Pixsys®
ELECTRONICS

DRR227

Controller

User manual

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Introduction

Thank you for choosing a Pixsys controller.
With the DRR227 Pixsys model Pixsys makes available in a single device multiple options related to sensor input and actuators command in addition to the extended power range 24..230 Vac/Vdc. With the various selectable sensors and the output configurable as relay or SSR command, the user or retailer can reduce stock by rationalising investment and device availability

1 Safety guide lines

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

2 Model Identification

Power supply 24..230 Vac/Vdc +/-15% 50/60 Hz – 5,5 VA

DRR227-12ABC	2 relays + 1 Out SSR + D.I.
DRR227-14ABC	3 Out SSR + 1 relays + D.I. + T.A.

3 Technical Data

3.1 General Features

Displays	4 0,40 inch displays + 4 0,30 inch displays
Operating temperature	0-45 °C - Humidity 35..95 uR%
Sealing	IP65 front panel (with gasket) IP20 box and terminals
Material	PC ABS UL94VO self-extinguishing
Weight	130 g

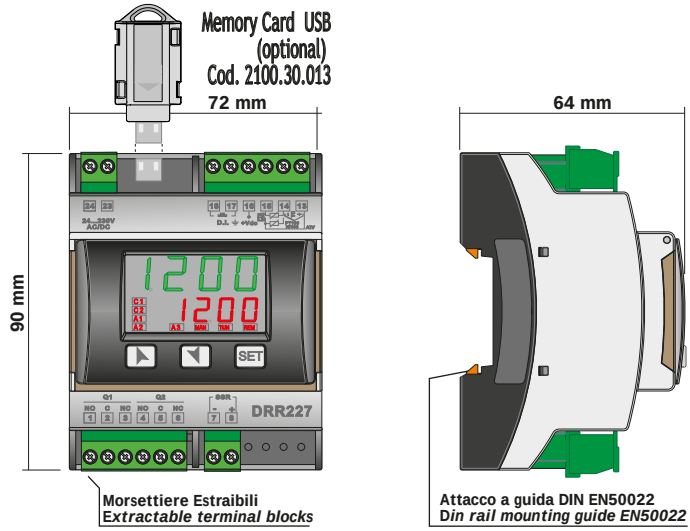
3.2 Hardware Features

Power supply	24..230 Vac/Vdc ±15% 50/60 Hz	Consumption: 5.5 VA
Analogue input	**1**: AN1 Configurable via software. **Input**: Thermocouple type K, S, R, J, T, E, N, B. Automatic compensation of cold junction from 0..50°C. **Thermoresistance**: PT100, PT500, PT1000, Ni100, PTC1K, NTC10K (β 3435K). **Input V/I**: 0-10 V, 0-20 or 4-20 mA, 0-60 mV. **Pot. input**: 6 kΩ, 150 kΩ	Tolerance (25 °C) +/-0.3% ±1 digit (su F.s.) for thermocouple, thermoresistance and V / mA. Cold junction accuracy 0.1 °C/°C **Impedence**: **0-10 V**: Ri>110 kΩ **0-20 mA**: Ri<50 Ω **4-20 mA**: Ri<50 Ω **0-60 mV**: Ri>500 kΩ
Relay outputs	**2** relays. Configurable as command and/or alarm output	Contacts 5 A - 250 V~. Resistive load
SSR output	**1** SSR. Configurable as command output and/or alarm output	+12Vdc ±15%/ 30mA

3.3 Software Features

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

4 Dimensions and Installation

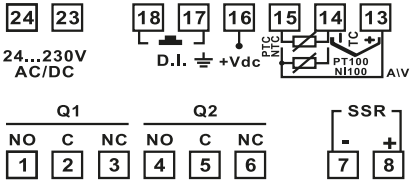


5 Electrical wirings

Although this controller was designed to resist electromagnetic interferences in industrial environments, please observe following safety guidelines:

- Separate the control line from the power wires.
- Avoid proximity of remote control switches, electromagnetic contactors, powerful engines and in all instances use specific filters.
- Avoid proximity of power groups, especially those with phase control.

5.1 Wiring diagram

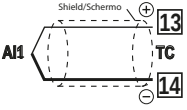


DRR227-12ABC

Power Supply

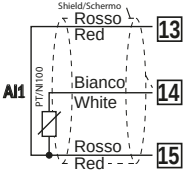
Switching power supply with extended range 24..230 Vac/dc ±15% 50/60 Hz – 5,5 VA (galvanically insulated)

AN1 Analogue Input



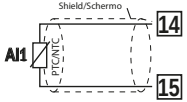
For thermocouples K, S, R, J, T, E, N, B.

- 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



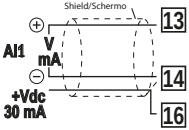
For thermoresistances PT100, Ni100.

- For the three-wire connection use wires with the same section
- For the two-wire connection short-circuit terminals 1 and 3
- 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



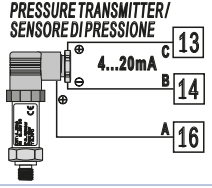
For linear signals in Volt and mA

+Vdc = 12Vdc ±15%/ 30mA

Comply with polarity

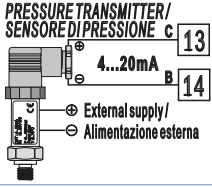
When shielded cable is used, it should be grounded at one side only to avoid ground loop currents

Examples of connection for Volt and mA inputs



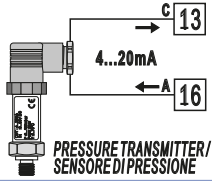
For linear signals 0/4..20 mA with three-wires sensors.

Comply with polarity:
A= Sensor output
B= Sensor ground
C= Sensor supply (+12Vdc ±15%/ 30mA)



For linear signals 0/4..20 mA with external power supply for sensor.

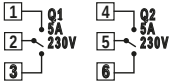
Comply with polarity:
A= Sensor output
B= Sensor ground



For linear signals 0/4..20 mA with two-wires sensors.

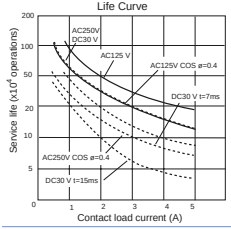
Comply with polarity:
A= Sensor output
C= Sensor supply (+12Vdc ±15%/ 30mA)

Relay Q1 - Q2 output



Contacts capacity 5 A / 250 V~ resistive loads.

NB: see graphic below



Electrical endurance Q1 / Q2.
5A, 250 Vac, resistive load, 10^5 operations
20/2 A, 250 Vac, cosφ = 0.3, 10^5 operations

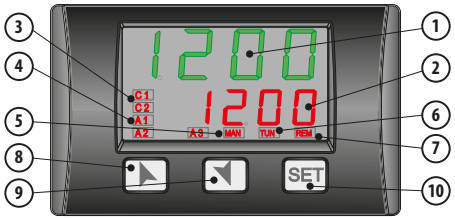
SSR output

SSR command output +12Vdc ±15%/ 30mA

Digital Input

NPN digital input
Digital input according to parameter dGti.
⚠ **To activate the digital input, shortcircuit pins 17 and 18**

6 Display and Keys Functions



6.1 Numeric Indicators (Display)

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

6.2 Meaning of Status Lights (Led)

3	**C1**	ON when the output command is on
4	**A1 A2**	ON when the corresponding alarm is active
5	**MAN**	ON when the "Manual" function is on
6	**TUN**	ON when the controller is running an "Autotuning" cycle
7	**REM**	ON when the controller communicates via serial port (USB)

6.3 Keys

8	▲	• Increases main setpoint • During configuration phase, allows to slide through parameters. Together with SET it modifies them • Pressed after SET increases alarm setpoint
9	▼	• Decreases main setpoint • During configuration phase, allows to slide through parameters. Together with SET it modifies them • Pressed after SET decreases alarm setpoint
10	SET	• Allows to display alarm setpoints and runs the Tuning function • Allows to modify configuration parameters

7 Controller Functions

7.1 Modifying Main Setpoint and Alarm Setpoint Values

Setpoint value can be modified by keyboard as follows:

	Press	Display	Do
1	▲ or ▼	Value on display 2 changes	Increase or decrease main setpoint
2	SET	Visualizes alarm setpoint on display 1	
3	▲ or ▼	Value on display 2 changes	Increase or decrease the alarm setpoint value

7.2 Auto-Tuning

Tuning procedure to calculate regulation parameters can be manual or automatic according to selection on parameter 8 (*P. id.*).

7.3 Manual Tuning

Manual procedure allows the user a greater flexibility to decide when to update PID algorithm parameters. After selected *MAn.* on parameter 8 (*P. id.*), the procedure can be activated in two ways:

- **Running Tuning by keyboard**:
  Press SET until display 1 shows the writing *tunE* with display 2 showing *oFF*, press ▲, display 2 shows *on*.
  TUN led switches on and the procedure starts.
- **Running Tuning by digital input**:
  Select *tunE* on parameter 25 *dGt. i*. At first activation of digital input (commutation on front panel) **TUN** led switches ON while at second activation switches off.

7.4 Automatic Tuning

Automatic tuning procedure has been conceived to give user the possibility to have a clear regulation also without knowledge of PID regulation algorithm. Setting *AuTo* on parameter 8 *P. id.*, the controller will check process oscillations and will modify PID parameters.

7.5 Soft-Start

At starting the controller can follow a gradient expressed in units (ex. Degree/Hour) to reach the setpoint.

Enter this gradient on parameter 21 *SFt.G.* with the chosen units/hour: at next activation the controller will execute the Soft-Start function.

If parameter 24 *St in.* is different from 0, after switch-on and elapsing of the time set on parameter 24 , setpoint does not follow the gradient anymore, but it reaches final setpoint with maximum power.

7.6 Automatic/Manual Regulation for % Output Control

This function allows to select automatic functioning or manual command of the output percentage.

By parameter 69 *Au.MR.* it is possible to select two modes.

1 **First selection** (*En.*) pressing SET display 1 shows *P.---* , while on display 2 appears *AuTo.*

Press ▲ to select *MAn* mode; it is now possible to modify the output percentage using ▲ and ▼. To back to automatic mode, using the same procedure, select *AuTo* on display 2: **MAN** led switches off and functioning backs to auomatic.

2 **Second selection** (*En.St.*) enables the same functioning, but with two important variants:

- If there is a temporary power failure or after switch-off, manual functioning as well as the previous output percentage value will be maintained at restarting.
- If the sensor breaks during automatic functioning, controller moves to manual mode while maintaining the output percentage command unchanged as generated by the PID immediately before breakage.
  Ex: on an extruder the resistance percentage command (load) is kept also in case of input sensor failure.

7.7 Digital input functions

On DRR227 digital input can be enabled by parameter 25 *diF. i.*

- *2.SPu.*: Switch between two setpoint thresholds: with digital input active DRR227 regulates on SET2, otherwise on SET1;
- *run.*: Regulation is enabled only with digital input active;
- *tunE*: Enables/disables Tuning, if parameter 8 *P. id.* is set on *MAn.*;
- *Au.MR.*: (Automatic/Manual) if par. 19 *Au.MR.* is set on *En.* or *En.St.*, DRR227 regulates in

manual mode if digital input active, otherwise the regulation is automatic.

- AcLt.t.: (Action Type) heating regulation with inactive digital input; Cooling regulation with active digital input;
- o.rSt: (Outputs Reset) allows to reset the outputs if Manual reset should be configured for command output and/or alarm outputs.

7.8 Memory Card (optional)

Parameters and setpoint values can be easily copied from one controller to others using the MEMORY CARD.
Enter the Memory Card **with the controller not connected to power supply.**
At starting display 1 visualizes MEMo while display 2 visualizes SH iP (**only if into the Memory are stored correct values**). Pressing ▲ display 2 visualizes LoAd. Press SET to confirm. The controller loads the new values and restarts.

NB: parameters may be copied only on controllers of the same model!

⚠ **Updating Memory Card.**
To update the memory card values, follow the procedure previously described, setting SH iP on display 2 so as not to load the parameters on controller.
Enter configuration (password 1234): Exiting configuration mode, the settings will be automatically saved on Memory card.

7.9 Regulation control

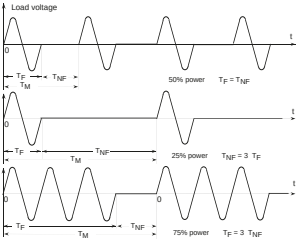
DRR227 integrates different types of control for the regulation of the SSR command output, selecting parameter 43 o.cLt. as follows:

tiME Time control

Activation and deactivation of the output is related to the time selected on parameter 52 c.t.. Ex. selecting a time of 10s and supposing a 30% percentage, the output will remain active for 3s and inactive for 7s.

bSt.F. Burst fire control

The "Burst-fire" control (1 cycle) is a duty cycle mode which consists of supplying a series of complete mains voltage cycles to the load.



At 50% power, the modulation time is 40ms:

- 1 firing cycle (20ms at 50Hz)
- 1 firing cycle (20ms at 50Hz)

For a setpoint less than 50%:

- The firing time remains constant (1 cycle)
- The non-firing and modulation time incr eases

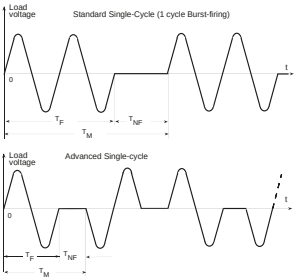
For a setpoint greater than 50%:

- The non-firing time remains constant (1 cycle)
- The firing and modulation time increases

A.bE.F. Advanced Burst fire control

In order to minimise power fluctuation during the modulation period, the "advanced Burst fire" SSR output firing mode uses:

- A complete number of cycles for firing
- A complete number of half-cycles for non-firing



For a percentage less than 66%, SSR output firing takes place as in the "Burst fire" mode (see bSt.F.)

For a setpoint greater than 66% in "Advanced Burst fire" mode:

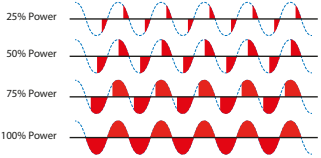
- The non-firing time is constant at one half-cycle
- Firing takes place over whole cycles

In a 'short-wave infrared' application, 'advanced Burst fire' firing mode reduces the brightness of the infrared elements and thus minimises annoying visual flickering

In a short-wave infrared application, "advanced Burst fire" firing mode reduces the brightness of the infrared elements and thus minimises annoying visual flickering.

PHS.A. Phase angle control

If this mode is active, the regulation is done through the phase choking



Using a no zero-crossing SSR, the DRR227 synchronizes with the power supply volage (necessarily AC) and determines when to activate the output to create the right choking

F.PH.A. Fixed Phase angle control

If this mode is active, the regulation is done as per "time control" (t inE), but during the activation it is managed a fixed choking selected on parameter 45 F.P.A.P..

8 Configuration

For configuration parameters see par. 10.

	Press	Display	Do
1	SET for 3 sec.	Display 1 shows 0000 with the 1st digit flashing, while display 2 shows PASS	
2	▲ or ▼	Modify the flashing digit and move to the next one pressing SET	Enter password 1234
3	SET to confirm	Display 1 shows the first parameter while display 2 shows the value	
4	▲ or ▼	Slide up/down through parameters	
5	SET ▲ or ▼	Increase or decrease the visualized value pressing SET and an arrow key	Enter the new data which will be saved on releasing the keys. To change another parameter return to point 4
6	▲ + ▼ togheter	End of configuration parameter change. The controller exits from programming	

8.1 Loading default values

This procedure allows to restore factory settings of the device.

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

9 Table of Configuration Parameters

The parameters list below can be entered by passwords 1234 (for standard) and 5678 (for advanced). Enter password 1357 to access the complete list

1 SEn. Sensor (Password 1234)

Analogue input configuration

tc.K	Tc-K (**Default**)	-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
Pt	Pt100	-100 °C..600 °C
Pt 1	Pt100	-100 °C..140 °C
n 1	Ni100	-60 °C..180 °C
ntc	NTC10K	-40 °C..125 °C
Ptc	PTC1K	-50 °C..150 °C
Pt5	Pt500	-100 °C..600 °C
Pt 1k	Pt1000	-100 °C..600 °C
0- 10	0..10 V	
0-20	0..20 mA	
4-20	4..20 mA	
0-60	0..60 mV	
Pot. 1	Potenziometri fino a 6 kOhm	
Pot.2	Potenziometri fino a 150 kOhm	

2 d.P. Decimal Point (Password 1234)

Select number of displayed decimal points

0	No displayed decimal **Default**
0.0	1 decimal
0.00	2 decimals
0.000	3 decimals

3 dEGr. Degree (Password 1234)

Select degree type

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

4 Lo.L.1. Lower Linear Input (Password 1234)

Analogue input lower range limit only for linear signals. Ex.: with input 4...20 mA this parameter takes value associated to 4 mA.

-999..+9999 [digit[1]] (degrees.tenths for temperature sensors), **Default**: 0.

5 uP.L.1. Upper Linear Input (Password 1234)

Analogue input upper range limit only for linear signals. Ex.: with input 4...20 mA this parameter takes value associated to 20 mA.

-999..+9999 [digit[1]] (degrees.tenths for temperature sensors).**Default**:1000

6 c.out Command Output (Password 1234)

Select command output type

c. o1	Command on Q1 relay output **Default.** (Q2->AL1; SSR->AL2)
c.SSr	Command on SSR output (Q1->AL1; Q2->AL2)
c.o 1.2	Command on Q1 and Q2 output (Q1 n.o.; Q2 n.c; SSR->AL1)

7 Act.t. Action type (Password 1234)

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

8 P.i.d. PID (Password 1234)

Select functioning (on/off or PID) and autotuning type

d iS.	Disabled (on/off) (**Default**)
Auto	Automatic (PID automatic calculation of parameters)
uSEr	User (PID parameters calculated by manual tune or tune once)
oncE	Once (PID parameters calculation only once at starting)
MAn.	Manual (PID automatic parameters calculation by keyboard)

9 Lo.L.S. Lower Limit Setpoint (Password 1234)

-999..+9999 [digit[1]] (degrees.tenths for temperature sensors), **Default**: 0.

10 uP.L.S. Upper Limit Setpoint (Password 1234)

-999..+9999 [digit[1]] (degrees.tenths for temperature sensors), **Default**: 1750.

11 o.cAL. Offset Calibration (Password 5678)

Value added/subtracted to the process value (ex: usually correcting the ambient temperature value).

-999..+1000 [digit[1]] for linear sensors and potentiometers.

-200.0..+100.0 (degrees.tenths for temperature sensors),

Default 0.0.

12 G.cAL. Gain Calibration (Password 5678)

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.
-99.9%..+100.0%, **Default**: 0.0.

13 c. HY. Command Hysteresis (Password 1234)

Hysteresis in ON/OFF
-999..+999 [digit1] (degrees.tenths for temperature sensors). **Default** 0.2.

14 c. Ld. Command Led (Password 5678)

State of the OUT1 led corresponding to the relevant contact
- o.c. ON with open contact
- c.c. ON with closed contact (**Default**)

15 c. S.E. Command State Error (Password 5678)

State of contact for command output in case of error
- o.c. Open contact (**Default**)
- c.c. Closed contact

16 c. S.P. Command Setpoint Protection (Password 1234)

Allows/denies modifications of command setpoint value
- FrEE Modifiable by the user (**Default**)
- Loch Locked

17 c. rE. Command Reset (Password 5678)

Type of reset for command contact (always automatic in PID functioning)
- ArE. Automatic Reset (**Default**)
- MrE. Manual Reset
- MrE.S. Manual Reset Stored (keeps relay status also after an eventual power failure)

18 c. dE. Command Delay (Password 5678)

Command delay (only in ON / OFF functioning).
-900..+900 seconds.. **Default**: 0.
Negative: delay in switching off phase.
Positive: delay in activation phase.

19 Au.MA. Automatic / Manual (Password 1234)

Enables automatic/manual selection.
- d iS. Disabled (**Default**)
- En. Enabled
- En.St. Enabled stored

21 SFt.G. Softstart Gradient (Password 5678)

Rising gradient for Soft-Start

0 Disabled. **Default**

1-9999 (degrees/hour).

24 S.t iM. Softstart Time (Password 5678)

Max. Softstart duration: the process will follow the gradient only for the time set on parameter, than moves to the max. power.

00.00 Disabled. **Default**

00.01-24.00 hh.mm

25 dGt. i. Digital Input (Password 1234)

Digital input functioning (see par. 7.7)

d iS. Disabled (**Default**)

2.SPu 2 setpoint thresholds

run Run

tunE Tune (impulsive digital input). Parameter 8 P. id. must be set as MAn.

Au.MA. Automatic/Manual

Act.t. Regulation type

o.rSt Output reset (impulsive digital input)

26 d. i.c.t. Digital Input Contact Type (Password 1234)

Select the digital input inactive contact.

o.c. Open contact (**Default**)

c.c. Closed contact

27 AL.1 Alarm 1 (Password 1234)

Alarm 1 selection.

d iS. Disabled (**Default**)

A. AL. Absolute / threshold, referring to process

b. AL. Band alarm

H.d.AL. Upper deviation alarm

L.d.AL. Lower deviation alarm

28 A1.S.o Alarm 1 State Output (Password 1234)

Alarm 1 output contact and intervention type.

n.o. S. (N.O. Start) Normally open, active at start (**Default**)

n.c. S. (N.C. Start) Normally closed, active at start

n.o. t. (N.O. Threshold) Normally open, active on reaching alarm [1]

n.c. t. (N.C. Threshold) Normally closed, active on reaching alarm[1]

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

29 A.1.HY. **Alarm 1 Hysteresis (Password 1234)**

-99.9..99.9 °C/°F. **Default**: 0.5.°C

30 A.1.Ld. **Alarm 1 Led (Password 5678)**

Defines the state of A1 led corresponding to the relative contact

- o.c. ON with open contact
- c.c. ON with closed contact (**Default**)

31 A.1.S.E. **Alarm 1 State Error (Password 5678)**

State of contact for alarm 1 output in case of error

- o.c. Open contact (**Default**)
- c.c. Closed contact

32 A.1.SP. **Alarm 1 Setpoint Protection (Password 1234)**

Does not allow the user to modify setpoint

- FrEE Modifiable by the user (**Default**)
- Loch Locked
- H idE Locked and hidden

33 A1.rE. **Alarm 1 Reset (Password 5678)**

Type of Reset for contact of alarm 1

- ArE. Automatic Reset (**Default**)
- MrE. Manual reset (by keyboard) (SET)
- MrE.S. Manual Reset Stored (keeps relay status also after an eventual power failure)

34 A.1.dE. **Alarm 1 Delay (Password 5678)**

-900..+900 secondi. **Default**: 0.

Negative: delay in alarm output phase

Positive: delay in alarm entry phase.

35 AL.2 **Alarm 2 (Password 1234)**

Alarm 2 selection.

- d iS. Disabled (**Default**)
- A. AL. Absolute / threshold, referring to process
- b. AL. Band alarm
- H.d.AL. Upper deviation alarm
- L.d.AL. Lower deviation alarm

36 A.2S.o Alarm 2 State Output (Password 1234)

Alarm 2 output contact and intervention type.

- n.o. S. (N.O. Start) Normally open, active at start (**Default**)
- n.c. S. (N.C. Start) Normally closed, active at start
- n.o. t. (N.O. Threshold) Normally open, active on reaching alarm[2]
- n.c. t. (N.C. Threshold) Normally closed, active on reaching alarm[2]

37 A.2HY. Alarm 2 Hysteresis (Password 1234)

-99.9..99.9 °C/°F. **Default**: 0.5.°C

38 A.2Ld. Alarm 2 Led (Password 5678)

Defines the state of A2 led corresponding to the relative contact

- o.c. ON with open contact
- c.c. ON with closed contact (**Default**)

39 A.2S.E. Alarm 2 State Error (Password 5678)

State of contact for alarm 2 output in case of error

- o.c. Open contact (**Default**)
- c.c. Closed contact

40 A.2SP. Alarm 2 Setpoint Protection (Password 1234)

Does not allow the user to modify setpoint

- FrEE Modifiable by the user (**Default**)
- Loch Locked
- HidE Locked and hidden

41 A2.rE. Alarm 2 Reset (Password 5678)

Type of Reset for contact of alarm 2

- Ar.E. Automatic Reset (**Default**)
- Mr.E. Manual reset (by keyboard) (SET)
- Mr.E.S. Manual Reset Stored (keeps relay status also after an eventual power failure)

42 A.2.dE. Alarm 2 Delay (Password 5678)

-900..+900 secondi. **Default**: 0.

Negative: delay in alarm output phase

Positive: delay in alarm entry phase.

[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.*

43 o.cL.t. Output Control Type (Password 5678)

Select output control type in case of PID regulation

- t iME Time control **Default**
- bSt.F. Burst fire control
- A.bt.F. Advanced Burst fire control
- PHS.A. Phase angle control
- F.PH.A. Fixed Phase angle control

44 PHS.d. Phase Displacement (Password 5678)

Select the phase displacement in case of inductive load when using the phase angle control

-90..90 degrees.> **Default** 0°.

45 F.P.A.P. Fixed Phase Angle Percentage (Password 5678)

Select the output % when "Fixed Phase Angle" control is selected.

10.0..90.0% .> **Default** 80.0%

46 L.L.P.P. Lower Limit Phase Angle Percentage (Password 5678)

Select the min. value for the command output % with Phase Angle control.

0..40%, **Default**: 10%.

47 u.L.P.P. Upper Limit Phase Angle Percentage (Password 5678)

Select the max. value for the command output % with Phase Angle control

60..100%, **Default**: 90%.

48 P.b. Proportional Band (Password 5678)

Process intertia in °C/°F

0 ON / OFF if t.i. is equal to 0 (**Default**)

1-9999 °C/°F

49 i.t. Integral Time (Password 5678)

Process inertia in seconds.

0.0-999.9 seconds (0 = integral disabled), **Default** 0.0

50 d.t. Derivative Time (Password 5678)

Normally ¼ of integral time.

0.0-999.9 seconds (0 = derivative disabled), **Default** 0.0

51 d.b. Dead Band (Password 5678)

0-1000 [digit1] (degrees.tenths for temperature sensors) (**Default**: 0)

52 c.t. **Cycle Time (Password 5678)**

(for PID on remote control switch 15 sec., for PID on SSR 1 sec.)
1-300 seconds (**Default**:15s) If par.6 c.out is set as c.SSr, (**Default**:2s).

53 LL.o.P. **Lower Limit Output Percentage (Password 5678)**

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

54 uL.o.P. **Upper Limit Output Percentage (Password 5678)**

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

55 S.d.tu. **Setpoint Deviation Tune (Password 5678)**

Selects the deviation from the command setpoint for the threshold used by autotuning to calculate the PID parameters
0.0-500.0°C/°F. **Default**: 30.0.

56 M.G.tu. **Max Gap Tune (Password 5678)**

Selects the max. process-setpoint gap beyond which the automatic tune recalculates PID parameters
0.1..50.0°C/°F. **Default:** 1.0°C

57 Mn.P.b. **Minimum Proportional Band (Password 5678)**

Selects the min. proportional band value selectable by the automatic tune.
0.0..100.0°C/°F. **Default: 5**.0°C

58 MA.P.b. **Maximum Proportional Band (Password 5678)**

Selects the max. proportional band value selectable by the automatic tune.
0.0..300.0°C/°F. **Default:** 50.0°C

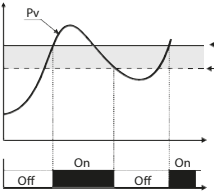
59 Mn.i.t. **Minimum Integral Time (Password 5678)**

Selects the min. integral time value selectable by the automatic tune.
0.0..999.9 secondi. **Default**: 40.0s.

10 Alarm Intervention Modes

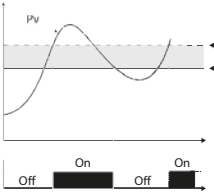
Absolute Alarm or Threshold Alarm (A. AL. selection)

1



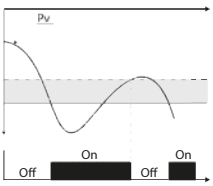
Absolute alarm with controller in heating functioning (Par. 7 Act.t. selected HEAt) and hysteresis value greater than "0" (Par.29 A. I.HY. > 0).*

2



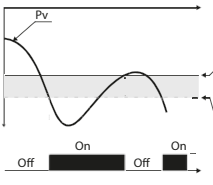
Absolute alarm with controller in heating functioning
(Par.7 Act.t. selected HEAt) and hysteresis value less than "0" (Par.29 A. I.HY. < 0).*

3



Absolute alarm with controller in cooling functioning
(Par.7 Act.t. selected CooL) and hysteresis greater than "0" (Par.29 A. I.HY. > 0).*

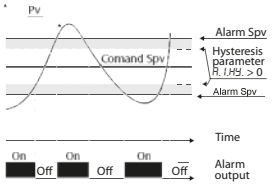
4



Absolute alarm with controller in cooling functioning
(Par.7 Act.t. selected CooL) and hysteresis value less than "0"(Par.29 A. I.HY. < 0).*

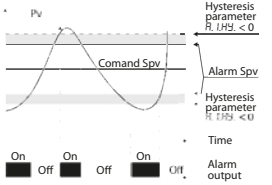
Band Alarm (b. AL. selection)

1



Band alarm hysteresis value greater than “0” (Par.29 A. I.HY. > 0).*

2

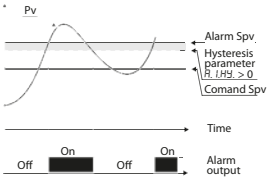


Band alarm hysteresis value less than “0” (Par.29 A. I.HY. < 0).*

* *The example refers to alarm 1; the function can also be enabled for alarm 2.*

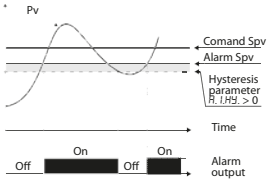
Upper Deviation Alarm (H.d.AL. selection)

1



Upper deviation alarm value of alarm setpoint greater than “0” and hysteresis value greater than “0” (Par.29 A. I.HY. > 0).**

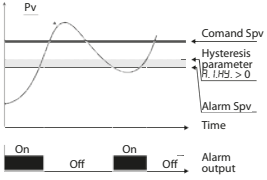
2



Upper deviation alarm value of alarm setpoint less than “0” and hysteresis value greater than “0” (Par.29 A. I.HY. > 0).**

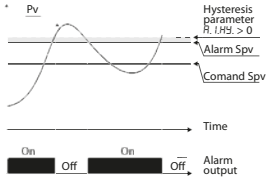
Lower Deviation Alarm (L.d.AL. selection)

1



Lower deviation alarm value of alarm setpoint greater than "0" and hysteresis value greater than "0" (Par.29 A. I.HY. > 0).**

2



Lower deviation alarm value of alarm setpoint less than "0" and hysteresis value greater than "0" (Par.29 A. I.HY. > 0).**

** *a) The example refers to alarm 1; the function can also be enabled for alarm 2 .b) With hysteresis value less than "0" (A. I.HY. < 0) the dotted line moves over the alarm setpoint.*

11 Table of Anomaly Signals

If installation malfunctions, controller will switch off regulation output and report the anomaly. For example, controller will report failure of a connected thermocouple visualizing E-05 (flashing) on display 1 and Prb. (sensor) on display 2. For other signals, see table below.

	Cause	What to do
E-01 EEP.E	Error in EEPROM cell programming	Call Assistance
E-02 SYS.E	Cold junction sensor fault or room temperature outside of allowed limits	Call Assistance
E-03 MEM.E	Error in Memory card programming	Repeat Memory card programming
E-04 EEP.E	Incorrect configuration data. Possible loss of calibration values	Check if the configuration parameters are correct
E-05 Prb.	Thermocouple open or temperature outside of limits	Check the connection with the sensors and their integrity
E-08 SYS.E	Missing calibration data	Call Assistance

12 Configuration EASY-UP

To simplify the setting of parameters and the integration of the different components involved in the control system, Pixsys introduces the EASY-UP coding which allows to set sensors and/or command outputs in one single step.
By means of the code listed in the data sheet enclosed to the sensor or actuator (SSR, motorized valve, etc.) the EASY-UP coding will set the relevant main parameters on the controllers (ex. selection of PT100 on parameter "SEN" and the corresponding measuring range on parameters "Lower and Upper limits of the setpoint").
Different codes may be entered on the controllers in sequence to configure inputs, control output or retransmission of signal.

2200	PT100 (-100..500°C); ON/OFF with hysteresis 1°C on Q1; absolute Alarm 1 on Q2
2201	PT100 (-100..500°C); ON/OFF with hysteresis 1°C on SSR; absolute Alarm 1 on Q1
2204	PT1000 (-100..250°C); ON/OFF with hysteresis 1°C on Q1; absolute Alarm 1 on Q2
2205	PT1000 (-100..250°C); ON/OFF with hysteresis 1°C on SSR; absolute Alarm 1 on Q1
2250	PT100 (-100..500°C); PID automatic tune on Q1; absolute Alarm 1 on Q2
2251	PT100 (-100..500°C); PID automatic tune on SSR; absolute Alarm 1 on Q1
2300	TC J (-100..600°C); ON/OFF with hysteresis 1°C on Q1; absolute Alarm 1 on Q2
2301	TC J (-100..600°C); PID automatic tune on SSR; absolute Alarm 1 on Q1
2400	TC K (-100..850°C); ON/OFF with hysteresis 1°C on Q1; absolute Alarm 1 on Q2
2401	TC K (-100..850°C); PID automatic tune on SSR; absolute Alarm 1 on Q1

13 Summary of Configuration parameters

Date:	Model DRR227
Installer	System:
Notes:	

1	SEn.	Sensor (Password 1234)
2	d.P.	Decimal Point (Password 1234)
3	dEGr.	Degree (Password 1234)
4	Lo.L.i.	Lower Linear Input (Password 1234)
5	uP.L.i.	Upper Linear Input (Password 1234)
6	c.out	Command Output (Password 1234)
7	Act.t.	Action type (Password 1234)
8	P.i.d.	PID (Password 1234)
9	Lo.L.S.	Lower Limit Setpoint (Password 1234)
10	uP.L.S.	Upper Limit Setpoint (Password 1234)
11	o.cAL.	Offset Calibration (Password 5678)
12	G.cAL.	Gain Calibration (Password 5678)

13	c. HY.	Command Hysteresis (Password 1234)
14	c. Ld.	Command Led (Password 5678)
15	c. S.E.	Command State Error (Password 5678)
16	c. S.P.	Command Setpoint Protection (Password 1234)
17	c. rE.	Command Reset (Password 5678)
18	c. dE.	Command Delay (Password 5678)
19	Au.MA.	Automatic / Manual (Password 1234)
21	SFt.G.	Softstart Gradient (Password 5678)
24	S.t iM.	Softstart Time (Password 5678)
25	dGt. i.	Digital Input (Password 1234)
26	d. i.c.t.	Digital Input Contact Type (Password 1234)
27	AL.1	Alarm 1 (Password 1234)
28	A1.S.o	Alarm 1 State Output (Password 1234)
29	A.1.HY.	Alarm 1 Hysteresis (Password 1234)
30	A.1.Ld.	Alarm 1 Led (Password 5678)
31	A.1.S.E.	Alarm 1 State Error (Password 5678)
32	A.1.SP.	Alarm 1 Setpoint Protection (Password 1234)
33	A1.rE.	Alarm 1 Reset (Password 5678)
34	A.1.dE.	Alarm 1 Delay (Password 5678)
35	AL.2	Alarm 2 (Password 1234)
36	A.2S.o	Alarm 2 State Output (Password 1234)
37	A.2.HY.	Alarm 2 Hysteresis (Password 1234)
38	A.2.Ld.	Alarm 2 Led (Password 5678)
39	A.2.S.E.	Alarm 2 State Error (Password 5678)
40	A.2SP.	Alarm 2 Setpoint Protection (Password 1234)
41	A2.rE.	Alarm 2 Reset (Password 5678)
42	A.2.dE.	Alarm 2 Delay (Password 5678)
43	o.cL.t.	Output Control Type (Password 5678)
44	PHS.d.	Phase Displacement (Password 5678)
45	F.P.A.P.	Fixed Phase Angle Percentage (Password 5678)
46	L.L.P.P.	Lower Limit Phase Angle Percentage (Password 5678)
47	u.L.P.P.	Upper Limit Phase Angle Percentage (Password 5678)
48	P.b.	Proportional Band (Password 5678)
49	i.t.	Integral Time (Password 5678)
50	d.t.	Derivative Time (Password 5678)
51	d.b.	Dead Band (Password 5678)
52	c.t.	Cycle Time (Password 5678)
53	L.L.o.P.	Lower Limit Output Percentage (Password 5678)

54 u.L.o.P. Upper Limit Output Percentage (Password 5678)
55 S.d.tu. Setpoint Deviation Tune (Password 5678)
56 M.G.tu. Max Gap Tune (Password 5678)
57 Mn.P.b. Minimum Proportional Band (Password 5678)
58 MA.P.b. Maximum Proportional Band (Password 5678)
59 Mn.i.t. Minimum Integral Time (Password 5678)

Notes / Updates

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

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

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Software Rev. 1.07

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