

# SVP Series Vibrating Probe Point Level Sensor

## Operation Manual

### Operating Principle

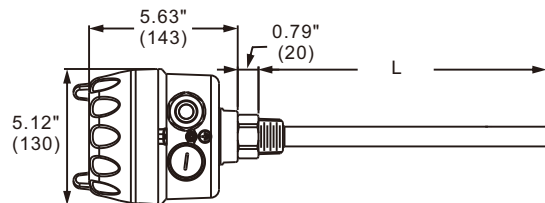
The SVP series is a vibrating probe point level sensor utilizing piezoelectric crystal and solidstate electronics technologies to produce vibration in the probe element at a specific frequency and receive electronic feedback. When the probe element is covered or in contact with the target material the vibration is dampened, the electronic feedback changes and presence of the material is thereby sensed by the electronics, which changes the state of the sensor output to indicate material presence. When the probe element is again free of the target material the vibration again is produced, the output state reverts indicating material absence.

### Specification

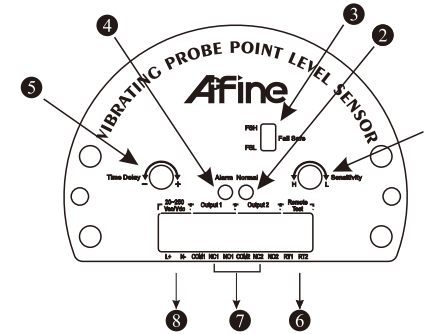
Supply voltage	20~250Vac/Vdc, 50/60Hz
Power consumption	15VA max.
Output rating	-ONE Relay Output: 5A @ 240Vac/28Vdc (Option: TWO Relay Output) -ONE NPN/PNP Output: 400mA @60Vac/Vdc (Option: TWO NPN/PNP)
Sensitivity	High/Low
Fail safe mode	FSH/FSL
Delay time	0~6sec
Switching time	3sec when sensor is covered 3sec when sensor is uncovered
Minimum density	20lbs/ft3 (S.G. = 0.32; 0.32g/cm3)
Ambient temp.	-40°F~176°F (-40°C~80°C)
Operating temp.	-40°F~176°F (-40°C~80°C)
Pressure	142psi (10bar)
Vibrating frequency	380~420Hz
Normal indicator	Green LED
Alarm indicator	Red LED
Housing material	Diecast Aluminum (powder coated)
Protection	IP65
Conduit entrance	Two (2) 3/4" NPT
Probe material	Type A, C, E, G, and H; 304SS/316SS/316LSS Type B and D; ETFE Coated 304SS
Maximum vertical force	177inlbs (20Nm)

### Dimensions

Unit:inch(mm)



### Operating Panel



- 1 Sensitivity; Turn Clockwise – DECREASE sensitivity; Turn Counter-Clockwise – INCREASE sensitivity
- 2 Normal: Green LED illuminates to indicate SVP unit is in Normal condition
- 3 Fail-Safe: FSH for high level use; FSL for low level use
- 4 Alarm: Red LED illuminates to indicate SVP unit is in Alarm condition
- 5 Time Delay: Adjust delay time 0~6sec
- 6 Remote Test: Contact closure across RT1/RT2 simulates alarm
- 7 Output 1 / Output 2: Wiring connections for SVP output
- 8 Power Supply: Wiring connections for 20~250Vac/vdc supply

### Fail Safe Function

	Operation mode	Indicator LED	NPN/ PNP Output	Relay Output
FSH		Normal/Green Alarm/Red	COM. — N.O.	COM. — N.O. N.C.
		Normal/Green Alarm/Red	COM. — N.O.	COM. — N.O. N.C.
FSL		Normal/Green Alarm/Red	COM. — N.O.	COM. — N.O. N.C.
		Normal/Green Alarm/Red	COM. — N.O.	COM. — N.O. N.C.

### Sensitivity Adjustment

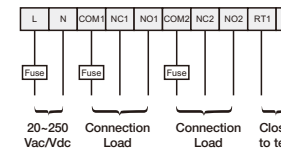
Please adjust the sensitivity to suit your specific application.

L: The lower setting, full clockwise adjustment, are suitable for materials with bulk density of  $\geq 35\text{lbs/ft}^3$

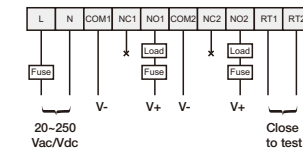
H: The higher setting, full counter-clockwise adjustment, are suitable for material  $< 35\text{lbs/ft}^3$

### Wiring

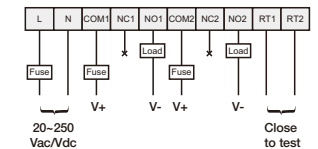
■ Relay



■ NPN:



■ PNP:



\*Fuse: 0.5A recommended for NPN/PNP output

Fuse rating for Relay output should be based on the lower of Load current draw or according to relay maximum current load specification

## Installation

### Top Mount Installation (Figure 1):

1. It is recommended that the SVP series vibrating probe point level sensor be installed away from the vessel fill inlet so as to avoid impact from material that can damage the probe or create false signaling.
2. Understand the material flow profile and characteristics in the vessel before choosing a mounting location.

### Side Mount Installation (Figure 2):

1. It is recommended to install the SVP series vibrating probe point level sensor away from the flow of material from the vessel inlet.
2. It is recommended to install a protective baffle or shield above the probe to eliminate impact from any falling material that can damage the probe or create a false indication of material presence.
3. For best performance install side mounted units at a downward angle of approximately 20 degrees to promote the flow of material away from the probe and to optimize the sensitivity of the unit.
4. Make sure conduit entrances are pointing downward during installation to avoid the ingress of moisture into the enclosure by or through the conduit or conduit connections.

### Notice:

1. Do NOT climb on the SVP Series vibrating probe or use it as a step.
2. Do NOT tighten the unit into its mounting connection by the housing, always tighten using the hex provided as a part of the probe section.
3. Do NOT do anything that might cause bending of the probe section nor should you attempt to modify the length of the probe section.
4. The maximum vertical force of the probe is 177inlbs (20Nm). Ensure that this is not exceeded or the probe may be damaged.

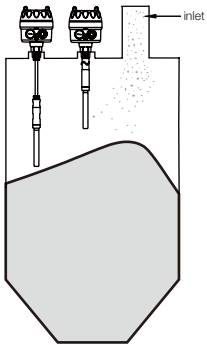


Figure 1

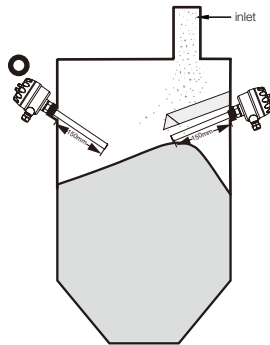
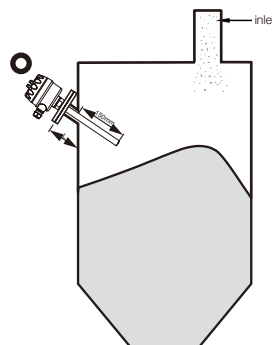


Figure 2



## Adjusting Time Delay

A potentiometer is provided for setting the “on” time delay between 0~6sec, labeled “-“ (minimum) and “+” (maximum). The time delay is the time between when the material is sensed by the SVP vibrating probe point level sensor and when the relay and LED’s change state. There is no delay adjustment for “off” delay.

## Simulating Alarm Test

The SVP vibrating probe point level sensor includes an alarm test function that can be used to check the control function of your level control setup. The test function simulates detection of the target material at the probe and uses terminals RT1 and RT2. To simulate a material detection condition perform the following steps:

1. Set the FSH/FSL Fail Safe switch to the FSH position.
2. Set the Time Delay potentiometer to minimum (all the way counterclockwise to“-“)
3. Short circuit terminals RT1 and RT2. Relay contact between COM and NC will be closed, COM and NO will be open. Red alarm LED will illuminate, green will be off. Or, transistor (NPN/PNP output) will be enabled.
4. Open the circuit between RT1 and RT2. Relay contact between COM and NC will be open, COM and NO will be closed. Green LED will illuminate, red will be off. Or, transistor (NPN/PNP output) will be disabled.

## Maintenance

No periodic or preventive maintenance is required when the SVP vibrating probe point level sensor is properly applied and installed. Follow the below guidelines for periodic inspection:

1. Clean electrical connection terminals if necessary.
2. Inspect for any broken or damaged parts, replace or repair if necessary.
3. Maintain tight and sealed conduit connections in the proper orientation as previously discussed.

## Troubleshooting

Fault Condition/Symptom	Possible Cause(s)	Action
Probe not vibrating when free of material	<ol style="list-style-type: none"> <li>1. Loose electrical connection</li> <li>2. Bent probe</li> <li>3. Water inside enclosure</li> <li>4. Circuit failure</li> </ol>	<ol style="list-style-type: none"> <li>1. Check wiring connections</li> <li>2. Return unit to factory for evaluation and repair</li> <li>3. Replace circuit board</li> </ol>
No output or LED indication	Failure in circuit board	Replace circuit board



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