BALTIMORE AIRCOIL COMPANY
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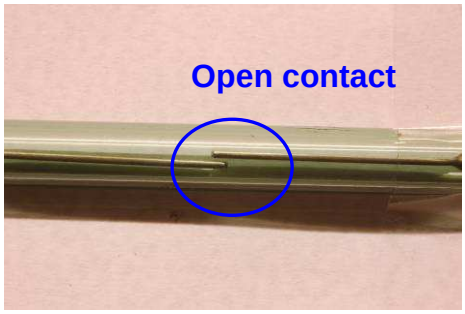
# Trouble shooting Low Level Cut Out Switch (LLCOS)

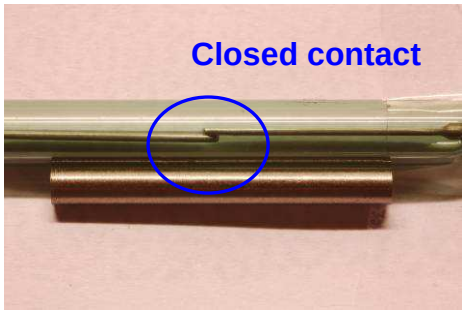
## 1. Working principle

The working principle of our LLCOS is based on the usage of a reed contact.

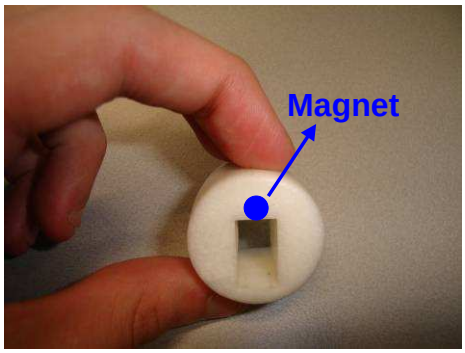
By use of pictures below the working principle is shown.
The reed contact is in normal condition an open contact.




When the reed contact is in close contact with a magnet, the contact closes.




In our LLCOS the floating element (cylinder) has a magnet in the thickest part.
The supporting rod incorporates a reed contact.



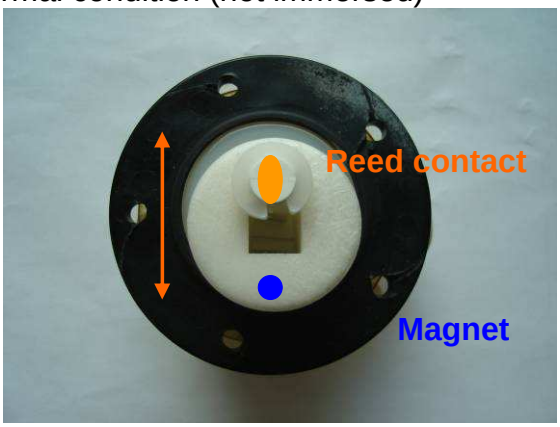


If the magnet comes close to the reed contact, the contact closes.

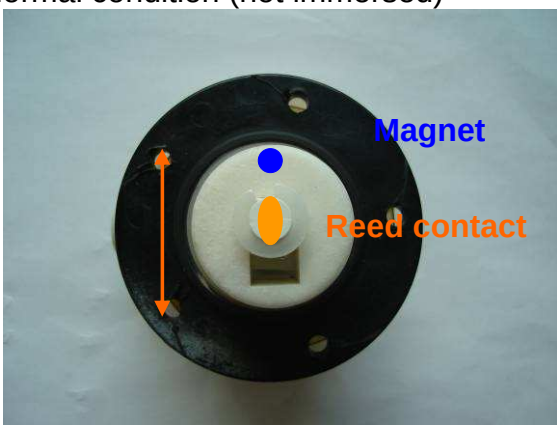
For proper functioning of the switch, the positioning of the floating element on the supporting rod is crucial, and also the position of the supporting rod itself.
When supplied from BAC the position is correct. But it could be mixed up by cleaning.

## 2. Installation

a) NO application: contact is open in normal condition (not immersed)


b) NC application: contact is closed in normal condition (not immersed)

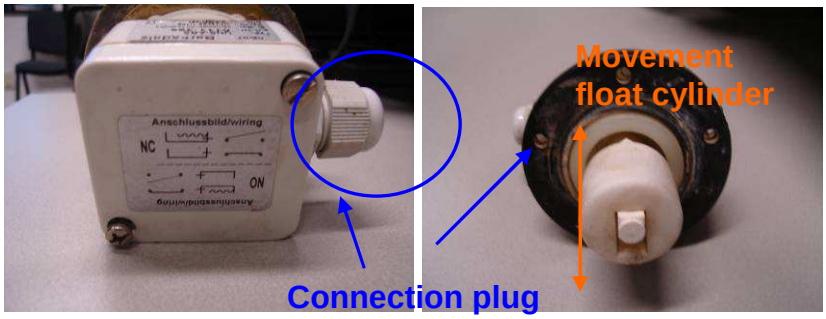



## 3. Troubleshooting

To test whether the LLCOS is functioning correctly, following actions need to be taken.

a) Wrong position of float element

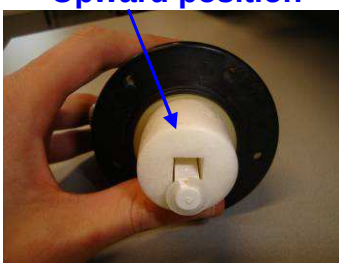
First of all the switch itself should be installed that when looking at the connection box the cable entry is pointing to the left or right (not upwards or downwards!).
If so, check whether the white float “cylinder” is installed correctly.
The cylinder should be able to move upwards and downwards as in the picture below.



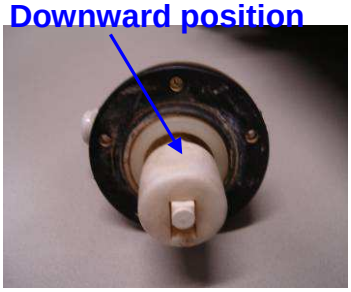

Depending on how the LLCOS is installed, the upward position of the cylinder creates a Normally Closed (NC) or Normally Open (NO) contact.
This can be seen on the label of the connection box when the LLCOS is installed. The cover of the switch can only be installed in 1 way (due to usage of 2 different screws).

For example: if the switch is installed like in the left picture above (you can clearly read NC). This means the following:
When the LLCOS is immersed the contact is open (cylinder is in the upward position). When not immersed cylinder in downward position), contact is closed.

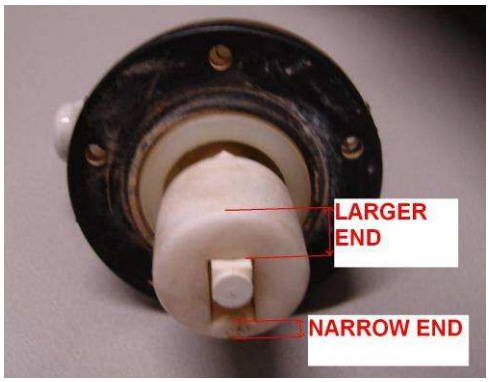
Upward position



Downward position



**Remark 1:** With the switch installed like in the example, make sure the larger end of the float element (containing the magnet) is on top and the narrow end below as shown in picture below.

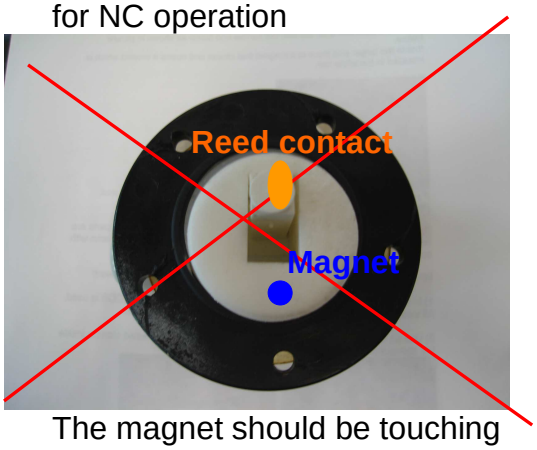



*If you would turn the LLCOS 180°, the NO and NC-log ic changes as well. (Immersed = NC, not immersed = NO)*

**Remark 2:** Therefore it's imperative that after cleaning the LLCOS all parts are reinstalled in their original position. Otherwise you will encounter problems with operation of the switch.

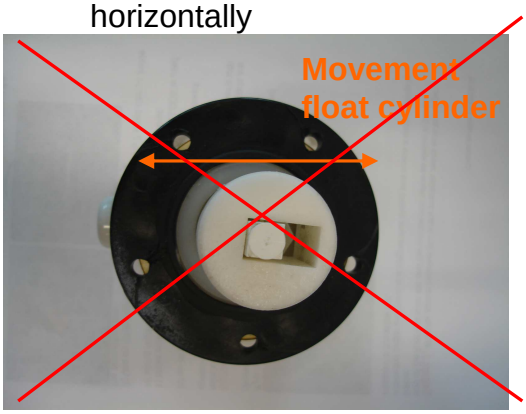
Below: 2 examples of the float element installed in wrong position.

Float element upside down for NC operation




The magnet should be touching the reed contact!
-> solution turn float element 180°

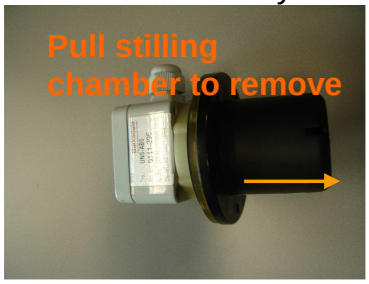
Float element installed horizontally

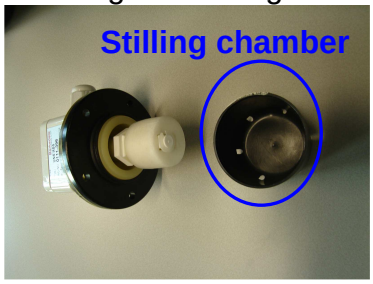


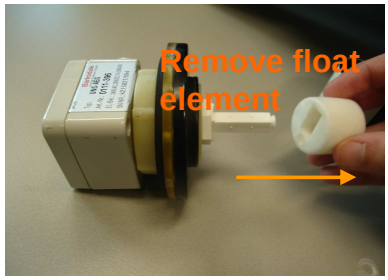

Movement should be vertical!
-> solution: turn float element 90°

b) Pollution of stilling chamber (cover) or float element

Make sure all parts are free of debris.
This can be done by disassembling & cleaning the llcos as followed:



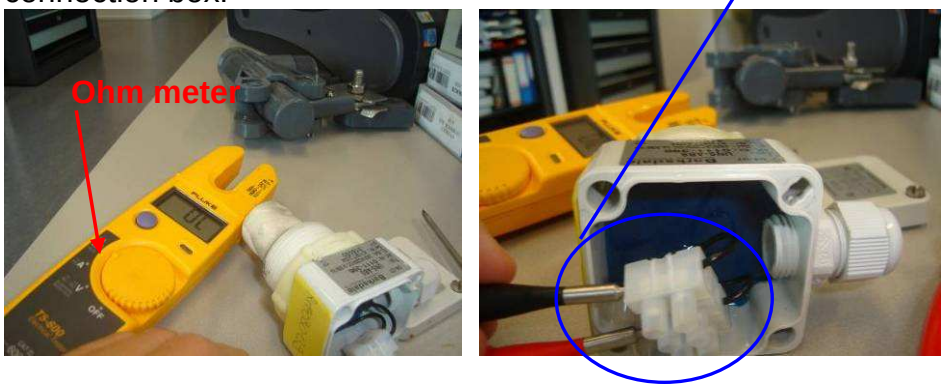



c) Wiring problem / reed contact

When all the above has been verified you can test the switch as followed:

1) Make sure the wiring is done correctly for the application the LLCOS is used. All wiring regarding the LLCOS needs to be done by the customer.

2) Use an Ohm-meter to measure resistance between the 2 wired clamps inside the connection box.




Check for open or closed contact when holding the cylinder in the downward and upward position as shown in the pictures on previous page.
One of both positions should create an open contact, other one a closed contact.
If both positions result in the same contact the switch is malfunctioning.

When all of the above instructions have been followed and it has been determined the switch is malfunctioning. Please provide the service department with following numbers that can be found on the connection box of the switch.
Service will then decide whether the part can be replaced under warranty or not.