

FN filling or emptying with alarm FN LS Part number 84870803



- Automatic control and regulation of liquid levels.
- 2 sensitivity ranges.
- Filling or emptying function selected via dip switch.
- High or low alarm selected via dip switch.
- Memory can be selected.
- LEDs indicate state of power supply, output relay and alarm relay.

Pai		

Туре	Voltages
84 870 803 FN LS	230 VAC

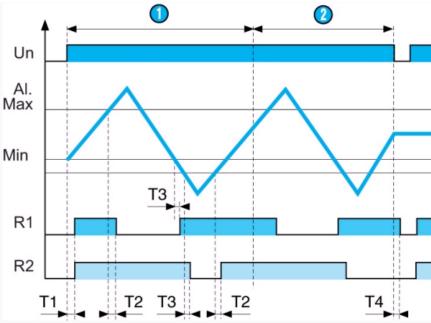
	ions

20, 120, 48 and 24 V AC 50/60 Hz galvanic isolation via transformer		
Nominal power 3 VA at Un 15 %	Supply voltage Un	230, 120, 48 and 24 V AC 50/60 Hz galvanic isolation via transformer
Maximal power	Operating range	0.85 to 1.15 Un except 120 V AC : 0.85 to 1.1 Un
Immunity from micro power cuts 10 ms	Nominal power	3 VA at Un
Delay on pick-up T1 = approx. 2 s Response time on power up T4 = 500 ms Insulation coordination Category III, degree of pollution 2 conforming to IEC/EN 60664-1 : 4 kV/2 Sensitivity range FN $5 kΩ \rightarrow 100 kΩ$ Sensitivity range FNLS $250 Ω \rightarrow 5 kΩ$ Display precision $± 30 % with maximum sensitivity$ Electrode voltage $15 V AC (50 / 60 Hz)$ Electrode current $1 mA$ Response time on immersion $12 = 400 ms$ Response time on emersion $13 = 700 ms$ Output $2 AgCdO Changeover$ Breaking capacity FN LS: $200 VA$ FN: $80 W$ Maximum breaking current FN LS: $4 AC$ FN: $80 W$ Minimum breaking current FN LS: $100 mA AC$ FN: $100 mA DC$ Multimum breaking voltage FN LS: $250 VAC$ FN: $150 mA DC$ Mechanical life (operations) Electrical life AC 12 $2000 VA - 10^5$ operations Electrical life AC 15 Electrical life (568.1.14) (°C) $2 \times 2.5 mm^2$ with ferrule	Maximal power	4 VA at Un + 15 %
Response time on power up T4 = 500 ms	•	
Insulation coordination Category III, degree of pollution 2 conforming to IEC/EN 60664-1 : 4 kV/2 Sensitivity range FN 5 kΩ—100 kΩ Sensitivity range FHLS 250 Ω—5 kΩ Display precision ± 30 % with maximum sensitivity Electrode voltage Electrode voltage Electrode voltage 15 V AC (50/60 Hz) Electrode current 1 mA Response time on immersion 72 = 400 ms Response time on emersion Output 2 AgCdO changeover FN LS: 2000 VA FN: 80 W Maximum breaking current FN LS: 8 A AC FN: 8 A DC Minimum breaking current FN LS: 100 mA AC FN: 100 mA DC Max. breaking voltage FN LS: 250 V AC FN: 250 V DC Mechanical life (operations) Electrical life AC 12 2000 VA - 10 ⁵ operations Electrical life AC 13 LR = 300 ms - 6000 operations Self-extinguishing Terminal capacity 2 x 1,5 mm² with ferrule 2 x 2,5 mm² with or ferrule 2 x 2,5 mm² without ferrule 1 minus stored (IEC 68.1.14) (°C) 7 meriperature limit operation (IEC 68.1.14) (°C) 7 meriperature limit stored (IEC 68.1.14) (°C) 7 meriperature limits stored (IEC 68.1.14) (°C) 7 meriperature limits stored (IEC 68.1.14) (°C) 7 merit maximum sensitivity 2 minus minus stored (IEC 68.1.14) (°C) 1 maximum maximum sensitivity 2 minus minus stored (IEC 68.1.14) (°C) 1 maximum minus stored (IEC 68.1.14) (°C) 2 maximum minus stored (IEC 68.1.14) (°C) 3 maximum minus stored (IEC 68.1.17) (°C) 3 maximum minus stored (IEC 68.1.17) (°C) 3 maximum minus stored (IEC 68.1.17) (°C) 3 maximum minus maximum minus stored (IEC 68.1.17) (°C) 3 maximum minus maximum minus stored (IEC 68.1.17) (°C)	Delay on pick-up	
Sensitivity range FN $5 \text{ k}\Omega \rightarrow 100 \text{ k}\Omega$ Sensitivity range FHLS $250 \Omega \rightarrow 6 \text{ k}\Omega$ Display precision $\pm 30 \%$ with maximum sensitivity Electrode voltage $15 \text{V} \text{AC} (50/60 \text{Hz})$ Electrode current 1mA Response time on immersion $12 \pm 400 \text{ms}$ Response time on emersion $13 \pm 700 \text{ms}$ Output $2 \text{AgCdO} \text{changeover}$ FNLS: 2000VA FNLS: 2000VA FNLS: 2000VA FNLS: 80AC FNLS: 80AC FN: 80VC Maximum breaking current $10 \text{FNLS} 100 \text{mA} \text{AC}$ FN: $100 \text{mA} \text{AC}$ FN: $100 \text{mA} \text{AC}$ FN: $100 \text{mA} \text{AC}$ FNLS: 250VAC FNLS: $250 V$		
Sensitivity range FHLS 250 Ω→5 kΩ Display precision ± 30 % with maximum sensitivity Electrode current 1 mA Response time on immersion 72 = 400 ms Response time on emersion 73 = 700 ms Output 2 AgCdO changeover Breaking capacity FN LS: 2000 VA FN : 80 W FN LS: 2000 VA FN : 80 W FN LS: 100 mA AC FN : 100 mA DC FN LS: 100 mA AC FN : 100 mA DC FN LS: 250 V AC FN : 250 V DC FN LS: 250 V AC FN : 250 V DC Sectorical life AC 12 Electrical life AC 15 Cos φ = 0.3 · 6000 operations Electrical life AC 13 L/R = 300 ms - 6000 operations Housing material Self-extinguishing Terminal capacity 2 x 1,5 mm² with ferrule Temperature limit operation (IEC 68.1.14) (*C) -20 → +60 Temperature limits stored (IEC 68.1.1/2) (*C) -30 → +70	Insulation coordination	Category III, degree of pollution 2 conforming to IEC/EN 60664-1 : 4 kV/2
Electrode voltage	Sensitivity range FN	5 kΩ→100 kΩ
Electrode voltage 15 V AC (50/60 Hz) Electrode current 1 mA Response time on immersion 73 = 700 ms Output 2 AgCdO changeover Breaking capacity FN LS : 2000 VA FN: 80 W Maximum breaking current FN LS : 8 A AC FN: 8 A DC Minimum breaking current FN LS : 100 mA AC FN: 100 mA DC Max. breaking voltage FN LS : 250 V AC FN: 250 V DC Mechanical life (operations) 2 x 10 ⁶ Electrical life AC 12 2000 VA - 10 ⁵ operations Electrical life AC 13 L/R = 300 ms - 6000 operations Electrical life AC 13 L/R = 300 ms - 6000 operations Housing material Self-extinguishing Temperature limit operation (IEC 68.1.14) (°C) - 20 → +60 Temperature limits stored (IEC 68.1.14) (°C) - 30 → +70	Sensitivity range FHLS	250 Ω→5 kΩ
Electrode current 1 mA Response time on immersion 72 = 400 ms Response time on emersion 73 = 700 ms Output 2 AQCIO changeover Breaking capacity FN LS : 2000 VA FN : 80 W Maximum breaking current FN LS : 8 A AC FN : 80 W Minimum breaking current FN LS : 100 mA AC FN : 80 AC FN : 100 mA DC FN : 100 mA DC FN : 250 V AC FN : 250 V DC Mechanical life (operations) 2 x 10 ⁶ Electrical life AC 12 2000 VA - 10 ⁵ operations Electrical life AC 13 LR = 300 ms - 6000 operations Housing material Self-extinguishing Terminal capacity 2 x 1,5 mm² with errule 2 x 2,5 mm² without ferrule Temperature limit operation (IEC 68.1.14) (°C) -20 →+60 Temperature limits stored (IEC 68.1.14) (°C) -30 →+70	Display precision	± 30 % with maximum sensitivity
Response time on immersion T2 = 400 ms Response time on emersion T3 = 700 ms Output 2 AgCdO changeover Breaking capacity FN LS : 2000 VA FN LS : 80 W FN LS : 84 AC Maximum breaking current FN LS : 8 A AC Minimum breaking current FN LS : 100 mA AC FN : 100 mA DC FN LS : 250 V AC FN : 250 V DC Mechanical life (operations) 2 x 10 ⁶ Electrical life AC 12 2000 VA · 10 ⁵ operations Electrical life AC 15 Cos φ = 0,3 · 6000 operations Electrical life AC 13 L/R = 300 ms · 6000 operations Housing material Self-extinguishing Terminal capacity 2 x 1,5 mm² with ferrule 2 x 2,5 mm² without ferrule 2 x 2,5 mm² without ferrule Temperature limit operation (IEC 68.1.14) (°C) -20 → +60 Temperature limits stored (IEC 68.1.14) (°C) -30 → +70	Ţ.	
Response time on emersion T3 = 700 ms Output 2 AgCdO changeover Breaking capacity FN LS : 2000 VA FN: 80 W FN LS : 8 A AC Maximum breaking current FN LS : 8 A DC Minimum breaking current FN LS : 100 mA AC FN: 100 mA DC FN LS : 250 V AC Max. breaking voltage FN LS : 250 V AC FN E : 250 V DC FN LS : 250 V AC Electrical life (operations) 2 x 10 ⁶ Electrical life AC 12 2000 VA - 10 ⁵ operations Electrical life AC 15 Cos φ = 0,3 - 6000 operations Electrical life AC 13 L/R = 300 ms - 6000 operations Housing material Self-extinguishing Terminal capacity 2 x 1,5 mm² with ferrule 2 x 2,5 mm² without ferrule 2 x 2,5 mm² without ferrule Temperature limit operation (IEC 68.1.14) (°C) -20 →+60 Temperature limits stored (IEC 68.1.1/2) (°C) -30 →+70		1 mA
Output 2 AgCdO changeover Breaking capacity FN LS : 2000 VA FN LS : 80 W Maximum breaking current FN LS : 8A AC FN : 8 A DC Minimum breaking current FN LS : 100 mA AC FN : 100 mA DC Max. breaking voltage FN LS : 250 V AC FN : 250 V DC Mechanical life (operations) 2 x 10 ⁶ Electrical life AC 12 2000 VA · 10 ⁵ operations Electrical life AC 15 Cos φ = 0.3 · 6000 operations Electrical life AC 13 L/R = 300 ms · 6000 operations Housing material Self-extinguishing Terminal capacity 2 x 1,5 mm² with ferrule 2 x 2,5 mm² without ferrule Temperature limit operation (IEC 68.1.1.4) (*C) -20 → +60 Temperature limit stored (IEC 68.1.1/2) (*C) -30 → +70		
Breaking capacity $FNLS: 2000 \text{ VA}$ $FN: 80 \text{ W}$ Maximum breaking current $FNLS: 8 \text{ A C}$ $FN: 8 \text{ A DC}$ Minimum breaking current $FNLS: 100 \text{ mA AC}$ $FN: 100 \text{ mA DC}$ Max. breaking voltage $FNLS: 250 \text{ V AC}$ $FN: 250 \text{ V DC}$ Mechanical life (operations) 2×10^6 Electrical life AC 12 $2000 \text{ VA} - 10^5 \text{ operations}$ Electrical life AC 15 $Cos \varphi = 0.3 - 6000 \text{ operations}$ Housing material $P(S)$ P	Response time on emersion	T3 = 700 ms
$FN:80 \ W$ $Maximum breaking current$ $FN LS:8 \ A A C$ $FN:8 \ A D C$ $Minimum breaking current$ $FN LS:100 \ mA \ A C$ $FN:100 \ mA \ D C$ $Max. breaking voltage$ $FN LS:250 \ V \ A C$ $FN:250 \ V \ D C$ $Mechanical life (operations)$ 2×10^6 $Electrical life AC 12$ $2000 \ VA - 10^5 \ operations$ $Electrical life AC 15$ $Cos \ \varphi = 0,3 - 6000 \ operations$ $Electrical life AC 13$ $L/R = 300 \ ms - 6000 \ operations$ $Housing material$ $Terminal \ capacity$ $2 \times 1,5 \ mm^2 \ with ferrule$ $2 \times 2,5 \ mm^2 \ without ferrule$ $2 \times 2,5 \ mm^2 \ without ferrule$ $2 \times 2,5 \ mm^2 \ without ferrule$ $1 \times 1,5 \ mm^2 \ without ferrule$ $2 \times 2,5 \ mm^2 \ without ferrule$ $2 \times 2,5 \ mm^2 \ without ferrule$ $3 \times 3 \times$	Output	2 AgCdO changeover
FN: 8 A DC Minimum breaking current FN LS: 100 mA AC FN: 100 mA DC Max. breaking voltage FN LS: 250 V AC FN: 250 V DC Mechanical life (operations) 2×10^6 Electrical life AC 12 $2000 \text{ VA} - 10^5 \text{ operations}$ Electrical life AC 15 Electrical life AC 13 L/R = 300 ms - 6000 operations Housing material Self-extinguishing Terminal capacity $2 \times 1,5 \text{ mm}^2 \text{ with ferrule}$ $2 \times 2,5 \text{ mm}^2 \text{ without ferrule}$ Temperature limit operation (IEC 68.1.14) (°C) Temperature limits stored (IEC 68.1.1/2) (°C) $-30 \rightarrow +70$	Breaking capacity	111 = 2 1 = 111 111
FN: 100 mA DC Max. breaking voltage FN LS: 250 V AC FN: 250 V DC Mechanical life (operations) 2×10^6 Electrical life AC 12 $2000 \text{ VA} - 10^5 \text{ operations}$ Electrical life AC 15 Cos $\varphi = 0,3 - 6000 \text{ operations}$ Electrical life AC 13 L/R = 300 ms - 6000 operations Housing material Self-extinguishing Terminal capacity $2 \times 1,5 \text{ mm}^2 \text{ with ferrule}$ $2 \times 2,5 \text{ mm}^2 \text{ without ferrule}$ Temperature limit operation (IEC 68.1.14) (°C) Temperature limits stored (IEC 68.1.1/2) (°C) -30 \rightarrow +70	Maximum breaking current	
$FN: 250 \text{ V DC}$ $Mechanical life (operations) 2 \times 10^6$ $Electrical life AC 12 2000 \text{ VA} - 10^5 \text{ operations}$ $Electrical life AC 15 Cos \varphi = 0,3 - 6000 \text{ operations}$ $Electrical life AC 13 L/R = 300 \text{ ms} - 6000 \text{ operations}$ $Housing material Self-extinguishing$ $Terminal capacity 2 \times 1,5 \text{ mm}^2 \text{ with ferrule}$ $2 \times 2,5 \text{ mm}^2 \text{ without ferrule}$ $1 \times 1,5 \text{ mm}^2 \text{ with out ferrule}$ $2 \times 2,5 \text{ mm}^2 \text{ without ferrule}$ $3 \times 1,5 \text{ mm}^2 \text{ with out ferrule}$ $3 \times 1,5 \text{ mm}^2 \text{ without ferrule}$ $4 \times 1,5 \text{ mm}^2 \text{ without ferrule}$ $5 \times 1,5 \text{ mm}^2 without ferrule$	Minimum breaking current	
Electrical life AC 12 $ 2000 \text{ VA} - 10^5 \text{ operations} $ Electrical life AC 15 $ \text{Cos } \varphi = 0,3 - 6000 \text{ operations} $ Electrical life AC 13 $ \text{L/R} = 300 \text{ ms} - 6000 \text{ operations} $ Housing material $ \text{Self-extinguishing} $ Terminal capacity $ 2 \times 1,5 \text{ mm}^2 \text{ with ferrule} $ $ 2 \times 2,5 \text{ mm}^2 \text{ without ferrule} $ Temperature limit operation (IEC 68.1.14) (°C) $ -20 \longrightarrow +60 $ Temperature limits stored (IEC 68.1.1/2) (°C) $ -30 \longrightarrow +70 $	Max. breaking voltage	
Electrical life AC 15 Cos ϕ = 0,3 - 6000 operations Electrical life AC 13 L/R = 300 ms - 6000 operations Housing material Self-extinguishing Terminal capacity 2 x 1,5 mm ² with ferrule 2 x 2,5 mm ² without ferrule Temperature limit operation (IEC 68.1.14) (°C) Temperature limits stored (IEC 68.1.1/2) (°C) -30 \rightarrow +70	Mechanical life (operations)	2×10^{6}
Electrical life AC 13 $L/R = 300 \text{ ms} - 6000 \text{ operations}$ Housing material Self-extinguishing Terminal capacity $2 \times 1,5 \text{ mm}^2 \text{ with ferrule}$ $2 \times 2,5 \text{ mm}^2 \text{ without ferrule}$ Temperature limit operation (IEC 68.1.14) (°C) $-20 \rightarrow +60$ Temperature limits stored (IEC 68.1.1/2) (°C) $-30 \rightarrow +70$	Electrical life AC 12	•
Housing material Self-extinguishing Terminal capacity $2 \times 1.5 \text{ mm}^2 \text{ with ferrule}$ $2 \times 2.5 \text{ mm}^2 \text{ without ferrule}$ Temperature limit operation (IEC 68.1.14) (°C) $-20 \rightarrow +60$ Temperature limits stored (IEC 68.1.1/2) (°C) $-30 \rightarrow +70$	Electrical life AC 15	
Terminal capacity $ 2 \times 1,5 \text{ mm}^2 \text{ with ferrule} $ $ 2 \times 2,5 \text{ mm}^2 \text{ without ferrule} $ $ 2 \times 2,5 \text{ mm}^2 \text{ without ferrule} $ $ 2 \times 2,5 \text{ mm}^2 \text{ without ferrule} $ $ 2 \times 2,5 \text{ mm}^2 \text{ without ferrule} $ $ -20 \rightarrow +60 $ $ 1 \text{ Temperature limits stored (IEC 68.1.1/2) (°C)} \qquad -30 \rightarrow +70 $	Electrical life AC 13	L/R = 300 ms - 6000 operations
$ \begin{array}{c} 2 \times 2,5 \text{ mm}^2 \text{ without ferrule} \\ \hline \text{Temperature limit operation (IEC 68.1.14) (°C)} & -20 \rightarrow +60 \\ \hline \text{Temperature limits stored (IEC 68.1.1/2) (°C)} & -30 \rightarrow +70 \\ \end{array} $	Housing material	Self-extinguishing
Temperature limit operation (IEC 68.1.14) (°C) $-20 \rightarrow +60$ Temperature limits stored (IEC 68.1.1/2) (°C) $-30 \rightarrow +70$	Terminal capacity	2 x 1,5 mm ² with ferrule
Temperature limits stored (IEC 68.1.1/2) (°C) -30 →+70		
Temperature limits stored (IEC 68.1.1/2) (°C) -30 →+70	Temperature limit operation (IEC 68.1.14) (°C)	-20 ->+60
Relative humidity (no condensation) 93 % (±2 % · 3 %)	Temperature limits stored (IEC 68.1.1/2) (°C)	-30 ->+70
Treative numbers (no condensation)	Relative humidity (no condensation)	93 % (+2 % ; -3 %)
Weight (g) 280	Weight (g)	

* Création *

TRADOS Empty Field

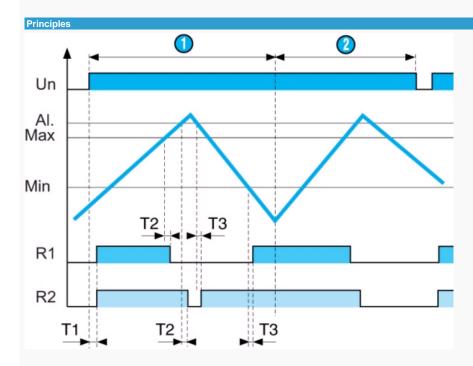
Principles



On power-up, probe Al. is submerged, relays R1 and R2 are energised and the pump is ON: filling starts, the LED for relay R1 is lit. When the level reaches the Max probe, relay R1 de-energises and the pump is OFF: filling stops, the LED for relay R1 goes off. Relay R1 re-energises, when the Min probe emerges. In the event of a fault (level continues to fall) probe Al. emerges, relay R2 deenergises and the alarm is triggered: the LED for relay R2 is lit.

This fault can be stored

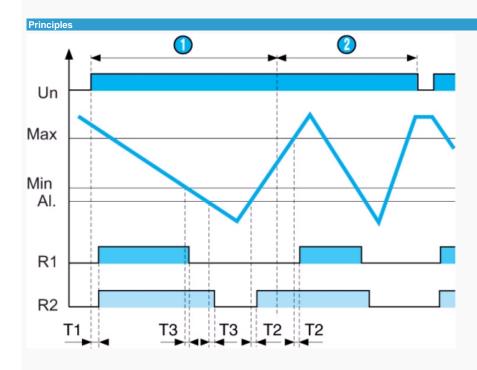
No	Legend
0	Memory OFF
②	Memory ON
	T1 : Delay on pick-up
	T2 : Response time on immersion
	T3 : Response time on emersion
	T4 : Response time on power-down



On power-up, the level in the tank is low, relays R1 and R2 are energised and the pump is ON: filling starts, the LED for relay R1 is lit. When the level reaches the Max probe, relay R1 de-energises and the pump is OFF: filling stops, the relay LED goes off. If, in the event of a fault, the level continues to rise and reaches proble Al., relay R2 de-energises and the alarm is triggered: the LED for relay R2 is lit.

This fault can be stored.

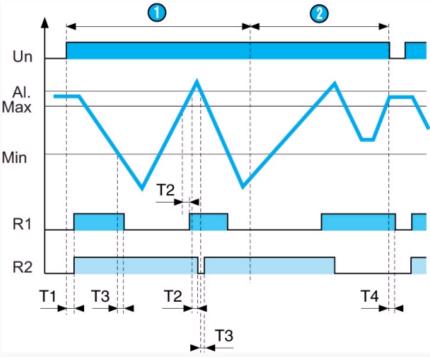
N°	Legend
0	Memory OFF
②	Memory ON
	T1 : Delay on pick-up
	T2 : Response time on immersion
	T3 : Response time on emersion



On power-up, probes Min, Max and Al. are submerged, relays R1 and R2 are energised and the pump is ON: emptying starts, the LED for relay R1 is lit. When the Min probe emerges, relay R1 goes off. If, in the event of a fault, the level continues to fall and probe Al. emerges, relay R2 de-energises and the alarm is triggered: the LED relay R2 is lit. This fault can be stored.

Nº	Legend
0	Memory OFF
②	Memory ON
	T1 : Delay on pick-up
	T2 : Response time on immersion
	T3 : Response time on emersion

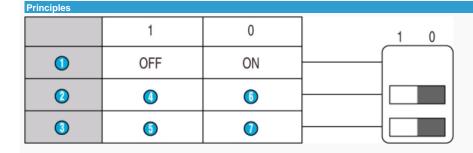
Principles



On power-up, probes Min, Max are submerged and probe Al. is above the level of the liquid. Relays R1 and R2 are energised and the pump is ON: emptying starts, the LED for relay R1 is lit. When the Min probe emerges, relay R1 de-energises and the pump if OFF: emptying stops, the LED for relay R1 goes off. If, in the event of a fault, the level continues to rise and reaches proble Al., relay R2 de-energises and the alarm is triggered: the LED for relay R2 is lit.

This fault can be stored.

No	Legend
1	Memory OFF
②	Memory ON
	T1 : Delay on pick-up
	T2 : Response time on immersion
	T3 : Response time on emersion
	T4 : Response time on power-down



Operating principle

Control of the level of a conductive liquid at specific points (high and low levels) with an alarm for a level which is abnormally high or low.

The principle is based on measurement of the apparent resistance of the liquid between submerged probes. When this value is lower than the present threshold on the unit front face, the output relay R1 and/or the alarm relay R2 change state.

The avoid electrolytic phenomena, an AC current runs across the probes.

Adjusting sensitivity

Set the sensitivity so that the relay will change state when the probes are in contact with the liquid. Then check that the relay returns to its initial position as soon as the probes emerge. In certain applications, fine-tuning the sensitivity prevents inappropriate detection, such as the presence of foam or bubbles on the surface or the occurrence of leakage impedance between probes (extended line capacity, humidity, etc).

Note

Latching of the alarm relay R2 in de-energised state if a fault occurs can the programmed via a switch on the underside of the unit (only when the unit is switched off). To reset alarm relay R2, cut the power, as long as the levels are reset.

Programming

The FN level controller can be programmed using 3 switches on the lower panel :

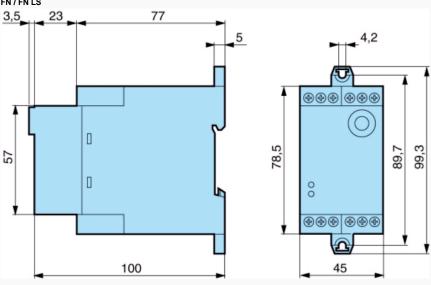
Note:

Memory, Alarm and Function must only be selected when the unit is switched off.

No	Legend
1	g

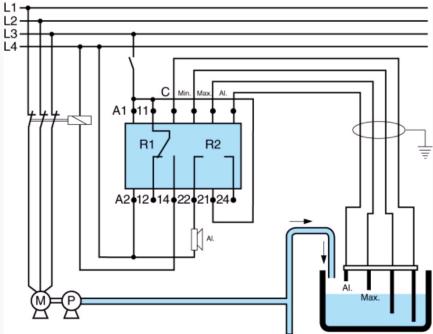
0	Memory
②	Alarm
•	Function
•	Low
•	Emptying
•	High
0	Filling

Dimensions (mm) FN / FN LS



Connections





Note: Dans le cas où le réservoir est conducteur (métal), il peut être utilisé comme électrode de référence (C). Une LED verte visualise l'alimentation. Une LED jaune visualise l'état du relais de sortie. Une LED rouge visualise, l'état du relais d'alarme.

Legend

A1 - A2 : Supply voltage

11 - 12 - 14 : Output relay (R1)
21 - 22 - 24 : Alarm output relay (R2)
C - Min - Max - Al. : Probe inputs