

Level measurement

Model 7356 High frequency level detector switch



Specifications

Connection: 1/2" BSPP according to ISO 228-1

Power supply: 7 to 34 VDC

Max. pressure: 1 bar

Ambient temperature: - 40°C to +80°C

Process temperature: - 40°C to +100°C

Material: 1.4404 stainless steel housing, 1.4301 stainless steel thread, nickel-plated brass/PA M12x1 connector, PEEK electrode coating

NBR or EPDM gasket supplied

IP67

Delivered with an M12 connector and 2m of cable

On request:

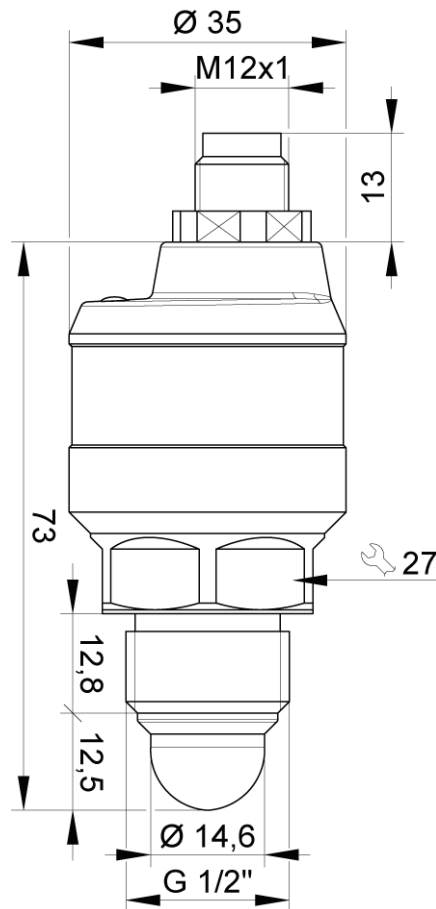
- ATEX version
- Clamp connector
- FKM gasket



Béné Inox – 11 chemin de la Pierre Blanche – 69800 SAINT-PRIEST – S.A.S with 240 000 € share capital – SIREN N° 311 810 287
Tel. N°: +33 (0)4 78 90 48 22 – Fax N°: +33 (0)4 78 90 69 59 – www.bene-inox.com – bene@bene-inox.com

Technical information, illustrations and photographs are provided for information only, they are not contractual. Some may vary according to the tolerances accepted in the profession and the applicable standards. All instructions for use, disassembly and maintenance are recommendations only. These could also vary depending on product usage conditions, its installation environment and purchaser requirements – of which the purchaser alone is responsible for their definition.

7356-A V0820



Gasket material	Weight (without cable) (kg)	Part number
NBR	0.15	673561-NBR
EPDM	0.15	673561-EPDM

Use

High frequency level detector switches are designed for use in industrial processes involving liquid fluids, pastes, crushed solids etc. They can be used instead of a vibrating level sensor or a capacitive sensor, and are compatible with a wider range of applications. The fluid that you want to detect must have a relative permittivity (or dielectric constant) of $\epsilon_r > 1.5$, whether it conducts electricity or not. For example: the relative permittivity of PTFE is ϵ_r (PTFE) = 2.1.

These detector switches can be installed on metal tanks (stainless steel, aluminium etc.), pipes or housings.

They use high frequency bands to accurately detect fluid levels while ignoring any deposits or foam that might remain on the electrode. This means that these detector switches are not wrongly influenced by deposits linked to viscous fluids (e.g. ketchup, mayonnaise, syrup, jam, cream, soap etc.) or by conductive or sticky fluids (e.g. cleaning detergents, alkalis etc.).

These detector switches can also be used to differentiate between different specific liquid fluids in different phases: e.g. they can differentiate between oil and water, or oil and air, or detect only the foam on top of beer and ignore the beer and air etc.

Specifications

- Power supply: 7-36 VDC
- Current consumption: Max. 5 mA
- Residual voltage (ON): 1.5 V max.
- Coupling capacitance (dielectric strength): 5 nF / 500 VAC (50Hz)
- 3 x 0.5 mm² wire cable

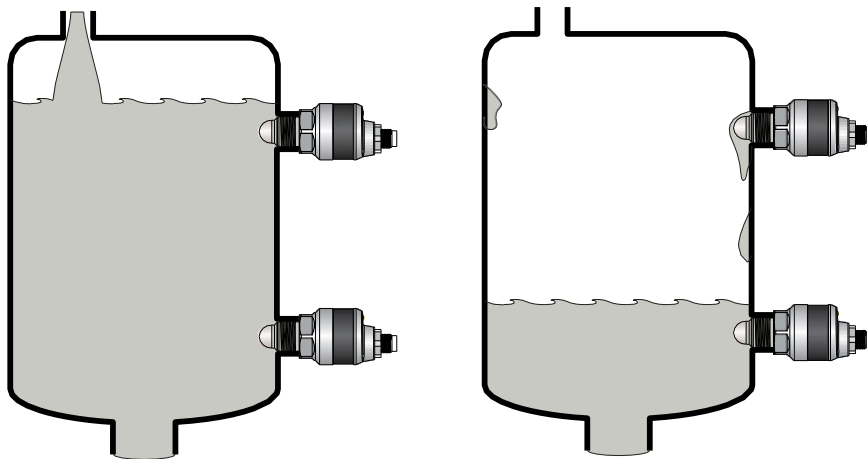
Installation and configuration

High frequency level detector switches can be installed horizontally, vertically or at an inclined angle. They can be fixed into female threaded flanges using their G 1/2" cylindrical thread or they can be welded onto a pipe. A high frequency level detector switch can be configured using the magnetic pen supplied with it. This configuration makes it possible to detect the presence or absence of a fluid.

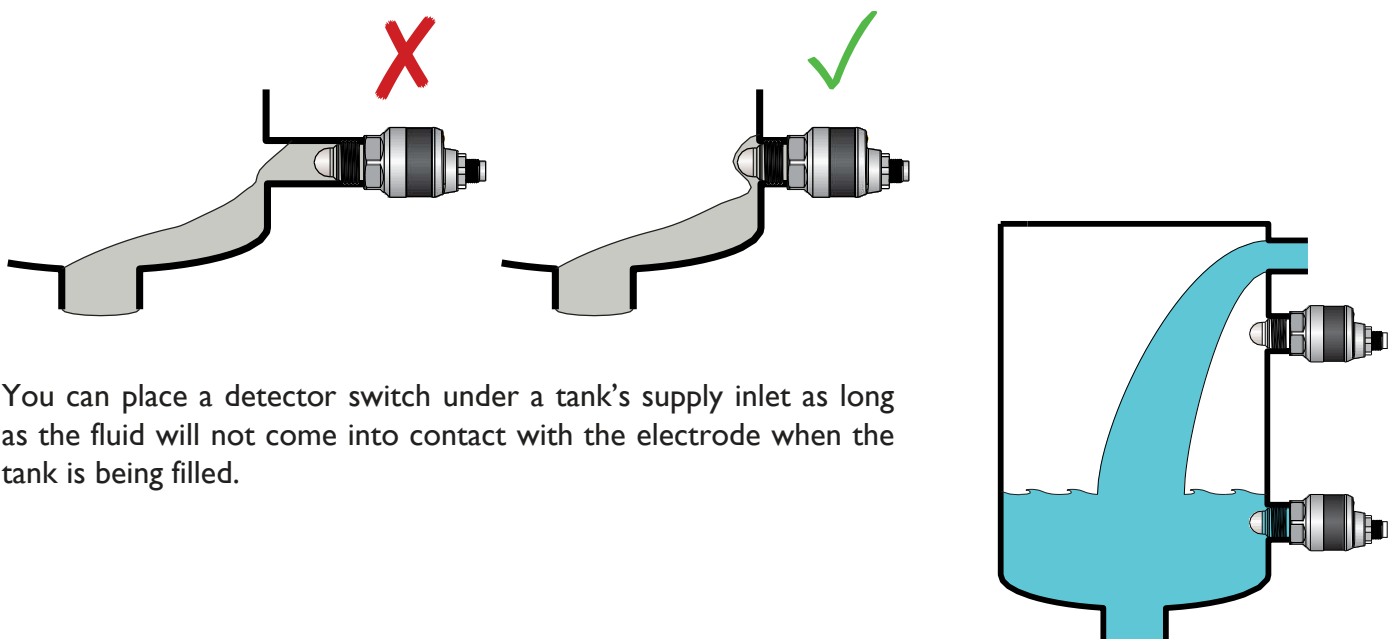
Installation diagram

Standard installation on a tank:

In general, fluid detection is carried out at the edge of a tank with the level detector switches positioned at the required levels (e.g. at the top and bottom). You can configure the detector switches to ignore any residual deposits on them.



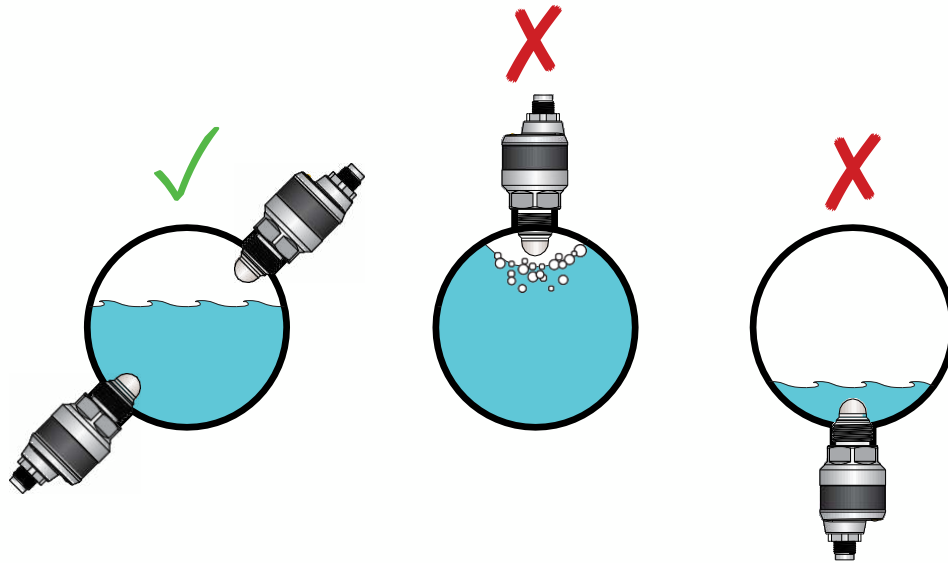
You should not place detector switches in pipes or necks where fluid could stagnate as this will stop the sensor from working correctly.



You can place a detector switch under a tank's supply inlet as long as the fluid will not come into contact with the electrode when the tank is being filled.

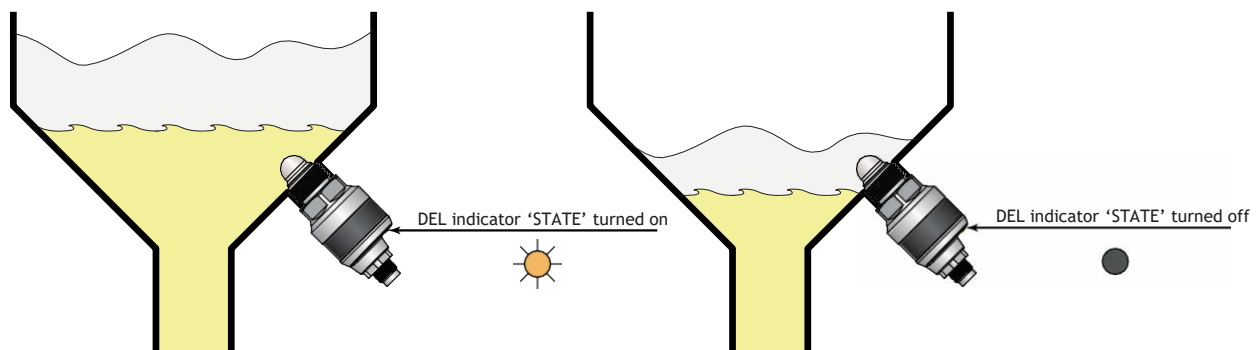
Installation in a pipe:

If you use a level detector switch in a pipe, you should not position it perpendicular to the horizontal axis. You should always incline a level detector switch at an angle to make sure you avoid level detection errors caused by air pockets or fluids which can stick to the bottom of the pipe:



Installation for differentiating between different liquid phases:

If you require accurate level detection for different liquid phases (e.g. foam on beer), you must configure the level detector switch so that it only detects one phase. This will ensure that when the level of this phase is lowered the level detector switch will not detect the other phase, or vice versa.



Wiring

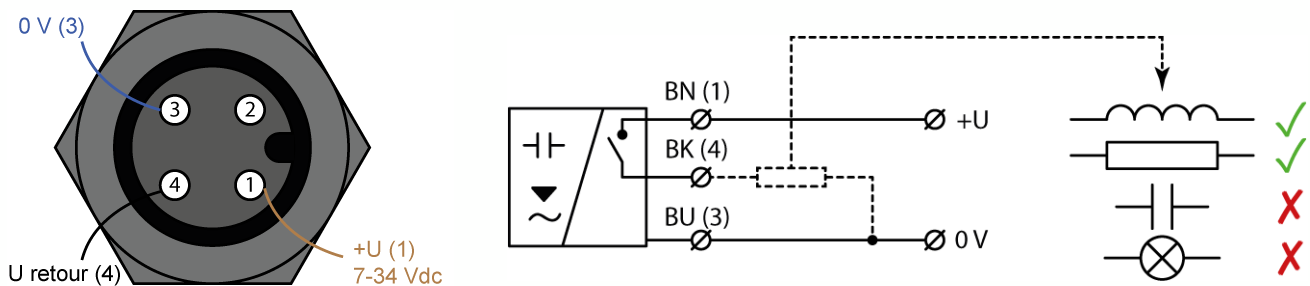
The 7356 level detector switch has a PNP outlet which can be connected to the neutral through a resistive load (resistor) or inductive load (coil).

If you add a capacitive load or a low resistance load (LED or light bulb) this will cause the level detector switch to short circuit.

Connect the power supply (the brown wire) to pin 1.

Connect the neutral (the blue wire) to pin 3.

Connect the PNP outlet (the black wire) to pin 4.

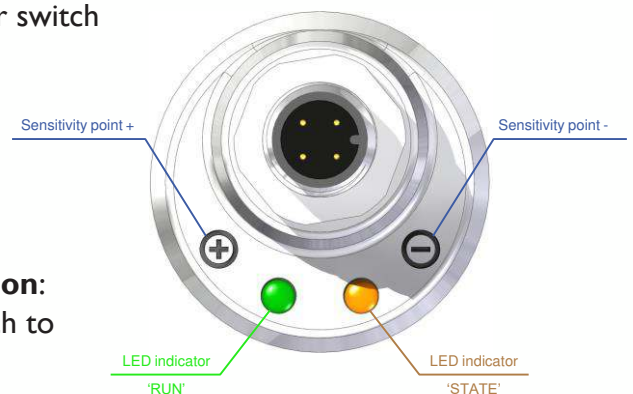


Configuration

Configure the level detector switch using the magnetic pen supplied with it. Position the pen on the sensitivity points \oplus or \ominus on the back of the level switch.

You can configure the level detector switch in three different ways:

1. **Quick configuration:** to start using the level detector switch and check that it is working.
2. **Basic configuration:** to configure the sensitivity of the level detection switch to take into account residual fluid deposits.
3. **Differentiation between fluid phases configuration:** to configure the sensitivity of the level detector switch to detect or ignore different fluid phases.




Quick configuration:


You can use this function when it is not possible (or it is very complicated) to change the level in a tank with the level detection switch installed on it. You can use this configuration to preconfigure a level detector switch before installing it.

You must make sure that the tank it is fitted on is empty and/or the level detector's electrode is not in contact with a fluid.

Mode 'O' (NO) - the level detector switch closes when it is in contact with a fluid:

1. Place the magnetic pen onto the  sensitivity point for 5 to 10 seconds.
2. While you are doing this the two LEDs will light up for about 3 seconds. Then, the orange 'STATE' LED will flash 3 times. After about 2 seconds, the orange 'STATE' LED will flash 3 times again.
3. Remove the magnetic pen. The level detector switch is configured in 'O' (NO) mode.

Mode 'C' (NC) - the level detector switch opens when it is in contact with a fluid:

1. Place the magnetic pen onto the  sensitivity point for 5 to 10 seconds.
2. While you are doing this the two LEDs will light up for about 3 seconds. Then, the orange 'STATE' LED will flash 3 times. After about 2 seconds, the orange 'STATE' LED will flash 3 times again.
3. Remove the magnetic pen. The level detector switch is configured in 'C' (NF) mode.

When they leave the factory, all level detector switches are configured in 'O' mode (NO).





A level detector switch that is configured in **quick configuration** mode will not ignore residual deposits so the level detector switch will be activated if any residual deposits are present. This is why you should configure it in at least **basic configuration** mode as quickly as possible.

Basic configuration:

You can use this function to configure a level detector switch's sensitivity to residual deposits. You must make sure that the level detector switch can come into contact with a fluid during this configuration. You should carry out this configuration with the level detector switch installed on a tank.

Mode 'O' (NO) - the level detector switch closes when it is in contact with a fluid:

1. Check that the electrode is totally covered with fluid.
2. Place the magnetic pen onto the  sensitivity point for 2 to 4 seconds (until the two LEDs light up).
3. Remove the magnetic pen. The orange 'STATE' LED will flash 3 times to confirm this configuration.
4. Check that the electrode is no longer covered by the fluid but leave the residual deposit on the electrode.
5. Place the magnetic pen onto the  sensitivity point for 2 to 4 seconds (until the two LEDs light up).
6. Remove the magnetic pen. The orange 'STATE' LED will flash 3 times to confirm this configuration. The level detector switch is configured in 'O' (NO) mode.
7. Check the LED indicators:
 - If the orange 'STATE' LED is turned off and the green 'RUN' LED is flashing then the level detector switch is configured correctly.
 - If the LEDs are flashing alternately this means that the level detector switch cannot identify the sensitivity limit between the open and closed position. If this is the case, check that the low level and the high level are not too close to each other.

Mode 'C' (NC) - the level detector switch opens when it is in contact with a fluid:

1. Check that the electrode is totally covered with fluid.
2. Place the magnetic pen on the \ominus sensitivity point for 2 to 4 seconds (until the two LEDs light up).
3. Remove the magnetic pen. The orange 'STATE' LED will flash 3 times to confirm this configuration.
4. Check that the electrode is no longer covered by the fluid but leave the residual deposit on the electrode.
5. Place the magnetic pen onto the \oplus sensitivity point for 2 to 4 seconds (until the two LEDs light up).
6. Remove the magnetic pen. The orange 'STATE' LED will flash 3 times to confirm this configuration. The level detector switch is configured in 'C' (NF) mode.
7. Check the LED indicators:
 - If the orange 'STATE' LED is turned off and the green 'RUN' LED is flashing then the level detector switch is configured correctly.
 - If the LEDs are flashing alternately this means that the level detector switch cannot identify the sensitivity limit between the open and closed position. If this is the case, check that the low level and the high level are not too close to each other.

For safety reasons, it is recommended to configure the level detector switch in 'O' mode (NO) for a tank's minimum level. If the level detector switch stops working correctly it will behave as though it has detected a phase change. Similarly, it is recommended to configure the level detector switch in 'C' mode (NC) for a tank's maximum level.

Differentiation between fluid phases configuration:

You can use this function to configure a level detector switch's sensitivity to different fluid phases. This means that it will not be activated when it comes into contact with a fluid that has a different permittivity to the one it has been configured for.

Mode 'O' (NO) - the level detector switch closes when it is in contact with a specific fluid:

1. Check that the electrode is totally covered by the fluid in its required phase.
2. Place the magnetic pen onto the \oplus sensitivity point for at least 10 seconds.
3. While you are doing this the two LEDs will light up. Then, after about 3 seconds the orange 'STATE' LED will flash 3 times. Then, after about 2 seconds the orange 'STATE' LED will flash 3 times. Then, after about 5 seconds the orange 'STATE' LED will flash 3 times again.
4. Remove the magnetic pen. The level detector switch is configured in 'O' (NO) mode.
5. Check the LED indicators:
 - If the orange 'STATE' LED is turned off and the green 'RUN' LED is flashing then the level detector switch is configured correctly.

Mode 'C' (NF) - the level detector switch closes when it is in contact with a specific fluid:

1. Check that the electrode is totally covered by the fluid in its required phase.
2. Place the magnetic pen onto the \ominus sensitivity point for at least 10 seconds.
3. While you are doing this the two LEDs will light up. Then, after about 3 seconds the orange 'STATE' LED will flash 3 times. Then, after about 2 seconds the orange 'STATE' LED will flash 3 times. Then, after about 5 seconds the orange 'STATE' LED will flash 3 times again.
4. Remove the magnetic pen. The level detector switch is configured in 'C' (NF) mode.
5. Check the LED indicators:
 - If the orange 'STATE' LED is turned off and the green 'RUN' LED is flashing then the level detector switch is configured correctly.

Béné Inox – 11 chemin de la Pierre Blanche – 69800 SAINT-PRIEST – S.A.S with 240 000 € share capital – SIREN N° 311 810 287
Tel. N°: +33 (0)4 78 90 48 22 – Fax N°: +33 (0)4 78 90 69 59 – www.bene-inox.com – bene@bene-inox.com

Technical information, illustrations and photographs are provided for information only, they are not contractual. Some may vary according to the tolerances accepted in the profession and the applicable standards. All instructions for use, disassembly and maintenance are recommendations only. These could also vary depending on product usage conditions, its installation environment and purchaser requirements – of which the purchaser alone is responsible for their definition.

State indicators:

LED indicator	Colour	Function
'RUN'	Green	Flashing (flash length about 0.4 seconds): detection configuration completed correctly Turned off : wrong installation or operating error Alternate flashing with the green 'RUN' LED: configuration error Simultaneously lit up with the green 'RUN' LED: awaiting configuration
'STATE'	Orange	Lit up : the level detector switch is closed Turned off : the level detector switch is open 3 short flashes : the configuration is confirmed Alternate flashing with the orange 'STATE' LED: configuration error Simultaneously lit up with the orange 'STATE' LED: awaiting configuration

Minimum level detection	Level	Mode	Output result	'STATE' LED
		O (NO)	Closed	
	O (NO)	Open		

Maximum level detection	Level	Mode	Output result	'STATE' LED
		C (NC)	Open	
	C (NC)	Closed		