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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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**ELECTRODES, ELECTRODE HOLDERS AND PROBES**
- Single-pole
- Three pole.

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**FLOAT LEVEL REGULATORS**
- Versions for white and black water
- Versions with PVC and Neoprene cable
- Emptying or filling functions.


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**PRIORITY CHANGE RELAY**
- Two outputs
- Single or multivoltage
- Modular and plug-in versions.

- Level monitoring for electrically conductive liquids.
- Modular and plug-in versions.
- Adjustable 2.5…200kΩ sensitivity.
- Single and three-pole electrodes.
- Float level regulators.
- Start-up priority change monitoring.









| Description | LEVEL CONTROL RELAYS | | | | | | PRIORITY CHANGE RELAYS FOR 2 MOTORS | | |
|---|---|---|---|---|---|---|---|---|---|
| | LVM20 | LVM25 | LVM30 | LVM40 | LV1E | LV2E | LVMP05 | LVMP10 | CSP2E |
| Modular version | ●(2U) | ●(1U) | ●(3U) | ●(3U) | | | ●(1U) | ●(3U) | |
| 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 | | | | ● | | | | | |
| 7…8kΩ fixed sensitivity | | | | | ● | ● | | | |
| Adjustable sensitivity full-scale value 25-50-100-200 kΩ | | | | ● | | | | | |
| Separate sensitivity adjustment for MAX probe (foam detection) | | | | ● | | | | | |
| Emptying function and alarms | ● | ● | ● | ● | ● | ● | | | |
| Filling function and alarms | | ● | ● | ● | | | | | |
| Emptying function with Extra-MIN and/or Extra-MAX alarm relays | | | | ● | | | | | |
| Filling function with Extra-MIN and/or Extra-MAX alarm relays | | | | ● | | | | | |
| Emptying function with start change control | | | | ● | | | | | |
| Filling function with start change control | | | | ● | | | | | |
| Tank filling, well drawing functions and alarm | | | | ● | | | | | |
| Filling-emptying adjustment selector | | ● | ● | | | | | | |
| Programming selector for 5 different functions | | | | ● | | | | | |
| Motor start-up priority change | | | | | | | ● | | |
| Motor start-up priority change with stand-by motor function | | | | | | | | ● | ● |
| Page | 19-3 | | | 19-4 | 19-5 | | 19-8 | | |




| Some permitted liquid substances | | | | Liquid substances not permitted |
|---|---|---|---|---|
| Type of liquid | Resistivity kΩcm | Type of liquid | Resistivity kΩcm | |
| Drinking water | 5–10 | Millk | ~1 | • Purified water<br>• Deionised water<br>• Petrol<br>• Oil<br>• Liquid gases<br>• Paraffin<br>• Ethylene glycol<br>• Paints<br>• 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…

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|---|---|---|---|---|
| | [V] 50/60Hz | | n° | [kg] |
| Automatic reset. | | | | |
| **LVM20 A024** | 24VAC | 1 | 1 | 0.215 |
| **LVM20 A127** | 110...127VAC | 1 | 1 | 0.215 |
| **LVM20 A240** | 220...240VAC | 1 | 1 | 0.215 |
| **LVM20 A415** | 380...415VAC | 1 | 1 | 0.215 |

**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)
- Protection rating: IP40 on front (if placed in IP40 housing and/or electrical panel), IP20 terminals.

**Certifications and compliance**
Certifications obtained: cULus, EAC.
Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL508, CSA C22.2 no. 14.

**Electrodes, electrode holders and floats**
Use electrodes and holders type:
SN1/PS31/PS3S/SCM/CGL or similar (see page 19-6).
For the choice of float see page 19–7.

## Multi-voltage relay

LVM25 240

LVMKIT25

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|---|---|---|---|---|
| | [V] | | n° | [kg] |
| Emptying or filling functions. Automatic reset. | | | | |
| **LVM25 240** | 24...240VAC/DC | 1 | 1 | 0.095 |

| Order code | Description | Qty per pack | Wt |
|---|---|---|---|
| | | n° | [kg] |
| Level control relay LVM25 240 and SN1 electrodes kit. | | | |
| **LVMKIT25** | Level control relay LVM25 240 and 2 SN1 electrodes | 1 | 0.192 |

**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)
- Protection rating: IP40 on front (if placed in IP40 housing and/or electrical panel), IP20 terminals.

**Certifications and compliance**
Certifications obtained: cULus, EAC.
Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-4, UL508, CSA C22.2 n° 14.

**Electrodes, electrode holders and floats**
Use electrodes and holders type:
SN1/PS31/PS3S/SCM/CGL or similar (see page 19-6).
For the choice of float see page 19–7.

## Dual-voltage relay

LVM30…

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|---|---|---|---|---|
| | [V] 50/60Hz | | n° | [kg] |
| Emptying or filling functions. Automatic reset. | | | | |
| **LVM30 A240** | 24/220...240VAC | 2 | 1 | 0.315 |
| **LVM30 A415** | 110...127VAC 380...415VAC | 2 | 1 | 0.315 |

**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)
- Protection rating: IP40 on front (if placed in IP40 housing and/or electrical panel), IP20 terminals.

**Certifications and compliance**
Certifications obtained: cULus, EAC.
Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL508, CSA C22.2 n° 14.

**Electrodes, electrode holders and floats**
Use electrodes and holders type:
SN1/PS31/PS3S/SCM/CGL or similar (see page 19-6).
For the choice of float see page 19–7.

## Single-voltage multifunction relay

**LVM40...**

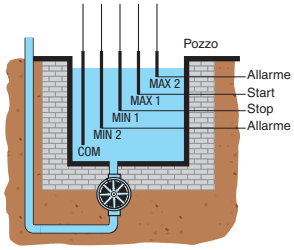
| Order code | Auxiliary supply voltage | Type of output contacts | Qty per pack | Weight |
|---|---|---|---|---|
| | [V] 50/60Hz | ❶ | n° | [kg] |
| Multifunctions. Automatic reset. | | | | |
| **LVM40 A024** | 24VAC | 1+1NO | 1 | 0.278 |
| **LVM40 A127** | 110...127VAC | 1+1NO | 1 | 0.278 |
| **LVM40 A240** | 220...240VAC | 1+1NO | 1 | 0.278 |
| **LVM40 A415** | 380...415VAC | 1+1NO | 1 | 0.278 |

❶ Two relay outputs; one with c/o (SPDT) and the other with N/O (SPST).

FUNCTIONS

A- Emptying with MIN and/or MAX alarms.

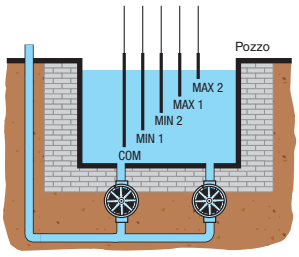
B- Filling with MIN and/or MAX alarms.




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.

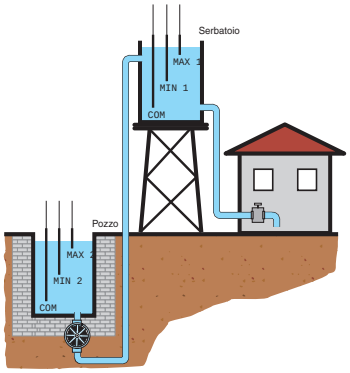
C- Emptying with pump priority change.

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 priority start-up change control (pos. C)
  - filling function with priority start-up change pump (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
- Mmodular DIN 43880 housing (3 modules)
- Protection rating: IP40 on front (if placed in IP40 housing and/or electrical panel), IP20 terminals.

**Certifications and compliance**
Certifications obtained: cULus, EAC.
Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL508, CSA C22.2 n° 14.

**Electrodes, electrode holders and floats**
Use electrodes and holders type:
SN1/PS31/PS3S/SCM/CGL or similar (see page 19-6).
For the choice of float see page 19–7.

## Single-voltage relay


31 LV1E...

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|---|---|---|---|---|
| | [V] 50/60Hz | | n° | [kg] |
| Automatic reset. | | | | |
| **31 LV1E 24** | 24VAC | 1 | 1 | 0.263 |
| **31 LV1E 110** | 110...120VAC | 1 | 1 | 0.263 |
| **31 LV1E 230** | 220...240VAC | 1 | 1 | 0.263 |
| **31 LV1E 400** | 380...415VAC | 1 | 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
- 35mm DIN rail fixing or 8-pin plug-in housing
- 8-pin plug-in housing (socket S8 or L48 P8 with G216; see page 19-9)
- Protection rating: IP30.

**Certifications and compliance**
Certifications obtained: EAC.
Compliant with standards: IEC/EN 60255-5.

**Electrodes, electrode holders and floats**
Use electrodes and holders type:
SN1/PS31/PS3S/SCM/CGL or similar (see page 19-6).
For the choice of float see page 19–7.

## Dual-voltage relay


31 LV2E...

| Order code | Auxiliary supply voltage | Type of output contact | Qty per pack | Wt |
|---|---|---|---|---|
| | [V] 50/60Hz | | n° | [kg] |
| Automatic reset. | | | | |
| **31 LV2E 48** | 24/48VAC | 1 | 1 | 0.266 |
| **31 LV2E 220** | 110...120VAC/ 220...240VAC | 1 | 1 | 0.266 |
| **31 LV2E 400** | 220...240VAC/ 380...415VAC | 1 | 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
- 35mm DIN rail fixing or 11-pin plug-in housing
- 11-pin plug-in housing (socket S11 or L48 P11 with G216; see page 19-9)
- Protection rating: IP30.

**Certifications and compliance**
Certifications obtained: EAC.
Compliant with standards: IEC/EN 60255-5.

**Electrodes, electrode holders and floats**
Use electrodes and holders type:
SN1/PS31/PS3S/SCM/CGL or similar (see page 19-6).
For the choice of float see page 19–7.

## Electrodes and electrode holder


11 SN1


31 SCM...


31 CGL125...


31 PS31


31 PS3S

| Order code | Probe included | Probe length | Qty per pack | Weight |
|---|---|---|---|---|
| | | [mm] | n° | [kg] |
| Single pole electrodes. | | | | |
| **11 SN1** | yes | 100 ❶ | 10 | 0.050 |
| **31 SCM 04** | yes | 43 | 1 | 0.060 |
| **31 SCM 50** | yes | 500 | 1 | 0.115 |
| **31 SCM 100** | yes | 1000 | 1 | 0.162 |
| **31 CGL125 3** | yes | 327 | 1 | 0.126 |
| **31 CGL125 5** | yes | 500 | 1 | 0.158 |
| **31 CGL125 7** | yes | 700 | 1 | 0.208 |
| **31 CGL125 10** | yes | 1000 | 1 | 0.281 |
| Three pole electrode. | | | | |
| **31 PS31** | yes | 300 | 1 | 0.120 |
| Electrode holder (for 3 rod probes). | | | | |
| **31 PS3S** | no | — | 1 | 0.184 |

❶ Total electrode length.

**General characteristics**
SN1 SINGLE POLE ELECTRODE
A single pole electrode used for level control in wells or storage tanks. It comprises an AISI 303 stainless steel probe, 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: 2.5mm$^2$.
Maximum operating temperature: +60°C.
Application: Tanks and deep wells.

SCM... ELECTRODES
A single pole electrode used for level control on boilers, autoclaves and in general where pressure (10 bar maximum) and high temperature (+100°C maximum) are present. It comprises an AISI 303 stainless steel probe 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.

CGL125... ELECTRODES
A single pole electrode with AISI 302 probe, used for level control on boilers and autoclaves and in general wherever pressure is up to 10 bar maximum.
Maximum operating temperature: +180°C.
Threaded coupling: 3/8" GAS.
Cable connection: Threaded rod with nut.
Application: Tanks, pressurised tanks and boilers.

PS31 ELECTRODE
A small electrode holder, complete with three AISI 304 stainless steel probes.
Particularly suited to small containers whenever pressure is maximum up to 2 bar.
Maximum operating temperature: +70°C.
Threaded coupling: 1/2" GAS.
Faston termination; relative lugs supplied
Application: Tanks and automatic dispensers.

PS3S ELECTRODE HOLDER
A thermoset resin electrode holder to be used with three probes (rods probes to be ordered separately) and complete with terminal cover.
Maximum operating temperature: +100°C.
2" GAS threaded coupling.
Cable connection: screw.
Application: tanks.

**Compliance**
Compliant with standards: IEC/EN 60255-5.

## Electrodes


31 ASTA...

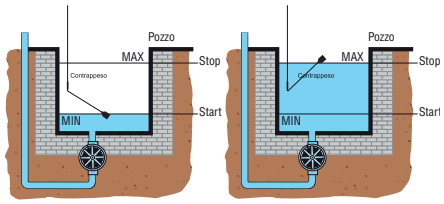
| Order code | Probe length | Qty per pack | Wt |
|---|---|---|---|
| | [mm] | n° | [kg] |
| For SCM electrodes. | | | |
| **31 ASTA 460 MM4** | 460 | 1 | 0.053 |
| **31 ASTA 960 MM4** | 960 | 1 | 0.103 |
| For PS3S electrode holder. | | | |
| **31 ASTA 460 MM6** | 460 | 1 | 0.100 |
| **31 ASTA 960 MM6** | 960 | 1 | 0.210 |

**General characteristics**
Stainless steel AISI 304 probes with 4M or 6M threaded extremity suitable as extensions for SCM electrode or as rod probe for PS3S holder.
For connecting SCM probes with electrode extension unit (ASTA...MM4), see page 19-9.

## For white water


| Order code | Cable material | Cable length | Counter-weight included | Qty | Wt |
|---|---|---|---|---|---|
| | | [m] | | n° | [kg] |
| **LVFS P1 W 03** | PVC | 3 | Yes | 1 | 0.610 |
| **LVFS P1 W 05** | PVC | 5 | Yes | 1 | 0.830 |
| **LVFS P1 W 10** | PVC | 10 | Yes | 1 | 1.410 |
| **LVFS P1 W 15** | PVC | 15 | Yes | 1 | 1.930 |
| **LVFS N1 W 05** | Neoprene | 5 | Yes | 1 | 0.880 |
| **LVFS N1 W 10** | Neoprene | 10 | Yes | 1 | 1.510 |
| **LVFS N1 W 15** | Neoprene | 15 | Yes | 1 | 2.080 |
| **LVFS N1 W 20** | Neoprene | 20 | Yes | 1 | 2.480 |

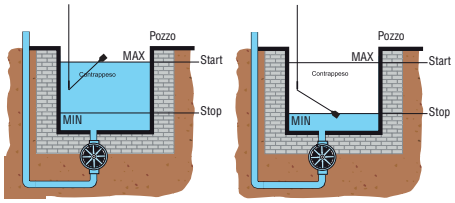
### Filling function




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 reaches the upper maximum level. The MIN and MAX levels can be adjusted by varying the distance between counterweight and float.


Start Stop

### Emptying function




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


Start Stop

**General characteristics**
Float level regulators 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 and chemical resistance over time.
The cables are 3x1 type, that is 3 wires with section 1mm$^2$. This allows the user to choose the filling and draining function during regulator wiring.

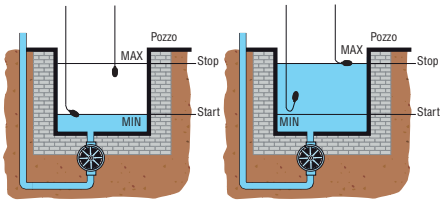
**Operational characteristics**
They are used for the civil and industrial control of levels of white water, e.g. rainwater, groundwater or cooling water from industry. They are available with PVC and Neoprene cables of various lengths.
- Activation angle -45°...+45°
- 130g external counterweight included
- Float casing material: polypropylene
- Cable A05 VV-F3X1 (PVC) available in lengths of 3, 5, 10 and 15m and cable H07 RN-F3X1 (Neoprene) available in lengths of 5, 10, 15 and 20m
- Rated cable diameter: 9mm (PVC and Neoprene)
- Relay with changeover contact 10(8)A 250VAC 50/60Hz
- Maximum installation depth: 30m
- Maximum pressure: 3 bar
- Maximum operating temperature: +50°C
- Maximum storage temperature: +70°C
- Protection rating: IP68
- Insulation class: II.

**Certifications and compliance**
Certifications obtained: TÜV SÜD.
Compliant with standards: IEC/EN 60730-1, IEC/EN 60730-2-15.

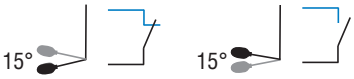
## For black water


| Order code | Cable material | Cable length | Qty per pack | Wt |
|---|---|---|---|---|
| | | [m] | n° | [kg] |
| **LVFS N1 B 05** | Neoprene | 5 | 1 | 1.250 |
| **LVFS N1 B 10** | Neoprene | 10 | 1 | 1.860 |
| **LVFS N1 B 15** | Neoprene | 15 | 1 | 2.460 |
| **LVFS N1 B 20** | Neoprene | 20 | 1 | 3.060 |

### Filling function❶

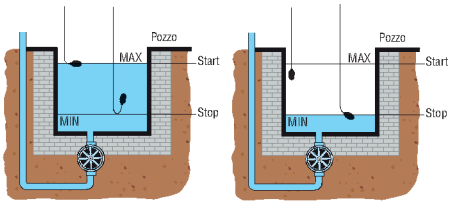



This function uses two floats and is achieved by connecting the black and blue float terminals. The MIN and MAX levels can be adjusted by varying the position of the floats.

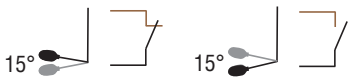



Start Stop

### Emptying function❶




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

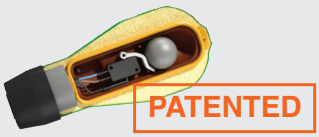



Start Stop

❶ 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.

**Operational characteristics**
This level regulator is used for the civil and industrial control of levels of black water, e.g. sewage or waste water from industry. The regulator comprises 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.
- Activation angle -15°...+15°
- Internal counterweight
- Float casing material: polypropylene
- Cable H07 RN-F3X1 (Neoprene) available in lengths of 5, 10, 15 and 20m
- Rated cable diameter: 9mm
- Relay with changeover contact 10(4)A 250VAC 50/60Hz
- Maximum installation depth: 50m
- Maximum pressure: 5 bar
- Maximum operating temperature: +50°C
- Maximum storage temperature: +70°C
- Protection rating: IP68
- Insulation class: II.

**Certifications and compliance**
Certifications obtained: TÜV SÜD.
Compliant with standards: IEC/EN 60730-1. IEC/EN 60730-2-15.



## Modular version

LVMP05...

| 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 | 2N/O | 1 | 0.090 |

**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 Ue
- Connection: permanent
- Green LED indicator for power on
- Red LED indicators for output relay state
- Modular DIN 43880 housing (1 module)
- Protection rating: IP40 on front (if placed in IP40 housing and/or electrical panel), IP20 terminals.

**Certifications and compliance**
Certifications obtained: cULus, EAC.
Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL508, CSA C22.2 n° 14.

LVMP10...

| Order code | Auxiliary supply voltage | Type of output contacts | Qty per pack | Weight |
|---|---|---|---|---|
| | [V] 50/60Hz | | n° | [kg] |
| 2 outputs. AC supply voltage. | | | | |
| **LVMP10 A024** | 24VAC | 2 NO | 1 | 0.250 |
| **LVMP10 A127** | 110...127VAC | 2 NO | 1 | 0.250 |
| **LVMP10 A240** | 220...240VAC | 2 NO | 1 | 0.250 |
| **LVMP10 A415** | 380...415VAC | 2 NO | 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 Ue
- Connection: permanent
- Green LED indicator for power on
- Red LED indicators for output relay state
- Modular DIN 43880 housing (3 modules)
- Protection rating: IP40 on front (if placed in IP40 housing and/or electrical panel), IP20 terminals.

**Certifications and compliance**
Certifications obtained: cULus, EAC.
Compliant with standards: IEC/EN 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-3, UL508, CSA C22.2 n° 14.

## Plug-in version

31 CSP2E...

| Order code | Auxiliary supply voltage | Type of output contacts | Qty per pack | Weight |
|---|---|---|---|---|
| | [V] 50/60Hz | √ | n° | [kg] |
| 2 outputs. AC supply voltage. | | | | |
| **31 CSP2E 24** | 24VAC | 2 NO | 1 | 0.150 |
| **31 CSP2E 110** | 110VAC | 2 NO | 1 | 0.150 |
| **31 CSP2E 220** | 220VAC | 2 NO | 1 | 0.150 |
| **31 CSP2E 230** | 230...240VAC | 2 NO | 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 Ue
- Connection: permanent
- Voltage applied to input contacts: 15VDC not insulated at power supply.
- Current consumption, input contacts: about 1mA.
- 11-pin plug-in housing (sockets S11 or L48 P11 with 31 G216.
- Protection rating: IP30.

**Certifications and compliance**
Certifications obtained: EAC.
Compliant with standards: IEC/EN 60255-5.

## Accessories

31 RE213

31 S8

31 S11

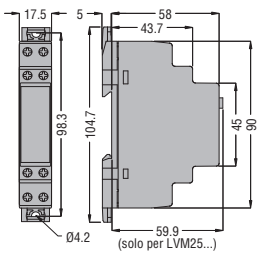
| Order code | Description | Qty per pack | Weight |
|---|---|---|---|
| | | n° | [kg] |
| **31 RE213** | Coupler unit for SCM with electrode extension ASTA...MM4 | 1 | 0.008 |
| **31 S8** | 8-pin socket for screw fixing or DIN rail 35mm for relay type LV1E... Screw terminals | 10 | 0.061 |
| **31 S11** | 11-pin socket for screw fixing or DIN rail 35mm for relays LV2E... CSP2E... Screw terminals | 10 | 0.064 |
| **31 RE014** | Retention spring for relay-socket S8 or S11 | 10 | 0.001 |
| **31 L48 P8** | 8-pin loose socket. Screw terminals | 10 | 0.040 |
| **31 L48P11** | 11-pin socket, loose. Screw terminals | 10 | 0.048 |
| **31 G216** | Kit for flush mounting socketed relays | 1 | 0.080 |

**Operational characteristics**
SOCKETS FOR INSTALLING PLUG-IN LEVEL CONTROL RELAYS.
– max. wire section for sockets: 2x2.5mm²/2x14AWG
– tightening torque: 0.8Nm/7.1lbin.

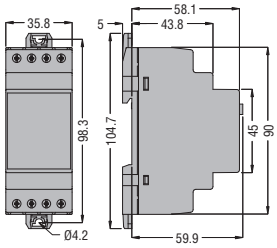
**Compliance**
Compliant with standards: IEC/EN 61984, IEC/EN 61210, IEC/EN 60999-1.

## LEVEL CONTROL AND PRIORITY CHANGE RELAYS

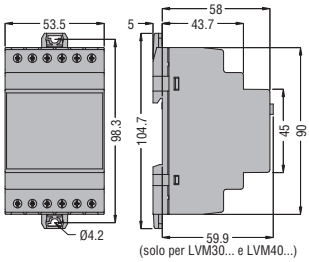
### LVM25... - LVMP05



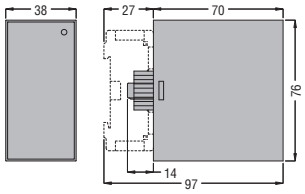

### LVM20...




### LVM30... - LVM40... - LVMP10

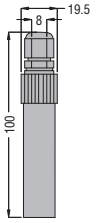



### LV1E... - LV2E... - CSP2E...

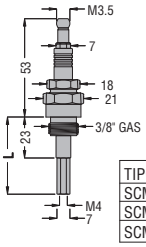



## ELECTRODES AND ELECTRODE HOLDERS FOR CONDUCTIVE LIQUIDS

### SN1

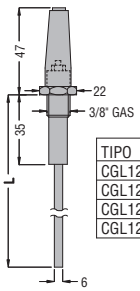



### SCM...



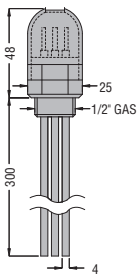

| TIPO | L |
|---|---|
| SCM04 | 43 |
| SCM50 | 500 |
| SCM100 | 1000 |

### CGL125...

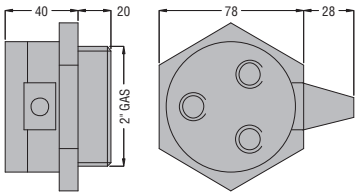



| TIPO | L |
|---|---|
| CGL125 3 | 327 |
| CGL125 5 | 500 |
| CGL125 7 | 700 |
| CGL125 10 | 1000 |

### PS31

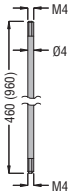



### PS3S

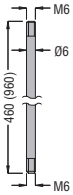



## ELECTRODES

### ASTA 460 MM4
### ASTA 960 MM4

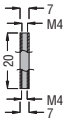



### ASTA 460 MM6
### ASTA 960 MM6



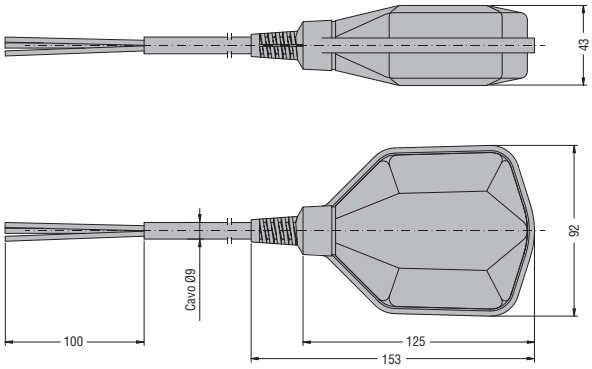

## Coupler unit

### RE213

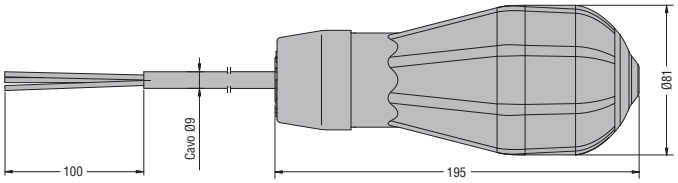



## FLOAT LEVEL REGULATORS

### LVFS...W...

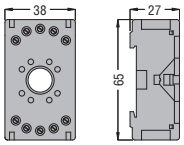



### LVFS N1 B...

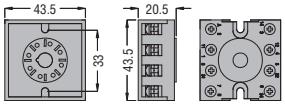



## ACCESSORIES

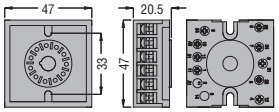
### S8 - S11



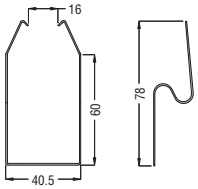

### L48 P8



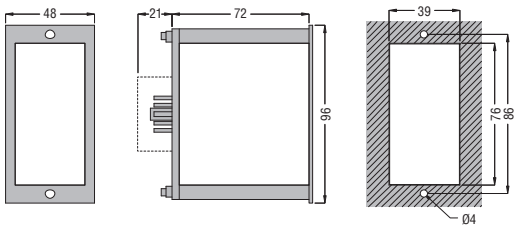

### L48 P11




### RE014

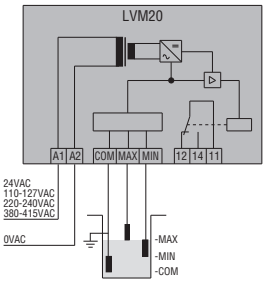



### G216

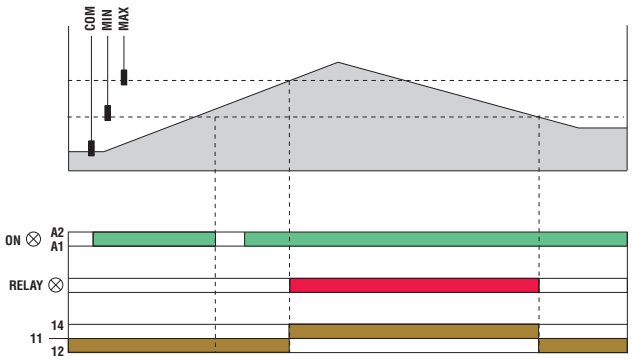


Emptying function

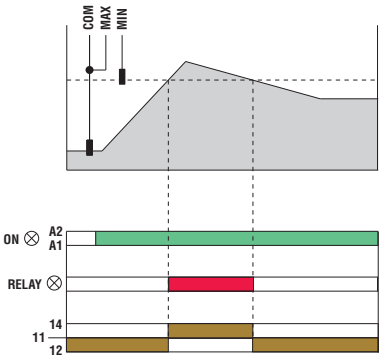
## LVM20




Emptying function with 3 electrodes

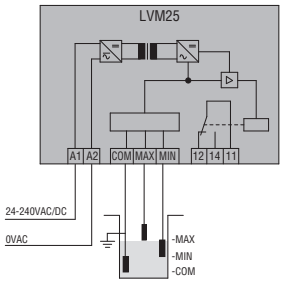



Emptying function with 2 electrodes

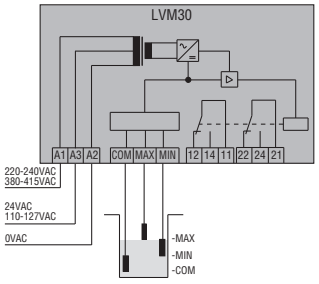



Emptying or filling function.

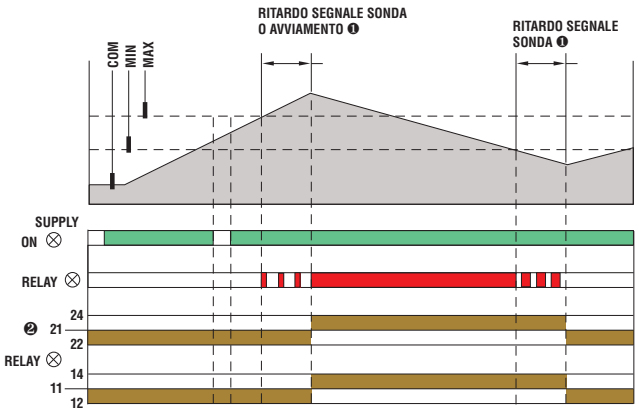
## LVM25



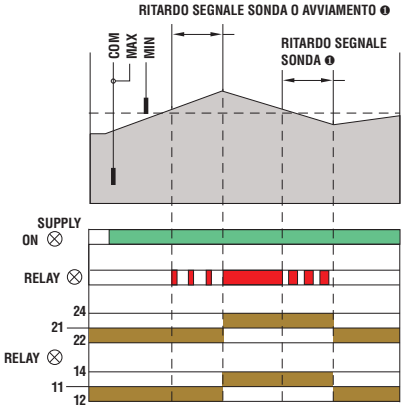

## LVM30




Emptying function (DOWN)
Connection with 3 electrodes

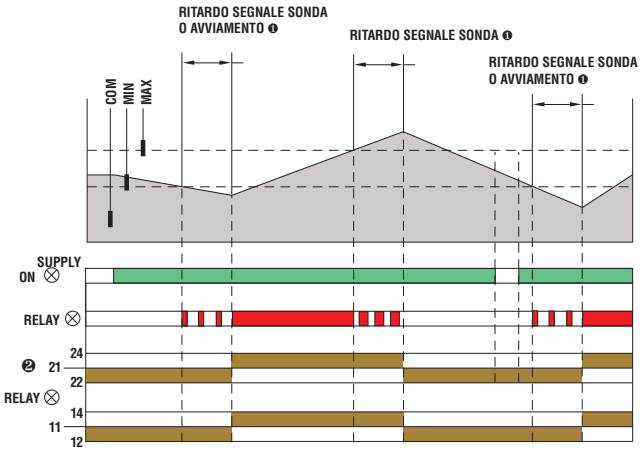



Connection with 2 electrodes

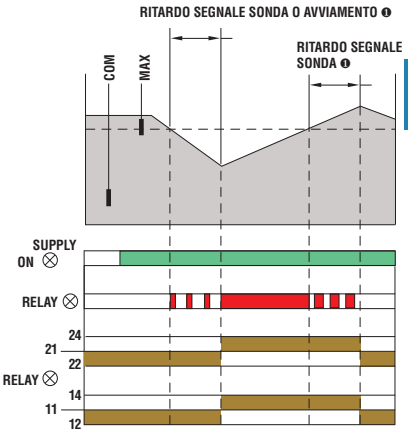



❶ Delay for LVM30 only.
❷ Changeover contact (SPDT) for LVM30 only.

Filling function (UP)
Connection with 3 electrodes



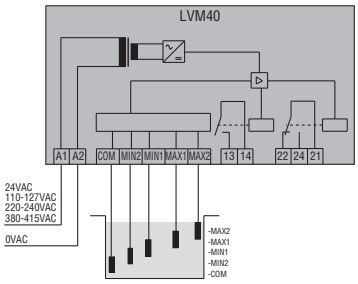

Connection with 2 electrodes



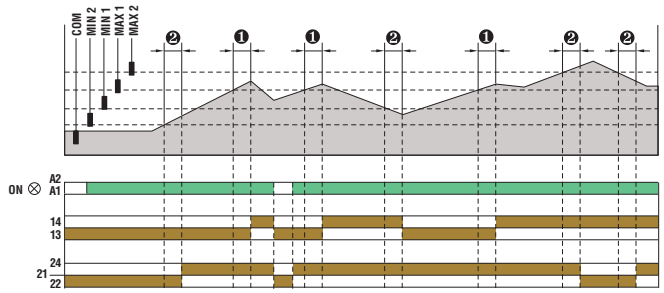

❶ Delay for LVM30 only.
❷ Changeover contact (SPDT) for LVM30 only.

Multifunctions.

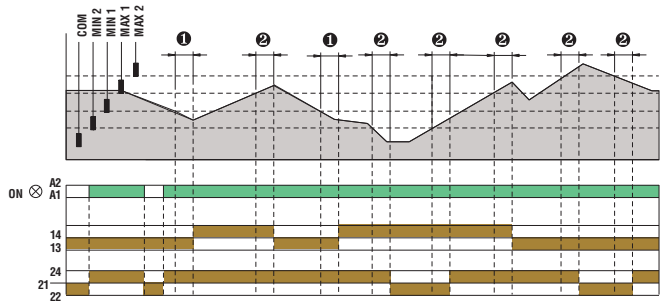
**LVM40**



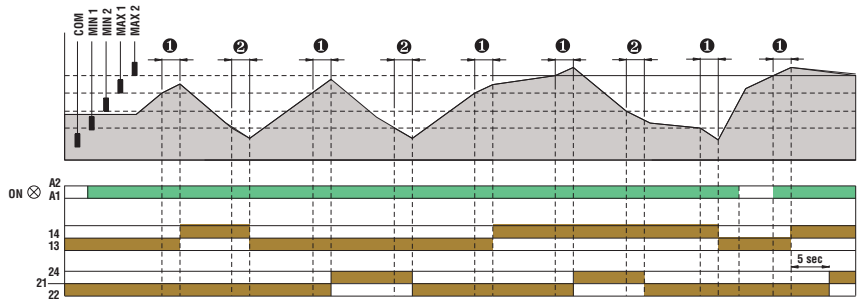

Emptying function + alarms



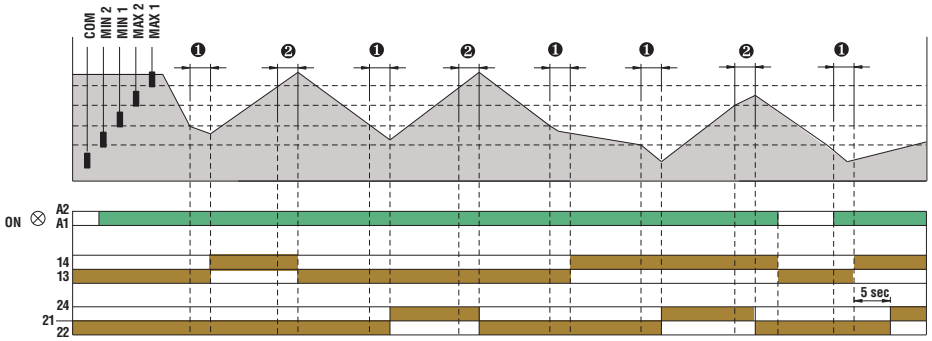

Filling function + alarms



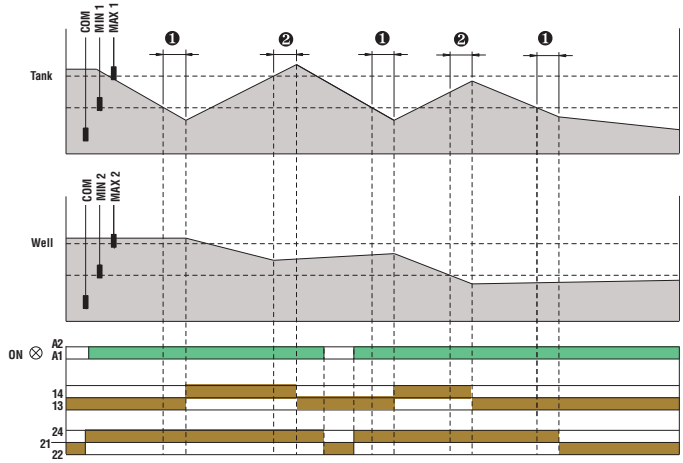

Emptying function + pump start change




Filling function + pump start change



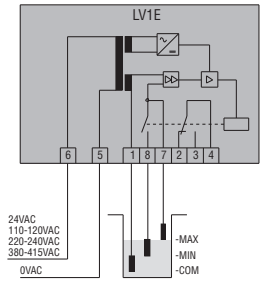

Filling tank and draining well function + alarm



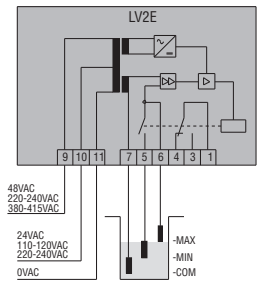

❶ Probe signal + starting delay.
❷ Probe signal delay.

Emptying function

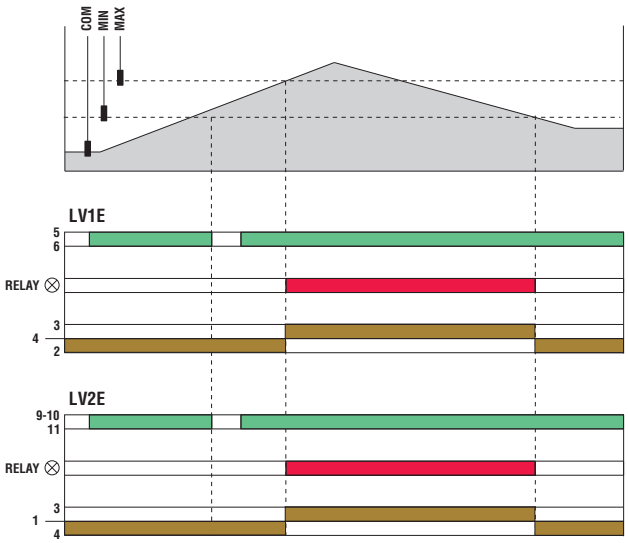
## LV1E



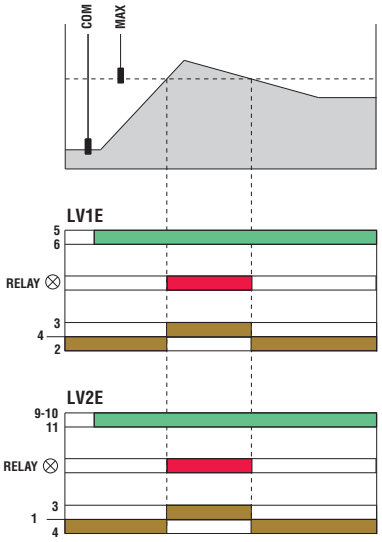

## LV2E




Emptying function with 3 electrodes

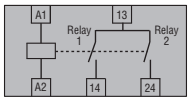


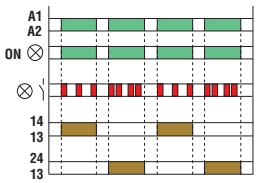

Emptying function with 2 electrodes




Priority change relays

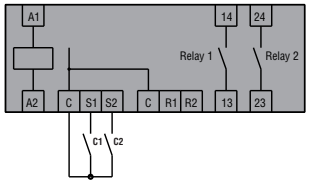
## LVMP05



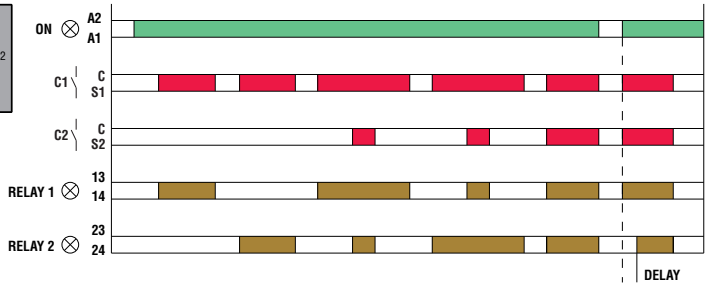




## LVMP10

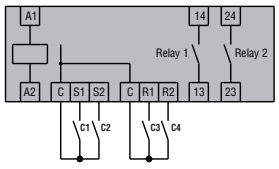
2-wire connection



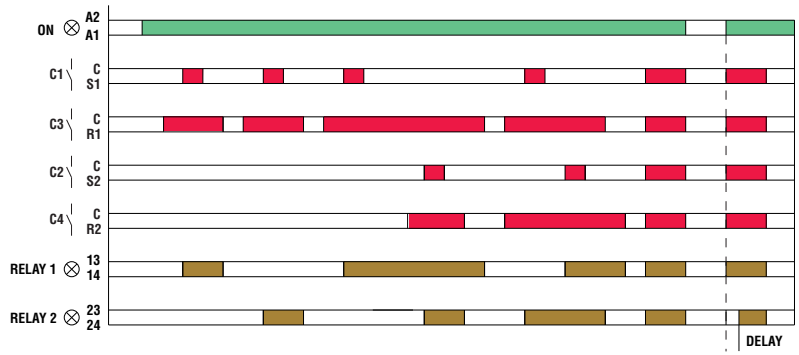

C1 = Primary
C2 = Secondary / Standby



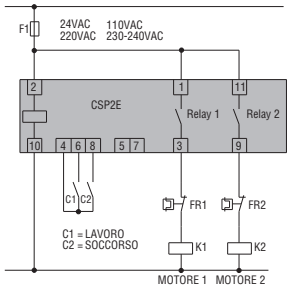

3-wire connection




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




## CSP2E



| TYPE | LVM20… | LVM25… | LVM30… | LVM40… | |
|---|---|---|---|---|---|
| DESCRIPTION | | | | | |
| | Modular | | | | |
| | Automatic reset | | | | |
| | Single voltage | Multi voltage | Dual voltage | Single voltage | |
| Use (examples) | Emptying function | Emptying or filling function | Emptying or filling function | Multifunctions | |
| Operating principle | Electrical conductivity of liquids | | | | |
| AUXILIARY SUPPLY | | | | | |
| Rated supply voltage (Us) | 24VAC<br>110...127VAC<br>220...240VAC<br>380...415VAC | 24...240VAC/DC | 24/220...240VAC<br>110...127/380...415VAC | 24VAC<br>110...127VAC<br>220...240VAC<br>380...415VAC | |
| Operating range | 0.85...1.1 Ue; 50/60Hz ±5% | | | | |
| Maximum power consumption | 3.5VA | 3VA | 5.5VA | 4.5VA | |
| Maximum power dissipation | 1.8W | 1.2W | 2.8W | 2.8W | |
| OUTPUTS | | | | | |
| Number of connectable electrodes | 3 | 3 | 3 | 5 | |
| Type of electrode | Electrode and electrode holders: SN1 / SCM / CGL / PS31 / PS3S or similar | | | | |
| Output voltage for electrodes | 7.5VAC | 5VPP | 7.5VAC | 5VPP | |
| Sensitivity | 2.5...50kΩ | 2.5...100kΩ | 2.5...50kΩ | 2.5...200kΩ | |
| TIMES | | | | | |
| Min. tripping time | ≤600ms | ≤1s | 1s | 1s | |
| Min. resetting time | ≤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 | 1 | 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 operating voltage | 250VAC | | | | |
| Max. switching voltage | 400VAC | | | | |
| IEC conventional free air thermal current Ith | 8A | | | | |
| Designation according to IEC/EN 60947-5-1. | B300 | | | | |
| Electrical life (with rated load) | $10^5$ cycles | | | | |
| Mechanical endurance | $30x10^6$ cycles | | | | |
| Indications | 1 green LED for power on<br>1 red LED for relay state | 1 green LED for power on<br>1 red LED for relay state | green LED indicator for power on<br>red LED for relay state | green LED indicator for power on<br>2 red LEDs for relay state<br>2 red LEDs for probe state | |
| INSULATION | | | | | |
| IEC rated insulation voltage Ui | 415VAC | 240VAC | 415VAC | 415VAC | |
| IEC rated impulse withstand voltage Uimp | 6kV | 4kV | 6kV | 6kV | |
| IEC power frequency withstand voltage | 4kV | 2kV | 4kV | 4kV | |
| Double insulation supply/relay/electrode | ≤250VAC | ≤250VAC❶ | ≤250VAC | ≤250VAC | |
| CONNECTIONS | | | | | |
| Max. terminal tightening torque | 0.8Nm (7lbin) | | | | |
| Conductor section min-max | 0.2...4mm² (24...12AWG) | | | | |
| AMBIENT CONDITIONS | | | | | |
| Operating temperature | –20...+60 °C | | | | |
| Storage temperature | –30...+80 °C | | | | |
| HOUSING | | | | | |
| Material | Self-extinguishing polyamide | | | | |
| Typical configurations (examples) | LVM20 + 3 × SN1 electrodes LVM25 + 3 × SN1 electrodes<br>LVM30 + 2 × SN1 electrodes LVM40 + 5 × SN1 electrodes | | | | |
| Max. relay-electrode cable length | ❸ | | | | |

❶ Double insulation between supply, electrodes and output relay circuit.
❷ Voltage applied to input contacts, not insulated at power supply.
❸ Contact our Customer Service Office (Tel. +39 035-4282422 - E-mail: service@LovatoElectric.com) for details.

| | LV1E... | LV2E... | LVMP 05 | LVMP 10 | CSP2E |
|---|---|---|---|---|---|
| | Plug-in | | Modular | Modular | Plug-in |
| | Automatic resetting | Automatic resetting | — | — | — |
| | Single voltage | Dual voltage | Multistage | Single voltage | Single voltage |
| | – Minimum-maximum level threshold<br>– Maintains level between minimum and maximum<br>– Protection against dry pump running | | Priority change relay for motors | | |
| | Electrical conductivity of liquids | | — | | |
| | 24VAC | 24/48VAC | 24...48VDC<br>24....240VAC | 24VAC | 24VAC❷ |
| | 110...120VAC | 110...120VAC/220...240VAC | | 110...127VAC | 110VAC❷ |
| | 220...240VAC | 220...240VAC/380...415VAC | | 220...240VAC | 230/240VAC❷ |
| | 380...415VAC | | | 380...415VAC | |
| | 0.8...1.1 Ue 50/60Hz | | | | |
| | 5.5VA | | 1.6VA | 4.8VA | 5VA |
| | 2.8W | | 0.9W | 3W | 3W |
| | 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 |
| | Normally de-energised, energises at tripping | | | | |
| | 1 changeover contact / SPDT | | 1 N/O - SPST | 1 N/O - SPST | 1 N/O - SPST |
| | 220VAC | | 250VAC | 250VAC | 250VAC |
| | 380VAC | | — | — | — |
| | 5A | | 8A | 8A | 5A |
| | B300 | | B300 | B300 | B300 |
| | $2.5x10^5$ cycles | | $10^5$ cycles | $10^5$ cycles | $10^5$ cycles |
| | $50x10^6$ cycles | | $30x10^6$ cycles | $30x10^6$ cycles | $30x10^6$ cycles |
| | red LED<br>relay tripping | | 1 green LED for power on<br>1 red LED for relay state | 1 green LED for power on<br>1 red LED for relay state | 1 green LED for power on<br>1 red LED for relay state |
| | 415VAC | | 250VAC | 415VAC | 250VAC |
| | 5kV | | 4kV | 4kV | 4kV |
| | 2kV | | 2kV | 2.5kV | 2.5kV |
| | — | | | | |
| | — | | 0.8Nm (7lbin) | 0.8Nm (7lbin) | — |
| | — | | 0.2...4.0mm² (24...12AWG) | 0.2...4.0mm² (24...12AWG) | — |
| | -20...+60°C | | | | |
| | -30...+80°C | | | | |
| | Self-extinguishing polycarbonate | | Polyamide | Polyamide | Self-extinguishing polycarbonate |
| | LV1E + 3 × SN1 electrodes<br>LV2E + 2 × SN1 electrodes + reset button | | — | — | — |
| | 500m/547yd single-core, double insulated cables | | — | — | — |

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