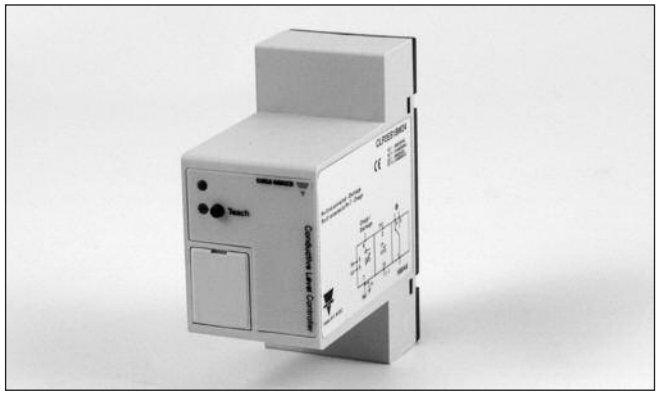
Conductive Sensors
2-point Basic Level Controller
Type CL with Teach-in



- **Conductive level controller**
- **Teach-in of sensitivity – operating resistance from 3.5KΩ to 50 KΩ**
- **For filling or emptying applications**
- **Low-voltage AC electrodes**
- **Easy installation with 11 pin circular plug**
- **Rated operational voltage: 24 VAC/DC, 115 VAC or 230 VAC**
- **Output 8A/250 VAC SPDT relay**
- **LED indication for: Calibration, faulty operation and relay status**
- **Possibility of serial connection**

Product Description

µ-Processor based level controller.
Max./min. control of charging/ discharging of liquids. The sensitivity is adjustable by means of the teach-in function.

Ordering Key

CLP2ES1BM24

- **Type**
- **DIN rail mounting**
- **Inputs**
- **Function**
- **Adjustment**
- **Outputs**
- **Relay versions**
- **Power supply**

Type Selection

Mounting	Ordering no. Supply: 24 VAC/DC	Ordering no. Supply: 115 VAC	Ordering no. Supply: 230 VAC
11-p circular plug	**CLP2ES1BM24**	**CLP2ES1B115**	**CLP2ES1B230**

Specifications

Rated operational voltage (U_B)		
Pin 2 & 10	230	195 to 265 VAC, 45 to 65 Hz
	115	98 to 132 VAC, 45 to 65 Hz
	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 supply		5 VA
AC/DC supply		5 VA / 5 W
Delay on operate (t_v)		< 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	8 A / 30 VDC (24 W)
	or	8 A 25 VDC (250 W)
Small induc. Loads	AC11	0,4 A 200 VAC
	DC13	0,4 A / 30 VDC
Mechanical life (typical)		≥ 30 x 106 operations @ 18'000 imp/h
Electrical life (typical)	AC1	> 250'000 operations
Level probe supply		Max. 5 VAC
Level probe current		Max. 1.5 mA
Sensitivity		3,5KΩ to 50KΩ
Factory preset		47KΩ

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)	
Relay output	2 HZ
Response time	
OFF-ON (t_{on})	1,5 s
OFF-ON (t_{off})	1,5 s
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)
Weight	
AC supply	200 g
AC/DC supply	125 g
Approvals	UL508, c UL us
CE marking	Yes

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Mode of Operation

Connection cable
2 or 3 conductor PVC cable, normally screened. Cable length: max. 100 m. The resistance between the cores and the ground must be at least 50k. 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 pin 7 (reference).

Teach-in:
Make sure that the reference electrode and one of the other electrodes are in contact with the liquid – approximately 1 cm. Press the "teach" pushbutton at the front of the controller for approximately 2 seconds, until the green LED turns OFF. The controller will now auto-adjust itself according to the resistance of the measuring liquid. If the resistance of the liquid is outside the maximum range handled by the controller, the green LED will flash quickly for a period of 2 seconds, indicating a wrong teach-in.

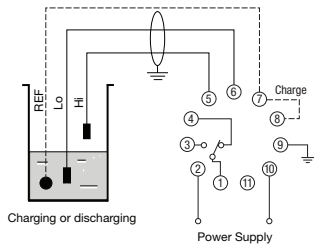
Function setting
The controller works per default as discharge. Connect pin 7 to pin 8 for charge.

Cascade
If more than 2 levels are required, up to 7 amplifiers can be cascaded, as shown in the example below.
Connect pin 9 of the master controller to ground and pin 11 of the master controller to pin 11 of the next controllers, the slave controllers (see drawing). Pin 9 of the slave controllers must be left open!
The connections must be made by screened cable to achieve optimal operation, e.g. in cable pits or trays where the cable is close to power cables. Connect the screen to pin 7, and be sure that the distance between two systems is max 3m.
Fill the tank with the liquid to be measured and teach in the master controller. If the teach in is performed correctly, the green power LED of the slave controller(s) will switch off and indicate: ready for teach in.
Teach in the slave controllers one by one, until all the green power LED's are on again. The system is now in run-mode.

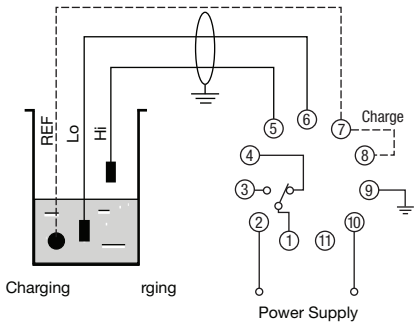
Example 1
The diagram shows the level control connected as max. and min. control. The relay react to the low alternating current created when the electrodes are in contact with the liquid.

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 7).
(In the diagram this electrode is shown by the dotted line)..

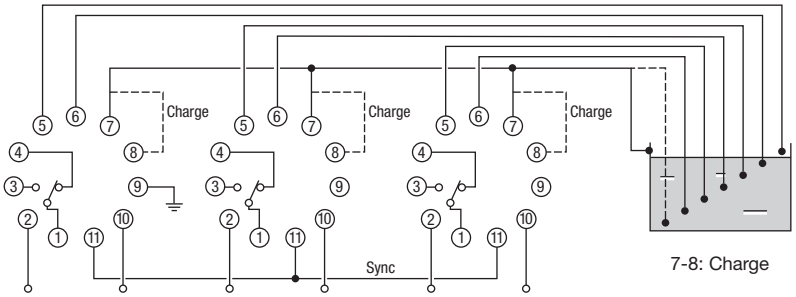
Example 1
(Din-rail)

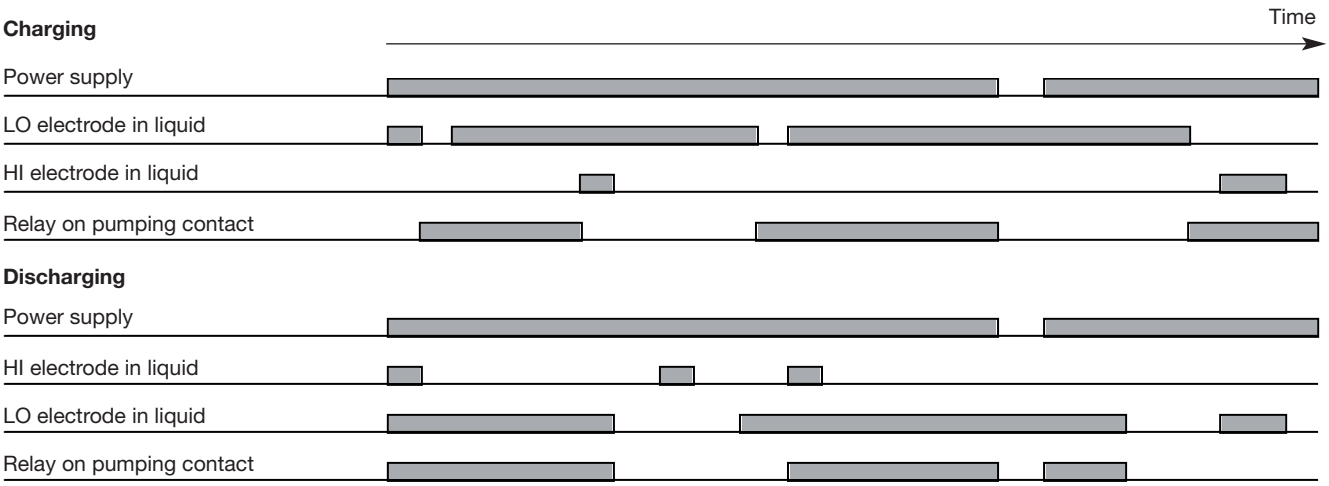


Function: Charge or Discharge



Function: Cascade





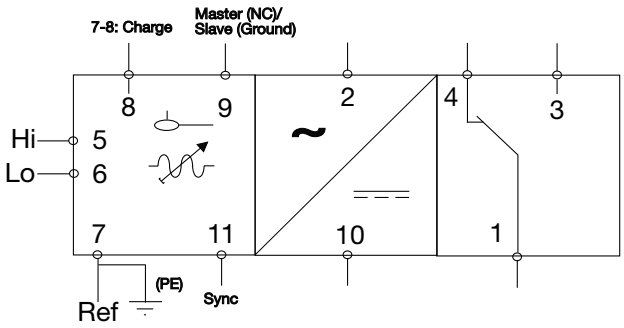
Operating Schedule

The following schedule provides an overview of the setup and failure situations

Situation	Condition	Action	Green Control lamp
Teach-in	Fill the tank with the liquid to be measured until the second longest electrode is immersed approx. 1cm	Press the Teach button in front of the controller for approx. 2 seconds until the green control lamp turn off continuously. Release the teach button	
Failure indication	The Green lamp is flashing fast for approx. 2 seconds after a teach-in operation	Control the electrode for short-cut connections. Control that the resistance of the measured liquid is within the specified range	

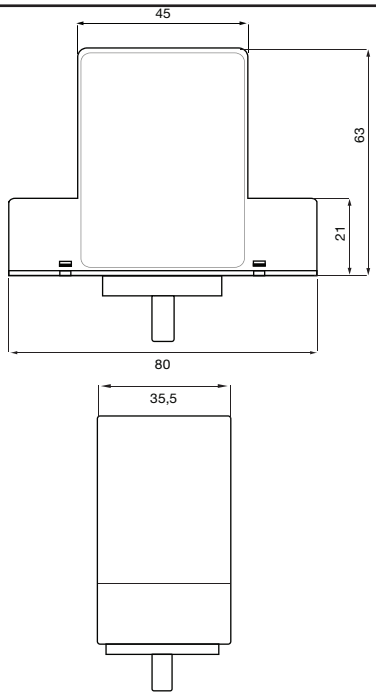
Wiring Diagram

Plug version



Dimension Drawings

Plug version



Accessories

• 11 pole corcular socket	ZVD11
• Mounting rack	SM13

Delivery Contents

- Amplifier
- Packaging: Carton box
- Manual