

## Conductive level program

# Sensors

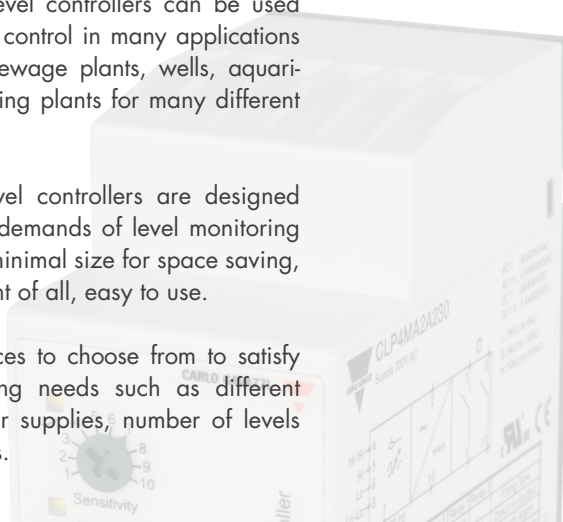
# CL - Series

## Conductive level program

The CL series of conductive level controllers can be used for level monitoring and pump control in many applications such as in tanks, reservoirs, sewage plants, wells, aquariums, swimming pools and mixing plants for many different conductive liquids.

Carlo Gavazzi conductive level controllers are designed specifically to meet the many demands of level monitoring such as flexibility, robustness, minimal size for space saving, affordability and most important of all, easy to use.

There are many different choices to choose from to satisfy every different level monitoring needs such as different housing, wide range of power supplies, number of levels required, cascading and others.



## The complete product range for level measurement

### Electrode probe

CL series can be used with all the Carlo Gavazzi's level probes that includes from 1 electrode up to 5 electrodes and also the level hanging probes.

### Various level control functions

The level controllers can perform various level control functions such as filling, emptying or combinations of the two. It can also be cascaded up to 7 controllers for many levels. This provides full flexibility and adaptability for various applications.

### Easy adjustments

The level controllers functions and sensitivity can be easily set and tuned by means of rotary switches and potentiometer. This makes installation and maintenance very easy.

### Wide range of power supply

Many different power supply ranges to choose from such as 24VAC, 115VAC, 230VAC, 24VDC Or the CLD2EB1BU24 with 24-240VAC/DC.

### LED status indication

Front LEDs indicate clearly the power state and status of each of the output relays for easy monitoring.

### Space-saving design

The level controller is available in the compact 17.5 mm for extra panel space saving or the standard 35mm wide DIN-rail or 11 pin plug housing for different installation needs.

### Approvals and markings

Exceptional and proven quality with UL, CSA and CE certified



## Applications

### Agriculture

- Level control in slurry tanks, water tanks, reservoirs, sewage plants, underground wells and mixing plants
- Flow detection in pipes, channels, and irrigation systems



### Chemical

- Level in chemical tanks
- Indication of liquid build-up due to filter blockages.
- Alarm control warning of abnormal or dangerously high or low levels.



### Food & beverage

- Level detection of liquids such as milk products, beer, wine, soft drinks and water, but also sticky or abrasive products such as chocolate or jam.



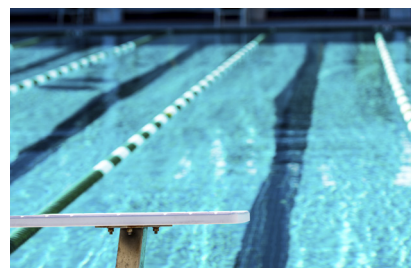
### Water distribution/treatment

- For level and pump control
- Fill level control of purified city water, industrial water or sewage
- Hot water supply heated by solar energy
- Filling application of tank level



### Swimming pool

- Swimming pools level control with level hanging probe



# CL - Series

## Conductive level program

### CLD1EA, 1-point basic level controller

Slim 17.5 wide DIN-rail housing for excellent space saving and basic sensitivity range that covers the conductivity

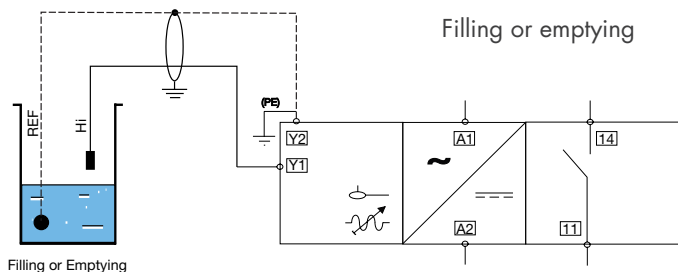
of most standard liquids in most applications. Equipped also with time delay from 1 to 30 seconds.

#### Features

- Max./min. control of filling or emptying of liquids by means of one level and a time delay function.
- Compact housing for mounting on standard rails in cabinet.
- Adjustable sensitivity by means of the potentiometer settings.
- SPST relay.
- Time settings from 1 to 30 seconds for filling or emptying.



#### Operation diagram



#### Technical data

Sensitivity	5kΩ to 150KΩ
Power supply	24 VAC/DC
Operating temperature	-20° to +50°C (-4° to + 122°F)
Input probe	1 + reference
Outputs	1 x SPST relay
AC1	8A/250 VAC
Approvals	UL508, CSA, CE

### CLD2EA & CLP2EA, 2-point level controller

Level controller with an extended sensitivity range that covers the conductivity of most liquids such as chemi-

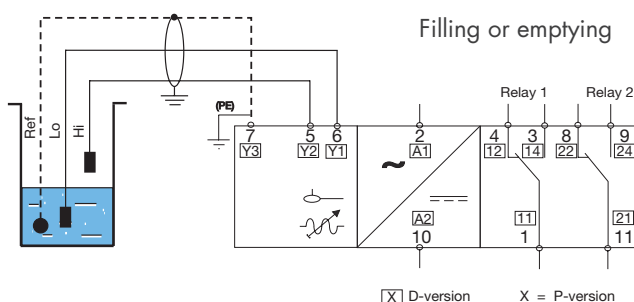
cals, sewage water, sea water, distilled water, etc.

#### Features

- Max./min. control of filling or emptying (charging or discharging) of liquids between two levels.
- Compact housing for mounting on standard DIN-rail or 11-pin plug-in socket.
- Extended and adjustable sensitivity by means of potentiometer with 3 sensitivity ranges.
- DPDT relay.



#### Operation diagram



[X] D-version X = P-version

#### Technical data

Low sensitivity	250Ω to 5KΩ
Medium sensitivity	5kΩ to 100KΩv
High sensitivity	50kΩ to 500KΩ
Power supply	24 VAC/DC, 115 VAC, 230 VAC
Operating temperature	-20° to +50°C (-4° to + 122°F)
Input probe	2 + reference
Outputs	1 x DPDT relay
AC1	8A/250 VAC
Approvals	UL508, CSA, CE

## CLD2EB1BU24, slim housing 2 point level controller

Slim 17.5mm wide housing for excellent space saving. The level controller has extended sensitivity range that covers the conductivity of most liquids

in any applications. Wide range of power supply from 24-240VAC/DC in a single unit ensures flexibility and reduces inventory.

### Features

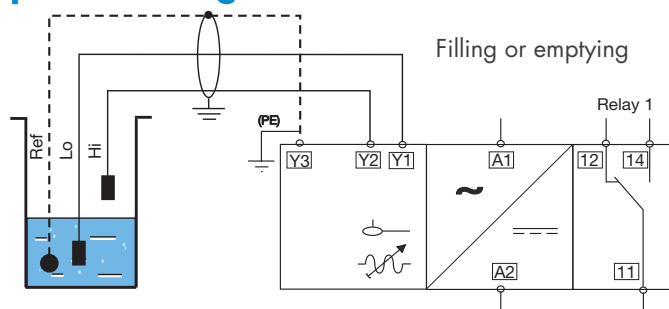
- Max./min. control of filling or emptying of liquids between two levels.
- 17.5mm slim housing for mounting on standard DIN-rail
- Wide power supply 24-240VAC/DC
- Extended and adjustable sensitivity by means of potentiometer with 3 sensitivity ranges
- SPDT relay



### Technical data

Low sensitivity	250Ω to 5KΩ
Medium sensitivity	5kΩ to 100KΩ
High sensitivity	50kΩ to 500KΩ
Power supply	24-240 VAC/DC
Operating temperature	-20° to +50°C (-4° to + 122°F)
Input probe	2 + reference
Outputs	1 x SPDT relay
AC1	8A/250 VAC
Approvals	cULus, CE

### Operation diagram



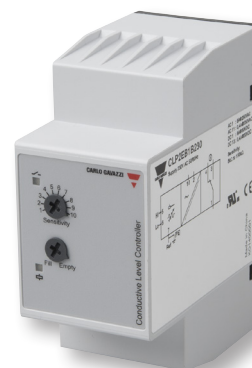
## CLP2EB, 2 point basic level controller

Simple and easy to use level controller with basic sensitivity range that

covers the conductivity of most standard liquids in most applications.

### Features

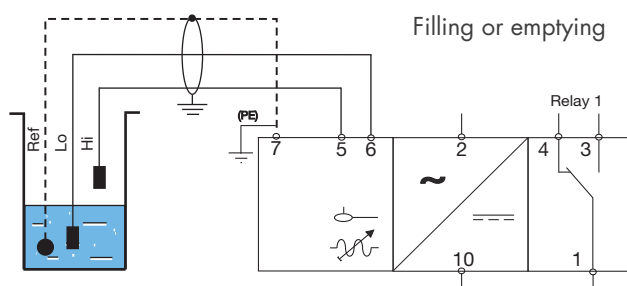
- Max./min. control of filling or emptying of liquids between two levels.
- Compact housing for mounting on standard 11 pin plug in socket
- Adjustable sensitivity by means of potentiometer settings.
- SPDT relay
- Good price to performance ratio



### Technical data

Low sensitivity	5Ω to 150KΩ
Power supply	24 VDC, 24 VAC, 115 VAC, 230 VAC
Operating temperature	-20° to +50°C (-4° to + 122°F)
Input probe	2 + reference
Outputs	1 x SPDT relay
AC1	8A/250 VAC
Approvals	UL508, CSA, CE

### Operation diagram



# CL - Series

## Conductive level program

### CLP2FA, 2-point level controller, cascade coupling

A state of the art level controller that can cascade up to 7 units for many different levels. The main unit is the master that can link with several slaves for the

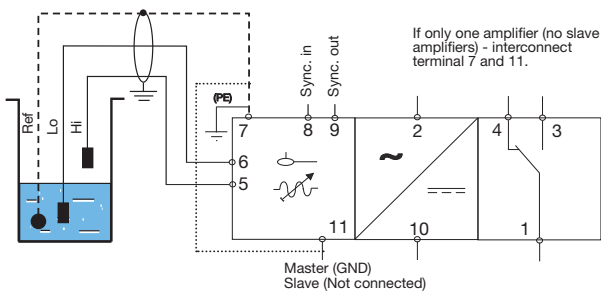
desired amount of levels. It can also be used as a standalone system with just 1 unit.

#### Features

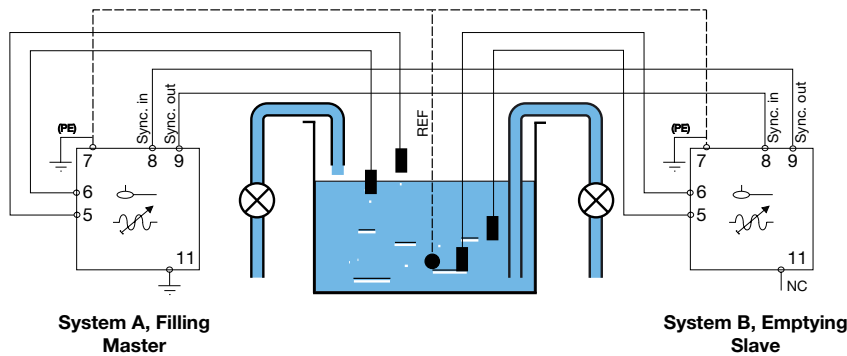
- Max./min. control of filling or emptying of liquids between two levels.
- Compact housing for mounting with 11-pin plug-in socket.
- Extended and adjustable sensitivity by means of potentiometer with 3 sensitivity ranges.
- SPDT relay.
- Master/slave system for cascade connecting of up to seven systems.



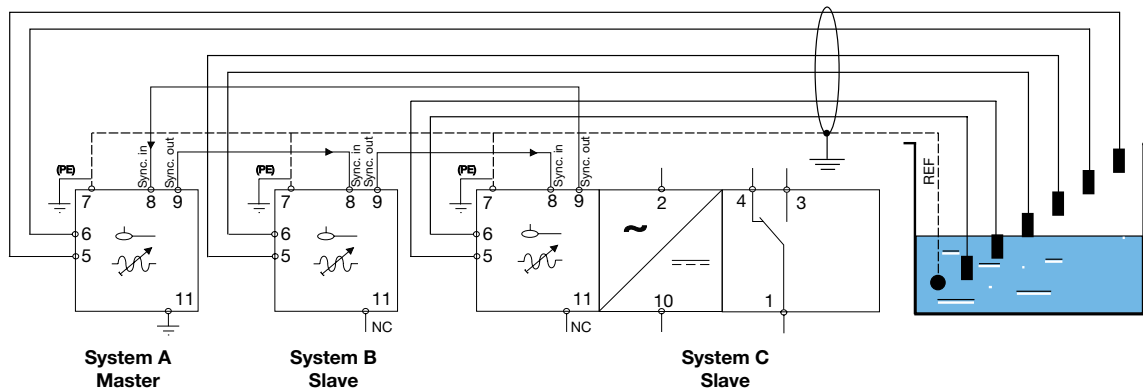
#### Operation diagram



Filling and emptying with more systems in one common tank



Multilevel application in one tank



#### Technical data

Low sensitivity	250Ω to 5KΩ
Medium sensitivity	5kΩ to 100KΩv
High sensitivity	50kΩ to 500KΩ
Power supply	24 VAC/DC, 115 VAC, 230 VAC
Operating temperature	-20° to +50°C (-4° to + 122°F)
Input probe	2 + reference
Outputs	1 x SPDT relay
AC1	8A/250 VAC
Approvals	UL508, CSA, CE

## CLD4MA & CLP4MA, 2 to 4-point level controller

Advanced level controller with 2 to 4 levels that can be configured in many different operating modes. The controller can handle up to 2 filling operations

or 2 emptying operations or combination of these. It can also operate with HiHi or LoLo alarm or in a tank-well situation.

### Features

- Max./min. control of filling or emptying of liquids between two levels.
- Compact housing for mounting with 11-pin plug-in socket or DIN-rail.
- Extended and adjustable sensitivity by means of potentiometer with 3 sensitivity ranges.

- SPDT & SPST (Din Rail); 2 x SPST (Plug In)
- Able to work in 4 different modes with many combinations

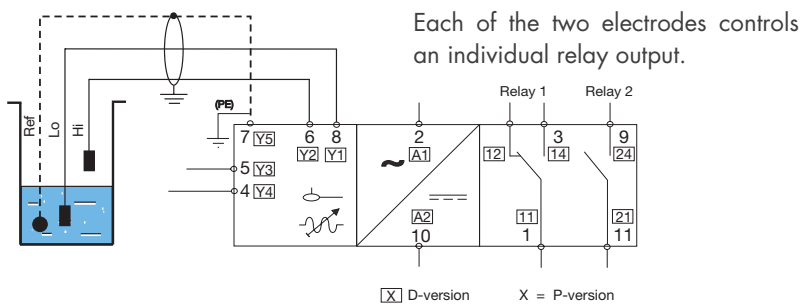


### Technical data

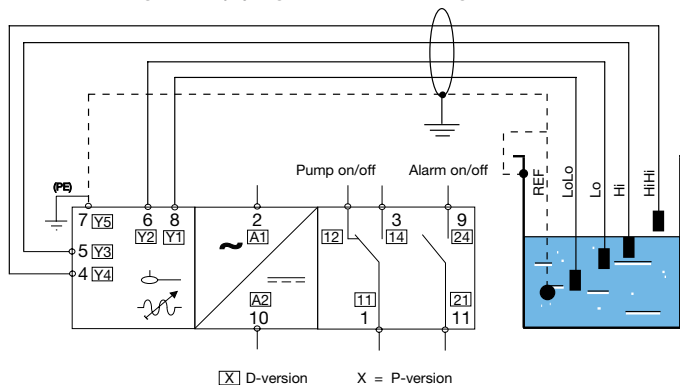
Low sensitivity	250Ω to 5KΩ
Medium sensitivity	5kΩ to 100KΩv
High sensitivity	50kΩ to 500KΩ
Power supply	24 VAC/DC, 115 VAC, 230 VAC
Operating temperature	-20° to +50°C (-4° to + 122°F)
Input probe	4 + reference
Outputs	1 x SPDT & 1 x SPST relay
AC1	8A/250 VAC
Approvals	UL508, CSA, CE

### Operation diagram

#### Mode 1: Direct input - output

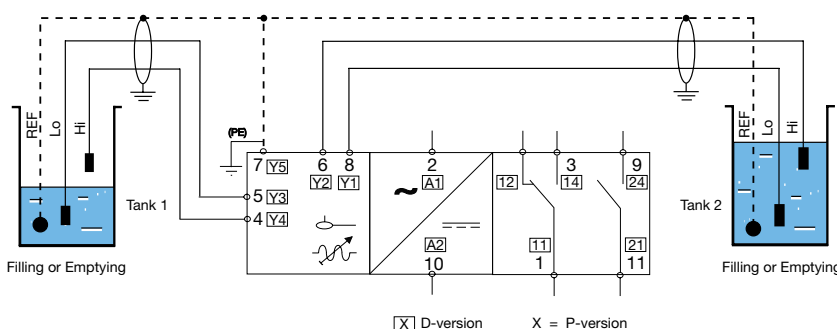


#### Mode 2: Filling or emptying with low and high alarms.



Extra 2 levels of HiHi and LoLo ensures the system is protected and output alarm when required such as in danger of over splash or dry run pump.

#### Mode 3: 2 in 1



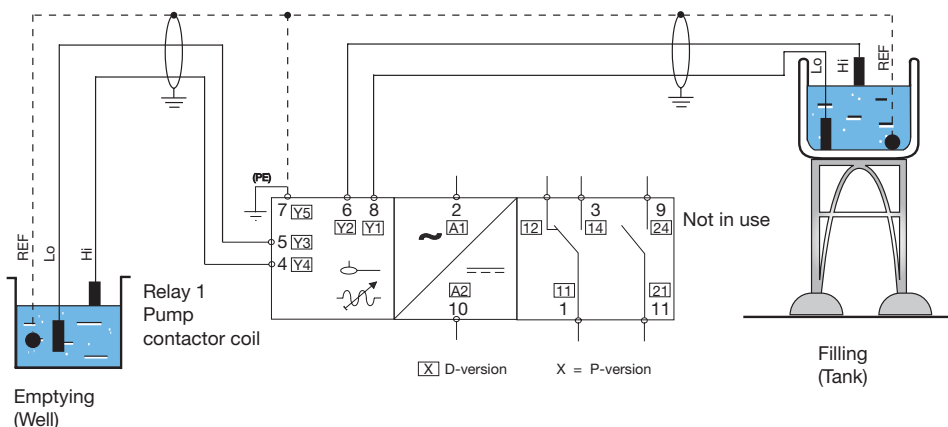
Filling or emptying of up to 2 systems with the same kind of liquid to be measured. Customer can just use one controller for 2 installations.

# CL - Series

## Conductive level program

### CLD4MA & CLP4MA, 2 to 4-point level controller

#### Mode 4: Tank - Well



Maximum and minimum control of two systems, a filling system and a emptying system with the same kind of liquid to be measured and one common pump especially in application to transfer from one tank to another tank.

### Type selection - level controller

Mounting	Relay	Power supply					
		115 VAC	230 VAC	24 VAC/DC	24 VAC	24 DC	24-240 VAC/DC
CLD1, 1-point basic level controller							
DIN-rail	SPST	-	-	CLD1EA1CM24	-	-	-
CLD2 & CLP2, 2-point level controller							
DIN-rail	DPDT	CLD2EA1C115	CLD2EA1C230	CLD2EA1CM24	-	-	-
11-pin plug*	DPDT	CLP2EA1C115	CLP2EA1C230	CLP2EA1CM24	-	-	-
CLD2EB1BU24, slim housing 2 point level controller							
DIN-rail	SPDT	-	-	-	-	-	CLD2EB1BU24
CLP2EB, 2 point basic level controller							
11-pin plug*	SPDT	CLP2EB1B115	CLP2EB1B230	-	CLP2EB1B024	CLP2EB1B724	-
CLP2FA, 2-point level controller, cascade coupling							
11-pin plug*	SPDT	CLP2FA1BM115	CLP2FA1B230	CLP2FA1BM24	-	-	-
CLD4MA & CLP4MA, 2 to 4 point level controller							
DIN-rail	SPDT + SPST	CLD4MA2D115	CLD4MA2D230	CLD4MA2DM24	-	-	-
11-pin plug*	2 SPST	CLP4MA2A115	CLP4MA2A230	CLP4MA2AM24	-	-	-

#### Accessories

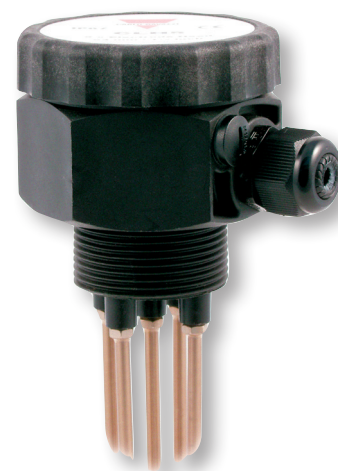
\* The 11-pin plug in level controller requires base socket which must be purchased separately with the part no ZPD11A.



## CLH3 & CLH5 level probes

Flexible conductive level probe that can accommodate up to five electrodes for four different levels with 1 electrode used for reference. The electrodes are available without isolation or coated

with isolation material for aggressive or sticky mediums. Length of the electrode can be extended by using extension electrode according to the requirements.



### Features

- Mounting probe head up to 5 electrodes (CLH 5) or 3 electrodes (CLH 3)
- Electrode length can be extended using extension electrodes.
- With Isolation or without isolation electrodes.

### Technical data probe head

Material	Polypropylene
No of possible electrodes	3 or 5
Degree of protection	IP65 (Housing) IP68 (Elec. Conn.)
Operating temperature	-20° to 90°C (-4° to + 194°F)
Electrode connection	Screw terminals

### Technical data electrodes

Material	Stainless steel AISI316
Length	1000 mm
Diameter	Ø 4 mm
Isolation	Kynar or polyolefine

## Type selection - probes and electrodes

	Probes		Electrodes		
	For 3 electrodes	For 5 electrodes	1000 mm basic	2000 mm extended	Extension 1000 mm
	CLH3	CLH5	-	-	-
Electrode without isolation	-	-	CLE1	CLE2	CLE1X
Electrode with isolation, kynar (PVDF)	-	-	CLE1K	CLE2K	CLE1KX
Electrode with isolation, polyolefine (FR)	-	-	CLE1P	CLE2P	CLE1PX
Pipe thread	1.5"		-		
Housing material	PP		-		
Description			1000 mm basic electrode for no further extension	1000 mm basic electrode for extension. 1000 mm extension electrode. 1 extension joint. 1 isolation tube.	1000 mm extension electrode. 1 extension joint. 1 isolation tube.

- Please order 3 electrodes if using CLH3 or 5 electrodes if using CLH5.
- Example: if you need 3 levels with Kynar isolated 1m probe, you need to order 1 x CLH3 + 3 x CLE1K.
- Please order CLE1X or CLE1KX or CLE1PX if you require further extension according to the isolation type required.

# Probe - Series

## Conductive level program

### VH3 & VH4 hanging probes

VH3 is a level hanging probe specifically designed to be used in swimming pools and resists high chlorine and high salinity. It is also suitable to be used in wells, reservoirs and tanks.

VH4 is a simple and easy to install level probe for general use. VH3-4-MB1 Snap-on brackets for easy and secure installation.



VH3

VH4

### Features

- VH3 – resistant to chlorine and salinity and suitable for use in swimming pools
- VH4- simple and easy to install probe for general use and comes with double screw terminal for secure cable connection
- Can be used outdoors under sunlight
- Snap on bracket for easy installation

### Technical data VH3

Electrode material	Stainless steel AISI316
Housing material	Polycarbonate
Over mould material	PA6
Operating temperature	0° to +80°C (32° to + 176°F)
Connection	6 m UV resistant PVC cable

### Technical data VH4

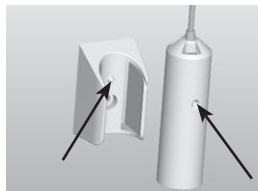
Electrode material	Stainless steel AISI304
Housing material	Polycarbonate
Operating temperature	0° to +80°C (32° to + 176°F)
Connection	2 x M4 Screw terminal

### VH3-4-MB1

- Snap on bracket exclusively for VH3 and VH4
- Positioning pin on the bracket ensures right installation
- Durable polycarbonate bracket



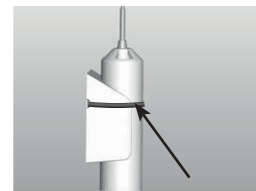
### Installation



**Step 1**  
Align the probe to the positioning pin of the bracket. Clamp the probe firmly in place.



**Step 2**  
A misalignment of the pin and the blind hole prevents proper installation of the probe.








**Step 3**  
Once the probe is snapped into the bracket, you can secure it with a cable tie around the recess on the rear of the bracket.

### Type selection - hanging probes

6 m cable	<b>VH3</b>
No cable	<b>VH4</b>
Snap-on bracket*	<b>VH3-4-MB1</b>

\* Bracket to be purchased separately. Bracket only for VH3 and VH4.

## Conductive level sensors

Types	VN / VNI	VNY / VNYI	VPC	VPP	VT / VTI					
<b>Connections</b>	Cable 2 m (PVC)	Screw connection	Screw connection	Screw connection	Cable 1 m (Silicone)					
										
<b>Electrodes</b>										
Number of electrodes	1, 2, 3 or 4	1, 2, 3 or 4	1, 2 or 3	1, 2 or 3	1, 2, 3 or 4					
Diameter/length (mm)	D5/1000	D5/1000	D4/500	D4/500	D5/1000					
Material	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel					
Isolation of electrodes	Yes (VNI)	Yes (VNYI)	Yes	Yes	Yes (VTI)					
Isolation	Polyethylene	Polyethylene	Polyethylene	PVDF	Teflon					
<b>Housing</b>										
Pipe thread	1 1/2"	1 1/2"	1/2" (VPCx05) or 1" (VPCx10)	1/2" (VPPx05) or 1" (VPPx10)	1 1/2"					
Material	Nylon 6	Nylon 6	PVC	Polyethylene	Teflon					
<b>References</b>										
1 electrode	VN1	VNI1	VNY1	VNYI1	VPC105	VPC110	VPP105	VPP110	VT1	VTI1
2 electrodes	VN2	VNI2	VNY2	VNYI2	VPC205	VPC210	VPP205	VPP210	VT2	VTI2
3 electrodes	VN3	VNI3	VNY3	VNYI3		VPC310		VPP310	VT3	VTI3
4 electrodes	VN4	VNI4	VNY4	VNYI4					VT4	VTI4
<b>Specifications</b>										
Degree of protection	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67
Operating temperature	0°C to 90°C	0°C to 90°C	0°C to 60°C	0°C to 60°C	0°C to 60°C	0°C to 100°C	0°C to 100°C	0°C to 100°C	0°C to 145°C	0°C to 145°C
Approvals/marks	CE	CE	CE	CE	CE	CE	CE	CE	CE	CE

Types	VH1 / VH2	VH3	VH4	A 94-10
<b>Connections</b>	Cable 5 m (Neoprene)	Cable 6 m (UV resistant PVC)	Screw connection	Cable 6 m (PVC)
				
<b>Electrodes</b>				
Number of electrodes	1	1	1	2
Diameter/length (mm)	D18/36.5 or D32/75.5	D19/65	D19/65	D22/75.0
Material	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Isolation of electrodes	No (VH1) - Yes (VH2)	No	No	No
Isolation	Nylon 6	-	-	-
<b>Housing</b>				
Material	Nylon 6	Polycarbonate	Polycarbonate	Polyester
<b>References</b>				
1 electrode	VH1 OR VH2	VH3	VH4	-
2 electrodes	-	-	-	A 94-10
Snap On Bracket	-	VH3-4-MB1	VH3-4-MB1	-
<b>Specifications</b>				
Degree of protection	IP67	IP67	-	IP67
Operating temperature	0°C to 90°C	0°C to 80°C	0°C to 80°C	0°C to 60°C
Approvals/marks	CE	CE	CE	CE

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## OUR COMPETENCE CENTRES AND PRODUCTION SITES

### DENMARK

Carlo Gavazzi Industri A/S  
Hadsten

### MALTA

Carlo Gavazzi Ltd  
Zejtun

### ITALY

Carlo Gavazzi Controls SpA  
Belluno

### LITHUANIA

Uab Carlo Gavazzi Industri Kaunas  
Kaunas

### CHINA

Carlo Gavazzi Automation (Kunshan) Co., Ltd.  
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