Safety for Industrial Processes

GSI 40

USER'S GUIDE

PROCESS INDICATOR

- Input signal : in voltage ±10 V and
  in current ±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

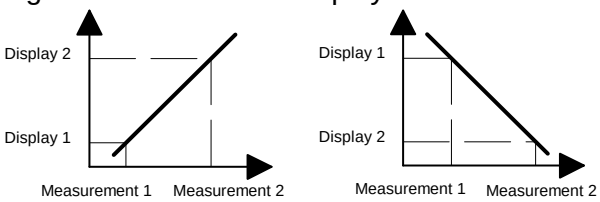
This indicator allows you to measure a voltage or current analog signal and display it directly in engineering units.

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

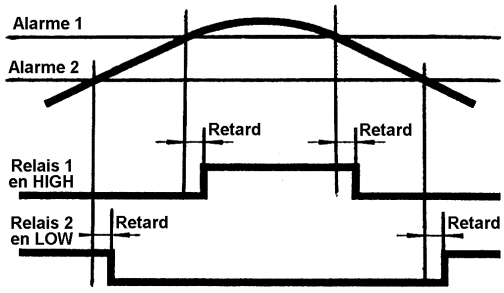
The indicator has as an option 2 alarms with relay outputs and make-break contacts.

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 :

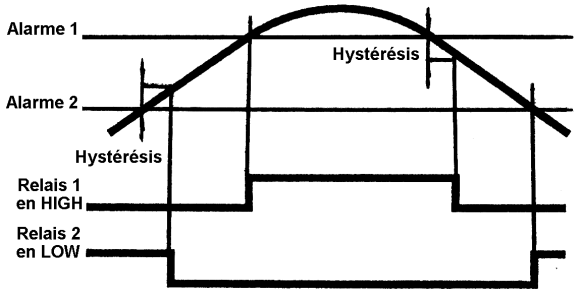
b) Action Delayed by Timeout

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	±10 V DC	±20 mA DC
Resolution	0.5 mV	10 µA
Input impedance	1 MΩ	12 Ω
Excitation		22±5V/30mA

- **Precision**

Max. error	±0.1% de la lecture
Warmup time	5 min

- **Input Signal's A/D Conversion**

Technical	Σ≅
Resolution	16 bits
Rate	25/s

- **Relay Outputs**

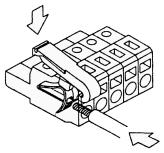
  2 make-break contacts

Cutoff capability	250VAC/1A
Physical life time	10^7

- **Power Supplies**

  24, 48, 115 or 230 VAC±10%, 50-60Hz
  24 VDC±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^2 and 2.5 mm^2.

- **Electromagnetic Compatibility**
  According to the standards EN50081, EN50082

Mechanical Characteristics

- **Degree of Protection IP65 in Front**
- **Temperature**

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

- **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

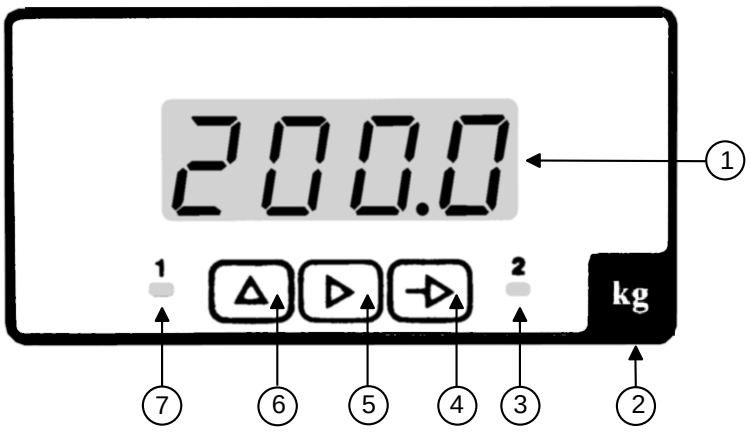
II = Power Supplies

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.

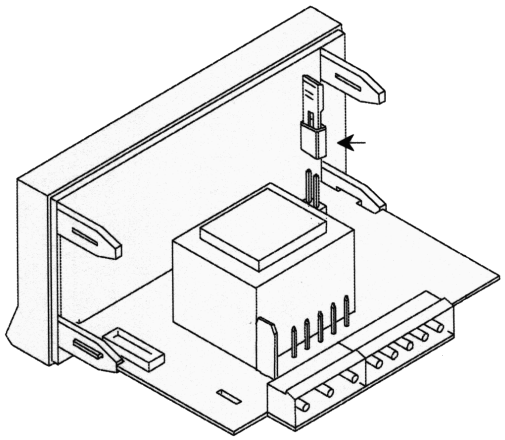
Procedure

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.

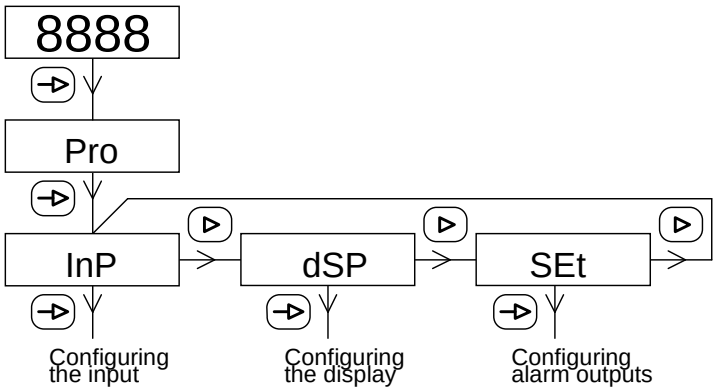
4° Where applicable, program the other modules.

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

InP

Process Signal Selection

-U-	Voltage Input
-A-	Current Input

2. Display Configuration

dSP

Display Range Selection

SCA	Keyboard mode scale
tEAC	Learning mode scale

Value of 1st measurement point

InP1

00.00 In SCA mode the value is to enter with the keyboard; in tEAC mode the applied input signal's value is accepted

Value of 1st display point

DSP1

0000 Value, to enter with the keyboard, displayed for the input signal's value defined in the previous phase

Decimal point of DSP1

0000 Position of the decimal point for the DSP1 value defined in the previous phase

Value of 2nd measurement point

InP2

00.00 In SCA mode the value is to enter with the keyboard; in tEAC mode the applied input signal's value is accepted

Value of 2nd display point

DSP2

0000 Value, to enter with the keyboard, displayed for the input signal's value defined in the previous phase; the position of the decimal point is fixed by the decimal point of the 1st display point's value

3. Alarm Outputs Configuration

SEt

Alarm No. 1 ☛ LED 1 lit

CnF

8 8 The configuration is effectuated by the programmation 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. 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 programmation 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
LC	1

Modification authorized
Modification forbidden

This line take effect if the programmation 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 Δ 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 Δ buttons.

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

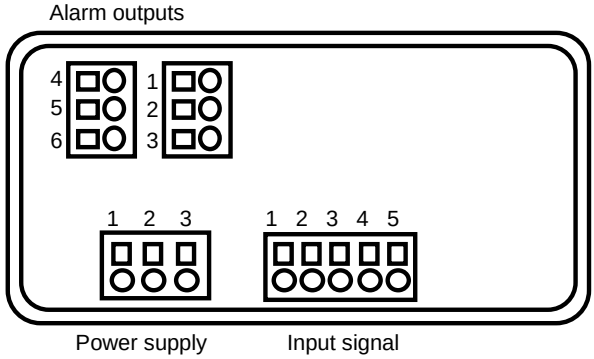
Alarm No. 2 ☞ LED 2 lit

00000

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

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

Wiring Diagram



- **Power Supply**

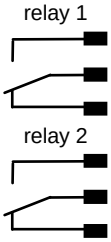
Version	VAC	VDC
Terminal 1 :	phase	power+
Terminal 2 :	ground	NC
Terminal 3 :	neutral	power-

- **Input Signal**

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

- **Alarm Outputs**

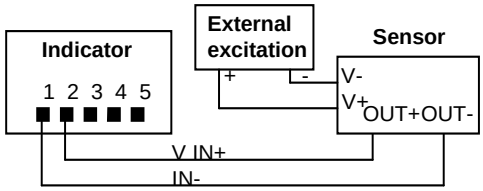
Terminal 1 : contact NO
Terminal 2 : common
Terminal 3 : contact NF
Terminal 4 : contact NO
Terminal 5 : common
Terminal 6 : contact NF



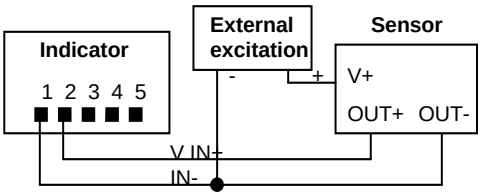
Connecting Examples

⇒ ***PROCESS Input in Voltage***

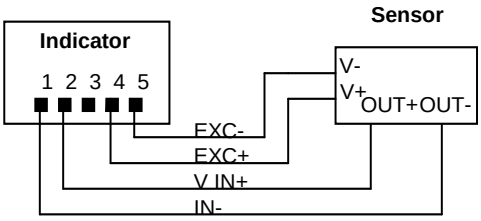
4-Wire Sensor and External Excitation



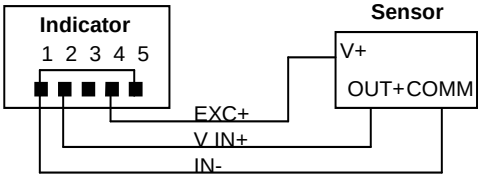
3-Wire Sensor and External Excitation



4-Wire Sensor

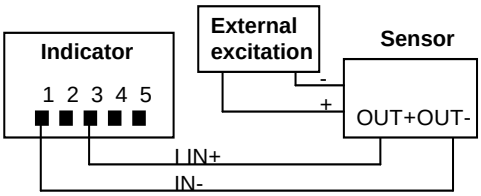


3-Wire Sensor

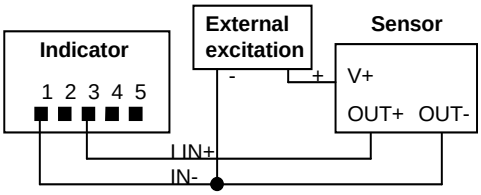


⇒ ***PROCESS Input in Current***

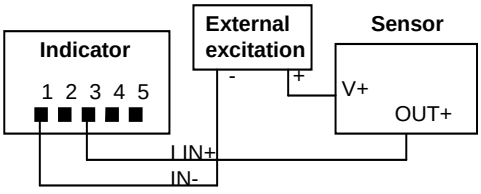
4-Wire Sensor and External Excitation



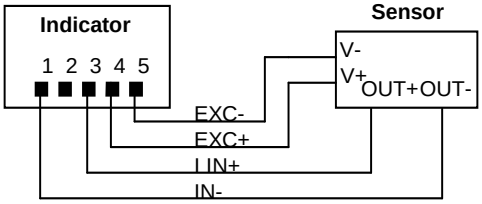
3-Wire Sensor and External Excitation



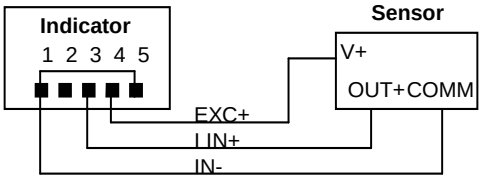
2-Wire 4-20 mA Sensor and External Excitation



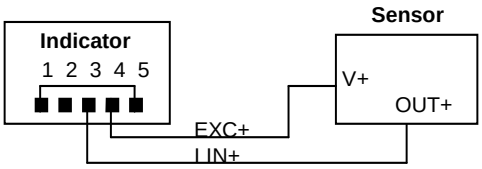
4-Wire Sensor



3-Wire Sensor

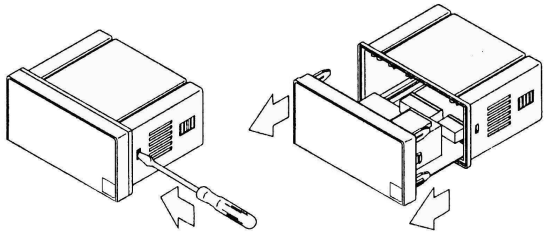


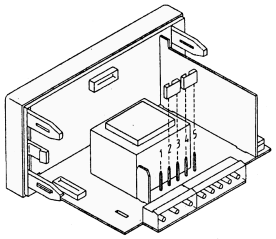
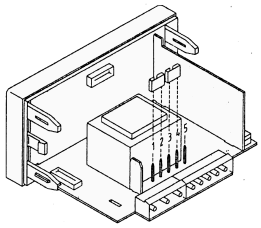
2-Wire 4-20mA Sensor



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	***Power Supply 115 VAC or 24 VAC***
	
Terminal 1 = free Jumper 1 on terminals 2 and 3 Jumper 2 on terminals 4 and 5	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.