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		-20º to +50ºC (-4º to + 122ºF)
Storage		-50º to +85ºC (-58º to +185ºF)
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

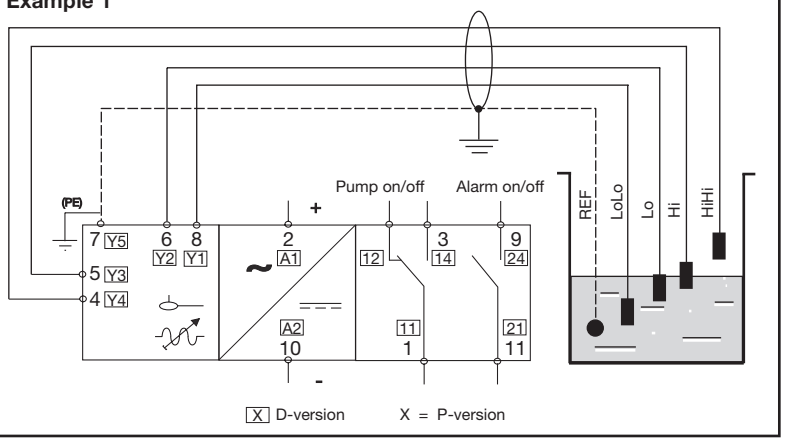
*C_F = maximum Cable Capacitance

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).

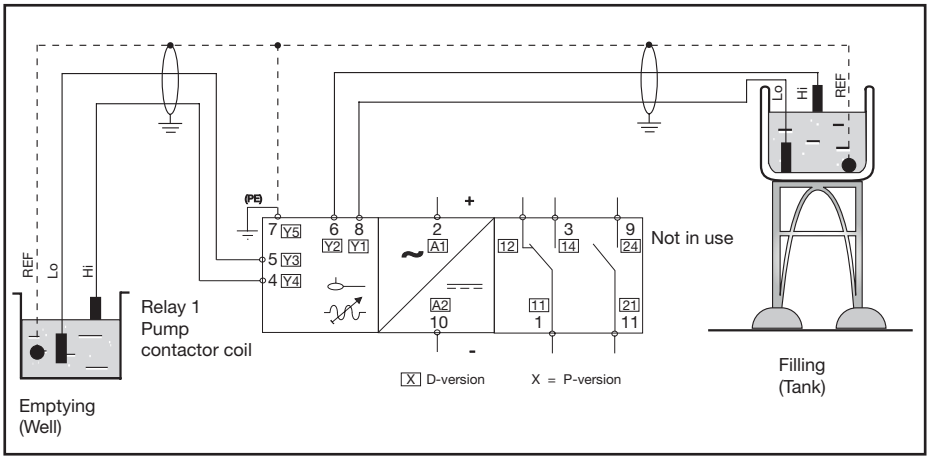
Example 1
The diagram shows the level control connected as max. and min. control, i.e. registration of 2 levels + 2 alarm levels. The relays react to the low alternating current created when the electrodes are in contact with the liquid.
The reference (Ref) must be connected to the container or if the 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

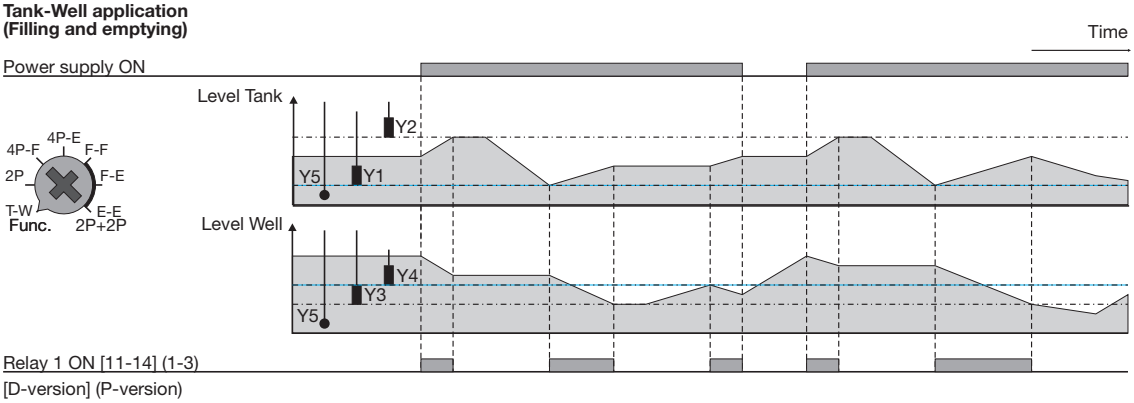


Operation Diagram

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.

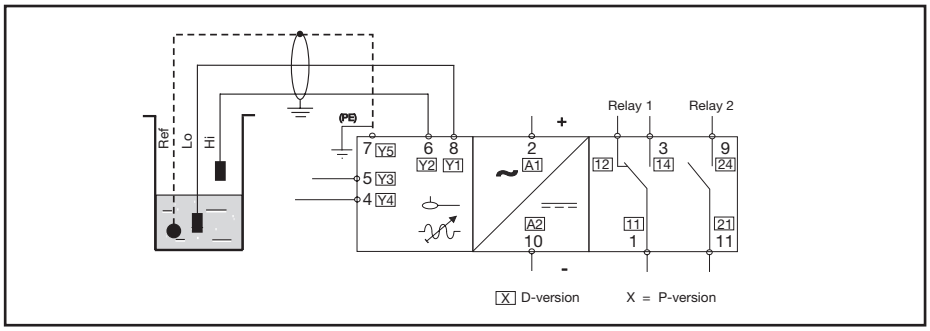


Tank-Well application (Filling and emptying)



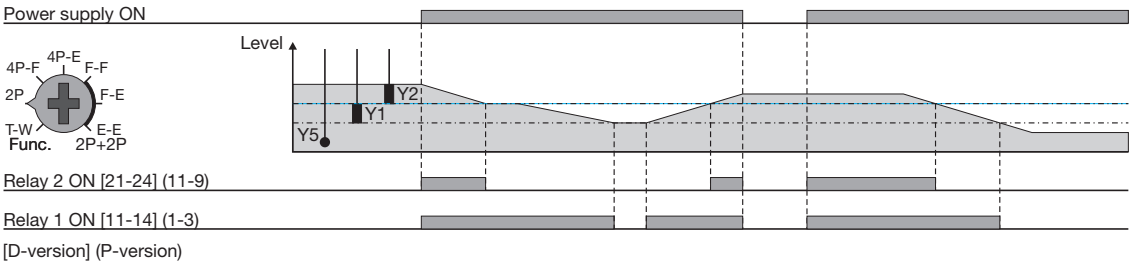
Operation Diagram

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.

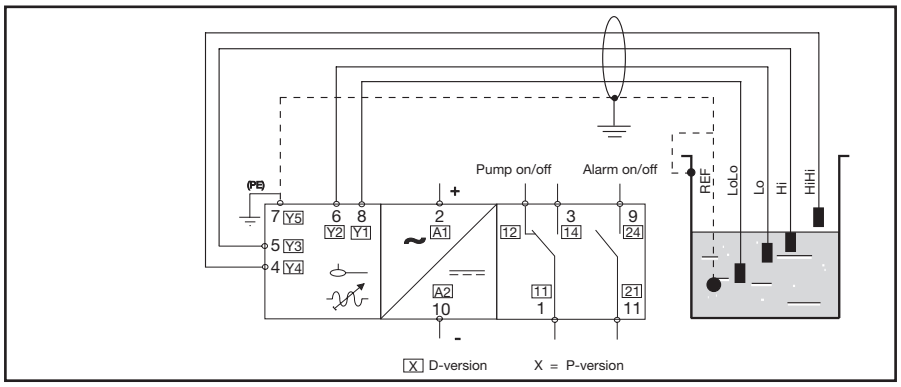


2-Probe
(Direct Input to output)

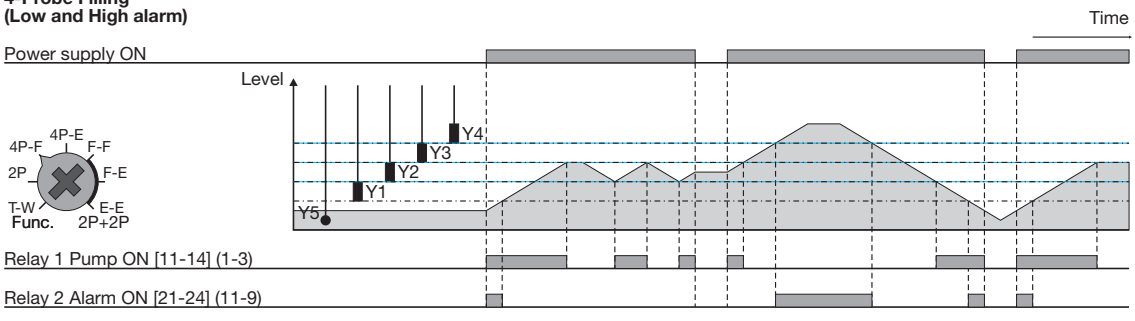
Time independent



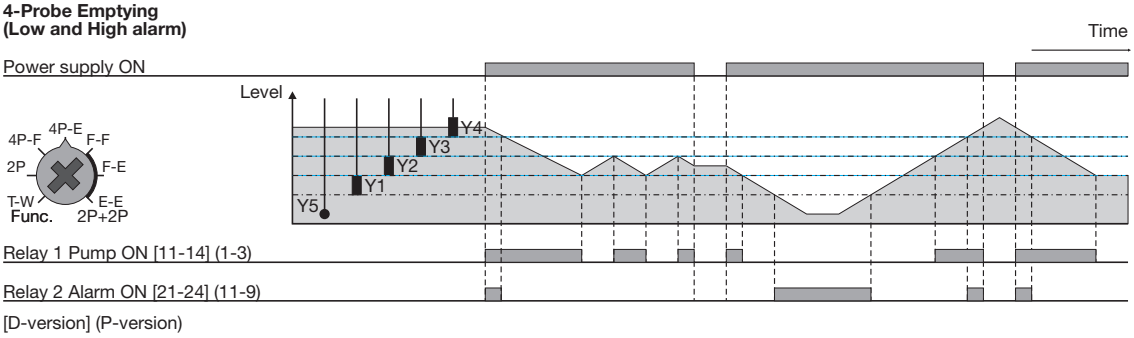
Function: Filling or Emptying with high and low alarms
The Multifunction Controller can be used as a minimum-maximum control filling or emptying system, with HiHi and LoLo Alarm output.



4-Probe Filling
(Low and High alarm)

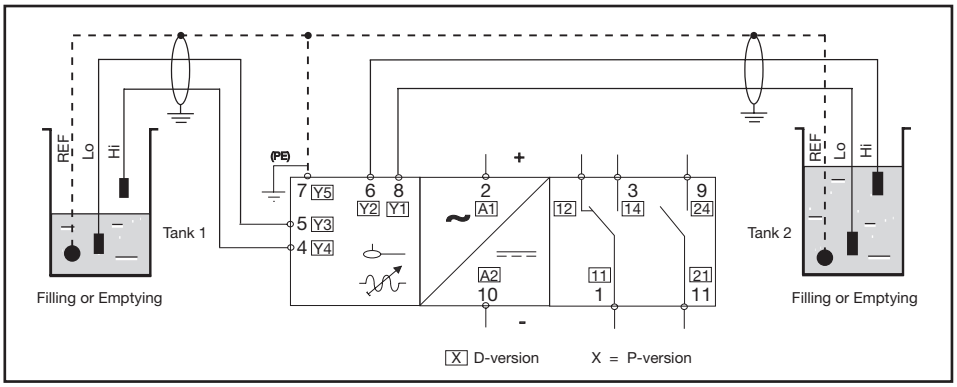


4-Probe Emptying
(Low and High alarm)

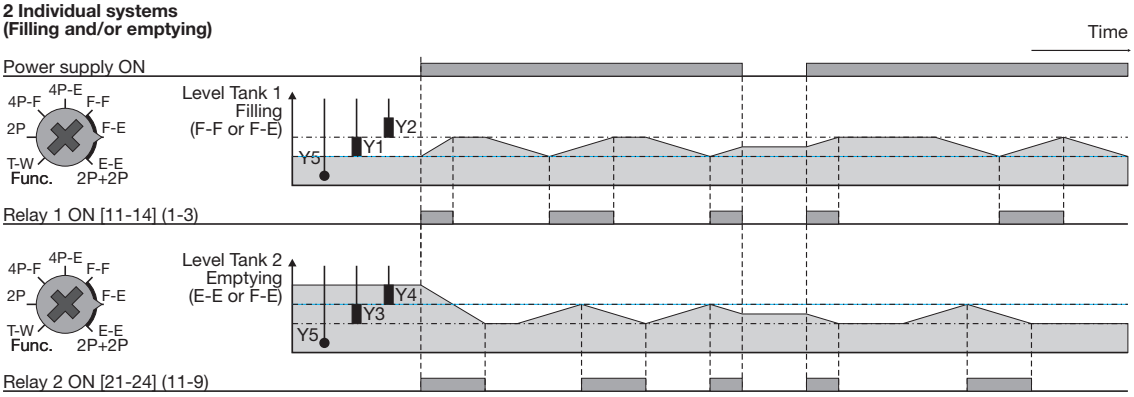


Operation Diagram

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.



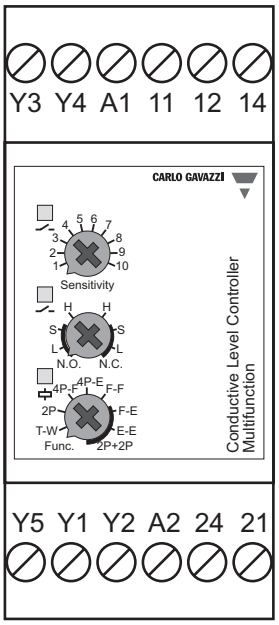
2 Individual systems (Filling and/or emptying)



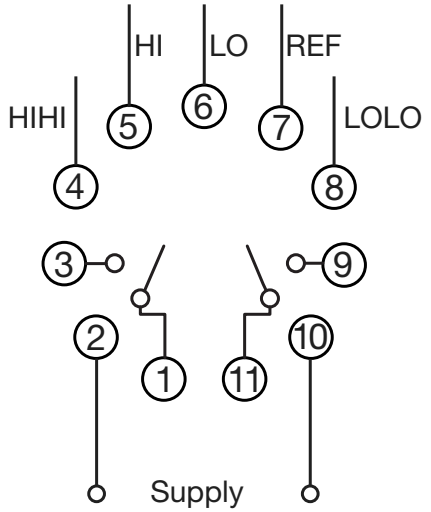
[D-version] (P-version)

Wiring Diagram

Din-rail version



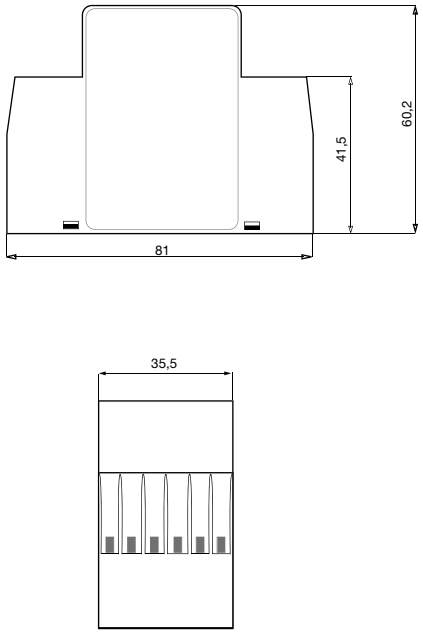
Plug version



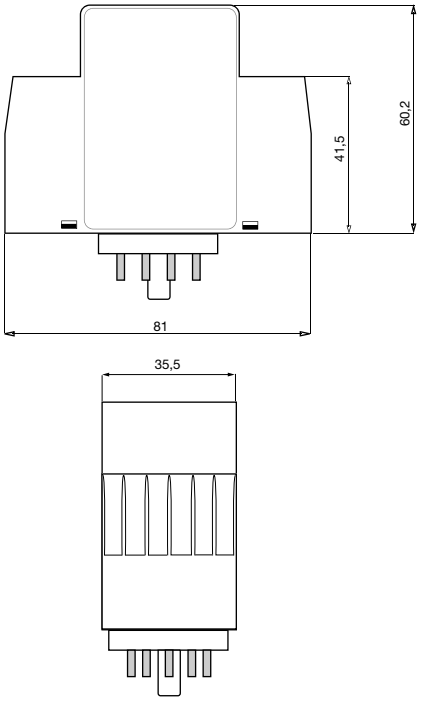
Bottom view

Dimension Drawings

Din-rail version



Plug version



Accessories

• 11 pole circular socket	ZPD11
• Retaining spring	HF

Delivery Contents

- Amplifier
- Packaging: Carton box
- Manual