BLX

CAPACITANCE TYPE LEVEL SWITCH

USER MANUAL



KANSAI Automation Co.,Ltd.

KTC-BLX-E090828

PRECAUTIONS FOR USE

- Please read this manual prior to installation and use of the instrument, and keep it readily available for your use.
- Please take adequate precautionary measures to prevent subsequent accidents or damages from occurring in case of the instrument failure.
- Please do not use the instrument under the circumstances involving a human fatality.

Safety Precautions

The manual shows the following two marks to be observed in order for you to operate the instrument safely and efficiently.

Mark	Meaning
⚠ Warning	" Incorrect handling may result in a fatal or serious injury accident "
⚠ Caution	" Incorrect handling may result in a human injury or physical damage "

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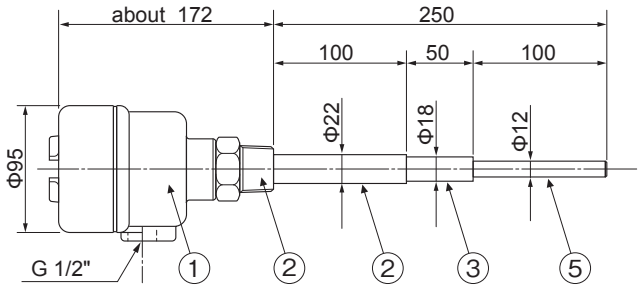
1. Standard Specifications

Power Source	: 105VAC / 210VAC ±10% 50/60Hz
Power Consumption	: 3.5VA
Output Contact	: SPDT × 1
Contact Capacity	: 250VAC 5A 30VDC 5A (Resistance load) *Minimum current load 10mA (24VDC)
Stable Detection Range	: 1. High sensitivity : 0.5 – 20pF 2. Standard sensitivity : 2 – 50pF
Allowable Temperature (Amplifier)	: −25 – +60°C (No Condensation or Freezing required)
Allowable Temperature (Electrode)	: −25 – +80°C (No Condensation or Freezing required)
Allowable Pressure (Electrode)	: 980KPa (10kgf/cm^2)
Allowable Lopsided Load (Electrode)	: Load at tip (L=250) 1kN (100kg)
Vibration	: 2.0mm 600 – 3,600/min. In all directions for 3 hours
Impact Shock	: Electrode : 98m/s^2 (10G)
Enclosure Rating	: Drip-proof

2. Principle of Operation

When the object to be measured touches the electrode inserted in the tank, the capacitance and conductance between the electrode and tank wall change. This impedance variation is taken out as electric signal (ON-OFF), and the instrument detects the existence or no existence, or interface of the object.

3. General Drawings



[Fig-1 Outline dimensions of standard built-in model]

[Table-1 Parts name]

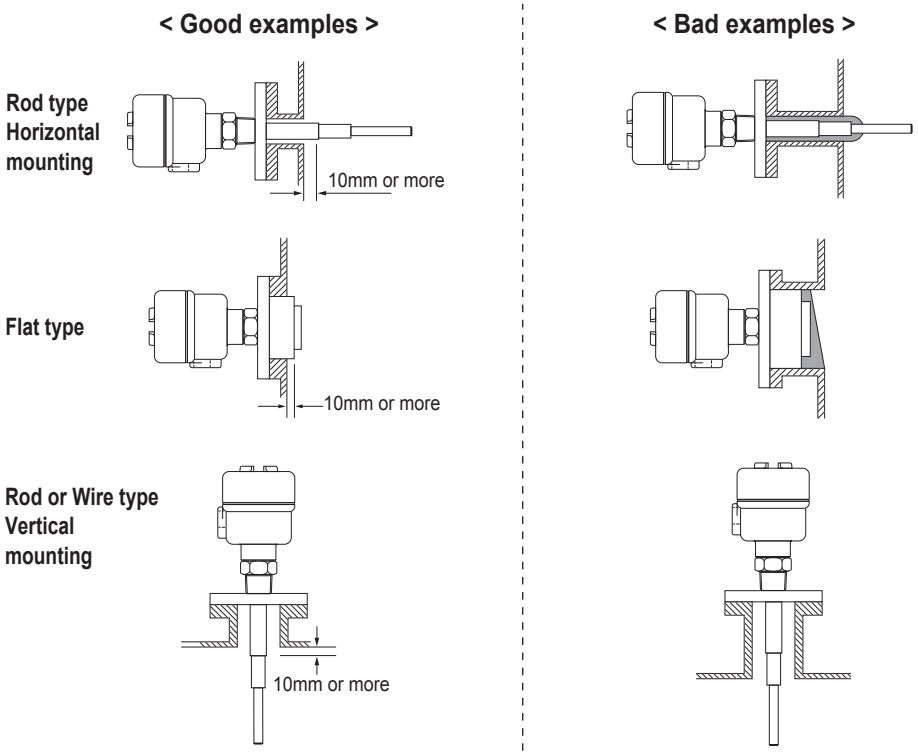
No.	Parts Name	Material	Q'TY
1	Housing	ADC	1
2	Process Connection	304SS	1
3	Earth Electrode	304SS	1
4	Insulator	Polyacetal	1
5	Main Electrode	304SS	1

4. Installation

4-1. Securely fix the detection electrode to the tank with a flange or by screwing.

4-2. Select an appropriate location to prevent the instrument from vibration or high ambient temperature.

4-3. The earthing electrode should protrude at least 10mm inside the tank. [Fig-2]



[Fig-2 Examples]

4-4. The earthing electrode should be electrically shorted with the tank wall.

4-5. Fasten the lid tightly after the wiring and or calibration.

4-6. Never put dirt, dust, moisture or water drops into the housing.

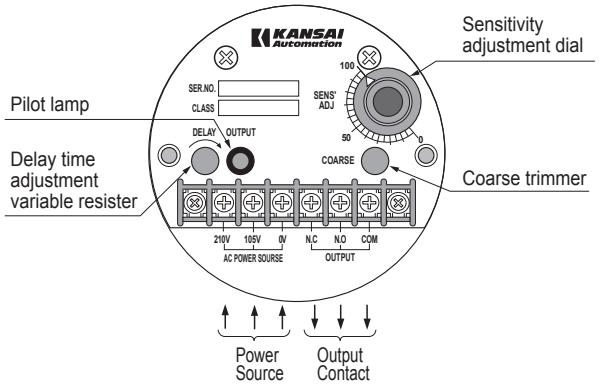
⚠Caution

- ●Fasten the lid of housing and a plug of conduit tightly to prevent invasion of water. The water invasion may damage the instrument.
- ●Never use the unit as scaffold or suspend on it. These conducts may cause damage to the unit.
- ●Install the instrument correctly following the manual. Incorrect installation may cause damage to the instrument.

5. Connection

5-1. Use either AC105V ±10% or AC210V ±10% as the instrument power source.

5-2. After a connection work, complete sealing on the cable gland, and securely fasten the housing lid in order to prevent dust or water.



[Fig-3 Amplifier]

⚠Caution

- ●Supply the power source with specified voltage and frequency. The instrument may be damaged if the voltage exceeds the specified rate or frequency.
- ●Wiring should be done correctly according to a manual. Confirm that there is no error in wiring before use. Incorrect wiring may cause damage to the instrument.

6. Sensitivity and Delay Time Adjustment

6-1. Sensitivity adjustment

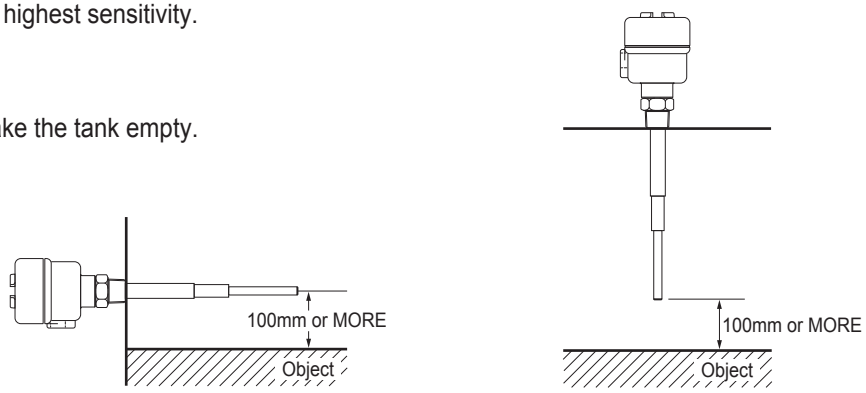
6-1-1. Caution in sensitivity adjustment.

6-1-1-a) It is necessary to adjust the sensitivity depending on the characteristics of the object to be measured or the installation conditions. Adjust the sensitivity under the worst conditions like the smallest specific gravity or the driest materials.

6-1-1-b) In case of detecting the interface between two liquids, a liquid of smaller dielectric constant should be considered as air (empty) and another liquid of bigger dielectric constant should be treated as substance (full). Set the sensitivity, referring the bigger dielectric constant. The relay contact will close when the liquid of bigger dielectric constant will touch the probe. (NO - COM will close, NC - COM will open)

6-1-1-c) The sensitivity adjustment dial can be set on from 0 to 100. 0 means the lowest and 100 means the highest sensitivity.

6-1-2. Make the tank empty.



[Fig-4 empty]

6-1-3. Rotate the sensitivity adjustment dial from 0 to 100

6-1-4. Note the point on a scale where the pilot lamp turns on, then go to section 6-1-6. If the lamp cannot turn on or lights up at the point below 30, go to section 6-1-5.

Lighting up point : at _____

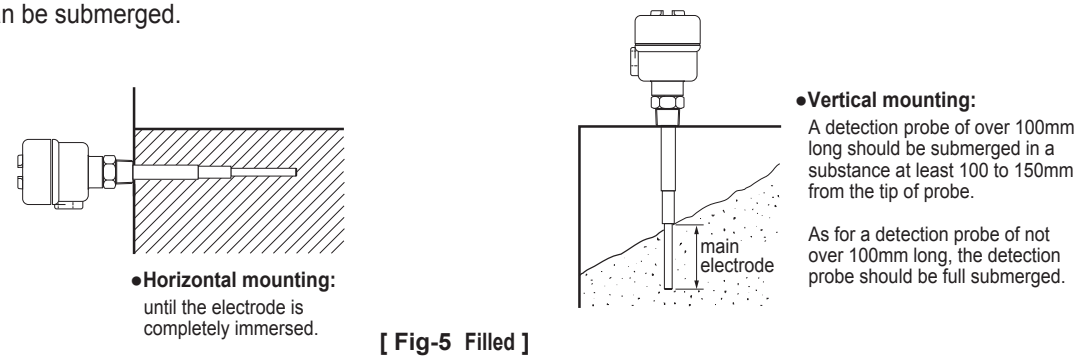
6-1-5. Please adjust a coarse trimmer dial with small minus screwdriver in case of the following conditions.

1. The pilot lamp cannot be turned on, even after rotating the dial from 0 to 100 on a empty tank.
2. The lighting point is below 30
   The coarse trimmer can rotates endlessly clockwise or counterclockwise. It comes back to the initial position after a rotation. You need not rotate it many times.

6-1-5-a) Set the sensitivity dial at 90.
*Set the sensitivity dial at 80 for wire type probes only.

6-1-5-b) Set the coarse trimmer at the point where the lamp starts lighting up, rotating the trimmer clockwise.

6-1-6. Fill the tank with the substance until the probe can be submerged.



●**Horizontal mounting:**
until the electrode is completely immersed.

●**Vertical mounting:**
A detection probe of over 100mm long should be submerged in a substance at least 100 to 150mm from the tip of probe.

As for a detection probe of not over 100mm long, the detection probe should be full submerged.

[Fig-5 Filled]

6-1-7. Note the point where the lamp turns off, rotating the sensitivity dial clockwise to 0 in the conditions stated in section 6-1-6. (filled)

Turning off point : at _____

6-1-8. Set the sensitivity dial at the medium of the two values gotten from section 6-1-4 and 6-1-7. If the lamp cannot turn off even to 0 (lowest point), then set the dial at 0. Setting is now completed.

6-2. Delay time adjustment

You can set delay time on activating the output relay up to 10 seconds from detection (A lamp will turn on when an instrument catches substances, regardless setting delay time) Delay time can be continuously set by a built-in variable resistor at required time up to 10 seconds

When the time contacted to the liquid is shorter than the present delay time, the output relay dose not work.

7. Periodical Maintenance

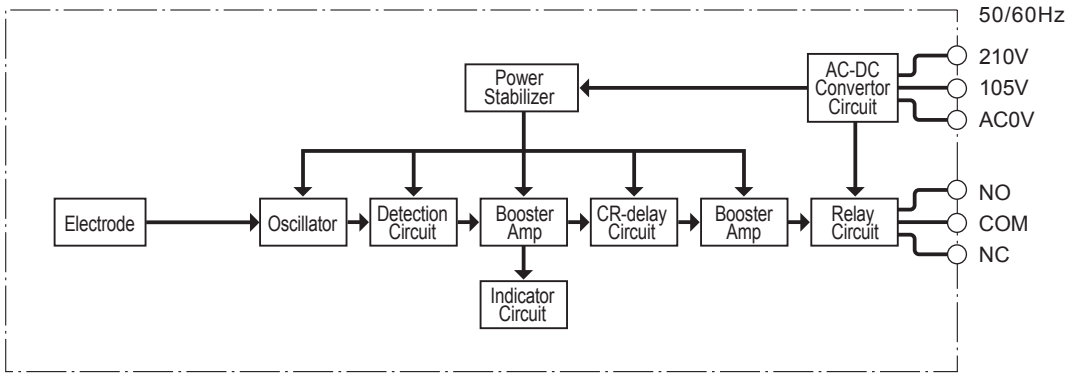
Please check the maintenance items as listed on the Table-2 below.

Warning ●When you start a manual check, be sure to turn off the power before your work. If not, you may get a lethal electric shock.

[Table-2]

Maintenance Menu						
Name		**Check Menu**	**Check Point**	**Method**	**Criteria**	**Frequency**
Equipment General	Surface	Deformation or Scratch	General	Visual	No misaligned, crack, pinhole, deformation	Once/Week
		Corrosion	General	Visual & Hand touch	No effective corrosion	Once/Month
	Bolts & Nuts	Loose & Misaligned	Bolts & Nuts	Visual & Hand touch	Tightened	Once/Month
	Housing & Internal	No corrosion & Condensation	General	Visual	No corrosion & condensation	Once/Month
	General	Operation	General	Visual, Hand touch & Listening	No abnormal noise, vibration	Once/Week
Probe Only		Insulation Resistance	Between Main & Earth Electrodes	Insulation Resistance Measurement by Tester, etc. (Make sure to remove the amplifier prior to measurement)	Insulation resistance more than 100M Ω	Once/Month
Amplifier		Sensitivity & Operation	Amplifier	Check a pilot lamp is on, turning the dial l to H when the tank is empty	The pilot lamp is on. (If not, then adjust the sensitivity following to this manual)	Once/Week
		Operation of Output Contact	Output Contact	When pilot lamp is on, proceed a check shown right	Check the contact is close on operation with a multimeter	Once/Week

8. Block Diagram



[Fig-6 Block Diagram]

9. Type Designation

[Table-3 Type Designation]

BLX－□□□－□□

Heat
- Blank. Standard
- H. Heat-resistant

Class of the sensitivity
1. High sensitivity
2. Standard sensitivity

Length of the detecting electrode
1. Up to 250（mm）
2. 251～500（mm）
3. 501～1000（mm）
4. 1001～2000（mm）
5. Others

Eletrode type
1. Uncovered rod shape
3. Flat
4. Wire

Instrument construction
1. Built-in construction

INQUIRY INFORMATION

Thank you very much for purchasing our products.
We are always working hard to provide you the quality products meeting your requirement.
Please feel free to call us or e-mail regarding your inquiries on our products, technical issues, etc.
Our staff will immediately contact you. Our stations are as follows;

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