



- Level monitoring relays for electrically conductive liquids
- Modular and plug-in versions
- Adjustable 2.5...200kΩ sensitivity
- Single and three-pole probes
- Float switches
- Start-up priority change relays.

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LEVEL CONTROL RELAYS

- For conductive liquids
- Single, dual or multivoltage
- Emptying or filling functions
- Multifunctions
- Automatic reset
- Modular and plug-in versions.



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PROBES, ELECTRODES AND ELECTRODE HOLDERS

- Single pole
- Three pole.



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FLOAT SWITCHES

- Versions for grey water, drinking water and dirty water
- Versions with PVC and Neoprene cable
- Emptying or filling functions.



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START-UP PRIORITY CHANGE RELAYS

- Versions for 2, 3 or 4 motors
- Single or multivoltage
- Modular and plug-in versions.



LEVEL CONTROL RELAYS



START-UP PRIORITY CHANGE RELAYS

| Description | LEVEL CONTROL RELAYS | | | | | | START-UP PRIORITY CHANGE RELAYS | | | |
|--|----------------------|-------|-------|-------|--------------|---------------|---------------------------------|--------|---------------|--------|
| | LVM20 | LVM25 | LVM30 | LVM40 | LV1E | LV2E | LVMP05 | LVMP10 | CSP2E | LVMP30 |
| Modular version | ●(2U) | ●(1U) | ●(3U) | ●(3U) | | | ●(1U) | ●(3U) | | ●(4U) |
| Plug-in version | | | | | ● (8 pin) | ● (11 pin) | | | ● (11 pin) | |
| 3 detecting electrodes (MIN, MAX and COM) | ● | ● | ● | | ● | ● | | | | |
| 5 detecting electrodes (MIN1, MAX1, MIN2, MAX2 and COM) | | | | ● | | | | | | |
| Sensitivity adjustment 2.5...50kΩ | ● | | ● | | | | | | | |
| Sensitivity adjustment 2.5...100kΩ | | ● | | | | | | | | |
| Sensitivity adjustment 2.5...200kΩ | | | | ● | | | | | | |
| Fixed sensitivity: 7...8kΩ | | | | | ● | ● | | | | |
| Adjustable sensitivity full-scale value 25-50-100-200 kΩ | | | | ● | | | | | | |
| Separate sensitivity adjustment for MAX probe (foam detection) | | | | ● | | | | | | |
| Emptying function | ● | ● | ● | ● | ● | ● | | | | |
| Filling function | | ● | ● | ● | | | | | | |
| Emptying function with MIN and/or MAX alarm | | | | ● | | | | | | |
| Filling function with MIN and/or MAX alarm | | | | ● | | | | | | |
| Emptying function with pump priority change | | | | ● | | | | | | |
| Filling function with pump priority change | | | | ● | | | | | | |
| Tank filling, well drawing functions and alarm | | | | ● | | | | | | |
| Filling-emptying adjustment selector | | ● | ● | | | | | | | |
| Programming selector for 5 different functions | | | | ● | | | | | | |
| Start-up priority change for 2 motors | | | | | | | ● | | | |
| Start-up priority change for 2 motors. Possible starting of stand-by motor | | | | | | | | ● | ● | |
| Start-up priority change for 3 or 4 motors | | | | | | | | | | ● |
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| Some permitted liquid substances | | | | Liquid substances not permitted |
|----------------------------------|------------------|------------------|------------------|--|
| Type of liquid | Resistivity kΩcm | Type of liquid | Resistivity kΩcm | |
| Drinking water | 5...10 | Milk | ~1 | <ul style="list-style-type: none"> • Purified water • Deionised water • Petrol • Oil • Liquid gases • Paraffin • Ethylene glycol • Paints • Liquids with a high percentage of alcohol |
| Well water | 2...5 | Whey | ~1 | |
| River water | 2...15 | Fruit juices | ~1 | |
| Rainwater | 15...25 | Vegetable juices | ~1 | |
| Sludge | 0.5...2 | Soups | ~1 | |
| Seawater | ~0.03 | Wine | ~2.2 | |
| Salt water | ~2.2 | Beer | ~2.2 | |
| Natural/hard water | ~5 | Coffee | ~2.2 | |
| Chlorinated water | ~5 | Suds | ~18 | |
| Condensed water | ~18 | | | |

N.B. The resistivity values in the table are purely indicative.

Single-voltage relay



LVM20...



LVMKIT20A...

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|------------|--------------------------|------------------------|--------------|------|
| | [V] 50/60Hz | $\frac{1}{1}$ | n° | [kg] |

Emptying function.
Automatic reset.

| | | | | |
|-----------|--------------|--------------|---|-------|
| LVM20A024 | 24VAC | 1 C/O (SPDT) | 1 | 0.215 |
| LVM20A127 | 110...127VAC | 1 C/O (SPDT) | 1 | 0.215 |
| LVM20A240 | 220...240VAC | 1 C/O (SPDT) | 1 | 0.215 |
| LVM20A415 | 380...415VAC | 1 C/O (SPDT) | 1 | 0.215 |

| Order code | Description | Qty per pack | Wt |
|------------|-------------|--------------|------|
| | | n° | [kg] |

Level control relay LVM20 and 11SN1 electrodes kit.

| | | | |
|--------------|--|---|-------|
| LVMKIT20A024 | Level control relay LVM20A024 and two 11SN1 probes | 1 | 0.340 |
| LVMKIT20A240 | Level control relay LVM20A240 and two 11SN1 probes | 1 | 0.340 |

new

Multi-voltage relay



LVM25240



LVMKIT25

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|------------|--------------------------|------------------------|--------------|------|
| | [V] 50/60Hz | $\frac{1}{1}$ | n° | [kg] |

Emptying or filling functions.
Automatic reset.

| | | | | |
|----------|----------------|--------------|---|-------|
| LVM25240 | 24...240VAC/DC | 1 C/O (SPDT) | 1 | 0.095 |
|----------|----------------|--------------|---|-------|

| Order code | Description | Qty per pack | Wt |
|------------|-------------|--------------|------|
| | | n° | [kg] |

Level control relay LVM25240 and 11SN1 electrodes kit.

| | | | |
|----------|---|---|-------|
| LVMKIT25 | Level control relay LVM25240 and two 11SN1 probes | 1 | 0.192 |
|----------|---|---|-------|

Dual-voltage relay



LVM30...

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|------------|--------------------------|------------------------|--------------|------|
| | [V] 50/60Hz | $\frac{1}{1}$ | n° | [kg] |

Emptying or filling functions.
Automatic reset.

| | | | | |
|-----------|------------------------------|--------------|---|-------|
| LVM30A240 | 24/220...240VAC | 2 C/O (SPDT) | 1 | 0.315 |
| LVM30A415 | 110...127VAC 380...415VAC | 2 C/O (SPDT) | 1 | 0.315 |

Operational characteristics

- Used with 3 sensing electrodes, MIN, MAX and COM
- 2.5...50kΩ adjustable sensitivity
- Double insulation between each supply, electrodes and output relay circuits
- Fixed probe signal delay: <1s
- Green LED indicator for power on
- Red LED indicator for output relay state
- Modular DIN 43880 housing (2 modules)
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance

Certifications obtained: UL Listed, EAC, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Level control relays.

Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL508, CSA C22.2 no. 14.

Probes and electrode holders

Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Operational characteristics

- Used with 3 sensing electrodes, MIN, MAX and COM
- 2.5...100kΩ adjustable sensitivity
- Insensitivity to stray electrode-cable capacitance
- Programming selector for emptying or filling function with fail-safe operation
- Double insulation between each supply, electrodes and output relay circuits
- Fixed probe signal delay: <1s
- Green LED indicator for power on
- Red LED indicator for output relay state
- Modular DIN 43880 housing (1 module)
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance

Certifications obtained: UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Level control relays, EAC. Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-4, UL508, CSA C22.2 n° 14.

Probes and electrode holders

Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Operational characteristics

- Used with 3 sensing electrodes, MIN, MAX and COM
- 2.5...50kΩ adjustable sensitivity
- Programming selector for emptying or filling function with fail-safe operation
- Double insulation between each supply, electrodes and output relay circuits
- Adjustable probe signal delay: 1...10s or pump start delay: 0...300s
- Green LED indicator for power on
- Red LED indicator for output relay state
- Modular DIN 43880 housing (3 modules)
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance

Certifications obtained: UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Level control relays, EAC. Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL508, CSA C22.2 n° 14.

Probes and electrode holders

Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Single-voltage multifunction relay



LVM40...

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|------------|--------------------------|------------------------|--------------|------|
| | [V] 50/60Hz | 1 | n° | [kg] |

Multifunction.
Automatic reset.

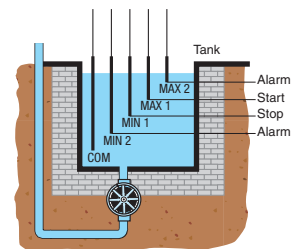
| | | | | |
|------------------|--------------|-------|---|-------|
| LVM40A024 | 24VAC | 1+1NO | 1 | 0.278 |
| LVM40A127 | 110...127VAC | 1+1NO | 1 | 0.278 |
| LVM40A240 | 220...240VAC | 1+1NO | 1 | 0.278 |
| LVM40A415 | 380...415VAC | 1+1NO | 1 | 0.278 |

1 Two relay outputs; one with C/O (SPDT) and one with N/O (SPST).

FUNCTIONS

A- Emptying with MIN and/or MAX alarms.

B- Filling with MIN and/or MAX alarms.

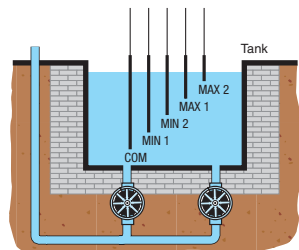


EXAMPLE OF EMPTYING OPERATION

To achieve this type of operation, two electrodes are used to control the liquid between the fixed limits using MIN1 and MAX1 and two alarm levels using MIN2 and MAX2. When one of the alarm electrodes is wet, the alarm relay is de-energised. The alarm can be caused by pump malfunction, insufficient pump delivery capacity, MAX control level failure or MIN level electrode shorted. With a proper connection, only the MIN alarm or MAX alarm can be activated or neither of the two can be activated so the relative output contacts can be used for pump control.

C- Emptying with pump priority change.

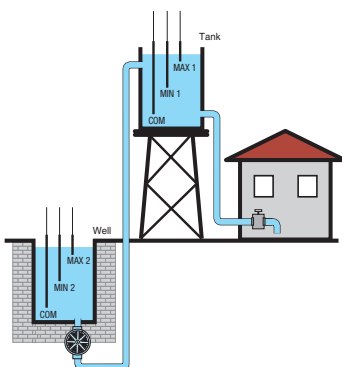
D- Filling with pump priority change.



EXAMPLE OF EMPTYING OPERATION

This operation is obtained by using four electrodes positioned at four different levels and two relay outputs to control two pumps. For example, one can place the four electrodes, MIN1, MIN2, MAX1 and MAX2, in increasing order from the lowest to the highest levels and must control the tank emptying. Usually the level is controlled between the MIN1 and MAX1 levels by starting one of the two pumps. This case is different so the pumps can be maintained at the best efficiency and optimise their wear. When the liquid wets the MAX2 level and because the first pump is faulty or else a higher delivery capacity is needed, the second stand-by pump is activated to back up the first pump. When the liquid lowers and no longer wets the MIN2 level, the second pump is stopped and then when the MIN1 level is no longer wet, the first pump is stopped too.

E- Tank filling and well drawing with alarm.



EXAMPLE

Two electrodes are used in this operation to control the tank level and another two for the well. One relay is used to activate the pump while the other for dry running / no water alarm. When the well liquid wets the MAX2 level and the liquid wets the MIN1 tank level, the tank-filling pump is activated. When the tank MAX1 level is wet, the pump is stopped. During the tank filling, the pump could stop before the MAX1 level is wet because the well MIN2 level is no longer wet. Should the tank MIN1 level no longer be wet at which the pump should restart but the well MIN2 level is also no longer wet, then the alarm relay is de-energised.

Operational characteristics

- Use with 5 sensing electrodes, MIN1, MAX1, MIN2, MAX2 and COM
- 2.5...200kΩ adjustable sensitivity
- Adjustable sensitivity full-scale value: 25-50-100-200kΩ
- Separate sensitivity adjustment of MAX electrodes for foam detection
- Insensitivity to stray electrode-cable capacitance
- Programming selector for 5 different functions:
 - Emptying function and alarms (pos. A)
 - Filling function and alarms (pos. B)
 - Emptying function with pump priority start-up change (pos. C)
 - Filling function with pump priority start-up change (pos. D)
 - Well draining and tank filling and alarms (pos. E)
- Double insulation between each supply, electrodes and output relay circuits
- Adjustable probe signal delay: 1...10s
- Adjustable pump start delay: 0...30min
- Green LED indicator for power on
- Red LED indicators for output relay and electrode state
- Modular DIN 43880 housing (3 modules)
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance

Certifications obtained: UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Level control relays, EAC. Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL508, CSA C22.2 n° 14.

Probes and electrode holders

Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Single-voltage relay



31LV1E...

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|------------|--------------------------|------------------------|--------------|------|
| | [V] 50/60Hz | 1 | n° | [kg] |

Emptying function.
Automatic reset.

| | | | | |
|------------------|--------------|--------------|---|-------|
| 31LV1E24 | 24VAC | 1 C/O (SPDT) | 1 | 0.263 |
| 31LV1E110 | 110...120VAC | 1 C/O (SPDT) | 1 | 0.263 |
| 31LV1E230 | 220...240VAC | 1 C/O (SPDT) | 1 | 0.263 |
| 31LV1E400 | 380...415VAC | 1 C/O (SPDT) | 1 | 0.263 |

Operational characteristics

- Used with 3 sensing electrodes, MIN, MAX and COM
- 7...8kΩ fixed sensitivity
- Red LED indicator for output relay state
- Max. relay-electrode cable length: 500m/547yd single-core, double insulated cables
- Mounting on 35mm/1.38" (IEC/EN/BS 60715) DIN rail or 8-pin plug-in housing
- 8-pin plug-in housing (socket 31S8, see page 23-6)
- IEC degree of protection: IP30.

Certifications and compliance

Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60255-27.

Probes and electrode holders

Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

Dual-voltage relay



31LV2E...

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|------------|--------------------------|------------------------|--------------|------|
| | [V] 50/60Hz | 1 | n° | [kg] |

Emptying function.
Automatic reset.

| | | | | |
|------------------|-------------------------------|--------------|---|-------|
| 31LV2E48 | 24/48VAC | 1 C/O (SPDT) | 1 | 0.266 |
| 31LV2E220 | 110...120VAC/ 220...240VAC | 1 C/O (SPDT) | 1 | 0.266 |
| 31LV2E400 | 220...240VAC/ 380...415VAC | 1 C/O (SPDT) | 1 | 0.266 |

Operational characteristics

- Used with 3 sensing electrodes, MIN, MAX and COM
- 7...8kΩ fixed sensitivity
- Red LED indicator for output relay state
- Max. relay-electrode cable length: 500m/547yd single-core, double insulated cables
- Mounting on 35mm/1.38" (IEC/EN/BS 60715) DIN rail or 11-pin plug-in housing
- 11-pin plug-in housing (socket 31S11, see page 23-6)
- IEC degree of protection: IP30.

Certifications and compliance

Certifications obtained: EAC.
Compliant with standards: IEC/EN/BS 60255-27.

Probes and electrode holders

Use probes and electrode holders type: 11SN1/31PS31/31PS3S/31SCM/31CGL or similar (see page 23-6).

23 Level controls and float switches

Probes, electrode holders and electrodes for conductive liquids.
Accessories



INDEX

Probes and electrode holders



11SN1



31SCM...



31CGL125...



31PS31



31PS3S

Electrodes



31ASTA...

Accessories



31RE213



31S8



31S11



31RE014

| Order code | Probe included | Probe length [mm/in] | Qty per pack n° | Weight [kg] |
|--------------------------------------|----------------|-------------------------|--------------------|----------------|
| Single pole electrodes. | | | | |
| 11SN1 | Yes | 1000/39.9" | 10 | 0.050 |
| 31SCM04 | Yes | 43/1.7" | 1 | 0.060 |
| 31SCM50 | Yes | 500/19.7" | 1 | 0.115 |
| 31SCM100 | Yes | 1000/39.4" | 1 | 0.162 |
| 31CGL1253 | Yes | 327/12.9" | 1 | 0.126 |
| 31CGL1255 | Yes | 500/19.7" | 1 | 0.158 |
| 31CGL1257 | Yes | 700/27.6" | 1 | 0.208 |
| 31CGL12510 | Yes | 1000/39.4" | 1 | 0.281 |
| Three pole electrode. | | | | |
| 31PS31 | Yes | 300/11.8" | 1 | 0.120 |
| Electrode holder (for 3 rod probes). | | | | |
| 31PS3S | No | — | 1 | 0.184 |

① Total electrode length.

| Order code | Rod probe length [mm/in] | Qty per pack n. | Weight [kg] |
|------------------------------|-----------------------------|--------------------|----------------|
| For 31SCM... probes. | | | |
| 31ASTA460MM4 | 460/18.11" | 1 | 0.053 |
| 31ASTA960MM4 | 960/37.8" | 1 | 0.103 |
| For 31PS3S electrode holder. | | | |
| 31ASTA460MM6 | 460/18.11" | 1 | 0.100 |
| 31ASTA960MM6 | 960/37.8" | 1 | 0.210 |

| Order code | Description | Qty per pack n° | Weight [kg] |
|----------------|---|--------------------|----------------|
| 31RE213 | Coupler unit for 31SCM... with electrode extension ASTA...MM4 | 1 | 0.008 |
| 31S8 | 8-pin socket for screw fixing or mounting on 35mm/1.38" DIN rail (IEC/EN/BS 60715), used with LV1E... relay. Screw terminals | 10 | 0.061 |
| 31S11 | 11-pin socket for screw fixing or mounting on 35mm/1.38" DIN rail (IEC/EN/BS 60715), used with LV2E... and CSP2E... relays. Screw terminals | 10 | 0.064 |
| 31RE014 | Relay-socket retention bracket; 31S8 or 31S11 types only | 10 | 0.001 |

General characteristics

11SN1 SINGLE POLE PROBES

A single pole probe used for level control in wells or storage tanks. It comprises of an AISI 303 stainless steel electrode, a plastic (PPOX) holder and a cable gland.

A seal ring and the tightening of the cable gland PG7 prevent water from entering the cable terminal connector and causing its oxidation.

Cable connection: screw.

The external cable diameter must be 2.5 to 6mm/Ø0.1 to 0.24" to warrant perfect sealing.

Maximum connection cable section: 2.5mm².

Maximum operating temperature: +60°C.

Application: tanks and deep wells.

31SCM... PROBES

A single pole probe used for level control on boilers, autoclaves and in general where pressure (10bar maximum) and high temperature (+100°C maximum) are present. It comprises of an AISI 303 stainless steel electrode embedded in an aluminium oxide body and a 3/8" GAS threaded metal support holder.

Cable connection: threaded rod with nut.

Application: tanks, pressurised tanks and boilers.

31CGL125... PROBES

A single pole probe with AISI 302 electrode, used for level control on boilers and autoclaves and in general wherever pressure is maximum up to 10bar.

Maximum operating temperature: +180°C.

Threaded coupling: 3/8" GAS.

Cable connection: threaded rod with nut.

Application: tanks, pressurised tanks and boilers.

31PS31 PROBE

A small electrode holder, complete with three AISI 304 stainless steel probes.

Particularly suited to small containers whenever pressure is maximum up to 2bar.

Maximum operating temperature: +70°C.

Threaded coupling: 1/2" GAS.

Faston termination; related lugs supplied.

Application: tanks and automatic dispensers.

31PS3S ELECTRODE HOLDER

A thermoset resin electrode holder to be used with three probes (rod probes to be ordered separately) and complete with terminal cover.

Maximum operating temperature: +100°C.

2" GAS threaded coupling.

Cable connection: screw.

Application: tanks.

ELECTRODES

Stainless steel AISI 304 electrodes with 4M or 6M threaded extremity suitable as extensions for 31SCM... probe or as rod probe for 31PS3S electrode holder.

Certification and compliance

Certification obtained: EAC.

Compliant with standards: IEC/EN/BS 60255-27.

Operational characteristics

SOCKETS FOR INSTALLING PLUG-IN

LEVEL CONTROL RELAYS.

– Max. wire section for sockets: 2x2.5mm²/2x14AWG

– Tightening torque: 0.8Nm/7.1lb.in

– Ratings: 10A - 400VAC.

Certifications and compliance

Certifications obtained: EAC.

Compliant with standards: IEC/EN/BS 61984,

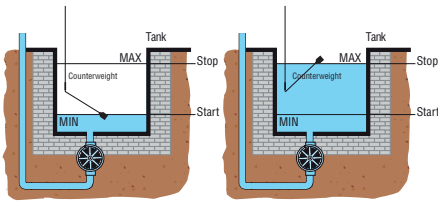
IEC/EN/BS 61210, IEC/EN/BS 60999-1.

For grey water

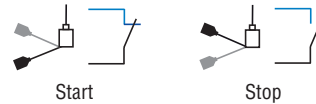


| Order code | Cable material | Cable length | Counterweight included | Qty per pack | Wt |
|------------|----------------|--------------|------------------------|--------------|-------|
| | | [m] | | n. | [kg] |
| LVFSP1W03 | PVC | 3 | Yes | 1 | 0.610 |
| LVFSP1W05 | PVC | 5 | Yes | 1 | 0.830 |
| LVFSP1W10 | PVC | 10 | Yes | 1 | 1.410 |
| LVFSP1W15 | PVC | 15 | Yes | 1 | 1.930 |
| LVFSP1W20 | PVC | 20 | Yes | 1 | 2.380 |
| LVFSN1W03 | Neoprene | 3 | Yes | 1 | 0.640 |
| LVFSN1W05 | Neoprene | 5 | Yes | 1 | 0.880 |
| LVFSN1W10 | Neoprene | 10 | Yes | 1 | 1.510 |
| LVFSN1W15 | Neoprene | 15 | Yes | 1 | 2.080 |
| LVFSN1W20 | Neoprene | 20 | Yes | 1 | 2.480 |

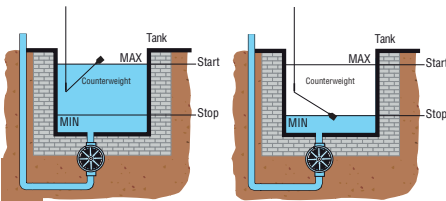
Filling function



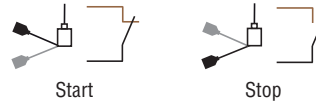
This function is achieved by connecting the black and blue float terminals. The level regulator contact closes the lower circuit at minimum level and opens the circuit when the float switch reaches the upper maximum level. The MIN and MAX levels can be adjusted by varying the distance between counterweight and float switch.



Emptying function



This function is achieved by connecting the black and brown float switch terminals. The level regulator contact closes the upper circuit at maximum level and opens the circuit when the float switch reaches the lower minimum level. The MIN and MAX levels can be adjusted by varying the distance between counterweight and float switch.



General characteristics

Float switches are used in the automation of electrical equipment, such as: pumps, solenoid valves, alarms, motorised sluice gates, etc. All versions feature an internal changeover contact operated in accordance with the level of liquid where the float is located. The cables used are high-quality and offer excellent mechanical or chemical resistance over time.

The cables are 3x1 type, that is 3 wires with section 1mm². This allows the user to choose the filling and emptying function during regulator wiring.

They are used for the civil and industrial control of levels of grey water, e.g. rainwater, groundwater or cooling water from industry. They are available with PVC and neoprene cables of various lengths.

Operational characteristics

- Upper switching angle: 30° ±5°
- Lower switching angle: 30° ±5°
- 130g external counterweight included
- Float casing material: polypropylene
- Cable A05 VV-F3X1 (PVC) available in lengths of 3, 5, 10, 15 and 20m/3.28, 5.47, 10.94, 16.40 and 21.87yd and cable H07 RN-F3X1 (Neoprene) available in lengths of 3, 5, 10, 15 and 20m/3.28, 5.47, 10.94, 16.40 and 21.87yd
- Rated cable diameter: 9mm/0.35" (PVC and Neoprene)
- Relay with changeover contact 10(8)A 250VAC 50/60Hz
- Maximum installation depth: 20m/21.26yd
- Maximum pressure: 2bar
- Operating temperature: 0...+50°C
- Storage temperature: -20...+80°C
- IEC degree of protection: IP68
- Insulation class: II.

Certifications and compliance

Certifications: TÜV-SUD.
Compliant with standards: IEC/EN/BS 60730-1, IEC/EN/BS 60730-2-15.

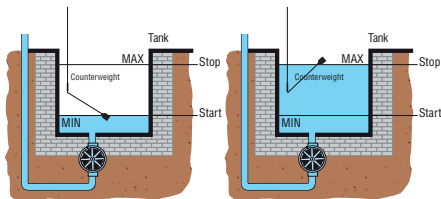
For drinking water



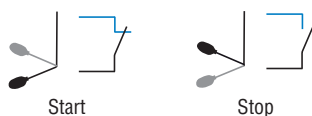
LVFSA1D...

| Order code | Cable material | Cable length | Counter-weight included | Qty | Wt |
|------------|----------------|--------------|-------------------------|---------|-------|
| | | | | per pkg | |
| | | [m] | | n. | [kg] |
| LVFSA1D03 | PVC ACS+AD8 | 3 | Yes | 1 | 0.630 |
| LVFSA1D05 | PVC ACS+AD8 | 5 | Yes | 1 | 0.850 |
| LVFSA1D10 | PVC ACS+AD8 | 10 | Yes | 1 | 1.430 |
| LVFSA1D15 | PVC ACS+AD8 | 15 | Yes | 1 | 1.950 |
| LVFSA1D20 | PVC ACS+AD8 | 20 | Yes | 1 | 2.400 |

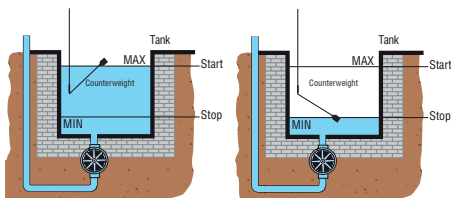
Filling function



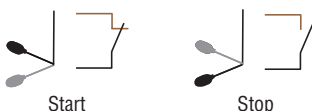
This function is achieved by connecting the black and blue float switch terminals. The level regulator contact closes the lower circuit at minimum level and opens the circuit when the float switch reaches the upper maximum level. The MIN and MAX levels can be adjusted by varying the distance between counterweight and float switch.



Emptying function



This function is achieved by connecting the black and brown float switch terminals. The level regulator contact closes the upper circuit at maximum level and opens the circuit when the float switch reaches the lower minimum level. The MIN and MAX levels can be adjusted by varying the distance between counterweight and float switch.

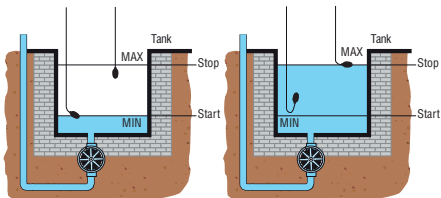


For dirty water

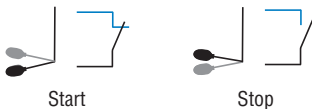


| Order code | Cable material | Cable length | Counter-weight | Qty | Wt |
|------------|----------------|--------------|----------------|---------|-------|
| | | | | per pkg | |
| | | [m] | | n. | [kg] |
| LVFSN1B05 | Neoprene | 5 | Internal | 1 | 1.250 |
| LVFSN1B10 | Neoprene | 10 | Internal | 1 | 1.860 |
| LVFSN1B15 | Neoprene | 15 | Internal | 1 | 2.460 |
| LVFSN1B20 | Neoprene | 20 | Internal | 1 | 3.060 |

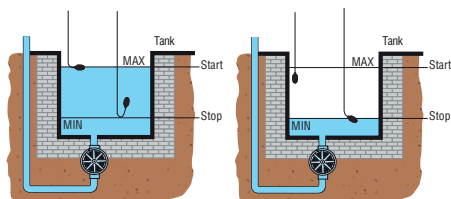
Filling function



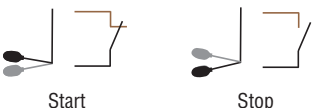
This function uses two float switches and is achieved by connecting the black and blue float switch terminals. The MIN and MAX levels can be adjusted by varying the position of the float switches.



Emptying function



This function uses two float switches and is achieved by connecting the black and brown float switch terminals. The MIN and MAX levels can be adjusted by varying the position of the float switches.



It is possible to use even a single float for black water, adjusting the level in a fixed range of 10cm max, a solution which is not advisable for turbulent waters.

General characteristics

Float switches LVFSA1D type are suitable for drinking water and foodstuffs applications such as aqueducts, fountains, aquariums, drinks, fish hatcheries, swimming pools, etc. They are realised with a non-toxic polypropylene outer shell, a stainless steel untreated sphere, and an AD8 cable with health certification ACS (Attestation de Conformité Sanitaire) with outer sheath with PVC suitable for drinkable water immersion and use with food products. They are provided with stainless steel counterweight AISI 316. All versions, which differ in the length of the cable, feature an internal changeover contact operated in accordance with the level of liquid where the float is located. The cables are 3x1 type, that is 3 wires with section 1mm². This allows the user to choose the filling and emptying function during regulator wiring.

Operational characteristics

- Upper switching angle: 30° ±5°
- Lower switching angle: 30° ±5°
- Stainless steel counterweight AISI 316 included
- Float casing material: polypropylene
- PVC cable ACS + AD8 certified
- Microswitch with changeover contact: 10(8)A 250VAC 50/60Hz
- Maximum installation depth: 20m/21.87yd
- Maximum pressure: 2bar
- Operating temperature: 0...+50°C
- Storage temperature: -20...+80°C
- Degree of protection: IP68
- Insulation class: II.

Certifications and compliance

Certifications: Health certification ACS (Attestation de Conformité Sanitaire) for the cable. Compliant with standards: IEC/EN/BS 60730-1, IEC/EN/BS 60730-2-15.

General characteristics

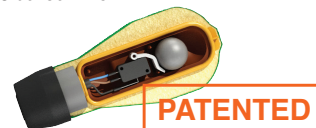
These float switches are used for the civil and industrial control of levels of dirty water, e.g. sewage or waste water from industry. The float switches comprises of a one-piece external blow-moulded polypropylene casing, with fixed internal counterweight located in the cable exit area. The regulator contact is positioned centrally in its own watertight chamber. This is insulated from the external casing by injecting closed-cell foam. This solution further increases protection against moisture leakage and heat insulates the watertight chamber housing the contact, eliminating the creation of condensation.

Operational characteristics

- Upper switching angle: 30° ±5°
- Lower switching angle: 20° ±5°
- Internal counterweight
- Float casing material: polypropylene
- Cable H07 RN-F3X1 (Neoprene) available in lengths of 5, 10, 15 and 20m/5.47, 10.94, 16.40 and 21.87yd
- Rated cable diameter: 9mm/0.35"
- Relay with changeover contact 10(4)A 250VAC 50/60Hz
- Maximum installation depth: 100m/109.36yd
- Maximum pressure: 10bar
- Operating temperature: 0...+50°C
- Storage temperature: -20...+80°C
- IEC degree of protection: IP68
- Insulation class: II.

Certifications and compliance

Certifications: TÜV-SUD. Compliant with standards: IEC/EN/BS 60730-1, IEC/EN/BS 60730-2-15.



Priority change relays for 2 motors Modular version



LVMP05



LVMP10...

Priority change relays for 2 motors Plug-in version



31CSP2E...

| Order code | Auxiliary supply voltage | Type of output contacts | Qty per pack | Weight |
|------------|--------------------------|-------------------------|--------------|--------|
| | [V] | ↘ | n° | [kg] |

2 outputs. AC and DC supply voltage.

| | | | | |
|---------------|-------------------------|----------------------|---|-------|
| LVMP05 | 24/48VDC 24...240VAC | 2NO with same common | 1 | 0.090 |
|---------------|-------------------------|----------------------|---|-------|

2 outputs. AC supply voltage.
Possible starting of stand-by motor.

| | | | | |
|-------------------|--------------|-------------|---|-------|
| LVMP10A024 | 24VAC | 2 NO (SPST) | 1 | 0.250 |
| LVMP10A127 | 110...127VAC | 2 NO (SPST) | 1 | 0.250 |
| LVMP10A240 | 220...240VAC | 2 NO (SPST) | 1 | 0.250 |
| LVMP10A415 | 380...415VAC | 2 NO (SPST) | 1 | 0.250 |

General characteristics

Priority change relays are designed to balance the operating time and hence the wear of pumps, compressors, generators, when two units, primary and stand-by, are installed.

Operational characteristics

- Operating limits: 0.85...1.1 U_e
- Connection: permanent
- Green LED indicator for power on
- Red LED indicators for output relay state 1 for LVMP05, 2 for LVMP10
- Modular DIN 43880 housing (1 module LVMP05, 3 modules LVMP10)
- IEC degree of protection: IP40 on front (only when mounted in housing or electric board with IP40); IP20 on terminals.

Certifications and compliance

Certifications obtained: UL Listed, for USA and Canada (cULus-File E93601), as Auxiliary Devices - Automatic starting control, EAC.

Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-3, UL508, CSA C22.2 n° 14.

| Order code | Auxiliary supply voltage | Type of output contacts | Qty per pack | Weight |
|------------|--------------------------|-------------------------|--------------|--------|
| | [V] | ↘ | n° | [kg] |

2 outputs. AC supply voltage.
Possible starting of stand-by motor.

| | | | | |
|-------------------|--------------|-------------|---|-------|
| 31CSP2E24 | 24VAC | 2 NO (SPST) | 1 | 0.150 |
| 31CSP2E110 | 110VAC | 2 NO (SPST) | 1 | 0.150 |
| 31CSP2E220 | 220VAC | 2 NO (SPST) | 1 | 0.150 |
| 31CSP2E230 | 230...240VAC | 2 NO (SPST) | 1 | 0.150 |

General characteristics

Priority change relays are designed to balance the operating time, and hence the wear of pumps, compressors, generators, when two units, primary and stand-by, are installed.

Operational characteristics

- Operating limits: 0.85...1.1 U_e
- Connection: permanent
- Voltage applied to input contacts: 15VDC not insulated at power supply
- Input contacts current consumption: about 1mA.
- 11-pin plug-in housing (see socket 31S11)
- IEC degree of protection: IP30.

Certifications and compliance

Certifications obtained: EAC.

Compliant with standards: IEC/EN/BS 60255-27, IEC/EN/BS 61000-6-2, IEC/EN/BS 61000-6-4.

Priority change relays for 3 or 4 motors Modular version



LVMP30...

new

| Order code | Auxiliary supply voltage | Type of output contacts | Qty per pack | Weight |
|-------------------------------|--------------------------|-------------------------|--------------|--------|
| | [V] | ∩ | n° | [kg] |
| 4 outputs. AC supply voltage. | | | | |
| LVMP30A024 | 24VAC | 4 | 1 | 0.250 |
| LVMP30A240 | 100...240VAC | 4 | 1 | 0.242 |

General characteristic

The LVMP30... priority change relays manage the alternation between 3 or 4 motors, with the purpose of making homogeneous operating time and wear. They are typically used in pumping systems where there may be 3 or 4 pumps to be controlled alternately. The presence of the keyboard with display allows to set up the system configuration quickly and easily, by selecting the number of motors to control, the setting of motor switch-on and switch-off delays, and to monitor the number of starting and the operating hours for each motor.

FUNCTIONS

- Management of alternation between 3 or 4 motors
- 5 digital inputs for liquid level signaling (enable + 4 levels)
- 1 digital input to enable the operation with latch (every time a motor is activated, it remains active until the liquid drops below the minimum level probe)
- 4 relay outputs with NO contact for motor control
- Possibility to set motor switch-on and switch-off delays
- Monitoring of the number of starts and the operating hours of each motor.

Operational characteristics

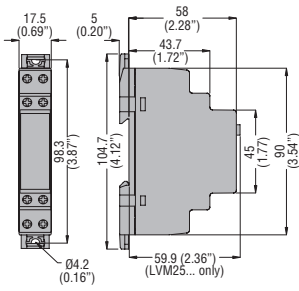
- Operating limits:
 - LVMP30A024: 20.4...28.8VAC (47...63Hz)
 - LVMP30A240: 85...265VAC (47...63Hz)
- Connection: permanent
- Modular DIN 43880 housing (4 modules)
- IEC degree of protection: IP20.

Certifications and compliance

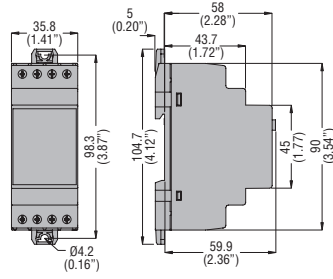
Certifications obtained: cULus, EAC.
Compliant with standards: IEC/EN/BS 61131-2, UL508, CSA C22.2 n°142.

LEVEL CONTROL AND START-UP PRIORITY CHANGE RELAYS

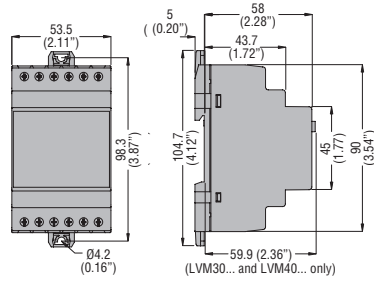
LVM25... - LVMP05



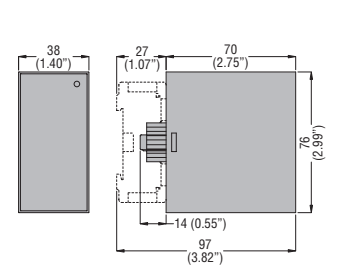
LVM20...



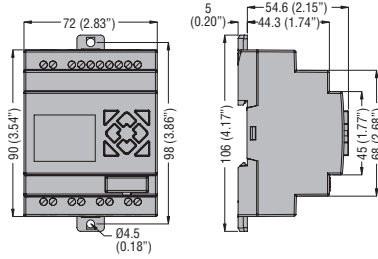
LVM30... - LVM40... - LVMP10



31LV1E... - 31LV2E... - 31CSP2E...

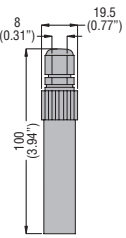


LVMP30...

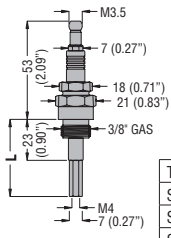


PROBES AND ELECTRODE HOLDERS FOR CONDUCTIVE LIQUIDS

11SN1

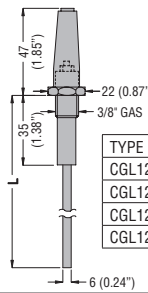


31SCM...



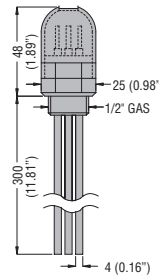
| TYPE | L |
|--------|---------------|
| SCM04 | 43 (1.69") |
| SCM50 | 500 (19.68") |
| SCM100 | 1000 (39.37") |

31CGL125...

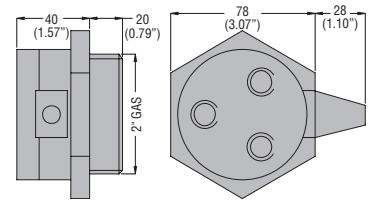


| TYPE | L |
|----------|---------------|
| CGL1253 | 327 (12.87") |
| CGL1255 | 500 (19.68") |
| CGL1257 | 700 (27.55") |
| CGL12510 | 1000 (39.37") |

31PS31

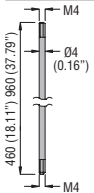


31PS3S

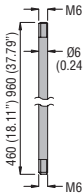


ELECTRODES

31ASTA460MM4 31ASTA960MM4

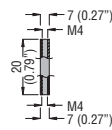


31ASTA460MM6 31ASTA960MM6



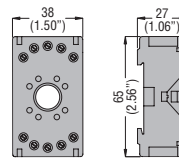
Coupler unit

31RE213

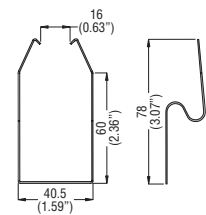


ACCESSORIES

31S8 - 31S11

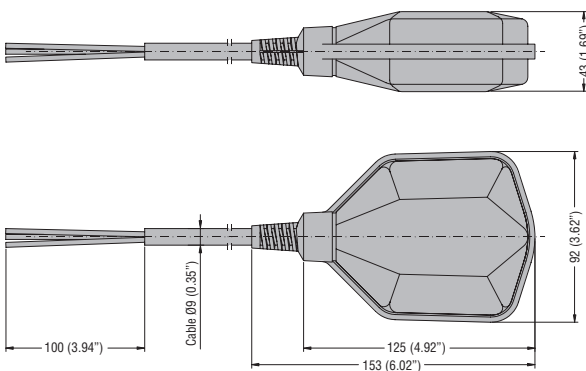


31RE014

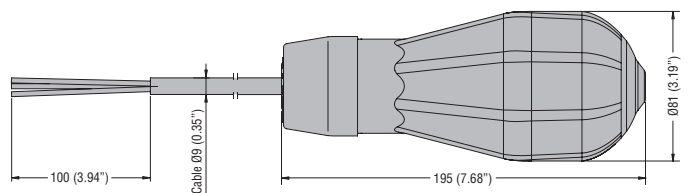


FLOAT SWITCHES

LVFS...W... LVFS...D...

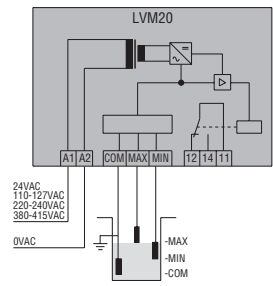


LVFSN1B...

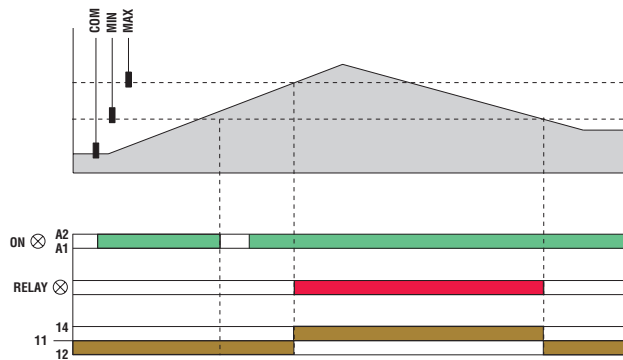


Emptying function

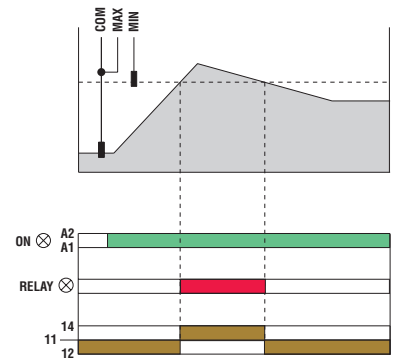
LVM20



Emptying function with 3 electrodes

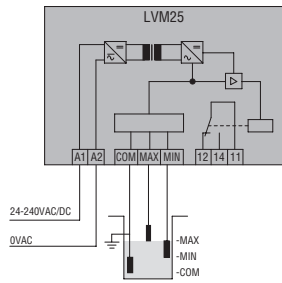


Emptying function with 2 electrodes

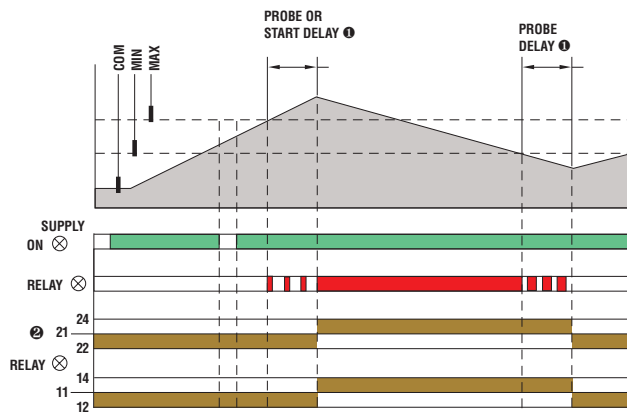


Emptying or filling functions

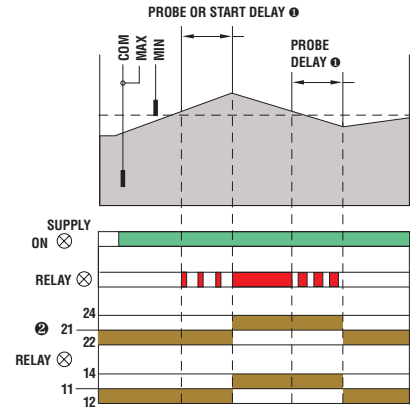
LVM25



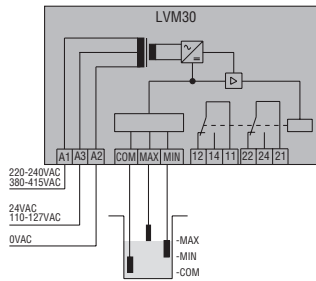
Emptying function (DOWN) Connection with 3 electrodes



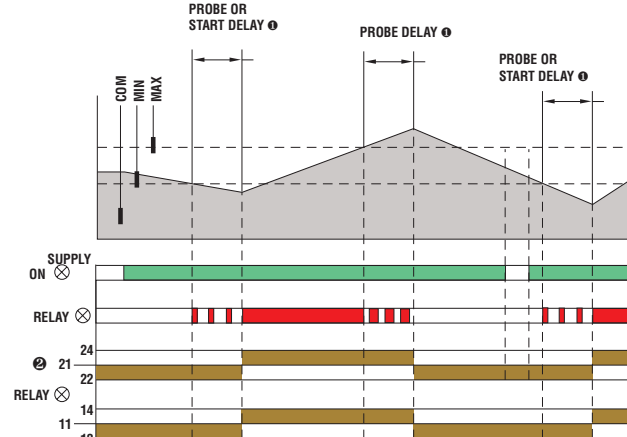
Connection with 2 electrodes



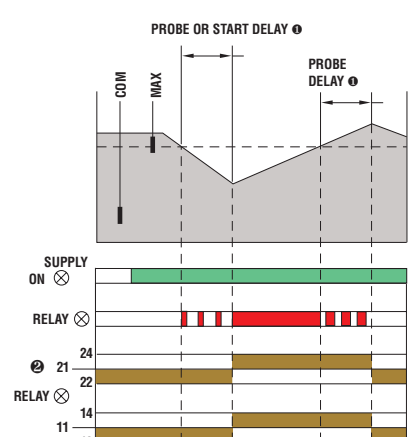
LVM30



Filling function (UP) Connection with 3 electrodes



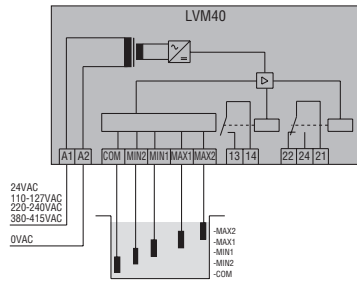
Connection with 2 electrodes



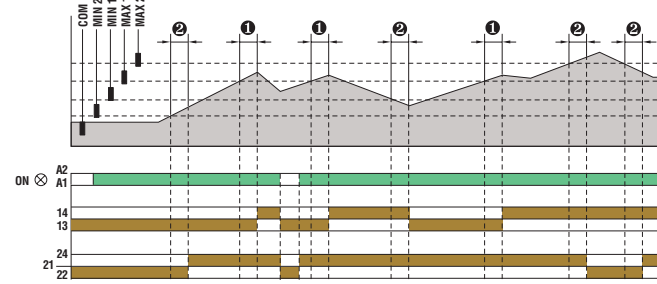
- ① Delay for LVM30 only.
- ② Changeover contact (SPDT) for LVM30 only.

- ① Delay for LVM30 only.
- ② Changeover contact (SPDT) for LVM30 only.

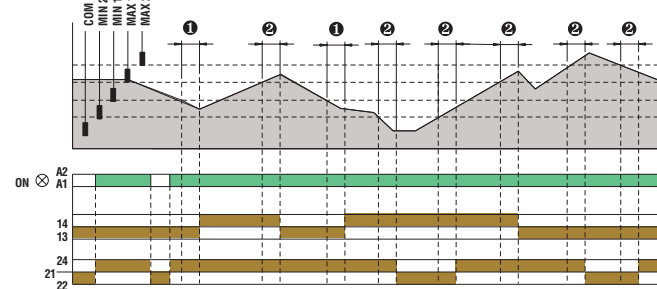
Multifunctions.
LVM40



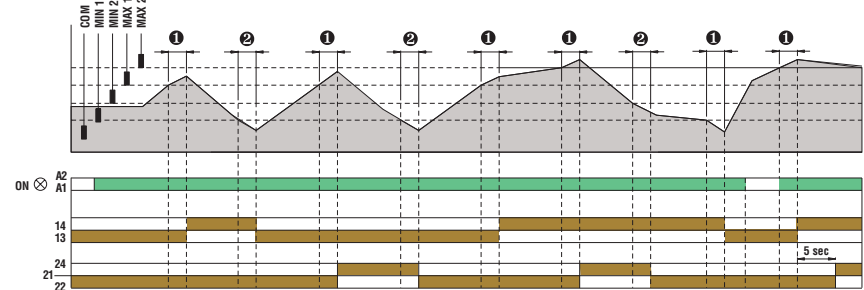
Emptying function + alarms



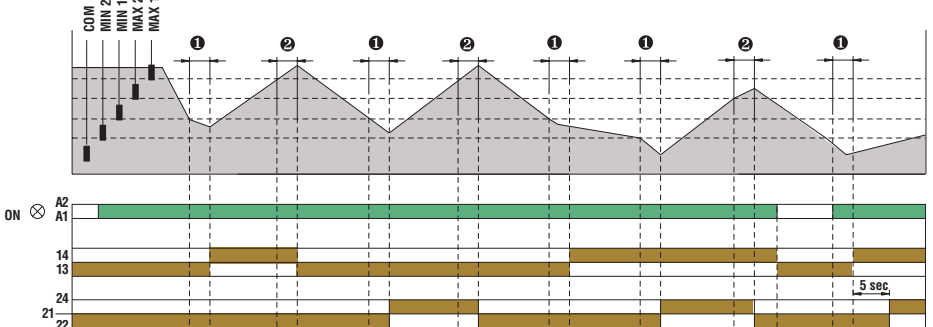
Filling function + alarms



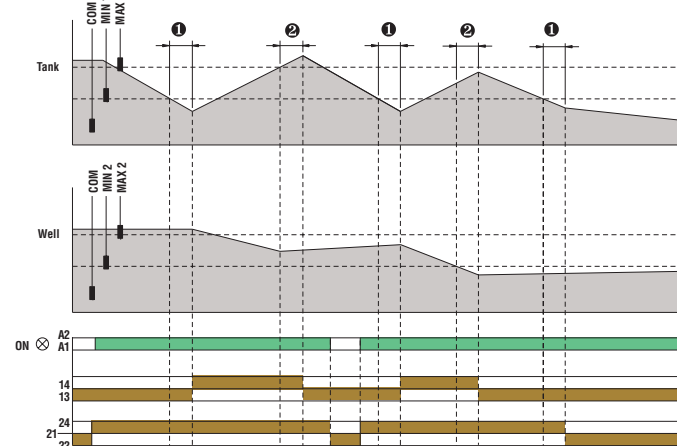
Emptying function + pump change



Filling function + pump change



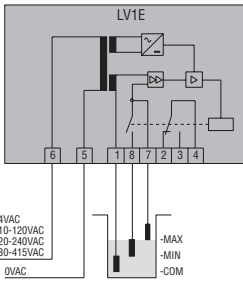
Filling tank and draining well function + alarm



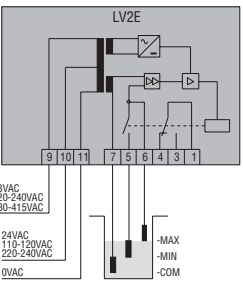
- ① Probe delay + start delay.
- ② Probe delay.

Emptying function

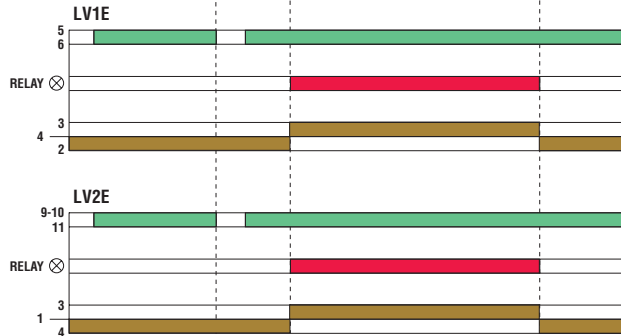
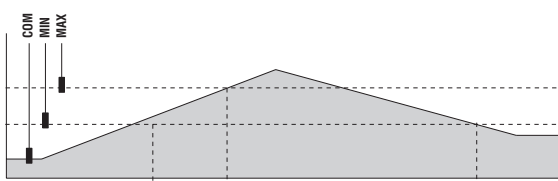
31LV1E



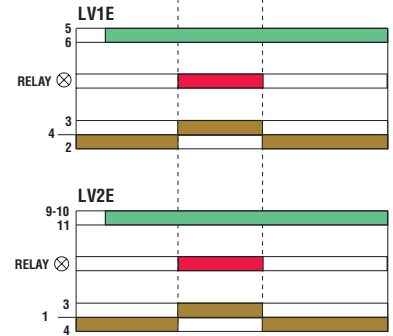
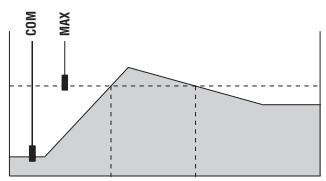
31LV2E



Emptying function with 3 electrodes

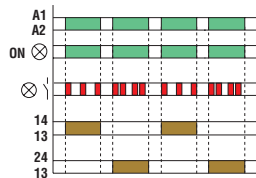
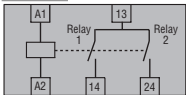


Emptying function with 2 electrodes



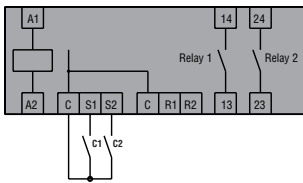
Priority change relays

LVMP05

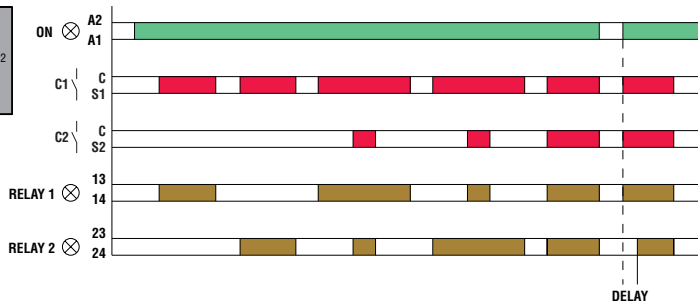


LVMP10

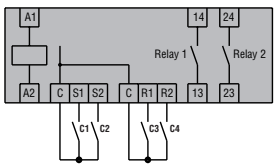
2-wire connection



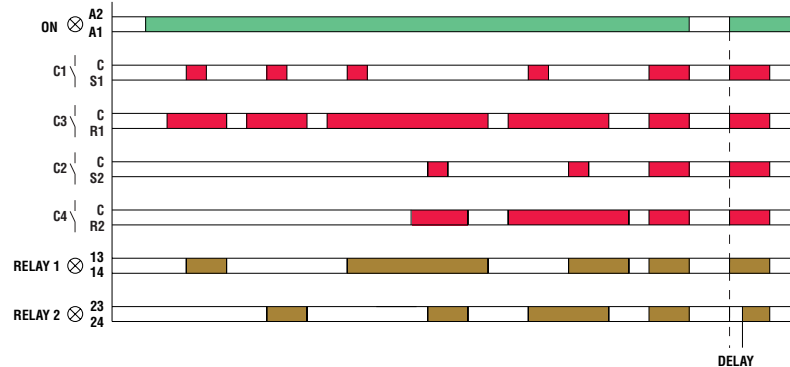
C1 = Primary
C2 = Secondary / Standby



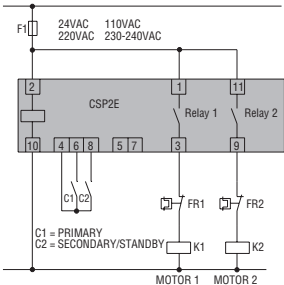
3-wire connection



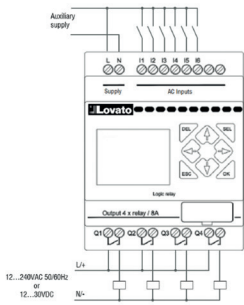
C1 = Start Primary
C2 = Start Standby
C3 = Stop Primary
C4 = Stop Standby



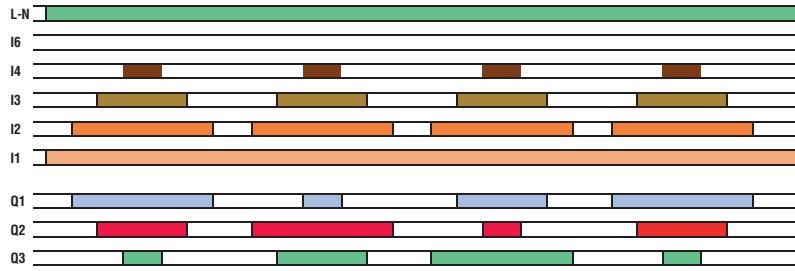
31CSP2E



LVMP30...

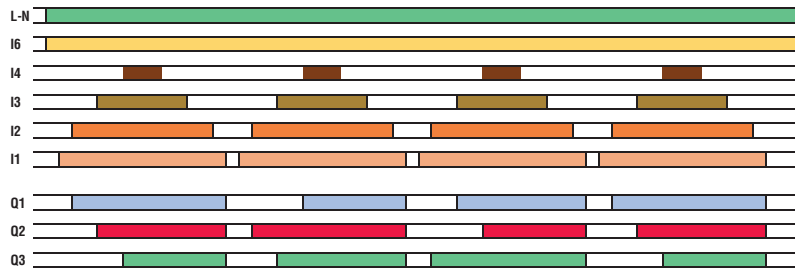


3-motor operation, without latch



- I1 = Minimum level (enable)
- I2 = Start motor 1
- I3 = Start motor 2
- I4 = Start motor 3
- I6 = Latch enable

3-motor operation, with latch



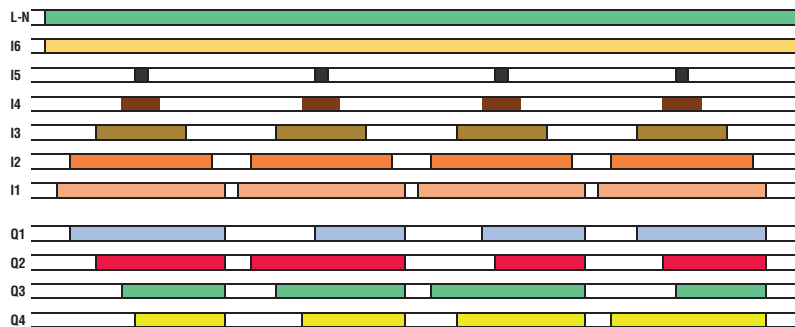
- Q1 = Motor 1
- Q2 = Motor 2
- Q3 = Motor 3

4-motor operation, without latch



- I1 = Minimum level (enable)
- I2 = Start motor 1
- I3 = Start motor 2
- I4 = Start motor 3
- I5 = Start motor 4
- I6 = Latch enable

3-motor operation, with latch



- Q1 = Motor 1
- Q2 = Motor 2
- Q3 = Motor 3
- Q4 = Motor 4

23 Level controls and float switches

Technical characteristics

| TYPE | LVM20... | LVM25... | LVM30... | LVM40... | |
|---|---|---|---|--|--|
| DESCRIPTION | | | | | |
| | Modular | | | | |
| | Automatic reset | | | | |
| Function | Single voltage Emptying function | Multi voltage Emptying or filling function | Dual voltage Emptying or filling function | Single voltage Multifunctions | |
| Operating principle | Electrical conductivity of liquids | | | | |
| AUXILIARY SUPPLY | | | | | |
| Rated supply voltage Us | 24VAC 110...127VAC 220...240VAC 380...415VAC | 24...240VAC/DC | 24/220...240VAC 110...127/380...415VAC | 24VAC 110...127VAC 220...240VAC 380...415VAC | |
| Operating voltage range | 0.85...1.1 Us; 50/60Hz ±5% | | | | |
| Power consumption (maximum) | 3.5VA | 3VA | 5.5VA | 4.5VA | |
| Power dissipation (maximum) | 1.8W | 1.2W | 2.8W | 2.8W | |
| LEVEL ELECTRODES | | | | | |
| Number of connectable electrodes | 3 | 3 | 3 | 5 | |
| Type of electrode | Electrode and electrode holders: SN1 / SCM / CGL / PS31 / PS3S or similar | | | | |
| Electrode voltage | 7.5VAC | 10Vpp | 7.5VAC | 10Vpp | |
| Sensitivity | 2.5...50kOhm | 2.5...100kOhm | 2.5...50kOhm | 2.5...200kOhm | |
| TIME DELAYS | | | | | |
| Tripping time (minimum) | ≤ 600ms | ≤ 1s | 1s | 1s | |
| Resetting time (minimum) | ≤ 750ms | ≤ 1s | 1s | 1s | |
| Probe tripping delay | — | — | OFF...10s | 1...10s | |
| Relay energising delay | — | — | OFF...300s | 0...30min | |
| RELAY OUTPUTS | | | | | |
| Number of relays | 1 | 1 | 2 | 2 | |
| Relay state | Normally de-energised, energises at tripping | | | | |
| Contact arrangement | 1 changeover / SPDT | 1 changeover / SPDT | 2 changeover / SPDT each | 1 changeover / SPDT and 1 with 1 N/O - SPST | |
| Rated utilisation voltage | 250VAC | | | | |
| Maximum switching voltage | 400VAC | | | | |
| IEC conventional free air thermal current Ith | 8A | | | | |
| UL/CSA and IEC/EN/BS 60947-5-1 designation | B300 | | | | |
| Electrical life (with rated load) | 10 ⁵ cycles | | | | |
| Mechanical life | 30x10 ⁶ cycles | | | | |
| Indications | 1 green LED for power on 1 red LED for relay state | 1 green LED for power on 1 red LED for relay state | 1 green LED indicator for power on 1 red LED for relay state | 1 green LED indicator for power on 2 red LEDs for relay state 2 red LEDs for probe state | |
| INSULATION | | | | | |
| IEC rated insulation voltage Ui | 415VAC | 250VAC | 415VAC | 415VAC | |
| IEC rated impulse withstand voltage Uimp | 6kV | 6kV | 6kV | 6kV | |
| IEC power frequency withstand voltage | 4kV | 4kV | 4kV | 4kV | |
| Double insulation Supply/relay/electrode | ≤ 250VAC | ≤ 250VAC ^① | ≤ 250VAC | ≤ 250VAC | |
| CONNECTIONS | | | | | |
| Tightening torque maximum | 0.8Nm (7lb.in; 7-9lb.in for UL/CSA) | | | | |
| Conductor section min-max | 0.2...4mm ² (24...12AWG; 18...12AWG for UL/CSA) | | | | |
| AMBIENT CONDITIONS | | | | | |
| Operating temperature | -20...+60°C | | | | |
| Storage temperature | -30...+80°C | | | | |
| HOUSING | | | | | |
| Material | Self-extinguishing polyamide | | | | |
| Typical configuration (examples) | LVM20 + n° 3 SN1 electrodes LVM30 + n° 3 SN1 electrodes | | LVM25 + n° 3 SN1 electrodes LVM40 + n° 5 SN1 electrodes | | |
| Maximum cable length | ② | | | | |

① Double insulation between supply, electrodes and output relay circuit.

② Voltage applied to input contacts, not insulated at power supply.

③ Consult Technical support for more information; see contact Tel. +39 035-4282422 - E-mail: service@LovatoElectric.com.

| | 31LV1E... | 31LV2E... | LVMP05 | LVMP10 | 31CSP2E | LVMP30 |
|--|--|---------------------------|--|--|----------------------------------|---|
| | Plug-in | | Modular | Modular | Plug-in | Modular with display |
| | Automatic resetting | | — | — | — | — |
| | Single voltage | Dual voltage | Multistage | Single voltage | Single voltage | Multi voltage |
| | Emptying function | | Priority change for two motors | | | Priority change for 3-4 motors |
| | Electrical conductivity of liquids | | — | | | — |
| | 24VAC | 24/48VAC | 24/48VDC 24...240VAC | 24VAC | 24VAC [Ⓢ] | 24VAC 100...240VAC |
| | 110...120VAC | 110...120VAC/220...240VAC | | 110...127VAC | 110VAC [Ⓢ] | |
| | 220...240VAC | 220...240VAC/380...415VAC | | 220...240VAC | 220VAC [Ⓢ] | |
| | 380...415VAC | | | 380...415VAC | 230/240VAC [Ⓢ] | |
| | 0.8...1.1 Us; 50/60Hz | | | | | 20.4...28.8VAC (LVMP30A024) 50/60Hz ±5% 85...265VAC (LVMP30A240) 50/60Hz ±5% |
| | 5.5VA | | 1.6VA | 4.8VA | 5VA | — |
| | 2.8W | | 0.9W | 3W | 3W | 7.5W |
| | 3 | | — | — | — | — |
| | Electrode and electrode holders: SN1 / SCM / CGL / PS31 / PS3S / or similar | | — | — | — | — |
| | 9VAC (voltage between probes) | | — | — | — | — |
| | 7...8 kΩ fixed | | — | — | — | — |
| | ≤ 50ms | | — | — | — | — |
| | ≤ 100ms | | — | — | — | — |
| | — | | — | — | — | — |
| | — | | — | — | — | — |
| | 1 | | 2 | 2 | 2 | 4 |
| | Normally de-energised, energises at tripping | | | | | |
| | 1 changeover contact / SPDT | | 2 N/O with same common | 2 N/O - SPST | 2 N/O - SPST | 4 N/O |
| | 220VAC | | 250VAC | 250VAC | 250VAC | 250VAC |
| | 380VAC | | — | — | — | 265VAC |
| | 5A | | 8A | 8A | 5A | 8A |
| | B300 | | B300 | B300 | B300 | — |
| | 2.5x10 ⁵ cycles | | 10 ⁵ cycles | 10 ⁵ cycles | 10 ⁵ cycles | 10 ⁵ cycles |
| | 50x10 ⁶ cycles | | 30x10 ⁶ cycles | 30x10 ⁶ cycles | 30x10 ⁶ cycles | — |
| | 1 red LED for relay state | | 1 green LED for power on 1 red LED for relay state | 1 green LED for power on 2 red LED for relays state | 1 green/red LED for relay state | Display for monitoring motor status, number of starts and working hours |
| | 415VAC | | 250VAC | 415VAC | 250VAC | Ⓢ |
| | 5kV | | 4kV | 4kV | 4kV | Ⓢ |
| | 2kV | | 2kV | 2.5kV | 2.5kV | Ⓢ |
| | — | | | | | |
| | — | | 0.8Nm (7lb.in; 7-9lb.in for UL/CSA) | | — | 0.6Nm (5.3lb.in) |
| | — | | 0.2...4.0mm ² (24...12AWG; 18...12AWG for UL/CSA) | | — | 0.14...2.5mm ² (26...14AWG) |
| | | | -20...+60°C | | -20...+55°C | |
| | | | -30...+80°C | | -40...+70°C | |
| | Self-extinguishing polycarbonate | | Self-extinguishing polyamide | Self-extinguishing polyamide | Self-extinguishing polycarbonate | Polyamide |
| | LV1E + n° 3 SN1 electrode LV2E + n° 2 SN1 electrodes + reset button | | — | — | — | — |
| | 500m/547yd single-core, double insulated cables | | — | — | — | — |