

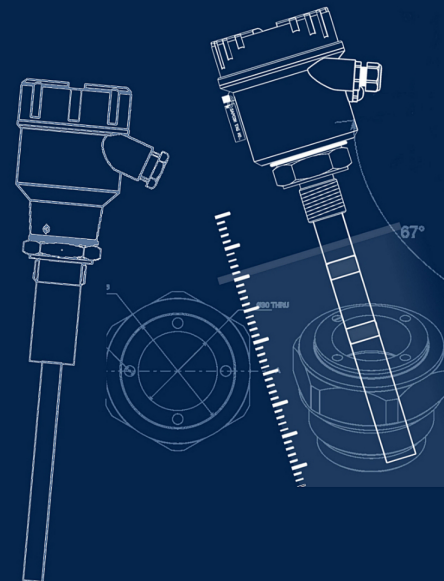
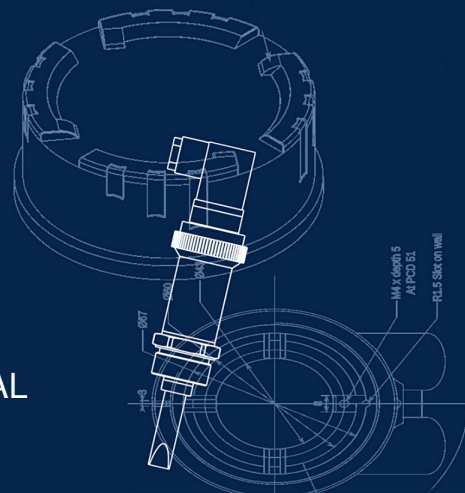
Grown...to meet challenges

## INSTRUCTION MANUAL

### ORBIT-LITE

Rotary Paddle Level Switch

Version 1.1



## SAPCON INSTRUMENTS PVT. LTD.

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## Revision History

Revision	Date	Author(s)	Description
1.0	19 Feb 2021	RND	First Version Editing
1.1	16 Aug 2021	RND	Addition of Spring Force

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- The images shown in this manual may differ from the actual instrument / housing in terms of dimensions, color and design. Please refer to GA drawings for dimensional details.
- Values (of performance) described in this manual were obtained under ideal testing conditions. Hence, they may differ under industrial environment and settings.

### General Instructions

- Instrument shouldn't block the material filling inlet.
- Secure the cover of housing tightly. Tighten the cable glands. For side mounting, the cable glands should point downwards.
- For side mounting, provide a baffle to prevent the material from falling on the probe.
- When handling forks, do not lift them using their tines. While using them with solids, ensure that material size is less than 10mm.
- Deforming the shape of the tines may interfere with the fork's operating frequency.
- Make all electrical connections as instructed in the manual. Don't power on the device before verifying the connections.

## 1 Introduction

Orbit-Lite is a compact rotating paddle level switch that uses a synchronous motor to drive highly reliable operation in most of the powders and granular solids. A light-weight body makes installation operation effortless. An adjustable spring arrangement can be used to control sensitivity using 3-point spring force options.



Figure 1: Orbit-Lite Product Image

## 2 Operating Principle

Orbit-Lite has a synchronous motor that drives the shaft connected to the rotating paddle. The motor is connected to the spring & Pvc Stud. When the application media covers the blades, the spring pulls the Pvc Stud & Pvc Stud push the micro-switch then motor turn to the left position which stops the rotation of paddle. whereas when application media uncovers the blades, spring push the Pvc Stud then micro-switch and motor back to original position and the paddle starts rotating.

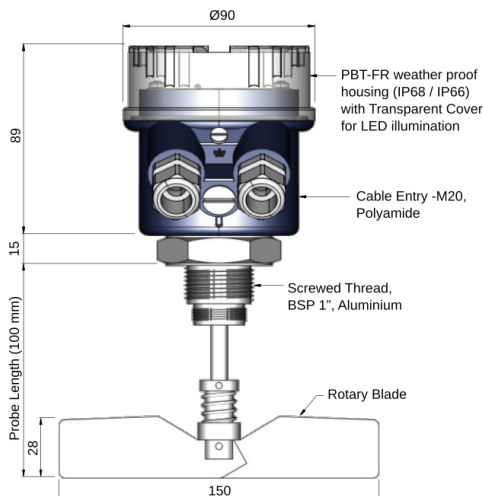


Figure 2: Description of Parts

## 3 Features

- Light weight body.
- Adjustable spring force for required torque in wide application area.

- AC synchronous motor design, maintenance-free.
- Foldable paddle mechanism for easy installation.
- Transparent cover, easy visibility.

## 4 Applications

Orbit-Lite is particularly designed for application media which has **lower mechanical load**. Some of applications where Orbit-Lite is ideal are as follows:

- Plastic Industry
- Plastic Chips
- Grain Handling
- Food Processing
- Man-Made Fibre

## 5 Application Specifications

Please refer to Table 1 for Application Specifications.

PARAMETER	VALUE
RPM	1.5
Density	Minimum 0.5 gm/cm <sup>3</sup>
Material Size	A maximum of 35 mm
Response Time	2-3 sec

Table 1: Application Specifications

## 6 Electrical Specifications

Please refer to Table 2 for Electrical Specifications.

PARAMETER	VALUE
Input Power Supply	230 V AC
Output	1NO, 1NC 6Amp potential-free at 230 V AC
Power Consumption	1.8W at 230 V
Switching	Single-point switching
Indication	Motor Status <ul style="list-style-type: none"> <li>• Green-ON</li> <li>• Red-OFF</li> </ul>

Table 2: Electrical Specifications

## 7 Mechanical Specifications

Please refer to Table 3 for Mechanical Specifications.

PARAMETER	VALUE
Housing	CELEBI: Weatherproof plastic housing with transparent cover for LED illumination , Rating IP68/IP66 , Material : PBT- FR and PC
Cable Entry	M20,(Polyamide)
Mounting	<ul style="list-style-type: none"> <li>• Screwed - 1" BSP</li> <li>• Flanged - 1-1/2 to 3" ANSI Standard B16.5</li> <li>• Custom - As Per Customer Requirement</li> </ul>
Operating Temperature	<ul style="list-style-type: none"> <li>• Ambient Temperature - 0°C - 60°C</li> <li>• Process Temperature - Up to 200°C</li> </ul>
Probe Length	<ul style="list-style-type: none"> <li>• Horizontal Mounting: 100mm - 250mm</li> <li>• Vertical Mounting: 100mm - 1000mm</li> </ul>
Motor	Synchronous Motor
Paddle	SS 316 foldable paddle
Shaft	SS 316
Bearing	Deep Groove Ball Bearing
Sealing	Paddle shaft sealing, Material: NBR/FKM
Slip Clutch	Protects the gear unit against impacts of the measuring vane
Maximum Permitted Mechanical Load	125 Nm

Table 3: Mechanical Specifications

## 8 Installation Guidelines

Please follow the instructions given below to properly install the instrument to avoid any hazardous conditions:

**Note:** For probe length greater than 250mm only top mounting is available.

1. Please ensure that the bore dimensions must match the width of Orbit-Lite blade. Refer the dimensions given below as per mounting specifications.

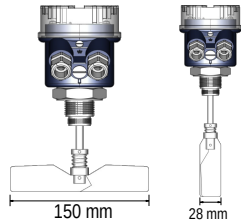


Figure 3: Dimensions for 1" & above Mountings

2. The instrument should be installed horizontally or vertically by bringing the twin vanes together and push them through the threaded female connection. Due to spring action, the paddle will flare out after entering the tank. No access from inside the vessel is required to install or uninstall the unit.

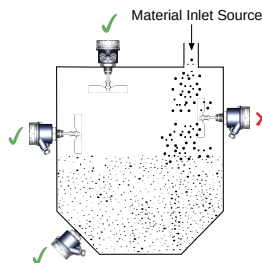


Figure 4: Proper Mounting Arrangement

3. Observe that when installed directly under the material inlet source, a canopy called baffle of appropriate strength and size should be welded right above the instrument as shown.

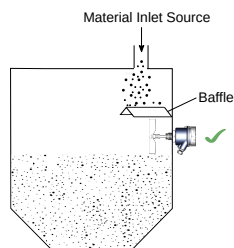


Figure 5: Orbit-Lite with Baffle

4. To prevent the ingress of moisture and water seepage in side mounting position, the cable entries should always point downwards.

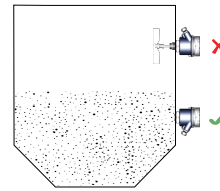


Figure 6: Cable Gland Arrangement

5. Secure the cover of housing tightly. Tighten the cable glands.
6. When handling Orbit-Lite, do not lift them using their paddle as shown in Figure 7.

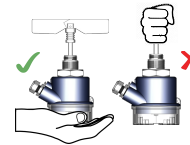


Figure 7: Correct Handling

7. While screwing the instrument, the hexagonal mounting bush should be turned and not the housing.
8. Make all electrical connections as instructed in the manual. Don't power on the device before verifying the connections.
9. Weatherproofness of enclosure is guaranteed only if the cover is in place and glands adequately tightened. Damage due to accidental entry of water can be avoided if the instrument is installed in a rain shade.
10. If the ambient temperature is high, the instrument should not be installed to receive direct sunlight. In case such a position of shade is not available, a heat shield should be fitted above the instrument especially if the operating temperature lies between 60°C and 80°C.

## 9 Electrical Connections

Electrical connections for the instrument will change with models. Please refer to figure 8 before connecting the device:

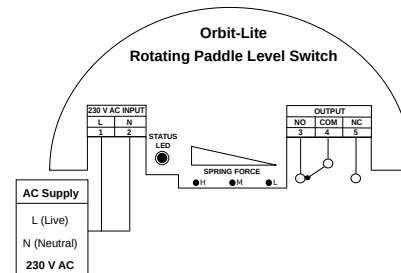


Figure 8: Electrical Connections

## 10 Spring Force Setting

Spring force adjustment may be required to sense sticky application media. This is typically done by adjusting the spring. The position of spring can be changed manually using hands only as per requirement. The spring position should only be changed in the following conditions:

- Excessive Material Load
- Spring loses its property

Otherwise, It is recommended not to change the spring position as the factory setting (Low Spring Force) will be applicable to all type of density media.

**Note:** Do not use plier or any other tool as it could permanently damage the spring.

**Note:** Do not shift the spring position when paddle is on.

### 10.1 For Low Spring Force

The instrument is shipped with this default low spring force setting. This spring force option is suitable for any type of application media. In this case, the spring exerts minimum force to stop the rotating paddle. It is represented as “L” on top cover of instrument.

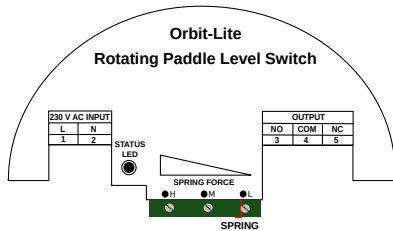


Figure 9: Low Spring Force

### 10.2 For Medium Spring Force

Medium Spring Force is introduced for the condition where the coating of sticky material covers the paddle blade and the instrument starts giving false switching in the absence of actual material due to the creation of high force. Thus, to resolve these conditions “Medium Spring Force” is required to work the instrument properly. It is represented as “M” on the top cover of instrument.

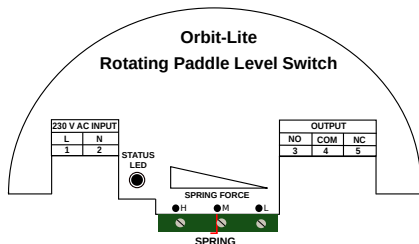


Figure 10: Medium Spring Force

### 10.3 For High Spring Force

High Spring Force is introduced for the condition where sticky material covers the paddle blade in excessive volume as well as the amount of force required to start the rotating paddle is lower in “Low Spring Force” “Medium Spring Force” results failure of switching operation. Thus, to resolve these conditions higher spring force is required to work the instrument properly. It is represented as “H” on the top cover of instrument.

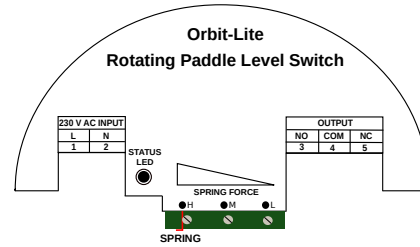


Figure 11: High Spring Force

## 11 Display Indications

As seen in Figure 12, Orbit-Lite has bi-color STATUS LED indication to signify motor status of instrument.

- RED: OFF
- GREEN: ON

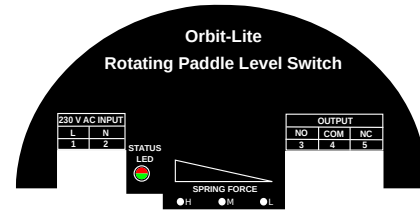


Figure 12: LED Indication on Top Cover



## 12 Customer Support

Thank you for going through the instructions given in this manual. To further ease the process of installation and use, we have developed special demo videos which are hosted on YouTube.

Sapcon's YouTube channel, SAPCON INSTRUMENTS, lists all these videos: <https://goo.gl/dnxfcz>

Should you require further information regarding installation, use or working of the instrument, please don't hesitate to contact us. Kindly provide the following information at the time of contacting:

- Instrument Model and Serial Number
- Purchase Order Number and Date of Purchase
- Description of the query
- Your contact details

In an attempt to serve you better, we are open seven days a week (9:30am to 7:30pm). We are available at:

- [www.sapconinstruments.com](http://www.sapconinstruments.com)
- [sales@sapcon.in](mailto:sales@sapcon.in)
- +91-731-4757575

## 13 Product Selection Order Code

### Product

**RPL : Orbit lite - Rotary Paddle Level Switch (Use in Grains, PVC Powders, Plastic Chips, Cement, Detergent etc. materials)**

#### Housing

CLB : Weatherproof plastic housing with transparent cover for LED illumination , Rating IP68/IP66 , Material : PBT-FR and PC

#### Probe Housing Cable Entry

PC20 : Threaded , M20 Gland , Polyamide

#### Output

1S : 1NO, 1NC SPDT Relay Output (rated at 6 A, 230 V AC for non-inductive load)

#### Power Supply

AU2 : 230V AC, 50Hz

#### Probe Type

RDP : Rod Probe

#### Mounting

MB10AL : Threaded, G 1" (BSP), Aluminium

#### Orientation

TM : Top Mount (Probe Length  $\geq$  251 mm)

AM : Agnostic Mount (Probe Length  $\leq$  250 mm)

#### Extension Material (Probe Length $\geq$ 151 mm)

EAL : Aluminium with SS 316 shaft rotary blade

#### Operating Temperature

10T : Up to 100°C

20T : Up to 200°C

#### Standoff Material (Except "10T")

STAL : Aluminium

#### Probe Length

1H : 100 mm (Only with "AM")

1.5H : 150 mm (Only with "AM")

1.5H2.5H : 151 to 250 mm (Only with "AM")

2.5H10H : 251 to 1000 mm (Only with "TM")

Example -

RPL-CLB-PC20-1S-AU2-RDP-MB10AL-TM-EAL-20T-STAL-2.5H10H