# Conductive Sensors 1-point Basic Level Controller Type CL with Potentiometer and Time Control





- Conductive level controller
- Sensitivity adjustment 5 KΩ to 150 KΩ
- For filling or emptying applications
- Low-voltage AC electrodes
- Easy installation on DIN rails 17.5 mm
- Rated operational voltage: 24 VAC/DC
- Output 8A/250 VAC SPST relay
- LED indication for: Output ON, Power ON



## **Product Description**

 $\mu\text{-Processor}$  based level controller for liquids with a wide sensitivity range from 5 KΩ to 150 KΩ.

One probe level control with built in ON or OFF time delay for filling or emptying applications. The time delay can be set from 1 to 30 seconds.

# **Ordering Key**

### CLD1EA1CM24

| Type — DIN rail mounting —                    |  |
|---|--|
| Inputs —                                      |  |
| Function ———————————————————————————————————— |  |
| Outputs —                                     |  |
| Relay versions ———                            |  |
| Power supply                                  |  |

## **Type Selection**

| Mounting | Ordering no.<br>Supply: 24 VAC/DC |
|----------|-----------------------------------|
| DIN-rail | CLD1EA1CM24                       |

# **Specifications**

| Rated operational voltage<br>Supply class 2 | (U <sub>B</sub> ) |   |
|---|-------------------|---|
| Pin A1 & A2                                 | 24                | 19.2 to 28.8 VAC/DC                                       |
| Rated insulation voltage                    |                   | <2.0 kVAC (rms)   |
| Rated impulse withstand                     |                   |   |
| voltage                                     |                   | 4 kV (1.2/50 μs) (line/neutral)                           |
| Rated operational power                     |                   |   |
| AC/DC supply                                |                   | 5 VA / 5 W  |
| Delay on operate (t <sub>v</sub> )          |                   | < 300 mS  |
| Outputs                                     |                   |   |
| Rated insulation voltage                    |                   | 250 VAC (rms) (cont./elec.)                               |
| Relay Rating (AgCdO)                        |                   | μ (micro gap)   |
| Resistive loads                             | AC1               | 8 A / 250 VAC (2500 VA)                                   |
|   | DC1               | 1 A / 250 VDC (250 W)                                     |
|   |                   | or 10 A 25 VDC (250 W)                                    |
| Small induc. Loads                          | AC15              | 0,4 A 250 VAC   |
|   | DC13              | 0,4 A / 30 VDC  |
| Mechanical life (typical)                   |                   | ≥ 30 x 10 <sup>6</sup> operations                         |
|   |                   | @ 18'000 imp/h  |
| Electrical life (typical)                   | AC1               | > 250'000 operations                                      |
| Level probe supply                          |                   | Max. 5 VAC  |
| Level probe current                         |                   | Max. 2 mA   |
| Sensitivity                                 |                   | 5 K $\Omega$ to 150 K $\Omega$ , $C_F = 2.2 \text{ nF}^*$ |
|   |                   | Factory preset 150 KΩ                                     |
|   |                   |   |

| $^{\sim}C_{F} =$ | maximum | Cable | Capacitance |
|------------------|---------|-------|-------------|
|                  |         |       |             |

| Dielectric voltage            | >2.0 KVAC (rms)                |
|-------------------------------|--------------------------------|
|                               | (contacts / electronics)       |
| Rated impulse withstand volt. | 4 kV (1.2/50 μS) (contacts /   |
|                               | electronics) (IEC 664)         |
| Operating frequency (f) max   |                                |
| Relay output                  | 0.5 Hz                         |
| Response time                 |                                |
| OFF-ON (t <sub>on</sub> )     | 1 sec to 30 sec adjustable     |
| ON-OFF (t <sub>off</sub> )    | 1 sec to 30 sec adjustable     |
| Environment                   |                                |
| Overvoltage category          | III (IEC 60664)                |
| Degree of protection          | IP 20 /IEC 60529, 60947-1)     |
| Pollution degree              | 2 (IEC 60664/60664A,           |
|                               | 60947-1)                       |
| Temperature                   |                                |
| Operating                     | -20° to +50°C (-4° to + 122°)  |
| Storage                       | -50° to +85°C (-58° to +185°F) |
| Housing material              | ABS VO, light grey             |
| Weight                        |                                |
| AC/DC supply                  | 125 g                          |
| Approvals                     |                                |
| UL c <b>%1</b> us             | UL508, UL325, CSA-C22.2        |
|                               | No.247                         |
| CSA                           | Yes                            |
| CE marking                    | Yes                            |
|                               |                                |



# **Mode of Operation**

#### **Connection cable**

2 conductor PVC cable, normally screened. Cable length: max. 100 m. The resistance between the cores and the ground must be at least 150K. Normally, it is recommended to use a screened cable between probe and controller, e.g. where the cable is placed in parallel to the load cables (mains). The screen has to be connected to Y2 (reference).

The filling or emptying process operate around one single electrode and a time control circuit.

#### **Cautions**

#### Overrunning of tank filling Cautions must be taken to assure that the tank cannot

overrun. Factors that have to be considered are the pump performance, the rate of discharge from the tank, the position of the single level electrode and the time delay.

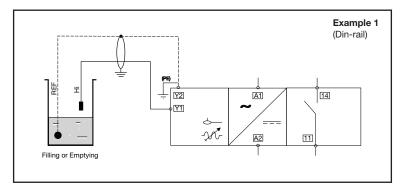
# Prevent dry running of pump on emptying

Care must be taken to ensure that the pump cannot run dry. Similar considerations must be given as mentioned above. Specifically keeping the time delay to a minimum will minimize this risk, but again, it will increase the switching rate.

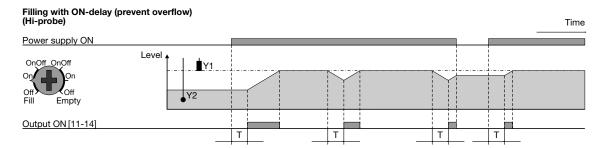
#### Example 1

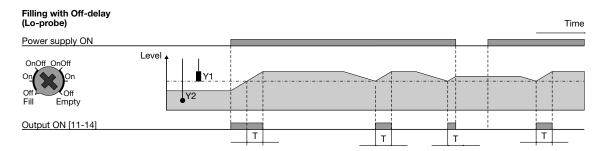
The diagram shows the level control connected as filling or emptying control. The relay react to the low alternating current created when the electrodes are in contact with the liquid.

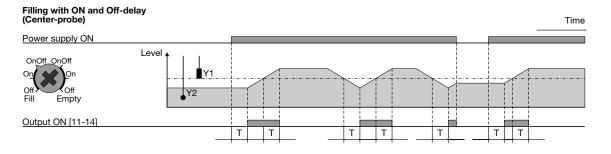
The reference (Ref) must be connected to the container or if the container consists of a non-conductive material, to an additional electrode. (To be connected to pin Y2). (In the diagram this electrode is shown by the dotted line).



## **Operation Diagram**

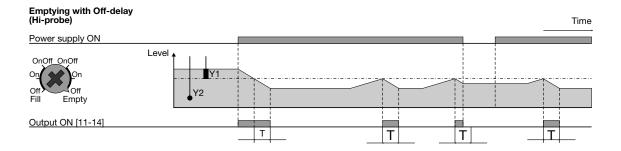


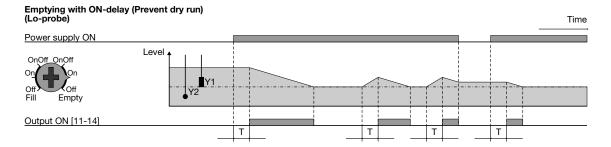


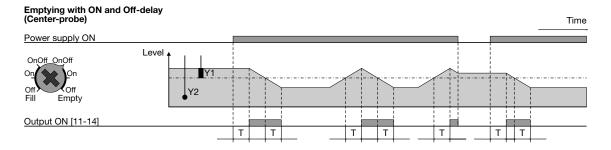




# **Operation Diagram**

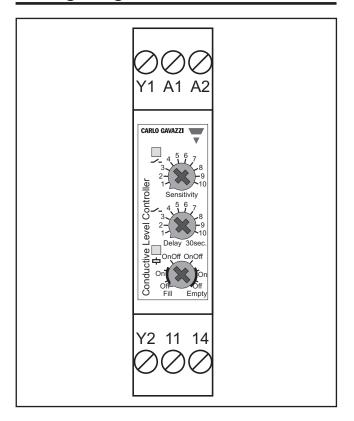




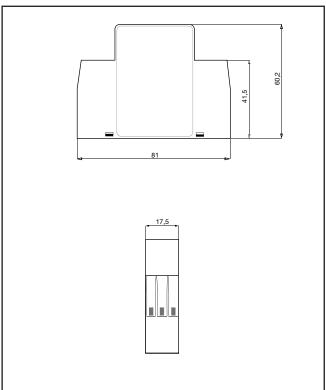




# **Wiring Diagram**



# **Dimension Drawings**



# **Delivery Contents**

- Amplifier
- Packaging: Carton box
- Manual