

INSTALLATION / INSTRUCTION MANUAL

DESCRIPTION

The Solitel vibrating rods are used for high or low level detection on powders and granulars with a minimum density of 0.05 kg/dm³ and max. diameter of 10-12 mm. The electronics and the sensor are an integral unit for easy installation.

OPERATING PRINCIPLE

A resonant frequency of 350 Hz keeps the vibration on the resonant part of the sensor ongoing. The medium will dampen the vibration when reaching the sensor. For a successful switching operation, the vibrating part of the sensor should be covered for 20 to 60 mm (depending upon density). The sensed dampening will cause the electronics to actuate the relay.

UNPACKING

Unpack the instrument carefully. Inspect all units for damage. Report any concealed damage to carrier within 24 hours. Check the contents of the packing slip and purchase order. Check and record the serial and reference numbers for future reference when ordering parts.



MODEL IDENTIFICATION

A complete measuring system consists of

Order code for SOLITEL sensor and electronics

S	Standard SOLITEL - max 110°C (230°F) (Flexible sensor - max 90°C (200°F))
H	High temperature SOLITEL - max 160°C (320°F) (only for rigid sensors - VHH/VHR)

TYPE OF SENSOR

H	Standard sensor with 235 mm (9.2") insertion length
R	Extended rigid sensor with insertion length from 50 cm up to 3 m (19.60" up to 9.8')
K	Extended flexible sensor with insertion length from 1 m up to 20 m (3.26' up to 65.6')

S	Non Ex
A	Dust Ex zone 10

POWER SUPPLY

1	240 V AC
2	24 V DC
6	24 V AC
0	120 V AC

INSERTION LENGTH

0 0 0	Standard length = 235 mm (9.2") (VSH/VHH units)
0 5 0 - 3 0 0	Extended rigid sensors (VSR/VHR units), specify length in 10 cm (3.9") increments, min 50 cm (19.7") and max 300 cm (9.8').
0 0 1 - 0 2 0	Extended flexible sensors (VSK), specify length in 1 m (3.28') increments, min 1 m (3.28') and max 20 m (65.6')

V 1 B

complete order code for SOLITEL – rigid sensor and electronics

GENERAL INSTRUCTIONS

MOUNTING

Solitel switches have to be installed at the desired switching point. The VSH and VSR units may be installed horizontally (at 45° inclination) as well as vertically. The VSK units with wire rope extension should only be mounted vertically. However the mechanical torque on the sensor and the adhesion properties of the medium also have to be taken into consideration when installing the unit in the tank (see Electrical Specifications (page 3) for the maximum mechanical load on sensor).

1. Screw sensor part into the mounting bushing (G 1 1/2"). Only apply a wrench (width flats = 55 mm) on the mounting nut.
2. Position the housing manually in the correct direction to allow easy wiring. The housing can rotate one full turn.

Important

1. Install the unit at a location where the level variation is detectable, taking the arching or caving of the material into account. See **Figure 1**.
2. Install the rigid sensors at a tilt angle larger than the slope angle of the material being filled (or for high level applications-vertically mounted), build up on the sensor would prevent the unit from starting the vibration and thus eliminates the 'self cleaning' effect which can lead to false output when level decreases. See **Figure 1**.

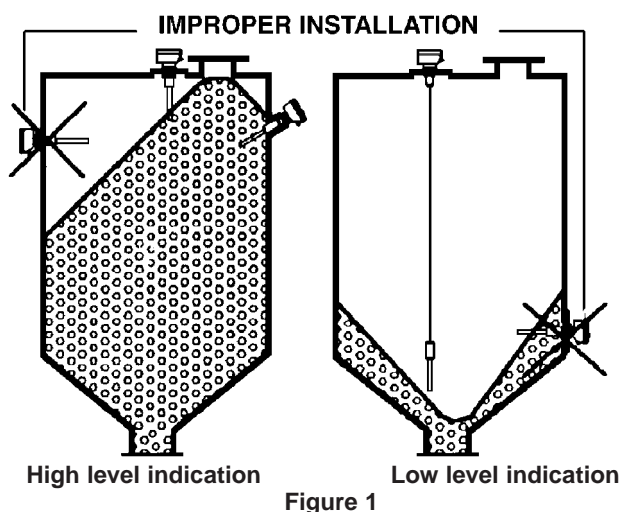


Figure 1

3. Install the unit in this way that the vibrating part is entirely free to vibrate. When the vibrating rod is fully blocked by medium, the unit will not change status of the relay. See **Figure 2**.
4. When the falling material can damage the rod by its nature (rough, heavy or with sharp angles) then protect the sensor. See **Figure 3**.

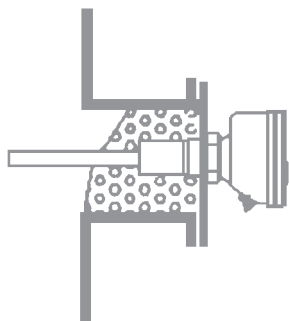


Figure 2

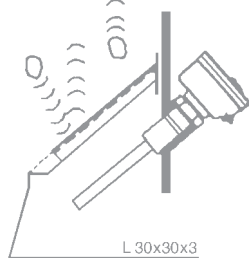


Figure 3

5. Provide extra damping materials such as rubber joints, when the tank is exposed to intense vibrations.

WIRING

Use cable with an outside diameter of 8 to 15 mm (0.3" to 0.6") – inner core 0.75 to 2.5 mm² – in order to block the cable sufficiently into the provided cable glands.

1. Make sure that the power supply is turned off.
2. Use a size 5 Allan type wrench to remove the housing cover – 4 screws at top of housing.
3. Pass the power cable through the cable glands (conduit connection) into the housing (power is left cable gland, relays is right cable gland).
4. Connect power leads to the proper terminals. To allow access to the terminals, the unit utilises easy to remove connector plugs (power terminals are 1 and 2, see **Figure 4**).
When using 3-wire cable, use the grounding screw at the inside of the housing base.
When using 2-wire cable, provide a grounding wire to be connected to the grounding screw at the outside of the housing base.

Caution:

24 V DC units: the negative terminal of the power supply is connected internally to ground.

5. Connect control circuit leads to relay terminals. (7, 8 and 9, see **Figure 4**)

Caution:

For alarm applications, it is recommended to use de-energised status of the relay as alarm status to allow detection of power failure as an alarm status, the relay contacts will show:

POWER	MATERIAL LEVEL	FAILSAFE JUMPER	RELAY COIL	RELAY 7 and 8	TERMINALS 8 and 9
on	high	A position	de-energised	open	closed
		B position	energised	closed	open
	low	A position	energised	closed	open
		B position	de-energised	open	closed
fails	high/low	A/B	de-energised	open	closed

6. Reposition the connector plugs, pull excess cable back and tighten the cable gland. Finally screw cover on housing base.
7. Wiring is completed. Turn power on.

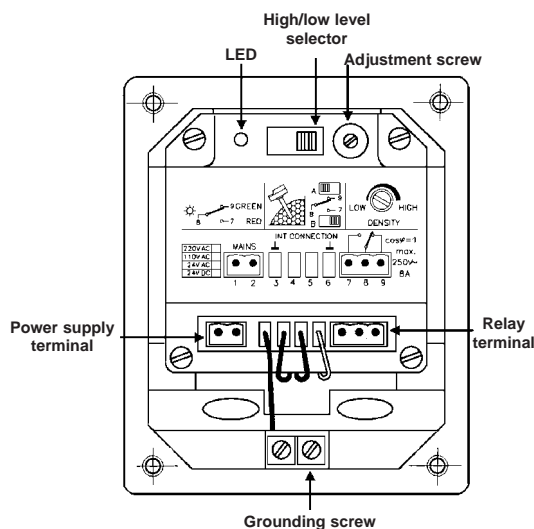


Figure 4

CALIBRATION

After being properly installed the unit is fully operational. The LED will show the relay status. By touching the rod by hand and thus performing a damping of the vibration the LED will reverse colour. See **Figure 4**.

The LED shows the status of the relay:

RED = relay energised

GREEN = relay de-energised.

DENSITY ADJUSTMENT

The unit is factory preset for media with densities higher than 0.3 g/cm³. For lower densities turn the adjustment

screw (see **Figure 4**) counterclockwise until the unit switches in that specific material.

When adjusted too sensitive, the unit may detect even slight residues of the material instead of level.

Caution:

It is recommended to perform a test set up of the unit in a sample of the material to be detected before installation.

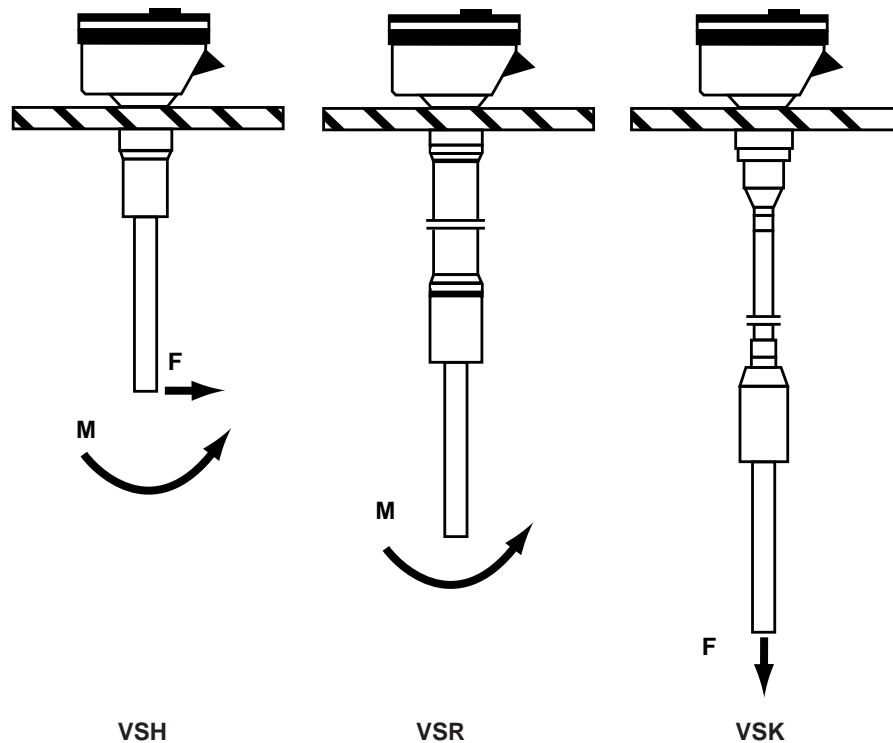
MAINTENANCE

The Solitel vibrating rods do not require maintenance on a regular basis. In some instances however it may be advised to clean the sensor of deposited material.

STORAGE CONDITIONS

Ambient temperature: -20°C up to +60°C (-4°F up to 140°F)

Relative humidity: up to 98%



REPLACEMENTS PARTS

Connector plugs for power supply: 2 pins

Connector plugs for control circuits: 3 pins

Cable gland PG 16

Sensor: VSH = standard rigid sensor

VSR = extended rigid sensor, specify length from bottom mounting nut to end of sensor – min. 0.5 m, max. 2 m (min. 1.6 ft, max. 6.5 ft)

VSK = extended wire rope sensor, specify length from bottom mounting nut to end of sensor – min. 1 m, max. 20 m (min. 3.2 ft, max. 65 ft)

Electronics module

ELECTRICAL SPECIFICATIONS

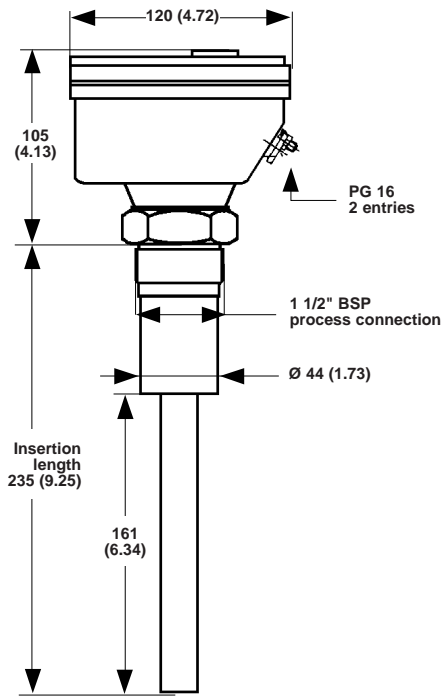
Description		Specifications		
Input voltage		240 V AC (-15 to +10% tolerance on nominal voltage) 110 V AC 24 V DC / V AC		
Power consumption		less or equal than 3 V A		
Operation frequency		± 350 Hz		
Output relay		8 A, SPDT (max. load 250 V AC) 1 A, SPDT (max. load 24 V DC)		
Time delay		6 seconds		
Process connection		1 1/2" BSP thread		
Housing		IP65, cast aluminium		
		Non Ex	Dust Ex Zone 10	
Max. process temperature	VSH/VSР	-40°C to +110°C (-40°F to +230°F)	-40°C to +110°C (-40°F to +230°F)	
	VHH/VHR	-40°C to +160°C (-40°F to +320°F)	-40°C to +160°C (-40°F to +320°F)	
	VSK	-25°C to + 90°C (-13°F to +200°F)	-20°C to + 90°C (-4°F to +200°F)	
Ambient temperature electronics		-40°C to +60°C (-40°F to +140°F)		
		Non Ex	Dust Ex Zone 10	
Max. process pressure	VSH/VSР - VHH/VHR	25 bar abs (360 PSIG)	6 bar abs (87 PSIG)	
	VSK	6 bar abs (87 PSIG)	6 bar abs (87 PSIG)	
Rod material		all wetted parts of 316 Ti SST		
Materials: Vibrating rod Process connection Cable for extended flexible Solitel:		316 SS Ti (Standard electropolished) 14408 x 6 Cr Ni Mo 1810 PE coated steel		
		<i>standard version</i>	<i>extended rigid version</i>	<i>flexible version</i>
Max. mechanical load on rod		85 Nm	86 Nm	45 kN
Weight of unit		2.5 kg	2.5 kg + 1.4 kg/m	2.5 kg + 0.6 kg/m

APPROVALS

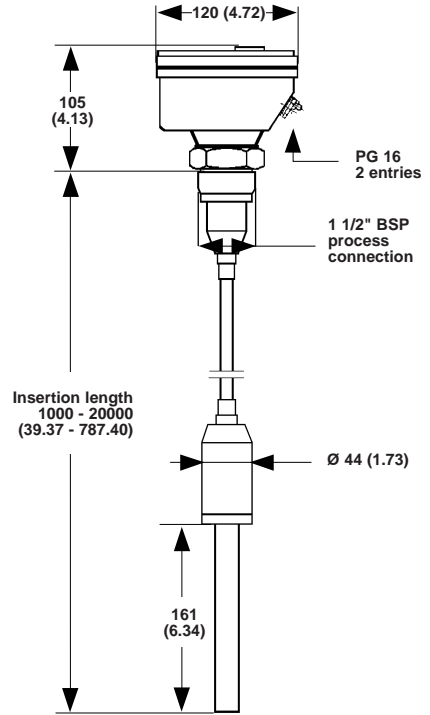
Agency	Approval
DMT	Dust Ex Zone 10

DIMENSIONS IN mm (inches)

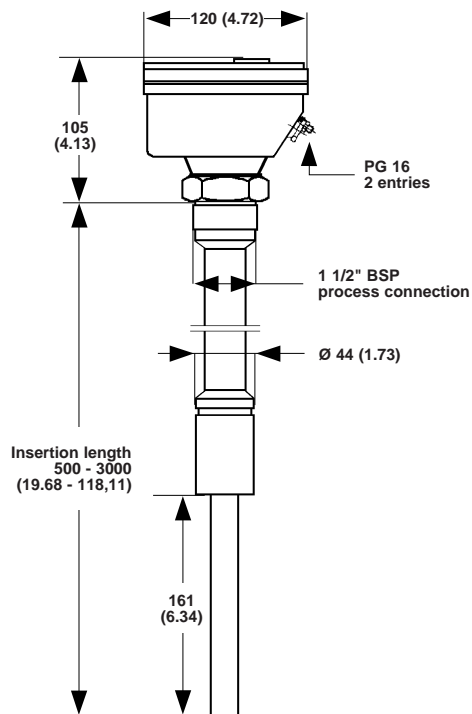
Standard VSH sensor



Flexible VSK sensor



Extended VSR rigid sensor



IMPORTANT

SERVICE POLICY

Owners of Magnetrol products may request the return of a control; or, any part of a control for complete rebuilding or replacement. They will be rebuilt or replaced promptly. Magnetrol International will repair or replace the control, at no cost to the purchaser, (or owner) **other than transportation cost** if:

- a. Returned within the warranty period; and,
- b. The factory inspection finds the cause of the malfunction to be defective material or workmanship.

If the trouble is the result of conditions beyond our control; or, is **NOT** covered by the warranty, there will be charges for labour and the parts required to rebuild or replace the equipment.

In some cases, it may be expedient to ship replacement parts; or, in extreme cases a complete new control, to replace the original equipment before it is returned. If this is desired, notify the factory of both the model and serial numbers of the control to be replaced. In such cases, credit for the materials returned, will be determined on the basis of the applicability of our warranty.

No claims for misapplication, labour, direct or consequential damage will be allowed.

RETURNED MATERIAL PROCEDURE

So that we may efficiently process any materials that are returned, it is essential that a "Return Material Authorisation" (RMA) form will be obtained from the factory. It is mandatory that this form will be attached to each material returned. This form is available through Magnetrol's local representative or by contacting the factory. Please supply the following information:

1. Purchaser Name
2. Description of Material
3. Serial Number and Ref Number
4. Desired Action
5. Reason for Return
6. Process details

All shipments returned to the factory must be by prepaid transportation. Magnetrol **will not accept** collect shipments.

All replacements will be shipped FOB factory.

UNDER RESERVE OF MODIFICATIONS

BULLETIN N°: BE 51-640.3
EFFECTIVE: FEBRUARY 1998
SUPERSEDES: July 1996



BELGIUM	Heikensstraat 6, 9240 Zele Tel. (052) 45.11.11	Fax. (052) 45.09.93
DEUTSCHLAND	Schloßstraße 76, D-51429 Bergisch Gladbach-Bensberg Tel. (02204) 9536-0	Fax. (02204) 9536-53
FRANCE	Le Vinci 6 - Parc d'activités de Mitry Compans, 1, rue Becquerel, 77290 Mitry Mory Tél. 01.60.93.99.50	Fax. 01.60.93.99.51
ITALIA	Via Arese 12, I-20159 Milano Tel. (02) 607.22.98 (R.A.)	Fax. (02) 668.66.52
UNITED KINGDOM	Unit 1 Regent Business Centre Jubilee Road Burgess Hill West Sussex RH 15 9TL Tel. (01444) 871313	Fax (01444) 871317
INDIA	B4/115 Safdurjung Enclave, New Delhi 110 029 Tel. 91 (11) 6186211	Fax 91 (11) 6186418