

Specifications

Input	from conductivity cell electrodes
Sensitivity Adjustment	<input type="checkbox"/> none, <input type="checkbox"/> sensitivity-adjustment trimmers
Activation / Release Threshold	<input type="checkbox"/> 10...20 k Ω , <input type="checkbox"/> 10...1000 k Ω
Input Wiring Capacitance	max. 5000 pF
Outputs:	up to 3
Electromechanical relay	5A/250VAC with NO/NC contact
SSR	1A/250VAC
MOS gate	0.1A/60V, optically isolated
Output for external SSR	5...24 VDC, 30 mA
- K1	<input type="checkbox"/> relay, <input type="checkbox"/> SSR, <input type="checkbox"/> MOS gate, <input type="checkbox"/> for ext. SSR
- K2	<input type="checkbox"/> relay, <input type="checkbox"/> SSR, <input type="checkbox"/> MOS gate, <input type="checkbox"/> for ext. SSR
- K3	<input type="checkbox"/> relay, <input type="checkbox"/> SSR, <input type="checkbox"/> MOS gate, <input type="checkbox"/> for ext. SSR
Power Supply	<input type="checkbox"/> 230 VAC, <input type="checkbox"/> 90...250 VAC/DC, <input type="checkbox"/> 24 VAC, <input type="checkbox"/> 12...24 VAC/DC, <input type="checkbox"/>
Consumption	less than 2 VA
Operating Temperature / Humidity	-10...65 °C / 0...85% RH
Protection Class: front / terminals	<input type="checkbox"/> IP65, <input type="checkbox"/> IP44 / IP20
Factory settings:	DIRECTION MODE
- output K1	<input type="checkbox"/> direct, <input type="checkbox"/> reverse <input type="checkbox"/> i/d, <input type="checkbox"/> L1/2, <input type="checkbox"/> A1/3
- output K2	<input type="checkbox"/> direct, <input type="checkbox"/> reverse <input type="checkbox"/> i/d, <input type="checkbox"/> L2/3, <input type="checkbox"/> A1/2
- output K3	<input type="checkbox"/> direct, <input type="checkbox"/> reverse <input type="checkbox"/> i/d, <input type="checkbox"/> L1/3, <input type="checkbox"/> A2/3
- hold time	<input type="checkbox"/> 1 s, <input type="checkbox"/> 5 s

Warranty and Support

.....
serial number

.....
manufacturing date

QC check mark(passed)
(stamp)

88 Slavyanska Str.
P.O.Box 378
Plovdiv 4000, BULGARIA
tel: +359 32 646523, 646524
fax: +359 32 634089, 646517
e-mail: support@comeco.org
QD-8.2.4-WC

Warranty

COMECO warrants this product to be free from defects in materials and workmanship for 2 years. If your unit is found to be defective within that time, we will promptly repair or replace it. This warranty does not cover accidental damage, wear or tear, or consequential or incidental loss. This warranty does not cover any defects caused by wrong transportation, storage, installation, or operating (see 'Specifications').

Technical support

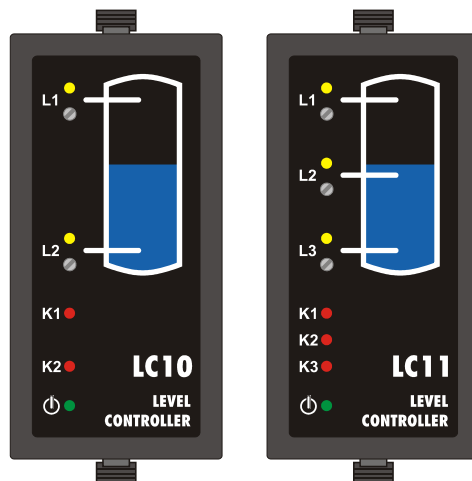
In the unlikely event that you encounter a problem with your COMECO device, please call your local dealer or contact directly our support team.

μ P-BASED LEVEL CONTROLLER

LC1x

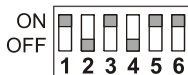
for panel mounting

OPERATION MANUAL



Please read this Operation Manual before mounting and operating!
Save the Manual for future references!

Configuring



The default (factory) settings are given in 'Specifications'.

4	5	K1	K2
1	1	independent	
0	1	A1/2	L1/2

4	5	K1	K2	K3
1	1	independent (i/d)		
1	0	L1/2	A1/2	i/d
0	1	A1/3	i/d	L1/3
0	0	i/d	L2/3	A2/3

0 - OFF; 1 - ON

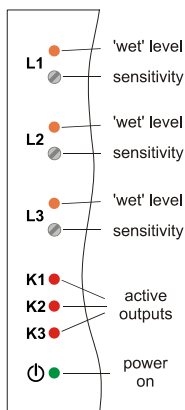
- Find the 6-key DIP switch on the device back panel.
- Set the desired direction for each of the outputs by turning ON (for direct action) or OFF (for reverse action) the key with the corresponding number (#1, #2, or #3).

In case of a LC10, set output K2 direction via key #3.

- Use keys #4 and #5 to configure output dependency according to the upper (in case of a LC10) or lower (for LC11) table.
- Set hold time by turning ON (1 second) or OFF (5 seconds) key #6.

In case of an alarm, the hold time is fixed to 10 s.

Indication and Adjusting



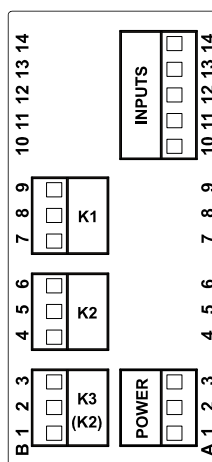
- The green LED on the front panel lights at power on.
- The yellow LEDs 'L1', 'L2', and 'L3' indicate the state of the controlled levels (light at 'wet' level L1, L2, and L3 respectively). In case of an alarm during dependent mode, the respective LEDs blink by turns.
- The red LEDs 'K1', 'K2', and 'K3' light when a corresponding output is activated.
- If sensitivity adjustment is necessary, use the respective trimmer (if such is mounted) accessible through the front panel.

Electro-Magnetic Interference (EMI) Issues

Important note:
A built-in RC noise suppression circuit is connected in parallel with relay contacts. Full AC voltage isolation is NOT provided when relay contacts are open. Small AC current (≈ 1.5 mA at 230 VAC) still flows through the RC circuit!

- All signal wires must be shielded. They must not be packaged together with power cables!
- Never lay the signal wires close to inductive or capacitive noise sources, such as relays, contactors, motors, etc.!
- All shields have to be grounded ONLY at one end, as closer as possible to the controller terminals!
- Avoid sharing supply lines with powerful consumers, especially with inductive loads, switched on and off.
- To stop unwelcome interference signals entering through the power supply lines, use shielded 1:1 isolation transformer!
- Shunt all switched (not only those switched by the controller) inductive consumers with special suppression networks: RC group and varistor - for AC loads, or diode - for DC loads.

Wiring



- Important notes:**
- Select cable after the admissible capacitance (see 'Specifications').
 - Power supply must be turned off during mounting and wiring!

Wiring terminals

- To connect the device, use the plug-in terminals arranged in 2 columns - 'A' and 'B' - on its back panel.
- Unplug the female part of the respective terminal, wire it, and then put it back into its socket.

Overview

LC1x is a low-cost electronic level controller. It employs measurement of the electrical conductivity of the liquid between electrodes or between electrode and metal vessel case and is applicable for liquids with relatively high conductivity that are normally used in chemical, paper, food, wine, biotechnological industries, etc. The LC10 variant allows monitoring 1 or 2 fixed levels, and LC11 can monitor 1, 2, or 3 fixed levels, and a corresponding relay is activated or deactivated when each level is reached (drainage / supply control). Besides signaling reached level, the output relays may also be used for controlling electrical actuators. The direction of relay action at reached level as well as the connection (dependence) between levels is user-selectable. The device can also be configured as a drainage or supply level controller with alarm relay. A high-tech microprocessor circuit guarantees accuracy and stability, prevents electrolytic polarization, and ensures stable operation. A possibility to adjust output activation threshold as well as an LED indication makes the LC1x level controller a solution for a wide range of level related problems.

Mounting

- ◆ Place LC1x into a 42x90 mm panel cut-out.
- ◆ Tighten it into place using the enclosed mounting brackets.

Declaration of Conformity



The undersigned hereby declares, on behalf of COMECO Inc., that this device has been manufactured in compliance with standards EN 61000 and EN 61010, and meets the requirements of Directives 73/23/EEC and 89/336/EEC.

Vladimir Sakaliyski
CEO
COMECO Inc.

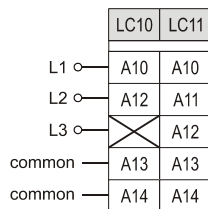
Waste Disposal



Do not dispose of electronic devices together with household waste material!

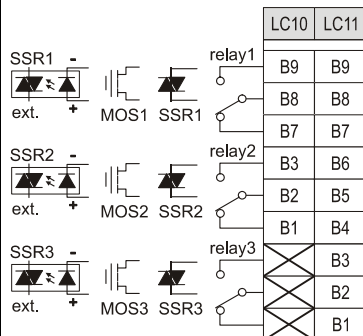
If disposed of within European Union, this product should be treated and recycled in accordance with the laws of your jurisdiction implementing the WEEE Directive 2002/96 on the Waste Electrical and Electronic Equipment.

Wiring



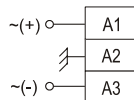
Input wiring

Connect the inputs with regard to your device variant through the respective terminals from column 'A'.



Output wiring

Connect the outputs with regard to their number and types (see '**Specifications**') and depending on your device variant via the respective terminals from column 'B'.



Power supply wiring

- ◆ Connect the right power supply voltage for your device (see '**Specifications**') via terminals A1(+) and A3(-).
- ◆ In case of 90...250 VAC/DC power supply, ground the device via terminal A2.



The diagrams show connection of the maximum number of controlled levels. Only 2 or just 1 level may also be connected.

Operating

Output reaction hold

A certain delay between the input change and the respective output reaction (configurable hold time) eliminates undesirable short-time switching.

Independent output mode

- ◆ The state of each output depends only on the state of the respective input and the preset direction.
- ◆ When direct action is set, the output is active at 'wet' level and inactive at 'dry' level.
- ◆ If reverse action is set, the output is active at 'dry' level and inactive at 'wet' level.

Dependent output mode

- ◆ Used is a combination of whichever 2 inputs and their respective outputs. One of the inputs senses 'lower' level and the other — 'upper' level. One of the outputs operates as control output and the other — as alarm output.
- ◆ A control output into direct action is active when both 'lower' and 'upper' levels are 'wet' and inactive when both levels become 'dry'.
- ◆ Following reversed action, the control output is active when both levels are 'dry' and inactive when they are 'wet'.
- ◆ If only one of the inputs has changed, the control output keeps its state.
- ◆ The alarm output activates when 'upper' level is sensed 'wet' while 'lower' level is 'dry' and remains active until power-off.

	alarm output			
		A1/2	A1/3	A2/3
control output	L1/2	L1/3	L2/3	
lower level	L2	L3	L3	
upper level	L1	L1	L2	



Important note:

When dependent output mode is configured, the power supply should be turned on ONLY when the vessel is empty!