

SHICO. CAPACITY TYPE LEVEL SENSOR

MODEL : SCL Series

The static capacity type level sensor is designed to operate the output relay through a high frequency oscillation circuit by detecting the specific inductive capacity by means of a measuring electrode and an earth electrode.

The detection will be easier as the deviation from the atmosphere (generally, dielectric constant $\epsilon = 1$) is larger.

The essential points in detecting the level of an object with the static capacity type level sensor are, besides the sensitivity of detection, the shape, dimensions and material of the sensor. We offer the following choices as the standard types, and we can also manufacture according to special specifications upon request.

■ APPLICATION

- Liquid : For fuel, solvent, acid, alkali, liquefied gas, pure water, and others.
- Mixed liquid : Factory waste, sewage, agricultural chemicals slurries, manufactured goods, and solution.
- Interface : Oil and water mercury in the water alcohol and acid, sediment in the water liquid and foam.
- Foam : latex foam, beer foam, soap foam, and others.
- Viscous : Mud, sludge, excrements tar, warnish, paint, grease, adhesive paste, soap, paraffin, cheese, honey, and others.
- Powder : Plastic powder, slaked lime, carbon, iron oxide, powder, dust, soil and sand, sugar, flour and others
- Granule : Plastic pellet, metal pellet, chemical fertilizer, medicine, grains, foods and others.

■ OPERATION PRINCIPLE :

Both capacitance and conductance between the electrode and the wall of tank change when the material contacts the electrode inserted in the tank. And this impedance variation is taken out as electric signal (On-Off).

Thus the level or interface is detected.



Standard type



Flange type

■ FEATURES

1. We have prepared many types of sensors (electrodes) assuming every possible application.
2. Products used in common measurements are standardized and mass-produced so as to improve the quality and reduce the cost.
3. The function unit of the integral type is assembled by plug-in fitting, so that the whole unit can be replaced easily.
4. The pilot lamp is built in, and the adjustment is also very easy.
5. Since the parallel resonance circuit is employed, the high frequency circuit can be extended.



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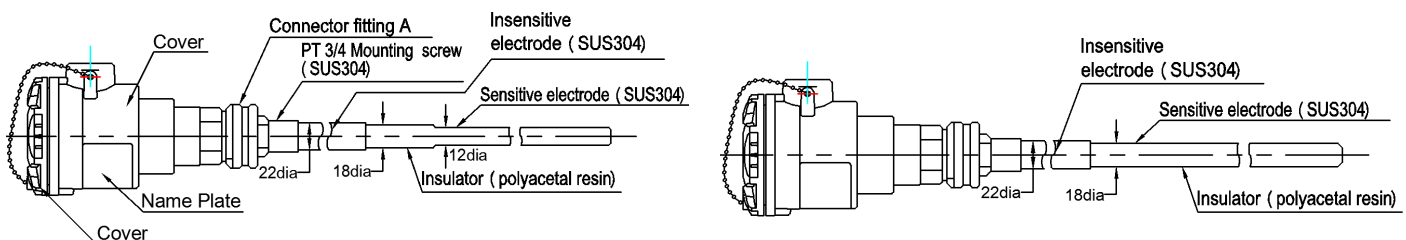
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■ STANDARD SPECIFICATION

- Instrument power source : 24VDC
110/220VAC±10% 50/60Hz
- Power consumption : 4.5VA
- Output contact : SPDT 200V AC, 1A resistive load
- Ambient temperature allowance : -25℃~+70℃
- Stabilized detection range :
 1. For high sensitivity 0.5~20pF
 2. For standard sensitivity 2~50pF
 3. For low sensitivity 2~1,000pF
 4. For ultra low sensitivity 2pF~5pF
- Delay time setting : Max. 10sec. variable
- Side ward loading at electrode : Top end load (ℓ: 250) 100kg
(Special specification : 500kg)
- Pressure withstand at electrode : 10kg/cm² (Special specification : 300kg/cm²)
- Allowable working temperature : -25℃~+80℃(electrode)
(Special specification : -45℃~+500℃)
- Impact : 10G at electrode
- Vibration : 2mm 600~3,600/min
in all directions for three hours
- Construction : Water tight
- Painting color : Silver

■ PARTS NAME



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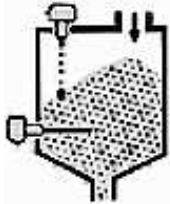
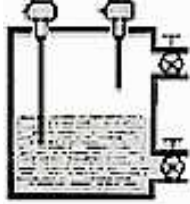
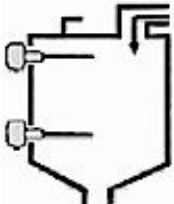
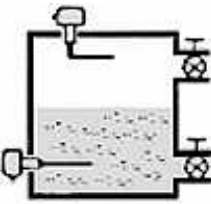
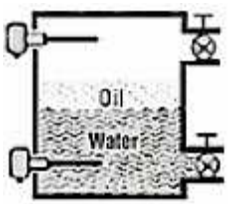
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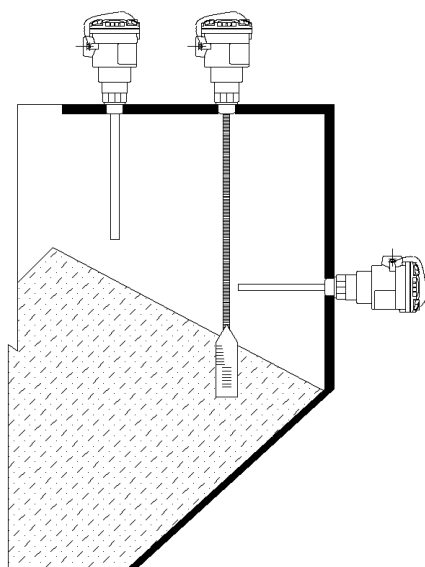
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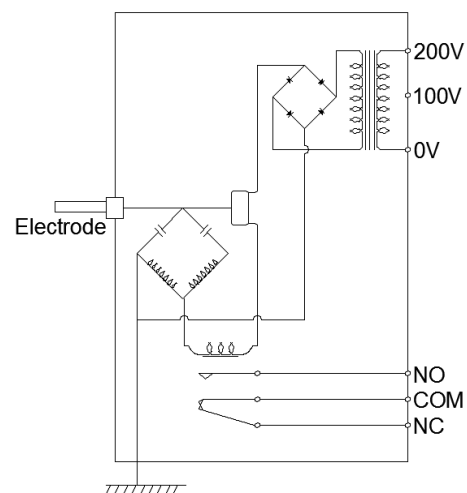
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SELECTION OF ELECTRODE BY SUBSTANCE AND SHAPE OF TANK

	Fodder	Substances related to chemical industry	Substances related to steel industry	Substances related to food industry	De oiling (separation of oil and water)
Substance subject to level control	Maize ($e_s=2.3$ to 2.6) Soybean cake ($e_s=2.7$ to 2.8) Wheat flour ($e_s=2.2$ to 3.0)	Trichlene ($e_s=3.4$) Barium nitrate ($e_s=5.0$ to 6.0) Sulfur (liquid) ($e_s=3.4$)	Silica sand ($e_s=2.5$ to 3.5) Aluminum oxide ($e_s=2.0$ to 2.2) Gravel ($e_s=5.4$ to 5.6) Ferric oxide ($e_s=1.4$ to 1.8)	Edible oil ($e_s=1.8$ to 2.2) Margarine(liquid) ($e_s=2.8$ to 3.2) Granulated sugar Powdered) ($e_s=1.5$ to 2.2)	Heavy oil, crude oil, vegetable oil ($e_s=2$ to 10) Industrial water, see water, pure water ($e_s=70$ to 80)
Shape of tank & Mounting location					
Electrode	For upper-limit control : Wire electrode (3000mm max.) is most suitable. For lower-limit control : 20-mm dia. load resistant electrode applicable to loads of up to 73kg (safety factor 4)	Coated electrode (with a coating of ethylene trifluoride resin or hexafluoride ethylene resin) or chemical resistant electrode (SUS316, hastelloy B)	Load resistance electrode	Standard electrode or L-shaped electrode (ideal for applications where higher precision is vital)	Standard electrode or coated electrode (where oil contains solvent or corrosive ingredient)



CIRCUIT DIAGRAM



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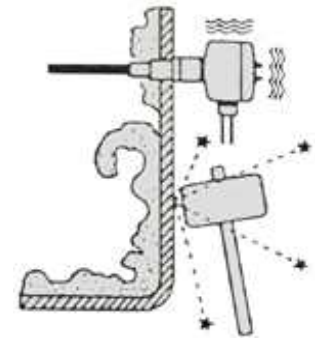
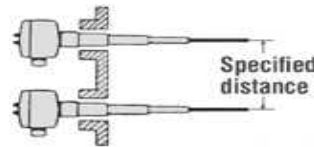
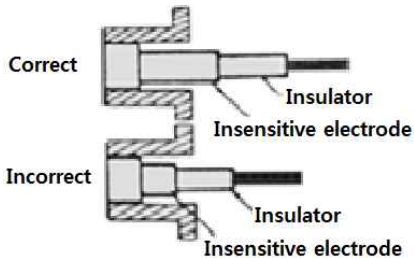
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Hints on Correct Use

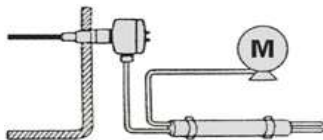
- When using the electro static capacity type level switch, pay adequate attention to the following items :
- Be sure to install the level switch so that the inner wall of the tank

- When two or more level switches are to be juxtaposed in the same tank, be sure to provide a specified distance between the two sensitive electrodes, to prevent mutual interference.

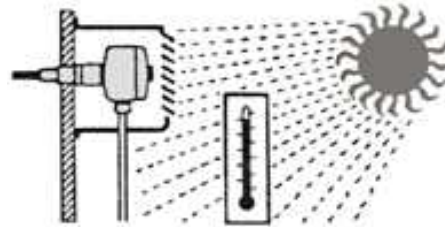
- Before striking the tank wall with a wood hammer to remove the substance adhering to it, remove the main circuit section (i.e. head section) of the level switch.



- The level switch is provide with adequate countermeasure against surge current. However, to improve switch power line by not routing the switch cable through the same duct or conduit tube as that used for the power line.



- In outdoor applications, be sure to use a cover to prevent the temperature of the switch circuitry from direct sunlight.



Mounting without flange	Mounting with flange	Mounting with flange mounting base
<p>For the electrode mounting section, taper pipe thread(PT $\frac{3}{4}$) is provided. When mounting the electrode section directly to the tank, use a conduit tube and screw it in the pipe thread to attach the electrode section to the tank. In this case, be sure that the insensitive electrode will protrude 10 to 20mm from the inner wall of the tank.</p>		<p>Determine the length of the flange pipe section of the flange mounting base in connection with the length of the insensitive electrode.</p>
Mounting with flange in a thick wall	Substance is apt to adhere to the electrode	Vertical mounting
<p>Where use of a longer mounting thread its necessary, be sure to use a longer insensitive electrode accordingly.</p>	<p>Where an excessive amount of residual substance adheres to the electrode section, be sure to extend the length of the insensitive electrode as much as possible.</p>	<p>This methode is effective where the tank has a small diameter, the shape of the tank is unfit for horizontal mounting, or where viscous substance is subject to level control.</p>



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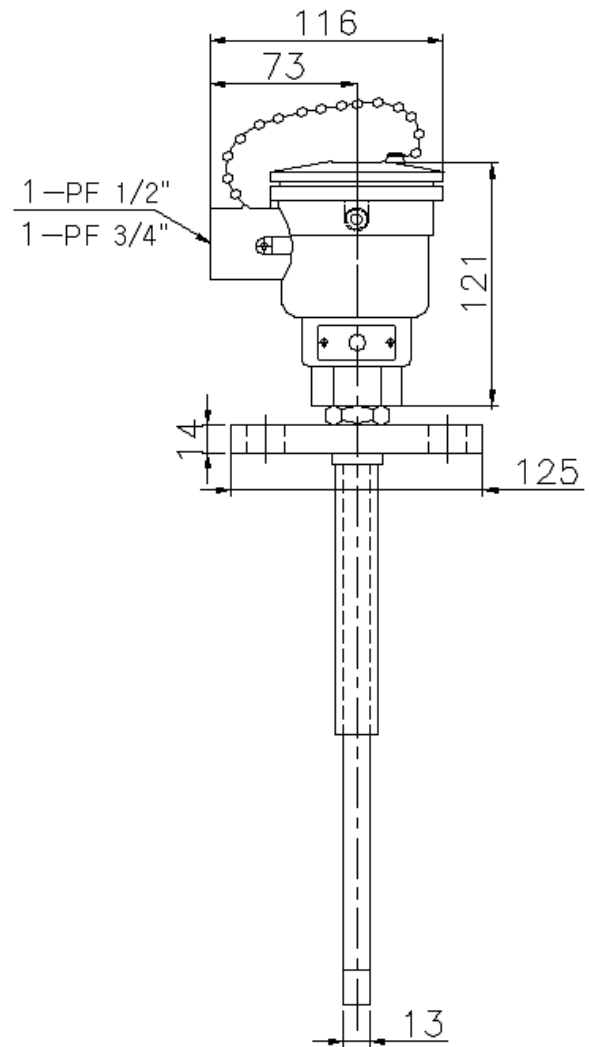
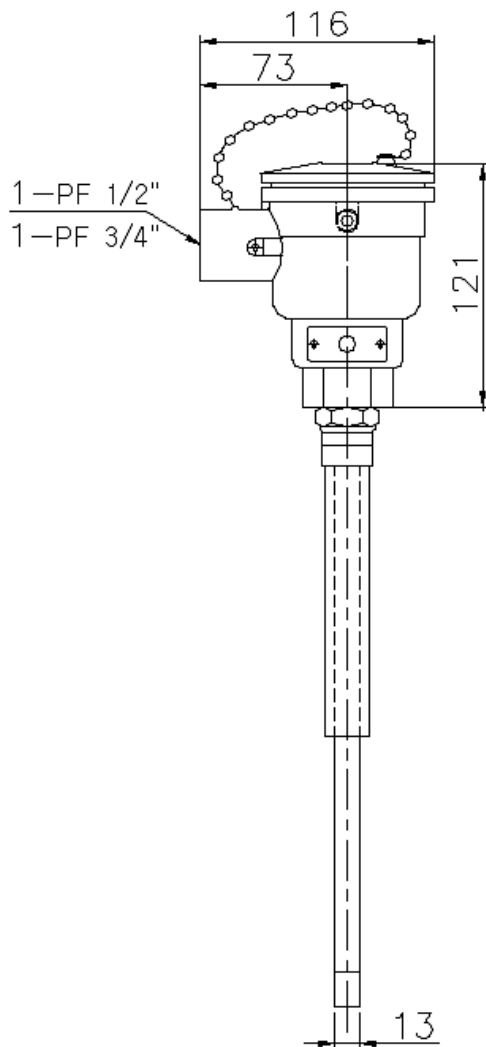
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■ DIMENSION

- Standard Type -

- Flange Type -



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■ ORDERING INFORMATION

MODEL	
POWER SUPPLY	
A	24VDC
B	100/220V (50/60Hz)
CONNECTION	
1	PF 1
2	SCREW PF 1/2
3	PF 3/4
4	Flange User requirement
LEVEL LENGTH	
1	STD 250mm,
2	User requirement
PROTECTOR CERTIFICATION	
1	IP57
2	Water Proof
3	Explosion Proof

SCL -				
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