# **INSTALLATION & OPERATIONAL MANUAL**

# Vertical Level Control for Boiler - 'VLC'



To get best intrinsic value of every Techtrol product it should be installed, maintained properly and used within its specified limits. It will help to extend the working life of your instrument.

#### **Unpacking:**

- 1. Examine the switch and ensure that it is in accordance with required specification.
- 2. Visually examine the instrument for any damages or breakage.
- 3. Check and record the model number and serial number for future reference.







### **Pre-Installation Check:**

- 1. Ensure that float connected to stem is properly tightened. If not, tighten it.
- 2. Ensure other fasteners / screws have not loosened in transit. Tighten them adequately, if found loose.
- 3. Open the enclosure cover. Switch assembly are fitted on the seal pipe.
- Select continuity range on multimeter and connect its probes to `P' and `NO' contact of level switch
- 5. Move the float manually upwards from its `Normal condition' to `Alarm condition' and ensure that `NO' contacts become `NC' by observing continuity on the multimeter.
- 6. Similarly check all the contacts.

# Installation:

- 1. Select suitable location on the tank where the vibrations are minimum.
- 2. The switch is installed vertically from top & can be mounted internally fig 3 or externally as shown fig.4.
- 3. External mounting is resorted to, where space is limited or mechanical devices like stirrers operate within the tank. Besides, in applications like boilers, reaction kettles etc. with external mounting, switch can be isolated for regular servicing.
- 4. Ensure that process connection of level switch should match with those on tank.
- 5. Ensure in case of externally mounted version CC distance of external cage match with those on tank.
- Provide separate Isolation valve on tank for safety & removal of Level switch for repairs/maintenance.
- 7. Ensure mounting nozzle length & inside diameter must be sized correctly to allow for switch actuation at desired level.
- 8. Provide suitable gasket between the flanges and appropriate thread sealant between threads before bolting / tightening, to ensure zero leakage through joints.
- 9. Ensure that stem does not get bend during installation.



#### Fig 3 - Internal mounting on tank



Fig 4 - External mounting on Chamber

#### **Termination:**

The switch can be wired directly " to make or break electrical circuits " of burners, contacts being rated for 5A at 230 VAC can be directly wired to control devices viz. Solenoid valve or pumps, through a PVC cable of 2.5 mm<sup>2</sup>.



#### **Operation**:

- 1. Ensure that during operation, operating temperature and pressure remains within specified limits.
- 2. Do not exceed the load limits (VA ratings) of switch.

#### **Replacement of Float & Stem:**

In case float is punctured or stem bend may be due to sudden change in float movement, replace it as per steps given below

- 1. Take out VLC from the chamber/ tank.
- 2. Float and stem is screwed to the flange connection with adaptor.
- 3. Unscrew the adaptor and you can remove the stem out.
- 4. Take the new stem. Ensure that the stopper is fixed at 85 mm from top of the actuator end.
- 5. Now insert the actuator through the insert provided on the flange and screw the adaptor to the flange. (Refer adjacent figure)
- 6. In case only float is punctured, unscrew the float from stem and remove it. Replace new float by screwing it to stem.



# Adjustment of switch position: (fig 7 & 8)

Number of switches are mounted on either side of the seal pipe.

- Each switch is fixed on guide rod pipe through a screw. They are set in factory at required level set point.
- The switch can be adjusted on site by loosening the screw and moving it in downward or upward for required distance. Now tighten the screw.
- 3. Refer values of A, B & C in fig 9 for minimum distances that can be set.







Fig 9





# Periodic Maintenance:

1. Periodic inspection is necessary to keep your level switches in good working condition.

- 2. Periodically, during shut down: remove the switch & wipe the float to remove deposits of scaling formed on it.
- 3. Vibration may sometimes cause terminal screws to get loose. Check all terminal connections and be certain that screws are tight.
- 4. Ensure that contacts of switching mechanism are not pitted / oxidized due to sparking.
- 5. Switches must be cleaned frequently, if the liquid has high viscosity or contain floating material.
- 6. Disconnect device from the supply, before opening, to prevent ignition in hazardous atmosphere.
- 7. Be sure the switch enclosure cover is always in place on the enclosure.

#### **Troubleshooting:**

SL	Problem	Cause	Solution
1	No switching signal from level control.	<ul> <li>a. Switch damaged due to load more than its rating.</li> <li>b. Terminal contacts oxidized / pitted due to sparking.</li> <li>c. Float punctured or stem bend</li> <li>d. Wiring terminals loose.</li> <li>e. Improper wiring.</li> <li>f. Liquid Sp. gr &lt; 0.8.</li> </ul>	<ul> <li>a. Replace switch.</li> <li>b. Clean contacts.</li> <li>c. Replace float /stem</li> <li>d. Tighten terminal contacts.</li> <li>e. Wiring as per wiring diagram.</li> <li>f. Consult factory.</li> </ul>
2	Switch chattering.	a. Loose wiring at terminals.	a. Tighten the terminals.
3	Switch not operating or not operating at desired level.	<ul><li>a. Excessive deposition on float surface due to dirt in liquid.</li><li>b. Vibration may cause damage to wiring connections.</li></ul>	<ul><li>a. Clean the surface where deposition has taken place.</li><li>b. Avoid vibrations by providing dampers.</li></ul>

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