FILSA

MS-1

Pendulum level indicator
for solids

Operating Instructions

Index **Page**

CE

Talleres Filsa, S.A.U. • E-08100 Mollet del Vallès (Barcelona) • **Tel.** +34 93 570 46 01 • **Fax** +34 93 570 24 71 • filsa@filsa.es • **www.filsa.es**

▶ Read these Safety Instructions before using the switch for the first time and follow the Operating instructions.

Safety instructions

1. The installation, initial operation and maintenance should only be carried out by a qualified expert with electrical know-how.
2. Comply with the local and statutory rules and/or the VDE0100.
3. Before electrical connection, check the specifications on the data plate and the technical data of this manual.
4. A fuse must be connected in series to the supply voltage, according to the Standard and Normative documents.
5. Protect the signal contacts of the limit switch against voltage peaks when inductive or capacitive loads are connected.
6. The device may be put into operation only if the electrical connection is correct. To secure the type of protection, the sealing cap and the gasket must be placed correctly and the screw nut of the cable gland has to be fixed and fastened to the cable entry.
7. The earth connection of the device has to be installed in such a way that mechanical damage will be excluded.
8. The controller has to be mounted in a horizontal plane, the rod has to be completely vertical and the pendulum must be able to swing unimpeded up to the switching point.
9. The pendulum must not to be struck by the filling stream.
10. For a proper function, the material to controll should make a 20 º slope from the horizontal.
11. Do not pour on the measuring cone. In case of full indication, the process has to be stopped immediately.
12. Switch off the power supply, before disconnecting the device.

Operating instructions

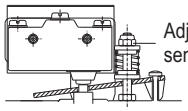
1. Specification

1.1 Intended use

The level indicator observes the filling level as a limit switch in silos and vessels. It can be used as a full and empty indicator for dusty and powdery, granulated and grainy bulk goods with a maximum grain size up to 100 mm and with a bulk density of 0.3 to 3 t/m³.

1.2 Function

The cone sensor must to be exposed to the material. The bulk goods, being dumped beside the pendulum, move the pendulum more aside as the filling level increases. This movement, approximetly 10 º of the rod-sensor, activates the switch for the full indication.
When the filling level falls, the pendulum moves back in the vertical position and the switch is disengaged.
The model “MS-1 SR” has a regulation system by a spring that allows the adjusment of the sensitivity. Tightening the regulation nut to reduce the sensitivity and increase the strain of the material to activate the microswitch. Clockwise insensitive.



Adjustment system of the sensitivity in model “SR”.

MS-1-001

1.3 Technical data

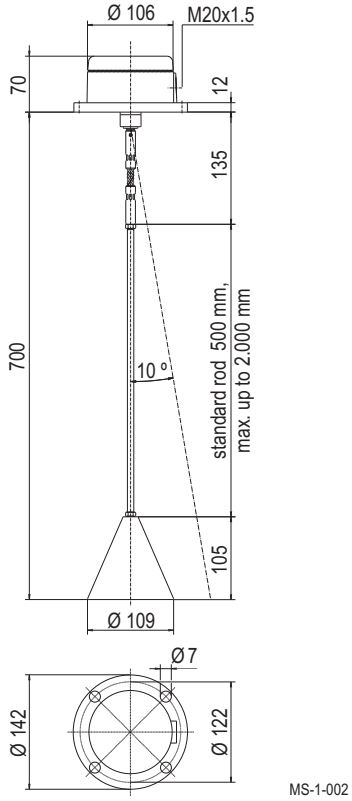
Manufacturer	Talleres Filsa, S.A.U.	
Adress	Bernat Metge, 33 08100 Mollet del Vallès (Barcelona)	
Name	Pendulum level indicator	
Type	**MS-1**	ref: **2305**
	MS-1 SR	ref: **2306**
Rod length	Standard 500 mm	
(Other lengths under request)		
Product density	0.3 t/m^3 ... 3 t/m^3	
Maximum pressure	+0.5 bar	
Cable entry	M20x1.5	
Switching voltage	250 V AC	
Switching function	1 NO + 1 NC	
Capacity of the contact	15 A / 250 V AC (for resistive loads)	
For inductive or capacitive loads reduce at 50%		
Bulk good temperature	-25 °C ... +80 °C	
Ambient temperature	-20 °C ... +70 °C	
Type of protection	IP66 according DIN EN60529	
Weight	1.15 kg	

1.4 Materials

Housing	Aluminium, RAL 7001 coated
Rod	Aluminium
(Under request Stainless Steel)	
Cone	Aluminium
(Under request Stainless Steel)	
Folding bellow	NBR

1.5 Dimensions

Aproximate measures are given in mm.

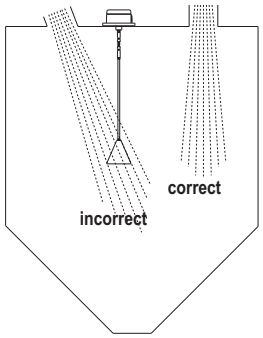


MS-1-002

2. Installation

2.1 Preparing for use

- Read the Safety Instructions and the Operating Instructions before using the controller.
- Verify if you have got all the parts:
  - Housing with buckling protector.
  - Rod with 2 locking nuts.
  - Sensor (cone).
- The controller must be mounted in a horizontal plane, the rod must be completely vertical and the pendulum must be able to swing unimpeded up to the switching point
- The pendulum must not be struck by the filling stream.



MS-1-003

2.2 Mechanical connection

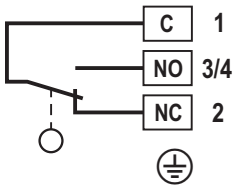
Drill 4 holes in the top of the silo or vessel and mount the indicator using screws, rods, fasteners or nuts M6 making sure of the verical position of the rod.

Mounting of sensor (cone) and rod

- Make sure if the nuts are screwed into the rod.
- Screw the rod into the buckling protector and to the sensor.
- Fix all the parts with the provided nuts.
- If the pendulum has to be mounted from the inside of the vessel, then screw at first the housing at the connection flange and mount then the pendulum rod-sensor as described.

2.3 Electrical connection

Connection diagram



MS-1-004

Cable gland

- After electrical connection, tighten the cable gland.
- Screw the cap nut, until the cable entry is closed tightly to ensure the water-thigtness.

3. Use

3.1 Commissioning

- Put the level indicator into operation only, if the installation and the electrical connection have been done correctly.

3.2 Normal operation

- Use the level indicator in its intended aplication only.
- Comply with the specifications on the data plate and the technical data of this manual.
- If the controller is damaged, disconnect it immediately.
- It is forbidden to make changes to the device. This violates the Normative.

3.3 Inexpert handling

- Ignoring the Safety instructions and the operating instructions.
- Not intended use.
- Making changes or handling the controller.
- Violation against applicable Law and Standards.
- Using non original parts.

4. Maintenance, servicing and spare parts

4.1 Maintenance

- If used correctly, no specific maintenance is required.

4.2 Servicing

- Check and review the state of the housing, rod and cone and the correct commutation of the electric contact, as well.

4.3 Spare parts

- Use only original parts.
- The spare parts of the level indicator can be consulted in the document “R-MS1-01”.

5. Storage

- Store the level indicator in a dry and dust-free envirnoment.
- Dismount the rod together with the cone. Store the housing on its top with the anti-buckling protection upwards.

6. Disposal

- Switch off the power supply, before disconnecting the device.
- The level indicator can be recycled.
- The disposal applies to the valid environmental Guidelines according to the location of he carrier and the local manufacturing conditions.

FILSA constantly strives to improve its products and reserves the right to modify designs, materials and data without prior notice.

Keep this manual for further questions!