WACHENDORFF
Prozesstechnik GmbH & Co. KG

# UR4848xA

## Universal Controller




## User manual

Revision D; July 2018

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# 1 Introduction

The process controller UR4848xA stands out for the bright display which ensures optimal visibility and increased level of information for the operator beside a scrolling Help function.
The process controller UR4848xA relies on Wachendorff flagship programming mode by NFC/RFID technology with dedicated App Wachendorff EMG for Android devices, 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 guide lines

Read carefully the safety guidelines and programming instructions contained in this manual before using/connecting the device. Disconnect power supply before proceeding to hardware settings or electrical wirings. Only qualified personnel should be allowed to use the device and/or service it and in accordance to technical data and environmental conditions listed in this manual.
Do not dispose electric tools together with household waste material.
In observance European Directive 2002/96/EC on waste electrical and electronic equipment and its implementation in accordance with national law, electric tools that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.

# 3 Model Identification

The UR4848xA series includes 4 versions:

| | |
|---|---|
| **Models with power supply 24..230 VAC/VDC ±15% 50/60 Hz – 6 Watt/VA** | |
| UR4841A | 1 analogue input + 2 relays 2 A + 2 SSR + 2 D.I. + 1 analogue output V/mA |
| UR48482A | 1 analogue input + 2 relays 2 A + 2 SSR / D.I. + 1 analogue output V/mA + RS485 |
| **Model with power supply 24 VAC/VDC ±15% 50/60 Hz – 6 Watt/VA** | |
| UR48483A | 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** | |
| UR48484A | 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)<br>IP20 box and terminals |
| Material | Box and front panel: PC UL94V2 self-extinguishing |
| Weight | Approx. 185 g |

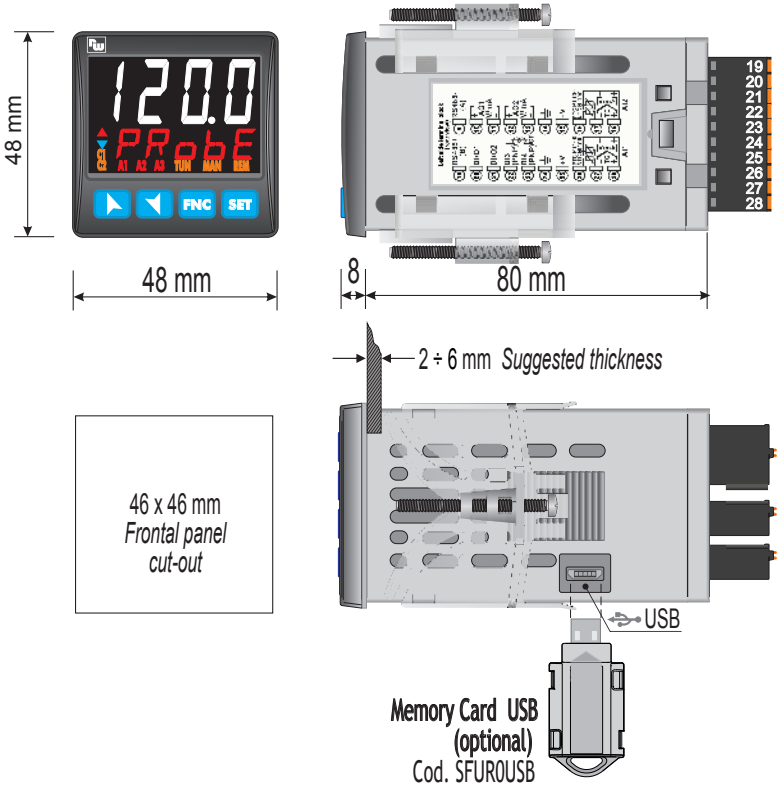
## 4.2 Hardware Features

| | | |
|---|---|---|
| Analogue inputs | **AI1 – AI2**:<br>Configurable via software.<br>**Input**: Thermocouple type K, S, R, J,T,E,N,B.<br>Automatic compensation of cold junction from -25…85° C.<br>**Thermoresistances**: PT100, PT500, PT1000, Ni100, PTC 1K, NTC 10K (β 3435K)<br>**Input V/mA**: 0-1 V, 0-5 V, 0-10 V, 0-20 o 4-20 mA, 0-60 mV.<br>**Pot. Input**: 1...150 KΩ.<br>**CT**: 50 mA. | Tolerance (25° C)<br>+/-0.2% ±1 digit (on F.s.) for thermocouple, thermoresistance and V/mA.<br>Cold junction accuracy 0.1° C/°C.<br><br>**Impedence**:<br>**0-10 V**: Ri>110 KΩ<br>**0-20 mA**: Ri<5 Ω<br>**0-40 mV**: Ri>1 MΩ |
| Relay outputs | Configurable as command and alarm output. | Contacts:<br>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 retrasmission of process / setpoints. | Configurable:<br>**0-10 V** with 40000 points +/-0.2% (on F.s.)<br>**4-20 mA** con 40000 points +/-0.2% (on F.s.) |
| Power-supply | **For UR48481A and UR4842A**:<br>Extended power-supply 24..230 VAC/ VDC ±15% 50/60 Hz<br>For **UR48483A:**<br>24 VAC/VDC ±15% 50/60 Hz<br>**For UR48484A:**<br>115..230 VAC ±15% 50/60 Hz | **For UR4841A and UR48482A:**<br>Consumption: 6 Watt/VA<br>**For UR48483A and UR48484A:**<br>Consumption: 6 Watt/VA |

## 4.3 Software Features

| | |
|---|---|
| Regulation algorithms | ON-OFF with hysteresis.<br>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. |

# 5 Dimensions and Installation




# 6 Electrical wirings

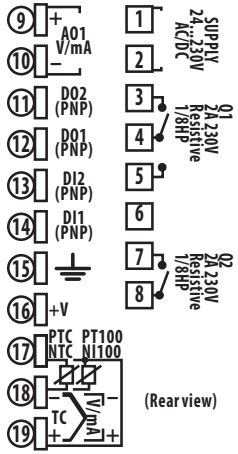
This controller has been designed and manufactured in conformity to Low Voltage Directive 2006/95/EC , 2014/35/EU (LVD) and EMC Directive 2004/108/EC, 2014/30/EU (EMC). For installation in industrial environments please observe following safety guidelines:

- 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.

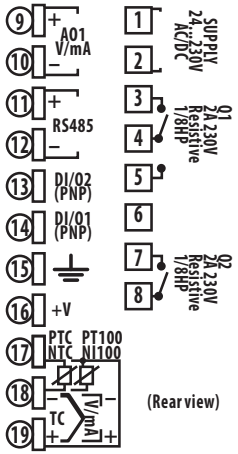
The controller is designed and conceived to be incorporated into other machines, therefore CE marking on the controller does not exempt the manufacturer of machines from safety and conformity requirements applying to the machine itself.

# 6.1 Wiring diagram

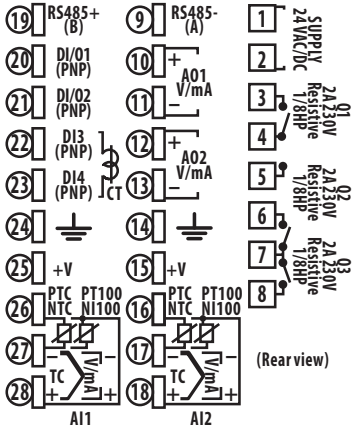
## UR48481A



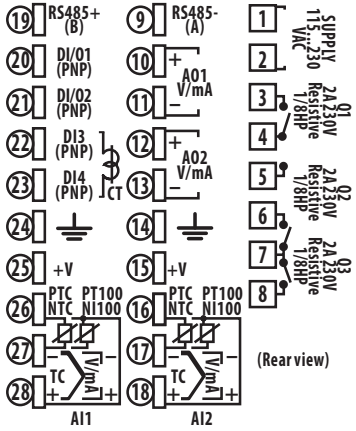

## UR48482A




## UR48483A



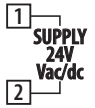

## UR48484A




## 6.1.a Power Supply




**For UR48481A and UR48482A**
Switching power supply 24..230 VAC/VDC ±15% 50/60 Hz - 6 Watt/VA.
Galvanic insulation (on all versions).



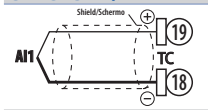

**For UR48483A**
Switching power supply 24 VAC/VDC ±15% 50/60 Hz - 6 Watt/VA.
Galvanic insulation.



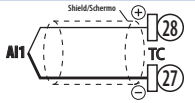

**For UR48484A**
Switching power supply 115..230 VAC ±15% 50/60 Hz - 6 Watt/VA.
Galvanic insulation.

## 6.1.b Analogue Input AI1

### UR48481A / 2A

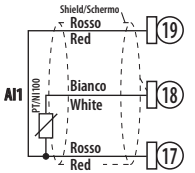



### UR48483A / 4A

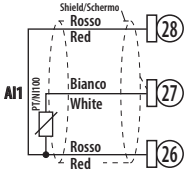



**For thermocouples K, S, R, J, T, E, N, B.**
- Comply with polarity
- For possible extensions, use compensated cable and terminals suitable for the thermocouples used (compensated).
- When shielded cable is used, it should be grounded at one side only.

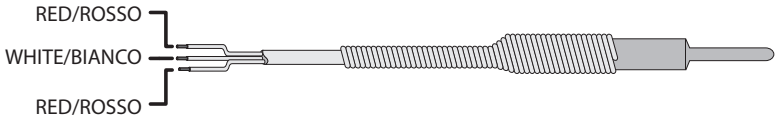
### UR48481A / 2A



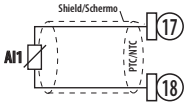

### UR48483A / 4A



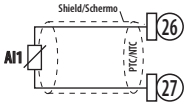

**For thermoresistances PT100, Ni100.**
- For the three-wire connection use wires with the same section.
- For the two-wire connection short-circuit terminals 17 and 19 (version -12x) or 26 and 28.
- When shielded cable is used, it should be grounded at one side only.




### UR48481A / 2A

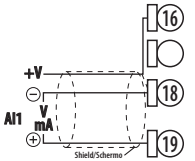



### UR48483A / 4A

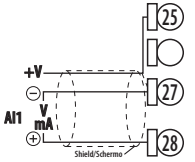



**For thermoresistances NTC, PTC, PT500, PT1000 and linear potentiometers.**
When shielded cable is used, it should be grounded at one side only to avoid ground loop currents.

### UR48481A / 2A

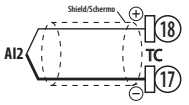



### UR48483A / 4A



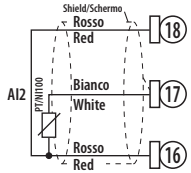

**For linear signals in Volt and mA**
- Comply with polarity
- When shielded cable is used, it should be grounded at one side only to avoid ground loop currents.

## 6.1.c Analogue Input AI2 (only UR48483A / 4A)



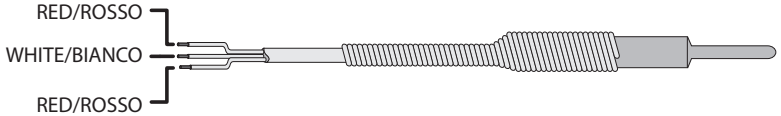

**For thermocouples K, S, R, J, T, E, N, B.**

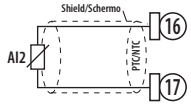
- Comply with polarity
- For possible extensions, use compensated cable and terminals suitable for the thermocouples used (compensated).
- When shielded cable is used, it should be grounded at one side only.



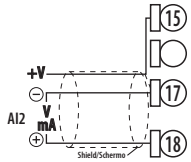

**For thermoresistances PT100, Ni100.**

- 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.



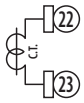

**For thermoresistances NTC, PTC, PT500, PT1000 and linear potentiometers.**
When shielded cable is used, it should be grounded at one side only to avoid ground loop currents.




**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.

## 6.1.d CT input (only UR48483A / 4A)

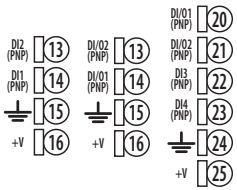



**To enable CT input, modify parameter 287** *CtF*.

- Input for 50 mA amperometric transformer.
- Sampling time 100 ms.
- Configurable by parameters.

## 6.1.e Digital inputs UR4848..

**1A** **2A** **3A/4A**



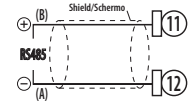

Digital inputs can be enabled by parameters.

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 ground pins (15).

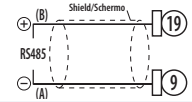
## 6.1.f Serial inputs (only UR48482A / 3A / 4A)

### UR48482A




Modbus RS485 communication.
RTU Slave with galvanic insulation.

### UR48483A / 4A

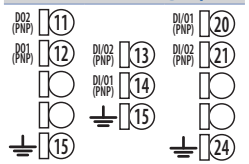



It is recommended to use the twisted and shielded cable for communications.



## 6.1.g Digital outputs UR4848..

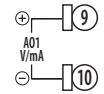
**1A** **2A** **3A / 4A**




Digital output PNP (including SSR) for command or alarm.
Range 12 VDC/25 mA or 24 VDC/15mA selectable by parameter 282 *out*.

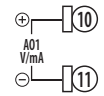
## 6.1.h Analogue output AO1

### UR48481A / 2A



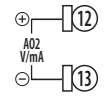

Linear output in **mA** or **V** (galvanically isolated) configurable as command, alarm or retransmission of process-setpoint.

### UR48483A / 4A




The selection mA or Volt for the linear output depends on the parameters configuration.

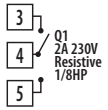
## 6.1.i Analogue output AO2 (only UR48483A / 4A)




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.

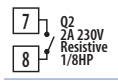
## 6.1.j Relay output Q1




Capacity 2 A / 250 VAC for resistive loads.

See chart below.

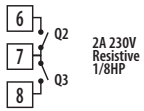
## 6.1.k Relay output Q2 (only UR48481A / 2A)




Capacity 2 A / 250 VAC for resistive loads.

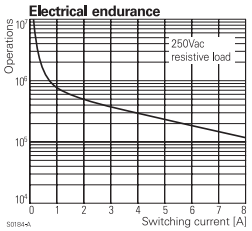
See chart below.

## 6.1.l Relays output Q2 - Q3 (only UR48483A / 4A)



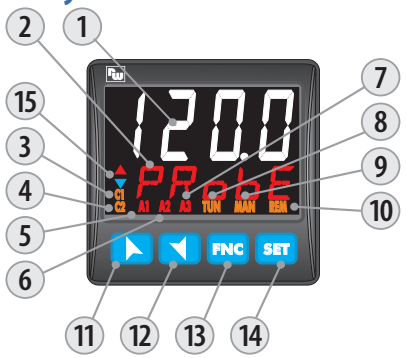

Capacity 2 A / 250 VAC for resistive loads.

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 case of motorized valve control it is ON during valve opening and flashes during valve closing. |
| 4 | C2 | ON when the command output 2 is active. n case of motorized valve control it is ON during valve opening and flashes during valve closing. |
| 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.<br>• During configuration allows to scroll the parameters or the groups of parameters.<br>• Increases the setpoints. |
| 12 | ▼ | • Decreases the main setpoint.<br>• During configuration allows to scroll the parameters or the groups of parameters.<br>• Decreases the setpoints. |
| 13 | SET | • Allows to visualize command and alarm setpoints.<br>• 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.<br>• 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 UR48483A/4A 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

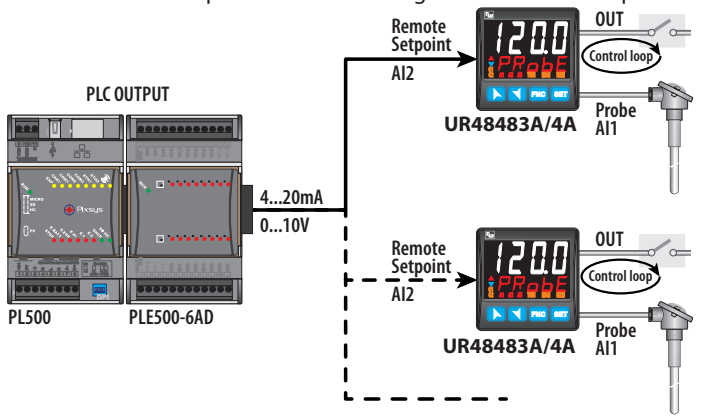
When second analogue input is enabled (par.18 *SEn.2* other than *diSAb.*) it is possible to choose the process value to be related to command output, to alarms and to retransmission.
Following options are available:

- *AI.in.1*: Value read by input AI1;
- *AI.in.2*: Value read by input AI2;
- *MEAn*: Mean between inputs AI1 and AI2;
- *diFF.*: Difference between inputs: AI1-AI2;
- *Ab.diF*: 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.1Pr.* 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 *A4.Pr.* for the alarm 4, on par. 196 *A5.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.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.*




In this example the command setpoint is the value read on second analogue input AI2: on par. 55 *c.Pr.2* it is selected the input that determines the setpoint.
The Remote Setpoint function is active only selecting *AI.in.1* or *AI.in. 2* 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.i.1F. (or on par. 239 d.i.2F., par. 247 d.i.3F., par. 255 d.i.4F). 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 tun1 or on parameter 98 tun.2.
Autotuning procedure is executed only once at next UR4848xA restart. If the procedure doesn't work, will be executed at next restart.

## 9.5 Synchronized tuning

Set SYnch. on parameter 73 tun.1 or on parameter 98 tun.2.
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 UR4848xA functions related to digital inputs, can be enabled by parameters 231 di.F, 239 d.i.2F., 247 di.3.F. and 255 di.4F.

- 2t.SU.: Two threshold setpoint modification: with digital input active the UR4848xA regulates on SET2, otherwise reulates on SET1;
- 2t.SU.i.: Modification of 2 setpoints by digital input with impulse command;
- 3t.SU.i.: Modification of 3 setpoints by digital input with impulse command,
- 4t.SU.i.: Modification of 4 setpoints by digital input with impulse command,
- St.rSt.: 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.1 or par. 98 tun.2 is selected as MAnu.;
- Au.MA.i.: If par. 48 A.MA.1. or par. 67 A.MA.2 is selected as EnAb. or En.Sto., with impulse command on digital input, the UR4848xA switches the related regulation loop, from automatic to manual and vice versa.
- Au.MA.c.: If par. 48 A.MA. 1. or par. 67 A.MA.2. is selected as EnAb. or En.Sto. the UR4848xA switches to manual the related regulation loop, with digital input active, otherwise the regulation is automatic.
- Act.tY.: On the regulation loop selected for this function (par. 234 d.i.1.r. or 242 d.i.2.r. or 250 d.i.3.r. or 258 d.i4r), the UR4848xA execute a cooling type regulation with digital input active, otherwise the regulation is of heating type;
- A.i. 0: Zero tare function: brings the related analogue input to 0. The analogue input is selected on par. 233 d.i.1.P. or 241 d.i.2.P. or 249 d.i.3.P. or 257 d.i.4.P.
- M.rES.: Allows the reset of the output if manual reset is active for the alarms and for the command outputs selected 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.;
- t.1.run: If timer 1 is enabled (par. 328 tM.1 different from di.SAb.), with digital input active, the timer is

switched to RUN, otherwise is kept in STOP;

- t.1S.E.: If timer 1 is enabled (par. 328 tMr.1 different from diSAb.), acting on the digital input, the status of the timer switches from STOP to RUN e vice versa;• t.1StA.: If il timer 1 is enabled (par. 328 tMr.1 differnet from diSAb.), acting on the digital input, the timer is switched to RUN;
- t.1End.: If il timer 1 is enabled (par. 328 tMr.1 differnet from diSAb.), acting on the digital input, the timer is switched to STOP;
- t.2run: If timer 2 is enabled (par. 331 tMr.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 tMr.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 tMr.2 different from diSAb.), acting on the digital input, the timer is switched to RUN;
- t.2End.: If timer 2 is enabled (par. 331 tMr.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;
- rEM.S.E.: If on par. 56 rEM.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.MA.1. (for regulation loop 1) or par. 67 A.MA.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 AutoM.
Press SET to visualize MAnu; 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 AutoM. 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 UR48483A / 4A)

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..

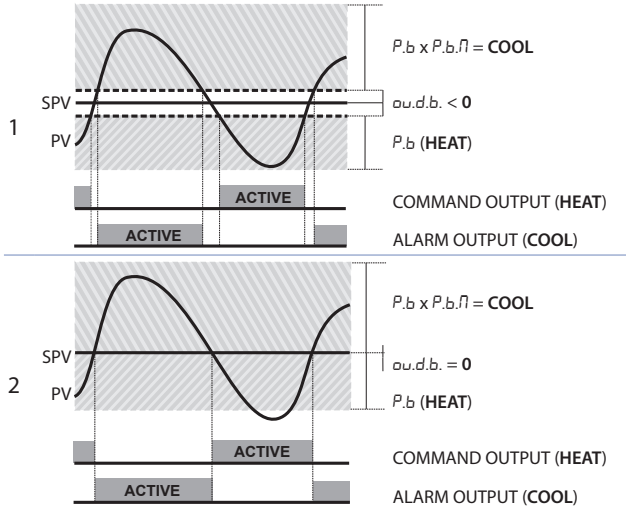
- Seletct on par. 289 H.b.A.r. the regulation loop referred to the current measure and the Heater Break Alarm intervention.
- Select on par. 290 H.b.A.t. the Heater Break Alarm intervention threshold in Ampere.
- Select on par. 291 ocu.t. the intervention threshold in Ampere to control the overcurrent.
- 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.

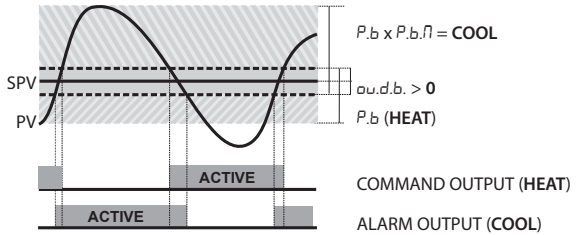
It is possible to visualize on display 2 the average current, selecting AMPEr. on par. 278 u.i.d.2.
Selecting 0 on par. 290 H.b.A.t. it is possible to visualize the current consumption without generating an Heater Break Alarm.



## 9.9 Dual Action (Heating-Cooling)

UR4848xA 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.3F. , AL.4F. , 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;
i.t. 1 or i.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.M.1: Proportional band multiplier;
o.d.b.1: Overlapping / Dead band;
c.c.t.1: Cooling time cycle.
Par. P.b.M.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.M.1.
This gives a proportional band for cooling which will be the same as heating band if P.b.M.1 = 1.00, or 5 times greater if P.b.M.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 ≤ 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 i.t. 1 = 0 e d.t. 1 = 0.






3

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.n.1 and the cooling PID cycle time c.c.t.1 according to cooling fluid type:

| co.F.1 | Cooling fluid type | P.b.n.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.n.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.1.1 or par. 21 LL.1.2) to the minimum position of the sensor and value of the scale end (par. 5 uL.1.1 or par. 22 uL.1.2) to the maximum position of the sensor (par. 10 tEc.1 or par. 27 tEc.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.1.1 / LL.1.2 and uL.1. 1 / uL.1.2) using the *"virtual zero"* option by selectin u.0.Sto. or u.0.t.on. on par. 10 tEc.1 or 27 tEc.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. tEc.1 or27 tEc.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.1.1 / LL.1.2) |
| 2 | ▼ | Store value on minimum. Display shows LoU. | Place sensor on maximum operating value (corresponding to uL.1.1 / uL.1.2). |
| 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 confi guration after changing the parameter.*



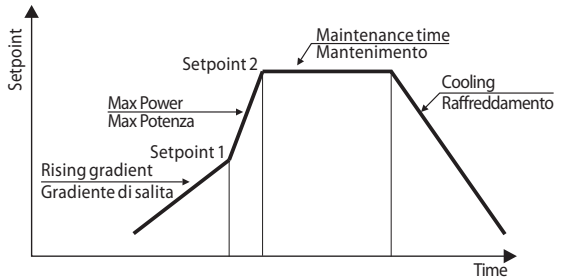
## 9.11 Soft-Start Function

UR4848xA 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.t 1. (*"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.t 1. (*"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. 1..
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 rtM.1 ("Retransmission 1") or on parameter 308 rtM.2 ("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 r.2LL. and 311 r.2uL. the input value rescale limites.

# 10 Serial communication

UR48482A/ 3A/ 4A 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 SL.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"*).
UR4848xA can introduce a delay (in milliseconds) of the response to the master request. This delay must be set on parameter 321 SE.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 S.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 UR4848xA (write 9999) | RW | 0 |
| 502 | Setpoint storing delay time | RW | 10 |
| 503 | Parameters storing delay time | RW | 1 |
| 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)<br>Bit0 = Alarm 1 Bit3 = Alarm 4<br>Bit1 = Alarm 2 Bit4 = Alarm 5<br>Bit2 = Alarm 3 Bit5 = Alarm 6 | RO | 0 |
| 1009 | Error flags 1<br>Bit0 = AI1 process error (sensor 1)<br>Bit1 = AI2 process error (sensor 2)<br>Bit2 = Cold junction error<br>Bit3 = Safety error<br>Bit4 = Generic error<br>Bit5 = Hardware error<br>Bit6 = Error H.B.A. (partial ropture of the load)<br>Bit7 = Error H.B.A. (SSR in short circuit)<br>Bit8 = Overcurrent error<br>Bit9 = Parameters out of range error<br>Bit10= CPU eeprom writing error<br>Bit11= RFid eeprom writing error<br>Bit12= CPU eeprom reading error<br>Bit13= RFid eeprom reading error<br>Bit14= Eeprom calibrations bench corrupted<br>Bit15= Eeprom constants bench corrupted | RO | 0 |
| 1010 | Error flags 2<br>Bit0 = Missing calibrations error<br>Bit1 = Eeprom CPU bench parameters corrupted<br>Bit2 = Eeprom CPU setpoint bench corrupted<br>Bit3 = RFid memory not formatted<br>Bit4 = Error AI2 disabled | RO | 0 |
| 1011 | Digital inputs status (0=not active, 1=active)<br>Bit0 = Digital inp. 1 Bit2 = Digital inp. 3<br>Bit1 = Digital inp. 2 Bit3 = Digital inp. 4 | RO | 0 |
| 1012 | Outputs status (0=off, 1=on)<br>Bit 0 = Q1 Bit 3 = DO1<br>Bit 1 = Q2 Bit 4 = DO2<br>Bit 2 = Q3 | RO | 0 |
| 1013 | Stato led (0=OFF, 1=ON)<br>Bit 0 = Led UP arrow Bit 6 = Led TUN<br>Bit 1 = Led C1 Bit 7 = Led point time 2<br>Bit 2 = Led C2 Bit 8 = Led MAN<br>Bit 3 = Led A1 Bit 9 = Led REM<br>Bit 4 = Led A2 Bit 10 = Led DOWN arrow<br>Bit 5 = Led A3 Bit 11 = Led point time 1 | RO | 0 |
| 1014 | Key status (0=released, 1=pressed)<br>Bit 0 = Key UP arrow Bit 2 = Key FNC<br>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 | - |

| Modbus address | Description | Read Write | Reset value |
|---|---|---|---|
| 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) | R/W | EEPROM |
| 1209 | Alarm 2 setpoint (degrees with tenth) | R/W | EEPROM |
| 1210 | Alarm 3 setpoint (degrees with tenth) | R/W | EEPROM |
| 1211 | Alarm 4 setpoint (degrees with tenth) | R/W | EEPROM |
| 1212 | Alarm 5 setpoint (degrees with tenth) | R/W | EEPROM |
| 1213 | Alarm 6 setpoint (degrees with tenth) | R/W | EEPROM |
| 1214 | Start/Stop<br>0=controller in STOP<br>1=controller in START | R/W | 0 |
| 1215 | Hold conversion ON/OFF<br>0=Hold conversion OFF<br>1=Hold conversion ON | R/W | 0 |
| 1216 | Tune management for regulation loop 1 | | |
| | With automatic Tune (par. 73 tun.1 = Auto):<br>0=autotunig function OFF<br>1=autotuning ON | RO | 0 |
| | With manual Tune (par. 73 tun.1 = MAnu. or OncE):<br>0=autotunig function OFF<br>1=autotuning ON | R/W | 0 |
| | With synchronized Tune (par. 73 tun.1 = SYncH):<br>0=autotunig function OFF<br>1=command output OFF (forces the cooling)<br>2=command output ON (forces the heating)<br>3=autotuning ON<br>4=autotuning ended | R/W | 0 |



| Modbus address | Description | Read Write | Reset value |
|---|---|---|---|
| 1217 | Tune management for regulation loop 2 | | |
| | With automatic Tune (par. 98 tun.2 = Auto):<br>0=autotunig function OFF<br>1=autotuning ON | RO | 0 |
| | With manual Tune (par. 98 tun.2 = MAnu. or OncE):<br>0=autotunig function OFF<br>1=autotuning ON | R/W | 0 |
| | With synchronized Tune (par. 98 tun.2 = SYncH):<br>0=autotunig function OFF<br>1=command output OFF (forces the cooling)<br>2=command output ON (forces the heating)<br>3=autotuning ON<br>4=autotuning ended | R/W | 0 |
| 1218 | Automatic/manual selection for regulation loop 1<br>0=automatic; 1=manual | R/W | 0 |
| 1219 | Automatic/manual selection for regulation loop 2<br>0=automatic; 1=manual | R/W | 0 |
| 1220 | Command output percentage for regulation loop 1 (0-10000)<br>Heating output percentage with regulation 1 in double loop (0-10000) | R/W | 0 |
| 1221 | Command output percentage for regulation loop 1 (0-1000)<br>Heating output percentage with regulation 1 in double loop (0-1000) | R/W | 0 |
| 1222 | Command output percentage for regulation loop 1 (0-100)<br>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)<br>Heating output percentage with regulation 2 in double loop (0-10000) | R/W | 0 |
| 1227 | Command output percentage for regulation loop 2 (0-1000)<br>Heating output percentage with regulation 2 in double loop (0-1000) | R/W | 0 |
| 1228 | Command output percentage for regulation loop 2 (0-100)<br>Heating output percentage with regulation 2 in double loop (0-100) | R/W | 0 |
| 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.<br>In reading 0=reset not allowed, 1=reset allowed | R/W | 0 |
| 1233 | Alarms manual reset: write 0 to reset all alarms.<br>In reading 0=reset not allowed, 1=reset allowed<br>Bit0 = Alarm 1 Bit3 = Alarm 4<br>Bit1 = Alarm 2 Bit4 = Alarm 5<br>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.<br>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 rtM.1 = Md.bu5) | R/W | 0 |

| Modbus address | Description | Read Write | Reset value |
|---|---|---|---|
| 1242 | Value AO2 by serial (Par. 308 rtn2 = Md.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 |
| 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 | R/W | EEPROM |
| 1309 | Alarm 2 setpoint, with decimal point selection | R/W | EEPROM |
| 1310 | Alarm 3 setpoint, with decimal point selection | R/W | EEPROM |
| 1311 | Alarm 4 setpoint, with decimal point selection | R/W | EEPROM |
| 1312 | Alarm 5 setpoint, with decimal point selection | R/W | EEPROM |
| 1313 | Alarm 6 setpoint, 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 UR4848xA is supported by the App Wachendorff EMG: using an ANDROID smartphone with NFC connection it is possible to program the device without using a dedicaded equipment. The App allows to read, set and backup all parameters which are stored into the internal memory of Wachendorff 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 UR4848xA'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 UR4848xA will show a restart request, necessary to update the configuration with the new written modifications; if it does not restart, the UR4848xA will continue to work with the previous configuration. In addition to the classic operation of parameters reading->modification->writing, Wachendorff EMG 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 UR4848xA 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 P001 (numeric visualization)

# 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. 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 | NTC 10K | -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) | |

### 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.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. 65]] **Default**: 0.

### 5 uL.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. 65]] **Default**:1000

### 6 Pot.1 Potentiometer Value AI1

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

### 7 i.oL.1 Linear Input over Limits AI1

If AI1 is a linear input, allows to the process to overpass the limits (Par. 3 and 4).

| | |
|---|---|
| diSAb. | Disabled (**Default**) |
| ENAb. | Enabled |

### 8 o.cA.1 Offset Calibration AI1

AI1 Offset calibration. Value added/subtracted to the process value (ex: usually correcting the ambient temperature value).
-9999..+9999 [digit1 p. 65] (degrees.tenths for temperature sensors). **Default** 0.

### 9 G.cA.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 LEc.1 Latch-On AI1

Automatic setting of limits for AI1 linear input

| | |
|---|---|
| diSAb. | Disabled (**Default**) |
| StNRd | Standard |
| V.0.Sto. | 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) |
| 6.25HZ | 6.25 Hz |
| 8.33H2 | 8.33 Hz |
| 10.0HZ | 10.0 Hz |
| 12.5HZ | 12.5 Hz |
| 16.7HZ | 16.7 Hz (**Default**) Ideal for filtering noises 50 / 60 Hz |
| 19.6HZ | 19.6 Hz |
| 33.2HZ | 33.2 Hz |
| 39.0HZ | 39.0 Hz |
| 50.0HZ | 50.0 Hz |
| 62.0HZ | 62.0 Hz |
| 123HZ | 123 Hz |
| 242HZ | 242 Hz |
| 470HZ | 470 Hz (Max. speed conversion) |

### 13÷17 Reserved Parameters - Group A

Reserved parameters - Group A

## GROUP B - A.in2 - Analogue input 2

### 18 SEn2 Sensor AI2

Analogue input configuration / sensor AI2 selection

| | | |
|---|---|---|
| diSAb. | 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 | NTC 10K | -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) | |

### 19 dP. 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** [digit1 p. 65] **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** [digit1 p. 65] **Default**:1000

### 23 PuA2 Potentiometer Value AI2

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

### 24 i.oL2 Linear Input over Limits AI2

If AI2 is a linear input, allows to the process to overpass the limits (Par. 18 and 19).

| | |
|---|---|
| diSAb. | Disabled (**Default**) |
| ENAb. | Enabled |

### 25 o.cA2 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. 65]] (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 LEc.2 Latch-On AI2

Automatic setting of limits for AI2 linear input

- dISAb. Disabled (**Default**)
- StNRd Standard
- V.0.Sto. 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)
- 6.25HZ 6.25 Hz
- 8.33HZ 8.33 Hz
- 10.0HZ 10.0 Hz
- 12.5HZ 12.5 Hz
- 16.7HZ 16.7 Hz (**Default**) Ideal for filtering noises 50 / 60 Hz
- 19.6HZ 19.6 Hz
- 33.2HZ 33.2 Hz
- 39.0HZ 39.0 Hz
- 50.0HZ 50.0 Hz
- 62.0HZ 62.0 Hz
- 123HZ 123 Hz
- 242HZ 242 Hz
- 470HZ 470 Hz (Max. speed conversion)

### 30÷34 Reserved Parameters - Group B

Reserved parameters - Group B

## GROUP C - cnd.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. SSR Command on digital output
- c. VAL. Sevo-valve command with open loop
- c.0-10 Command 0-10 V on analogue output AO1.
- c.4-20 Command 4-20 mA on analogue output AO1.

**UR48481A and UR48482A**

| | Command | Alarm 1 | Alarm 2 | Alarm 3 | Alarm 4 |
|---|---|---|---|---|---|
| c. o2 | Q2 | Q1 | DO1 | DO2 | AO1 |
| c. o1 | Q1 | Q2 | DO1 | DO2 | AO1 |
| c. SSR | DO1 | Q1 | Q2 | DO2 | AO1 |
| c. VAL. | Q1(open) Q2(close) | DO1 | DO2 | AO1 | - |
| c.0-10 | AO1 (0..10 V) | Q1 | Q2 | DO1 | DO2 |
| c.4-20 | AO1 (4..20 mA) | Q1 | Q2 | DO1 | DO2 |

**UR48483A and UR48484A**

| | 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. SSR | DO1 | Q1 | Q2 | Q3 | DO2 | AO1 | AO2 |
| c. VAL. | Q1(open) Q2(close) | Q3 | DO1 | DO2 | AO1 | AO2 | - |
| c.0-10 | AO1 (0..10 V) | Q1 | Q2 | Q3 | DO1 | DO2 | AO2 |
| c.4-20 | AO1 (4..20 mA) | Q1 | Q2 | Q3 | DO1 | DO2 | AO2 |

### 36 dA.1 Command Process 1 *(only for UR4843A and UR48484A)*

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].
- 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).

### 37 rES. Reserved

Reserved parameter.

### 38 Ac.t.1 Action type 1

Action type to control process 1.

- HEAt Heating (N.A.) (**Default**)
- cooL Cooling (N.C.)

### 39 c.HY.1 Command Hysteresis 1

Hysteresis to control process 1 in ON/OFF.
-9999..+9999 [digit[1 p. 65]] (degrees.tenths for temperature sensors). **Default** 0.2.

### 40 LLS.1 Lower Limit Setpoint 1

Lower limit setpoint selectable for command setpoint 1.
-9999..+30000 [digit[1 p. 65]] (degrees.tenths for temperature sensors). **Default** 0.

### 41 uLS.1 Upper Limit Setpoint 1

Uower limit setpoint selectable for command setpoint 1.
-9999..+30000 [digit[1 p. 65]] (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)

### 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). In case of valves it works also in P.I.D. and represents delay between opening and closure of two contacts.
-3600..+3600 seconds (tenth of second in case of servo valve). **Default**: 0.
Negative: delay when turning off output.
Positive: delay when turning on output.

### 46 c.S.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.MA.1 Automatic / Manual 1

Enables the automatic/manual selection for command 1

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

### 49÷53 Reserved Parameters - Group C

Reserved parameters - Group C

## GROUP D - cMd2 - Outputs and regulation Process 2

### 54 c.ou.2 Command Output 2 *(only on UR48483A / 4A)*

Selects the command output related to the process 2

- diSAb. Command disabled. (**Default**)
- c. o3 Command on relay output Q3
- c. SSR 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

### 55 c.Pr.2 Command Process 2 *(only on UR48483A / 4A)*

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 *(only on UR48483A / 4A)*

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 A.i. 1 or A.i. 2) or through serial.

- diSAb. 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. 65]] (degrees.tenths for temperature sensors). **Default** 0.2.

### 59 LLS.2 Lower Limit Setpoint 2

Lower limit setpoint selectable for command setpoint 2.
-9999..+30000 [digit[1 p. 65]] (degrees for temperature sensors). **Default** 0.

**60 uLS.2 Upper Limit Setpoint 2**

Uower limit setpoint selectable for command setpoint 2.
-9999..+30000 [digit[1 p. 65]] (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)

**62 cS.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.

**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). In case of valves it works also in P.I.D. and represents delay between opening and closure of two contacts.
-3600..+3600 seconds (tenth of second in case of servo valve). **Default**: 0.
Negative: delay when turning off output.
Positive: delay when turning on output.

**65 cS.P.2. Command Setpoint Protection 2**

Allows or not to modify command setpoint 2 value
FREE Modification allowed (**Default**)
Lock Protected

**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.

**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 S.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. 65]] (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. 65]] (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. 65]] (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.
diSAb. Disabled. Band under (heating) or over (cooling)(**Default**)
ENAb. Centered band

**80 o.o.S.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)
diSAb. Disabled (**Default**)
ENAb. 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. 65]] (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 uA.t.1
1-300 seconds (**Default**:15 s)

### 83 coF.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.

| | |
|---|---|
| AIR | Air (**Default**) |
| oIL | Oil |
| WAtEr | Water |

### 84 Pb.M.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 LLP.1 Lower Limit Output Percentage 1

Selects min. value for command output 1 percentage.
0%...100%, **Default**: 0%.

### 88 uLP.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. 65]] (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. 65]] (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. 65]] (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. 6 |
| Lev. 1 | Lev. 7 |
| Lev. 2 | Lev. 8 |
| Lev. 3 | Lev. 9 |
| Lev. 4 | Lev. 10 |
| Lev. 5 (**Default**) | |

### 94÷97 Reserved Parameters - Group E

Reserved parameters - Group E

## GROUP F - rEG.2 - Autotuning and PID 2

### 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. 65]] (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. 65]] (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. 65]] (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.

d.SAb. 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)

d.SAb. 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. 65]] (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 uA.t.2

1-300 seconds (**Default**:15 s)

**108 co.F2 Cooling Fluid 2**

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

AIR Air (**Default**)
oIL Oil
WAtER Water

**109 P.b.M.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 LLP2 Lower Limit Output Percentage 2**

Selects min. value for command output 2 percentage.

0%...100%, **Default**: 0%.

**113 uLP.2 Upper Limit Output Percentage 2**

Selects max. value for command output 2 percentage.

**0%...100**%, **Default**: 100%.

**114 M.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. 65]] (degrees.tenths for temp. sensors). **Default**: 2.0

**115 Mn.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. 65]] (degrees.tenths for temp. sensors). **Default**: 3.0

**116 MA.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. 65]] (degrees.tenths for temp. sensors). **Default**: 80.0

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

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

Reserved parameters - Group F

## GROUP G - AL. 1 - ALARM 1

### 123 AL.1F. Alarm 1 Function

Alarm 1 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 1235
- di. 1 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.A. Heater Break Alarm and Overcurrent Alarm

### 124 A.1Pr. Alarm 1 Process *(only on UR48483A / 4A)*

Selects the size related to alarm 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].
- 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).

### 125 AU.r.c. Alarm 1 Reference Command

Selects alarm 1 reference command

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

### 126 AU.S.o. Alarm 1 State Output

Alarm 1 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. 65]
- N.c. tH. (N.C. Threshold) Normally closed, active on reaching alarm[2 p. 65]

### 127 rES. Reserved

Reserved parameter.

### 128 A.1HY. Alarm 1 Hysteresis

Alarm 1 hysteresis

-9999..+9999 [digit[1 p. 65]] (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. 65]] (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. 65]] (degrees for temp. sensors). **Default** 1750.

### 131 A.1rE. Alarm 1 Reset

Alarm 1 contact reset type

- 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)

### 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.

-3600..+3600 seconds. **Default**: 0.

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**)
- Loc Protected
- HidE Protected and not visualized

### 136 A.1Lb. Alarm 1 Label

Selects the message to be visualized in case of alarm 1 intervention

- 0 Disabled. **Default** 0.
- 1-20 Message 1..20 (Vedi tabella messaggi personalizzabili)

### 137÷140 Reserved Parameters - Group G

Reserved parameters - Group G

## GRUPPO H - AL. 2 - Alarm 2

### 141 AL2F. Alarm 2 Function

Alarm 2 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 1236
- di. 1 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.A. Heater Break Alarm and Overcurrent Alarm

### 142 A2Pr. Alarm 2 Process *(only on UR48483A / 4A)*

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].
- 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 AI (AI1+AI2).

### 143 A2rc. Alarm 2 Reference Command

Selects alarm 2 reference command

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

### 144 A2So. Alarm 2 State Output

Alarm 2 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. 65]
- N.c. tH. (N.C. Threshold) Normally closed, active on reaching alarm [2 p. 65]

### 145 rES. Reserved

Reserved parameter.

### 146 A2HY. Alarm 2 Hysteresis

Alarm 2 hysteresis

-9999..+9999 [digit [1 p. 65]] (degrees for temp. sensors). **Default** 0.5.

### 147 A2LL. Alarm 2 Lower Limit

Lower limit selectable for the alarm 2 setpoint.

-9999..+30000 [digit [1 p. 65]] (degrees for temp. sensors). **Default** 0.

### 148 A2uL. Alarm 2 Upper Limit

Upper limit selectable for the alarm 2 setpoint

-9999..+30000 [digit [1 p. 65]] (degrees for temp. sensors). **Default** 1750.

### 149 A2rE. Alarm 2 Reset

Alarm 2 contact reset type

- 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)

### 150 A2SE. 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 A2Ld. 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 A2dE. Alarm 2 Delay

Alarm 2 Delay.

-3600..+3600 seconds. **Default**: 0.

Negative value: delay when exit alarm status.

Positive value: delay when enter alarm status

### 153 A2SP. 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 A2Lb. Alarm 2 Label

Selects the message to be visualized in case of alarm 2 intervention

- 0 Disabled. **Default** 0.
- 1-20 Message 1..20 (see customizable messages table)

### 155÷158 Reserved Parameters - Group H

Reserved parameters - Group H

## GROUP I - AL. 3 - Alarm 3

### 159 AL3.F. Alarm 3 Function

Alarm 3 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 rupture.
- 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

### 160 AL3.Pr. Alarm 3 Process *(only on UR48483A / 4A)*

Selects the size related to alarm 3.

- AI.1 Value read on input AI1. (**Default**)
- AI.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).

### 161 AL3.r.c. Alarm 3 Reference Command

Selects alarm 3 reference command

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

### 162 AL3S.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. 65]
- N.c. tH. (N.C. Threshold) Normally closed, active on reaching alarm [2 p. 65]

### 163 AL3.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 AL3HY. Alarm 3 Hysteresis

Alarm 3 hysteresis.
-9999..+9999 [digit [1 p. 65]] (degrees for temp. sensors). **Default** 0.5.

### 165 AL3.L.L Alarm 3 Lower Limit

Lower limit selectable for the alarm 3 setpoint.
-9999..+30000 [digit [1 p. 65]] (degrees for temp. sensors). **Default** 0.

### 166 AL3.u.L. Alarm 3 Upper Limit

Upper limit selectable for the alarm 3 setpoint
-9999..+30000 [digit [1 p. 65]] (degrees for temp. sensors). **Default** 1750.

### 167 AL3.rE. Alarm 3 Reset

Alarm 3 contact reset type.

- 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)

### 168 AL3S.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 AL3Ld. 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 AL3dE. Alarm 3 Delay

Alarm 3 Delay.
-3600..+3600 seconds. **Default**: 0.
Negative value: delay when exit alarm status.
Positive value: delay when enter alarm status

### 171 AL3S.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 AL3Lb. Alarm 3 Label

Selects the message to be visualized in case of alarm 3 intervention0
Disabled. **Default** 0.
1-20 Message 1..20 (see customizable messages table)

### 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.

- 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 rupture.
- 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 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.A. Heater Break Alarm and Overcurrent Alarm

### 178 AnA. Alarm 4 Process *(only on UR48483A / 4A)*

Selects the size related to alarm 4.

- 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).

### 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 A4S.o. Alarm 4 State Output

Alarm 4 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. 65]
- N.c. tH. (N.C. Threshold) Normally closed, active on reaching alarm[2 p. 65]

### 181 A4.o.t. Alarm 4 Output Type

Defines the output type if the alarm 4 is analogue.

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

### 182 A4.HY. Alarm 4 Hysteresis

Alarm 4 hysteresis.

-9999..+9999 [digit[1 p. 65]] (degrees for temp. sensors). **Default** 0.5.

### 183 A4.LL Alarm 4 Lower Limit

Lower limit selectable for the alarm 4 setpoint.

-9999..+30000 [digit[1 p. 65]] (gradi per sensori di temperatura). **Default** 0.

### 184 A4.uL. Alarm 4 Upper Limit

Upper limit selectable for the alarm 4 setpoint.

-9999..+30000 [digit[1 p. 65]] (degrees for temp. sensors). **Default** 1750.

### 185 A4.rE. Alarm 4 Reset

Alarm 4 contact reset type.

- 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)

### 186 A4S.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 MA 0 mA. **Default**
- 20 MA 20 mA.
- 4 MA 4 mA.
- 21.5MA 21.5 mA.

### 187 rES. Reserved

Reserved parmeter

### 188 A4.dE. Alarm 4 Delay

Alarm 4 Delay.

-3600..+3600 seconds. **Default**: 0.

Negative value: delay when exit alarm status.

Positive value: delay when enter alarm status

### 189 A4S.P. Alarm 4 Setpoint Protection

Allows or not to change the alarm 4 setpoint.

- FREE Editable by the user (**Default**)
- Lock Protected
- HidE Protected and not visualized

### 190 A4.Lb. Alarm 4 Label

Selects the message to be visualized in case of alarm 4 intervention

- 0 Disabled . **Default** 0.
- 1-20 Message 1..20 (Vedi tabella messaggi personalizzabili)

### 191÷194 Reserved Parameters - Group J

Reserved parameters - Group J

## GROUP K - AL. 5 - Alarm 5 *(only on -23ABC-T)*

### 195 AL5.F. Alarm 5 Function

Alarm 5 selection 5.

- 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 1239
- 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

### 196 AL5.Pr. Alarm 5 Process *(only on AUR48483A / 4A)*

Selects the size related to alarm 5.

- 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).

### 197 AL5.r.c. Alarm 5 Reference Command

Selects alarm 5 reference command

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

### 198 AL5.o. Alarm 5 State Output

Contatto uscita allarme 5 e tipo intervento.

- 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. 65]
- N.c. tH. (N.C. Threshold) Normally closed, active on reaching alarm[2 p. 65]

### 199 AL5.o.t. Alarm 5 Output Type

Defines the output type if the alarm 5 is analogue.

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

### 200 AL5.HY. Alarm 5 Hysteresis

Alarm 5 hysteresis.
-9999..+9999 [digit[1 p. 65]] (degrees for temp. sensors). **Default** 0.5.

### 201 AL5.L.L. Alarm 5 Lower Limit

Lower limit selectable for the alarm 5 setpoint.
-9999..+30000 [digit[1 p. 65]] (degrees for temp. sensors). **Default** 0.

### 202 AL5.u.L. Alarm 5 Upper Limit

Upper limit selectable for the alarm 5 setpoint.
-9999..+30000 [digit[1 p. 65]] (degrees for temp. sensors). **Default** 1750.

### 203 AL5.rE. Alarm 5 Reset

Alarm 5 contact reset type.

- 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)

### 204 AL5.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 MA 0 mA. **Default**
- 20 MA 20 mA.
- 4 MA 4 mA.
- 21.5MA 21.5 mA.

### 205 rES. Reserved

Reserved parmeter

### 206 AL5.dE. Alarm 5 Delay

Alarm 5 Delay.
-3600..+3600 seconds. **Default**: 0.
Negative value: delay when exit alarm status.
Positive value: delay when enter alarm status

### 207 AL5.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 AL5.Lb. Alarm 5 Label

Selects the message to be visualized in case of alarm 5 intervention

- 0 Disabled. **Default** 0.
- 1-20 Message 1..20 (see customizable messages table)

### 209÷212 Reserved Parameters - Group K

Reserved parameters - Group K

## GROUP L - AL. 6 - Alarm 6 *(only on -23ABC-T)*

### 213 AL6.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)
- PPb.ER. Probe error. Alarm active in case of sensor rupture.
- 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
- di. 1 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.A. Heater Break Alarm and Overcurrent Alarm

### 214 AL6.Pr. Alarm 6 Process *(only on UR48483A / 4A)*

Selects the size related to alarm 6.

- AI.N.1 Value read on input AI1. (**Default**)
- AI.N.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).

### 215 AL6.rc. 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 AL6.So. 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. 65]
- N.c. tH. (N.C. Threshold) Normally closed, active on reaching alarm[2 p. 65]

### 217 AL6.ot. 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 AL6HY. Alarm 6 Hysteresis

Alarm 6 hysteresis

-9999..+9999 [digit[1 p. 65]] (degrees.tenths for temp. sensors). **Default** 0.5.

### 219 AL6.LL. Alarm 6 Lower Limit

Lower limit selectable for the alarm 6 setpoint.

-9999..+30000 [digit[1 p. 65]] (degrees for temp. sensors). **Default** 0.

### 220 AL6.uL. Alarm 6 Upper Limit

Upper limit selectable for the alarm 6 setpoint.

-9999..+30000 [digit[1 p. 65]] (degrees for temp. sensors). **Default** 1750.

### 221 AL6.rE. Alarm 6 Reset

Alarm 6 contact reset type.

- 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)

### 222 AL6S.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 AL6.dE. Alarm 6 Delay

Alarm 6 Delay.

-3600..+3600 seconds. **Default**: 0.

Negative value: delay when exit alarm status

Positive value: delay when enter alarm status

### 225 AL6S.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 AL6.Lb. Alarm 6 Label

Selects the message to be visualized in case of alarm 6 intervention

- 0 Disabled . **Default** 0.
- 1-20 Message 1..20 (see customizable messages table)

### 227÷230 Reserved Parameters - Group L

Reserved parameters - Group L

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

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

Digital input 1 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)
- AcE.tY. Action Type. Cooling regulat. 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 fnd 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.)

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

Defines the resting contact of the digital input 1.

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

**233** d.i.1P. **Digital Input 1 Process** *(only on UR48483A / 4A)*

Select the size related to the digital input 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].
- 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).

**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.i. 2 - Digital input 2

**239** d.i.2F. **Digital Input 2 Function**

Digital input 2 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)
- AcE.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.)

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

Defines the resting contact of the digital input 2.

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

**241** d.i.2P. **Digital Input 2 Process** *(only on UR48483A / 4A )*

Select the size related to the digital input 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).

**242** d.i.2r. **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

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

Digital input 3 functioning.

- d.SAb. 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.)

### 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 *(only on UR48483A / 4A)*

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.i.4 - Digital input 4

### 255 d.i4.F. Digital Input 4 Function

Digital input 4 functioning.

- d.SAb. 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.)

### 256 d.i4.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.i4.P. Digital Input 4 Process *(only on UR48483A / 4A)*

Select the size related to the digital input 4.

- 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).

### 258 d.i4.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 - SFt.S - Soft-start and mini cycle

### 263 Pr.cY. Pre-programmed Cycle

Enables special functionings.

- diSAb. Disabled (**Default**)
- ENAb. Enabled (all remote sepoint functions are inhibited)

### 264 SS.tY. Soft-Start Type

Enables and selects the soft-start type

- diSAb. Disabled (**Default**)
- GRAd. Gradient
- PERc. Percentage (only with pre-programmed cycle disabled)

### 265 SS.r.c. Soft-Start Reference Command *(only on UR48483A / 4A)*

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 SS.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 SS.PE. Soft-Start Percentage

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

### 268 SS.tH. Soft-Start Threshold

Threshold under which the soft-start percentage function is activated, at starting.
-9999...30000 [digit[1 p. 65]] (degrees.tenths for temp. sensors) (**Default**: 1000)

### 269 SS.t1. Soft-Start Time

Max. Softstart duration: if the processs will not reach the threshold selected on par. SS.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 MAt1. Maintenance Time

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

### 271 FAGr. Falling Gradient

Falling gradient for pre-programmed cycle.

- 0 Disabled (**Default**)
- 1..10000 Digit/ora[1 p. 65] (degrees.tenths/hour if temperature)

### 272÷276 Reserved Parameters - Group Q

Reserved parameters - Group Q

## GROUP R - diSP. - Display

### 277 u.FLt Visualization Filter

- diSAb. Disabled
- PtcHF Pitchfork filter (**Default**)
- Fi.oRd. First Order
- Fi.oR.P. First Order with Pitchfork
- 2 SA.M. 2 Samples Mean
- .... ...n Samples Mean
- 10.SA.M. 10 Samples Mean

### 278 u1.d2 Visualization Display 2

Selects visualization on display 2.

- c.1.SPv Command 1 setpoint (**Default**)
- ou.PE.1 Percentage of command output 1
- Ai.iN.1 Value read on input AI1.
- Ai.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
- ou.PE.2 Percentage of command output 2
- AMPER. Ampere from current transformer

### 279 too.d. Timeout Display

Determines the display timeout

- diSAb. Disabled. Display always ON (**Default**)
- 15 S 15 seconds
- 1 MiN 1 minute
- 5 MiN 5 minutes
- 10MiN 10 minutes
- 30MiN 30 minutes
- 1 H 1 hour

### 280 toS. Timeout Selection

Selects which display is switched off when Display Timout expires

- diSP.1 Display 1
- diSP.2 Display 2 (**Default**)
- dSP.1.2 Display 1 and 2
- d.1.2.Ld. Display 1, 2 and led

### 281 u.MP.c. 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.

- diSAb. Disabled (**Default**)
- Ri.S.GR. Only rising gradient
- MR.ti. Only retention time
- Ri.G.M.t. Rising gradient and retention time
- FAL.GR Only falling gradient
- Ri.FA.G. Rising and falling gradient
- FA.G.M.t. Falling gradient and retention time
- R.F.G.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 u i.d2 set on c.tSPu) |

**285 nFc.L. NFC Lock**

| | |
|---|---|
| diSAb. | NFC lock disabled: NFC accessible. |
| ENAb. | NFC lock enabled: NFC not accessible. |

**286 Reserved Parameters - Group R**

Reserved parameters - Group R

## GROUP S - ct - Current transformer

**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 Hb.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 Hb.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 Hb.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.

| | |
|---|---|
| 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 1241 |
| AIN.1 | Value read on input AI1 |
| AIN.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.tty. 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! p. 65] (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! p. 65] (degrees if temperature), **Default**: 1000.

**302 r.tS.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

### 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 r2tY. 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. 65]] (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. 65]] (degrees if temperature), **Default**: 1000.

### 312 r2SE. 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 - SEr. - Seriale

### 318 SLAd. 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 S.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 SE.dE. Serial Delay

Selects serial delay
0...100 ms. **Default**: 5 ms.

### 322 oFFL. 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 - tMr - Timer

### 328 tMr.1 Timer 1

Enabling Timer 1

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

### 329 t.b.t.1 Time Base Timer 1

Selects time base for timer 1

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

### 330 A.tM.1 Action Timer 1

Select the type of the action executed by the timer 1 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

### 331 tMr.2 Timer 2

Enabling Timer 2

- diSAb. Disabled (**Default**)
- ENAb. Enabled
- EN.StR. 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.tM.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 tMr.S. Timers Sequence

Select the correlation between the two timers.

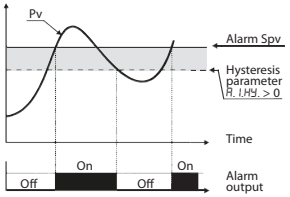
- SinGL. Singles. Timers work independently (**Default**)
- SEQuE. Sequential. When timer 1 ends, timer 2 starts.
- LooP Loop. When a timer ends, another starts.

### 335÷339 Reserved Parameters - Group W

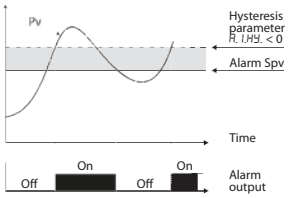
Reserved parameters - Group W

# 14 Alarm Intervention Modes

## 14.a Absolute or threshold alarm active over (par. 123 AL.1F. = Ab.uPA)

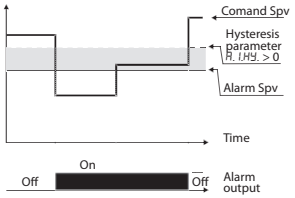



Absolute alarm.
Hysteresis value greater than "0" (Par. 128 A.1HY > 0).



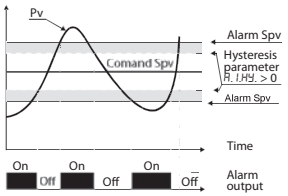

Absolute alarm.
Hysteresis value less than "0" (Par. 128 A.1HY > 0).

## 14.b Absolute or threshold alarm referred to command setpoint active over (par. 123 AL.1F. = Ab.c.u.A)

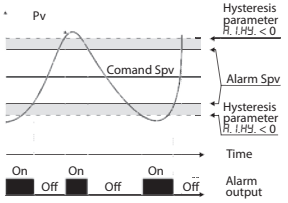



Absolute alarm referred to command setpoint. Hysteresis value greater than "0" (Par. 128 A.1HY > 0).

## 14.c Band alarm (par. 123 AL.1F. = bAnd)

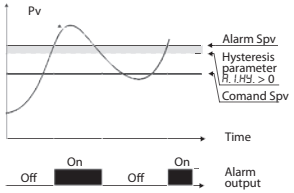



Band alarm hysteresis value greater than "0" (Par. 128 A.1HY > 0).



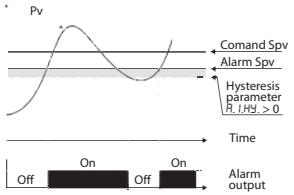

Band alarm hysteresis value less than "0" (Par. 128 A.1HY < 0).

## 14.d Upper deviation alarm (par. 123 AL.1F. = uP.dEu.)




Upper deviation alarm value of alarm setpoint greater than “0” and hysteresis value greater than “0” (Par.128 A.1.HY. > 0).

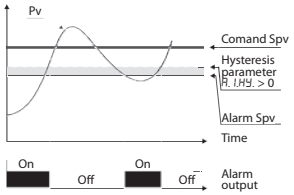
With hysteresis value less than “0” (A.1.HY. < 0) the dotted line moves under the alarm setpoint.




Upper deviation alarm value of alarm setpoint less than “0” and hysteresis value greater than “0” (Par.128 A.1.HY. > 0).

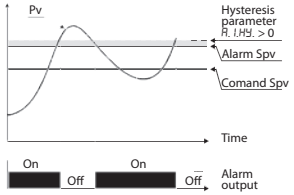
With hysteresis value less than “0” (A.1.HY. < 0) the dotted line moves under the alarm setpoint.

## 14.e Lower deviation alarm (par. 123 AL.1F. = Lo.dEu.)




Lower deviation alarm value of alarm setpoint greater than “0” and hysteresis value greater than “0” (Par.128 A.1.HY. > 0).

With hysteresis value less than “0” (A.1.HY. < 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.1.HY. > 0).

With hysteresis value less than “0” (A.1.HY. < 0) the dotted line moves under the alarm setpoint.



# 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 SEn. 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.*

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| **GROUP E - rEG.1 - Autotuning and PID 1** | | | |
| 73 | tun.1 | Tune 1 | 35 |
| 74 | S.d.t.1 | Setpoint Deviation Tune 1 | 35 |
| 75 | P.b. 1 | Proportional Band 1 | 35 |
| 76 | i.t. 1 | Integral Time 1 | 35 |
| 77 | d.t. 1 | Derivative Time 1 | 35 |
| 78 | d.b. 1 | Dead Band 1 | 35 |
| 79 | P.b.c.1 | Proportional Band Centered 1 | 35 |
| 80 | o.o.S.1 | Off Over Setpoint 1 | 35 |
| 81 | o.d.t.1 | Off Deviation Threshold 1 | 36 |
| 82 | c.t. 1 | Cycle Time 1 | 36 |
| 83 | co.F.1 | Cooling Fluid 1 | 36 |
| 84 | P.bM.1 | Proportional Band Multiplier 1 | 36 |
| 85 | o.d.b.1 | Overlap / Dead Band 1 | 36 |
| 86 | c.c.t.1 | Cooling Cycle Time 1 | 36 |
| 87 | LL.P.1 | Lower Limit Output Percentage 1 | 36 |
| 88 | uL.P.1 | Upper Limit Output Percentage 1 | 36 |
| 89 | M.G.t.1 | Max Gap Tune 1 | 36 |
| 90 | Mn.P.1 | Minimum Proportional Band 1 | 36 |
| 91 | MA.P.1 | Maximum Proportional Band 1 | 36 |
| 92 | Mn.i.1 | Minimum Integral Time 1 | 37 |
| 93 | o.cL.1 | Overshoot Control Level 1 | 37 |
| 94÷97 | | Reserved Parameters - Group E | 37 |
| **GROUP F - rEG.2 - Autotuning and PID 2** | | | |
| 98 | tun.2 | Tune 2 | 37 |
| 99 | S.d.t.2 | Setpoint Deviation Tune 2 | 37 |
| 100 | P.b. 2 | Proportional Band 2 | 37 |
| 101 | i.t. 2 | Integral Time 2 | 37 |
| 102 | d.t. 2 | Derivative Time 2 | 37 |
| 103 | d.b. 2 | Dead Band 2 | 37 |
| 104 | P.b.c.2 | Proportional Band Centered 2 | 38 |
| 105 | o.o.S.2 | Off Over Setpoint 2 | 38 |
| 106 | o.d.t.2 | Off Deviation Threshold 2 | 38 |
| 107 | c.t. 2 | Cycle Time 2 | 38 |
| 108 | co.F.2 | Cooling Fluid 2 | 38 |
| 109 | P.bM.2 | Proportional Band Multiplier 2 | 38 |

| | | |
|---|---|---|
| 110 o.d.b.2 | Overlap / Dead Band 2 | 38 |
| 111 c.c.t.2 | Cooling Cycle Time 2 | 38 |
| 112 L.L.P.2 | Lower Limit Output Percentage 2 | 38 |
| 113 u.L.P.2 | Upper Limit Output Percentage 2 | 38 |
| 114 M.G.t.2 | Max Gap Tune 2 | 39 |
| 115 Mn.P.2 | Minimum Proportional Band 2 | 39 |
| 116 MA.P.2 | Maximum Proportional Band 2 | 39 |
| 117 Mn.i.2 | Minimum Integral Time 2 | 39 |
| 118 o.c.L.2 | Overshoot Control Level 2 | 39 |
| 119÷122 | Reserved Parameters - Group F | 39 |

**GROUP G - AL. 1 - ALARM 1**

| | | |
|---|---|---|
| 123 AL.1.F. | Alarm 1 Function | 40 |
| 124 A1 Pr. | Alarm 1 Process (only on UR48483A / 4A | 40 |
| 125 A1.r.c. | Alarm 1 Reference Command | 40 |
| 126 A1.S.o. | Alarm 1 State Output | 40 |
| 127 rES. | Reserved | 40 |
| 128 A.1.HY. | Alarm 1 Hysteresis | 40 |
| 129 A.1.L.L. | Alarm 1 Lower Limit | 41 |
| 130 A.1.u.L. | Alarm 1 Upper Limit | 41 |
| 131 A.1.rE. | Alarm 1 Reset | 41 |
| 132 A.1S.E. | Alarm 1 State Error | 41 |
| 133 A.1Ld. | Alarm 1 Led | 41 |
| 134 A.1.dE. | Alarm 1 Delay | 41 |
| 135 A.1S.P. | Alarm 1 Setpoint Protection | 41 |
| 136 A.1Lb. | Alarm 1 Label | 41 |
| 137÷140 | Reserved Parameters - Group G | 41 |

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

| | | |
|---|---|---|
| 141 AL.2.F. | Alarm 2 Function | 42 |
| 142 A2Pr. | Alarm 2 Process (only on UR48483A / 4A) | 42 |
| 143 A2.r.c. | Alarm 2 Reference Command | 42 |
| 144 A2S.o. | Alarm 2 State Output | 42 |
| 145 rES. | Reserved | 42 |
| 146 A.2HY. | Alarm 2 Hysteresis | 42 |
| 147 A2L.L. | Alarm 2 Lower Limit | 43 |
| 148 A2.u.L. | Alarm 2 Upper Limit | 43 |
| 149 A.2.rE. | Alarm 2 Reset | 43 |
| 150 A2S.E. | Alarm 2 State Error | 43 |
| 151 A2Ld. | Alarm 2 Led | 43 |
| 152 A.2.dE. | Alarm 2 Delay | 43 |
| 153 A2S.P. | Alarm 2 Setpoint Protection | 43 |
| 154 A2Lb. | Alarm 2 Label | 43 |
| 155÷158 | Reserved Parameters - Group H | 43 |

**GROUP I - AL. 3 - Alarm 3**

| | | |
|---|---|---|
| 159 AL.3.F. | Alarm 3 Function | 44 |
| 160 A3Pr. | Alarm 3 Process (only on UR48483A / 4A) | 44 |
| 161 A3.r.c. | Alarm 3 Reference Command | 44 |
| 162 A3S.o. | Alarm 3 State Output | 44 |
| 163 A3.o.t. | Alarm 3 Output Type | 44 |
| 164 A.3HY. | Alarm 3 Hysteresis | 45 |
| 165 A3L.L. | Alarm 3 Lower Limit | 45 |
| 166 A3.u.L. | Alarm 3 Upper Limit | 45 |
| 167 A.3.rE. | Alarm 3 Reset | 45 |
| 168 A3S.E. | Alarm 3 State Error | 45 |
| 169 A3Ld. | Alarm 3 Led | 45 |
| 170 A.3.dE. | Alarm 3 Delay | 45 |
| 171 A3S.P. | Alarm 3 Setpoint Protection | 45 |
| 172 A3Lb. | Alarm 3 Label | 45 |
| 173÷176 | Reserved Parameters - Group I | 45 |

**GROUP J - AL. 4 - Alarm 4**

| | | |
|---|---|---|
| 177 AL.4.F. | Alarm 4 Function | 46 |
| 178 A4Pr. | Alarm 4 Process (only on UR48483A / 4A) | 46 |
| 179 A4.r.c. | Alarm 4 Reference Command | 46 |
| 180 A4S.o. | Alarm 4 State Output | 46 |
| 181 A4.o.t. | Alarm 4 Output Type | 47 |
| 182 A4HY. | Alarm 4 Hysteresis | 47 |
| 183 A4L.L. | Alarm 4 Lower Limit | 47 |
| 184 A4.u.L. | Alarm 4 Upper Limit | 47 |
| 185 A4.rE. | Alarm 4 Reset | 47 |
| 186 A4S.E. | Alarm 4 State Error | 47 |
| 187 rES. | Reserved | 47 |
| 188 A4.dE. | Alarm 4 Delay | 47 |
| 189 A4S.P. | Alarm 4 Setpoint Protection | 47 |
| 190 A4Lb. | Alarm 4 Label | 47 |
| 191÷194 | Reserved Parameters - Group J | 47 |

**GROUP K - AL. 5 - Alarm 5** *(only on -23ABC-T)*

| | | |
|---|---|---|
| 195 AL.5.F. | Alarm 5 Function | 48 |
| 196 A5Pr. | Alarm 5 Process (only on UR48483A / 4A) | 48 |
| 197 A5.r.c. | Alarm 5 Reference Command | 48 |
| 198 A5S.o. | Alarm 5 State Output | 48 |
| 199 A5.o.t. | Alarm 5 Output Type | 48 |
| 200 A5HY. | Alarm 5 Hysteresis | 49 |
| 201 A5L.L. | Alarm 5 Lower Limit | 49 |
| 202 A5.u.L. | Alarm 5 Upper Limit | 49 |
| 203 A5.rE. | Alarm 5 Reset | 49 |
| 204 A5S.E. | Alarm 5 State Error | 49 |
| 205 rES. | Reserved | 49 |
| 206 A5.dE. | Alarm 5 Delay | 49 |
| 207 A5S.P. | Alarm 5 Setpoint Protection | 49 |
| 208 A5Lb. | Alarm 5 Label | 49 |
| 209÷212 | Reserved Parameters - Group K | 49 |

**GROUP L - AL. 6 - Alarm 6** *(only on -23ABC-T)*

| | | |
|---|---|---|
| 213 AL.6.F. | Alarm 6 Function | 50 |
| 214 A6Pr. | Alarm 6 Process (only on UR48483A / 4A) | 50 |
| 215 A6.r.c. | Alarm 6 Reference Command | 50 |
| 216 A6S.o. | Alarm 6 State Output | 50 |
| 217 A6.o.t. | Alarm 6 Output Type | 51 |

| | | |
|---|---|---|
| 218 A.6HY. | Alarm 6 Hysteresis | 51 |
| 219 A.6.L.L. | Alarm 6 Lower Limit | 51 |
| 220 A.6.u.L. | Alarm 6 Upper Limit | 51 |
| 221 A.6.rE. | Alarm 6 Reset | 51 |
| 222 A.6.S.E. | Alarm 6 State Error | 51 |
| 223 rES. | Reserved | 51 |
| 224 A.6.dE. | Alarm 6 Delay | 51 |
| 225 A.6.S.P. | Alarm 6 Setpoint Protection | 51 |
| 226 A.6.Lb. | Alarm 6 Label | 51 |
| 227÷230 | Reserved Parameters - Group L | 51 |
| **GROUP M - d.i. 1 - Digital input 1** | | |
| 231 d.i.1.F. | Digital Input 1 Function | 52 |
| 232 d.i.1.c. | Digital Input 1 Contact | 52 |
| 233 d.i.1.P. | Digital Input 1 Process (only on UR48483A / 4A) | 52 |
| 234 d.i.1.r. | Digital Input 1 Reference Command | 52 |
| 235÷238 | Reserved Parameters - Group M | 52 |
| **GROUP N - d.i. 2 - Digital input 2** | | |
| 239 d.i.2.F. | Digital Input 2 Function | 53 |
| 240 d.i.2.c. | Digital Input 2 Contact | 53 |
| 241 d.i.2.P. | Digital Input 2 Process (only on UR48483A / 4A) | 53 |
| 242 d.i.2.r. | Digital Input 2 Reference Command | 53 |
| 243÷246 | Reserved Parameters - Group N | 53 |
| **GROUP O - d.i. 3 - Digital input 3** | | |
| 247 d.i.3.F. | Digital Input 3 Function | 54 |
| 248 d.i.3.c. | Digital Input 3 Contact | 54 |
| 249 d.i.3.P. | Digital Input 3 Process (only on UR48483A / 4A) | 54 |
| 250 d.i.3.r. | Digital Input 3 Reference Command | 54 |
| 251÷254 | Reserved Parameters - Group O | 54 |
| **GROUP P - d.i. 4 - Digital input 4** | | |
| 255 d.i.4.F. | Digital Input 4 Function | 55 |
| 256 d.i.4.c. | Digital Input 4 Contact | 55 |
| 257 d.i.4.P. | Digital Input 4 Process (only on UR48483A / 4A) | 55 |
| 258 d.i.4.r. | Digital Input 4 Reference Command | 55 |
| 259÷262 | Reserved Parameters - Group P | 55 |
| **GROUP Q - SFt.S - Soft-start and mini cycle** | | |
| 263 Pr.cY. | Pre-programmed Cycle | 56 |
| 264 SS.tY. | Soft-Start Type | 56 |
| 265 SS.r.c. | Soft-Start Reference Command (only on AUR48483A / 4A) | 56 |
| 266 SS.Gr. | Soft-Start Gradient | 56 |
| 267 SS.PE. | Soft-Start Percentage | 56 |
| 268 SS.tH. | Soft-Start Threshold | 56 |
| 269 SS.ti. | Soft-Start Time | 56 |
| 270 MA.ti. | Maintenance Time | 56 |
| 271 FA.Gr. | Falling Gradient | 56 |
| 272÷276 | Reserved Parameters - Group Q | 56 |
| **GROUP R - diSP. - Display** | | |
| 277 u.FLt | Visualization Filter | 57 |
| 278 u.d.2 | Visualization Display 2 | 57 |
| 279 tMo.d. | Timeout Display | 57 |
| 280 tMo.S. | Timeout Selection | 57 |
| 281 u.MP.c. | User Menu Pre-Programmed Cycle | 57 |
| 282 u.out | Voltage Output | 58 |
| 283 Scl.t. | Scrolling Time | 58 |
| 284 d.SP.F. | Display Special Functions | 58 |
| 285 nFc.L. | NFC Lock | 58 |
| 286 Reserved Parameters - Group R | | 58 |
| **GROUP S - ct - Current transformer** | | |
| 287 ct F. | Current Transformer Function | 58 |
| 288 ct u. | Current Transformer Value | 58 |
| 289 H.b.A.r. | Heater Break Alarm Reference Command | 58 |
| 290 H.b.A.t. | Heater Break Alarm Threshold | 58 |
| 291 ocu.t. | Overcurrent Alarm Threshold | 58 |
| 292 H.b.A.d. | Heater Break Alarm Delay | 59 |
| 293÷297 | Reserved Parameters - Group S | 59 |
| **GROUP T - A.o. 1 - Retransmission 1** | | |
| 298 rtM.1 | Retransmission 1 | 59 |
| 299 r.1.tY. | Retransmission 1 Type | 59 |
| 300 r.1. LL. | Retransmission 1 Lower Limit | 59 |
| 301 r.1. u.L. | Retransmission 1 Upper Limit | 59 |
| 302 r.1.S.E. | Retransmission 1 State Error | 59 |
| 303÷307 | Reserved Parameters - Group T | 59 |
| **GROUP U - A.o. 2 - Retransmission 2** | | |
| 308 rtM.2 | Retransmission 2 | 60 |
| 309 r.2.tY. | Retransmission 2 Type | 60 |
| 310 r.2. LL. | Retransmission 2 Lower Limit | 60 |
| 311 r.2. u.L. | Retransmission 2 Upper Limit | 60 |
| 312 r.2.S.E. | Retransmission 2 State Error | 60 |
| 313÷317 | Reserved Parameters - Group U | 60 |
| **GROUP V - SEr. - Seriale** | | |
| 318 SL.Ad. | Slave Address | 61 |
| 319 bd.rt. | Baud Rate | 61 |
| 320 S.P.P. | Serial Port Parameters | 61 |
| 321 SE.dE. | Serial Delay | 61 |
| 322 oFFL. | Off Line | 61 |
| 323÷327 | Reserved Parameters - Group V | 61 |
| **GROUP W - tiMr - Timer** | | |
| 328 tMr.1 | Timer 1 | 62 |
| 329 t.b.t.1 | Time Base Timer 1 | 62 |
| 330 A.tM.1 | Action Timer 1 | 62 |
| 331 tMr.2 | Timer 2 | 62 |
| 332 t.b.t.2 | Time Base Timer 2 | 62 |
| 333 A.tM.2 | Action Timer 2 | 62 |
| 334 tMr.S. | Timers Sequence | 62 |
| 335÷339 | Reserved Parameters - Group W | 62 |