



## USER'S GUIDE

Installation, Operation, Maintenance Instructions



**SC250**

Capacitive Level Switch

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## SC250 - Capacitive Level Switch

The SC250 Capacitive Level Switch offers multiple advantages over typical capacitive level switches. The SC250 has a field adjustable sensitivity adjustment which enables the user to calibrate the sensor to detect a wide variety of products including conductive or non-conductive products, various types of liquid including acids or corrosive solvents, solid or granular substances such as glass, plastics, sugar, flour, grains and fine filaments. The SC250 does not require a reference enabling it to be applied in concrete or plastic containers.

The SC250 is a compact sensor made with a 316L Stainless Steel body and PTFE sensing tip with an acrylic viewing lid to access the sensitivity adjustment. A high luminous LED gives the operator a clearly visible indication of the switch output status.

Standard configuration comes with an IP67 rated M12 quick connector. Available with higher temperature limit for CIP applications.

The SC250 is available for 12...30Vdc supply voltage with PNP output and can be used in conjunction with RL202 relay powered by 110Vac or 220Vac, with NO + NC switch relay output.

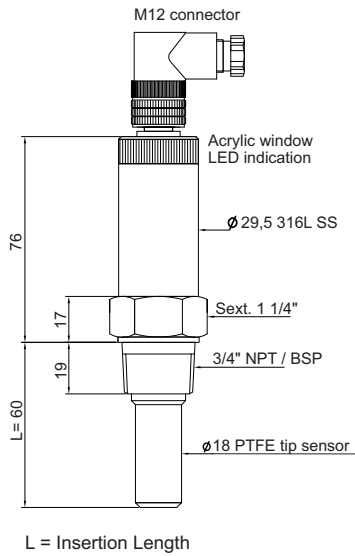
### Features

- Field adjustable sensitivity adjustment
- Class Protection: IP67
- Process Connection size starting at 1/2" NPT or BSP
- Customized insertion lengths upon request
- 316L/PTFE or all PVC design for corrosive environments
- No moving part capacitive technology with highly visible LED indication
- Works in conductive or non-conductive medias with no need for a separate reference.

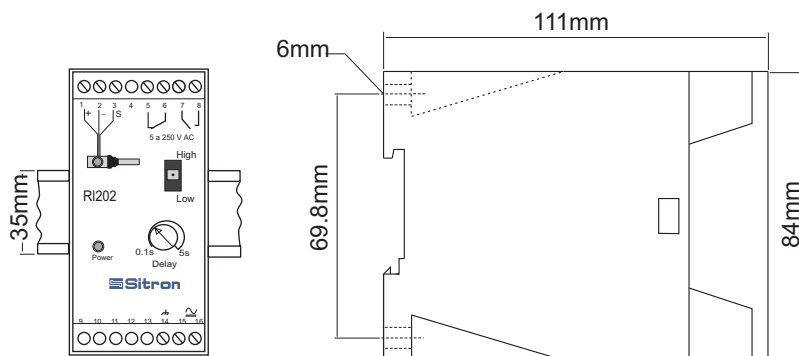


Models & Dimension

**SC250 Standard**



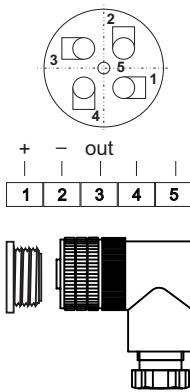
**Relay Controller RL202 Optional**



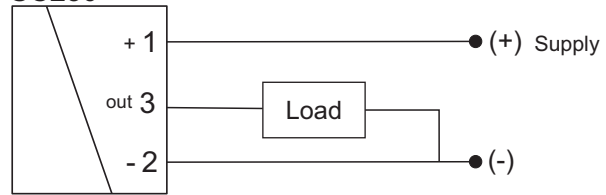
# Wiring Diagram

## SC250 Standard

M12 Connector



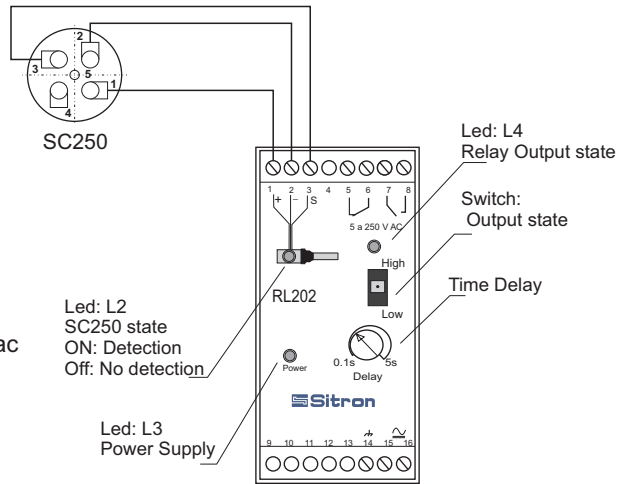
SC250



## SC250 & RL202 Relay Output

RL202 controller

- 1- Positive
- 2- Negative
- 3- Out
- 5 } NC Contact
- 6 } NC Contact
- 7 } NO Contact
- 8 } NO Contact
- 14- Ground
- 15 } DC: 24Vdc
- 16 } AC: 110Vac or 220Vac



## Installation

Verify that the location the probe is to be mounted is clear from the stream of product (Fig. 1).

When installing more than one probe in your process, verify that they are separated by a minimum distance of 500mm (Fig. 1).

Material falling onto the probe can cause damage or switching errors. If this is unavoidable, it is recommended that a protective shield be installed above the probe to protect it. The shield is also recommended when the probe is used for a low level switch or in the outflow of the product (Fig. 2).

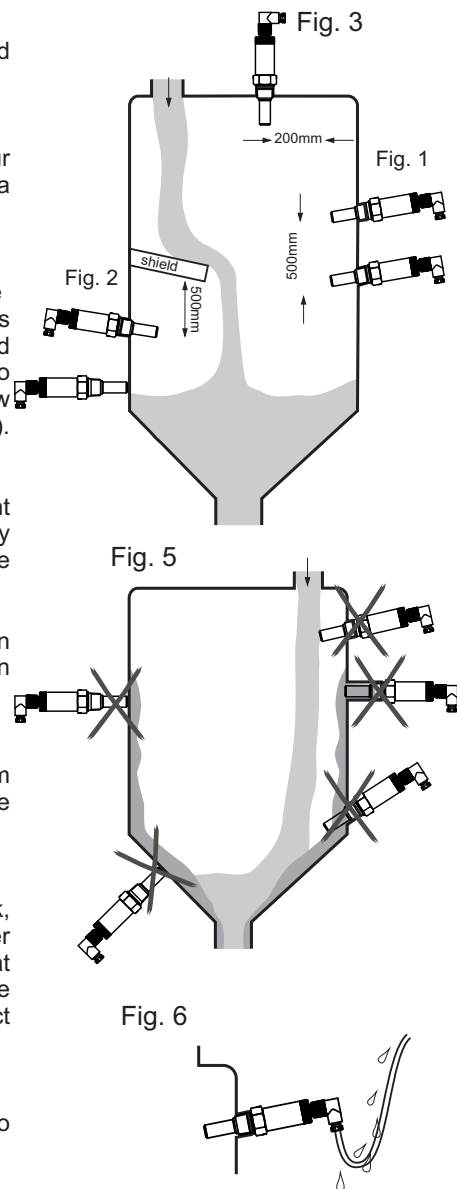
The tip of the probe should slightly point downward (when possible) so that if there are any excess of product it will easily slide from the probe (Fig. 2).

The SC250 model can be detect without being in contact with the product. For this type of detection the tank can't be metallic (Fig. 4)

When installing from the top of the tank confirm that the tip of the probe has cleared the side of the vessel at least 200mm (Fig. 3).

When installing the sensor directly to the tank, make sure that the rod extends beyond the inner wall of the tank, by as much as possible, so that internal build up or other debris does not interfere with the sensor's performance. (Fig. 2 correct Fig. 5 incorrect).

Ensure that the conduit is facing downward to avoid water from entering the housing (Fig. 6)



## Mounting Notes

When making connections use reliability cables and make sure they are grounded.

A stable Power Supply prevents burning and equipment malfunction.

Shielded cables prevent interference and changes in electronic improving and protecting against false measurements.

To avoid radio frequency interference and possible malfunction. When possible, keep hand held communication equipment away from the SC250 and RL202. If this unavoidable make a metal shield around the the flow switch and confirm that the unit has been properly grounded.

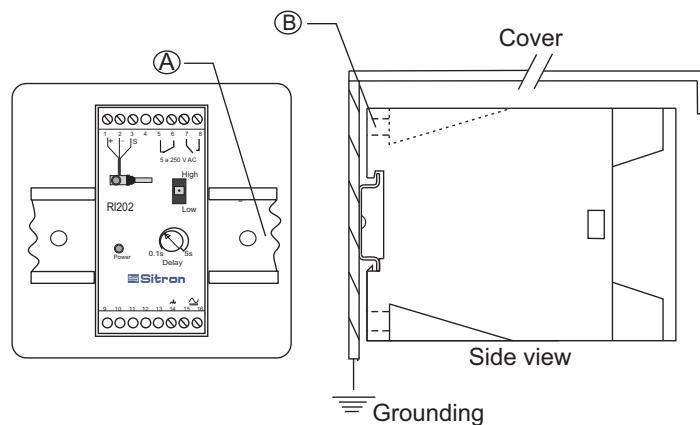
Do not install the controller RL202 in harsh environments and humid. Respect class protection, working temperature and protect the same from rain and excessive heat.

### **Controller Mounting**

Panel mounting with  
the protection cover

A- DIN rail (35mm)

B- Screws



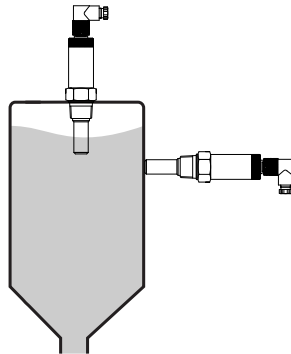
## Calibration

### Calibration Instructions for the SC250:

:

1. Install the SC250 in the tank. Remove the acrylic cover to access the electronics module. Be careful not to put excessive strain on the wires between the electronics and the screw cover. (fig.1) Connect the M12 connector and power up the unit.

2. Fill the tank until the probe is in contact with the medium.

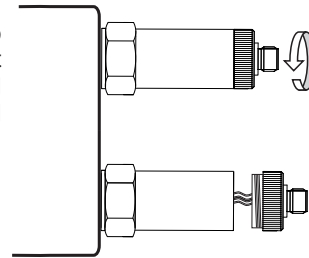


3. Turn the potentiometer counter clockwise until the LED turns off. Then stop. This point will mark the sensitivity necessary to detect the product. (Fig.2)

4. Now turn the potentiometer clockwise until the LED turns on indicating detection of the target medium. Turn the potentiometer clockwise again one full turn so that the switch point is not at a critical state. (Fig.3)

5. Now that calibration is complete, disconnect the M12 connector. Before replacing the acrylic cover, turn the cover counter clockwise about 4 time so that the wires will be twist back into a neutral position once the cover is tightend. Now screw the acrylic cover back on until it is sealed and re-attach the M12 connector to complete the installation and calibration process.

Fig.1



### Internal adjustment

Fig.2

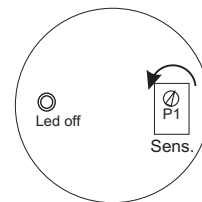


Fig.3

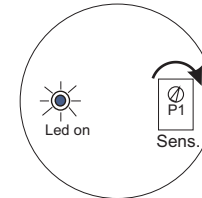
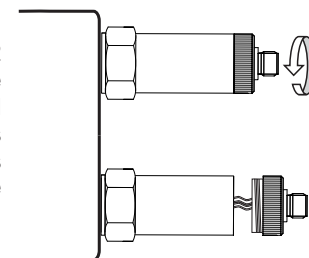


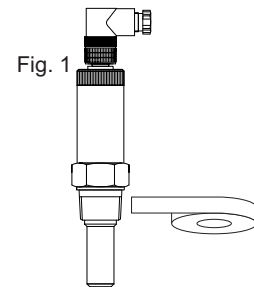
Fig.4



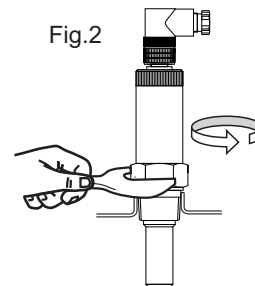


## Installation, Handling & Maintenance

Seal the thread with Teflon tape before installation (Fig. 1).

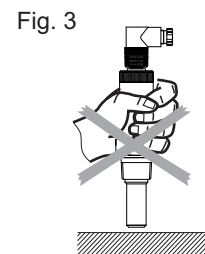


When tightening the sensor, use only use the 316S.S. hexagon fitting to achieve a seal, do not twist with the body of the sensor. (Fig. 2)



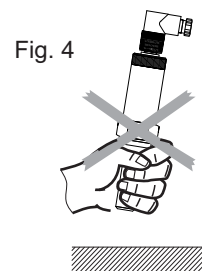
The probe should not be dropped or suffer any impact or fall that could damage the electronics or the coating of the probe (Fig. 3 and 4).

Periodic visual inspection of the probe is required to check for corrosion or deposit build-up. If deposits are found, clean the sensor to ensure optimum performance.



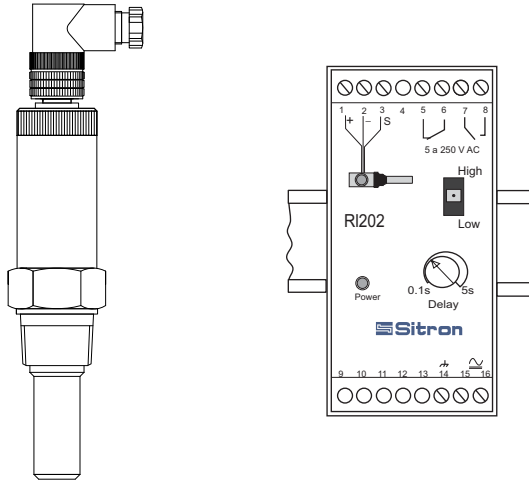
Care should be taken when handling and installing probes with coated rods to avoid scratching them. Scratching the coating could interfere with the probe's performance.

Use a soft brush when cleaning the rod.



## Technical Specification

### SC250 & RL202



Application	Level switch for liquids and granular mediums
Operating Voltage	SC250: 12...30Vdc / RL202: 110 or 220Vac
Current Consumption	12mA
Output	SC250: PNP (500mA) / RL202: NA + NF (optional)
Adjustment	Sensibility
Frequency Oscilation	5MHz
Level Indication	LED status ON/OFF
Electrical Connection	M12 Connector
Process Connection	NPT or BSP
Material	316L SS Body / PTFE tip sensor or PVC body & tip
Operating Temp. Range	-10 to 70°C
Maximum Temperature	100°C for 30 minutes (CIP)
Max Pressure	145 PSI (10 Bar)
Class Protection	SC250: IP67 / RL202: IP40

## Trouble Shooting

Fail	Cause	Solution
PNP Output does not work	SC200 or RL202 Off, without Power Supply	Check the Power Supply
Rele does not work	-Load is not connected, -Lack of signal from SC200	Verify the connections
	Low sensibility	Adjust sensibility by the SC200 potentiometer
PNP Output does not turn off	Coating on the probe is damaged	Send back to repair
Rele does not turn off	Material Build-up on the rod	Clear the rod

# Ordering Information

MODEL	
SC250	
SIZE	
<input type="checkbox"/> 3	1/2"
<input type="checkbox"/> 4	3/4"
<input type="checkbox"/> 5	1"
<input checked="" type="checkbox"/> X	OTHERS - SPECIFY
PROCESS CONNECTION TYPE	
<input type="checkbox"/> B	BSP
<input type="checkbox"/> N	NPT
<input type="checkbox"/> T	TRI-CLAMP
<input type="checkbox"/> E	FLANGE (ACCESSORY)
<input checked="" type="checkbox"/> X	OTHER - SPECIFY
TYPE OF ROD OR CABLE	
<input checked="" type="checkbox"/> K	THREAD & BODY 316SS - PTFE TIP
<input type="checkbox"/> L	THREAD & BODY & TIP - PTFE
<input type="checkbox"/> V	BODY AND TIP IN PVC
INSERTION LENGTH	
<input checked="" type="checkbox"/> L60	60mm - STANDARD
<input type="checkbox"/> L	SPECIFY
ELECTRICAL CONNECTION	
<input checked="" type="checkbox"/> M	M12 Connector

MODELS	
RL202-11	115 VAC (50/60 Hz) 1 SPDT (5A-250 VAC)
RL202-23	230 VAC (50/60 Hz) 1 SPDT (5A-250 VAC)

**NOTES:**  
 1. The SC250 comes standard w/ PNP Transistor output

## Terms & Conditions

### Sitron's TERMS & CONDITIONS

**Design:** Sitron reserves the right to make any alterations or changes necessary to improve the Products, correct defects or to make the Products safer, without prior notice or consent by Buyer.

**Pricing:** All stipulated amounts shall be in US dollars and all prices quoted are valid for thirty (30) days from date of offer, unless otherwise stated.

**Safety and Instructions:** The Buyer ensures that it and all its representatives and agents will observe all safety and technical instructions in Sitron's operating manuals, catalogs or other directions or instructions (either written or verbal).

**Delivery and Freight:** All goods are sold FOB point of shipment, Brasil. Transportation to the destination is the Buyer's responsibility and Buyer alone shall bear the cost of freight, optional or other shipping requirements, and or insurance. Sitron shall not be liable for loss or damage to the Products after said Products are delivered to or received by the shipper/carrier, and all risk of damage or loss shall immediately pass to Buyer.

Receiving, unloading and storing of Products will be the responsibility of the Buyer.

Buyer also accepts that courier may choose to return Products to Sitron if any local taxes or duties are not paid by Buyer at point of delivery. Buyer must make any and all claims for corrections or deductions within ten days of the delivery of the Products.

**Shipment Delays:** Sitron has no control over the length of time shipments may be held at customs, etc. For this reason, Sitron commits only to a "shipment date", not a "delivery date". Buyer shall not hold Sitron liable for claims resulting from delay in shipment except in cases where these terms are accepted in writing by Sitron. Acceptance of delivery of Products by Buyer shall constitute a waiver of all claims for delay.

**Partial Deliveries:** While Sitron strives to deliver all orders on time and complete, Sitron reserves the right to make partial deliveries when necessary.

**Changes:** Any changes initiated by the Buyer which affects the products specifications; quantities ordered; delivery schedule; method of shipment or packing; or delivery location, must be made in writing and signed by both parties.

In this case, Sitron reserves the right to adjust the pricing and or delivery of the order, which will be agreed to by both parties before further work is performed on the order. Any such requests will be priced according to the scope of changes and the status of the current order. Customer must sign and return or acknowledge approval of drawings along with any Purchase Order. If approval drawings are not returned with order, the delivery date may be held or pushed back until Customer has acknowledged approval.

**Cancellation:** Any cancellation of the Contract by the Buyer shall be effective only if made in writing and accepted, in writing by the Sitron. In such a case, Sitron is entitled to reasonable cancellation charges including but not limited to labor, material and other related expenses.



## Terms & Conditions

**Termination Fee Schedule:**

Order entered but not released for manufacturing	10%
Order in any stage of production	75%
Order complete and ready for shipment	100%

**Warranty:** Sitron warrants its product against manufacturing defects in material and workmanship, when installed in applications approved by Sitron, for a period of one year from the date of original shipment, unless otherwise stated in writing by Sitron.

Sitron is not responsible for damage to Sitron's Products or other equipment or products because of improper installation or misapplication of the Products by Buyer. Installation or startup of Sitron's equipment must be performed under the guidelines set forth in Sitron's instruction manuals, wiring diagrams, etc., or performed under the direct supervision of Sitron's field technicians or Sitron's authorized Sales Representatives, in order to be covered by Sitron's warranty.

Sitron shall be under no liability in respect to any defect from fair wear and tear, willful damage, negligence, abnormal working conditions, failure to follow Sitron's instructions (whether written or verbal), misuse, modification or alteration or attempted repair of the Goods without Sitron's approval.

Sitron shall not be liable under the above warranty (or any other warranty, condition or guarantee) if the total price for the Products or the payment of Services rendered has not been paid by the due date for payment.

The Buyer must make all tools, resources or personnel available to help Sitron to diagnose the defect without any back charge. In absence of Buyer's cooperation in this regard, there shall be no liability under the above Warranty.

Sitron's liability under this warranty shall be limited to repair or replacement at Sitron's option of such defective Products, FOB factory, upon proof of defect satisfactory to Sitron. Warranty does not include transport.

**Return Goods:** No goods may be returned without Sitron's permission and an RMA number. Sitron assumes no responsibility for return shipments made without permission. In issuing credit for such shipments, Sitron reserves the right to charge a restocking fee dependent on Sitron's ability to recondition and resell the returned equipment.

**Insurance:** The responsibility for insuring the Goods after the risk in them has passed to the Buyer shall be that of the Buyer.

**Confidential Information:** All drawings, specifications, and technical information provided by either Buyer or Sitron shall be treated as confidential and shall not be disclosed to anyone other than those who require it as part of the fulfillment of the order. Buyer agrees that the designs and/or any other related material provided are and remain Sitron's exclusive property and that the Buyer acquires no right, title or interest to this intellectual property, whether in whole or in part.

**Errors:** Sitron reserves the right to correct all typographical or clerical errors or omissions, in its prices or specifications.



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Sitron - Brasil  
R. Baronesa de Itu, 83  
São Paulo - SP - 01231-001  
T: (5511) 3825-2111  
F: (5511) 3825-2171

Sitron - USA  
1800 Prime Place  
Hauppauge, NY 11788  
PH: 516-935-8001  
FX: 800-516-1656

[www.sitron.com](http://www.sitron.com)

BRASIL: [vendas@sitron.com](mailto:vendas@sitron.com)

USA / Other Countries: [info@sitron.com](mailto:info@sitron.com)