

High Frequency Limit Level Sensor HFS202



Ultra-modern High-Frequency limit level sensor ignores build-up or foam on the electrode and flawlessly detects tank level.

Characteristics

- Designed for reliable limit level detection of a wide range of fluids, oils, paste-like materials, foam, fibers and solids (including plastic pellets) with either high or low densities or dielectric constants.
- Generates a high frequency sensing field which is immune to product adhesion, making it an ideal solution for viscous or sticky media such as ketchup, yogurt, syrups, creams or pastes, tar like materials, alkalis, etc.
- An ideal replacement for other technologies such as vibrating forks, capacitive, ultrasonic or conductive level switches.
- Direct mounting into tanks, vessels, pipes or containers.
- Fully configurable sensitivity adjustment using a simple magnet pen
- Universal design for all types of fluids (electrically conductive and non-conductive) with a sensing tip made from PEEK or PTFE.
- High stability at high sensitivity (can be used in applications with substances with $\epsilon_r \geq 1.5$).

HFS202

High Frequency Limit Level Sensor

Sitron's HFS high frequency limit level sensor is designed to effortlessly detect the level of fluids or paste-like media while ignoring the influence of deposits of viscous media (ketchup, yogurt, pastes, syrups, jams and jellies, creams, soap) as well as products such as detergents, alkalis, or various chemicals. The sensor works in the high frequency band, enabling reliable detection of the level of media without interference from coating or build-up on the electrode.

The HFS sensor is an excellent replacement technology for vibrating tuning forks, capacitance, ultrasonic, conductive or optic level sensors in either simple or more demanding applications. The media may be electrically conductive or non-conductive. It can be installed in either metal or plastic tanks, pipes, filling tanks, sumps, etc. and does not rely on a metallic reference.

The sensor is made from an all stainless steel (AISI 316L) housing with a sensing electrode made from highly resistant PEEK. The top of the sensor features dual LED status indicators with magnetic point (+/-) sensitivity and calibration controls along with an M12 electrical connection. It is designed to be mounted into the wall of a tank or pipe, at the point where level detection is required and can operate at process temperatures up to 105°C.



Seals / Electrode

HFS202_E

Insulated electrode (PEEK) with sealing O-ring EPDM, for sensing various fluids, mashed and paste-like materials, suitable also for acids, bases or alcohol, ammonia, acetone, chlorine, from -40°C.

HFS202 - 2P

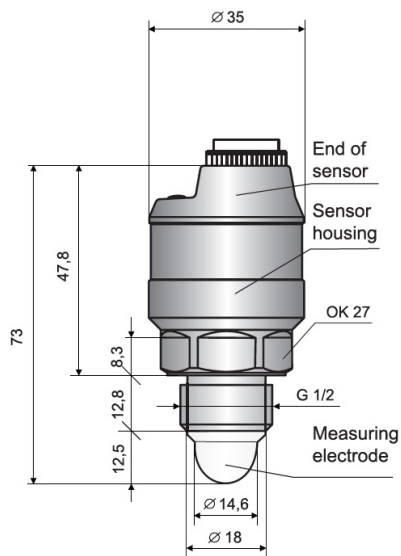
Insulated electrode (PTFE) without O-ring, for sensing various liquid, mashed and paste-like materials, especially suitable for aggressive liquids, use from minimum temperature of -40 °C.

HFS202

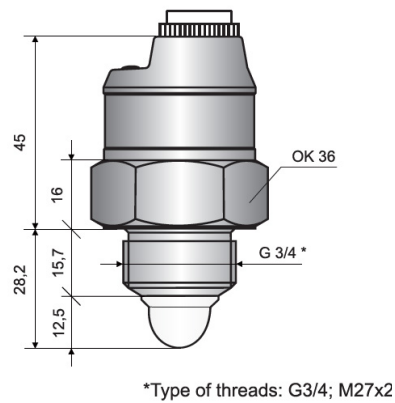
High Frequency Limit Level Sensor

Dimensions

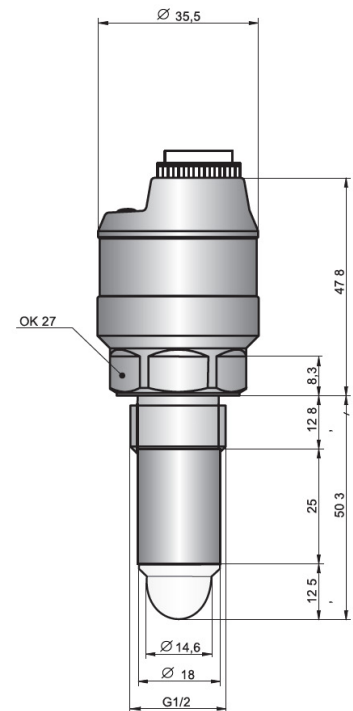
HFS202_-1E-G1/2



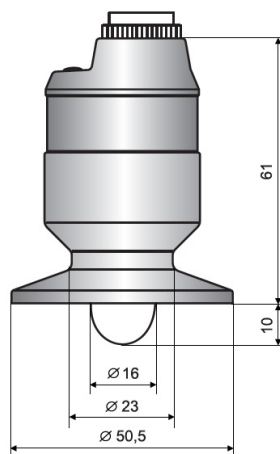
HFS202_1E-G3/4



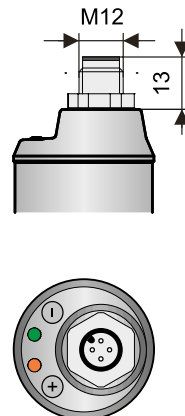
**HFS202_11E-G1/2
Extended version**



**HFS202_-2P-T50
Tri-clamp**



**Variant M
M12 connector**



HFS202

High Frequency Limit Level Sensor

Basic Technical Data

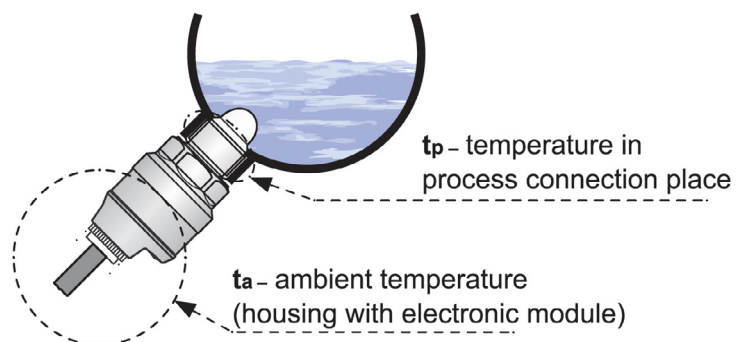
Supply voltage	7 ... 34 V DC
Power consumption	max. 5 mA DC
Max. switching current (PNP output)	300 mA
Residual voltage - ON state	max. 1.5 V
Coupling capacity (housing - power) / dielectric strength	5 nF / 500 V DC V AC (50 Hz)
Ambient temperature range	-40 ... +85°C
Protection class HFS202 -M	IP67

Used Material

Part of the sensor	Standard material
Housing	Stainless steel W.Nr. 1.4404 (AISI 316L)
End of sensor	Stainless steel W.Nr. 1.4301 (AISI 303)
Electrode coating	PEEK (1E/11E) / PTFE (2P)
M12 connector (design M)	Nickel-plated brass / PA

Temperature and Pressure Durability

Design variant	Temperature t_p	Temperature t_a	Max. overpressure
HFS202-_E	-40°C ... +105°C	-40°C ... +85°C	10 MPa
HFS202-2P	-20°C ... +105°C	-40°C ... +85°C	5 MPa (<50°C) 2,5 MPa (>50°C)

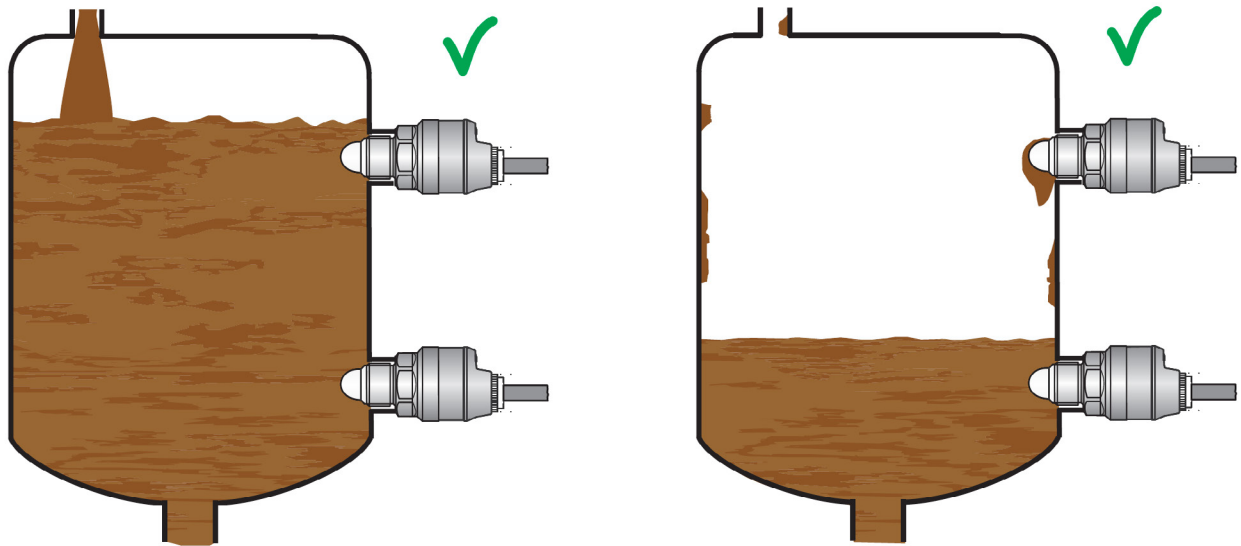


HFS202

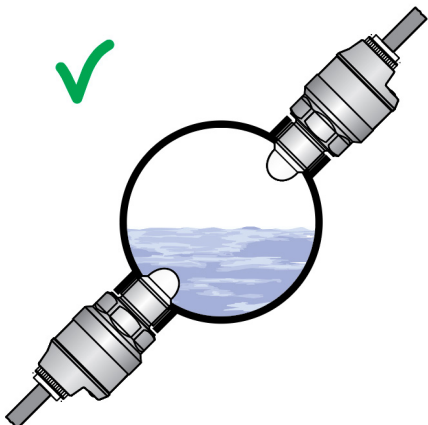
High Frequency Limit Level Sensor

Mounting Recommendations and Calibration:

Thanks to its design, the sensor can be used for level detection of viscous and simultaneously electrically conductive media (yogurt, jams and jellies, mayonnaise, spreads, liquid soap, creams or pastes) or non-conductive materials such as oils, grease or tar/asphalt. Calibration is achieved by placing the unit in contact with the medium and activating the magnet + for about 3 seconds. Next, remove the unit from the medium (do not clean or remove any media that remains on the probe) and then activate the magnet - for about 3 seconds. Now the unit is calibrated. After setting the sensitivity of the unit to the medium, it will reliably react to the presence or absence of level. Even with product build up on the probe, the sensor will ignore this “false level” of viscous material that remains on the measuring electrode.



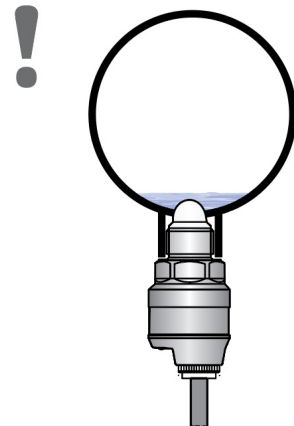
It is recommended that the sensors are installed in a horizontal pipe on an angle from the side.



It is recommended that the sensors are installed in a horizontal pipe on an angle from the side.

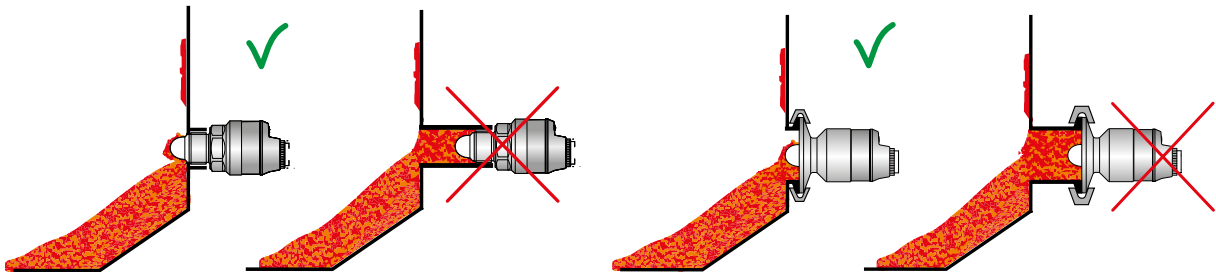


Or, the remains of product or viscous media at the bottom of the pipe.

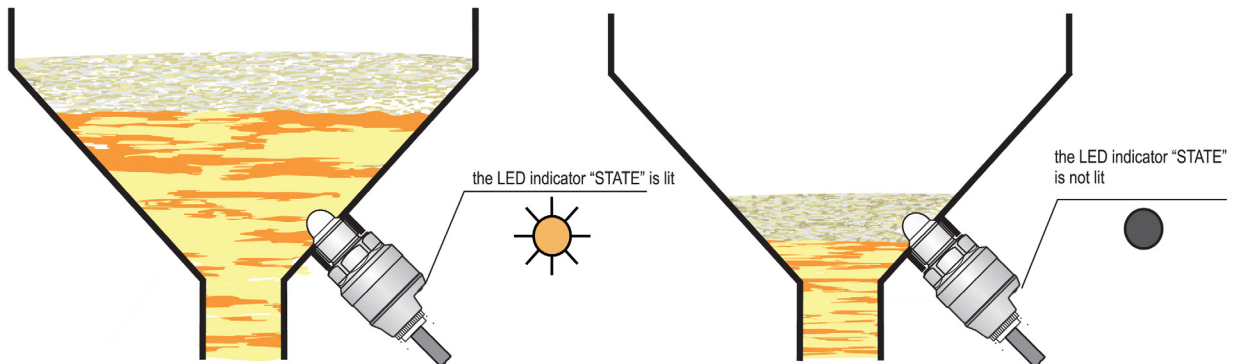


HFS202

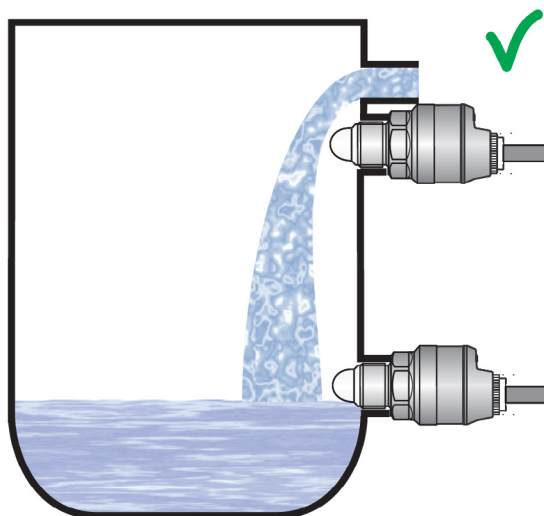
High Frequency Limit Level Sensor



In the case of side wall mounting it is necessary to avoid connection necks where the medium could enter and create a blockage of product in front of the sensor. We recommend mounting the sensor so that the whole measuring electrode is inside the tank.



When installing the probe with the presence of foam, care should be taken to calibrate the unit in the non active state when in contact with the foam (if the user wants the sensor to ignore the foam level). By setting the sensitivity of the sensor in this way, it can be set to detect the liquid interface with foam. After a drop in the fluid level, the sensor will ignore the foam level or coating and show a noncontact state of level.



Another advantage of the HFS level switch is that it can be mounted at the inlets of the tank. After calibrating the switch to the level of the given media, the sensor will not react to the current of flowing medium making contact with the sensor tip.

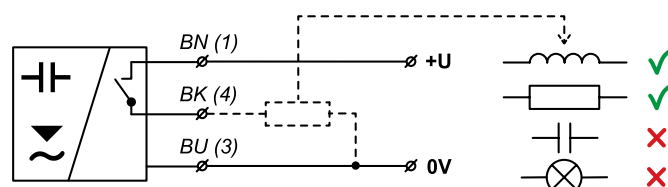
HFS202

High Frequency Limit Level Sensor

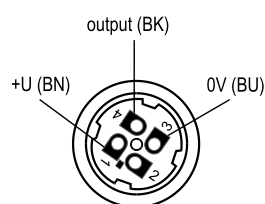
A sensor with PNP output can be loaded only by resistive or inductive load. The capacitive loads and low resistance loads (bulb) are evaluated by the sensor as a short circuit. Wiring diagrams are provided in the figures on the right.

Note: In case of strong ambient electromagnetic interference, paralleling of conductors with power distribution, or for the distribution to distance over 30 m, we recommend using shielded cable.

In this case the cable is connected to the inside pins of the socket according to the figure on the right. The recommended diameter of this cable is 4 to 6 mm (the recommended cross-sectional area is 0.5 to 0.75 mm²).



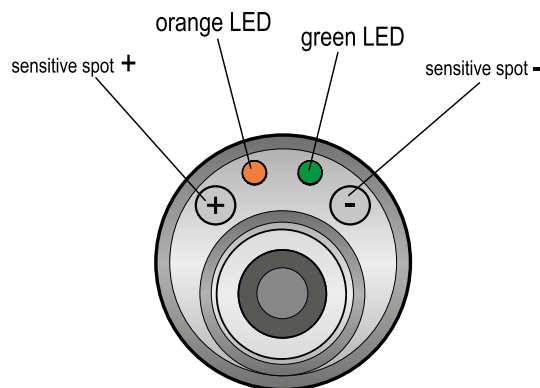
PNP output type sensor connection



Inside of the connector socket
(Variant M)

Legend: (1...) – terminal numbers
connector sockets
BN – brown
BU – blue
BK – black

Sensor settings Settings are performed by placing the magnetic pen on the sensitive spot marked “+” or “–” located beside the connector or cable gland. This method is used to set the sensitivity to the measured medium, switching (O, C), with or without the presence of medium. The third function is designed for fine-tuning the sensor sensitivity. Upon a change in the measured medium, it is necessary to perform new limit settings.

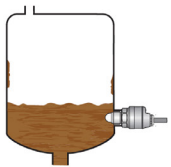

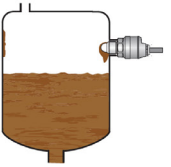

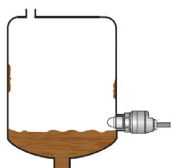

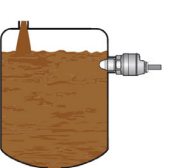



Top view of sensor

LED indicator	Clour	Function
“RUN”	Greem	Measuring function indication Flashing – (approx. 0.4 s) – correct function of level detection Dark – incorrect installation or malfunction. Alternating flashing of the green and orange LED – error in settings Simultaneous shine of green and orange LED – when applying the mag. pen, when the setting is confirmed
“STATE”	Orange	Settings indication Permanent shine – the sensor is closed Dark – the sensor is open 3 short flashes – settings confirmed Alternating flashing of the green and orange LED – error in settings Simultaneous shine of green and orange LED – when applying the mag. pen, when the setting is confirmed

HFS202

High Frequency Limit Level Sensor

	level state	mode	output state	LED indicator		level state	mode	output state	LED indicator
minimum level sensing		O	CLOSED	 illuminated	maximum level sensing		C	CLOSED	 illuminated
		O	OPEN	 not illuminated			C	OPEN	 not illuminated

Basic Settings

To set the sensitivity and switching mode of the HFS it will be necessary to submerge the sensor in or remove it from the medium. When using this setting, the sensor eliminates the presence of deposits and foam on the electrode. This is necessary for putting into operation.

a) Setting the mode 0 (It is closed when submerged)

- 1 - Bring the level of the measured medium in the tank to a state so that the electrode sensor would.
- 2 - be covered. Place the magnetic pen for at least 2 seconds ** on the sensitive spot "+" of the sensor (until both LEDs illuminate) and then remove the magnetic pen. Settings are confirmed by three flashes of the orange LED.
- 3 - Bring the level of the measured medium in the tank to a state so that the electrode sensor would be uncovered. Leave possible deposits on the electrode.
- 4 - Place the magnetic pen for at least 2 seconds on the sensitive spot "-" of the sensor until both LEDs illuminate and then remove the magnetic pen. Settings are confirmed by three flashes of the orange LED.

5. Check the state of indicators:

- If the orange LED is not illuminated and the green LED is flashing, the sensor is correctly set.
- If alternating flashing of the orange and green LED occurs, the sensor did not recognize the limits for closing and opening. In this case, find out if the minimum and maximum levels are not set too close to one another.

b) Setting the mode C (it is open when submerged)

- 1 - Bring the level of the measured medium in the tank to a state so that the electrode sensor would.
- 2 - be covered. Place the magnetic pen for at least 2 seconds ** on the sensitive spot "-" of the sensor until both LEDs illuminate and then remove the magnetic pen. Settings are confirmed by three flashes of the orange LED.
- 3 - Bring the level of the measured medium in the tank to a state so that the electrode sensor would be uncovered.
- 4 - Leave possible deposits on the electrode. Place the magnetic pen for at least 2 seconds ** on the sensitive spot "+" of the sensor until both LEDs illuminate and then remove the magnetic pen.
 - If the orange LED is illuminated and the green LED is flashing, the sensor is correctly set.
 - If alternating flashing of the orange and green LED occurs, the sensor did not recognize the limits for closing and opening. In this case, find out if the minimum and maximum levels are not set too close to one another and possible to repeat the settings.

**) Maximum 4 seconds.

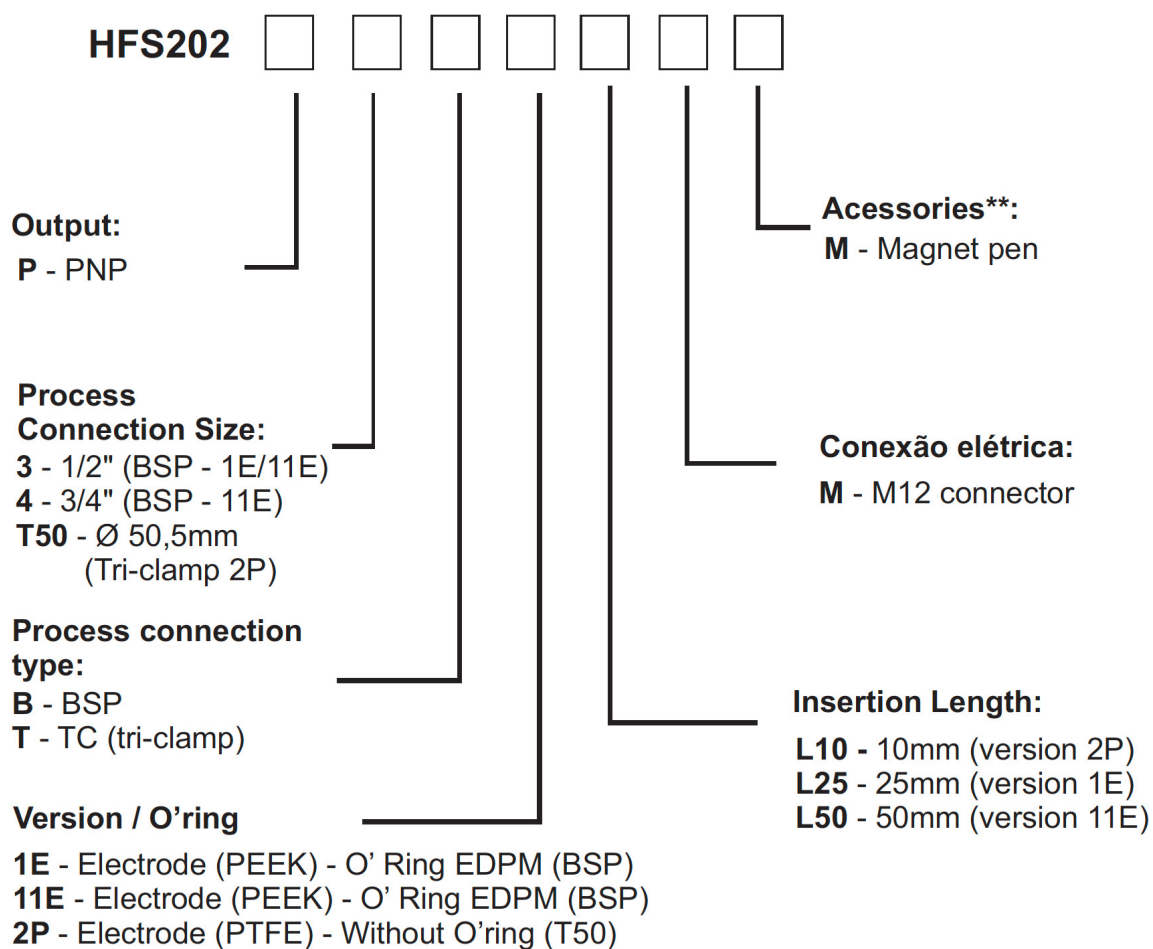
HFS202

High Frequency Limit Level Sensor

Safety, Protections, Compatibility and Explosion Proof

The level sensor is equipped with protection against electric shock on the electrode, reverse polarity, output current overload, short circuit and against current overload on output. Protection against dangerous contact is provided by low safety voltage. Electromagnetic compatibility is provided by conformity with standards EN 55022/B, EN 61326-1, EN 61000-4-2, -3, -4, -5 and 6.

Order Code



Example: HFS202-P-3-B-1E-L25-M-M

HFS202 PNP, process connection 1/2" BSP, O'ring EPDM, Insertion 25mm, M12, magnet pen.

Example: HFS202-P-T50-T-2P-L10-M-M

HFS202 PNP, process connection 50,5mm TC, Insertion 10mm, M12, magnet pen.

**Magnet Pen comes standard with the each unit. Charge only applies to replacement pen.

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. 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.



Overcome and evolve with the newest Sitron technology

Sitron Brasil

R. Baronesa de Itu, 83
São Paulo - SP - CEP: 01231-001
Tel.: 11 3825-2111
vendas@sitron.com
sitron.com

Sitron EUA

1800 Prime Place Hauppauge,
NY 11788
Tel.: 516-935-8001
info@sitron.com