

SC 2410 Mini Tuning Fork Vibrating Switch

Operating Manual

Description :

SC2410 tuning fork switch uses two wires power supply with $12 \sim 55 \text{ Vdc}$, *PNP / NPN*. It can be utilized to detect medium in applications with $\text{S.G.} > 0.7 \text{ g/cm}^3$ and viscosity between $1 \sim 10000 \text{ cSt}$. It also has compact size, which is suitable for applications with limited space.

SC2410 offers 3 options of plug connections: *DIN 43650*、*Cable Connec* 及 *Connect As-i bus*. Furthermore, the fork can be polished(*Ra*) to meet the requirements for particular industries like pharmaceutical and food processing.

SC2410 is equipped with magnetic test function. It can examine the functioning of the switch after the switch is installed.

Features :

- Compact size, suitable for limited space.
- Wide range of power supply is $12 \sim 55 \text{ Vdc}$ with *PNP / NPN* output mode.
- 3 options of plug connections.
- Fork polished to users' standard for industries like pharmaceutical and food processing.
- Magnetic test to examine proper functioning of the switch.

- Thread 1" PT
- Material SUS 304,316,316L

Tuning fork

- Material 304,316,316L
- Length Min. 100 mm
- Surface quality Option

Weight

- Total weight **Approx. 0.4 kg**

Electronics

- Power supply 12~55 Vdc
- Output PNP / NPN
- Internal current requirement Approx. 10 mA
- Load current Max. 350 mA
- Vibrating frequency Approx. 355~365 Hz
- Switching time 1~3 s when covering
1~3 s when becoming free
- Switching mode Min./Max. detecting mode by connection
- Control lamp Blue LED—Power indicants
Red LED—Switching status indicants
- Switching point Vertical orientation : 23 mm from top of fork
Horizontal orientation : 10 mm from fork centre
- Magnetic testing
- Protection class **I**
- Overvoltage category **III**

Ambient conditions

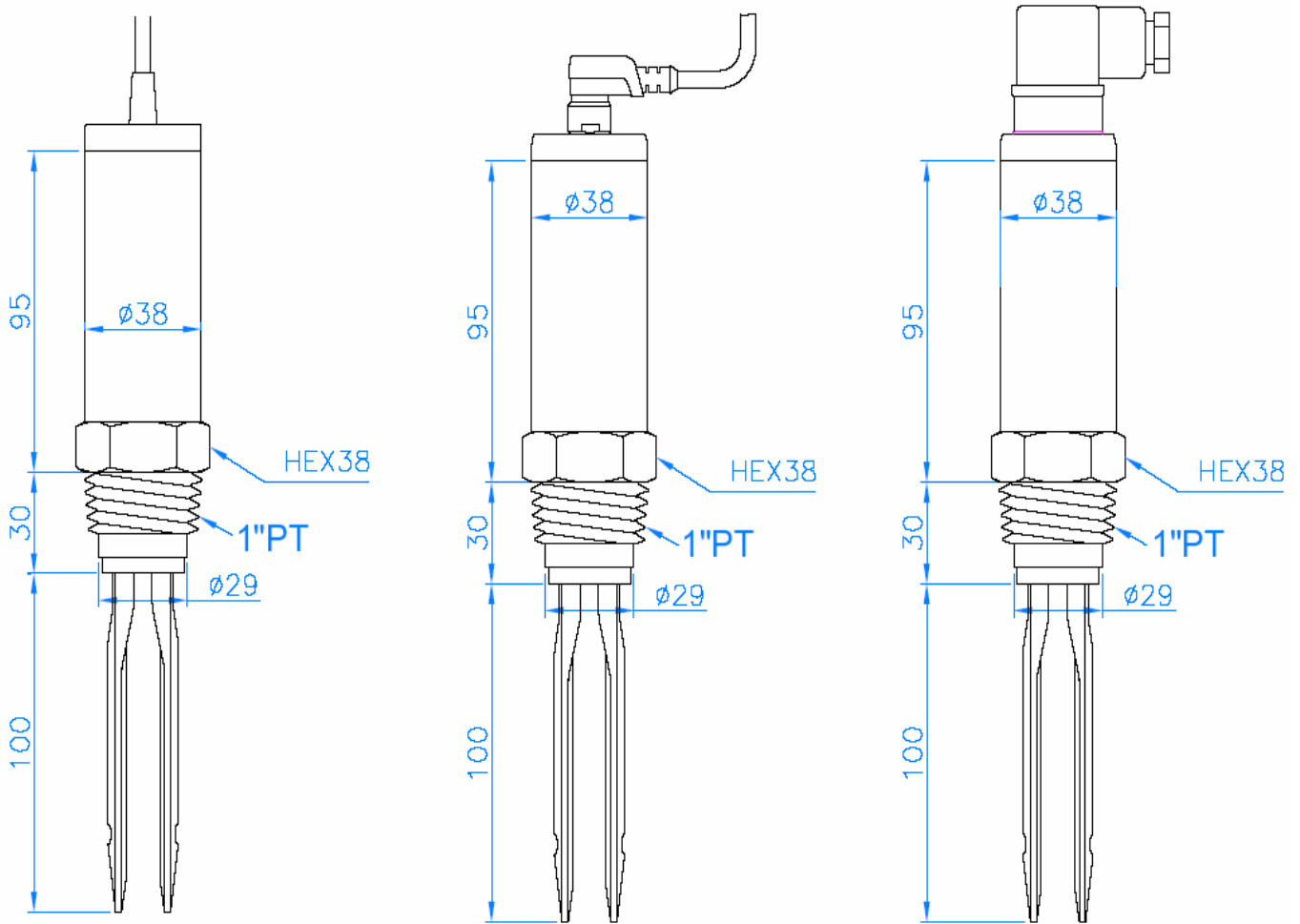
- Ambient temperature on the housing -10~+60 °C
- Storage and transport temperature -10~+70 °C
- Product temperature -10~+150 °C
- Ambient damp 20%~80% RH non-condensed
- Operating pressure Max. 40 Bar

Product

- Viscosity 1~10000 cSt
- Density $\geq 0.7 \text{ g/cm}^3$

3. Appearance :

Types of SC2410 series as shown below :



Cable connector

Connect As-i bus

Valve plug DIN 43650

Figure 1 sizes and plug connections

4. Wiring :

Power supply is *DC*. Output is *PNP / NPN*. Please see Figure 2.

➤ *PNP* wiring :

- **Low(*Min.*) mode** : No. 1 pin(Brown) is connected to *L-*. No.3 pin(Blue) is connected to *L+*. Output is connected to No. 2 pin(Green), then connected to *L-*. No. 4 pin(Black) goes to ground.
- **High(*Max.*)mode** : No. 1 pin(Brown) is connected to *L-*. No.2 pin(Green) is connected to *L+*. Output is connected to No. 3 pin(Blue), then connected to *L-*. No. 4 pin(Black) goes to ground.

➤ *NPN* wiring :

- **Low(*Min.*) mode** : No. 1 pin(Brown) is connected to *L+*. No.3 pin(Blue) is connected to *L-*. Output is connected to No. 2 pin(Green), then connected to *L+*. No. 4 pin(Black) goes to ground.
- **High(*Max.*)mode** : No. 1 pin(Brown) is connected to *L+*. No.2 pin(Green) is connected to *L-*. Output is connected to No. 3 pin(Blue), then connected to *L+*. No. 4 pin(Black) goes to ground.

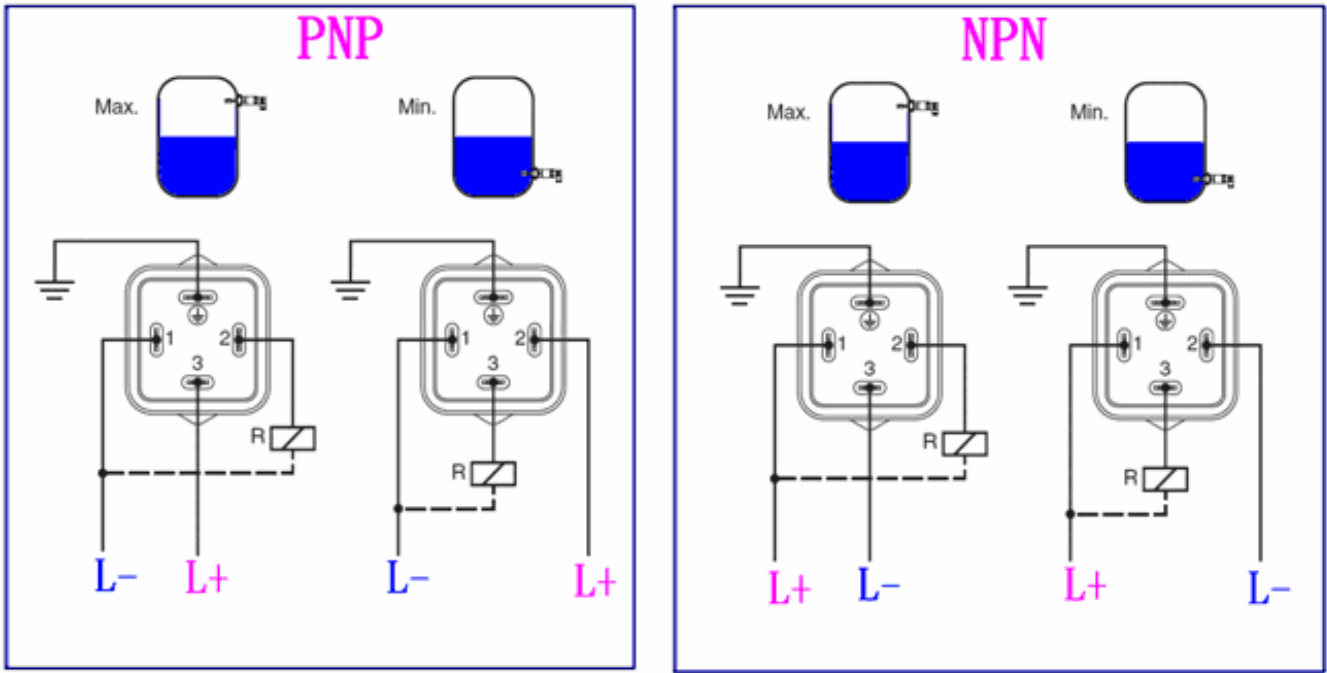


Figure 2 PNP / NPN Output Wiring Diagram

Pin No. <i>(DIN 43650)</i>	Wiring Color <i>(Cable Connec 、 Connect As-i bus)</i>
PIN 1	Brown
PIN 2	Green
PIN 3	Blue
PIN 4	Black

Pin No. and Wiring Colors Chart

5. Fork Sensing Spot :

SC2410 fork sensing spot is shown as Figure 3 below. Considering testing medium is water(S.G.= 1 g/cm^3), sensing spot is at the fillister about 23mm from the tip. If testing medium has S.G. lower than 1 g/cm^3 , sensing spot would be above the fillister. In contrast, sensing spot will be below the fillister.

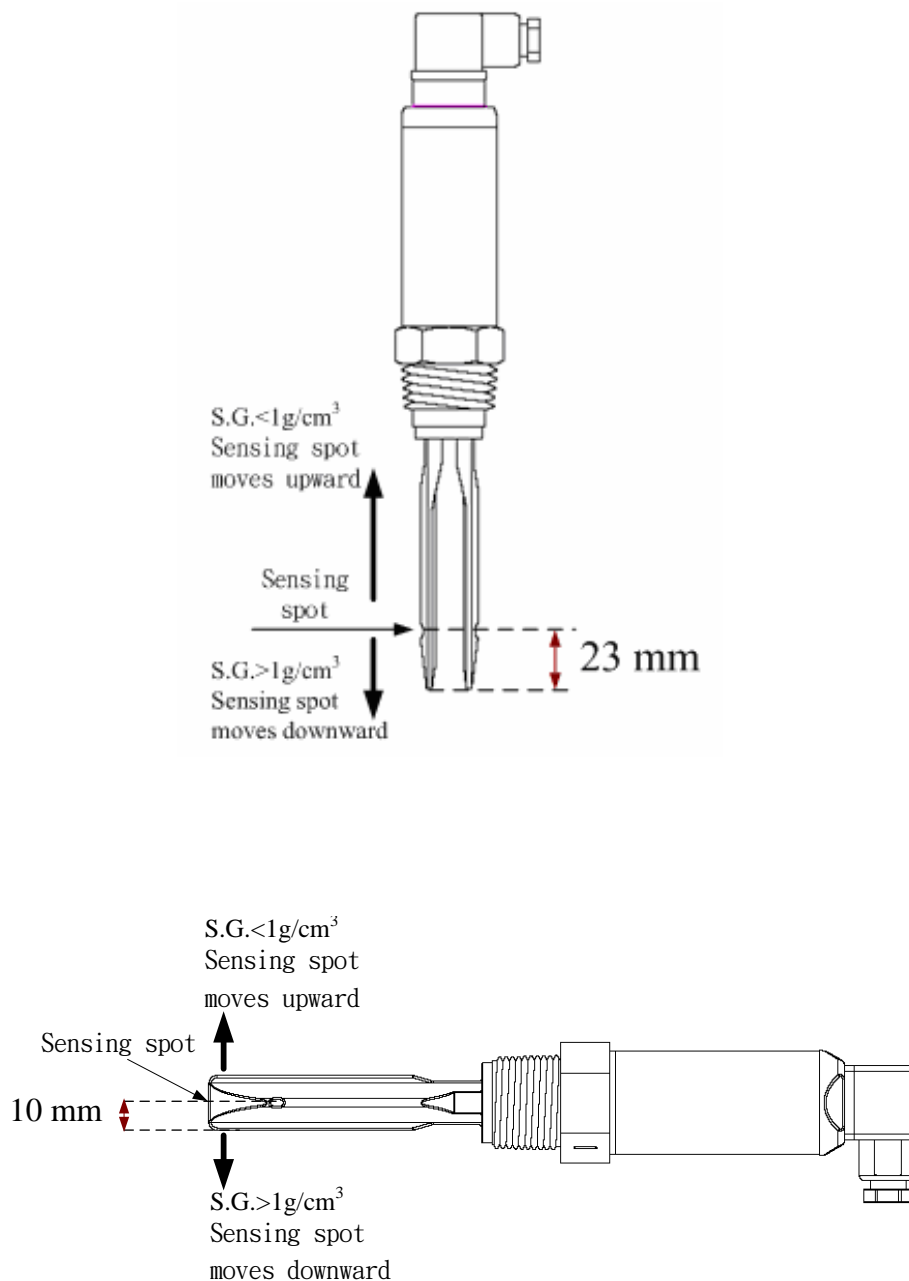


Figure 3 Fork Sensing Spot

6. Output Status :

SC2410 is equipped with *DC* power. There are two output options of *PNP / NPN*, which offers *Min./ Max.* modes according to different pin numbers. When powered with *12 ~ 55 Vdc*, top of housing would light up with blue LED.

- **Low(*Min.*) Mode :** Tuning fork switch will be actuated 3 seconds after the power is on. Output transistor is *NO* and red LED indication is off. When tuning fork is covered by testing medium, vibration stops and output transistor becomes *NC*. Red LED indication is on.
- **High(*Max.*) Mode :** Tuning fork switch will be actuated 3 seconds after the power is on. Output transistor is *NC* and red LED indication is on. When tuning fork is covered by testing medium, vibration stops and output transistor becomes *NO*. Red LED indication is off.

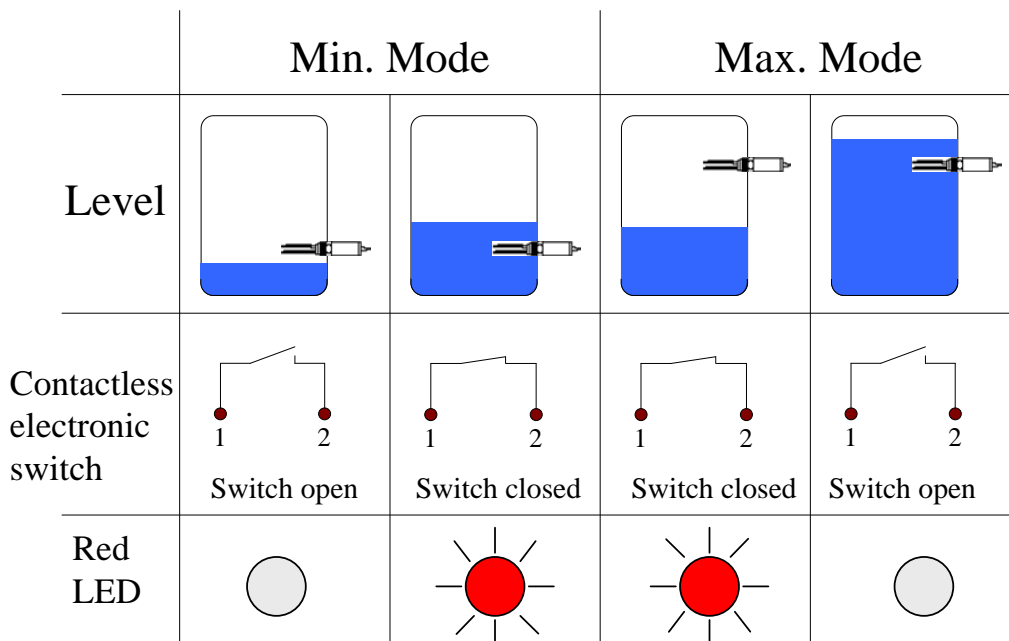


Figure 4 *Min./ Max.* Mode

7. Magnetic Test :

After the switch is installed and powered, magnetic switch can be performed accordingly. Please see Figure 5 below. Output status will switch from NC to NO, and red LED indication will be on while fork continues to vibrate.

When magnet is pulled away from the housing, red LED would return as default while fork continues to vibrate. The purpose of testing is to confirm the wiring and functioning are correct.

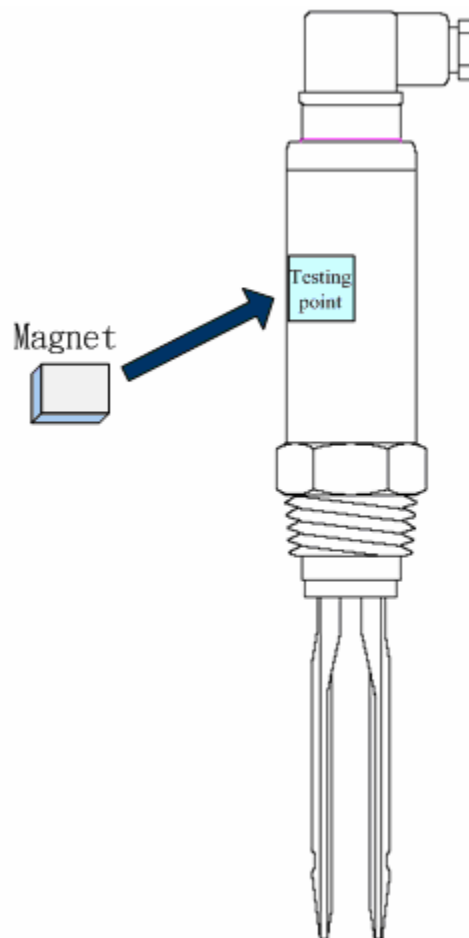


Figure 5 Magnetic Test Diagram