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# PA 400

## USER'S GUIDE



## PROCESS INDICATOR

- Input signal : in voltage  $\pm 10$  V and in current  $\pm 20$  mA
- 14 mm LED display, 4 digits from -1999 to 9999
- 2 alarms with relay outputs
- Sensor excitation 24 VDC
- Delivered with a set of 100 self-adhesive "units" labels
- Dimensions DIN 48 x 96 mm

### Description - Utilization

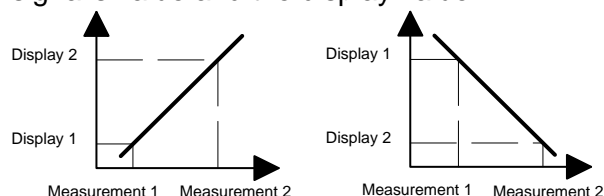
This indicator allows you to measure a voltage or current analog signal and display it directly in engineering units.

The alarm option is used to program the 2 threshold values and thus monitors a signal's evolution ; you can modify these threshold values quickly and easily with the keyboard buttons.

## Operation

### • Display Range

By defining the display range the input signal may be scaled to obtain a readout in the units you want. To do this, you have to define 2 measurement/display points in order to set up a proportional relationship between the input signal's value and the display value.



**Normal Scale**

**Inverse Scale**

You should always select 2 measurement/display points at the signal's 2 evolving endpoints to obtain the best possible precision. You may enter the coordinates of these 2 endpoints either directly on the keyboard or via the "teach" mode option by mapping a value measured by the indicator to the displayed value.

### • Alarm Outputs

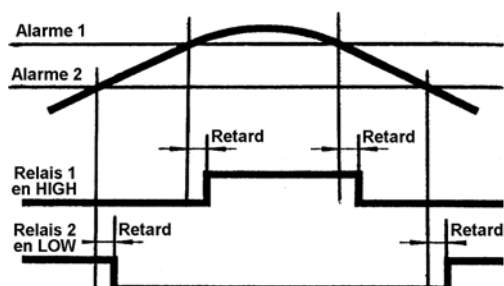
The indicator has as an option 2 alarms with relay outputs and make-break contacts.

Output activation is programmable in the HIGH level mode, that is, when the displayed value passes the threshold value in the increasing direction, or in the LOW level mode, that is, when the displayed value passes the threshold value in the decreasing direction.

The alarm operating mode is also programmable :

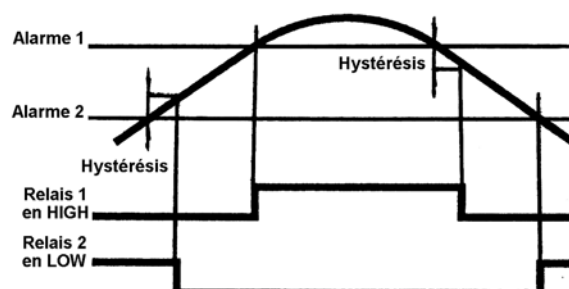
#### **b) Action Delayed by Timeout**

The timed-out delay acts on both sides of the alarm threshold value when the display value passes it in either the increasing or decreasing direction. This delay is programmable in seconds from 0 to 99.



#### **b) Asymmetrical Hysteresis**

The output is immediately activated when the display value passes the alarm threshold value; on the other hand, the output is deactivated when it exceeds the hysteresis band programmed in display units from 0 to 9999.



## Electrical Characteristics

### • Display

7 segments LED red digits, 14mm high  
4 digits from -1999 to 9999  
Refresh time 250ms  
Capacity overflow OVE

### • Input signal

Asymmetric differential configuration

Input	Voltage	Current
Max. value	$\pm 10$ V DC	$\pm 20$ mA DC
Resolution	0.5 mV	10 $\mu$ A
Input impedance	1 M $\Omega$	12 $\Omega$
Excitation		22 $\pm$ 5V/30mA

### • Precision

Max. error  $\pm 0.1\%$  de la lecture  
Warmup time 5 min

### • Input Signal's A/D Conversion

Technical  $\Sigma \cong$   
Resolution 16 bits  
Rate 25/s

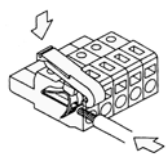
### • Relay Outputs

2 make-break contacts  
Cutoff capability 250VAC/1A  
Physical life time  $10^7$

### • Power Supplies

24, 48, 115 or 230 VAC $\pm 10\%$ , 50-60Hz  
24 VDC $\pm 10\%$ , max. 5% RW  
Power consumption 3 W

## ● Connections



Screwless unpluggable connectors with CLEMP-WAGO hold system for cables having cross sections between 0.08 mm<sup>2</sup> and 2.5 mm<sup>2</sup>.

## ● Electromagnetic Compatibility

According to the standards EN50081, EN50082

## Mechanical Characteristics

### ● Degree of Protection IP65 in Front

### ● Temperature

In operation -10°C to + 60°C  
In storage - 25°C to + 85°C  
Relative humidity < 95% to 40 °C

### ● Dimensions in mm

48 x 96 x 90 (H x W x D)  
Cutout 45 x 93 (H x W)

## ● Attachment by supplied clamps

## ● Weight 250 g

## Ordering References

### PA400. + I + II + AX01

#### I = Alarms Outputs

00 without  
01 2 relay outputs

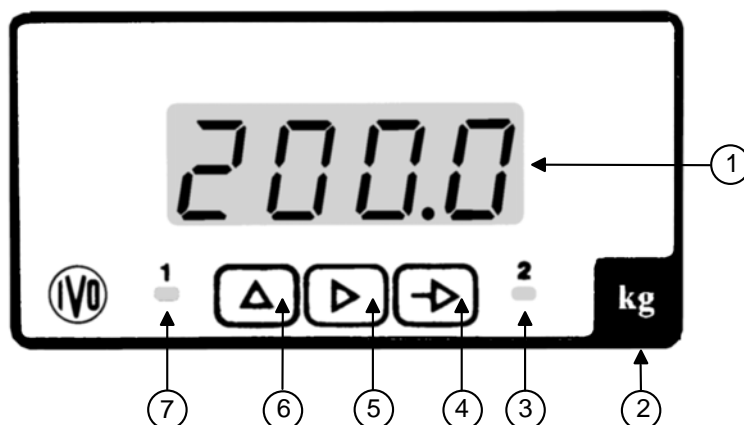
#### II = Power Supplies

1 24 VAC  
2 48 VAC  
3 115 VAC  
4 230 VAC  
5 24 VDC, 5% RW

## ● Accessorie

**ZPA4.001** DIN rail mounting accessory

## Description of Keyboard and Display



Item No.	Designation	Function in RUN Mode	Function in PROG Mode
1	DISPLAY	Data display area in the RUN and PROG modes	
2	LABEL	Stick the "units" label here	
3	LED 2	Alarm output 2 activation	Alarm output 2 programming
	→ KEY	Enter the PROG mode	Select the lines to be programmed
5	▶ KEY		Select the digit to be modified
6	▲ KEY		Increment the selected digit
7	LED 1	Alarm output 1 activation	Alarm output 1 programming

## Consultation and Programming


### CONSULTATION Mode


The indicator is in this mode at power up. In this mode you may consult and programme the 2 alarm threshold values.


### PROGRAMMING Mode

The programming mode allows you to completely configure the indicator's operations. It is divided into the following 3 modules :








- Input configuration
- Display configuration
- Alarm outputs configuration

With the  key, you may access the programming mode, a configuration module, or scroll the various lines to be programmed.

With the  key, you may select a configuration module to be programmed, an operating option, or a digit to be modified.

With the  key, you may increment the selected digit.

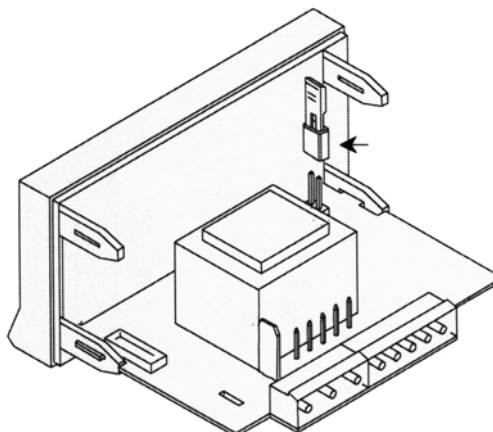
#### **Procedure**

1. Press the  key ; the [-PRO-] message appears on the display. Press the  key to go to the select module mode.
2. Use the  key to select the module to be programmed ; the various modules are identified by a name.
3. Use the  key to validate the selected module and the ,  and  buttons to program the various lines.

After programming the selected module the indicator stores the modifications and displays the [StorE] message during the save operation.

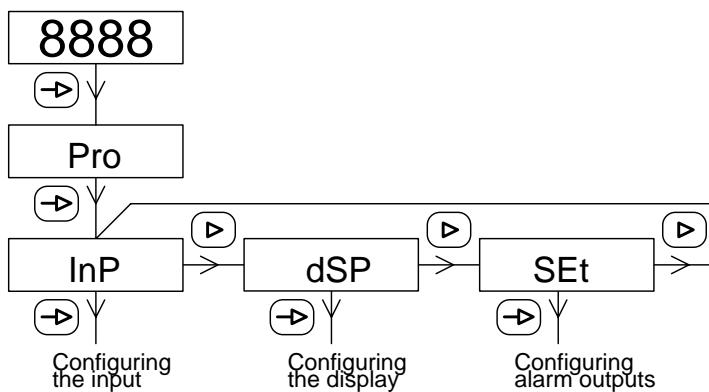
- 4° Where applicable, program the other modules.

5. If necessary, lock the programming mode by removing the jumper inside the indicator. Refer to the end of this guide for the procedure to open the indicator's case.



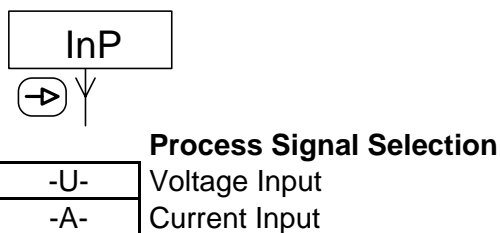
Once programming is locked, you can always access the various configuration modules to check the contents. In this case, the [DAtA] message will display instead of the [PRO] message if you enter the programming mode.

## Block Diagram : Display of the Configuration Modules

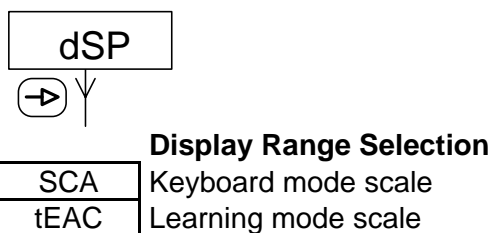


The configuration module for alarm outputs is only accessible if the indicator is equipped with the corresponding option.

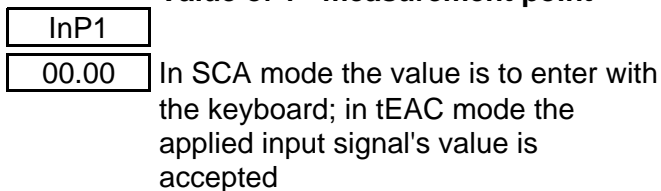
### 1. Input Configuration



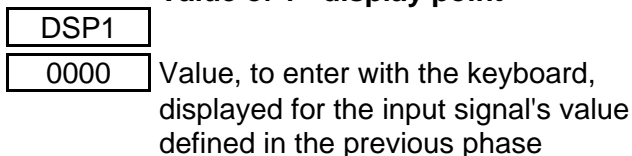
### 2. Display Configuration



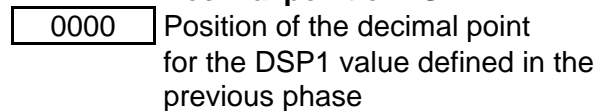
#### Value of 1<sup>st</sup> measurement point



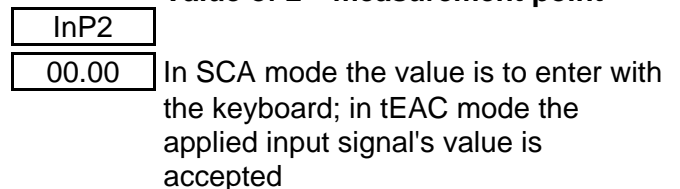
#### Value of 1<sup>st</sup> display point



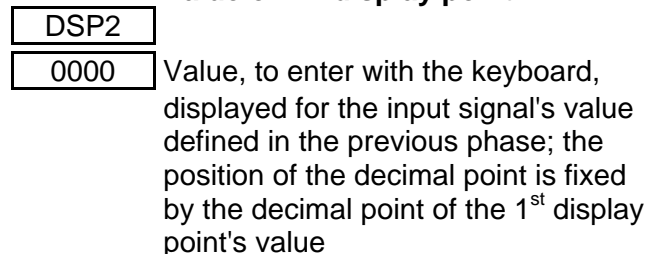
#### Decimal point of DSP1



#### Value of 2<sup>nd</sup> measurement point



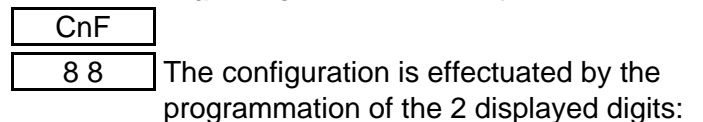
#### Value of 2<sup>nd</sup> display point



### 3. Alarm Outputs Configuration



#### Alarm No. 1 LED 1 lit



#### Left Digit :

0 = output activation in the HIGH level mode  
1 = output activation in the LOW level mode

#### Right Digit :

0 = action delayed by timeout  
1 = asymmetrical hysteresis

### Configuration Value Alarm No. 1

dLY-HYS

0000

Programming the delay (dLY) from 0 to 99 sec or hysteresis (HYS) from 0 to 9999 display units

### Alarm No. 2 LED 2 lit

CnF

8 8

The configuration is effectuated by the programming of the 2 displayed digits:

#### Left Digit :

0 = output activation in the HIGH level mode

1 = output activation in the LOW level mode

#### Right Digit :

0 = action delayed by timeout

1 = asymmetrical hysteresis

### Configuration Value Alarm No. 2

dLY-HYS

0000

Programming the delay (dLY) from 0 to 99 sec or hysteresis (HYS) from 0 to 9999 display units

### Modification Alarm Values

LC 0

Modification authorized

LC 1



Modification forbidden

This line take effect if the programming mode is locked by removing the jumper inside the indicator.

## Programming the Alarm Thresholds



This programming is independent of the programming of the configuration modules ; you may carry it out at any moment.

### Procedure

1. Press the  key ; the [PRO] message displays.
2. Press the  key to access the modification of the first threshold.

### Alarm No. 1 LED 1 lit



00000


Value of threshold no. 1 ; to be modified with the  and  buttons.

3. Press the  key to access the modification of the second threshold.

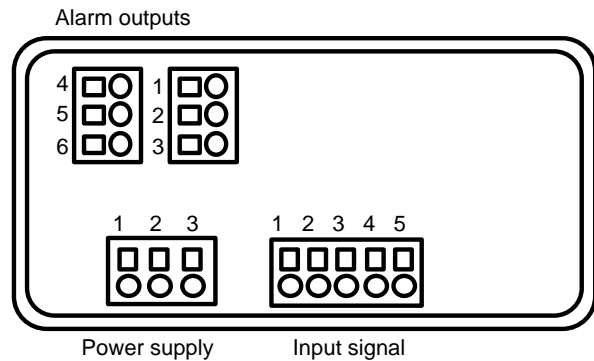
### Alarm No. 2 LED 2 lit

00000

Value of threshold no. 2 ; to be modified with the  and  buttons.

4. Press the  key to validate the programmed thresholds and return to the consultation mode.

## Wiring Diagram



### Power Supply

Version	VAC	VDC
Terminal 1 :	phase	power+
Terminal 2 :	ground	NC
Terminal 3 :	neutral	power-

### Input Signal

Terminal 1 :	IN -
Terminal 2 :	V IN +
Terminal 3 :	I IN +
Terminal 4 :	Excitation +
Terminal 5 :	Excitation -

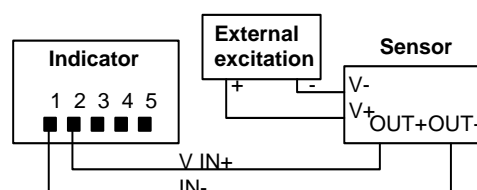
### Alarm Outputs

Terminal 1 :	contact NO	relay 1
Terminal 2 :	common	
Terminal 3 :	contact NF	
Terminal 4 :	contact NO	relay 2
Terminal 5 :	common	
Terminal 6 :	contact NF	

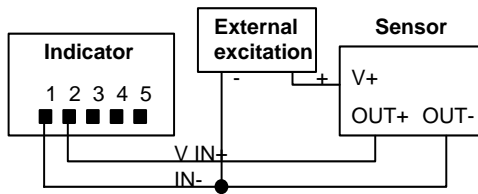
## Connecting Examples

### ⇒ PROCESS Input in Voltage

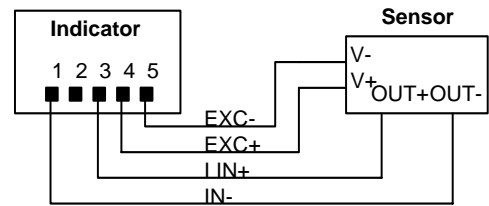
#### 4-Wire Sensor and External Excitation



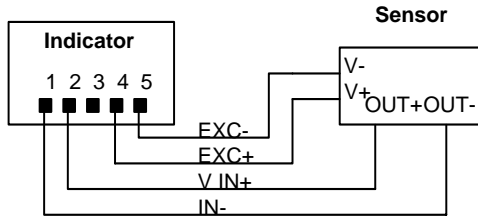
### 3-Wire Sensor and External Excitation



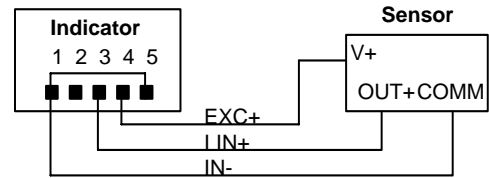
### 4-Wire Sensor



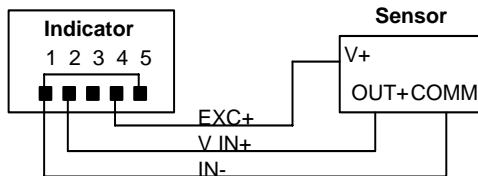
### 4-Wire Sensor



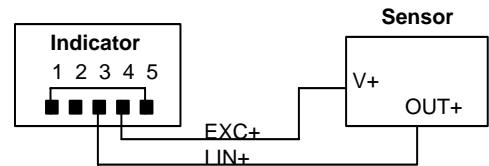
### 3-Wire Sensor



### 3-Wire Sensor

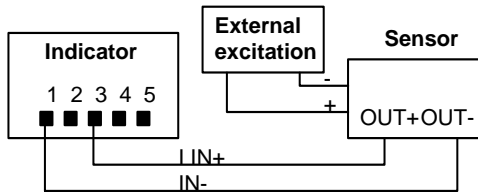


### 2-Wire 4-20mA Sensor

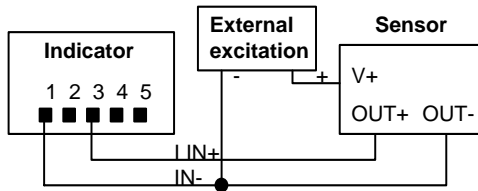


## ⇒ PROCESS Input in Current

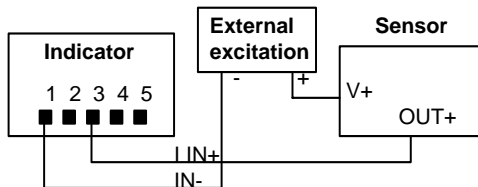
### 4-Wire Sensor and External Excitation



### 3-Wire Sensor and External Excitation

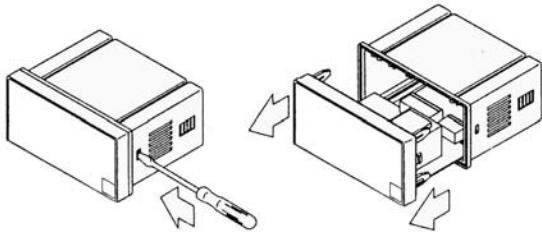


### 2-Wire 4-20 mA Sensor and External Excitation

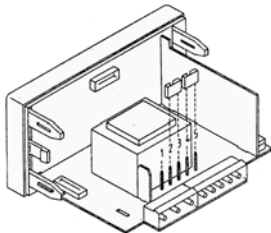


## Selecting the Power Supply

The indicator's AC versions are dual voltage rated units. The voltage can be changed by programming jumpers inside the unit.

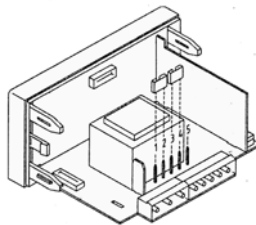


**Power Supply  
230 VAC or 48 VAC**



Terminal 1 = free  
Jumper 1 on terminals 2 and 3  
Jumper 2 on terminals 4 and 5

**Power Supply  
115 VAC or 24 VAC**



Jumper 1 on terminals 1 and 2  
Jumper 2 on terminals 3 and 4  
Terminal 5 = free

### **IMPORTANT :**

If the power supply voltage rating has been modified with respect to the original configuration, the value of the new voltage rating should be indicated on the connection label.