Sitron

USER'S GUIDE

Installation, Operation, Maintenance Instructions

# SC 700 Series

## Capacitive Point Level Detection

Sitron

# Contents

# SC700/SC750
## Capacitive Point Level Detection

The SC700 Series of capacitance switches are ideal for High/Low level detection for liquid, solids, granular materials and pastes. Unlike other capacitance probes, the SC700 Series can detect conductive, non-conductive or low dielectric materials with extremely accurate performance without requiring an external reference or installation in a metal vessel.

## Technology

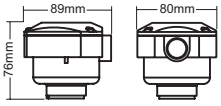
The sensor operates in a manner that is similar to a simple capacitor. A high frequency oscillator is located within the tip of the probe. When the tip of the probe comes in contact with the medium, the frequency of the oscillation reaches a preset point and the detection circuit signals the switch to change state.

## Features

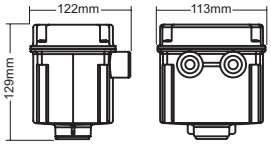
- No Moving Parts – Rugged Construction
- Highly customizable:
  - Polyacethal Delrin, PTFE or PVC Sensing Tip
  - Extended Lengths with both Rigid 316 Rod or Cable
  - Threaded, Flange or Sanitary Process Connections
- Available in DC or Universal Power Supply versions
- Almost completely immune from build-up, coating media or aggressive products
- Easily applied in a wide range of applications such as: water, oils, corrosives, solids, powders, grains, conductive as well as non-conductive medias.

## Mounting Options for SC700/ SC750

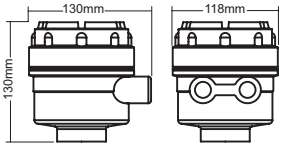
Nylon-N1




Nylon-N2

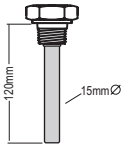



Aluminum-G2

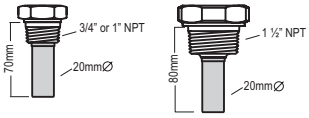



## Insertion Types

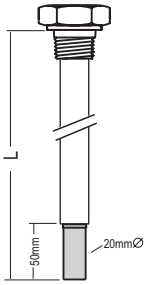
SC700 Standard



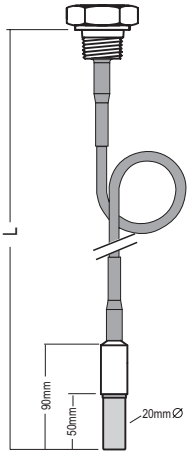

SC750 Standard Sizes




SC750 Extended Length



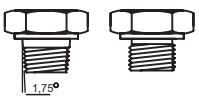

SC750 Cable Extension



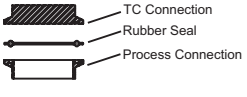

## Process Connections

| Threaded Connections |
|---|
| 3/4" |
| 1" |
| 1 ½" |
| 2" |

NPT BSP



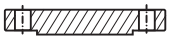

| Tri-Clamp Connection |
|---|
| 1 ½" |
| 2" |
| 2 ½" |
| 3" |




| Flange Connections ANSI 150# ANSI 300# |
|---|
| 1" |
| 1 ½" |
| 2" |
| 2 ½" |

FF

RF

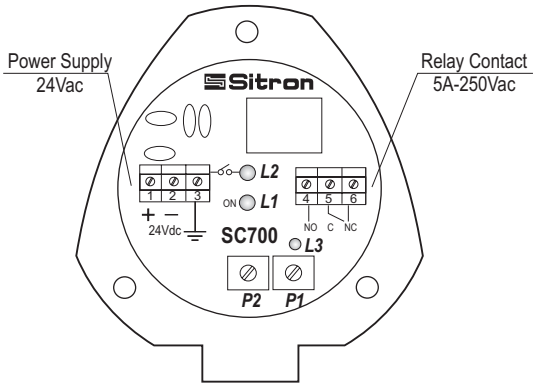


# Wiring Diagram

L1 - Power ON (Green)
L2 - Output Status (Red
L3 - Sensor Status (Delay) Yellow
P1 - Sensitivity Adjustment
P2 - Time Delay Adjustment

## SC700DC/ SC750DC With N1 Housing

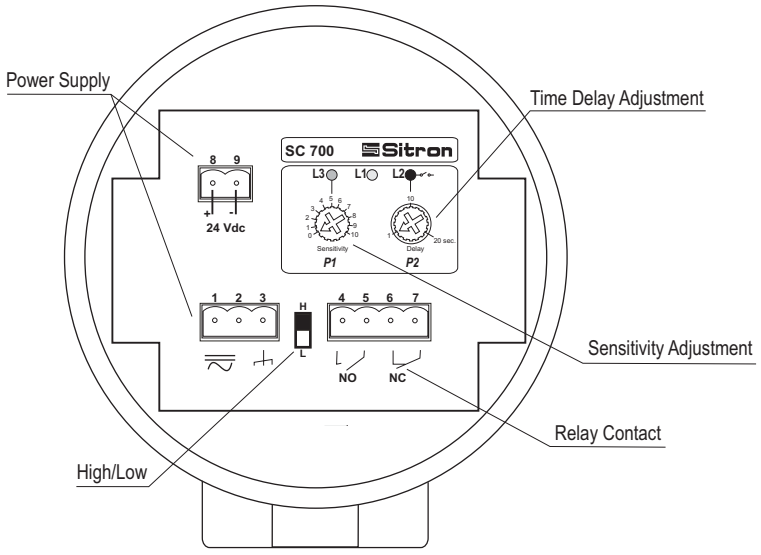
1 - Positive DC
2 - Negative DC
3 - Ground
4 - NO Contact
5 - Common
6 - NC Contact



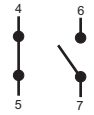
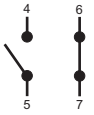
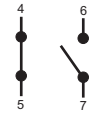
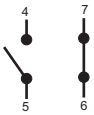

## SC700U/ SC750U With G2 Housing

1 - Power Supply
2 - Power Supply
3 - Ground
4 - Common
5 - NO Contact
6 - Common
7 - NC Contact

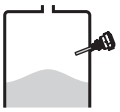
8 - Positive DC
9 - Negative DC



## For SC700/SC750U

| Switch Position | Level | NO - NC | Green LED | Yellow LED | Red LED |
|---|---|---|---|---|---|
| H<br>Maximum fail-safe |  <br>Probe covered |  | ON | ON | ON |
| |  <br>Probe uncovered |  | ON | OFF | OFF |
| L<br>Minimum fail-safe |  <br>Probe covered |  | ON | ON | OFF |
| |  <br>Probe uncovered |  | ON | OFF | ON |

## For SC700/SC750DC

| Level | SPDT | Green LED | Yellow LED | Red LED |
|---|---|---|---|---|
|  <br>Probe uncovered |  | ON | OFF | OFF |
|  <br>Probe covered |  | ON | ON | ON |

## 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 use 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 is any excess product, on the probe, it will easily slide off (Fig. 2).

When installing from the top of the tank confirm that the tip of the probe has cleared the side of the vessel at least 500mm (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. 4 incorrect).

Fig. 3

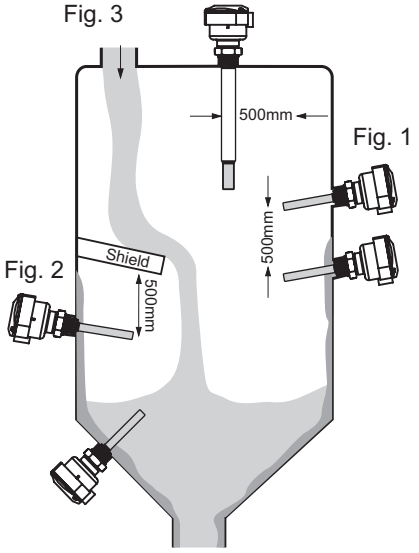
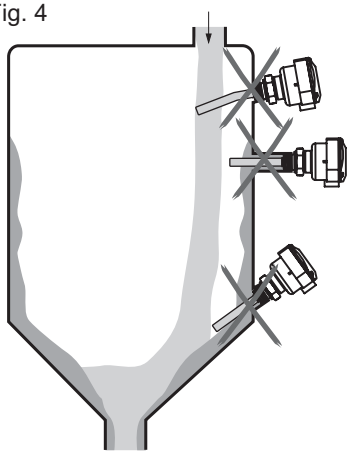



Fig. 1

Fig. 2

Fig. 4



For probes with cable extensions, installation should be from the top of the tank. It is also recommended that for these probes the process shouldn't have any agitation as this can cause fluctuating readings or damage to the probe (Fig. 5).

The SC750 with Rigid Rod (not cable version) is recommended for applications that have turbulence or vortices throughout use (Fig. 6).

Ensure that the conduit is facing downward to avoid water from entering the housing (Fig. 7).

Before installing the probe, ensure that the available power supply is correct.

Verify that the probe has been wired as per the instructions on page 7.

Verify that the operating pressure and temperature of the process corresponds to the operating parameters of the probe.

The probe must be installed utilizing the type of connection provided.

**Caution:**

The SC700 Series will not work properly in viscous, coating mediums with high salt content (high di-electric), especially when mounting from the side of the vessel. Sitron does not recommend using this product in this type of application unless otherwise specified.

Fig. 5

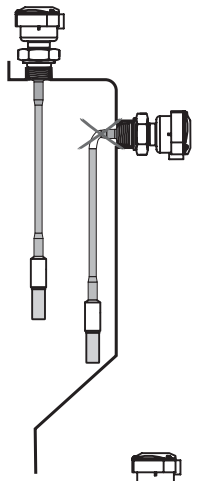


Fig. 6

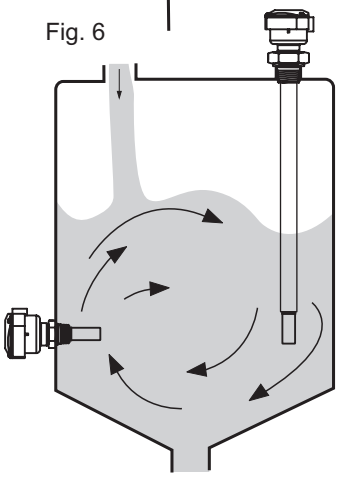
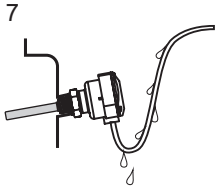


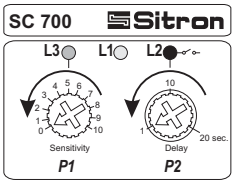
Fig. 7



# Calibration

1. Turn both potentiometers (P1 and P2) fully counterclockwise before you begin (Fig. 1).

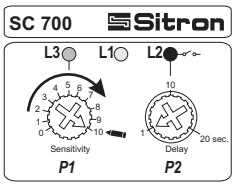
Fig.1




2. Install the probe and power it on. The L1 green LED should be on.

3. With the vessel empty (or the medium not in contact with the sensor), turn the sensitivity potentiometer (P1) clockwise until the yellow LED (L3) turns On. Mark that location on the electronics' label using a pencil. If this LED (L3) does not turn on, mark the maximum position on the label with a pencil (Fig. 2).

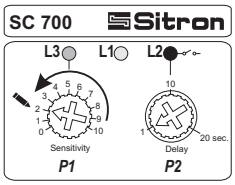
Fig.2




4. Fill the vessel until the medium is in contact with the sensor.

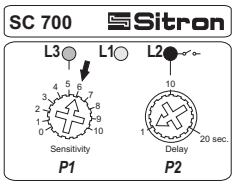
5. Turn the potentiometer (P1) counter-clockwise until the yellow LED (L1) turns Off. Mark the location where the yellow LED shuts off on the electronics' sticker using a pen or pencil. If the LED does not turn Off, leave the potentiometer completely turned counter-clockwise (Fig. 3).

Fig.3




6. Now that you have marked minimum and maximum settings for your particular application, turn the sensitivity potentiometer (P1) clockwise half way between the two pencil marks. This point should be the ideal setting where the probe is neither too sensitive or not sensitive enough. This method of calibration should also prevent false alarms.

Fig.4




## Delay

Adjust the delay time from 0,1 to 20 seconds by setting potentiometer P2.

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

Do not turn or handle by the housing when tightening the process connection. However, the housing is suitable to be reoriented by once the process connection has been tighten.(Fig. 2).

Use the correct tool during installation (Fig. 3)

The probe should not be dropped or suffer any impact or fall that could damage the electronics or the plastic tip of the probe (Fig. 4 and 5).

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.

When cleaning the rod use a soft brush or any other similar object.

Fig. 1

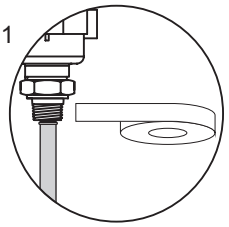


Fig. 2

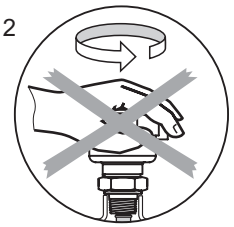


Fig. 3

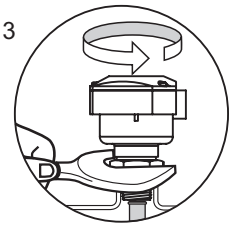


Fig. 4

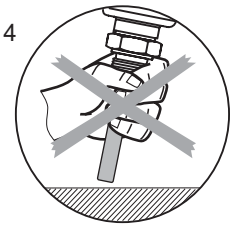
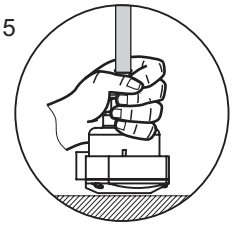
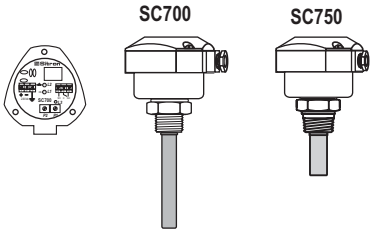


Fig. 5



# Technical Specifications

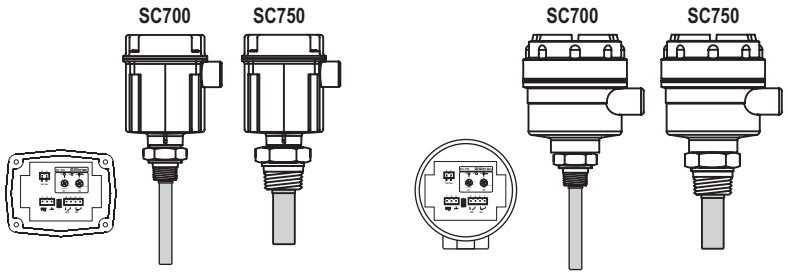
## SC700DC / SC750DC




| | |
|---|---|
| Application | Level switch for liquids solids and granular |
| Operating Voltage | 24 Vdc +/- 10% |
| Current Consumption | 2VA |
| Output | Relay (SPDT) 5A max (250Vac) |
| Adjustment | Potentiometer - Switch Point |
| Time Delay | Potentiometer 1 to 20 seconds |
| Frequency oscilation | 5MHz |
| Level indication | Led status on/off |
| Electrical Connection | Cable gland - ½"NPT cond. entry or M12 connector |
| Process Connection | 3/4" to 1 1/2" BSP or NPT flange or sanitary connections |
| Wetted Material | Sensor for SC700DC: Polyacethal Delrin - standard (PTFE or PVC optional)<br>Sensor for SC750DC: Polyacethal Delrin - standard (PTFE or PVC optional) |
| Enclosure Material | Glass filled nylon, N1 |
| Max pressure | 145 PSI (10 Bar) |
| Operating Temperature | 14 to 176º F (-10 to 80ºC) |
| Class Protection | NEMA 4 (IP 65) |

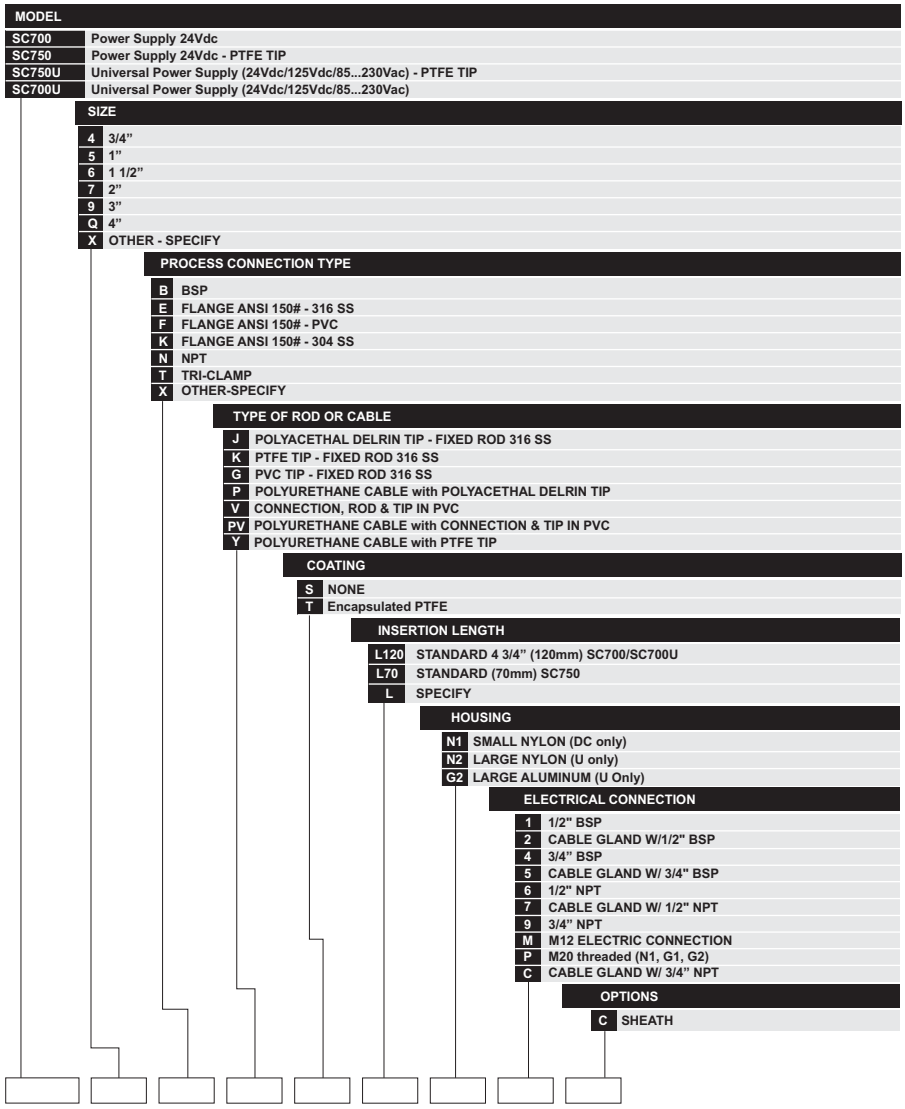
# Technical Specifications

**SC700U / SC750U**




| | |
|---|---|
| Application | Level switch for liquids solids and granular |
| Operating Voltage | 85...230 Vac<br>24 Vdc |
| Current Consumption | 4VA |
| Output | Relay (2X, SPDT) 5A max (250Vac) |
| Adjustment | Potentiometer - Switch Point |
| Time Delay | Potentiometer 1 to 20 seconds |
| Frequency oscilation | 5MHz |
| Level indication | Led status on/off |
| Electrical Connection | Cable gland - ½"NPT cond. entry or M12 connector |
| Process Connection | 3/4" to 1 1/2" BSP or NPT flange or sanitary connections |
| Wetted Material | Sensor for SC700U: Polyacethal Delrin - standard (PTFE or PVC optional)<br>Sensor for SC750U: Polyacethal Delrin - standard (PTFE or PVC optional) |
| Enclosure Material | Glass filled nylon, N2 or Aluminium, G2 |
| Max pressure | 145 PSI (10 Bar) |
| Operating Temperature | 14 to 176º F (-10 to 80ºC) |
| Class Protection | NEMA 4 (IP 65) |

# Ordering Information




**NOTES:**
SC700: Supply Voltage 24 Vdc
SC700AC1 and AC700AC2 available in the Large Nylon or Large Aluminum Housing Only.
SC700U - UNIVERSAL POWER SUPPLY 85 to 240VAC OR 24VDC (Available in the Large Nylon or Aluminum Housing Only)
Triclamp connections start at 1 1/2"
Maximum Length for rigid rod - 3 mts (quote the cable starting from that length)
SC750 should only be used on products with a Low Dielectric Constant.
SC700/SC750 will not work with mediums with High Dielectrics such as Maionese or Shampoo with high salt content.

| Fault | Cause | Solution |
|---|---|---|
| Doesn't Power Up | Green LED Off<br>No power | Verify current supply |
| | Bad contact | Verify cable connection |
| Doesn't Detect Medium | Low sensitivity | Adjust sensitivity trimpot |
| Always On | Build up on the sensor | Clean sensor then adjust sensitivity |

# 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.

**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.
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Sitron

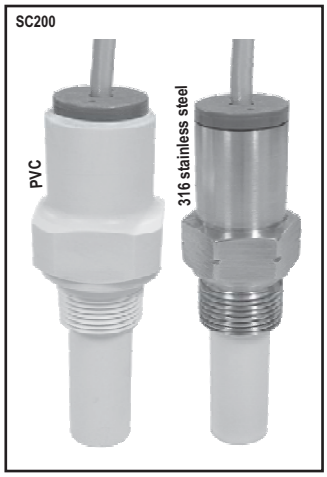
USER'S GUIDE

Installation, Operation, Maintenance Instructions

# SC200 / RL202

## Proximity Sensor Capacitive

# Contents



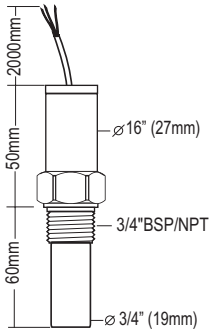

Sitron´s SC200 Capacitive Proximity Sensor is used to detect the level of conductive or non-conductive products, various types of liquid, solid or granular substances such as acids, solvents, wood shavings, crushed coal, paper, glass, plastics, sugar, flour, solid aggregates, and fine filaments, etc.

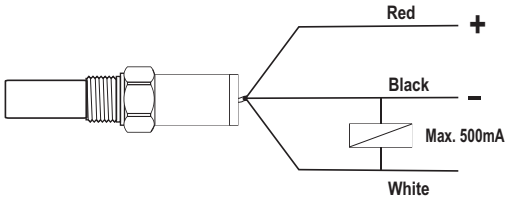
The SC200 is a compact sensor with a standard 3/4" BSP or NPT process connection made of either 316 Stainless Steel or PVC. This unit comes with a standard insertion length of 60mm and 2m cable for the electrical connection.

The SC200 has can be supplied with 12...30Vdc and when necessary, can be used in conjunction with the power supply relay RL202 which accepts 110Vac or 220Vac, with a standard relay NO + NC output.

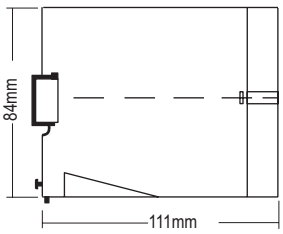
## DIMENSIONS AND WIRING DIAGRAM

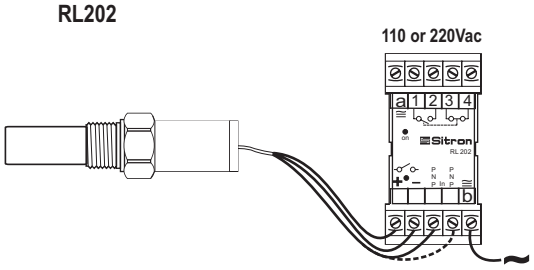
**SC200**



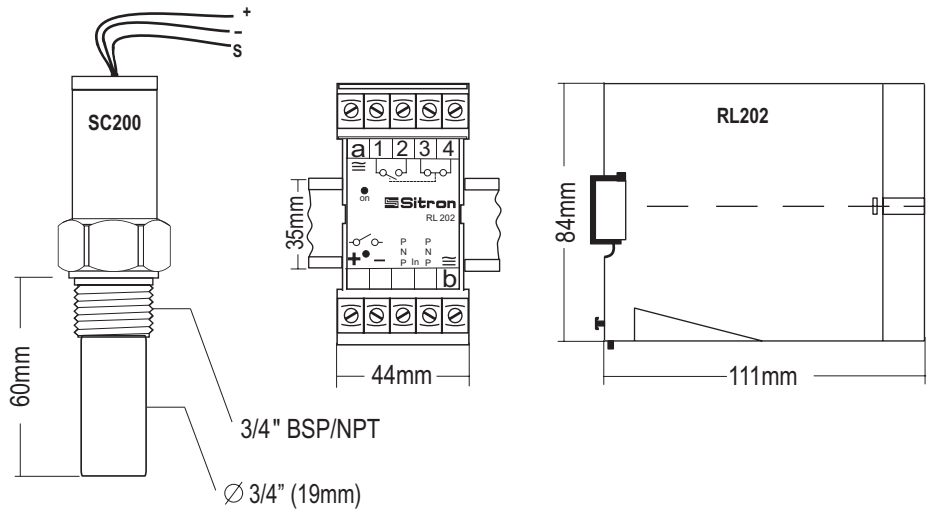

**RL202**



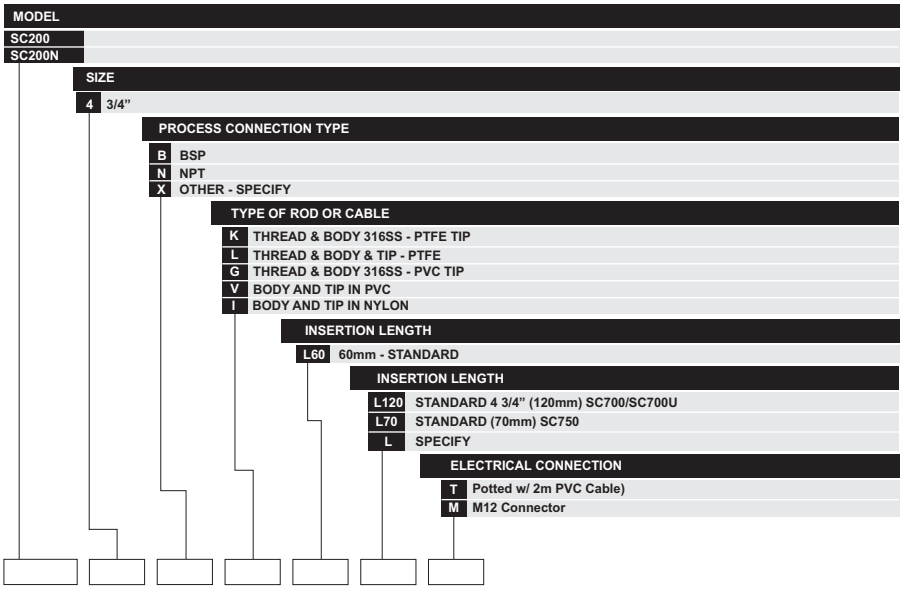
# Technical Specifications

**MODELS: SC200 + RL202**




| | |
|---|---|
| Application | Level switch for liquids and granular mediums |
| Operating Voltage | SC200: 12...30Vdc / RL202: 110 or 220Vac |
| Current Consumption | 12mA |
| Output | SC200: PNP (3wires) / RL202: NA + NF |
| Adjustment | Sensibility |
| Frequency Oscilation | 5MHz |
| Level Indication | LED status ON/OFF |
| Electrical Connection | Cable gland with cable 2000mm |
| Process Connection | 3/4" BSP or NPT |
| Wetted Material | 316 Stainless Steel with Nylon (Optional: Nylon all) |
| Operating Temperature | -10 to 80ºC |
| Max Pressure | 0.5 bar (25ºC) |
| Class Protection | SC200: IP65 / RL202: IP40 |

**ORDERING INFORMATION**




**ORDERING INFORMATION**


**NOTES:**

1. The SC200 comes standard w/ PNP Transistor ouput
2. The SC200N comes standard w/ NPN Transistor ouput
3. Nylon body and tip only available with an NPT connection.

# 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.

**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.
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