LEVEL CONTROLS

LEVEL CONTROL RELAYS FOR CONDUCTIVE LIQUIDS
PRIORITY CHANGE RELAYS
PROBES, ELECTRODES AND ELECTRODE HOLDERS
FLOAT SWITCHES

Lovato electric

ENERGY AND AUTOMATION

1

LEVEL CONTROL RELAYS FOR CONDUCTIVE LIQUIDS

LVM20

STANDARD

Emptying function

LVM25

MULTIVOLTAGE

Emptying or filling functions

LVM30

DELAY START

Emptying or filling functions

LVM40

MULTIFUNCTION

Delay start, 5 electrodes inputs, emptying or filling functions, pump priority control, high sensitivity

2

PRIORITY CHANGE RELAYS

LVMP05

STANDARD

Multivoltage

LVMP10

WITH EMERGENCY FUNCTION

Fixed delay in case of simultaneity

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ENERGY AND AUTOMATION

3

PROBES, ELECTRODES AND ELECTRODE HOLDERS

SN1

1 ELECTRODE

Tank and deep wells up to +60°C

SCM

1 ELECTRODE

Tank, presurised tank and boilers up to +100°C and 10bar

CGL125

1 ELECTRODE

Tank, presurised tank and boilers up to +180°C and 10bar

PS31

3 ELECTRODES

Compact size

31ASTA...MM6

PS3S

ELECTRODES + ELECTRODE HOLDERS

Tank and deep wells up to +60°C

4

FLOAT SWITCHES

LVFS...W

FOR GREY WATER

PVC or Neoprene cable from 3 to 20m length

LVFS...B

FOR DIRTY WATER

Neoprene cable from 5 to 20m length

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ENERGY AND AUTOMATION

1 LEVEL CONTROL RELAYS FOR CONDUCTIVE LIQUIDS




Descriptions	LVM20	LVM25	LVM30	LVM40
Modular version	■ (2U)	■ (1U)	■ (3U)	■ (3U)
3 detecting electrodes (MIN, MAX and COM)	■	■	■	
5 detecting electrodes (MIN1, MAX1, MIN2, MAX2 and COM)				■
Sensitivity	2.5...50kΩ	2.5...100kΩ	2.5...50kΩ	2.5...200kΩ
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 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				■
1 relay out 8A 250VAC (AC1) or 1.5A 240VAC (AC15)	1 C/O	1 C/O	2 C/O	1 C/O + 1 NO
Fixed probe signal time delay: <1s	■	■		
Time delay adjustment for probe signal: 1...10s or for pump starting: 0...300s			■	
Probe signal delay adjustment: 1...10s				■
Pump starting delay adjustment: 0...30min				■
Stray electrode-cable capacitance insensitivity		■		■
Operating temperature	-20...+60°C			
Storage temperature	-30...+80°C			
IEC degree of protection	IP20 on terminal, IP40 on front			

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 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-4, UL508, CSA C22.2 n° 14


Some permitted liquid substances				Liquid substances not permitted
Type of liquid	Resistivity kΩcm	Type of liquid	Resistivity kΩcm	
Drinking water	5...10	Milk	~1	
Well water	2...5	Whey	~1	• Purified water
River water	2...15	Fruit juices	~1	• Deionised water
Rainwater	15...25	Vegetable juices	~1	• Petrol
Sludge	0.5...2	Soups	~1	• Oil
Seawater	~0.03	Wine	~2.2	• Liquid gases
Salt water	~2.2	Beer	~2.2	• Paraffin
Natural/hard water	~5	Coffee	~2.2	• Ethylene glycol
Chlorinated water	~5	Suds	~18	• Paints
Condensed water	~18			• Liquids with a high percentage of alcohol

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

2 PRIORITY CHANGE RELAYS

LVMP10

LVMP05

This device is used to balance the number of motors startings and to optimise wear of two units - primary and stand-by. Both with 2 output relays, each with 1 normally open contact.

Operating temperature: -20...+60°C.
Storage temperature: -30...+80°C.
IEC degree of protection: IP20 on terminal, IP40 on front.

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 60255-5, IEC/EN 61000-6-2, IEC/EN 61000-6-4, UL508, CSA C22.2 n° 14.

For LVMP05 only
- Multivoltage (24/48VDC, 24...240VAC)
- Simple operation and installation.

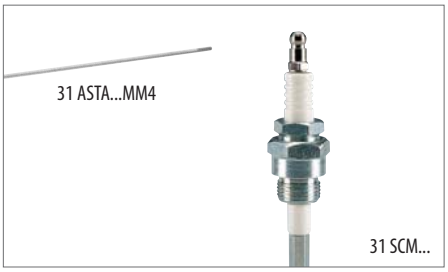
For LVMP10 only
- 4 inputs for motor control: 2 for starting and 2 for stopping, protected against over voltages
- Fixed delay for motor starting at power up in case of simultaneity to exclude current peaks on the supply system
- 3-wire start-stop motor control to exclude control contact chattering available
- Function usage as motor priority or stand-by change available.

3 PROBES, ELECTRODES AND ELECTRODE HOLDERS

SINGLE PROBE ELECTRODE, SN1 TYPE
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 prevent water from entering the cable terminal connector and from causing its oxidation.
The external cable diameter must be 2.5 to 6mm to warrant perfect sealing of the PG7 gland.
Maximum operating ambient temperature: +60°C.
Maximum conductor section: 2.5mm^2, 12AWG.
Application: tanks and deep wells.

11 SN1

SINGLE-PROBE ELECTRODE, SCM TYPES
Single-pole electrode used for level control on boilers, autoclaves and in general where pressure, 10bar maximum, and high temperature, +100°C maximum, are present.
It comprises an AISI 303 stainless steel probe embedded in an alumina-oxide body and a 3/8" GAS threaded metal support holder.
Extendable with a 4mm rod probe.
Application: tanks, pressurised tanks and boilers.



31 SCM...

SINGLE-PROBE ELECTRODE, CGL125 TYPES
Single-pole electrode with AISI 302 probe, used for level control on boilers and autoclaves and in general wherever pressure is up to 10 bars maximum. Maximum ambient operating temperature: +180°C.
Fixing: 3/8" GAS threaded metal holder.
Application: tanks, pressurised tanks and boilers.

31 CGL125...

THREE-PROBE ELECTRODE, PS31 TYPE
Small electrode holder, complete with three AISI 304 stainless steel probes.
Particularly suited to small containers whenever pressure is up to 2 bars maximum.
Maximum operating ambient temperature: +70°C.
Fixing: 1/2" GAS threaded plastic holder.
Cable connection termination: faston tabs included.
Application: tanks and automatic dispensers.

31 PS31

ELECTRODE HOLDER, PS3S TYPE AND ELECTRODES
Thermoset resin electrode holder to be used with three 6mm probes (to be purchased separately) and complete with terminal cover.
Maximum ambient operating temperature: +100°C.
Fixing: 2" GAS threaded plastic holder.
Application: tanks.

31 PS3S

4 FLOAT SWITCHES

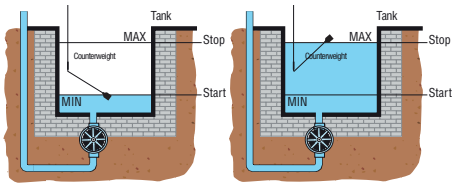
General characteristics
Float switches are used in the automation of electrical equipment, such as: pumps, solenoid valves, alarms, motorised sluice gates, etc. All versions feature an internal changeover contact operated in accordance with the level of liquid where the float is located. The cables used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

For grey water

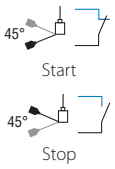
Operational characteristics
They are used for the civil and industrial control of levels of grey water, e.g. rainwater, groundwater or cooling water from industry. They are available with PVC and neoprene cables of various lengths.
– Activation angle ±45°C
– 130g external counterweight included
– Float 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 3, 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: 3bar
– Operating temperature: 0...+50°C
– Storage temperature: -20...+70°C
– IEC degree of protection: IP68
– Insulation class: II.

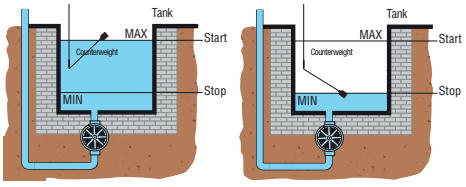
Certifications and compliance
Certifications obtained: TÜV.
Compliant with standards: IEC/EN 60730-1, IEC/EN 60730-2-15.


LVFS...W...

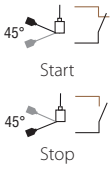


Filling function
This function is achieved by connecting the black and blue float terminals. The level regulator contact closes the lower circuit at minimum level and opens the circuit when the float reaches the upper maximum level. The MIN and MAX levels can be adjusted by varying the distance between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





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.



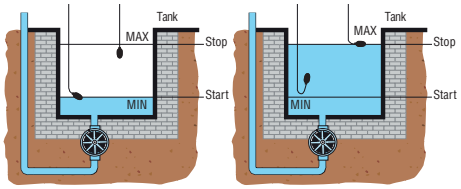
For dirty water

Operational 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. – Activation angle ±15°C
– 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: 5bar
– Operating temperature: 0...+50°C
– Storage temperature: -20...+70°C
– IEC degree of protection: IP68
– Insulation class: II.

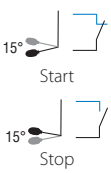
Patented
The float switches comprises of a one-piece external blow-moulded polypropylene casing, with fixed internal counterweight located in the cable exit area.
The regulator contact is positioned centrally in its own watertight chamber. This is insulated from the external casing by injecting closed-cell foam. This solution further increases protection against moisture leakage and heat insulates the watertight chamber housing the contact, eliminating the creation of condensation.

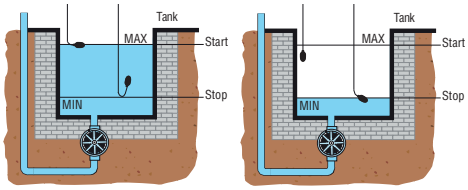
Certifications and compliance
Certifications obtained: TÜV.
Compliant with standards: IEC/EN 60730-1. IEC/EN 60730-2-15.


LVFS...B...

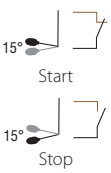


Filling function
This function uses two floats and is achieved by connecting the black and blue float terminals.
The MIN and MAX levels can be adjusted by varying the position of the floats.





Emptying function
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.



HOW TO ORDER

LEVEL CONTROL RELAYS FOR CONDUCTIVE LIQUIDS


LVM20...


LVM25 240


LVM30...


LVM40...

Order code	Description	Auxiliary supply voltage [V]	Qty per pack	Weight (kg)
LVM20 A024	Standard	24VAC	1	0.215
LVM20 A127	Standard	110...127VAC	1	0.215
LVM20 A240	Standard	220...240VAC	1	0.215
LVM20 A415	Standard	380...415VAC	1	0.215
LVM25 240	Multivoltage	24...240VAC/DC	1	0.095
LVM30 A240	Delay start	24/220...240VAC	1	0.315
LVM30 A415	Delay start	110...127VAC 380...415VAC	1	0.315
LVM40 A024	Multifunction	24VAC	1	0.278
LVM40 A127	Multifunction	110...127VAC	1	0.278
LVM40 A240	Multifunction	220...240VAC	1	0.278
LVM40 A415	Multifunction	380...415VAC	1	0.278

PRIORITY CHANGE RELAYS


LVMP05


LVMP10...

Order code	Description	Auxiliary supply voltage [V]	Qty per pack	Weight (kg)
LVMP05	Standard	24/48VDC, 24...240VAC	1	0.090
LVMP10 A024	With emergency function	24VAC	1	0.250
LVMP10 A127	With emergency function	110...127VAC	1	0.250
LVMP10 A240	With emergency function	220...240VAC	1	0.250
LVMP10 A415	With emergency function	380...415VAC	1	0.250

PROBES, ELECTRODES AND ELECTRODE HOLDERS


11 SN1


31 SCM...


31 CGL125...


31 PS31


31 PS3S


31 ASTA...

Order code	Description	Probe length (mm/in)	Qty per pack	Weight (kg)
11 SN1	1 electrode	100/3.9"	10	0.050
31 SCM 04	1 electrode	43/1.7"	1	0.060
31 SCM 50	1 electrode	500/19.7"	1	0.115
31 SCM 100	1 electrode	1000/39.4"	1	0.162
31 CGL125 3	1 electrode	327/12.9"	1	0.126
31 CGL125 5	1 electrode	500/19.7"	1	0.158
31 CGL125 7	1 electrode	700/27.6"	1	0.208
31 CGL125 10	1 electrode	1000/39.4"	1	0.281
31 PS31	3 electrodes	300/11.8"	1	0.120
31 PS3S	Electrode holder	-	1	0.184
31 ASTA 46O MM4	Electrode	460/18.11"	1	0.530
31 ASTA 96O MM4	Electrode	960/37.8"	1	0.103
31 ASTA 46O MM6	Electrode	460/18.11"	1	0.100
31 ASTA 96O MM6	Electrode	960/37.8"	1	0.210

FLOAT SWITCHES


LVFS...W...


LVFS...B...

Order code	Description	Cable material	Cable length (m)	Counterweight included	Qty per pack	Weight (kg)
LVFS P1 W 03	For grey water	PVC	3	Si	1	0.610
LVFS P1 W 05	For grey water	PVC	5	Si	1	0.830
LVFS P1 W 10	For grey water	PVC	10	Si	1	1.410
LVFS P1 W 15	For grey water	PVC	15	Si	1	1.930
LVFS N1 W 03	For grey water	Neoprene	3	Si	1	0.640
LVFS N1 W 05	For grey water	Neoprene	5	Si	1	0.880
LVFS N1 W 10	For grey water	Neoprene	10	Si	1	1.510
LVFS N1 W 15	For grey water	Neoprene	15	Si	1	2.080
LVFS N1 W 20	For grey water	Neoprene	20	Si	1	2.480
LVFS N1 B 05	For dirty water	Neoprene	5	SI	1	1.250
LVFS N1 B 10	For dirty water	Neoprene	10	SI	1	1.860
LVFS N1 B 15	For dirty water	Neoprene	15	SI	1	2.460
LVFS N1 B 20	For dirty water	Neoprene	20	SI	1	3.060

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