **Soft-Start Percentage**

Output percentage during soft-start function.
0..100%. (**Default**: 50%)

268 55.tH. **Soft-Start Threshold**

Threshold under which the soft-start percentage function is activated, at starting.
-9999...30000 [digit[1 p. 70]] (degrees.tenths for temp. sensors) (**Default**: 1000)

269 55.t1. **Soft-Start Time**

Max. Softstart duration: if the processs will not reach the threshold selected on par. 55.tH. within the selected time, the controller starts to regulate on setpoint.
00:00   Disabled
00:01-24:00 hh:mm (**Default**: 00:15)

270 NR.t1. **Maintenance Time**

Maintenance time for pre-programmed cycle.
00:00-24:00 hh.mm (**Default**: 00:00)

271 FR.Gr. **Falling Gradient**

Falling gradient for pre-programmed cycle.
0   Disabled (**Default**)
1..10000 Digit/ora[1 p. 70] (degrees.tenths/hour if temperature)

272 dE.5t. **Delayed Start**

To set the initial waiting time for the delayed start of the setting or cycle, even in case of a blackout. The elapsed time is saved every 10 minutes.
0   Initial waiting time disabled: the controller starts immediately (**Default**)
00:01-24:00 hh.mm   Initial waiting time enabled.

273÷276 **Reserved Parameters - Group Q**

Reserved parameters - Group Q

GROUP R - ᴅⁱꜱᴘ. - Display and interface

277 ᵤ.ꜰʟᵗ **Visualization Filter**

dⁱꜱʀb.	Disabled
Pᵗᴄʜꜰ	Pitchfork filter (**Default**)
Fⁱ.ₒʀd.	First Order
Fⁱ.ₒʀ.P.	First Order with Pitchfork
2 ꜱʀ.ᴹ.	2 Samples Mean
....	...n Samples Mean
10.ꜱʀ.ᴹ.	10 Samples Mean

278 ᵤⁱ.d.2 **Visualization Display 2**

Selects visualization on display 2.

ᴄ.1.ꜱPⱽ	Command 1 setpoint (**Default**)
ₒᵤ.PE.1	Percentage of command output 1
ʀ.ⁱN.1	Value read on input AI1.
ʀ.ⁱN.2	Value read on input AI2.
ᴹEʀN	Arithmetic average of the value read on inputs AI1 and AI2 [(AI1-AI2)/2].
dⁱFF.	Difference of the values read on inputs AI1 and AI2 (AI1-AI2).
ʀb.dⁱF.	Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|).
5ᵤᴹ	Sum of values read on inputs AI1 and AI2 (AI1+AI2).
ᴄ.2.ꜱPⱽ	Command 2 setpoint
ₒᵤ.PE.2	Percentage of command output 2
ʀᴹPEʀ.	Ampere from current transformer

279 ᵗᴹₒ.d. **Timeout Display**

Determines the display timeout

dⁱꜱʀb.	Disabled. Display always ON (**Default**)
15 5	15 seconds
1 ᴹⁱN	1 minute
5 ᴹⁱN	5 minutes
10ᴹⁱN	10 minutes
30ᴹⁱN	30 minutes
1 ʜ	1 hour

280 ᵗᴹₒ5. **Timeout Selection**

Selects which display is switched off when Display Timout expires

dⁱꜱP.1	Display 1
dⁱꜱP.2	Display 2 (**Default**)
d5P.1.2	Display 1 and 2
d.1.2.ʟd.	Display 1, 2 and led

281 ᵤ.ᴹP.ᴄ. **User Menu Pre-Programmed Cycle**

Allows to modify rising/falling gradient and rentention time form the user menu, in pre-programmed cycle functioning. To access parameter modification, press **SET**.

dⁱꜱʀb.	Disabled (**Default**)
ʀ.ꜱ.ɢʀ.	Only rising gradient
ᴹʀ.ᵗⁱ.	Only retention time
ʀ.ⁱ.ɢ.ᴹ.ᵗ.	Rising gradient and retention time
Fʀʟ.ɢʀ	Only falling gradient
ʀⁱ.Fʀ.ɢ.	Rising and falling gradient
Fʀ.ɢ.ᴹ.ᵗ.	Falling gradient and retention time
ʀ.F.ɢ.ᴹ.ᵗ.	Rising gradient, retention time and falling gradient

282 ᵤ.ₒᵤᵗ **Voltage Output**

Selects the voltage on the sensors power terminals and of the digital outputs (SSR).

12 ⱽ	12 volt (**Default**)
24 ⱽ	24 volt

283   `ScL.t.`   **Scrolling Time**

Select the duration for the visualization of the user menu data, before returning to the default page.

`3 S`	3 seconds
`5 S`	5 seconds (**Default**)
`10 S`	10 seconds
`30 S`	30 seconds
`1 MiN`	1 minutes
`5 MiN`	5 minutes
`10MiN`	10 minutes
`MAN.Sc.`	Manual scroll

284   `d.SPF.`   **Display Special Functions**

`diSAb.`	Special functions disabled
`SWAP`	Shows the setpoint on display 1 and the process on display 2 (only if Par. 278 `ui.d.2` set on `c.iSPu`)

285   `nFc.L.`   **NFC Lock**

`diSAb.`	NFC lock disabled: NFC accessible.
`ENAb.`	NFC lock enabled: NFC not accessible.

286   `S.t.S.F.`   **Set Key Special Functions**

Assign special functions to the **SET** button. To execute the function the button must be pressed for 1 second. The selections `2t.SWi.`, `3t.SWi.`, `4t.SWi.` and `A.i. 0` are not available for versions with double analogue input (ATR244-23A-T e ATR244-23BC-T).

`diSAb.`	No special function linked to the **SET** key. (**Default**)
`St./St.`	Start/Stop. Pressing **SET** key the controller switches from Start to Stop and viceversa. Status of the controller, upon power-up, depends on parameter ini.s.
`2t.SWi.`	2 Threshold Command Setpoint Switch. The controller changes the regulation setpoint alternating between Set1 and Set2
`3t.SWi.`	3 Threshold Command Setpoint Switch. The controller changes the regulation setpoint alternating between Set1, Set2 and Set3
`4t.SWi.`	4 Threshold Command Setpoint Switch. The controller changes the regulation setpoint alternating between Set1, Set2, Set3 and Set4
`A.i. 0`	Analogue Input 0. Set analogue input to zero (zero tare)

GROUP S - `ct` - Current transformer *(only on ATR244-13ABC and 23xx-T)*

287   `ct F.`   **Current Transformer Function**

Enables the C.T. input and selects the net frequency

`diSAb.`	Disabilitato (**Default**)
`50 HZ`	50 Hz
`60 HZ`	60 Hz

288   `ct u.`   **Current Transformer Value**

Selects the amperometric transformer full-scale

1..200	Ampere (**Default**: 50)

289   `H.b.A.r.`   **Heater Break Alarm Reference Command**

Defines the reference command for the heater break alarm and the overcurrent alarm.

`cMd. 1`	Command 1 (**Default**)
`cMd. 2`	Command 2

290   `H.b.A.t.`   **Heater Break Alarm Threshold**

Heater Break Alarm activation threshold

0	Alarm disabled. (**Default**:)
0.1-200.0	Ampere.

291 ocu.t. **Overcurrent Alarm Threshold**
Overcurrent alarm threshold.
0   Alarm disabled. (**Default**)
0.1-200.0 Ampere

292 H.b.A.d. **Heater Break Alarm Delay**
Heater Break Alarm and overcurrent alarm activation delay.
00:00-60:00 mm:ss (**Default**: 01:00)

293÷297 **Reserved Parameters - Group S**
Reserved parameters - Group S

GROUP T - A.o. 1 - Retransmission 1
298 rtN.1 **Retransmission 1**
Retransmission for output. Parameters 300 and 301 define lower and upper limit of the operating scale.
d.SAb.   Disabled (**Default**)
c.1.SPV Command 1 setpoint
AL. 1   Alarm 1 setpoint
AL. 2   Alarm 2 setpoint
Md.buS   Retransmits the value written on word 1241
A.iN.1   Value read on input AI1
A.iN.2   Value read on input AI2
MEAN   Arithmetic average of the value read on inputs AI1 and AI2 [(AI1+AI2)/2]
diFF.   Difference of the values read on inputs AI1 and AI2 (AI1-AI2)
Ab.diF. Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|)
SuM   Sum of values read on inputs AI1 and AI2 (AI1+AI2)
c.2.SPV Command 2 setpoint
AMPER.   Ampere from current transformer

299 r.1.tY. **Retransmission 1 Type**
Selects the retransmission type for AO1
0.10 V   Output 0...10 V.
4.20MA   Output 4...20 mA. **Default**

300 r.1. LL. **Retransmission 1 Lower Limit**
Retransmission 1 lower limit range (value related to 10 V or 0/4 mA).
-9999..+30000 [digit[1 p. 70]] (degrees if temperature), **Default**: 0.

301 r.1. uL. **Retransmission 1 Upper Limit**
Retransmission 1 upper limit range 2 (value related to 10 V or 20 mA).
-9999..+30000 [digit[1 p. 70]] (degrees if temperature), **Default**: 1000.

302 r.1S.E. **Retransmission 1 State Error**
Determines retransmission 1 value in case of error or anomaly
If the retransmission output is 0-10V:
0 V   0 V. **Default**
10 V   10 V.
If the retransmission output is 0-20 mA or 4-20 mA:
0 MA   0 mA. **Default**
4 MA   4 mA.
20 MA   20 mA.
21.5MA   21.5 mA.

303÷307 **Reserved Parameters - Group T**
Reserved parameters - Group T

GROUP U - *A.o. 2* - Retransmission 2 *(only on ATR244-23XX-T)*

308 *rtN2* **Retransmission 2**

Retransmission for output AO2. Parameters 310 and 311 define lower and upper limit of the operating scale.

diSAb.	Disabled (**Default**)
c.1.SPV	Command 1 setpoint
AL. 1	Alarm 1 setpoint
AL. 2	Alarm 2 setpoint
Md.buS	Retransmits the value written on word 1242
A.iN.1	Value read on input AI1
A.iN.2	Value read on input AI2
MEAN	Arithmetic average of the value read on inputs AI1 and AI2 [(AI1+AI2)/2]
diFF.	Difference of the values read on inputs AI1 and AI2 (AI1-AI2)
Ab.diF.	Module of the difference of the values read on inputs AI1 and AI2 (|AI1-AI2|)
SuM	Sum of values read on inputs AI1 and AI2 (AI1+AI2)
c.2.SPV	Command 2 setpoint
AMPER.	Ampere from current transformer

309 *r2.tY.* **Retransmission 2 Type**

Selects the retransmission type for AO2
0.10 V	Output 0...10 V.
4.20MA	Output 4...20 mA. **Default**

310 *r2. LL.* **Retransmission 2 Lower Limit**

Retransmission 2 lower limit range (value related to 10 V or 0/4 mA).
-9999..+30000 [digit[1 p. 70]] (degrees if temperature), **Default**: 0.

311 *r2. uL.* **Retransmission 2 Upper Limit**

Retransmission 2 upper limit range 2 (value related to 10 V or 20 mA).
-9999..+30000 [digit[1 p. 70]] (degrees if temperature), **Default**: 1000.

312 *r2S.E.* **Retransmission 2 State Error**

Determines retransmission 2 value in case of error or anomaly.
If the retransmission output is 0-10V:
0 V	0 V. **Default**
10 V	10 V.

If the retransmission output is 0-20 mA or 4-20 mA:
0 MA	0 mA. **Default**
4 MA	4 mA.
20 MA	20 mA.
21.5MA	21.5 mA.

313÷317 **Reserved Parameters - Group U**

Reserved parameters - Group U

GROUP V - 5Er. - Seriale *(not available on ATR244-12ABC)*

318 5L.Ad. Slave Address
Selects slave address for serial communication.
1...254. **Default**: 247.

319 bd.rt. Baud Rate
Selects baudrate for serial communication
1.2 K	1200 bit/s
2.4 K	2400 bit/s
4.8 K	4800 bit/s
9.6 K	9600 bit/s
19.2 K	19200 bit/s (**Default**)
28.8 K	28800 bit/s
38.4 K	38400 bit/s
57.6 K	57600 bit/s
115.2K	115200 bit/s

320 5.P.P. Serial Port Parameters
Selects the format for the modbus RTU serial communication.
8-N-1	8 bit, no parity, 1 stop bit (**Default**)
8-E-1	8 bit, even parity, 1 stop bit
8-o-1	8 bit, odd parity, 1 stop bit
8-N-2	8 bit, no parity, 2 stop bit
8-E-2	8 bit, even parity, 2 stop bit
8-o-2	8 bit, odd parity, 2 stop bit

321 5E.dE. Serial Delay
Selects serial delay
0...100 ms. **Default**: 5 ms.

322 oFF.L. Off Line
Selects the off-line tine. If there is no serial communication during the selected time, the controller switches-off the command output.
0	Offline disabled (**Default**)
0.1-600.0	tenths of second.

323÷327 Reserved Parameters - Group V
Reserved parameters - Group V

GROUP W - t iNr - Timer

328 tNr.1 Timer 1
Enabling Timer 1
di5Ab.	Disabled (**Default**)
ENAb.	Enabled
EN.5tA.	Enabled and active at start

329 t.b.t.1 Time Base Timer 1
Selects time base for timer 1
MM.55	minutes.seconds (**Default**)
HH.MM	hours.minutes

330 A.tN.1 Action Timer 1
Select the type of the action executed by the timer 1 to be related to an alarm..
5tARt	Start. Active during timer counting (**Default**)
ENd	End. Active at timer expiry
WARN.	Warning. Active 5" before the timer expiry

331	*tN.r.2*	**Timer 2**

Enabling Timer 2

diSAb.	Disabled (**Default**)
ENAb.	Enabled
EN.StA.	Enabled and active at start

332	*t.b.t.2*	**Time Base Timer 2**

Selects time base for timer 2

MM.SS	minutes.seconds (**Default**)
HH.MM	hours.minutes

333	*A.tN.2*	**Action Timer 2**

Select the type of the action executed by the timer 2 to be related to an alarm.

StARt	Start. Active during timer counting (**Default**)
ENd	End. Active at timer expiry.
WARN.	Warning. Active 5" before the timer expiry.

334	*tN.r.S.*	**Timers Sequence**

Select the correlation between the two timers.

SiNGL.	Singles. Timers work independently (**Default**)
SEQuE.	Sequential. When timer 1 ends, timer 2 starts.
LooP	Loop. When a timer ends, another starts.

335÷339		**Reserved Parameters - Group W**

Reserved parameters - Group W

14 Alarm Intervention Modes

14.a Absolute or threshold alarm active over (par. 123 *AL.I.F. = Ab.uPA.*)

Absolute alarm.
Hysteresis value greater than "0" (Par. 128 *A.IHy* > 0).

Absolute alarm.
Hysteresis value less than "0" (Par. 128 *A.IHy* > 0).
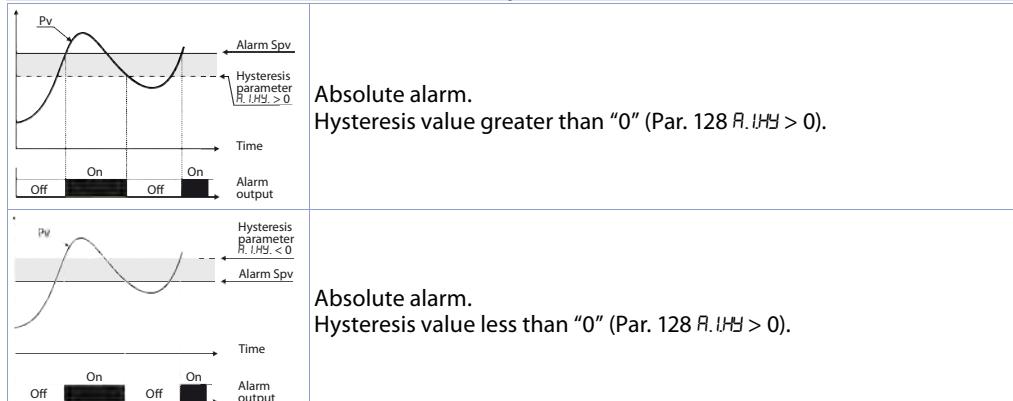
14.b Absolute or threshold alarm referred to command setpoint active over (par. 123 *AL.I.F. = Ab.c.u.A.*)

Absolute alarm referred to command setpoint. Hysteresis value greater than "0" (Par. 128 *A.IHy* > 0).
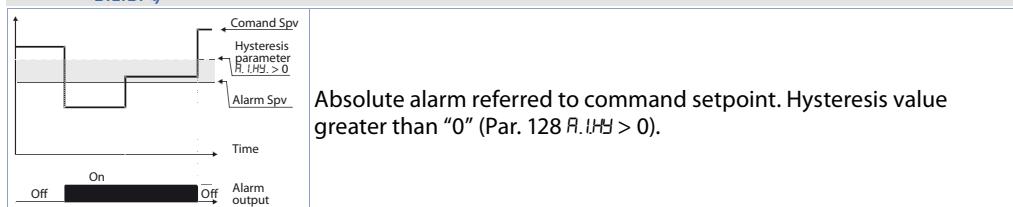
14.c Band alarm (par. 123 AL.IF. = bAnd)
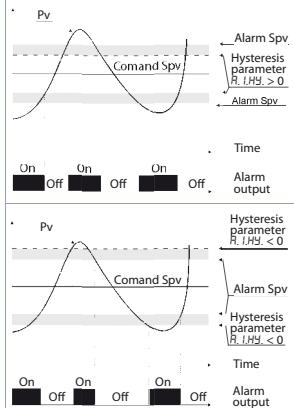
	Band alarm hysteresis value greater than "0" (Par. 128 A.1HY > 0).
	Band alarm hysteresis value less than "0" (Par. 128 A.1HY < 0).

14.d Upper deviation alarm (par. 123 AL.IF. = uP.dEu.)
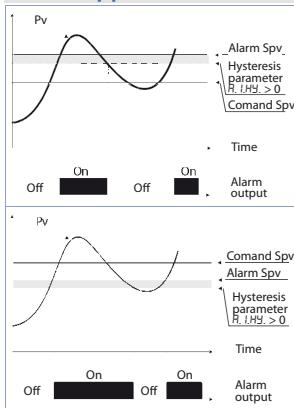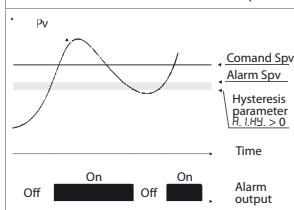
	Upper deviation alarm value of alarm setpoint greater than "0" and hysteresis value greater than "0" (Par.128 A.1HY. > 0). With hysteresis value less than "0" (A.1HY. < 0) the dotted line moves under the alarm setpoint.
	Upper deviation alarm value of alarm setpoint less than "0" and hysteresis value greater than "0" (Par.128 A.1HY. > 0). With hysteresis value less than "0" (A.1HY. < 0) the dotted line moves under the alarm setpoint.

14.e Lower deviation alarm (par. 123 AL.IF. = Lo.dEu.)
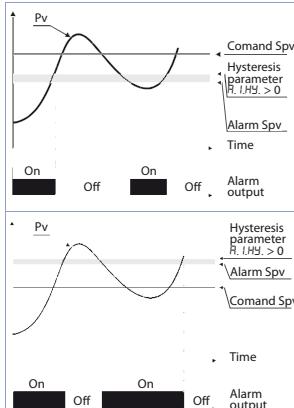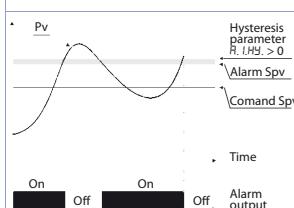
	Lower deviation alarm value of alarm setpoint greater than "0" and hysteresis value greater than "0" (Par.128 A.1HY. > 0). With hysteresis value less than "0" (A.1HY. < 0) the dotted line moves under the alarm setpoint.
	Lower deviation alarm value of alarm setpoint less than "0" and hysteresis value greater than "0" (Par.128 A.1HY. > 0). With hysteresis value less than "0" (A.1HY. < 0) the dotted line moves under the alarm setpoint.

14.1   Alarms label

By setting a value from 1 to 20 on the parameters 136 A.1.Lb., 154 A.2.Lb., 172 A.3.Lb., 190 A.4.Lb., 208 A.5.Lb. e 226 A.6.Lb., the display 2 will show one of the following messages in case of alarm:

Selection	Message displayed in the alarm event
1	alarm 1
2	alarm 2
3	alarm 3
4	alarm 4
5	alarm 5
6	alarm 6
7	open door
8	closed door
9	light on
10	light off
11	warning
12	waiting
13	high limit
14	low limit
15	external alarm
16	temperature alarm
17	pressure alarm
18	fan command
19	cooling
20	operating

By setting 0, no message will be displayed. While setting 21, the user will have up to 23 characters available to customize his message via the *"MyPyxsys"* App or via modbus.

15   Table of Anomaly Signals

If installation malfunctions, the controller switches off the regulation output and reports the anomaly noticed. For example, controller will report failure of a connected thermocouple visualizing E-05 (flashing) flashing on display.
For other signals see table below.

	Cause	What to do
E-02 SYStEM Error	Cold junction temperature sensor failure or environment temperature out of range	Call assistance
E-04 EEProM Error	Incorrect configuration data. Possible loss of instrument calibration	Verify that configuration parameters are correct.
E-05 ProbE 1 Error	Sensor connected to AI1 broken or temperature out of range	Control connection with probes and their integrity.
E-06 ProbE 2 Error	Sensor connected to AI2 broken or temperature out of range	Control connection with probes and their integrity.
E-08 SYStEM Error	Missing calibration	Call assistance
E-10 A.in.2 diSAbLEd	Analogue input 2 disabled but used during configuration.	Enable A.in.2 or disable it during configuration.
E-80 rFid Error	Tag rfid malfunctioning	Call assistance

Notes / Updates

1 Display of decimal point depends on setting of parameter 5En. and parameter d.P.

2 On activation, the output is inhibited if the controller is in alarm mode. Activates only if alarm condition reappers, after that it was restored.

3 Changing the control setpoint, the alarm will be disabled. It will stay disabled as long as the parameters that created it are active. It only works with deviation alarms, band alarms and absolute alarms (referring to the control setpoint).

Table of configuration parameters

GROUP D - *cΠd.2* - Outputs and regul. Process 2 *(only on ATR244-23XX-T)*

GROUP E - *rEG.1* - Autotuning and PID 1

GROUP F - *rEG.2* - Autotuning and PID 2 *(only on ATR244-23XX-T)*

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