

META

07 SERIES

Vibrating fork level limit switches

Patent: Taiwan, China



Fiammengo srl.

Blanco Encalada 1190. (B1768BIP) Villa Madero.
Prov. de Buenos Aires, Argentina.
Telefax: (+54 11) 4454 8343.
E-mail: ventas@fiammengo.com.ar





Features

- Thorough metal construction, sturdy and durable.
- No calibration necessary, user friendly handling.
- Large vibrating range and the amplitude up to 6mm for the weak sticky materials hanging on the forks.
- Adjustable amplitude for distinguishing from the density of different substances.
- Ultra red LED offers a immediate warning for the operator to control the measurement.
- Flexible AC, DC power input makes not only less inventory but broad application.
- Various output modes, flexible use.
- Suitable for measurement of level of liquid, particulate and dense materials.
- Protection Classification: IP67
- EU RoHS Compliance (NO.EMA06N022-01CTSP)
- Certification: CE (NO. EMA-0611-5880-CE/SAFETY)

Shock wave, generated by piezoelectric elements, through metallic conductance, is transmitted to vibration rod to make it vibrate. In case of any materials or liquids completely covering the vibration rod, the vibration rod will stop vibrating and output a contact signal. (Relay, NPN, PNP) if the materials or liquids didn't cover the vibration rod completely, then the vibration rod will output certain amplitude in the proportion of being covered. Output signal generates analog signal. (4-20mA, 0-10V) analog output is applied in a circumstance, in which the misoperation could be caused because of the violent frothing that occurs.

Operating principle

Application

Suitable for chemical plastics, pharmacy, feed, cement, fertilizer, food or other solid and liquid industries.

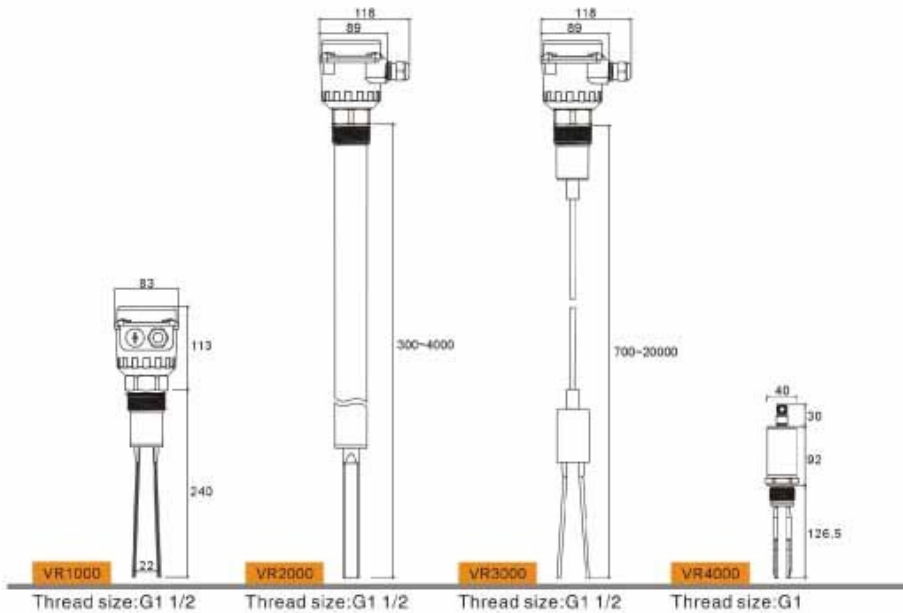


Standard VR 1000 specifications

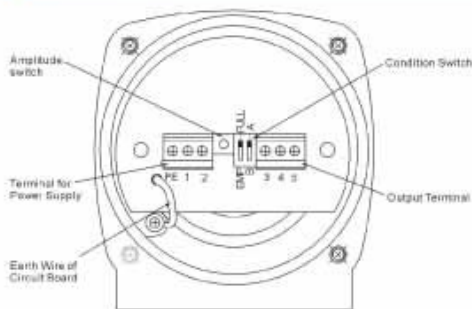
- Power input: 20~250VAC
20~60VDC
- Electricity consumption: AC 7.5W/DC 1.8W Max.
- Connection mode: Fixture, Flange
- Connection box: aluminum alloy
- Cable gland: 7.5mm
- Available proportion: 5g/L
- Output mode: 1. Relay - SPDT 4A/250VAC
4A/60 VDC
2. NPN/PNP - 800mA
3. 0~10VDC, 4~20mA
- Protection Classification: IP67
- Operation temperature: -40℃~150℃



Structure



VR1000~VR3000 Terminal Drawing



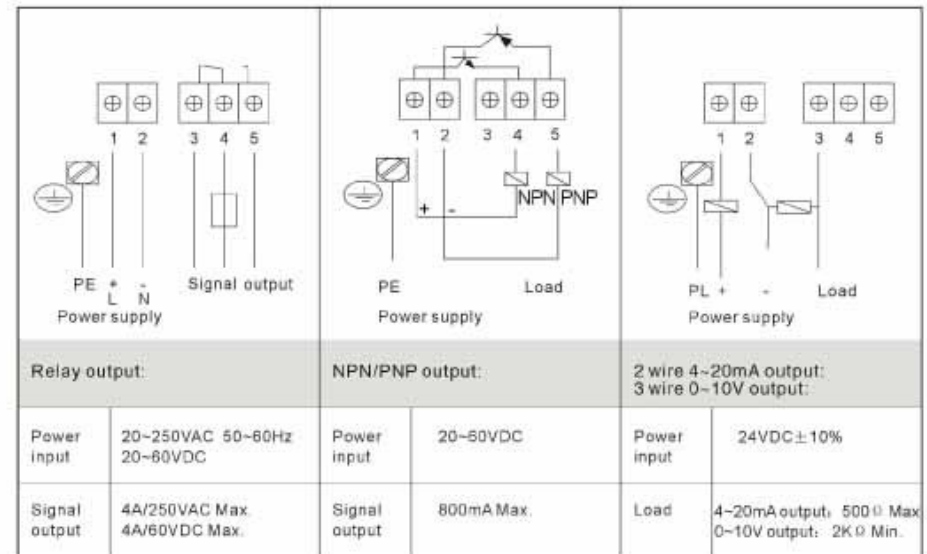
There are two suits of DIP Switch, the left suit is switch 2 and the right one is switch 1. Switch 2: condition explanation: FULL position: If the level sensor is used to indicate the full loaded condition of materials, then please place the switch in FULL position. EMP position: If the level sensor is used to indicate the empty condition of materials, then please place the switch in EMP position.

VR1000~VR3000 High and low position setting adjustment

Level status	High position		Low position	
	FULL	EMP	FULL	EMP
Switch 2				
Relay OUT				
NPN OUT				
PNP OUT				
4-20mA OUT	I=20mA	I=4mA	I=4mA	I=20mA
0-10VDC OUT	U=10V	U=0V	U=0V	U=10V
Indicator				

- The terminal "4" in the table is the public end of the relay and can be connected to the "+" anode of AC or DC power input.
- NO and NC condition of the relay is determined by the position of the "switch 2".
- Switch 1 is designed for signal boost up purpose for over 1500mm(L) vibration rod of VR2000 & V-3000 series only - "A" intensive, "B" normal. (This switch might be disable when the vibration rod is less than 1500mm.)

VR1000-VR3000 Hookup



VR4000 Terminal Drawing

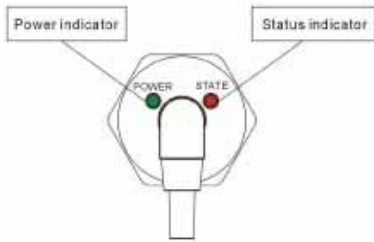


图 A

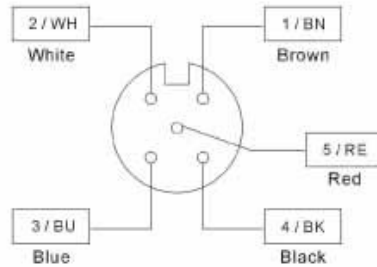
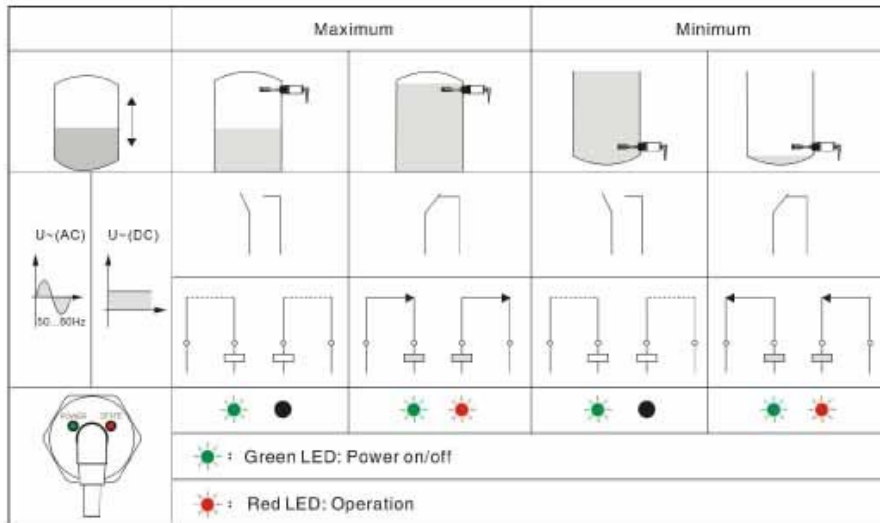


图 B

VR4000 Status Indicators



VR4000 Hookup

NO: Wire WH connect to wire BU- NC: Wire WH connect to wire BN-			
NPN/PNP output: Power input: 20~60VDC Signal output: 800mA Max.		Relay output: Power input: 20~250VAC, 20~60VDC Signal output: 4A/250VAC Max., 4A/60VDC Max.	2 wire 4~20mA output: 3 wire 0~10V output: Power input: 24VDC ±10% Load: 4~20mA 輸出: 500Ω Max., 0~10V 輸出: 2KΩ Min.

Accessories specifications and order number

Cable order number:	C	02	L	5	C	12
	C: Cable	Length: 02: 2m, 05: 5m, 10: 10m	Connector type: J: J型, L: L型	Cable type: 4: 4芯, 5: 5芯	Materials: F: PUR, C: PVC	Connector size: 12: M12
	Flange			Fixture		
VR1000 VR2000 VR3000	Order No. 0607F 			Order No. 0607X 		
VR4000	Order No. 0608F 			Order No. 0608X 		

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Order example

VR	2	02K	2	2	2	S	T
Series	VR2000 Extension	2000mm	24VDC±10%	4-20mA output	Flange	Standard type	Teflon

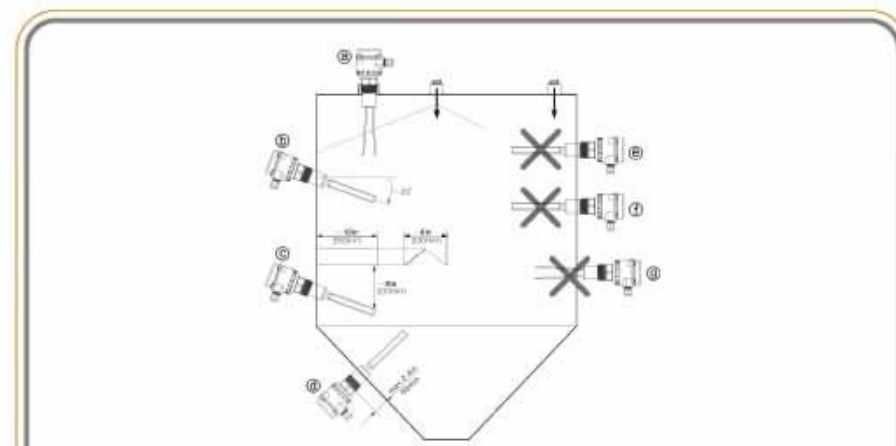
VR	Series: VR
2	Fork type: 1: VR1000 Standard, L=240 mm 2: VR2000 Extension, L=300mm-4000mm 3: VR3000 Extension with cable, L=700mm-20000mm 4: VR4000 Micro, L=127mm
02K	Fork length: For VR 1000 & VR 4000, this blank is 000. For VR 2000 & VR 3000, this blank should be filled in according to the length of the switches. It should be displayed by K if the length is over 1000mm. (EX.1000mm=01K ; 2500mm=2K5)
2	Power input: 1: 20-60VDC & 20-250VAC 50-60Hz (for relay output only) 2: 24VDC ± 10% (for 4-20mA & 0-10VDC output only) 3: 20-60VDC (for NPN & PNP output only)
2	Output mode: 1: Relay output SPDT 4A/250VAC or 4A/60VDC 2: 4-20mA & 0-10VDC output 3: NPN & PNP output
2	Mounting method: 1: G1-1/2"-n11 thread for VR1000-VR3000 2: Flange(thread for VR1000-VR3000) 3: Fixture(thread for VR1000-VR3000) 4: G1 thread for VR4000 5: 3/4"NPT thread for VR1000
S	Protection type: S: Standard type
T	Fork materials: 4: 304 stainless steel - for weak acidic or alkaline substances 6: 316 stainless steel - for hygienic or foodstuff substances T: Stainless steel with Teflon - for strong acidic or alkali substances

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Installation

1. The preferred installation for reducing the shock to materials and the hanging of materials is making the switch at an angle of 15-20 to horizontal.
2. Keep the switches away from the feed opening of the barrel to reduce the shock to materials, if unavoidable, a separator plate is necessary.
3. The inlet of the connection box should be downward and the fixing nuts of power line must be tightened.
4. The operators cannot use vibration rod to climb or hook any object when working within the barrel.



- Correct mounting:**
- (A) Top-mounted
Fork is vertical towards bottom and mounted in any position far away from the feed opening of top side.
 - (B) Laterally mounted
Fork angled slightly downwards by 15-20 degree so as to reduce the shock and the hanging of the flowing materials.
 - (C) Laterally mounted with shield
With a shield, length approx. 10 in(250mm), width approx. 8 in(200mm), fork angled slightly downwards by 15-20 degree so as to reduce the shock of the flowing materials and prevent the improper stock from itself.
 - (D) In discharge hopper
Max. nozzle length 2.4 in (60mm), so that no build-up occurs which prevents the fork from oscillating.

- Incorrect mounting:**
- (E) Laterally mounted in filling curtain or under the feed opening.
Incorrect fork orientation
 - (F) Broad time surface is subjected to high load caused by discharging material; malfunction due to residual material.
 - (G) The switch will not work normally when the distance of mounting nozzle and barrel is over 2.4"(60mm)

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Correct mounting:

- ⓐ Next to the silo wall, but with enough distance from it and from material build-ups.
- ⓑ Avoid of the false warning from material flow.

Incorrect mounting:

- ⓐ Too close to the wall and material build-up.
- ⓑ In the centre of the discharge hopper.
- ⓒ In filling curtain.
- ⓓ Laterally mounted (Extension type with cable).

- ⓐ Shield to protect against flowing material.
- ⓑ Sufficient space for mounting and for adjusting.

Mark on the hex nut.

The top of the fork is marked.

Enclosed by PTFE thread seal tape. Tightened by a wrench. Not wrested by hands.

Do not damage the fork; bend the fork; shorten the fork; and lengthen the fork.