V4LM4S30 24-240V AC/DC

Manufacturer data sheet: V1.073

Monitoring relays- Level monitoring f.condu. liquid c.

Status: Available Data sheet created: 01.07.2025

Item Number: 2104500 - **Serie:** Veo - **EAN:** 9008662013933



- Monitoring relays VEO series
- level monitoring - pump control
- 4 probe inputs for level monitoring
- 10 functions
- supply voltage 24 - 240V AC/DC
- 3 NO contacts
- width 45 mm
- compact industrial design

Description

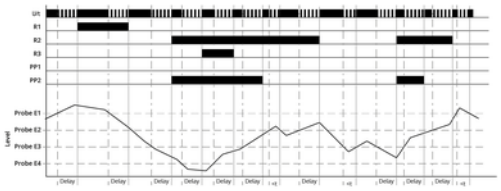
Level monitoring of conductive liquid, timing for tripping delay and turn-off delay separately adjustable.

General information

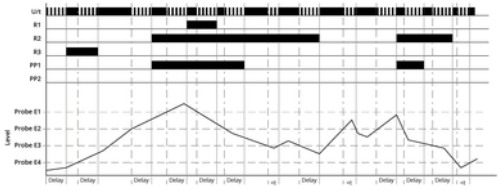
Short description	Level monitor for conductive liquids, 4 +1 probes. 4 +1 probes, 10 functions, 3 change over contacts, 24-240V AC/DC
Item Number	2104500
EAN	9008662013933
Main category	Monitoring Relays
Series	Veo
Type	V4LM4S30 24-240V AC/DC
Design	Compact industrial design
Supply	24-240V AC/DC
Dimensions	45 x 67 x 76 mm

Functions and measurands

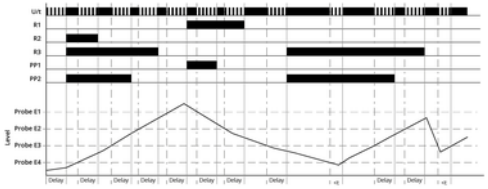
Amount of functions 10



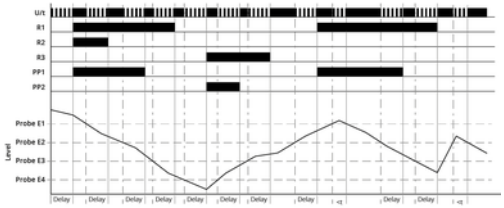
Pump up with MIN and MAX alarm (1 container, 4 probes) (2uA)
Connection of the probes E0 - E4. Instead of the reference probe E0, the electroconductive container can be connected. When the liquid level drops below the probe E3 the set delay interval is triggered. After the delay time has elapsed the output relay R2 is energised. Simultaneously the yellow LED PP2 (pump performance) is switched on and stays on until the liquid reaches a stable level at probe E3 (delay time elapsed). As soon as probe level E2 is reached and the delay time has elapsed the output relay R2 is de-energised. The minimum probe E4 and the maximum probe E1 are used for extreme value monitoring and are linked to the output relays R1 (maximum alarm probe E1) and R3 (minimum alarm probe E4) and can be used to control alarm lamps, additional pumps or inflow and discharge valves.



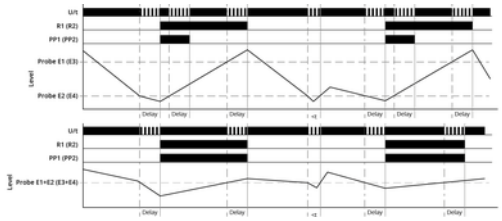
Pump down with MIN and MAX alarm (1 container, 4 probes) (2dA)
Connection of the probes E0 - E4. Instead of the reference probe E0 the electroconductive container can be connected. When the liquid level rises above the probe E2 the set delay interval is triggered. After the delay time has elapsed the output relais R2 is energised. Simultaniously the yellow LED PP1 (pump performance) is switched on and stays on until the liquid level stablely drops below the probe level E2 (delay time elapsed). As soon as the level drops below probe level E3 and the delay time has elapsed the output relais R2 is deenergised. The minimum probe E4 and the maximum probe E1 are used for extreme value monitoring and are linked to the output relays R1 (maximum alarm probe E1) and R3 (minimum alarm probe E4) and can be used to control alarm lamps, additional pumps or inflow and discharge valves.



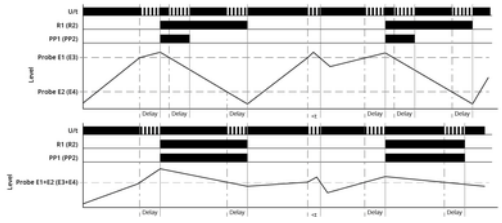
Pump up and down with MIN alarm (1 container, 3(4) probes) (3b-)
Connection of the probes E0 - E4. Instead of the reference probe E0, the electroconductive container can be connected. This function controls the liquid level around probe E2. When the liquid level rises above the probe E1 the set delay interval is triggered. After the delay time has elapsed the output relay R1 (pump down) is energised. Simultaneously the yellow LED PP1 (pump performance) is switched on and stays on until the liquid reaches a stable level at probe E1 (delay time elapsed). As soon as the level drops below probe level E2 and the delay time has elapsed the output relay R1 is de-energised. When the liquid level drops below the probe E3 the set delay interval is triggered. After the delay time has elapsed the output relay R3 (pump up) is energised. Simultaniously the yellow LED PP2 (pump performance) is switched on and stays on until the liquid reaches a stable level at probe E3 (delay time elapsed). As soon as probe level E2 is reached and the delay time has elapsed the output relay R2 is de-energised. The minimum probe E4 serves for dry running monitoring and is coupled to the output relay R2 and can be used to control alarm lamps, additional pumps or inflow valves.



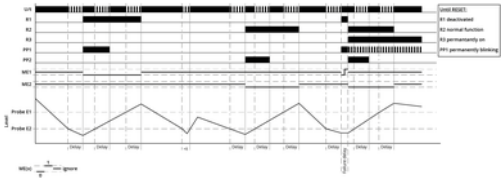
Pump up and down with MAX alarm (1 container, 3(4) probes) (3b+)
Connection of the probes E0 - E4. Instead of the reference probe E0 the electroconductive container can be connected. This function controls the liquid level around probe E3. When the liquid level rises above the probe E2 the set delay interval is triggered. After the delay time has elapsed the output relay R1 (pump down) is energised. Simultaneously the yellow LED PP1 (pump performance) is switched on and stays on until the liquid reaches a stable level at probe E2 (delay time elapsed). As soon as the level drops below probe level E3 and the delay time has elapsed the output relay R1 is de-energised. When the liquid level drops below the probe E4 the set delay interval is triggered. After the delay time has elapsed the output relay R3 (pump up) is energised. Simultaneously the yellow LED PP2 (pump performance) is switched on and stays on until the liquid level stablely reaches the probe level E4 (delay time elapsed). As soon as probe level E3 is reached and the delay time has elapsed the output relay R2 is de-energised. The maximum probe E1 serves for overflow monitoring and is coupled to the output relay R2 and can be used to control alarm lamps, additional pumps or discharge valves.



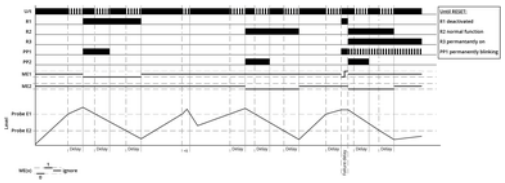
Pump up (2 independent containers, 2 probes each) (2u2)
This function serves the level control in two separate tanks. A pair of probes and an output relay are available for each of the tanks. Both level controls work independently. Connection of the probes E0, E1, E2 (second tank E0, E3, E4). Instead of the reference probe E0 the electroconductive containers can be connected. When the liquid level drops below the probe E2 (resp. E4) the set delay interval is triggered. After the delay time has elapsed the output relay R1 (resp. R2) is energised. Simultaneously the yellow LED PP1 (resp. PP2) (pump performance) is switched on and stays on until the liquid reaches a stable level at probe E2 (resp. E4) (delay time elapsed). As soon as probe level E1 (resp. E3) is reached and the delay time has elapsed the output relay R1 (resp. R2) is de-energised. The use of this function is also possible with a single probe per container - in this case a single probe is connected to both inputs E1 and E2 (resp. E3 and E4). The „Concurrent Sensing“ mode is deactivated in function 2u2 in order to avoid measuring inaccuracies.



Pump down (2 independent containers, 2 probes each) (2d2)
This function serves the level control in two separate tanks. A pair of probes and an output relay are available for each of the tanks. Both level controls work independently. Connection of the probes E0, E1, E2 (second tank E0, E3, E4). Instead of the reference probe E0 the electroconductive containers can be connected. When the liquid level rises above the probe E1 (resp. E3) the set delay interval is triggered. After the delay time has elapsed the output relay R1 (resp. R2) is energised. Simultaneously the yellow LED PP1 (resp. PP2) (pump performance) is switched on and stays on until the liquid reaches a stable level at probe E2 (resp. E4) (delay time elapsed). As soon as the level drops below probe level E2 (resp. E4) and the delay time has elapsed the output relay R1 (resp. R2) is de-energised. The use of this function is also possible with a single probe per container - in this case a single probe is connected to both inputs E1 and E2 (resp. E3 and E4). The „Concurrent Sensing“ mode is deactivated in function 2u2 in order to avoid measuring inaccuracies.

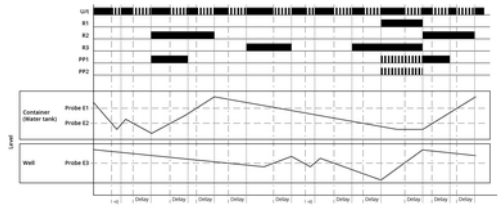


Pump up with pump change (1 container, 2 probes, 2 pumps) (2uc)
Connection of the probes E0 - E4. Instead of the reference probe E0 the electroconductive container can be connected. The probe inputs E3 and E4 are optionally available for pump monitoring (blockage or dry running monitoring e.g. V2IM10AL10 / V4IM100AL20, coupling to the monitoring inputs E3, E4 via the NC contacts of the monitoring relays). When the liquid level drops below the probe E2 the set delay interval is triggered. After the delay time has elapsed the output relay R1 (resp. R2) is energised. Simultaneously the yellow LED PP1 (resp. PP2) (pump performance) is switched on and stays on until the liquid reaches a stable level at probe E2 (delay time elapsed). As soon as probe level E1 is reached and the delay time has elapsed the output relay R1 (resp. R2) is de-energised. The two output relays R1 and R2 for pump controll are triggered alternately to ensure balanced utilization of the pumps. In the event of an error of the currently prioritized pump, the NC contact of the monitoring relay closes and the error signal is transfered to the respective monitoring input (E3 or E4). The faulty pump is deactivated and the alternative relay output gets energized. Simultaneously the relay output R3 (pump failure) gets permanently energized and the pump efficiency LED of the affected pump (PP1 or PP2) starts flashing. The fault-free pump remains permanently prioritized. The fault status is reset by temporarily switching to a different function or disconnecting the device from the mains.



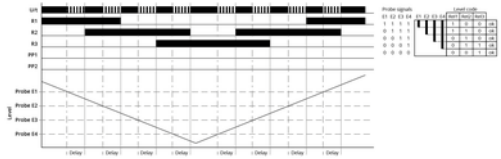
Pump down with pump change (1 container, 2 probes, 2 pumps) (2dc)

Connection of the probes E0 - E4. Instead of the reference probe E0 the electroconductive container can be connected. The probe inputs E3 and E4 are optionally available for pump monitoring (blockage or dry running monitoring e.g. V2IM10AL10 / V4IM100AL20, coupling to the monitoring inputs E3, E4 via the NC contacts of the monitoring relays). When the liquid level rises above the probe E1 the set delay interval is triggered. After the delay time has elapsed the output relay R1 (resp. R2) is energised. Simultaneously the yellow LED PP1 (resp. PP2) (pump performance) is switched on and stays on until the liquid reaches a stable level at probe E1 (delay time elapsed). As soon as the level drops below probe level E2 and the delay time has elapsed the output relay R1 (resp. R2) is de-energised. The two output relays R1 and R2 for pump controll are triggered alternately to ensure balanced utilization of the pumps. In the event of an error of the currently prioritized pump, the NC contact of the monitoring relay closes and the error signal is transfered to the respective monitoring input (E3 or E4). The faulty pump is deactivated and the alternative relay output gets energized. Simultaneously the relay output R3 (pump failure) gets permanently energized and the pump efficiency LED of the affected pump (PP1 or PP2) starts flashing. The fault-free pump remains permanently prioritized. The fault status is reset by temporarily switching to a different function or disconnecting the device from the mains.



Well control with MIN alarm(2 containers, 3 probes) (3w-)

The function is used to ensure the water supply by means of a water tower and a well. Connection of the probes E0 - E2 (water tower) and E0 and E3 (well). Instead of the reference probe E0 the electroconductive container can be connected. When the liquid level in the water tower drops below the probe E2 the set delay interval is triggered. After the delay time has elapsed the output relay R2 is energised and water from the well is pumped up. Simultaneously the yellow LED PP1 (pump performance) is switched on and stays on until the liquid reaches a stable level at probe E2 (delay time elapsed). As soon as probe level E1 is reached and the delay time has elapsed the output relay R2 is de-energised. When the liquid level in the well drops below the probe E3 the set delay interval is triggered. After the delay time has elapsed the output relay R3 (well alarm) is energised and remains in this state until the liquid level stablely reaches the probe E3 again (delay time elapsed). Only then pumping up into the water tower can be ensured again. If the liquid level in the well as well as the liquid level in the water tower fall below the respective minimum levels (E2 and E3 dry), the output relay R1 (dry alarm) is energized after the delay time has elapsed and the two LEDs PP1 and PP2 start to flash. This state remains until the probe E3 is once again stablely wetted (delay time elapsed) and thus pumping up into the water tower is again possible.



Level code (Up to 4 containers, 4 probes) (4ce)

Connection of the probes E0 - E4. Instead of the reference probe E0 the electroconductive container can be connected. This function maps the probe states of the probes E1-E4 as a code to the relay outputs R1-R3. Each status change is subject to the set delay time. By using an external decision logic (e.g. PLC), reactions to the respective probe states may be programmed as desired. Undefined signal sequences provide the error code 1 - 0 - 1 to the output relay R1 - R3. Overflow or dry-running monitoring for 4 separate containers is possible by means of simple funktional wiring.

Time ranges

Number Of Areas	1	
Time ranges	**Setting range**	
	Measuring filter delay	1 ... 10s

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Indicators

Supply/time lapse 1	Green LED U/t ON: Supply voltage applied
Supply/time lapse 2	Green LED U/t flashing:indication of time lapse for measuring filter
Relay state	Yellow LED Rel 1 ON/OFF: Position of the output relay Rel 1
Relay state	Yellow LED Rel 2 ON/OFF: Position of the output relay Rel 2
Relay state	Yellow LED Rel 3 ON/OFF: Position of the output relay Rel 3
Error / monitoring function	Yellow LED PP1 ON: Pump efficiency pump 1
Error / monitoring function 2	Yellow LED PP2 ON: Pump efficiency pump 2

Mechanical design

Housing material	PA 66, self-extinguishing plastic, class V-0
Housing - protection degree	IP40
Mounting	top hat rail TH 35 7,5-15 according to IEC 60715:2017 / EN 60715:2017
Terminals/connections	Screw terminal
Terminals - protection degree	IP20
Mounting position	any
Stripping length	8 mm
Max. Tightening Torque	1 Nm
Terminal capacity	• flexible with wire end ferrule 0.5 ... 2.5 mm² (20 AWG ... 13 AWG) • flexible without ferrule 0.5 ... 4 mm² (20 AWG ... 12 AWG) • rigid 0.5 ... 4 mm² (20 AWG ... 12 AWG).

Supply circuit

Terminals/connections	A1-A2
Supply voltage d.c.	24 ... 240 V
Supply voltage tolerance d.c.	-25% ... +25 %
Rated consumption d.c.	24 V d.c.: typ. 0,65 W
Supply voltage a.c.	24 ... 240 V
Supply voltage tolerance a.c.	-10% ... +10%
Rated frequency [Hz]	a.c. 16,6 ... 400 Hz; d.c.
Tolerance of the Frequency	16,0 ... 420 Hz
Rated consumption a.c.	230V a.c.: typ. 0,75 W / 1,3 VA
Duty cycle	100%
Backup power time	< 30 ms
Recovery time	< 500 ms
Drop-out voltage	≥ 6 V
Overvoltage category	III (IEC 60664-1)
Rated surge voltage	6 kV (IEC 60947-1)
Isolation test voltage	3780 V (IEC 60947-1)

Output curcuit

Type	Relay
Terminals 1	17-18; 17-28; 17-38
Maximum switching voltage	250 V a.c.
Minimum Switch Voltage/Current	5 V d.c. / 10 mA
Rated voltage	250 V (IEC 60947-5-1)
Rated current 1	AC-1 5 A / 250 V (IEC 60947-5-1)
Rated current 2	AC-15 1,5 A / 240 V (B300) (IEC 60947-5-1)
Rated current 3	DC-12 5 A / 24 V (IEC 60947-5-1
conditional short-circuit current	1000 A
Contacts material	AgNi / Au
Fuse Protection	5 A quick
Mechanical life	1 x 10^6 Switching cycles
Electrical life	100 x 10^3 Switching cycles (AC-1)
Switching frequency	1200/min without load
Switching frequency 2	6/min with load
Rated surge voltage	6 kV (IEC 60947-1)
Overvoltage category	III (IEC 60947-5-1)

Measuring circuit

Measurand	Level

Measuring circuit - level

Measuring input	Liquid level with conductive probes (type SK1, SK5)
Probe voltage	a.c., 18.33Hz, 100% = 2.3Vrms open-circuit voltage
Probe current	Range L: max. 1 mA, Range H: max. 0.1 mA
Probe cable length (line capacitance 100nF/km)	@Vsens H = 100% Sensitivity ≤ 50% 1000 m
Overvoltage category	III (IEC 60947-5-1)
Rated surge voltage	6 kV (IEC 60947-1)
Terminals	E0-E0-E1-E2-E3-E4 (E0-E0 internal connected)
Voltage waveform	Resistance measurement E1-E0, E2-E0, E3-E0, E4-E0
Measurement-input voltage	Low (L): 250 Ω – 12.5 kΩ High (H): 10 kΩ - 500 kΩ
Hysteresis	approx. 10% of adjusted sensitivity
Measuring mode	sequentially (delay = 1 ... 10 s); simultaneously (concurrent sensing)

Ambient conditions and general specifications

Ambient temperature IEC	-25 ... +60°C
Storage temperature	-40 ... +70 °C
Relative humidity	5 ... 95 %
Vibration resistance	2 ... 13,2 Hz: 1 mm; 13,2 ... 100 Hz: 7 m/s² (EN 60947-1)
Shock resistance	150 m/s² 11 ms (EN 60947-1)
Pollution degree	2, pollution level can be increased by installation in suitable enclosures (according to IEC 60664-1)

V4LM4S30 24-240V AC/DC

Logistics

Minimum Quantity	1
Tariff Number	85364900
EAN	9008662013933
Country of Origin	AT
Product Weight (g)	147

Available declarations / conformities

EAC	✓
CE	Open document
UL	Open document
c(UL)	Open document
REACH	Open document
WEEE	Open document
TSCA	Open document
RoHs	Open document
CMRT	Open document

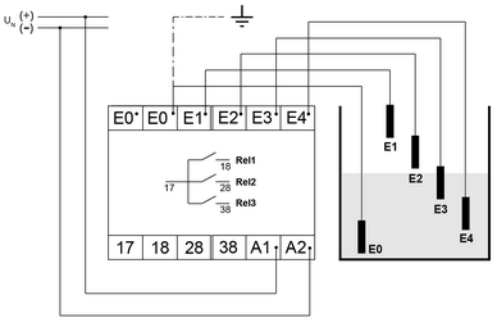
CAD Files

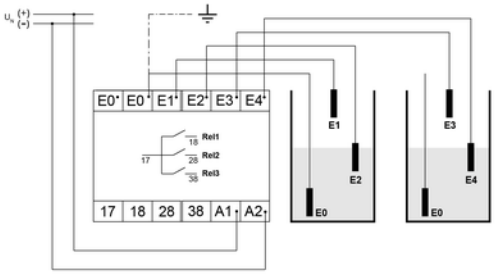
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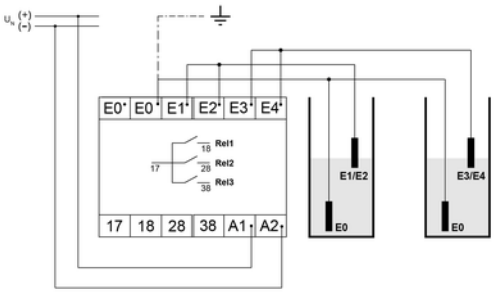
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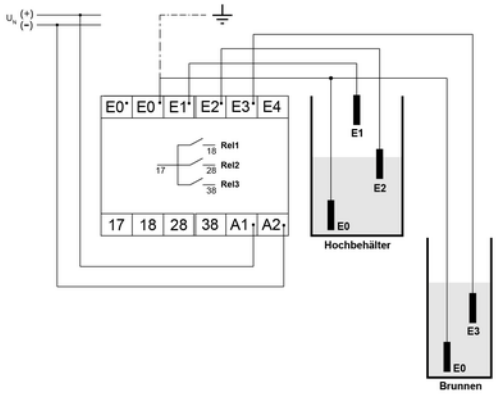
Media & drawings

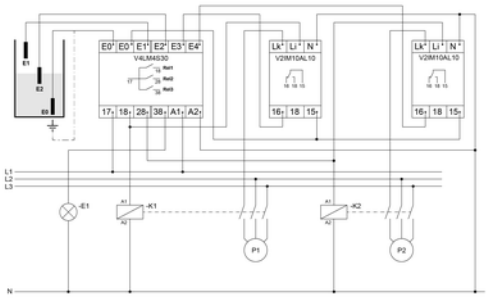


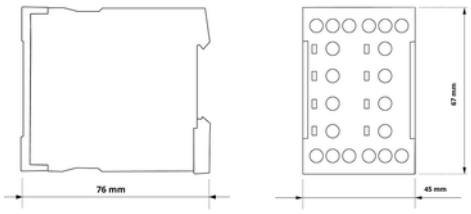












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Changes and errors excepted