

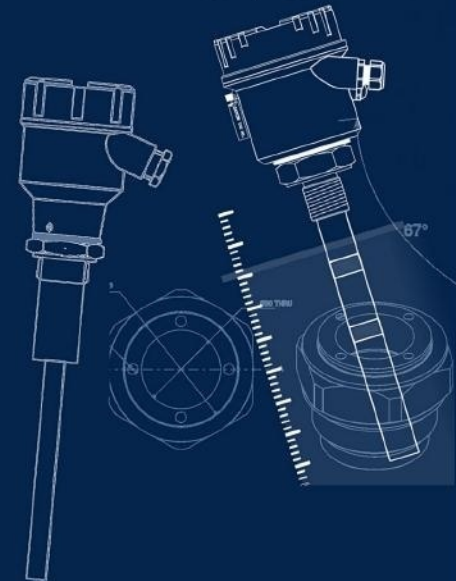
Grown...to meet challenges

INSTRUCTION MANUAL

SLA..M/B

Admittance Level Switch

Version 2.1



SAPCON INSTRUMENTS PVT. LTD.

30+ Years in Process Control Instrumentation

An ISO 22000 company

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Revision History

Revision	Date	Author(s)	Description
1.0	12 Apr 2014	RND	First Version Editing
1.1	20 Oct 2014	MRK	Applications Revision
1.2	27 Jun 2015	RND	Features Revision
1.3	19 Dec 2015	RND	Specs Revision
1.4	23 Aug 2016	RND	Specs Revision
2.0	08 Jan 2017	BRND	Revised Format
2.1	17 Sep 2017	BRND	Branding Revisions

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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

Sapcon admittance level limit switch utilizing specially designed Immuno coat probe offers a reliable solution to level detection problems so far difficult to solve with capacitance type system utilizing conventional probes. The main advantage offered by admittance range of level switches is their ability to ignore build up and coating of material on the probe. Purpose of adding a shield in between sensing element and ground is to avoid RF currents from reaching the container wall via the coating. Although there would be RF current flowing between the shield and the container wall via the build-up, it would not be considered by the measuring circuit and will not affect on the level measurement. This unique design enables the electronic circuitry to distinguish between significant process coating and the actual process material thereby gives reliable accurate switching.



Figure 1: SLA..M/B

2 Operating Principle

The sensing element and the container wall (or ground electrode) form a means to measure the admittance of the system with and without the intervening material. When all the parameters that affect the admittance value are kept constant then its value changes only due to the difference in material level. The sensed signal is further amplified and used to actuate the relay. The relay contacts are used for alarm or control purpose.

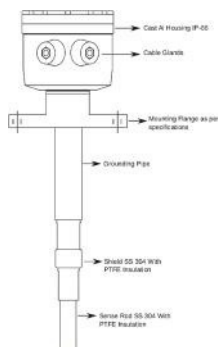


Figure 2: Part Diagram

3 System Description and Features

A complete measuring system comprises:

- Evaluation unit

- Immuno coat probe
- Interconnecting cable

Immuno coat probe is of a special construction with three concentrically positioned electrodes that are electrically insulated from each other. The innermost electrodes serve as the sense electrode whereas the one next to it is the shield, and the outermost is ground. The sense electrode is connected to a radio frequency source and the shield is also connected to the same source but through an isolating amplifier. They therefore have identical waveforms and the shield follows the sense, maintaining equivalent potential, frequency and phase relationship. Due to this there is no flow of RF current between the shield and the sense electrode. The flow of RF currents via the shield to side walls does not affect the measurement due to isolation amplifier.

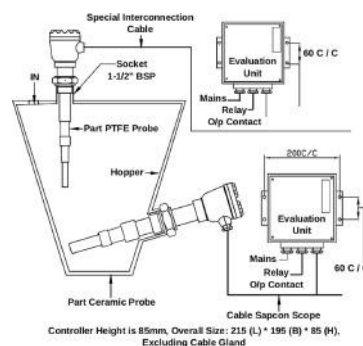


Figure 3: System Diagram

The probe head is of cast aluminium weatherproof construction provided with suitable cable glands, and fitted on to the probe mounting arrangement. A discharge device is provided with the system where there is a possibility of generation of static charge in the service material. The immuno coat probe is connected to the evaluation unit with a special screened cable of pre-trimmed length. The Evaluation unit is housed in a cast aluminium weatherproof housing that is stoving enamel painted & provided with three nos. of cable entries of 1/2" size. The electronics and the inter-connecting terminals are assembled on a glass epoxy printed circuit board that is heavily lacquered for rendering it immune to moisture, dust & fungus.

4 Application Note

Admittance measurement using Immunocoat probe gives satisfactory solution in tough environments where,

- Material has a tendency to coat.
- There is bridging (build-up) of material between probe and side wall.
- Material particles with electrostatic charge and varying temperature float in the vicinity of the probe.

5 Technical Specifications

5.1 Evaluation Unit

For Evaluation Unit, please refer Table 1

PARAMETER	VALUE
Housing	Cast aluminium weather proof stoving enamel painted/siemens Grey powder coated/Epoxy coated suitable for back panel/wall mounting.
Cable Entry	1/4"ET-2nos. and 1 no. for jack connector
Cable Gland	Single Double Compression, size 1/2"/3/4"BSP/ NPT/ Brass/ Stainless Steel/ NG20
Tolerable Ambient Temp.	0°C to 60°C
Power Consumption	5VA Approx.
Mains Supply	90 to 265 V AC,50Hz (Universal Power Supply), 110/230 V AC-50Hz Optional 24 V DC
Mounting	<ul style="list-style-type: none"> • Screwed - 1"/1-1/2" BSP/NPT (M) • Flanged - (As per your order) • Material - MS (Plated) / SS
Fail-Safe Mode	Max/Min field selectable
Output	One/Two set of potential free c/o contacts rated at 6A 230V AC for non-conductive loads
Indication	Red LED for alarm and Green LED for normal condition
Sensitive Indicator	Ten Dot display for sensitivity Calibration, also for showing the material trend in the vicinity of the probe
Calibration	Through multi-turn potentiometer
Measuring Frequency	100KHz
Response Time	Less than 1 second
Switching Delay	Adjustable from 5 to 20 seconds(covered and uncovered)applicable for model SLA322M and 622M
Inter-connection	Between Probe and Evaluation Unit, by special coaxial cable with drain wire
Weight	2.25kgs
Overall Dimensions	Please refer attached drawing 10 and 11

Table 1: Evaluation Unit

5.2 Probe

For Probe Specifications, please refer Table 2

PARAMETER	VALUE
Housing	Cast aluminium weather proof
Cable Entry	one no. 1/2" BSP/NTP/Brass/Stainless Steel
Cable Gland	Single/Double Compression
Mounting Connection	<ul style="list-style-type: none"> • Screw - 1"/1 1/2" BSP/NTP • Flange - As per requirement
Insulation	Part/Full
Insulating Material	PTFE/Ceramic
Process Temperature	Probes types available for 80°C/120°C/250°C/400°C/600°C
Extension	<ul style="list-style-type: none"> • Rod - Stainless Steel/Mild Steel (Plated) • Rope - Galvanized Steel/Stainless Steel
Sensing Part	Stainless Steel/Mild steel (Plated)
Grounding Pipe	Galvanized Steel/Stainless Steel/Mild Steel (Plated)
Stand-off	Galvanized Steel/Stainless Steel/Aluminium
Discharge Device	In case of static charge build-up

Table 2: Probe

5.3 Disc Probe

SLA Disc Probe (Chute Block Level Switch) offers a reliable solution to detect joining / blockage of conveyor chute, which has been so far difficult to solve with capacitance based systems utilizing conventional or diaphragm type probes.



5.4 Principle

The probe comprises of sense, shield and ground electrodes electrically isolated from the metallic tank by means of suitable insulators. The sense electrodes and the vessel wall serve as the two electrodes of an imperfect capacitor with the service material as the dielectric. A change in material level causes a change in admittance of this imperfect tank capacitor.

5.5 Measuring Systems

It consists of an evaluation unit and an immunocoat disc probe. The probe is mounted from side of the chute wall (Figure 2). The evaluation unit measures the change of admittance accurately by using Radio Frequency (R.F.) technique coupled with coat immunizing circuitry. R.F. signal transmission between probe and evaluation unit via a coaxial cable with shield arrangement eliminates cable capacitance and drift due to changes in temperature. The processed signal is used to energize or deenergize a relay.

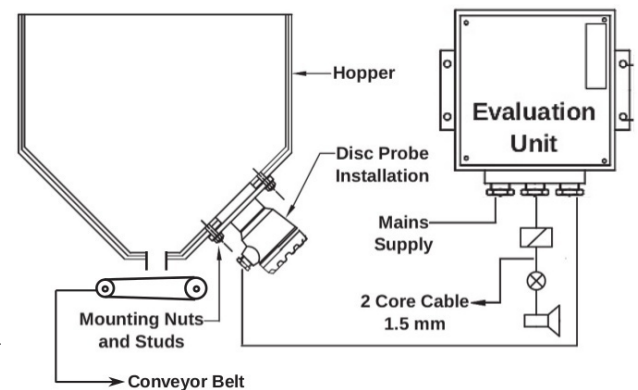


Figure : Mounting Arrangement for SLA Disc Probe

- Refer the diagram pasted inside the cover before making the interconnection.
- Do not immediately energize the instrument until wires are fully secured.
- In case of DC power supply instrument -ve is ground.
- Always tighten the housing cover and the cable entry securely.
- Use appropriate size of spanner for rotating mounting bush.
- True earths must be connected to the instrument.
- Use recommended cable only for interconnection.
- Weatherproofness of enclosure is guaranteed only, if the cover is in place cable glands are adequately tightened.

11 Safety Information and Maintenance

Before installing the admittance level controller, please read these instructions carefully and familiarize yourself fully with the requirement and functions of the instrument. Please do not dispose off the carton or packing material until the unit has been inspected in all respects. If the unit is received in damaged condition, kindly note the dispatch details and inform us immediately. Inter-connection must be done as per the national standards. If you find any difficulty or have any doubts about installing this product, please do not hesitate to contact our service center for instant support. Please refer Table 3.

12 Recommended Spares

Instrument having no moving part therefore no wear and tear. However we advise to keep at least one set of card and probe assembly, if population of instrument are more.

13 Warranty

Instrument is manufactured as per the purchase order specification. Standard guarantee for twelve months from the date of commissioning or eighteen months from the date of supply whichever ever is earlier. Guarantee is against manufacturing defects. We undertake to correct such defects which are due to workmanship, at our expenses. Instrument should be forwarded to us on freight paid basis with seals unbroken. The guarantee is valid for our customer and does not extend to third parties or caused by mishandling, accident or abnormal conditions.

PROBLEM	PROBABLE CAUSE	REMEDY
No change in bar display	No change in level or evaluation unit is faulty	Check level or evaluation unit with other probe
LED indication does not changes	LED driving circuit faulty	Diagnose the fault and remove the defective component
Relay not actuating but LED changes	Relay and its associated circuit is faulty	As above
Evaluating unit o.k.but no change occurs when probe is connected	Probe or interconnected wire is disconnected	Check cable connectivity and probe
Relay actuating but no output	Relay Contact worn out/Track discontinuity	Replace relay/check tracks

Table 3: Troubleshooting

14 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:

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