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Process Automation Solutions for Food & Beverage Industries



SCS16X SANITARY VIBRATION FORK LEVEL SWITCH

WORKING PRINCIPLE

Piezoelectric element drives the fork and vibrates at its frequency. When medium contacts the fork, a frequency reduction occurs. The change of the frequency is then detected and transferred to the electronics, and is converted into a signal output. There is no electronic amplifier, free of sensitivity adjustment for different media.

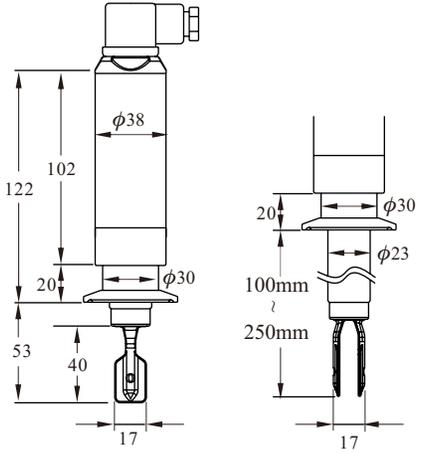
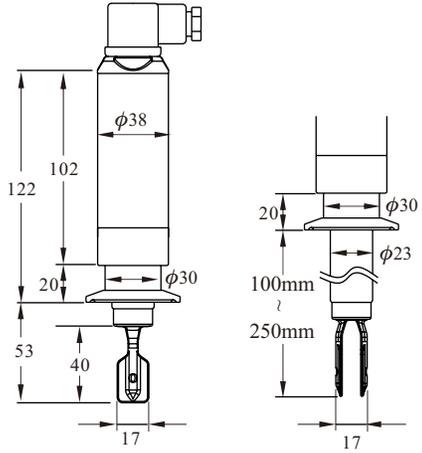
APPLICATION

Liquid: Water, Oil, Beverage, Sauce, Alcohol, etc.
Excellent performance at liquid applications with viscosity and foam
Sanitary process connections for CIP cleaning system / SIP disinfection system complied with USA FDA and 3A Standards.

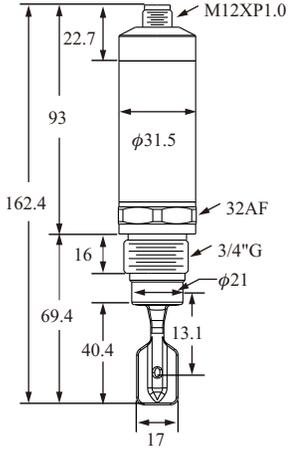
FEATURE

- No calibration required
- Compact design, ideal for any installation
- Durable and maintenance-free
- IP69K Stainless Steel M12 electrical connection provides excellent performance at air-sealed environment, and allows up to 1 hour long submerged under water for intensive cleaning.
- Polishing rate (Ra) on request
- Power 10~35Vdc
- Suitable for liquid S.G. bigger than 0.7g/cm^3 ; viscosity between 1~10000cst.
- Working temperature up to 150°C
- High / Low Fail-safe mode protection system
- Magnetic testing function to confirm the functions of peripheral equipment and wirings.
- Current overload protection. Output switch is off and LED alarm activated when current overload.
- Durable SUS316L housing
- High / Low level detection of any liquids
- Self-monitored function provides protection mode by switching off output when any abnormality (corrosive) inside the fork detected.(SCS164)

SPECIFICATION

Dimension (unit:mm)		
Model No.	SCS162	SCS163
Material	316L	316L
Protection Rate	IP65 / IP67	IP65 / IP67
Electrical Connection	DIN43650/Cable Connector/ M12x1	DIN43650/Cable Connector/ M12x1
Process Connection	Clamp	
Fork Length	40mm	
Power Supply	20~250Vac/Vdc,50/60Hz	12~55Vdc
Power Consumption	<750mW	<825mW
Current Consumption	<3mA	<10mA
Overload Current	Min.10mA, Max.350mA	Max.350mA
Fork Vibration Frequency	Air, Approx. 1KHz ± 10%	
Switch Point	Vertical Installation: 12mm ±3mm from the tip of the fork Horizontal Installation: 8mm ±1mm from the crevice centre of the fork	
Failure Safe Protection	Max./Min.	
Display	Green: Power /Red: Switch Function	
Delay Time	Switch function activated in 1~3 sec. after fork covered by medium	
	Switch function activated in 1~3 sec. after uncovered by medium	
Setup Time	<3s	
Contact Form	Contact less Electronic	NPN/PNP
Magnetic Testing	Confirm the function of the product with a magnet.	
Ambient Temp.	-40°C~80°C	
Storage Temp.	-40°C~85°C	
Working Temp.	-40°C~150°C	
Working Humidity	20% ~ 80% RH non-condensed	
Working Press.	Maximum 40 Bar	
Viscosity	1~10000 cst	
Specific Gravity	Liquid:0.7g/cm ³	

SPECIFICATION

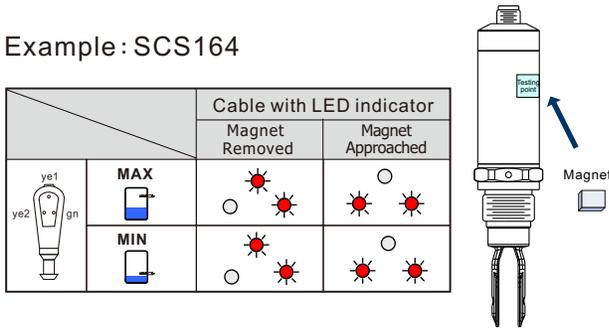
<p>Dimension (unit:mm)</p>	
Model No.	SCS164
Material	316L
Protection Rate	IP67 / IP68 / IP69K
Electrical Connection	M12x1
Process Connection	3/4" G
Fork Length	40mm ± 2mm
Power Supply	10~35Vdc
Power Consumption	<825mW
Current Consumption	<15mA
Overload Current	Max.350mA ± 10%
Fork Vibration Frequency	Approx.1KHz ± 10%
Switch Point	Vertical Installation: 13mm ± 1mm from the tip of the fork Horizontal Installation: 4mm ± 1mm from the crevice centre of the fork
Repeatability	± 0.5mm
Hysteresis	3 ± 0.5mm
Failure Safe Protection	Max./min
Display	Green: Power/Red: Error/Yellow: Switch function
Delay Time	Approx. 0.5sec. after covered by medium Approx. 1sec. after uncovered by medium
Setup Time	<2s
Contact Form	PNP
Magnetic Testing	Confirm the function of the product with a magnet.
Ambient Temp.	-40°C~70°C
Storage Temp.	-40°C~85°C
Working Temp.	-40°C~150°C
Working Humidity	20%~80% RH non-condensed
Working Press.	Maximum 40 Bar
Viscosity	1~10000 cst
Specific Gravity	Liquid:0.7g/cm ³

FUNCTION DESCRIPTION

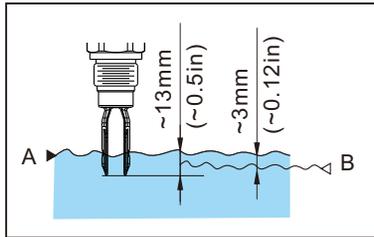
MAGNETIC TESTING :

After the switch has been properly installed, introduce corresponding power to activate the vibration of the fork. Approach a magnet to the testing area of the housing (shown below), so that relay output performs the switch function (N/O to N/C; N/C to N/O). It uses the LED indication (yellow LED) to switch the status, and the fork continuously vibrates. Removing the magnet from the testing area, the output and LED indication (yellow LED) will return as default and the fork continuously vibrates. This verification is to confirm the function and wiring of the product.

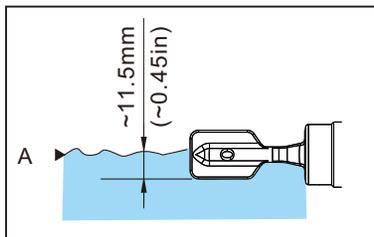
Example: SCS164



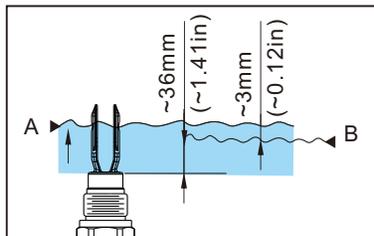
SENSING POINT :



▲Vertically Top Mounted



▲Horizontally Side Mounted



▲Vertically Bottom Mounted

SCS164 WIRING CONNECTION:

Power Supply 10~35Vdc

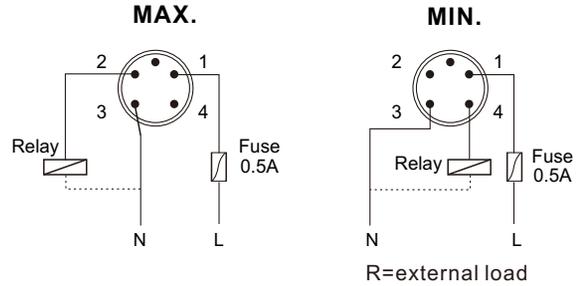
Wiring connection is divided into MAX and MIN, as shown below.

MAX:

As shown on the figure, connect pin 1 to 0.5A Fuse, and then connect it to L. External overload connects to pin 2, and then connect it to N with pin 3.

MIN:

As shown on the figure, connect pin 1 to 0.5A Fuse, and then connect it to L. External overload connects to pin 4, and then connect it to N with pin 3.



NO.	1	2	3	4
Color	brown	white	blue	black

Connexion DC-PNP Plug M12x1

OUTPUT STATUS :

	Max.	Min.	Error Status
Status	Light ON	Light ON	Overload current or fork abnormal
Switch Function	Switch closed	Switch open	No Power
LED	Light ON	Light ON	Light OFF

☀ : Light ON ○ : Light OFF

※ Cable with LED indicator on request (Max. 5M).

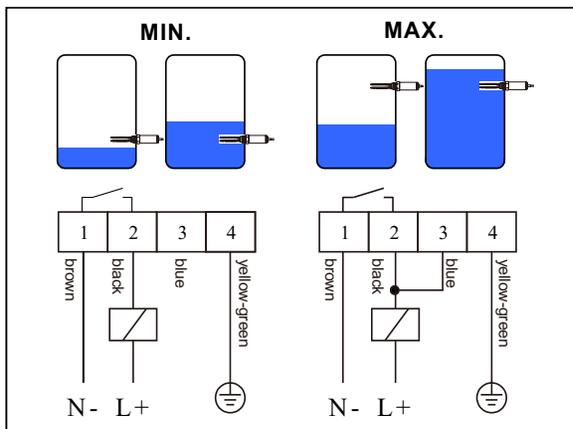
FUNCTION DESCRIPTION

SCS162 WIRING CONNECTION :

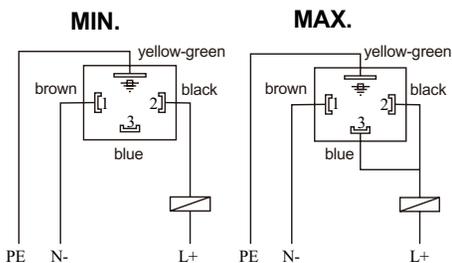
Supplied power is AC/DC, so it is 2-wire wiring connection. Relay output connects to 2-wire (L+/N-), as shown below.

◎ **Low Level (Min.) Operation Mode:** Connect pin 1 (brown) to N- terminal; Connect relay to pin 2 (black). Then, connect it to L+. Pin 4 (yellow-green) connects to ground. ◦

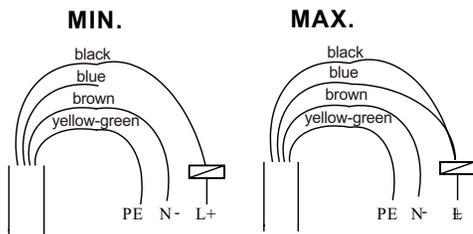
◎ **High Level (Max.) Operation Mode:** Connect pin 1 (brown) to N- terminal; Connect relay to pin 2 & 3 (black & blue). Then, connect it to L+. Pin 4 (yellow-green) connects to ground.



Connection for two-wire



Connection Diagram for DIN



Connection Diagram for M12x1, Cable

OUTPUT STATUS :

SCS162X series is 2-wire type power supply. Relay output connects to cable wire of power supply (L+/-). It provides Min. / Max. operation modes: When introduced 20~250, 50/60Hz Vac/Vdc power, the power indicator, green LED, on top of the housing will be activated. Detailed description is shown below.

◎ **Low Level (Min.) Operation Mode:**

After proper installation, the fork vibrates in 3 seconds after power introduced. Relay status is N/O, and the red LED is OFF; when the fork is covered by medium, relay switches to N/C, and red LED turns ON.

◎ **High Level (Max.) Operation Mode:**

After proper installation, the fork vibrates in 3 seconds after power introduced. Relay status is N/C, and the red LED is ON; when the fork is covered by medium, relay switches to N/O, and red LED turns OFF.

◎ Flashing red indicates abnormal:

Possible causes overloads or short-circuit load back, equipment malfunction or wear tuning fork probe.

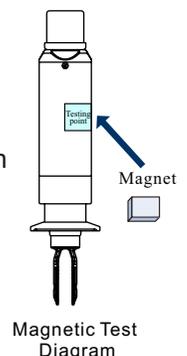
	Min. Mode		Max. Mode		
Status					Instrument failure
Switch Function	Switch open	Switch closed	Switch closed	Switch open	Switch open
LED					

✳ It represents Blinking

Min. / Max. Switch Mode Corresponding Status

MAGNETIC TEST :

After the switch is installed and powered, magnetic test function can be performed accordingly. The testing point is marked on the housing label. User holds the magnet and moves it close to testing point, the output status will switch from NO. to NC. or NC to NO. and red LED would switch ON or OFF while fork continues to vibrate. When magnet is pulled away from the testing point, the output status and red LED would return as default while fork continues to vibrate. The purpose of testing is to confirm the wiring and functioning are correct.



FUNCTION DESCRIPTION

SCS163 WIRING CONNECTION :

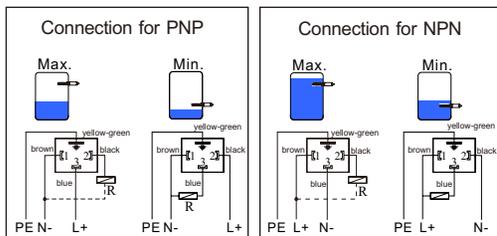
DC Power supply, PNP / NPN output. Wiring connection is shown below.

PNP Wiring Connection :

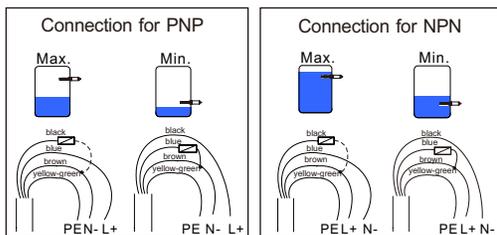
- ⊙ High Level (Max.) Operation Mode:
Pin 1 (brown) connects to N-. Pin 3 (blue) connects to L+. Output load connects to pin 2 (black), and then connect it to N-. Pin 4 (yellow-green) connects to ground.
- ⊙ Low Level (Min.) Operation Mode:
Pin 1 (brown) connects to N-. Pin 2 (black) connects to L+. Output load connects to pin 3 (blue), and then connect it to N-. Pin 4 (yellow-green) connects to ground.

NPN Wiring Connection :

- ⊙ High Level (Max.) Operation Mode:
Pin 1 (brown) connects to L+. Pin 3 (blue) connects to N-. Output load connects to pin 2 (black), and then connect it to L+. Pin 4 (yellow-green) connects to ground.
- ⊙ Low Level (Min.) Operation Mode:
Pin 1 (brown) connects to L+. Pin 2 (black) connects to N-. Output load connects to pin 3 (blue), and then connect it to L+. Pin 4 (yellow-green) connects to ground.



Connection Diagram for DIN



Connection Diagram for M12x1, Cable
Connection for output PNP/NPN

OUTPUT STATUS :

SCS163X series provides Min. / Max. operation modes based on the pin that is connected to ground: When introduced 12~55Vdc, the power indicator, green LED, on top of the housing will be activated. Detailed description is shown below.

- ⊙ **Low Level (Min.) Operation Mode:**
After proper installation, the fork vibrates in 3 seconds after power introduced. Transistor is non-contact, and red LED is OFF; when the fork is covered by medium, transistor switches to contact, and red LED turns ON.
- ⊙ **High Level (Max.) Operation Mode:**
After proper installation, the fork vibrates in 3 seconds after power introduced. Transistor is contact, and red LED is ON; when the fork is covered by medium, transistor switches to non-contact, and red LED turns OFF.

- ⊙ Flashing red indicates abnormal:

Possible causes overloads or short-circuit load back, equipment malfunction or wear tuning fork probe.

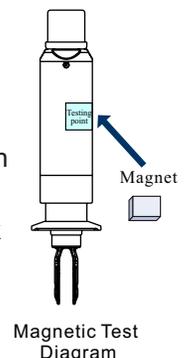
	Min. Mode		Max. Mode		
Status					Instrument failure
Switch Function	1 2 Switch open	1 2 Switch closed	1 2 Switch closed	1 2 Switch open	Switch open
LED					

It represents Blinking

Min. / Max. Switch Mode Corresponding Status

MAGNETIC TEST :

After the switch is installed and powered, magnetic test function can be performed accordingly. The testing point is marked on the housing label. User holds the magnet and moves it close to testing point, the output status will switch from NO. to NC. or NC to NO. and red LED would switch ON or OFF while fork continues to vibrate. When magnet is pulled away from the testing point, the output status and red LED would return as default while fork continues to vibrate. The purpose of testing is to confirm the wiring and functioning are correct.

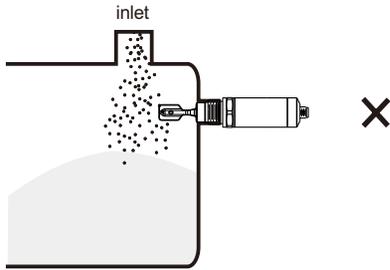


Magnetic Test Diagram

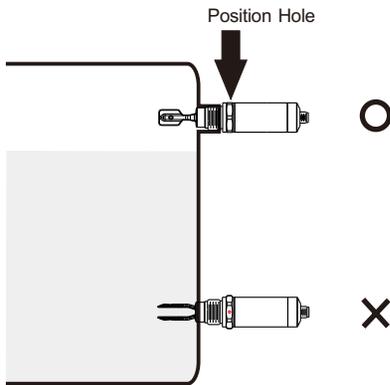
INSTALLATION

HORIZONTAL INSTALLATION:

1. Avoid material inlets

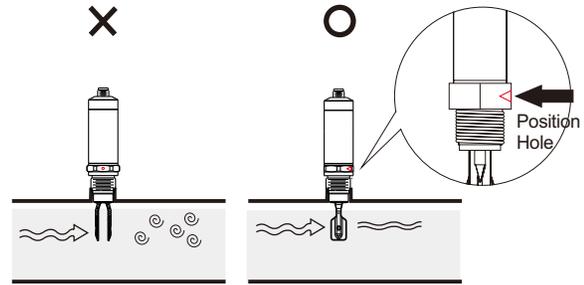


2. The position hole must face upward, otherwise, the flowing medium might press the fork and lead to product failure.

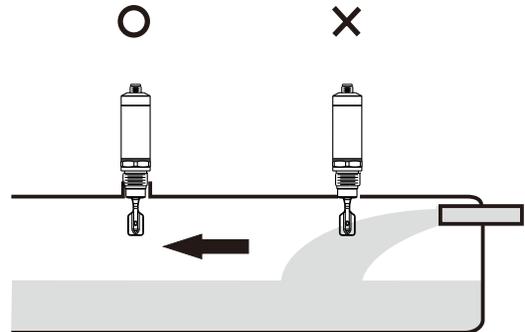


VERTICAL INSTALLATION:

1. When installed in a pipe with flowing liquid, the gap of the two forks shall be in the same direction as the liquid flowing direction.



2. Avoid material inlets



ORDER INFORMATION

SCS 1 0 0 0 0 - 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

09 Construction

- A: Standard
- B: Extended type

10 Input/Output

- A: 20~250Vac/Vdc, 50/60Hz ; 2 wire Contactless electronic switch
- B: 12~55Vdc ; 3 wire PNP/NPN Output

Connection

11 12

AI : 3A

13 14

- A8: 1"
- B1: 1-1/2"
- B2: 2"

15 16

00: None

17 18 Probe material

MC: SUS 316L

19 Tuning fork surface roughness

- A: Ra<0.3
- B: Ra<0.8
- C: Ra<1.5

20 Wiring

- A: M12 X 1 (180°C),2m
- B: M12 X 1 (90°C),2m
- C: Cable,2m
- D: DIN Connector

21 22 23 24 Length

Code	Probe Length
0100~0250	100~250mm

SCS 2 0 0 0 0 - 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

09 Construction

A: Standard

10 Input/Output

A: 10~35 Vdc, 3 wire DC connector PNP

Connection

11 12

AD: DIN

AI : 3A

AA: JIS

13 14

A7: 3/4"

A8: 1"

B1: 1-1/2"

B2: 2"

E1: DN40

15 16

00: None

03: PF male

17: G male

17 18 Probe material

MC: SUS 316L

19 Tuning fork surface roughness

A: Ra<0.3

B: Ra<0.8

C: Ra<1.5

20 Wiring

A: M12 X 1

B: M12 X 1 (90°C) PVC 24AWG with LED

C: M12 X 1 (90°C) PVC 24AWG no LED

21 22 23 24 Length

Code	Probe Length
0069~0069	69mm

EGS SANITARY MAGNETOSTRICTIVE LEVEL TRANSMITTER

WORKING PRINCIPLE

Magnetostrictive Level Transmitter is based on the principle that two different magnetic fields intersect create a torsion wave. Computing the time cycle that is needed to detect this signal will get the exact distance (D).

The two magnetic fields, one comes from dynamic magnet outside the transmitter, and the other is from current pulse on the metal wire inside the transmitter. The current pulse is generated by current of the transmitter. When the two magnetic fields intersect, a torsion wave is generated. This signal travels back at a fixed speed to the sensor of the transmitter in the way of ultrasound. The time cycle from the time when a current pulse is generated to the pulse travels back the sensor multiples fixed speed will get the exact distance of the dynamic magnet. The process is non-stop. Whenever the magnet moves, new location will be detected immediately. Output signal is absolute output.

FEATURE

High resolution and high accuracy, easy installation, free of maintenance and calibration, stable and reliable Anti-pollution, anti-dust, resistant to high pressure

Housing is made of corrosive resistance seamless Stainless Steel.

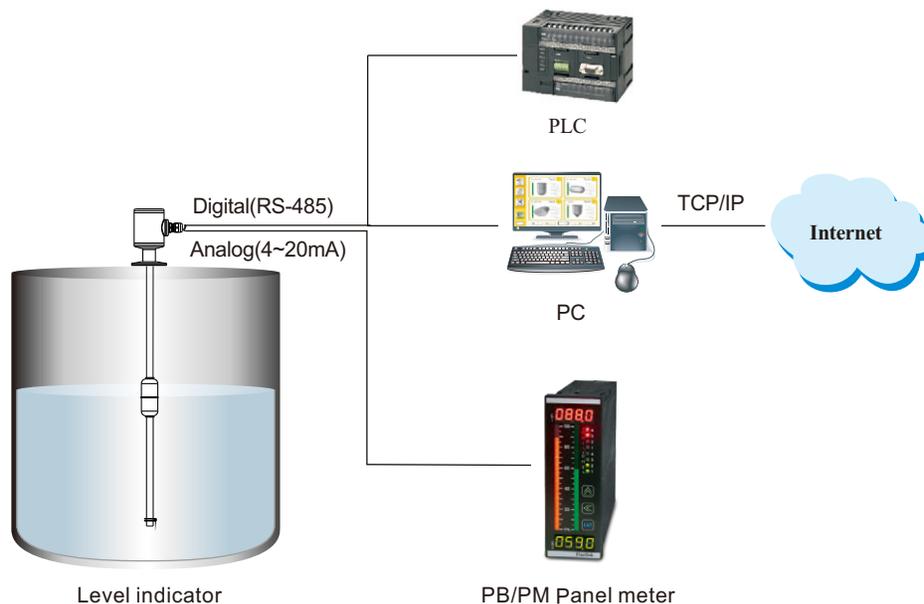
Remote control via PC

Working temperature -40~ +125°C

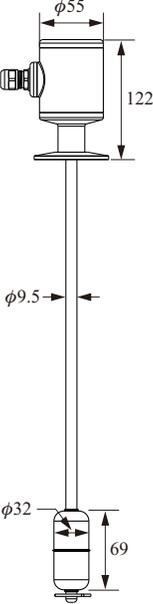
Oil/Water interface detection

APPLICATION

- High temperature disinfection (125°C)
- High pressure cleaning
- CIP cleaning system
- SIP disinfection system
- Pasteurization system
- Pharmaceutical equipment
- Beverage, drinking water, edible oil
- Food filling and level control
- Temperature measurement



SPECIFICATION

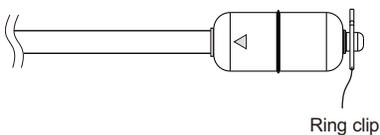
Dimension (Unit:mm)	
Model No.	EGS15
Housing	SUS316
Wetted Parts	SUS316/SUS316L
Polishing (um)	Ra<0.3 or Ra<0.5 or Ra<0.8
Measuring Range	25mm~2500mm
Temperature Sensor	PT100
Temperature Accuracy	± 1°C
Ambient Temp.	-40~85°C
Working Temp.	-40~125°C
Power Supply	12~30Vdc
Output Current Mode	4~20mA/20~4mA
Output Current Resistance	<500(ohm)
Output Voltage Mode	0~10V,10~0V,0~5V,5~0V, ± 10V, ± 5V
Output Voltage Ripple	<10mV
Output Voltage Resistance	2KΩ
Sampling Rate	500 time / sec.
Linearity	± 100um@500mm or ± 0.02% FS
Repeatability	± 0.002% F.S.
Hysteresis	± 0.004% F.S.
Communication Output	RS485
Protection Rate	IP67(Housing)/IP69K(Probe)
Connection	1-1/2"~2"(Sanitary)
Working Press.	10bar(Max)

INSTALLATION

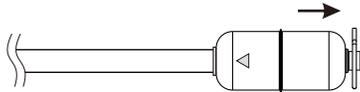
- 12Vdc~30Vdc
- The product is calibrated by the manufacturer. Users shall not change the measuring ranges by themselves.
- Do not bend the stem as it will destroy the measurement accuracy of the product.
- Do not change the float of the product as it will affect the measurement accuracy of the product.
- The product can be installed directly without taking off the float if the diameter of the process connection hole is bigger than the float.
- If the diameter of the float is bigger than the diameter of the process connection hole, it is necessary to take off the float before installing. While re-installing the float, mark on the float has to be pointing at the direction of the product housing.
- The stopper must be fixed well on the stem core.
- Please keep the float from dropping down as attack on the float might result in magnet breaking inside the float which will lead to product failure.
- The product should be well packed by vibration-absorbed packing material, such as, bubble or foam bags, to ensure safety during delivery.
- Due to accuracy concern, do not open then cover of the housing.

INSTALLATION METHOD IF THE FLOAT HAS TO BE TAKEN OFF BEFORE INSTALLATION

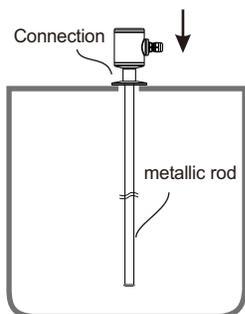
STEP 1:
Remove the ring clip
from the stem.



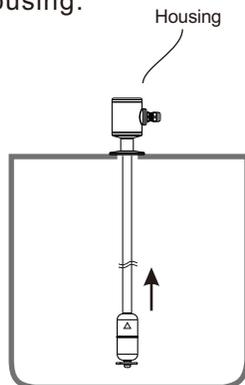
STEP 2:
Take off the float.



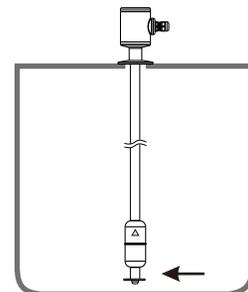
STEP 3:
Install the product into
the tank and screw tight
the process connection.



STEP 4:
Install back the float to the
stem, and the mark on the
float should be pointing at
the direction of the product
housing.



STEP 5:
Screw the ring clip well
on the core of the stem.



SPS SANITARY THERMAL DISPERSION FLOW SWITCH

WORKING PRINCIPLE

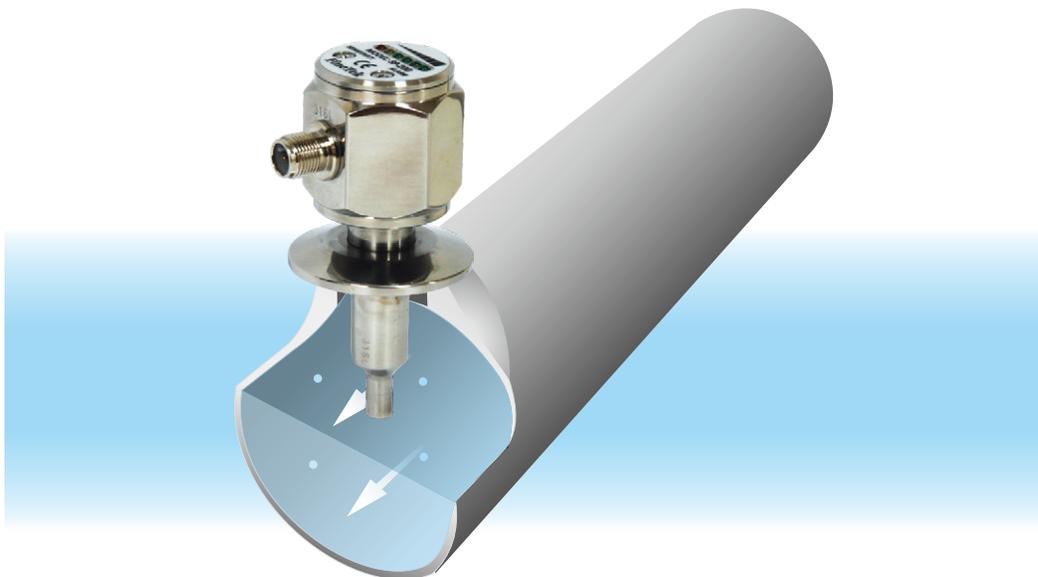
Thermal Dispersion Flow Switch is a reliable and accurate flow switch based on thermal dispersion principle. Two temperature sensors are built inside the probe of the product. One sensor is heated, and the other is used as a reference to detect the temperature of the medium. This creates a temperature difference between two sensors, and switch changes state once it reaches the set point. Temperature difference is an inverse ratio to the flow velocity. Material of the probe and housing are stainless steel or engineering plastic. Since the device is without moving parts, there is no wear and tear problem.

FEATURE

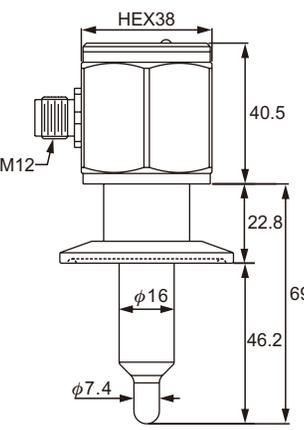
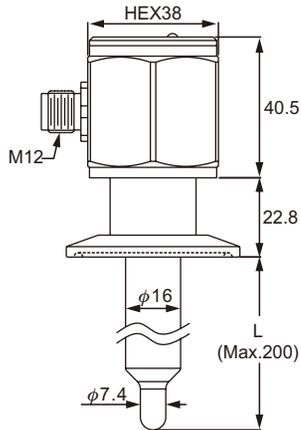
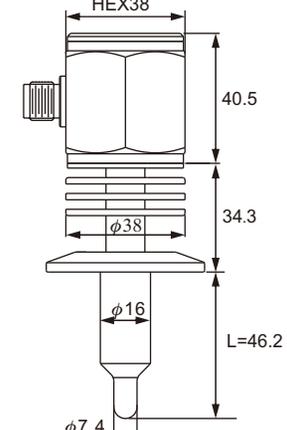
Compared to the traditional paddle type flow switch, thermal dispersion flow switch offers high sensitivity, no limitation on installing location, and no moving parts tear and wear. Suitable for liquid application with impurities. Different materials on request for food / food additives application. Probe lengths are customized to meet any application. Three different signal outputs are available for selection.

APPLICATION

Food, Beverage, Drinking Water, Edible Oil, Food Process Filling, Pharmaceutical, High Temperature Disinfection, etc. Any pipes flow control.



SPECIFICATION

<p>Dimension (Unit:mm)</p>			
<p>Model No.</p>	<p>SPS200-□□□-□-□ Compact Type</p>	<p>SPS201-□□□-□-□ Extension Probe Type</p>	<p>SPS202-□□□-□-□ High temperature Type</p>
<p>Measuring Range (Velocity)</p>	<p>Water: 1~150 cm/s Oil: 3~300 cm/s</p>		
<p>Measuring Range (Velocity)</p>	<p>-20 ~ 80°C</p>		
<p>Working Temp.</p>	<p>-20 ~ 80°C</p>		<p>-20 ~ 120°C</p>
<p>Alarm</p>	<p>Transistor: NPN / PNP (<400mA) Relay: 1A/30Vdc, 0.3A/125Vac (N/O or N/C)</p>		
<p>Working Press</p>	<p>100 bar (max.)</p>		
<p>LED Display (Velocity below set point)</p>	<p>Red LED ON, Open Yellow LED ON, Close 4 Green LED indicates the speed of flow, the output turns on</p>		
<p>Housing</p>	<p>SUS316L</p>		
<p>Wetted Parts</p>	<p>SUS 316L</p>		
<p>Protection Rate</p>	<p>IP67</p>		
<p>Warm-Up</p>	<p>Approx. 15 seconds</p>		
<p>Process Connection</p>	<p>3A</p>		
<p>Power Supply</p>	<p>19 ~ 30Vdc</p>		
<p>Power Consumption</p>	<p>50mA (max.)</p>		
<p>Electrical Connection</p>	<p>3-wire NPN / PNP: Power-Brown; GND-Blue; Output-Black 4-wire Relay: Power-Brown; GND-Blue; Relay contact-Green, Black</p>		
<p>Accessory</p>	<p>Waterproof Cable Conduit</p>		

INSTALLATION

- (1). "a" has to be 4 times bigger than the internal diameter of the pipe, "d". (See Fig. 1).
- (2). Liquid inside the pipe must be bubble-free to ensure alarm working properly. (See Fig. 2).
- (3). When the pipe is not fully filled with liquid, SPS must be installed underneath the pipe, and liquid level has to be higher than the sensing probe. (See Fig. 3)
- (4). SPS must be screwed tightly at installation to avoid liquid leakage from the pipe and cause danger. SPS can be installed at any angle. For best sensitivity and response speed, please refer to the installation in Fig. 4.
- (5). For liquid that contains impurities or particle, please install a filter upstream to protect SPS from being crashed by impurities.

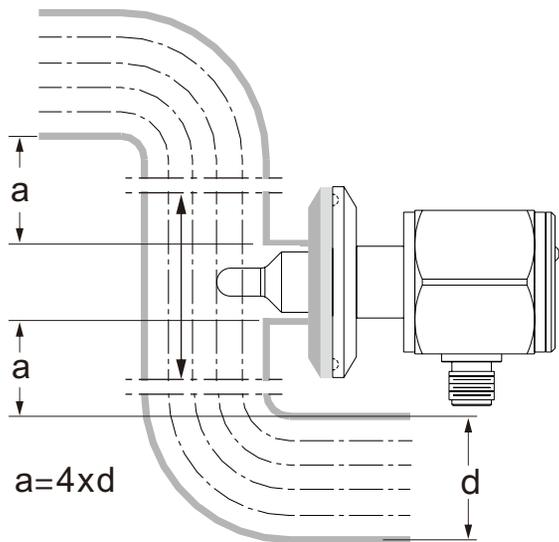


Fig. 1

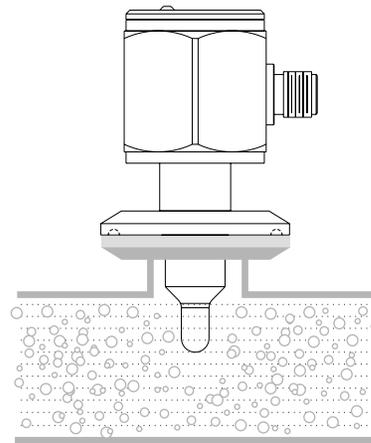


Fig. 2

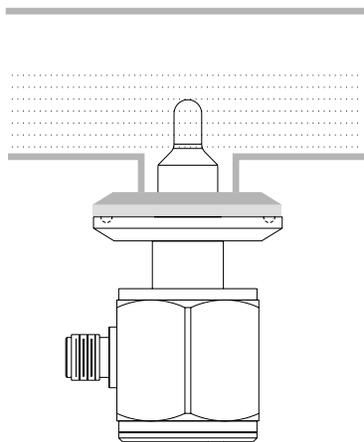


Fig. 3

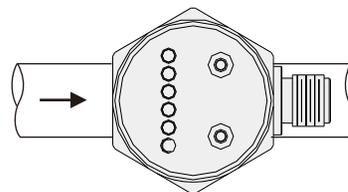


Fig. 4

CONNECTOR DIAGRAM

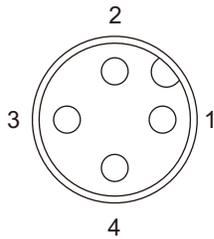


Fig. 5. Electrical Connection Diagram (NPN & PNP Output)

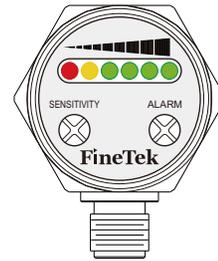


Fig.6

WIRING

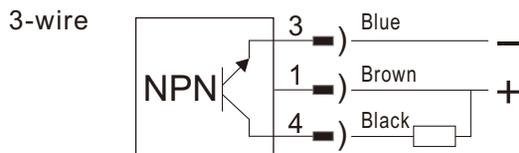


Fig. 7, NPN Output

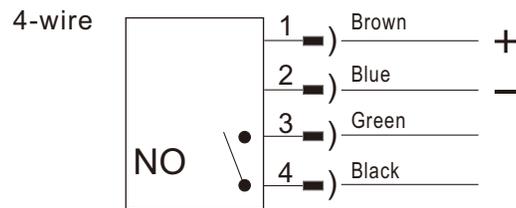


Fig. 10, Relay Output (NO)

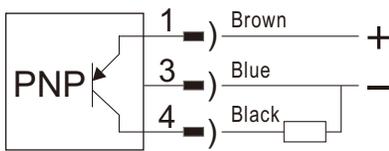


Fig. 8, PNP Output

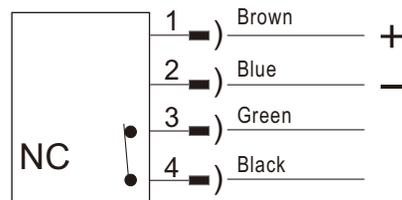
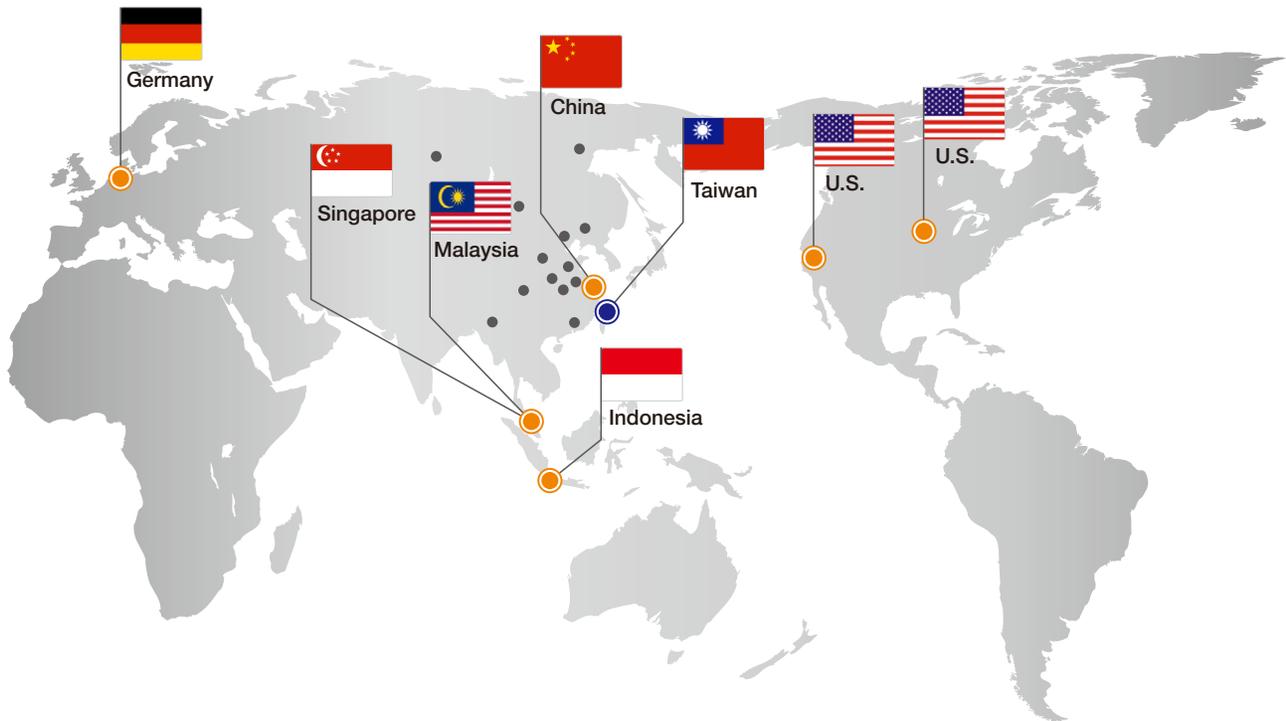


Fig. 11, Relay Output (NC)

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