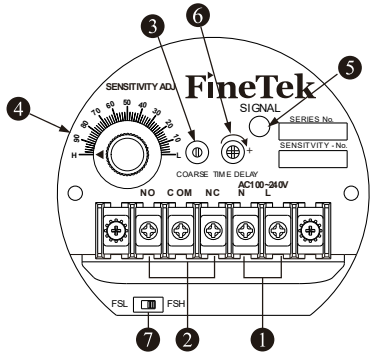
SA27(SAX10□7C)Capacitance Level Switch Operation Manual

※ When there are materials or mixtures with multiple characteristics such as high/low dielectric and conductive haracteristics simultaneously (for example; silica sand in the glass industry, etc), it must be tested on the site first, to etermine whether the sensor is suitable or not. If there still exists measuring problems, we suggest using our uning Fork Level Switch (SC) or Rotary Paddle Level Switch (SE).

PANEL FUNCTION



SA27 UL Type

①: Power supply
②: Output terminal
③: Coarse calibration
④: Sensitivity adjustment
⑤: Material indicator
⑥: Delay time adjustment
⑦: Fail-Safe protection adjustment

CONTACT & LED INDICATOR

1. LED off when no contact or empty tank.
2. LED on when contact or full tank.

Operation Mode	LED Indicator	Relay Output	3-Wire NPN Output	3-Wire PNP Output	4-Wire NPN/PNP Output
FSH	red ●	COM. N.O. N.C.	O/P 0V	24Vdc O/P	COM N.O.
	red ☼	COM. N.O. N.C.	O/P 0V	24Vdc O/P	COM N.O.
FSL	red ●	COM. N.O. N.C.	O/P 0V	24Vdc O/P	COM N.O.
	red ☼	COM. N.O. N.C.	O/P 0V	24Vdc O/P	COM N.O.
Power failure	red ●	COM. N.O. N.C.	O/P 0V	24Vdc O/P	COM N.O.

NEPSI Ex ia/db IIC T3...T6 Ga/Gb
Ex ia/tb IIIC T85℃...T200℃ Da/Db

SPECIAL CONDITIONS FOR SAFE USE OF PRODUCTS

1.The user should contact the manufacturer directly if detailed information regarding the product is required.
2.If the product sensor bar is made of or coated with non-metallic materials, specific measures should be taken to prevent the danger of static electrical explosion.

PRECAUTIONS FOR RRODUCT USE

1. The safety parameters of the electrostatic capacitance level switch are listed below：

- Power supply : maximum voltage Um : 250V
- Supply voltage / Contact rating : 110~220Vac±10% ,24Vdc±20%
- Power consumption : 2W
- Contact output : maximum voltage Um : 250V
- Relay (SPDT) : 5A / 250 Vac, 5A /28 Vdc
- Transistor (three-wire PNP or NPN) : 400mA/24Vdc±20%
- Transistor (four-wire PNP or NPN) : 400mA/60Vdc

Type.SA27□	Temperature Group	Medium Temperature(℃)
2,7 High Temperature Type	T6/T85℃	-20~+80
	T5/T100℃	-20~+95
	T4/T135℃	-20~+130
	T3/T200℃	-20~+195
4, Acid & Alkali Resistant Type	T6/T85℃	-20~+80
	T5/T100℃	-20~+95
	T4/T135℃, T3/T200℃	-20~+120
0,1,3,5,6,8 Normal Temperature	T6/T5/T4/T3 T85℃/T100℃/ T135℃/T200℃	-20~+80

(Figure1)

2. Open the product only after the power supply is cut off.
3. The cable entry port must be equipped with a cable entry device or a plug. The component must be explosion-proof certified according to GB3836.1-2010(IEC 60079-0:2007),andGB3836.2-2010(IEC 60079-1:2007) The explosion-proof type is IIC Gb or Ex db IIC, and connection type is 1/2NPT. The minimum number of clamps is 6. The installation and use of the cable entry device or the plugging device must comply with the requirements as stated in the instruction manual. Ensure that the cover's protection level reaches IP65, and that it meets the requirements of GB4208-2008(IEC 60529:2001) standard.
4. The user should keep the product's surface cover clean to prevent dust from accumulating. Do not use methods such as blowing with compressed air to prevent dust clouds from raising and forming.
5. The user should not replace the product parts by himself. Contact the product manufacturer to resolve any operational problems and prevent damage.
6. The relation between the temperature group and medium temperature range is as follows (refer to Figure 1).
7. Installation, use and maintenance of the product should comply with the instructions found in the product manual and the following standards:

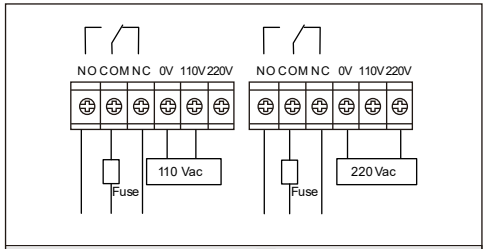
- GB3836.13-1997(IEC60079-19:1993) "Electrical Equipment for Explosive Gaseous Atmosphere Part 13: Repair of Electrical Equipment for Explosive Air Pressure".
- GB3836.15-2000 (IEC 60079-14:1996) "Electrical Equipment for Explosive Gaseous Atmosphere Part 15: Electrical Installation in Hazardous Locations (except Coal Mines)".
- GB3836.16-2006(IEC 60079-17:2002) "Explosive Electrical Equipment for Gaseous Environment Part 16: Inspection and Maintenance of Electrical Installations (except coal mines)".
- GB15577-2007"Dust Explosion Safety Precautions".
- GB12476.2-2006(IEC 61241-14:2004)"Electrical Equipment for Combustible Dust Environment Part 1: Electrical Equipment Protected by Covers".
- GB50257-1996"Electrical Equipment Installation and Engineering in an Explosive and Fire Hazardous Environment".

DELAY TIME SET UP

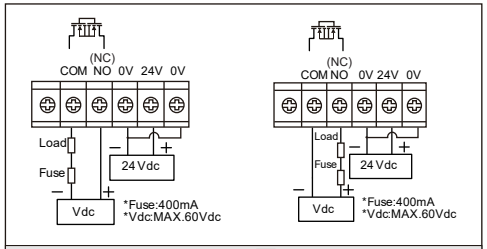
The default Delay Time setting is 0 second. When probe contacts with material, LED indicator is turned on and relay or PNP/NPN output will be activitated. Turn the "Delay Time Adjustment" button clockwise to set up delay time. After delay time is set, when probe contacts with material, LED is turned on but the relay or PNP/NPN output will not be generated immediately until delay time is up. Delay time function is applicable for liquid tanks with agitator, or solid tanks which the medium will have sudden impact or contact with probe.

CAUTION FOR WIRING

SA27 Euro Type



SA27□A



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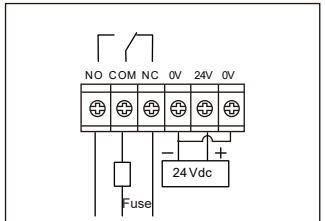
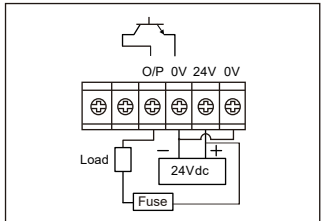
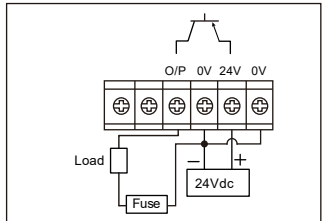


SA27□B

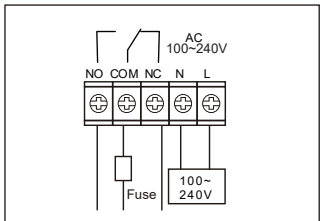


SA27□C

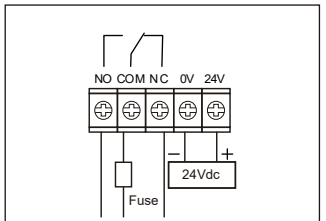


SA27□E

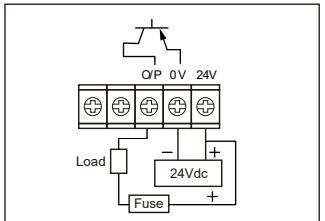
SA27 UL Type



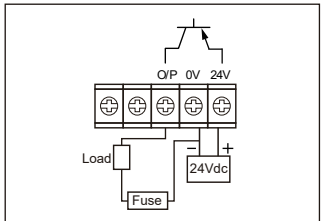
SA27□M



SA27□N

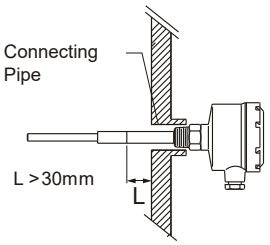


SA27□P

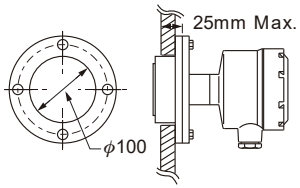


SA27□Q

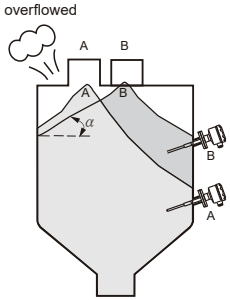
INSTALLATION



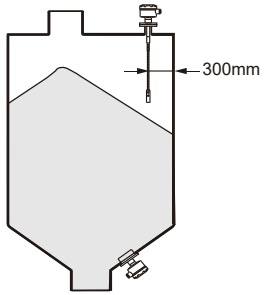
The insulation part must be 30cm inside the tank at least to ensure sensitivity is adjustable and to avoid false action when medium build up.



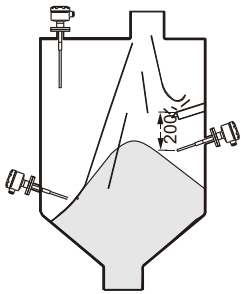
For SA27 Plate Model installation, thickness including tank wall & connection flange must be less than 25mm to advoid false action.



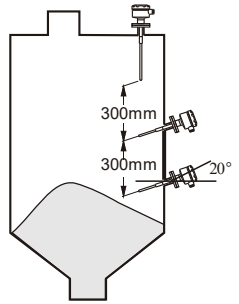
Be cautious with installation location. Angle of repose must be considered if inlet is not located in center top of the tank.



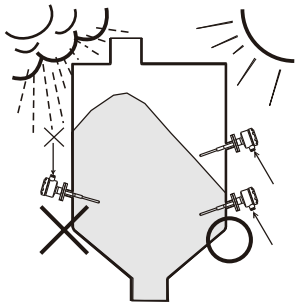
For top mounting, angle of repose must be considered when installation. SA27 Wire Probe Model must be installed min. 300mm from tank wall. SA27 Plate Model is applicable for bottom mounting.



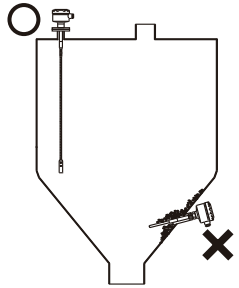
It's recommended to install the switch away from material inlet to avoid damage. If switch must be installed near inlet area, a protective cover must be placed 200mm on top of the switch.



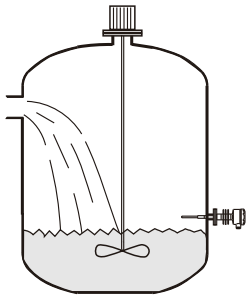
When multiple switches are installed, keep at least 300mm distance for each switch.



Cable entry must face down firmly locked to avoid rain damage.



Top mounting is recommended for medium with poor flowability to avoid medium build up.



Switches with delay time function is recommended for tank with agitator to advoid false action.

CALIBRATION (ROTARY KNOB)

INITIAL CALIBRATION

1. After installation with power supply, make sure no material within 300 mm around the probe.
2. Turn the "SENSITIVITY" to the "H" position (Figure 2).
3. Using flat-head screwdriver to turn "Coarse" clockwisely for adjustment until LED indicator is on.
4. Turn the knob clockwise from H position to 90% position about 1/2 circle (95% position) until LED indicator shut off (Figure 3). Then, Initial calibration is complete. After that, please continue to next step "SENSITIVITY ADJUSTMENT".

SENSITIVITY ADJUSTMENT

1. Make sure the "Indicator" sign does not light up, when the medium does not contact with the probe, and vice versa, when the medium contacts or covers the probe, then the "Indicator" sign lights up.
2. Gradually, adjust the capacitance value (turn the knob clockwise to the "L" direction) until "Indicator" light turns off.
3. Record the turning angle from "Indicator" sign lights up status to turn off status, then reset "SENSI TIVITY ADJ" by turning the knob counterclockwise back for half of the recorded turning angle.
4. Based on the previous experience, 70% (Figure 4) adjustment position can be used to most of mediums (Need to do INITIAL CALIBRATION first).

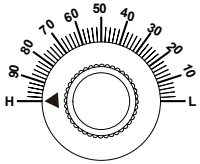


Figure 2

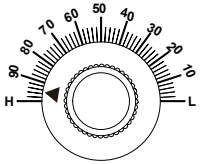


Figure 3

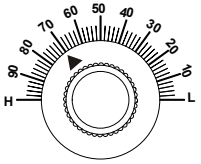


Figure 4

MAINTENANCE & TROUBLE SHOOTING

Circumstance	Possibility Cause	Inspection / Evidence	Trouble Shooting
Water get into housing	Enclosure is not firmly locked	Enclosure is loose	Lock the enclosure firmly
	Seal ring aged & failed	Seal ring aged	Replace seal ring
	Cable entry is not firmly locked	Cable entry is not firmly locked	Lock the cable entry firmly
	Cable entry does not face down	Cable entry faces up	Turn the cable entry & face down
	Cable wire does not connected downward	Cable wire is connected upward	Connect the cable downward
	Diameter of cable wire does not fit	Cable wire is loose	Replace cable with diameter 8mm~10mm
Level up & down but switch / relay no response	Sensivity Adjustment knob is activated by mistake	Position of Sensivity Adjustment knob is abnormal	Re-adjust sensivity
	False wiring of power & signal cable	False wiring of power & signal cable	Re-wiring according to wiring guide
	Circuit damaged by EMI	Dry powder or high speed frictioin	Replace with anti-static model
	Dielectric constant of medium is too small.	Continuous action when coarse or fine adjustment	Contact your local business representative
Level up & down but switch on/off continuously non-stop or relay can't be reset	Humidity inside tank is over limit	Probe with water or dew	Replace probe with coating
	Probe contacts with tank wall	Probe contacts with tank wall	Re-install and avoid grounding
	Circuit damaged by EMI	Dry powder or high speed frictioin	Replace with anti-static model
	Dielectric constant is over limit	Continuous action when coarse or fine adjustment	Contact your local business representative
Unstable switch signal.	Wiring terminals are loose	Loose screw bolt	Lock screw bolt firmly
	Process connection is not firmly locked	Loose thread	Lock thread or flange firmly
	Short-circuit due to aging	Idle loop, resistance abnormal	Revise external layout
	Abnormal of supply voltage	Supply voltage over limit	Restore power supply
	Loose structure due to vibration	Obvious vibration environment	Replace with remote model

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

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