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SNZA

TRIPLE LEVEL CONTROL
FOR CONDUCTIVE LIQUIDS

|	
Field of application	· Control of up to three independent levels, belonging to the same tank or not. · Level control, alarm for maximum and alarm for minimum. · Several connection possibilities
Difference	It is composed by three independent level controls with a relay (SPST contacts) associated to each one of them. They can work as individual or related among them (see the application examples in page 4).
Operating principle	**Control of maximum and minimum level:** _Only relays R1 and R2:_ Relays R1 and R2 activate when the level of the liquid reaches the electrodes of maximum level (Y1M and Y2M, respectively) and they deactivate when the liquid descends below the electrodes of mininum level (Y1m and Y2m, respectively) **Set-point level control:** _All relays:_ Relays 1, 2 and 3 activate when the level of the liquid reaches electrodes Y1M, Y2M and Y3, respectively, and they deactivate when the liquid descends below each one of them. The electrodes Y1m and Y2m are not used in this function.
Leds indication	Power on: Green Relay on: Red (one led per relay) Progammation aid: Red
Power supply	See the column SUPPLY at the footer table.
Sensitivity	Adjustable between 1..100 KΩ (1000 μs..10 μs) (See table in page 2).
V/A in probes line	5 V$_{pp}$ / 4 mA (in shortcircuit)
Probes connection cables	Usually 1..2,5 mm^2 section cables are used, with good insulation and without shielding. In some installations (when the supply and probe lines are parallel in the same tube and with long distances) shielded cable is recommended. The resistance between cables and ground must be at least 200 KΩ. The screen is connected to ground. The probes must be specially protected when frequncy converters are used in the installation.
Connection of the common electrode	<u>Conductive tanks</u>: The tank can be used as the common electrode by connecting a cable from the tank to terminal Z1. Do not use the cable of the electrical ground for this purpose. <u>Non-conductive tanks</u>: An additional probe must be fitted for connecting the common electrode Z1. It must be placed as lowest as possible in order to keep it always in touch with the liquid. <u>At any case</u>: When two or three independent tanks are to be controlled, a common electrode Z1 must be installed at each one of them. The cable of each electrode must arrive by itself to the terminal Z1.
Probes cable length	No especification detailed. For long distances, it can be used the option "Calibration" (see "Options selector/Cable calibration" at page 2) to compensate the capacitance effect produced along the cables.
Remarks about the installation	The behaviour of SNZA can be conditioned by the length of the cable, the characteristics of the installation and the conductivity of the liquid. In the hypothetical case that some operating difficulties appear, these may be due to someone of the above mentioned factors or to the combination among them. To overcome them, use the option "Calibration" (see "Options selector/ Cable calibration" at page 2).
⚠ Warranty warning	The manufacturer is not responsible of the electric behavior of this level relay when using conductive electrodes belonging to another manufacturers.

Reference	HOUSING		FUNCTION		OUTPUT		SUPPLY		RANGE	
	S	Flush mounting	**NZ**	Triple level	**A**	1+1+1 SPST NO	**724**	24 VDC (not isolated)	**100**	1KΩ..100KΩ
							024	24 VAC		
							048	48 VAC		
							110	110..125 VAC		
							230	220..230 VAC		
							400	380..415 VAC		
							901	15..70 VAC/DC		
							902	60..240 VAC/DC		
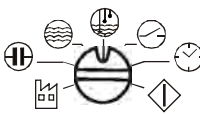
To compose the reference, select one option of each column. Example: **SNZA 230 100**

Start-up and adjustment

Prior to start working with the relay SNZA, it must be adjusted for getting a right operation.

Adjustments can be modified whenever required. It must be taken into account that the behaviour of the device can be different whether the adjustments are done while the electrodes are in touch or not with the liquid.

Be sure that the options selector is right positioned. While it is moved to a different option, the Ⓟ led keeps flashing. When the option has been correctly reached, the led Ⓟ shows the state of such option.

|		
Relays selector		Each one of the three relays must be adjusted separately. Use this button to select the relay to be adjusted.
Options selector		Use this button to select and adjust the different options according to the informations below. The options remarked with ⚠ could modify the state of the relay and this could provoke undesired effects in the case that any device be connected to the contacts of the relay.
⚠ *Default values*		SNZA is adjusted from factory with values that can be used in a large number of applications. Follow the indications of the "Advanced adjustments" in page 3 to restore the factory defaults (they are framed with ☐ at the left column).
⚠ *Cable calibration* OFF		Use this option when the cable of the electrodes have a considerable length. It is not required to use this option irf the behaviour of SNZA is rigth with the standard configuration. This option must be performed with the probes "on the air", it is, with the cables connected to the related terminals but not being in touch with the liquid. Keep pressing the push-button PROG during 3 seconds (led Ⓟ turned on). Once this time has elapsed the calibration process starts up (led Ⓟ flashing). When that process is over the led Ⓟ turns off. This option can be used as many times as required.
⚠ *Sensitivity adjustment* *Relays R1-R2-R3* 5		When accessing to this option, the led Ⓟ emits as many flashes as the adjusted sensitivity value, between 0 and 9. Each time the push-button PROG is pressed, the sensitivity value increases in 1, except when the value is 9 that moves to 0. If it is pressed longer than 3 seconds, the sensitivity value moves to 0. See the table "Sensitivity ranges" at bottom to relate each digit with its ohmic value.
⚠ *Function* *Relays R1-R2* Max-Min		*Max-Min control: led Ⓟ ON; Set-point control: led Ⓟ OFF* This option can be only used with relays R1 and R2. When accessing to this option the led Ⓟ shows the actual state of the adjustment. Each time the push-button PROG is pressed, it activates the funtion contrary to the one set up to that moment. If this option is accessed while relay R3 is selected, the led Ⓟ keeps flashing.
⚠ *State of the relay contact* *Relays R1-R2-R3*		*Relay NO (╱╴): led Ⓟ OFF; Relay NC (╲╴): led Ⓟ ON* When accessing to this option, the led Ⓟ shows the actual state of the adjustment. Each time the push-button PROG is pressed, the relay contacts reverses.
Timing *Relays R1-R2-R3* 1s		This option effects to relays R1 and R2 only if they are set to the function "Set-point control". It always affects to relay R3. When accessing to this option, the led Ⓟ emits as many flashes as the number of seconds adjusted in the timer, between 0 and 9 seconds. Each time the push-button PROG is pressed, the time value increases in 1 second, except when the value is 9 that moves to 0. If it is pressed longer than 3 seconds, the time value moves to 0. If you want to adjust the time of the relays R1 and R2 while they are set to the function "Max-Min control", the led Ⓟ keeps flashing.
Run		Normal operation mode.
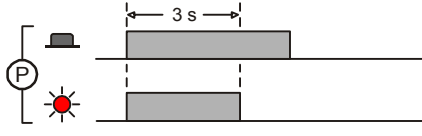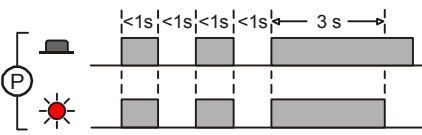
Sensitivity ranges

Sensitivity	Detecting (≤ kohm)	Undetecting (≥ kohm)
0	1	2
1	6	12
2	12	24
3	17	34
4	23	46
5	28	56
6	34	68
7	39	78
8	45	90
9	50	100

The length of the cable could lightly alter these values.

Advanced functions: Restoring parameters

SNZA is provided with two preset programs containing a set of parameters that can be restored any time required.
Restoring such parameters means to overwrite some of the current adjustments of the relay.
Prior to restore whichever of both programs, see in the following table the effects that will be produced as well as the pulsation sequence over the push-button PROG and the informations offered by the led Ⓟ.

Program	Description	Options selector	Action over the push-button PROG	R1 R2 R3	R1 R2 R3	R1 R2 R3	R1 R2 R3	R1 R2 R3
STANDARD	It restores the default values. Applies separately to each relay. Select the relay before to perform the operation.		Press more than 3 seconds. Operation is done when the led turns off.	X	5	X X X	↗	1
FACTORY	It restores the factory values. Applies simoultaneously to the three relays, regardless the position of the relays selector.		Press twice shortly and press more than 3 seconds. Operation is done when the led turns off.	OFF	5	MAX MIN X	↗	1

[**X** : No changes for this option. It remains in the same state.]

Advanced functions: User's configuration

SNZA allows to store the parameters set for a determinate application and restore them when necessary. This option can be useful in the case of an undesired handling of the device in order to restore the installation adjustments.
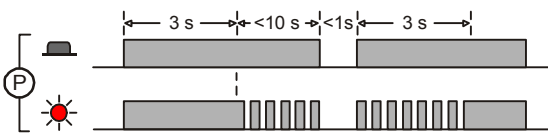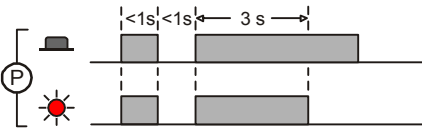The user's program does not contain any data when SNZA is received from factory, so the action to restore parameters before to save them previously will not produce any effect.
Restoring such parameters means to overwrite some of the current adjustments. It is applied simultaneously to the three relays regardless the position of the relays selctor.
Prior to restore whichever of both programs, see in the following table the effects that will be produced as well as the pulsation sequence over the push-button PROG and the informations offered by the led Ⓟ.

| Program	Description	Optinos selector	Action over the push-button PROG
USER	It saves the values currently existing for each option.		Press more than 3 seconds until the led starts flashing. Before than 10 seconds, stop pressing and press again for a time longer than 3 seconds. Operation is done when the led remains lighting fix.
	Restores the last values stored in the user's program.		One short press followed for a press longer than 3 seconds. Operation is done when the led turns off.

The calibration of the cable of the electrodes is not affected by no-one of the operations described in this section.

⚠ Restoring parameters could modify the state of the relay and this could provoke undesired effects in the case that any device be connected to the contacts of the relay.

Generic connection diagram
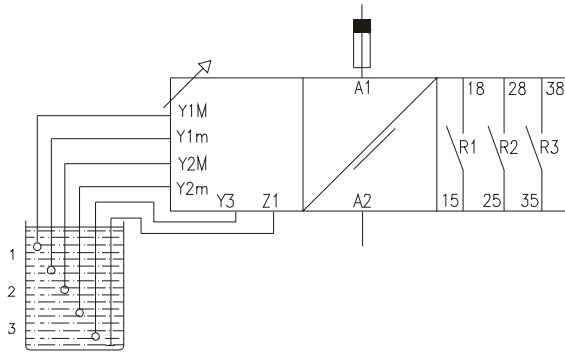
SNZA provides a large number of connection possibilities. For example:
- Two max/min controls in the same tank (one for normal operation and another for safety) plus one extra alarm.
- Control of two pumps starting at different levels and stopping at the same point.
- Max/min control and two alarms, one for over-max and another for under-min.

Set-point: Indication of three level points
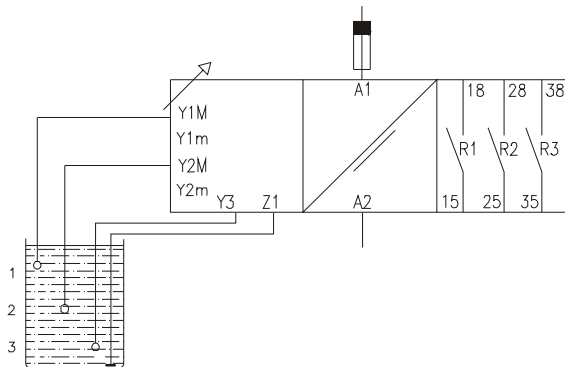
Relays R1, R2 and R3 activate when the liquid level reaches the electrodes Y1, Y2 and Y3, respectively. Relays release when the liquid is below each one of the electrodes.

Control of three independent tanks
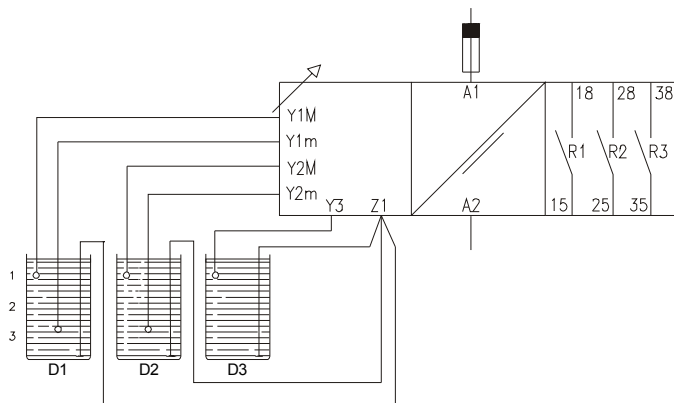
Level group Y1 controls the max/min level of tank D1. The same occurs with tank D2 and level group Y2. Y3 controls one only level in tank D3. It is very important to place an independent cable as reference (common) from each tank to terminal Z1.

Control of five independent level points
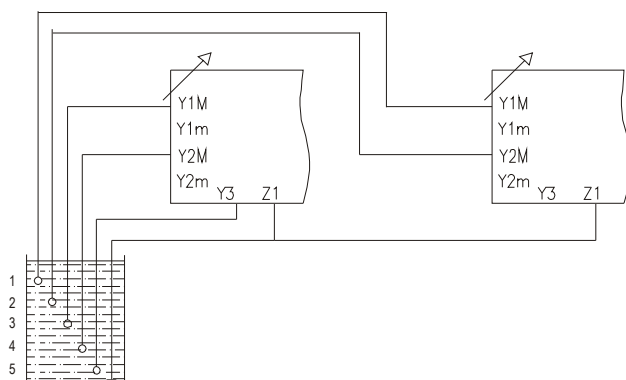
In this application the reference electrode (common) can be the same and must be connected the terminals Z1 of as many SNZA be controlling the same tank.

Application examples

Adjustment buttons and signaling
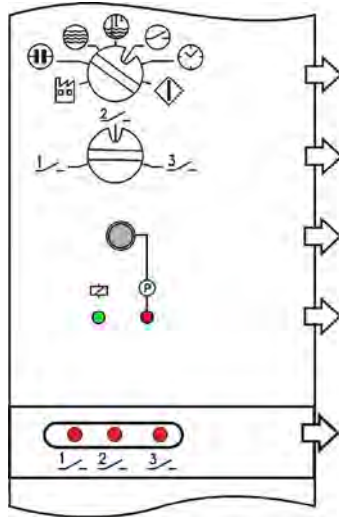
Adjustment of: Defaults, Line calibration, Sensitivity, Function, Relay contact mode, Timing. Run mode.

Relay selection

Programming push-button

Programming aid led (red)
Power-on indicator led (green)

Relay operation leds (red)

Output relays

		SNZA
Resistive load	AC	6 A / 250 V
	DC	0,2 A / 200 V
		6 A / 24 V
Inductive load	AC	3 A / 250 V
	DC	0,12 A / 200V
		3 A / 24 V
Mechanical life		> 30 x 10^6 operations
Max. switching rate, mech.		72.000 operations / hour
Electrical life at full load		360 operations / hour
Contact material		AgNi 90/10
Maximum voltage		440 VAC
Operating voltage		250 VAC
Volt. between changeovers		2500 VAC
Voltage between contacts		1000 VAC
Voltage coil/contact		5000 VAC
Distance coil/contact		10 mm
Isolation resistance		> 10^4 MΩ

Supply voltage

Galvanic isolation	Yes	No	9XX: Yes / UXX: No
Consumption	1,6 VA	1,2 W	1,6 W
Frequency	50 / 60 Hz	-	-
Operating margins	±10% -15%	±10%	
Positive	-	Terminal A1	Terminal A1
Protected polarity	-	Yes	Yes
Start time	250 ms	250 ms	< 700 ms

Constructive and anviromental data

	SNZA
Voltage phase-neutral	300 V
Overvoltage category	II
Rated impulse voltage	Standard: 4 kV - 901/902: 1,5 kV
Pollution degree	2
Protection	IP 20
Approximate weight	270 g
Storage temperature	-50..+85ºC
Operating temperature	-20..+50ºC
Humidity	30..85% HR
Housing	Cycoloy - Light grey
Socket	-
Visor leds	Lexan - Transparent
Button, terminal block, clip	Technyl - Dark blue
Pins of the socket	-
Pins of the terminal block	Brass

Designed and manufactured under EEC normative.
Directives referred:
  Electromagnetic compatibility: EMC 2004/108/EEC.
  Low voltage: LVD 2006/95/EEC.
  Hazardous substances: 2011/65/EEC
  Plastics: UL 91 V0

Dimensions

SNZA

52.5   55
91.5   45   81