CLD
Технические характеристики

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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

µ-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**
- **Adjustment**
- **Outputs**
- **Relay versions**
- **Power supply**

Type Selection

Mounting	Ordering no. Supply: 24 VAC/DC
DIN-rail	**CLD1EA1CM24**

Specifications

Rated operational voltage (U_B)		
Supply class		2
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_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 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 10^6 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 KΩ to 150 KΩ, C_F* = 2.2 nF
		Factory preset 150 KΩ
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_{on})		1 sec to 30 sec adjustable
ON-OFF (t_{off})		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
Screw type		M3
Tightening tourque min/max		0.4Nm/0.8Nm
Weight		
AC/DC supply		125 g
Approvals		
UL	cURus	UL508, UL325,
CSA		CSA-C22.2 No.247
CE marking		Yes

*C_F = maximum Cable Capacitance

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

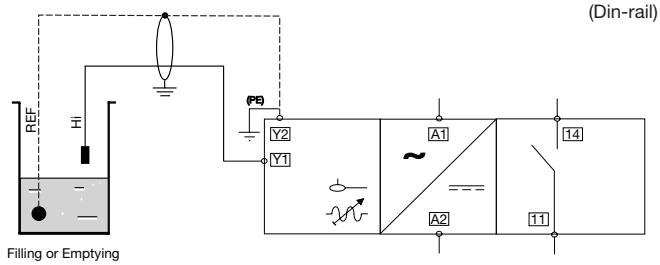
Overrunning of tank filling
Cautions must be taken to assure that the tank cannot overrun. Factors that have to be considered are the pump performance, the rate of discharge from the tank, the position of the single level electrode and the time delay.

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.

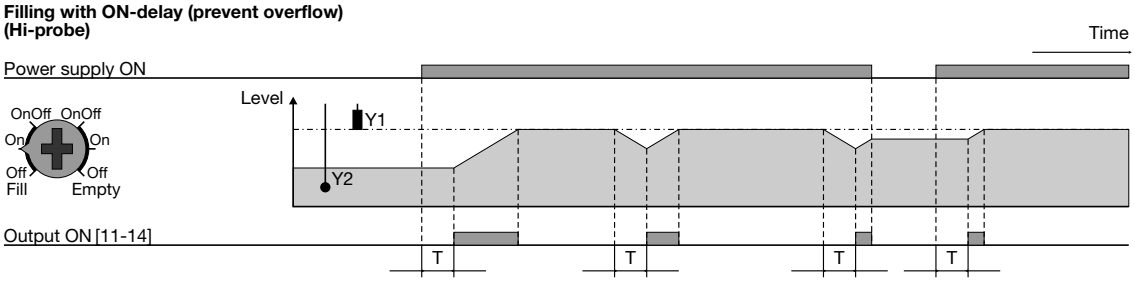
The reference (Ref) must be connected to the container or if the container consists of a non-conductive material, to an additional electrode. (To be connected to pin Y2). (In the diagram this electrode is shown by the dotted line).

Example 1
(Din-rail)

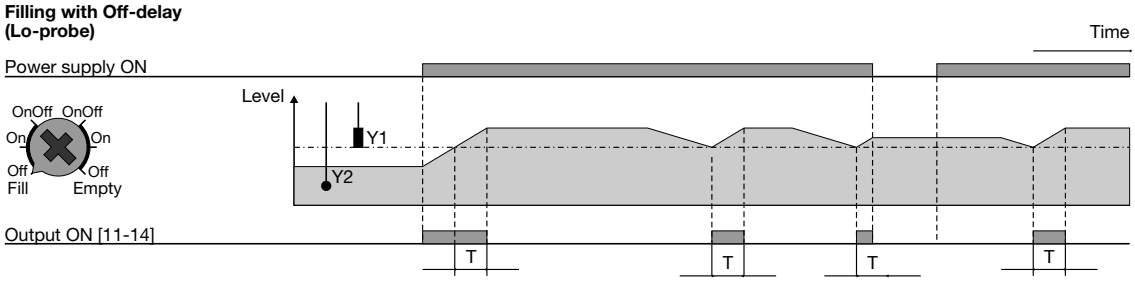


Operation Diagram

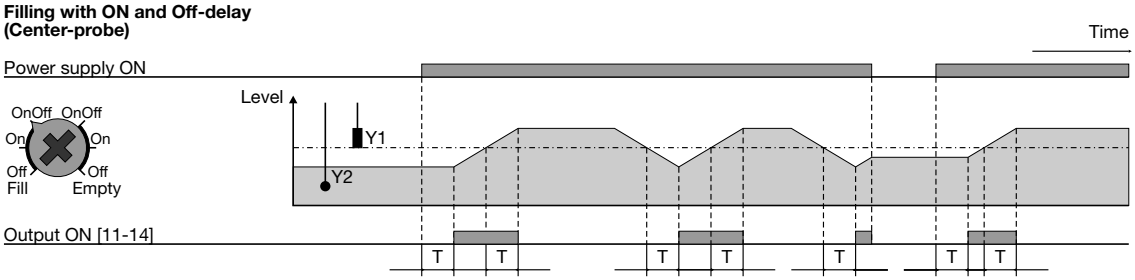
Filling with ON-delay (prevent overflow)
(Hi-probe)



Filling with Off-delay
(Lo-probe)



Filling with ON and Off-delay
(Center-probe)



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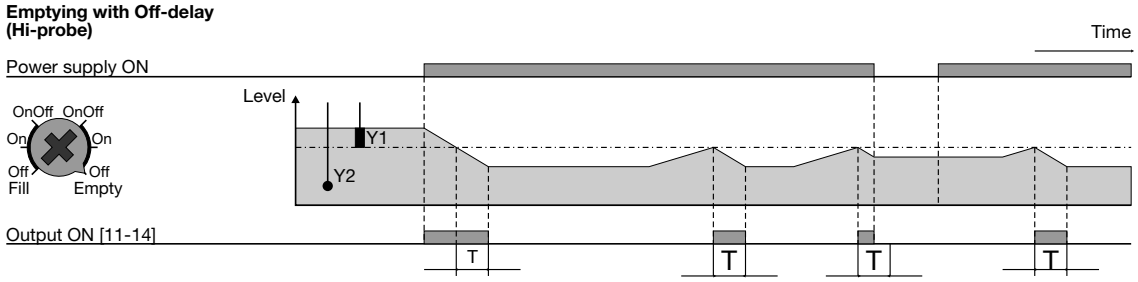
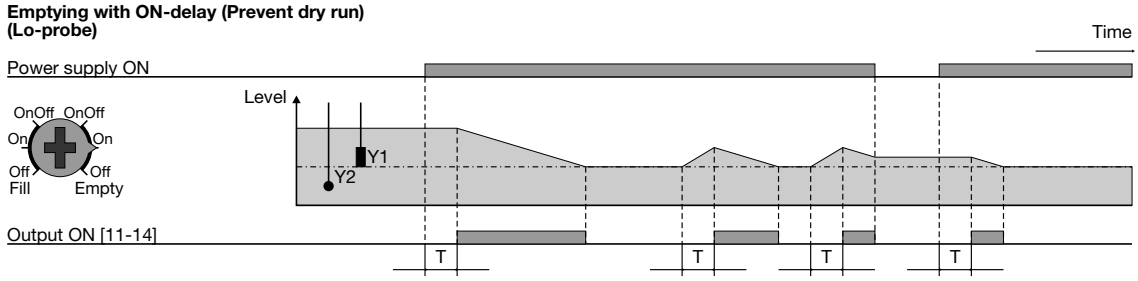
Operation Diagram

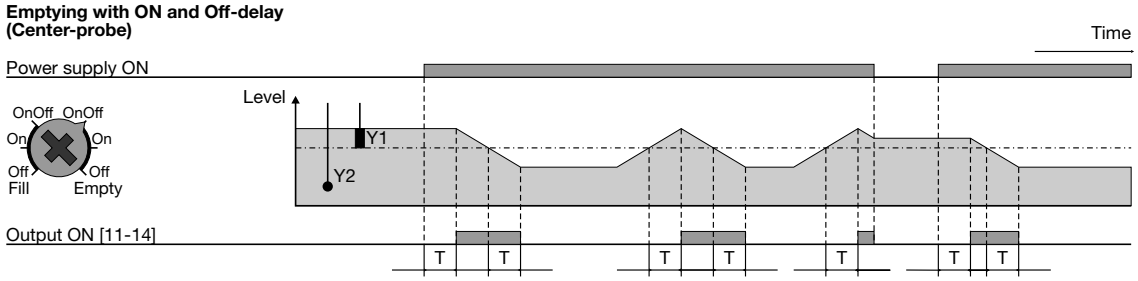
Emptying with Off-delay (Hi-probe)



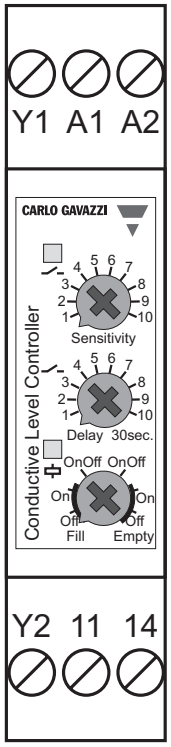
Emptying with ON-delay (Prevent dry run) (Lo-probe)



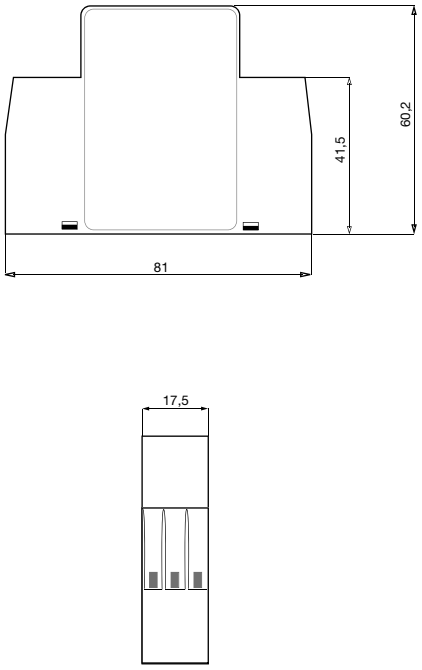
Emptying with ON and Off-delay (Center-probe)



Wiring Diagram



Dimension Drawings



Delivery Contents

- Amplifier
- Packaging: Carton box
- Manual

Conductive Sensors
2-point level controller
Type CL with potentiometer

- **Conductive level controller**
- **Sensitivity adjustment from 250 Ω to 500 KΩ**
- **For filling or emptying applications**
- **Low-voltage AC electrodes**
- **Easy installation on DIN rails or with 11 pin circular plug**
- **Rated operational voltage: 24 VAC/DC, 115 VAC or 230 VAC**
- **Output 2 x 8A/250 VAC DPDT relay**
- **LED indication for: Output ON and Power ON**

Product Description

µ-Processor based level controller for liquids with a wide sensitivity range (like sewage water, chemicals, salt water etc.).

Max./min. control of charging/ discharging. The sensitivity is adjustable by means of the potentiometer and the rotary switch.
2 x 8A DPDT relay output.

Ordering Key

CLD2EA1CM24

- **Conductive level**
- **DIN rail or plug mounting**
- **No of inputs**
- **Charge/discharge**
- **Adjustment potentiometer**
- **Output**
- **Relay DPDT**
- **Power supply**

Type Selection

Mounting	Relay	Ordering no. Supply: 24 VAC/DC	Ordering no. Supply: 115 VAC	Ordering no. Supply: 230 VAC
DIN-rail	DPDT	**CLD2EA1CM24**	**CLD2EA1C115**	**CLD2EA1C230**
11-p circular plug		**CLP2EA1CM24**	**CLP2EA1C115**	**CLP2EA1C230**

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
Supply class 2	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	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 10^6 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		250Ω to 500KΩ Factory settings standard range "S" 100KΩ
Ranges L (Low sensitivity)		250 Ω to 5 KΩ, C_F* = 4.7 nF
Ranges S (Standard sensitivity)		5 KΩ to 100 KΩ, C_F* = 2.2 nF
Ranges H (High sensitivity)		50 KΩ to 500 KΩ, C_F* = 1.0 nF
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		0.5 HZ
Response time		
OFF-ON (t_{on})		1 s
ON-OFF (t_{off})		1 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°F)
Storage		-50° to +85°C (-58° to +185°F)
Housing material	CLP	NORYL PPO, light grey
	CLD	ABS VO, light grey
Screw type		M3
Tightening tourque min/max		0.4Nm/0.8Nm
Weight		
AC supply		200 g
AC/DC supply		125 g
UL Approvals	cURus	UL508, UL325, CSA-C22.2 No.247
CE marking		Yes

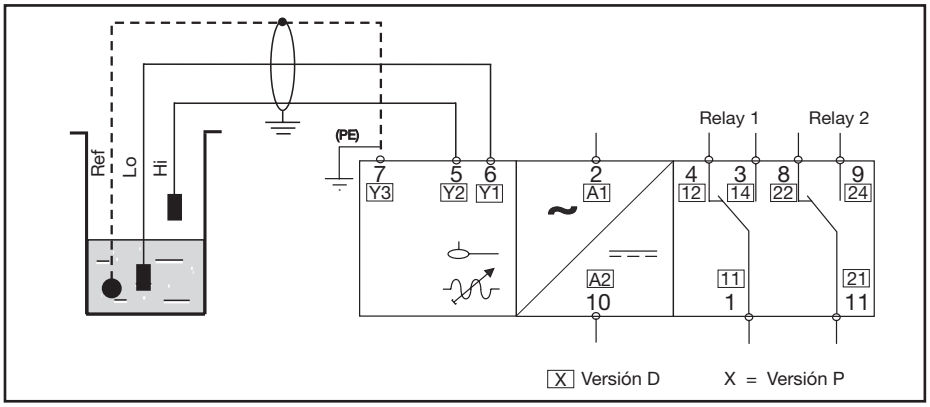
*C_F = maximum Cable Capacitance

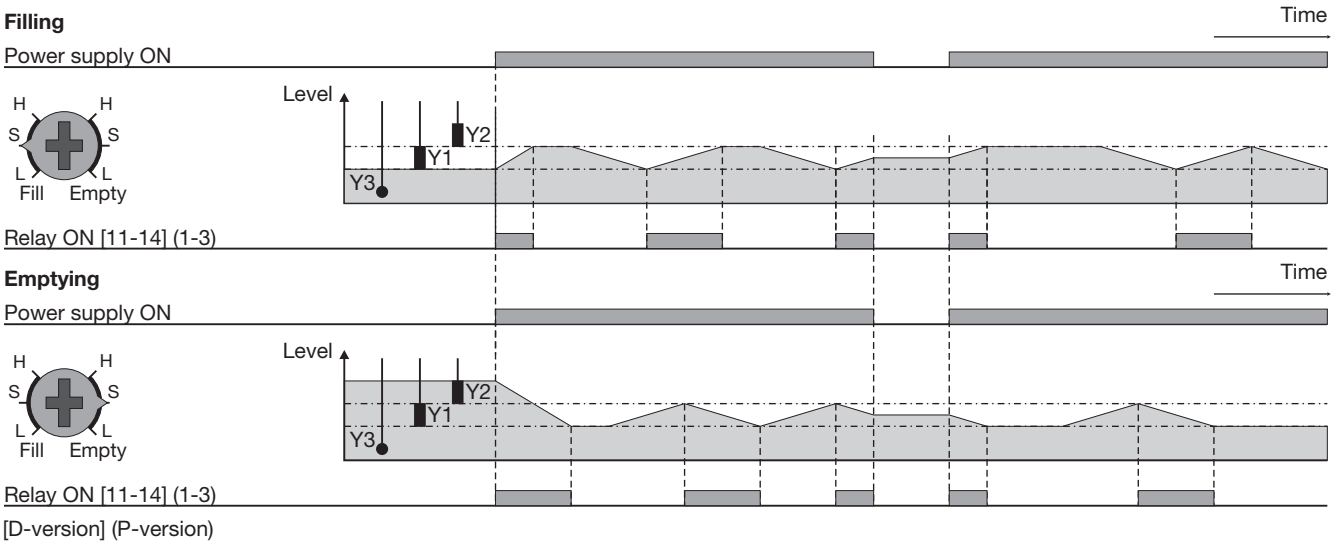
Mode of Operation

Connection cable
2, 3, or 4 conductor PVC cable, normally screened. Cable length: max. 100 m. The resistance between the cores and the ground must be at least 500k. 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 Y3 (reference).

Example 1
The diagram shows the level control connected as max. and min. control. The relays 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 Y3). (In the diagram this electrode is shown by the dotted line).

NB!
If only one level detection is required - interconnect the two inputs Y1 and Y2.

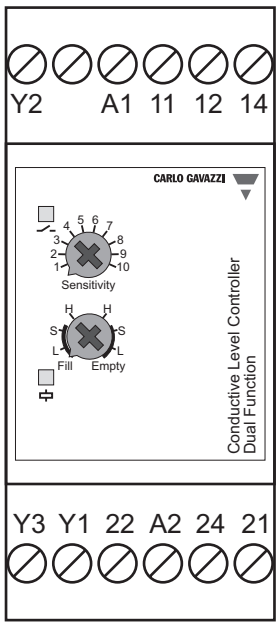




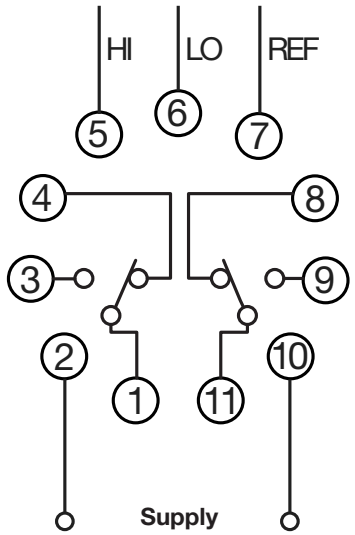
[D-version] (P-version)

Wiring Diagram

Din-rail version



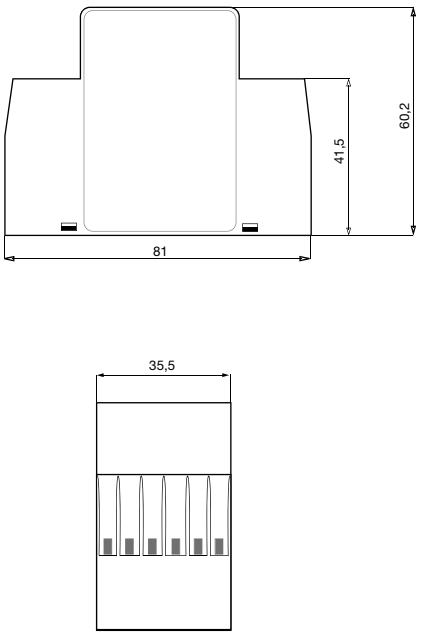
Plug version



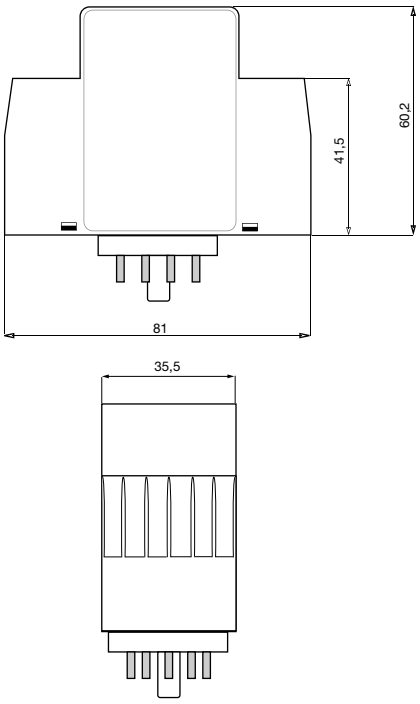
Bottom view

Dimension Drawings

Din-rail version



Plug version



Accessories

• 11 pole circular socket	ZPD11
• Retaining spring	HF

Delivery Contents

- Amplifier
- Packaging: Carton box
- Manual

Conductive Sensors
2-point level controller
Type CL with potentiometer

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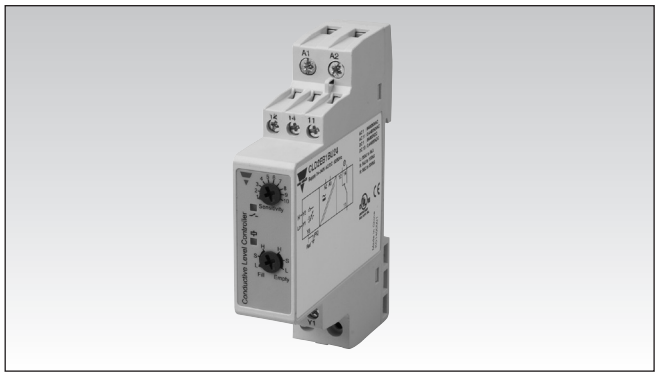

- **Conductive level controller**
- **Sensitivity adjustment from 250 Ω to 500 KΩ**
- **For filling or emptying applications**
- **Low-voltage AC electrodes**
- **Easy installation on DIN rails**
- **Rated operational voltage: 24 to 240 VAC/DC**
- **Output 1 x 8 A / 250 VAC SPDT relay**
- **LED indication for: Output ON and Power ON**

Product Description

µ-Processor based level controller for liquids with a wide sensitivity range (like sewage water, chemicals, salt water etc.).

Max./min. control of charging/ discharging. The sensitivity is adjustable by means of the potentiometer.
1 x 8 A SPDT relay output.

Ordering Key

CLD2EB1BU24

- **Conductive level**
- **DIN rail**
- **No of inputs**
- **Charge/discharge**
- **Basic with potentiometer**
- **1 relay output**
- **Relay SPDT**
- **Power supply**

Type Selection

Mounting	Relay	Ordering no. Supply: 24-240 VAC/DC
DIN-rail	SPDT	**CLD2EB1BU24**

Specifications

Rated operational voltage (U_B)		
Pin 2 & 10		20 to 265 VAC/DC, 45 to 65 Hz
Rated insulation voltage		<2.0 kVAC (rms)
Rated impulse withstand voltage		4 kV (1.2/50 µs) (line/neutral)
Rated operational power		
230 VAC/DC supply		2 W
24 VAC/DC supply		1 W
Delay on operate (t_v)		< 2 s
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 10^6 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		250Ω to 500KΩ Factory settings standard range "S" 100KΩ
Ranges L (Low sensitivity)		250 Ω to 5 KΩ, C_F* = 4.7 nF
Ranges S (Standard sensitivity)		5 KΩ to 100 KΩ, C_F* = 2.2 nF
Ranges H (High sensitivity)		50 KΩ to 500 KΩ, C_F* = 1.0 nF

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		1 Hz
Response time		
OFF-ON (t_{on})		1 s
ON-OFF (t_{off})		1 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°F)
Storage		-40° to +85°C (-40° to +185°F)
Housing material		PA66, light grey
Screw type		M3
Tightening tourque min/max		0.4Nm/0.8Nm
Weight		
AC/DC supply		125 g
Approvals	cULus	UL508, CSA C22.2
CE marking		Yes

*C_F = maximum Cable Capacitance

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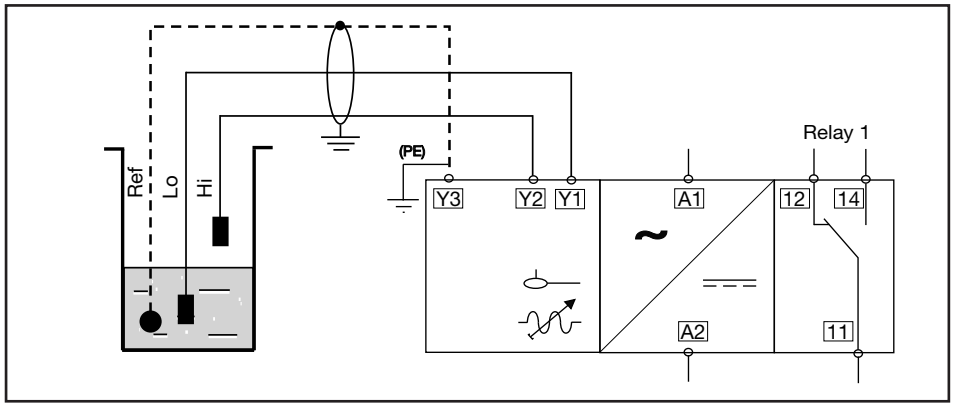
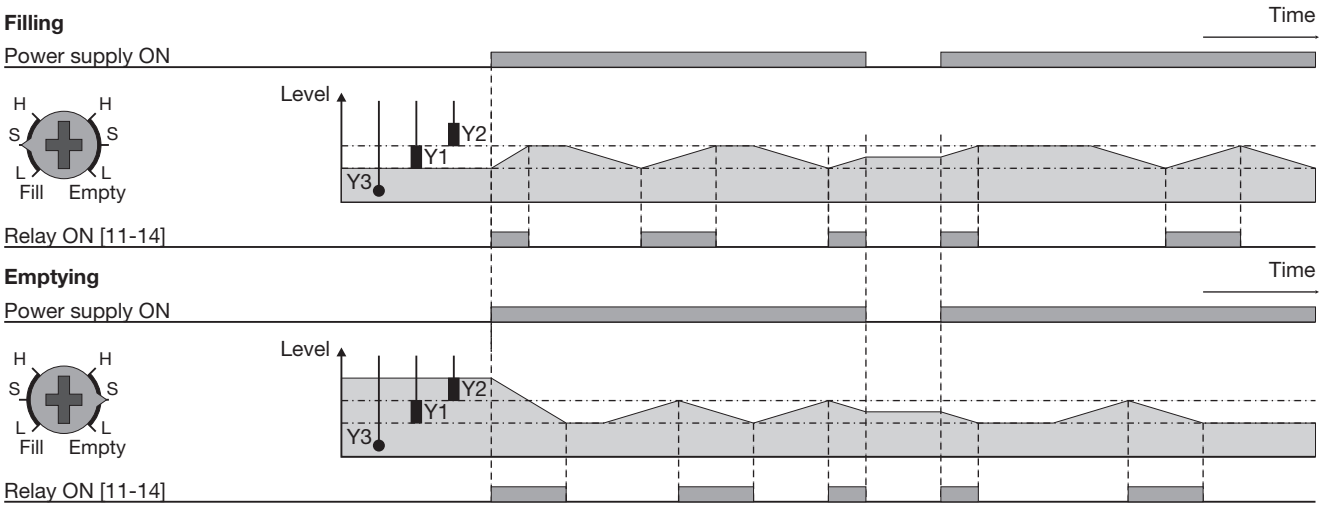
Mode of Operation

Connection cable
2, 3, or 4 conductor PVC cable, normally screened. Cable length: max. 100 m. The resistance between the cores and the ground must be at least 500k. 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 the reference port (Ref) must be connected to Protective Earth (PE).

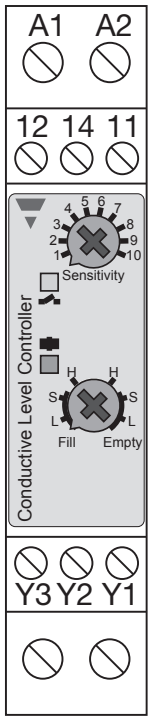
Example 1
The diagram shows the level control connected as max. and min. control. The relays react to the low alternating current created when the electrodes are in contact with the liquid.
The reference (Ref) must be connected to the container or if the container consists of a non-conductive material, to an additional electrode. (To be connected to pin Y3). (In the diagram this electrode is shown by the dotted line).

NB!
If only one level detection is required - interconnect the two inputs Y1 and Y2.

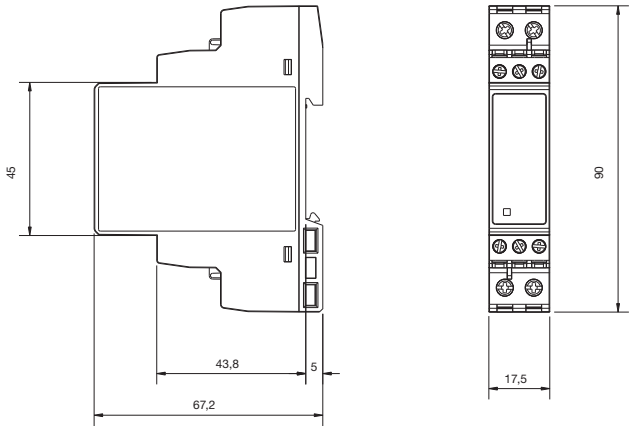




Wiring Diagram



Dimension Drawings



Delivery Contents

- Amplifier
- Packaging: Carton box
- Manual

Conductive Sensors
2-point level controller
Type CL with teach-in

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- **Conductive level controller**
- **Teach-in of sensitivity – operating resistance from 220Ω to 220KΩ**
- **For filling or emptying applications**
- **Low-voltage AC electrodes**
- **Easy installation on DIN rails or with 11 pin circular plug**
- **Rated operational voltage: 24 VAC/DC, 115 VAC or 230 VAC**
- **Output 2x5A/250 VAC DPDT relay**
- **LED indication for: Calibration, faulty operation and relay status**

Product Description

µ-Processor based level controller for liquids with a wide sensitivity range (like sewage water, chemicals, salt water etc.).

Max./min. control of charging/ discharging. The sensitivity is adjustable by means of the teach-in function.
2 X 5A DPDT relay output.

Ordering Key

CLD2ET1CM24

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

Type Selection

Mounting	Relay	Ordering no. Supply: 24 VAC/DC	Ordering no. Supply: 115 VAC	Ordering no. Supply: 230 VAC
DIN-rail	DPDT	**CLD2ET1CM24**	**CLD2ET1C115**	**CLD2ET1C230**
11-p circular plug		**CLP2ET1CM24**	**CLP2ET1C115**	**CLP2ET1C230**

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	5 A / 250 VAC (2500 VA)
	DC1	1 A / 250 VDC (250 W)
	or	5 A 25 VDC (250 W)
Small induc. Loads	AC11	0,4 A 250 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. 12 VAC
Level probe current		Max. 2.5 mA
Sensitivity		220Ω to 220KΩ 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	1 HZ
Response time	1 s (3.5 s with filter)
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°F)
Storage	-50° to +85°C (-58° to +185°F)
Housing material	NORYL SE1, light grey
Weight	
AC supply	200 g
AC/DC supply	125 g
UL-Approval c𝑹us	UL508
CE marking	Yes

Mode of Operation

Connection cable
2, 3, or 4 conductor PVC cable, normally screened. Cable length: max. 100 m. The resistance between the cores and the ground must be at least 220k. 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 Y3 (reference).

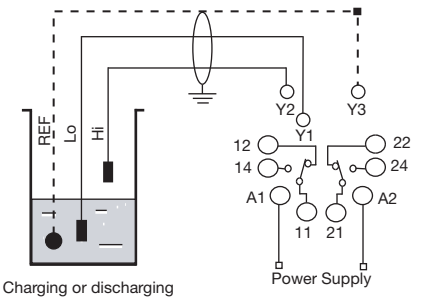
DIP-switch setting
Select the needed function on the DIP-switches, so that the desirable application occurs. Press the push-button in front of the controller shortly, until the green LED flashes once. The DIP-switch setting will now be read by the controller.

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.

Filter
The signal delay is selectable from 1 second or 3 seconds, and works for the on/off switching of the output relays.

Example 1
The diagram shows the level control connected as max. and min. control. The relays 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 Y3). (In the diagram this electrode is shown by the dotted line).

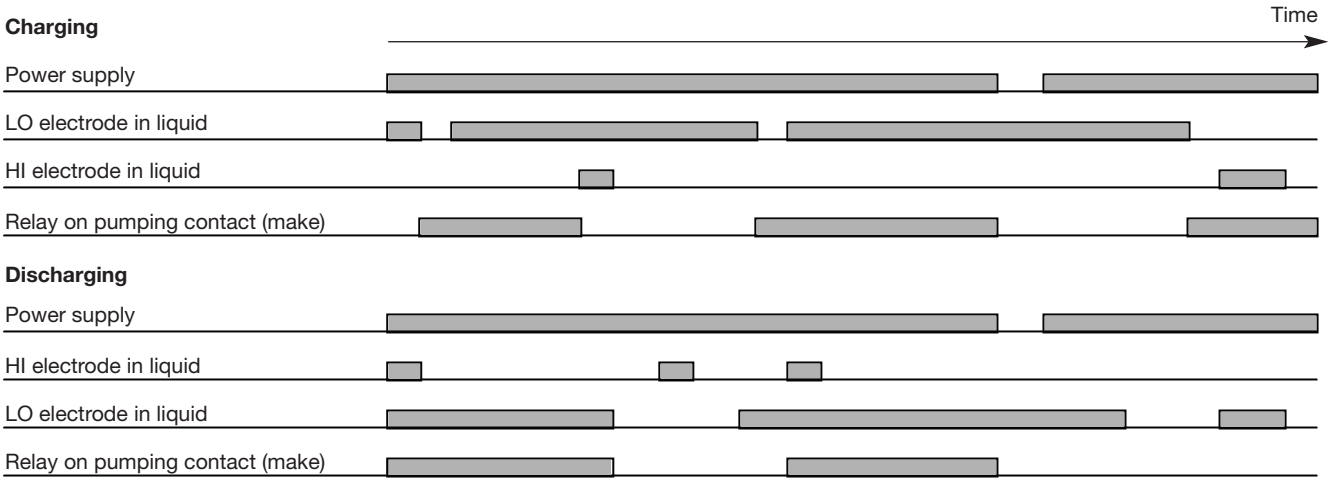
Example 1
(Din-rail)



Function: Charge or Discharge
The Controller can be used as a minimum-maximum control for one system.

ON
DIP switches
1 Discharge
1 Charge
2 Filter off
2 Filter on
ON

X-REFERENCE	
TERM	PLUG
Y1	6
Y2	5
Y3	7
A1	2
A2	10
11	1
12	4
14	3
21	11
22	8
24	9



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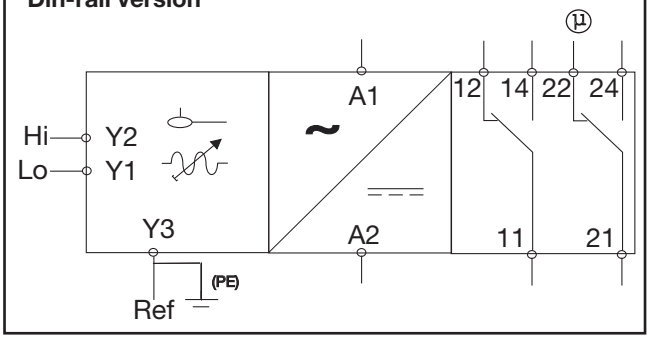
Operating Schedule

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

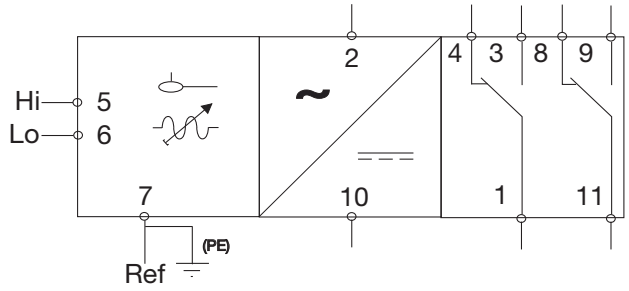
Situation	Condition	Action	Green Control lamp
Read DIP-switch setting	The DIP-switch setting has to match one of the descriptions written in ”mode of operation”	Press the Teach-button in front of the controller shortly until the green control lamp turns off. Release the teach button immediately	
Teach-in	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

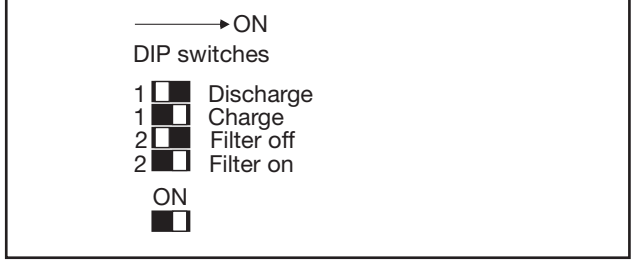
Din-rail version



Plug version

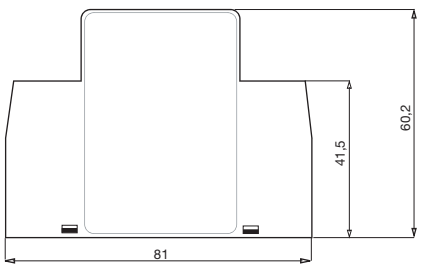


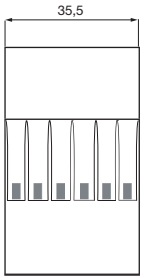
Dip Switch Settings



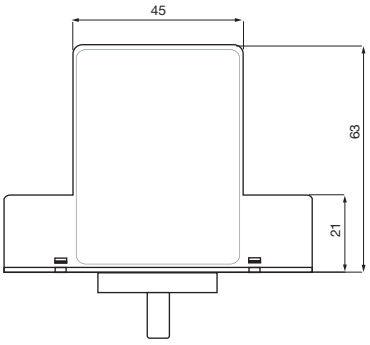
Dimension Drawings

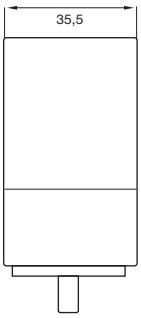
Din-rail version





Plug version





Accessories

• 11 pole corcular socket	ZVD11
• Mounting rack	SM13

Delivery Contents

- Amplifier
- Packaging: Carton box
- Manual

Conductive Sensors
2 to 4-point level controller
Type CL with potentiometer

- **Conductive level controller**
- **Adjustment of sensitivity – operating resistance from 250Ω to 500KΩ**
- **Multiple combinations of filling and emptying applications**
- **Low-voltage AC electrodes**
- **Easy installation on DIN rails or with 11 pin circular plug**
- **Rated operational voltage: 24 VAC/DC, 115 VAC or 230 VAC**
- **Output 2x8A/250 VAC SPDT relay**
- **LED indication for: Output ON and Power ON**

Product Description

µ-Processor based level controller for liquids with a wide sensitivity range (like sewage water, chemicals, salt water etc.). The controller has a separate output for alarm indication in case of a tank running dry or if an overflow condition occurs.
8A SPDT/SPST relay output, NO/NC.
Sensitivity control by potentiometer level in 3 ranges.

Ordering Key

CLD4MA2DM24

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

Type Selection

Mounting	Relay	Ordering no. Supply: 24 VAC/DC	Ordering no. Supply: 115 VAC	Ordering no. Supply: 230 VAC
DIN-rail	SPDT + SPST	**CLD4MA2DM24**	**CLD4MA2D115**	**CLD4MA2D230**
11-p circular plug	2 SPST	**CLP4MA2AM24**	**CLP4MA2A115**	**CLP4MA2A230**

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
Supply class 2	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		Make or break on rotary-switch
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 10^6 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		250Ω to 500KΩ Factory settings standard range "S" 100KΩ
Ranges L (Low sensitivity)		250 Ω to 5 KΩ, C_F* = 4.7 nF
Ranges S (Standard sensitivity)		5 KΩ to 100 KΩ, C_F* = 2.2 nF
Ranges H (High sensitivity)		50 KΩ to 500 KΩ, C_F* = 1.0 nF

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		0.5 HZ
Response time		
OFF-ON (t_{on})		1 s
ON-OFF (t_{off})		1 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°F)
Storage		-50° to +85°C (-58° to +185°F)
Housing material	CLP	NORYL PPO, light grey
	CLD	ABS VO, light grey
Screw type		M3
Tightening tourque min/max		0.4Nm/0.8Nm
Weight		
AC supply		200 g
AC/DC supply		125 g
UL Approvals	cURus	UL508, UL325, CSA-C22.2 No.247
CE marking		Yes

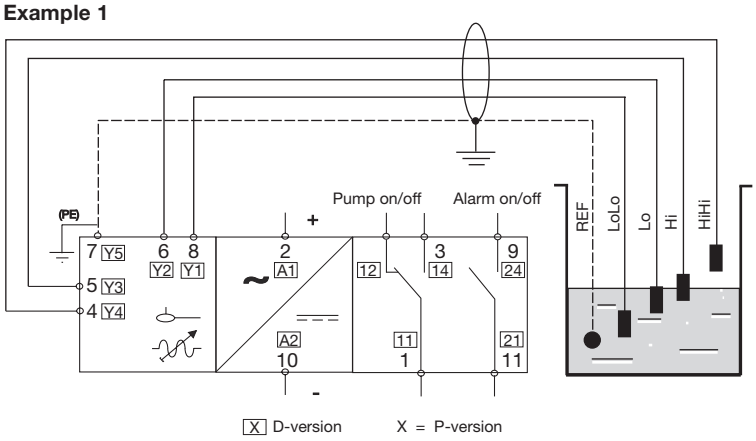
*C_F = maximum Cable Capacitance

Mode of Operation

Connection cable
2, 3, 4 or 5 conductor PVC cable, normally screened. Cable length: max. 100 m. The resistance between the cores and the ground must be at least 500k. 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 Y5 (reference).

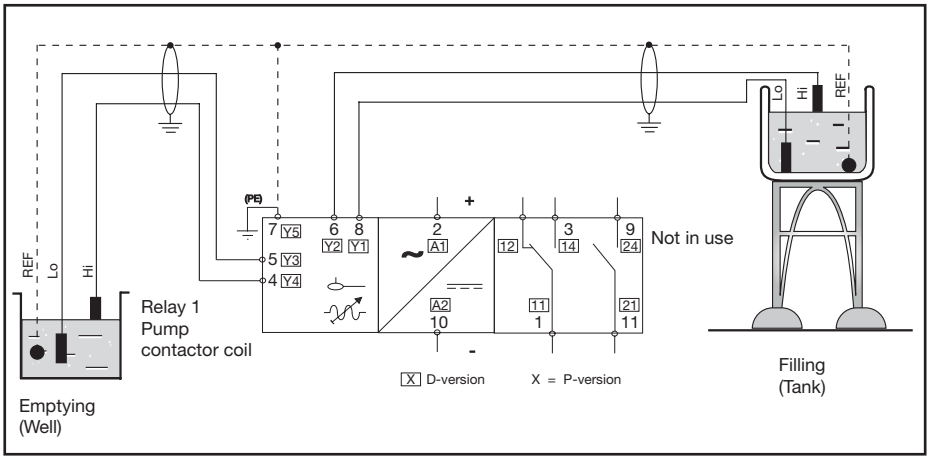
Example 1
The diagram shows the level control connected as max. and min. control, i.e. registration of 2 levels + 2 alarm levels. The relays react to the low alternating current created when the electrodes are in contact with the liquid.
The reference (Ref) must be connected to the container or if the container consists of a non-conductive material, to an additional electrode. (To be connected to pin Y5).
In the diagram this electrode is shown by the dotted line.)
The alarm outputs utilize electrodes on Y4 for HiHi alarm - and Y1 for LoLo alarm outputs.

Example 1

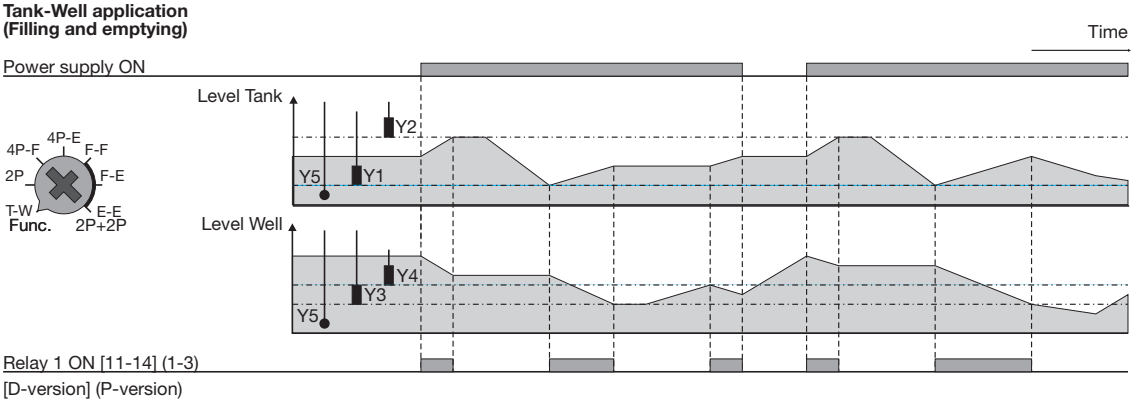


Operation Diagram

Function: Filling or Emptying
The Multifunction Controller can be used as a minimum-maximum control for two systems, a filling system and a emptying system, with the same kind of liquid to be measured and one common pump.

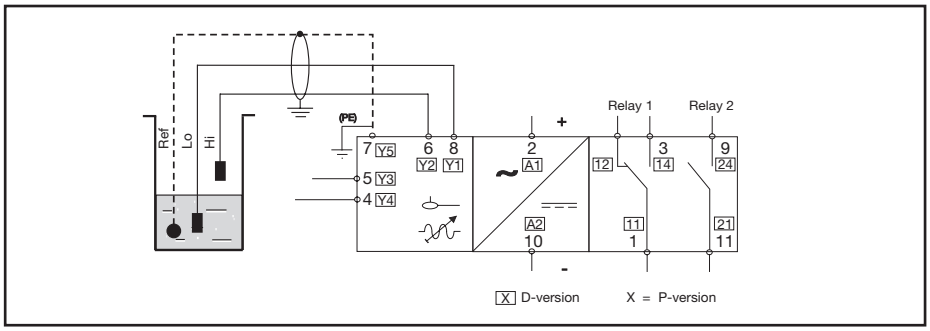


Tank-Well application (Filling and emptying)



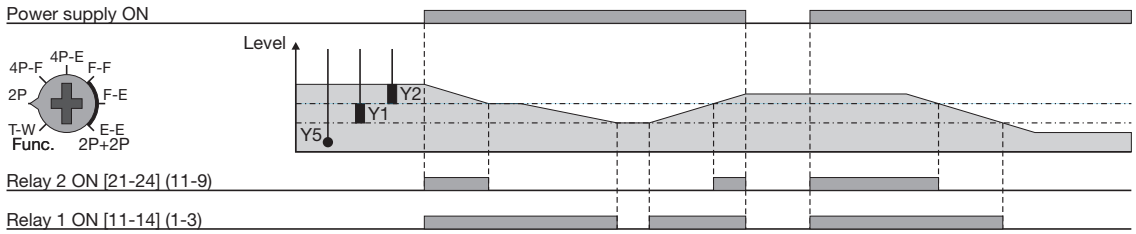
Operation Diagram

Function: Direct input- output
The Multifunction Controller can be used as direct input/ output, where each of the two inputs (electrodes) controls an individual relay output:
Electrode no. 1 = Relay no. 1
Electrode no. 2 = Relay no. 2.

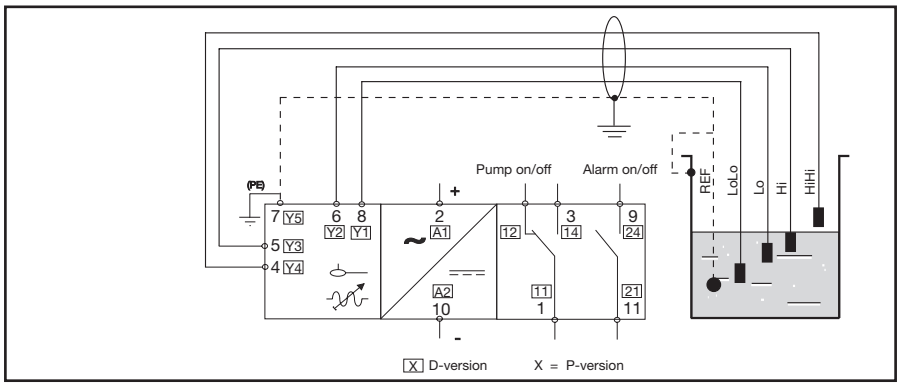


2-Probe
(Direct Input to output)

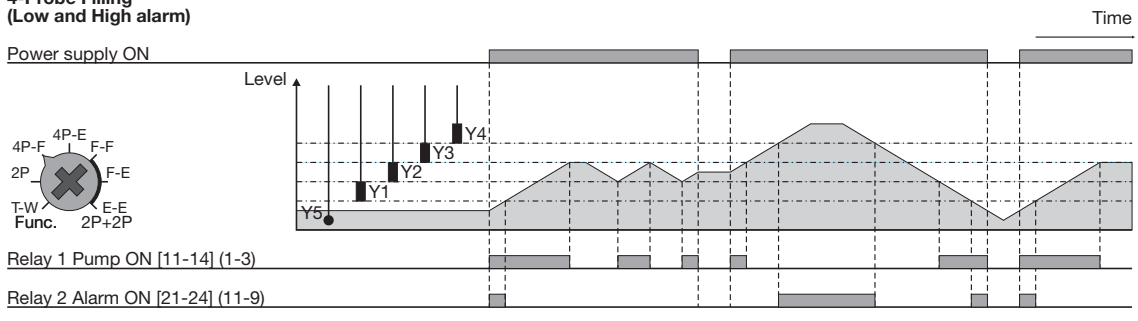
Time independent



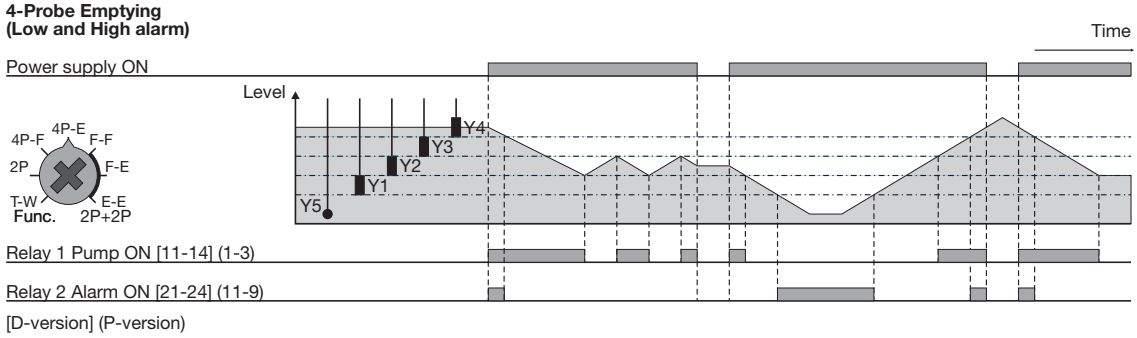
Function: Filling or Emptying with high and low alarms
The Multifunction Controller can be used as a minimum-maximum control filling or emptying system, with HiHi and LoLo Alarm output.



4-Probe Filling
(Low and High alarm)

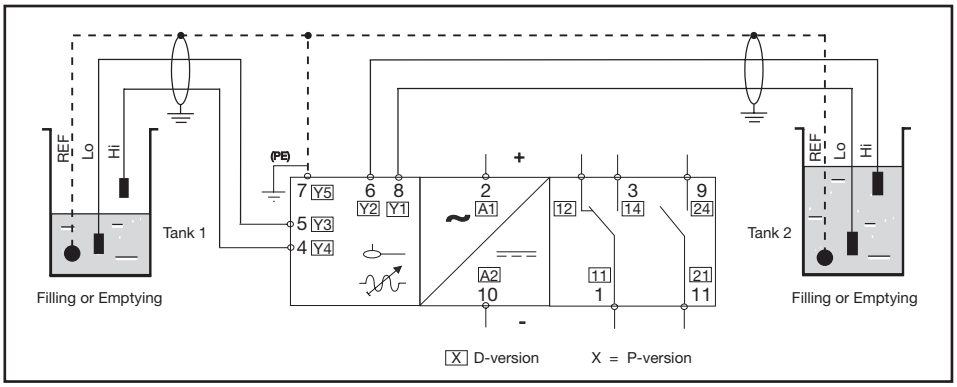


4-Probe Emptying
(Low and High alarm)

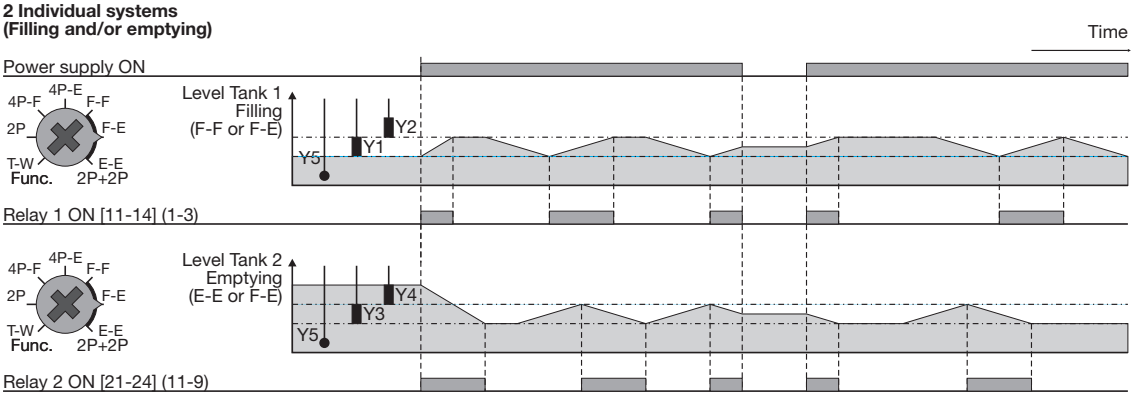


Operation Diagram

Function: Filling or Emptying
The Multifunction Controller can be used as a minimum-maximum control for up to two individual systems, with the same kind of liquid to be measured.



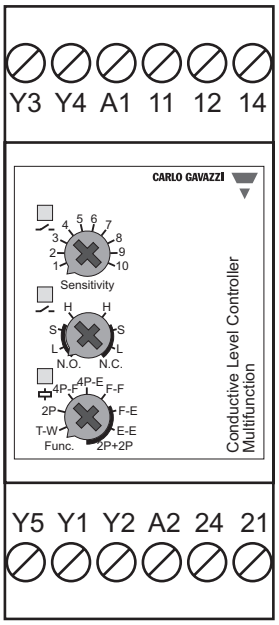
2 Individual systems (Filling and/or emptying)



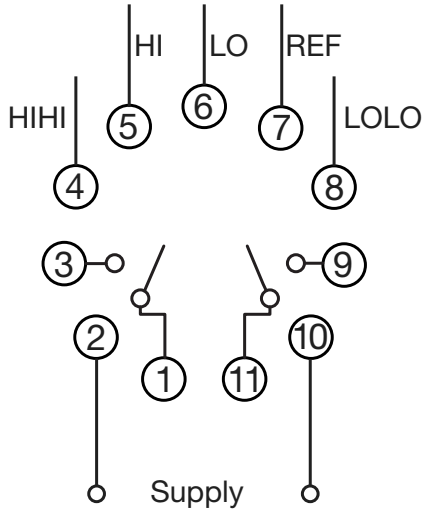
[D-version] (P-version)

Wiring Diagram

Din-rail version



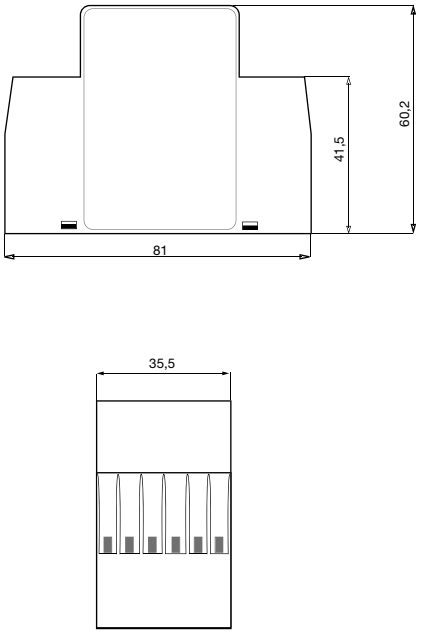
Plug version



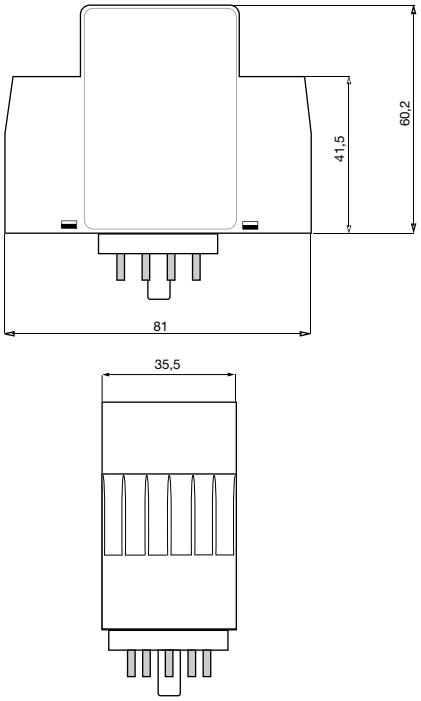
Bottom view

Dimension Drawings

Din-rail version



Plug version



Accessories

• 11 pole circular socket	ZPD11
• Retaining spring	HF

Delivery Contents

- Amplifier
- Packaging: Carton box
- Manual

Conductive Sensors
2 to 4-point level controller
Type CL with teach-in

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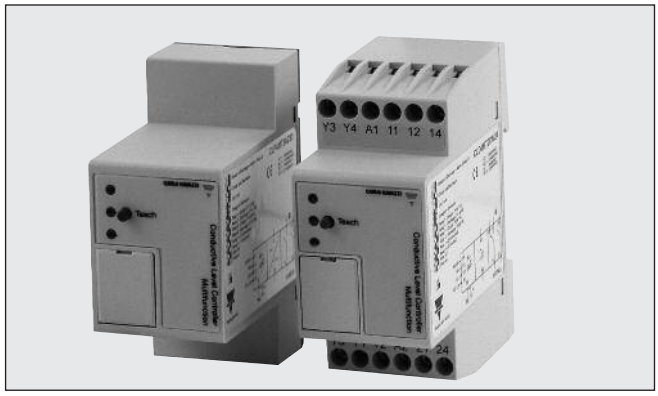

- **Conductive level controller**
- **Teach-in of sensitivity – operating resistance from 220Ω to 220KΩ**
- **Multiple combinations of filling and emptying applications**
- **Low-voltage AC electrodes**
- **Easy installation on DIN rails or with 11 pin circular plug**
- **Rated operational voltage: 24 VAC/DC, 115 VAC or 230 VAC**
- **Output 2x8A/250 VAC SPDT relay**
- **LED indication for: Calibration, faulty operation and relay status**

Product Description

µ-Processor based level controller for liquids with a wide sensitivity range (like sewage water, chemicals, salt water etc.). The controller has a separate output for alarm indication in case of a tank running dry or if an overflow condition occurs.
8A SPDT/SPST relay output, NO/NC.

Ordering Key

CLD4MT2DM24

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

Type Selection

Mounting	Relay	Ordering no. Supply: 24 VAC/DC	Ordering no. Supply: 115 VAC	Ordering no. Supply: 230 VAC
DIN-rail	SPDT + SPST	**CLD4MT2DM24**	**CLD4MT2D115**	**CLD4MT2D230**
11-p circular plug	2 SPST	**CLP4MT2AM24**	**CLP4MT2A115**	**CLP4MT2A230**

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		Make or break on DIP-switch
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	AC11	0,4 A / 250 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. 12 VAC
Level probe current		Max. 2.5 mA
Sensitivity		220Ω to 220KΩ 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	1 HZ
Response time	1 s (3,5 s with filter)
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°F)
Storage	-50° to +85°C (-58° to +185°F)
Housing material	NORYL SE1, light grey
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

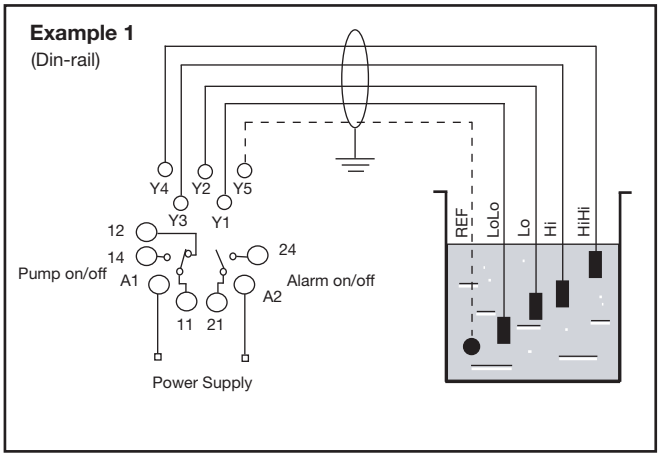
Connection cable
2, 3, 4 or 5 conductor PVC cable, normally screened. Cable length: max. 100 m. The resistance between the cores and the ground must be at least 220k. Normally, it is recommended to use a screened cable between probe and controller, e.g. where the cable is placed in parallel to the load cables (mains). The screen has to be connected to Y5 (reference).

DIP-switch setting
Select the needed function on the DIP-switches, so that the desirable application occurs. Press the pushbutton in front of the controller shortly, until the green LED flashes once. The DIP-switch setting will now be read by the controller.

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.

Filter
The signal delay is selectable from 1 second or 3 seconds, and works for the on/off switching of the output relays.

Example 1
The diagram shows the level control connected as max. and min. control, i.e. registration of 2 levels + 2 alarm levels. The relays 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 Y5). In the diagram this electrode is shown by the dotted line.)
The alarm outputs utilize electrodes on Y1 for HiHi alarm and Y4 for LoLo alarm.



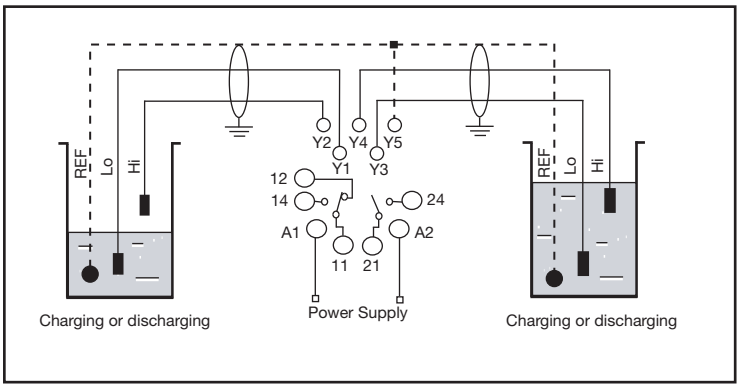
Function: Charge or Discharge
The Multifunction Controller can be used as a minimum-maximum control for up to two individual systems, with the same kind of liquid to be measured.

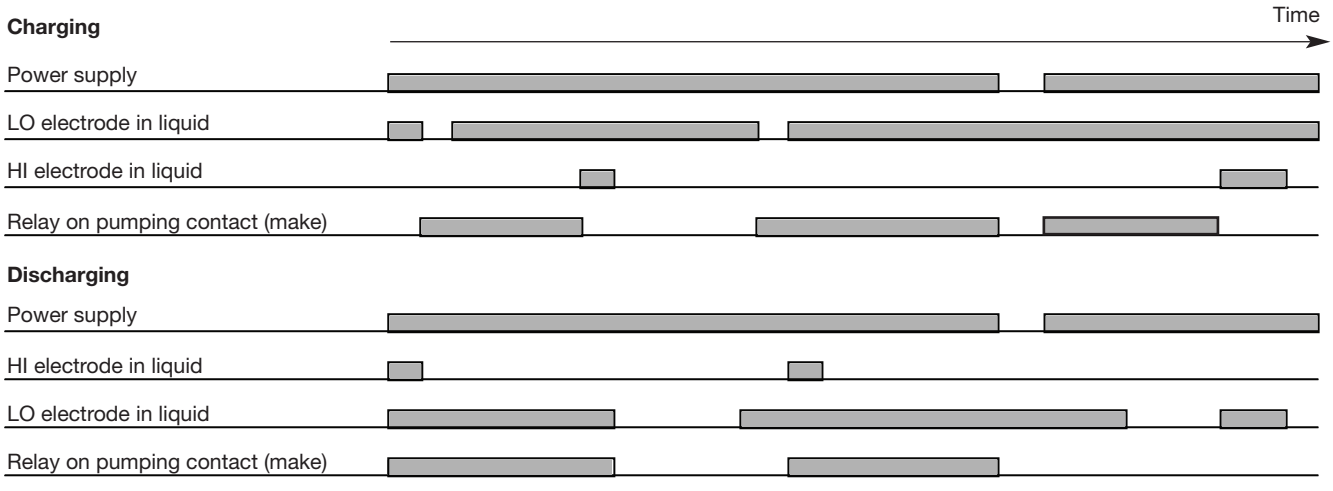
ON
DIP switches (Plug-version)

1 Function selection
2 Function selection
3 Relay 1 - Charge (off) or Discharge (on)
4 Relay 2 - Charge (off) or Discharge (on)
5 NO/NC
6 Filter on/off

ON

X-REFERENCE	
TERM	PLUG
Y1	8
Y2	6
Y3	5
Y4	4
Y5	7
A1	2
A2	10
11	1
12	-
14	3
21	11
24	9





CARLO GAVAZZI

Operation Diagram

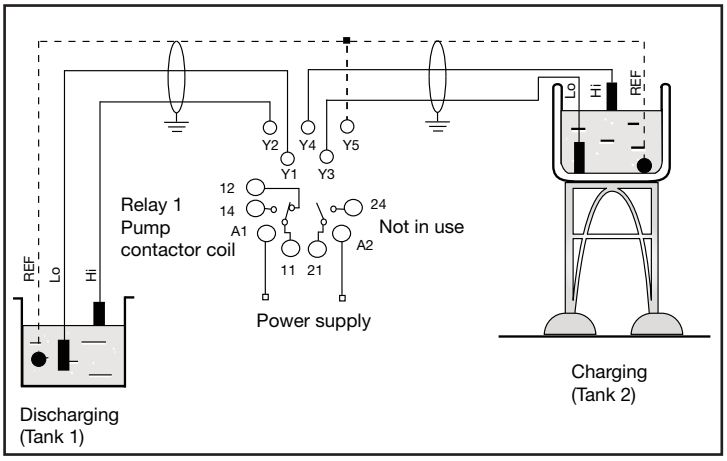
Function: Charge and Discharge
The Multifunction Controller can be used as a minimum-maximum control for two systems, a charging system and a discharging system, with the same kind of liquid to be measured and one common pump.

→ ON
DIP switches (Plu

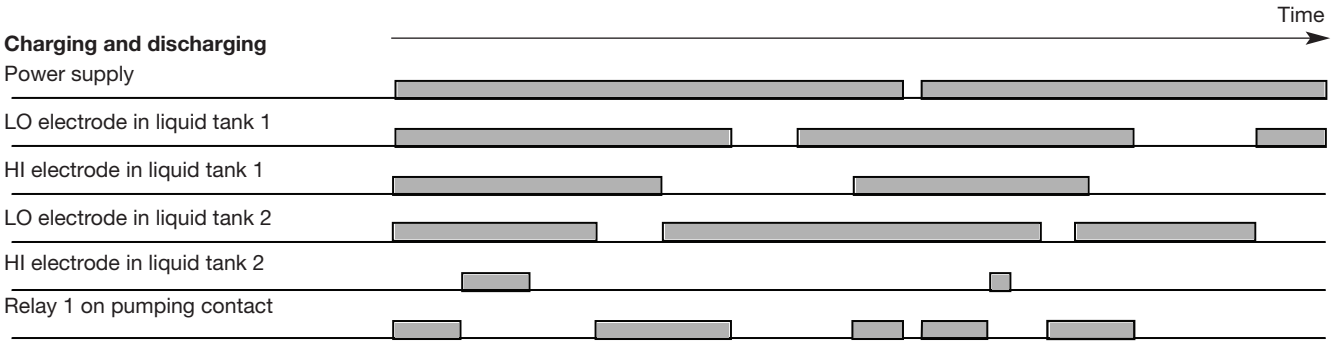
1 Function selection
2 Function selection
3 No function
4 No function
5 NO/NC
6 Filter on/off

ON

X-REFERENCE	
TERM	PLUG
Y1	8
Y2	6
Y3	5
Y4	4
Y5	7
A1	2
A2	10
11	1
12	-
14	3
21	11
24	9



Charging and discharging



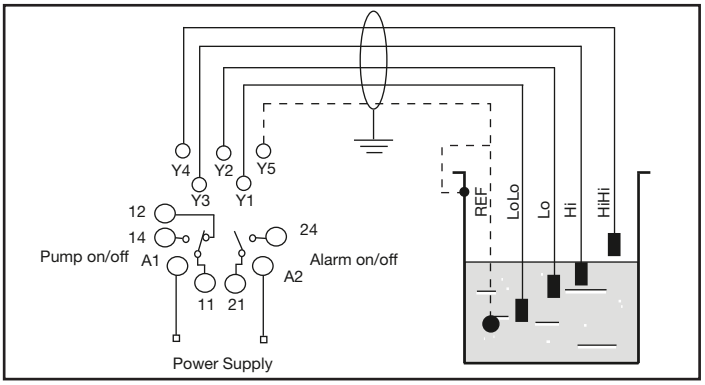
Function: Charge or Discharge with high and low alarms
The Multifunction Controller can be used as a minimum-maximum control charging or discharging system, with HiHi and LoLo Alarm output.

→ ON
DIP switches (Plug-version)

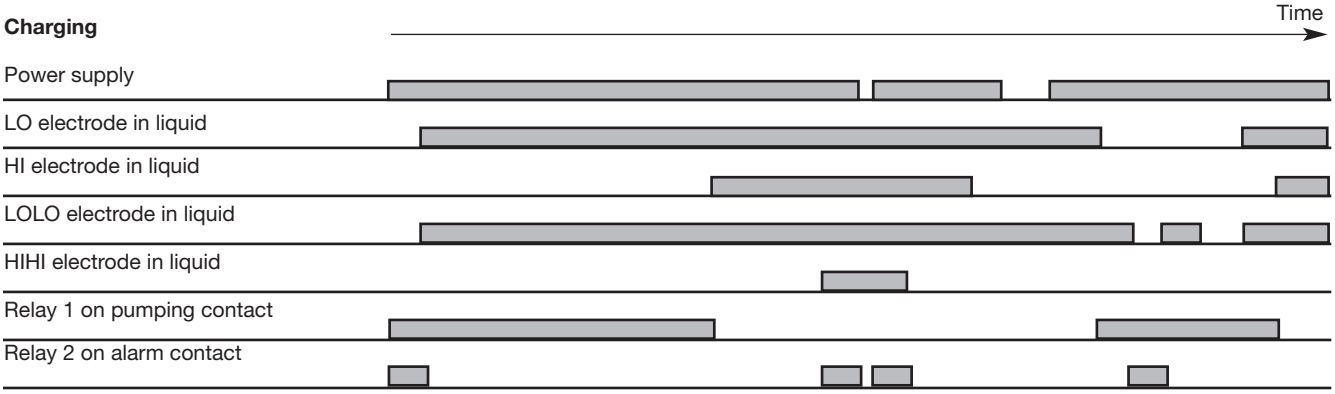
1 Function selection
2 Function selection
3 Relay 1 - Charge (off) or Disc
4 Relay 2
5 NO/NC
6 Filter on/off

ON

X-REFERENCE	
TERM	PLUG
Y1	8
Y2	6
Y3	5
Y4	4
Y5	7
A1	2
A2	10
11	1
12	-
14	3
21	11
24	9

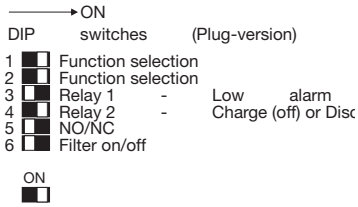


Charging

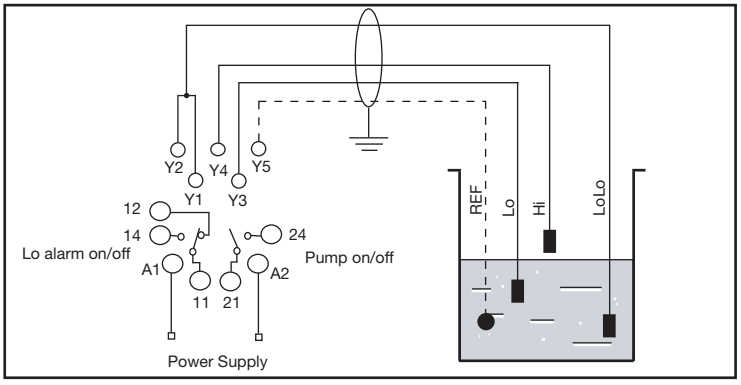


Operation Diagram

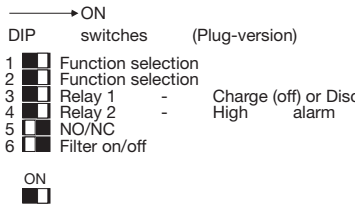
Function: Charge or discharge with low alarm
The Multifunction Controller can be used as a minimum-maximum control charging or discharging system, with one LoLo alarm output.



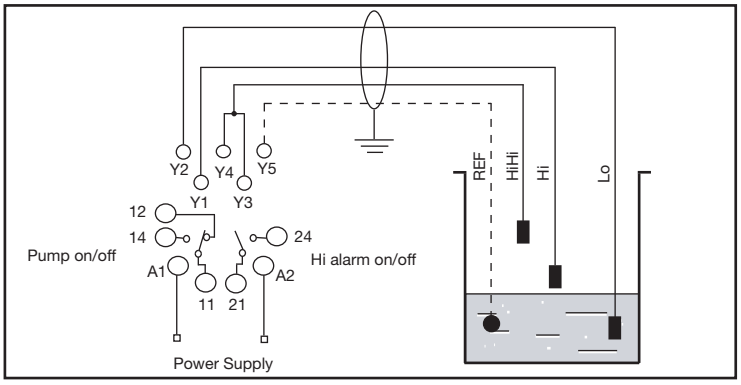
X-REFERENCE	
TERM	PLUG
Y1	8
Y2	6
Y3	5
Y4	4
Y5	7
A1	2
A2	10
11	1
12	-
14	3
21	11
24	9



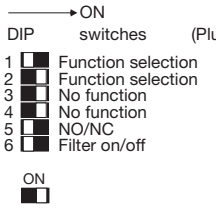
Function: Charge or discharge with high alarm
The Multifunction Controller can be used as a minimum-maximum control charging or discharging system, with one HiHi alarm output.



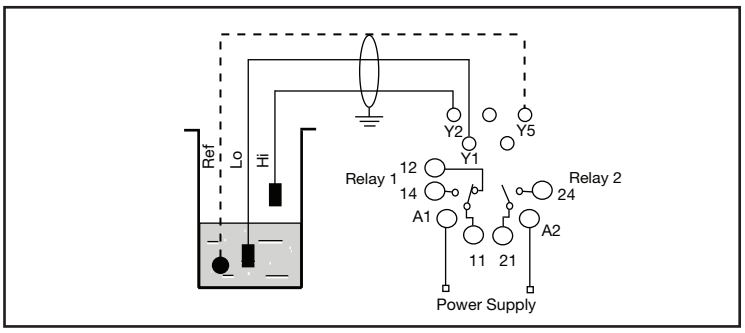
X-REFERENCE	
TERM	PLUG
Y1	8
Y2	6
Y3	5
Y4	4
Y5	7
A1	2
A2	10
11	1
12	-
14	3
21	11
24	9



Function: Direct input- output
The Multifunction Controller can be used as direct input/ output, where each of the two inputs (electrodes) controls an individual relay output:
Electrode no. 1 = Relay no. 1
Electrode no. 2 = Relay no. 2.



X-REFERENCE	
TERM	PLUG
Y1	8
Y2	6
Y3	5
Y4	4
Y5	7
A1	2
A2	10
11	1
12	-
14	3
21	11
24	9



Direct input- output

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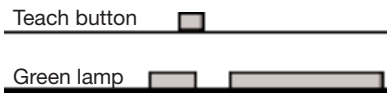
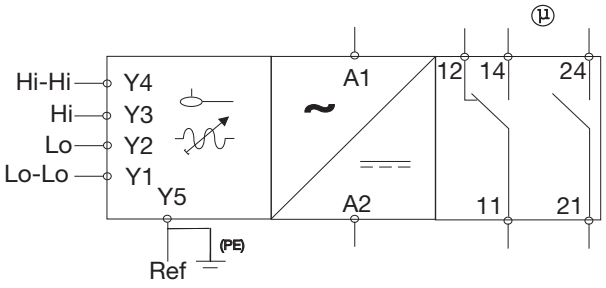
Operating Schedule

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

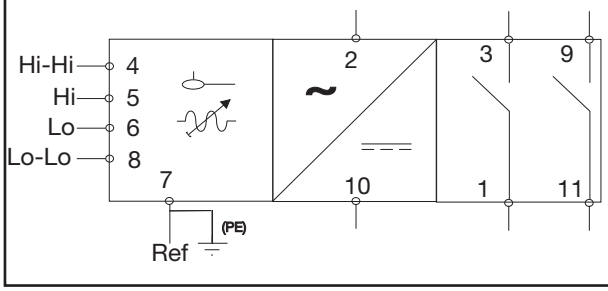
Situation	Condition	Action	Green Control lamp
Read DIP-switch setting	The DIP-switch setting has to match one of the descriptions written in "mode of operation"	Press the Teach-button in front of the controller shortly until the green control lamp turns off. Release the teach button immediately	
Teach-in	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

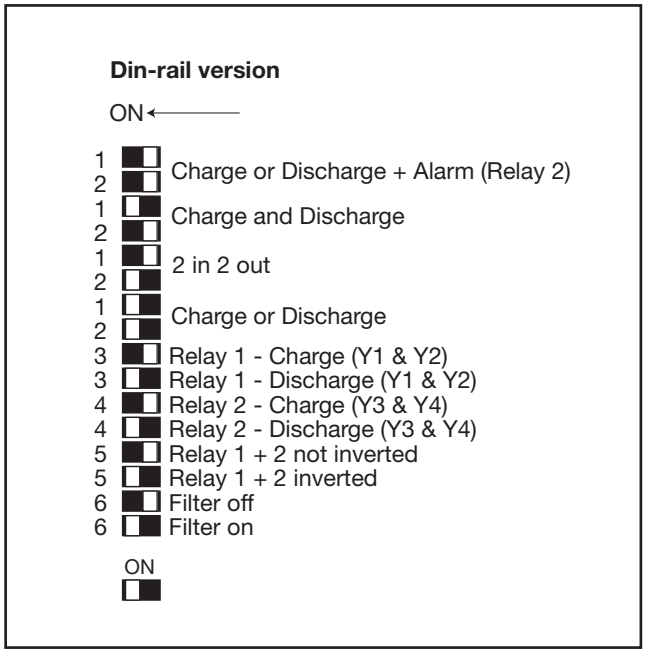
Din-rail version

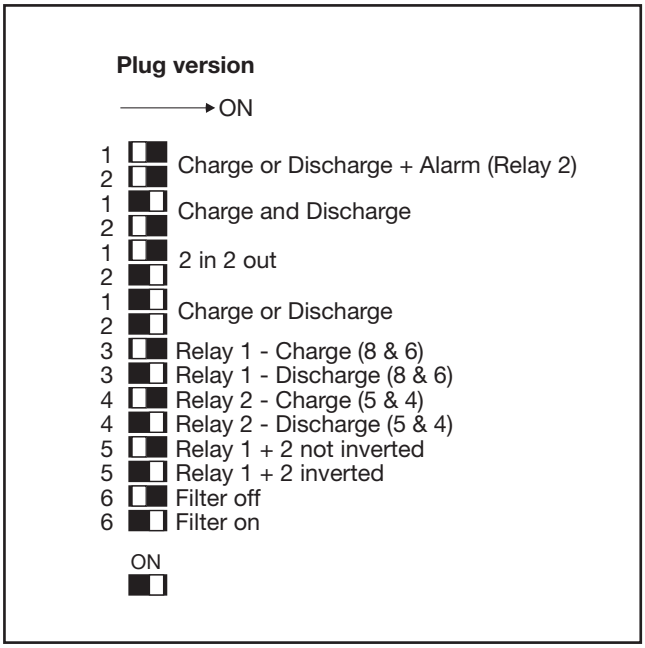


Plug version



Dip Switch Settings



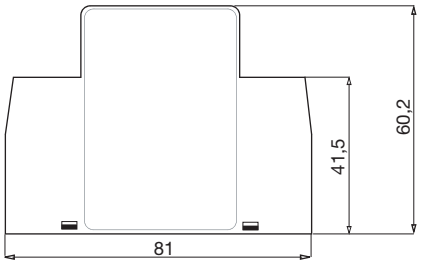


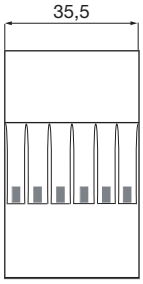
Dip Switch Function

	Dip-switch						Functionality	Comments
	1	**2**	**3**	**4**	**5**	**6**		
Function settings	0	0					Charge or discharge +alarm	One system in one tank
	1	0					Charge and discharge	One system in two tanks with one relay output
	0	1					2 in - 2 out	Each input direct controlling one output relay
	1	1					Charge or discharge	2 seperate systems
Relay #1 function	1	1	0				Discharge	Emptying system #1
	1	1	1				Charge	Filling system #1
Relay #2 function	1	1	-	0			Dicharge	Emptying system #2
	1	1	-	1			Charge	Filling system #2
Relay output	-	-	-	-	0		Normally open	Relays in normally open position
	-	-	-	-	1		Normally closed	Relays in normally closed position
Filter	-	-	-	-	-	0	Normal filter time	On-delay <0.5s
	-	-	-	-	-	1	Extended filter time	On-delay <2.0s

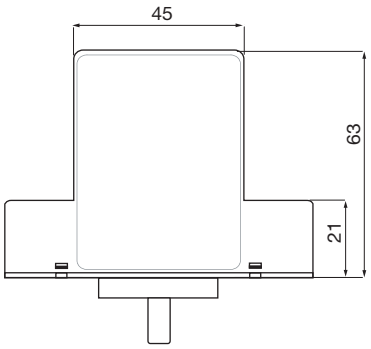
Dimension Drawings

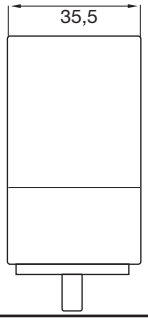
Din-rail version





Plug version





Accessories

• 11 pole corcular socket	ZVD11
• Mounting rack	SM13

Delivery Contents

- Amplifier
- Packaging: Carton box
- Manual

По вопросам продаж и поддержки обращайтесь:

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