

SC38 Multi-functional Tuning Fork Level Switch (NPN/PNP Three-wire Type) Operation Manual

WORKING PRINCIPLE

The piezoelectric component is used to drive the tuning fork and feedback signal, which produces the resonation on the fork. When the fork comes into contact with a material, it relies on the damping effect by covering the testing material on the tuning fork which changes the frequency of the tuning fork. The frequency is judged by the micro-processor in the circuit. The signal display and output status are determined based on the conditions set by the user.

SPECIFICATION

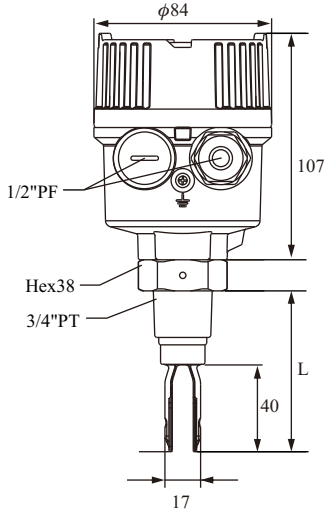
Power supply	10~55 Vdc
Power consumption	15mA
Input protection	Reverse protection function
OVP	Overvoltage category III
Max. measurement error	Max. ±1 mm
Repeatability	0.5mm
Hysteresis band	Approx. 2 mm
Storage temp.	-40~85°C
Environment temp.	-40~85°C
Operating temp.	-40~150°C
Material viscosity	Max. 10000 mm²/s (10000 cst)
Particle size in liquid	Max. ϕ5 mm
General cable	ϕ6~10 mm
Operating pressure	Max. 40 Bar
Protection grade	IP 66/67
Contact capacity	350mA, 55Vdc

FEATURES

- All-in-one design, 3/4" thread is suitable to the installation of a small tube (SC38 series).
- A maximum length of 3m for the ultra-extension type.
- Sensitivity adjustment is available for different density of media. ($\rho > 0.5 \text{ g/cm}^3$ or $\rho > 0.7 \text{ g/cm}^3$)
- High/low failure safe mode, safe and reliable.
- Self-diagnosis can detect the fork abrasion
- Switch delay function
- Alarm indicators based on failure status or output status selected according to the customer's habits
- Test button can be tested after the installation is completed
- Calibration of the operation points for different density of media by the customer if required

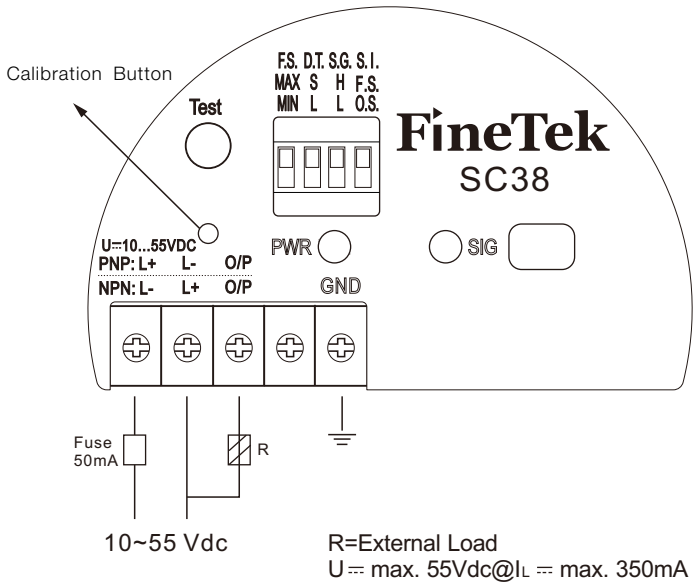
DIMENSIONS

(Unit:mm)

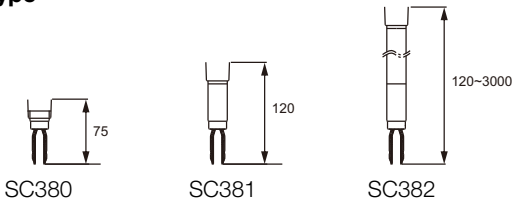


SC380

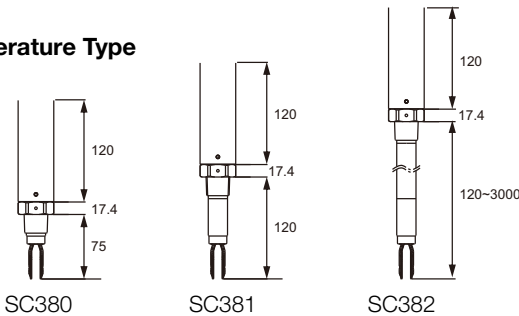
PANEL AND ELECTRICAL



Common Type



High-Temperature Type



DESCRIPTION OF FEATURES

Abbr.	Function	Options description	Notes
Test	Test Bottom	Reverse the signal output	It is for the test after the installation is completed.
F.S.	Fail Safe	MAX: High MIN: Low	It is for the high and low Fail-Safe mode.
D.T.	Delay Time	S: Default setting L: Delay for 5 second	Covered by material: Approx. 0.5s Not covered by material: Approx. 1.s Switch to L to set it as 5 seconds for being covered or not covered by the material.
S.G.	Specific Gravity	H: $\geq 0.7 \text{ g/cm}^3$ L: $\geq 0.5 \text{ g/cm}^3$	The switch to set the material density.
S.I.	Signal Indicator	F.S.: Fail-Safe mode O.S.: Output mode	Turn ON/OFF the red indicator based on the output status or the fail-safe status.

OUTPUT STATUS

SC38 provides Max./Min. operation modes, and has the corresponding indicators and output status according to the functional settings and whether it is covered by the material. The working status is detailed in the figure below.

Failure Mode	Material Level	Output Signal	LED Indicator
MAX		$\square \xrightarrow{I_L} \square$	O.S. F.S.
		$\square \xrightarrow{<100\mu A} \square$	O.S. F.S.
MIN		$\square \xrightarrow{I_L} \square$	O.S. F.S.
		$\square \xrightarrow{<100\mu A} \square$	O.S. F.S.
Instrument failure		$\square \xrightarrow{<100\mu A} \square$	
Over Load($I_L > 350\text{mA}$)		$\square \xrightarrow{<100\mu A} \square$	

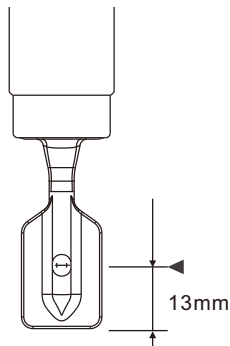
I_L : Load current

: ON : Flash : OFF

FORK TRIGGER POINT

The position of the SC38 fork trigger point depends on the mounting position as shown in the figure below: (When the testing medium is water, S.G.=1 g/cm³, temperature 23°C, and working pressure 0 Bar). If the testing medium has an S.G lower than 1g/cm³, the trigger point would rise. Similarly, the trigger point will move downward while the S.G is larger than that of water. The moving range is depended on the S.G

※Operating point position: ◀



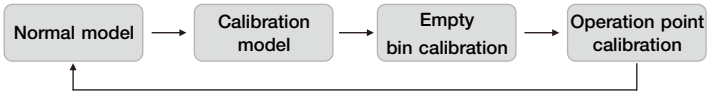
Top Mounting

DESCRIPTION OF TEST BUTTON

This button is mainly provided for the user to check whether the output operation works normally after the installation is completed. When the button is pressed, the output and indicator (ON<->OFF) will be reversed. Once the button is released, it will recover the original status.

FUNCTION OF SELF-SET OPERATING POINT POSITION

SC38 provides the function of customizing the operating point position in accordance with what is required by the user.



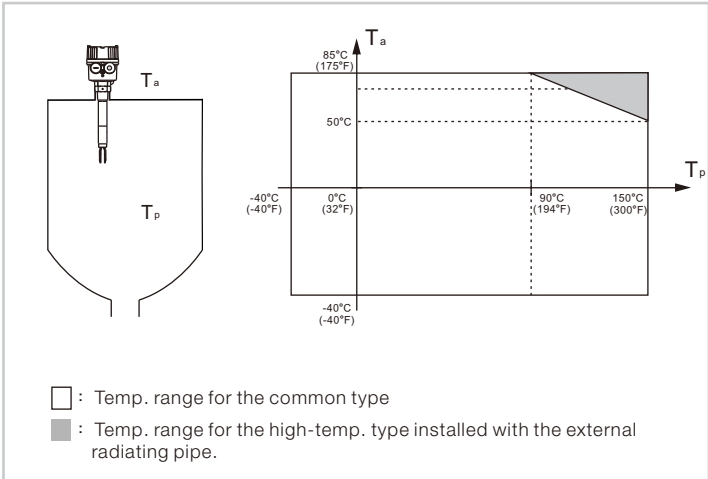
Settings

1. Keep pressing the “Calibration Button” for 3 seconds. When the red and green LED indicators flash in turn every 0.5 second, it enters the calibration mode. Press the calibration button again to enter the Empty Bin Calibration mode.
2. Calibration status: The red LED indicator flashes every 0.5 second, and the output current switches to operate every 0.5 second.
3. This mode is to calibrate the vibration frequency of the tuning fork in the air. Thus, it shall press “Calibration Button” when the tuning fork doesn't sense any material. In this case, it will write the vibration frequency in the air, and enter the operating point calibration mode.

[Operating Point Calibration]

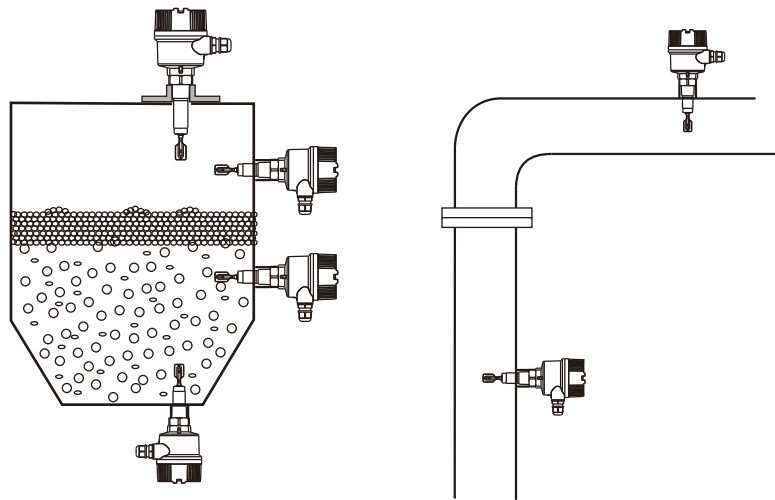
1. Calibration status: The red LED indicator flashes every 0.25 second, and the output current switches to operate every 0.25 second.
2. Cover the material to the desired operating point position under this mode, and then press “Calibration Button”. It will be adjusted to the corresponding operating point position according to the H/L setting of the S.G.

ENVIRONMENT/MEDIUM TEMPERATURE LIMITATION



PRODUCT APPLICATION

The product can detect the high/low level of the medium in the tank or the tube, which is applicable to various liquids, such as in the food or pharmaceuticals industry.



INSTALLATION INSTRUCTIONS

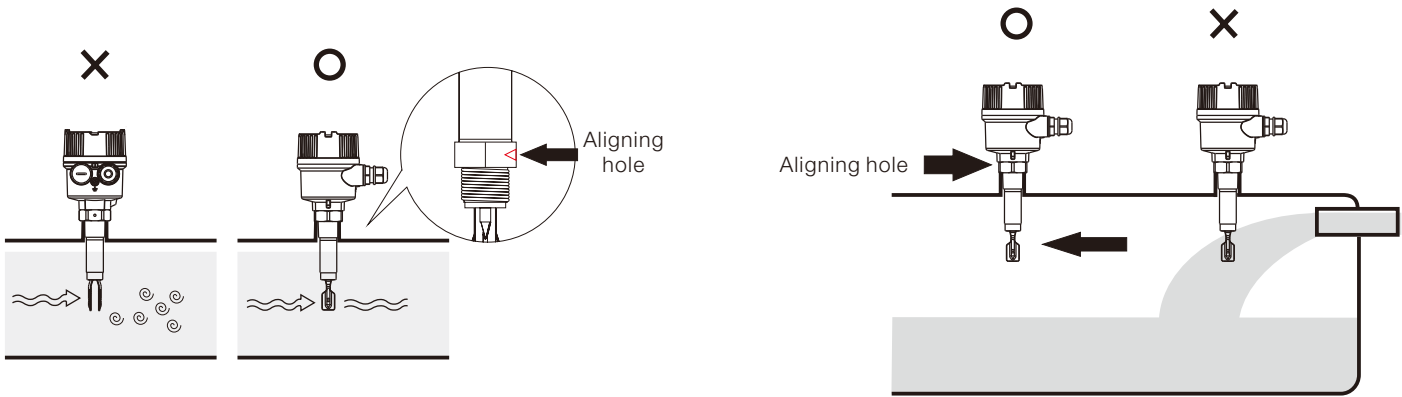
Horizontal Installation:

1. Don't install it near or around the material inlet.
2. When installing, adjust the cable gland to face downward. If the aligning hole is not installed upward, the floating material in the bin may squeeze the tuning fork, which will possibly cause product failure.

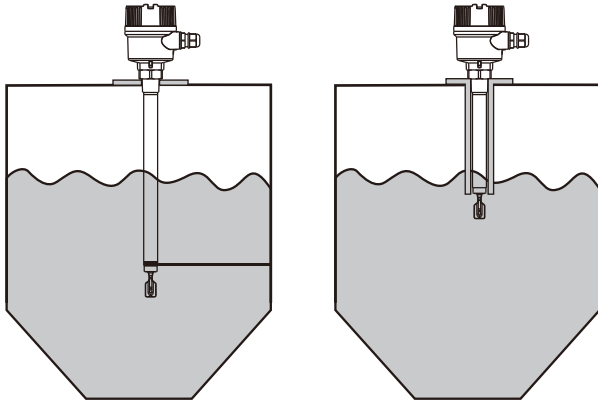
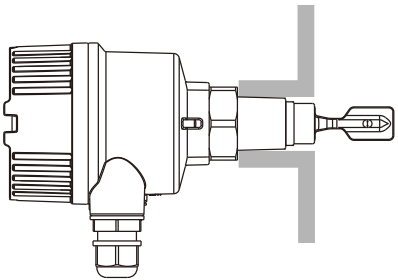


Vertical Installation:

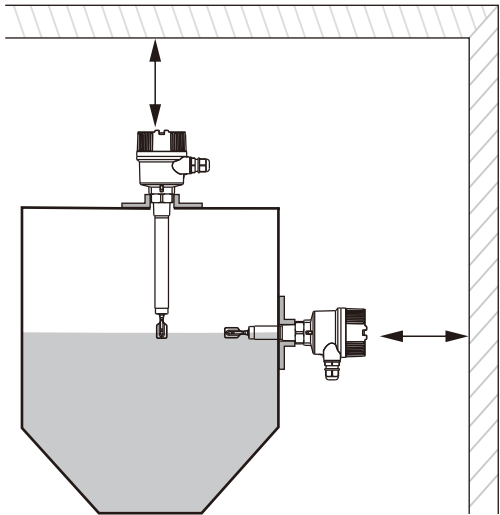
1. It is installed in the tube filled with liquid, and it shall keep consistent with the liquid's flowing direction in the middle between two triggers.
2. Don't install it near or around the material inlet.



3. When installing the standard tuning fork, please make sure it is in flush with the sidewall.
4. The protective tube should be installed when the liquid fluctuates frequently.



5. When installing, enough space should be left for wiring and calibration.



FineTek Co.,Ltd.
No.16, Tzuchiang St., Tucheng Industrial Park, New Taipei City 23678, Taiwan.
Tel: 886-2-22696789 Fax: 886-2-22686682
Email: info@fine-tek.com http://www.fine-tek.com



08-SC38F-B0-EM,10/16/2015

