



Sensors for Marine Application

Float / Capacitance / Diaphragm





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Company Profile

About KANSAI

KANSAI Automation is one of the top 3 manufacturers of level sensors in Japan.

Established in 1969 in Osaka, it was named after the name of the birth region, Kansai.

Global Network

We have been offering our level sensors to all over the world for many years.

Having official distributors in Singapore, Malaysia, Thailand, Vietnam, Philippines,

China, Korea, Turkey, and other countries in Asia, we offer after-sales-service to support the customers.

Custom Made

With 50 years of experiences, we supply custom-made level sensors for a variety of applications.

Our end-users include Shipbuilding, Foods, Cement, Metal, Power plant, Water treatment, Plastics and more.

KANSAI Automation provides you with the reliable sensors that are suitable for your automation process.



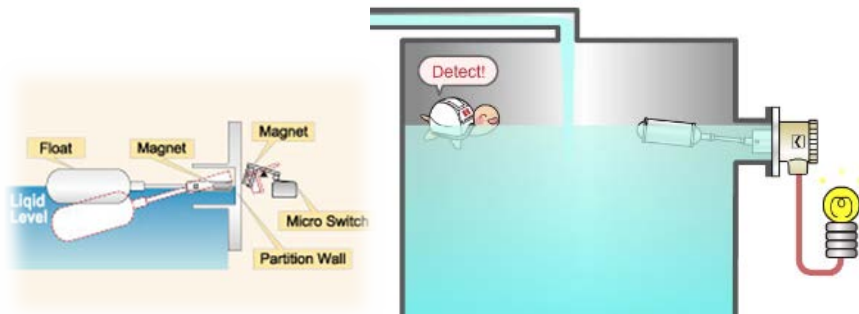
Horizontal Float Level Switch

WORKING PRINCIPLE

Float sensor equips two magnets.
(1 at the end of float, and 1 in the enclosure)

When the float rises, the two magnets attract mutually, causing the micro switch to close the contact and output ON.

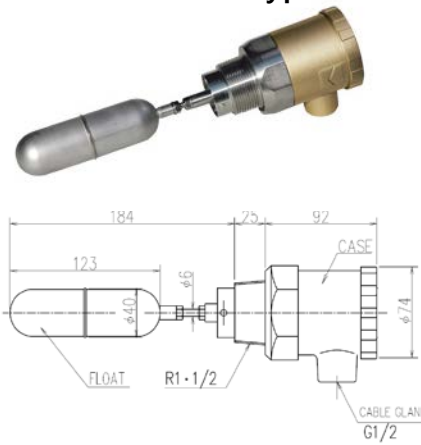
When the liquid level lowers, the float falls back to the original position, and the contact opens to output OFF.



PRODUCT FEATURES

- ▶ For wide range of applications
- ▶ No power supply needed, and reliably detects the level
- ▶ Simple internal-mechanisms, hence easy maintenance

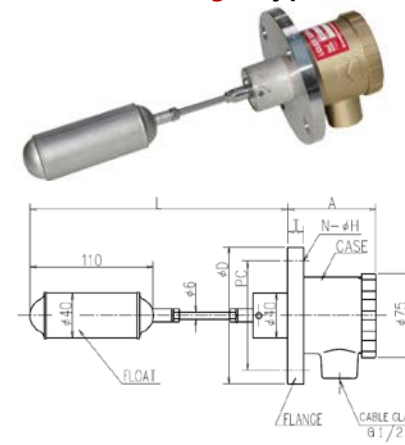
KF-213 Standard screw type



Technical Data

Specification	Model	KF-207
Application		Water-, Oil Gen. Liquid (Flange Mounting)
Float dimensions		Φ40 x 110L
Allowable pressure		Max. 490kPa
Heat resistant		100°C
Process connection		JIS5K40A
Liquid Gravity		Over 0.88
Contact Capacity		250VAC 5A
Float Material		304SS
Material of Mounting Part		304SS or 316SS
Material of Terminal Box		ADC

KF-207 Standard flange type



Technical Data

Specification	Model	KF-213
Application		Water-, Oil Gen. Liquid (Screwed Joint Type)
Float dimensions		Φ40 x 123L
Allowable pressure		Max. 490kPa
Heat resistant		100°C
Process connection		R1 1/2
Liquid Gravity		Over 0.81
Contact Capacity		250VAC 5A
Float Material		316SS
Material of Mounting Part		304SS or 316SS
Material of Terminal Box		ADC

APPLICATION EXAMPLE

- Ballast pump room
- Bilge high level alarm
- Fresh water tank
- Waste oil tank

ALSO AVAILABLE

- Other flange size & material
- Other float size & material
- Bellows type
- Ex-proof type
- Two contact output (*Except Ex-proof type)
- Class NK certified products

Class NK

Horizontal Float Level Switch

KF-2□□□ — **Special Specifications**

Blank Standard
 P With Chamber (External)
 TF Super Heatproof

Wet Parts		Float Dim	Specific Gravity of Liquid
3	Screw	Φ40×123L	Over 0.81
5	High Pressure	Φ49× 80L	Over 0.83
7	Standard	Φ40×110L	Over 0.88
9	Bellows Seal	Φ40×200L	Over 0.87

Process Connection

0 Flange (fabrication of both main unit and flange)
 1 Screw (optionally available with flange)

Horizontal Type Float Switch

General Nonation of Float Gages



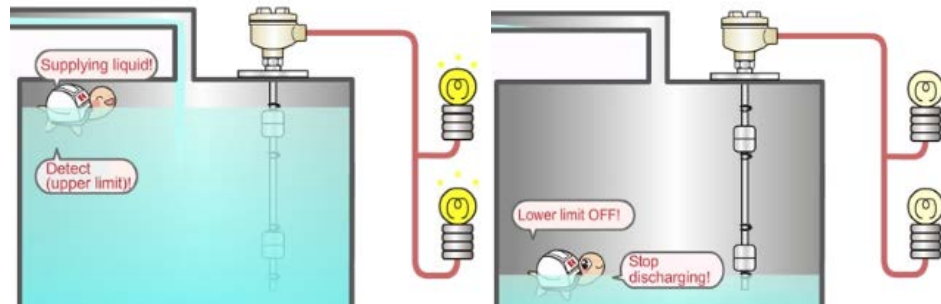
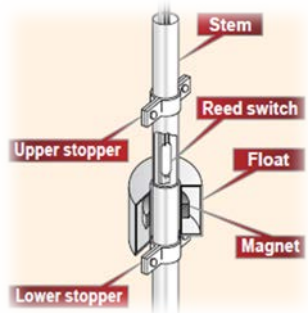
Vertical Float Level Switch

WORKING PRINCIPLE

Float equips a magnet inside, and Stem equips a reed switch inside.

When the float moves upward, the magnet causes the reed switch to close the contact and output ON.

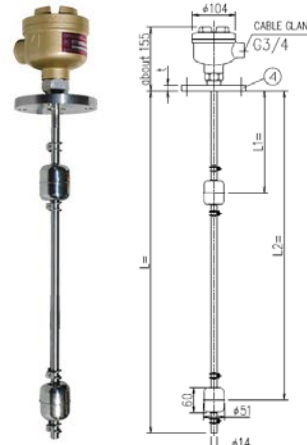
When the liquid level lowers and the float falls downward, the contact opens and output OFF.



PRODUCT FEATURES

- ▶ **DURABLE** : Operates 10 million times of ON/OFF cycles thanks to reed switch
- ▶ **CORROSION-RESISTANT** : SUS type or Resin type available
- ▶ **WIDE-RANGE** : Multiple points can be detected
- ▶ **SAFE** : Insusceptible to humidity, gas, dust, etc.
- ▶ **EASY** : Simple structure, hence easy maintenance

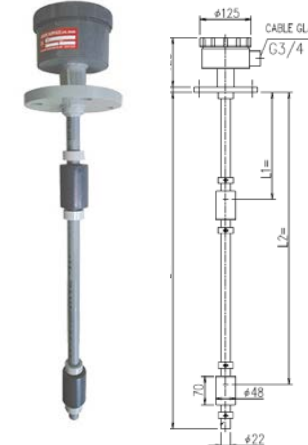
■ KF-322 - □ Small mounting size type



Technical Data

Specification	Model	KF-322-□
Application		Small-caliber Low Density Liquid
Withstand Pressure		490kPa
Heat-resistant		100°C
Mounting Flange		Over JIS5k50A
Specific Gravity of Liquid		Over 0.63
Float Shape		$\phi 51 \times 60L$
Float Material		SUS316L
Stem Material		SUS304 or 316, 316L
Flange Material		SS, SUS
Material of Terminal box		AC
Cable Gland		G 3/4

■ KF-352-□ Corrosion resistant type



Technical Data

Specification	Model	KF-352-□
Application		Corrosive Liquid Small-caliber Type
Withstand Pressure		196kPa
Heat-resistant		50°C (80 when wetted part made of P.P)
Mounting Flange		JIS5K50A or over
Specific Gravity of Liquid		Over 0.89
Float Shape		$\phi 48 \times 70L$
Float Material		P.P (can be made of PVC, liquid density be over 1.0.)
Stem Material		PVC
Flange Material		PVC
Material of Terminal box		PVC
Cable Gland		G 3/4

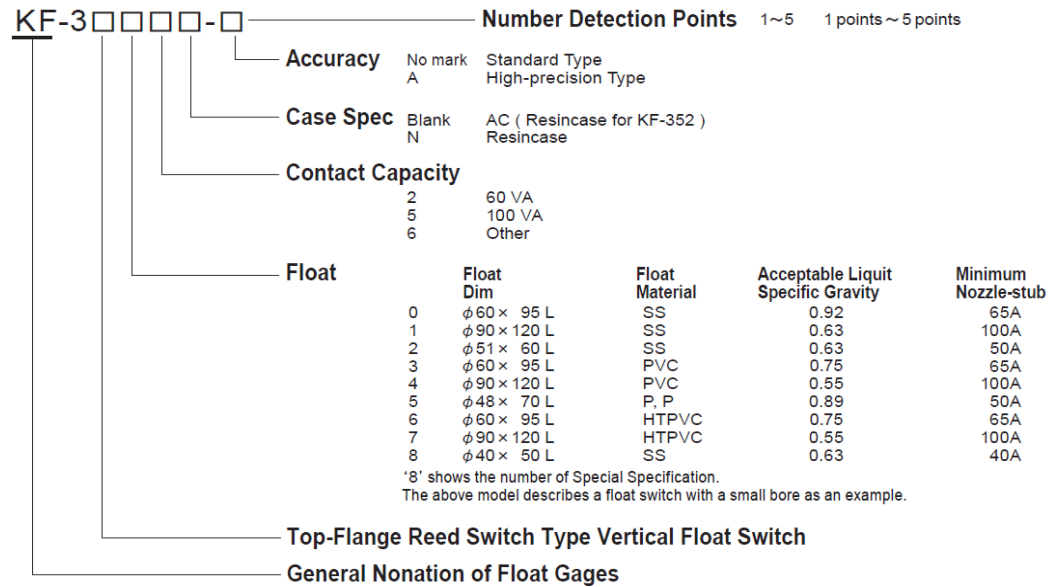
▶ APPLICATION EXAMPLE

Fuel tank oil

▶ ALSO AVAILABLE

- Other flange size & material
- Other float size & material
- Explosion-proof type

Vertical Float Level Switch

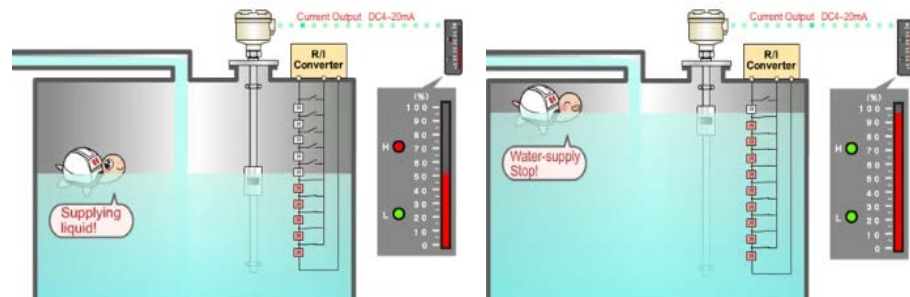
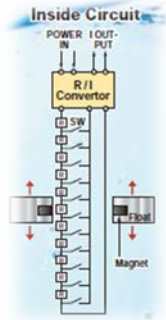


Vertical Float Level Meter

WORKING PRINCIPLE

Float equips a magnet inside.
Stem equips read switch (SW) and Resistance (R) inside.

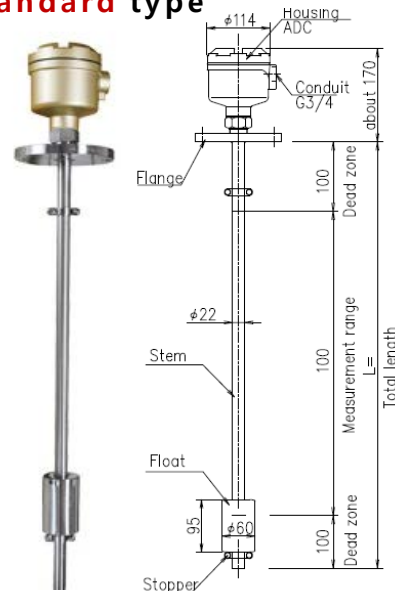
The float moves up and down according to the liquid level.
As the float moves, SW closes and R value changes.
Sensor captures the change of R value and outputs DC4-20mA.



PRODUCT FEATURES

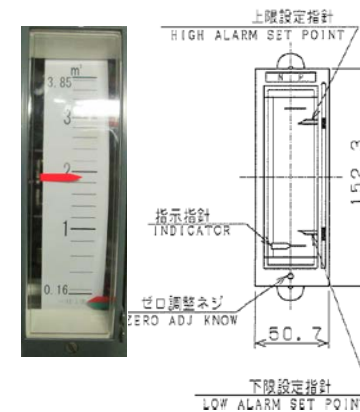
- ▶ Highly reliable and maintenance-friendly with no moving parts except the float
- ▶ Independent of material's characteristics or measuring environment such as vapor and gas
- ▶ Can be used for various types of liquids.
- ▶ SUS or Corrosion-resistant resin available for wetted part

KF-100 Standard type



Spec	Model	KF-100□
Application		Water, oil, General Liquid
Pressure		490kPa
Temperature		100°C
Process Connection		over JIS5K65A
Specific Gravity of Liquid		over 0.90
Float dimension		Φ60×95L
Float Material		304SS or 316SS
Stem Material		304SS or 316SS
Flange Material		304SS or 316SS, SS400
Housing Material		ADC
Conduit Connection		G 3/4

NRE152 (Indicator)



Example of Use

KF-100 measures liquid level

↓
The level is converted to volume

↓
The volume is indicated on NRE152

APPLICATION EXAMPLE

- Fuel oil tank*
- Lubricant oil tank*
- Fresh water tank*
- Air conditioner's drain tank*

ALSO AVAILABLE

- PVC material
- TEFLON material
- Remote amplifier type

Vertical Float Level Meter

KF-1□□

Instrument Construction

- 0 : Built-in construction
- 1 : Remote construction (Amplifier for indoor use)
- 2 : Remote construction (Amplifier for outdoor use)

Float, Stem

	Float Dim	Float Material	Acceptable Liquid Specific Gravity	Min. Size
0	Φ60×95	304SS	0.90	65A
1	Φ90×120	304SS	0.61	100A
2	Φ90×120	304SS (With Rib)	0.77	100A
3	Φ60×95	PVC	0.66	65A
4	Φ90×120	PVC	0.50	100A
5	Not In Use			
6	Φ60×95	HTPVC	0.67	65A
7	Φ90×120	HTPVC	0.50	100A
8	Φ90×120	PVC (With Rib)	0.55	100A
9	Φ90×120	Teflon	1.00	100A
a	Φ90×120	304SS (High-Viscosity)	0.76	100A
b	Φ90×120	PVC (High-Viscosity)	0.55	100A

Vertical Float Type Level Indicator

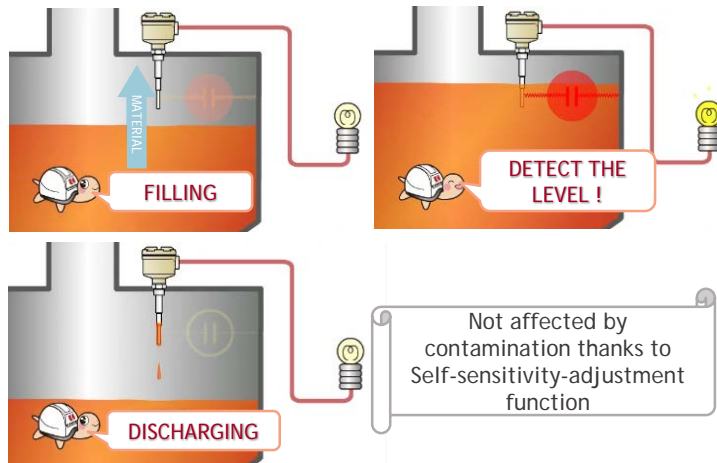
Generic Designation of Float Gages



Capacitance Level Switch

▶ WORKING PRINCIPLE

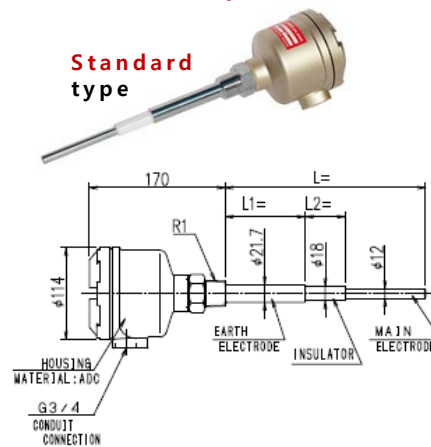
Sensor measures the value of the capacitance between main electrode and the tank wall. The value of the capacitance changes according to rise or fall of the material level. The sensor outputs ON when the value has reached the programmed value.



▶ PRODUCT FEATURES

- ▶ More than 1,000 electrode types and special circuits available
- ▶ Can be used for any kind of materials
- ▶ Highly reliable and stable
- ▶ Excellent mechanical strength and service life
- ▶ Insusceptible to contamination on the electrode thanks to *Self-sensitivity-adjustment* function

■ ALN series (For Ordinary area)



Standard Technical Data

POWER SUPPLY
AC105/210V±10%50/60Hz

OUTPUT
AC250V 5A, DC30V 5A, 1xSPDT

TEMPERATURE FOR PROBE
Max. 80°C

PROTECTION RATING
IP67

SENSITIVITY RANGE

- 1 = High Sensitivity 0.5-20pF
- 2 = Standard Sensitivity 2-50pF
- 3 = Low Sensitivity 20-1000pF
- 4 = Very low Sensitivity 5-35Ω

■ ST8 series (Intrinsically safe for Hazardous area)

ST8 (Sensor) + PS8 (Power)



Standard Technical Data

ST8 (Sensor)

ST82: ia3nG2
Temperature -20~220°C *Depends on probe

ST85: ia3nG5
Temperature -20~60°C

Other specs same as ALN series

PS8 (power)

PS81: AC105V±10% 50/60Hz

PS82: AC210V±10% 50/60Hz

▶ APPLICATION EXAMPLE

Bilge pump room

▶ ALSO AVAILABLE

- Separated amplifier type
- Other power supply
- Probe mat. SUS304/316/316L
- Various Mounting type
- Heat-resistant type
- Corrosion-resistant type

Capacitance Level Switch

ALN-□□□-□□

- Heat
 - Blank. Standard
 - H . Heat-resistant
- Class of the sensitivity
 1. High sensitivity
 2. Standard sensitivity
 3. Low sensitivity
 4. Ultralow 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
- Eleetrode type
 1. Uncovered rod shape
 2. Covered rod shape
 3. Flat
 4. Wire
 5. Others
- Instrument construction
 1. Built-in construction
 2. Remote construction (Amplifier
 3. Remote construction (Amplifier

ST8□-□□□-□□

- Model code
 - ST82 Intrinsically safe explosion-proof construction (ia3nG2)
 - ST85 Intrinsically safe explosion-proof construction (ia3nG5)
- Instrument construction
 - 1 Electrode-Amplifier Built-in Type
 - 2 Electrode-Amplifier Remote Type
 - 3 Amplifier remote Model (Compact head case)
 - 4 Amplifier remote Model (Cable direct out)
- Eleetrode type
 - 1 Uncovered rod shape
 - 2 Covered rod shape
 - 3 Flat
 - 4 Wire
 - 5 Uncovered pipeline electrode
 - 6 Covered pipeline electrode
- Length of the detecting electrode
 - 1 Up to 250mm
 - 2 251 ~ 500mm
 - 3 501 ~ 1000mm
 - 4 1001 ~ 2000mm
 - 5 2001 ~ 4000mm (20000mm)

() Is for wire electrode only
- Sensitivity class
 - 1 High sensitivity
 - 2 Standard sensitivity
 - 3 Low sensitivity
 - 4 Ultralow sensitivity
- Heat resistance
 - Blank. Standard
 - H Heat-resistant



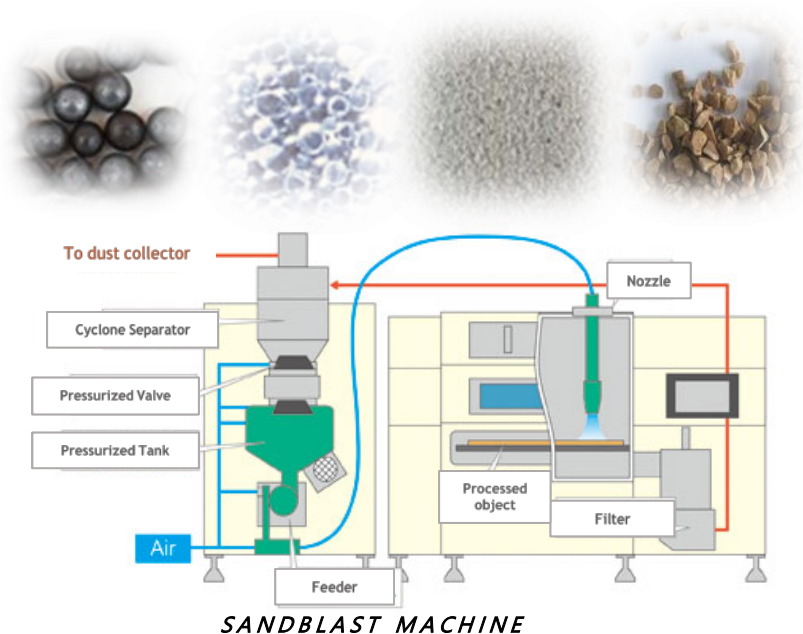
Capacitance Level Switch

- For Blasting Machine -

▶ ABRASIVE BLASTING

In shipbuilding industry, shot blasting or sandblasting is one of the most important processes. The purpose of the blasting includes, to get rid of scales, rust or coating, make the surface smoother, make the surface rougher, pre-finish the surface before painting, by shooting abrasive blasting media against the workpiece.

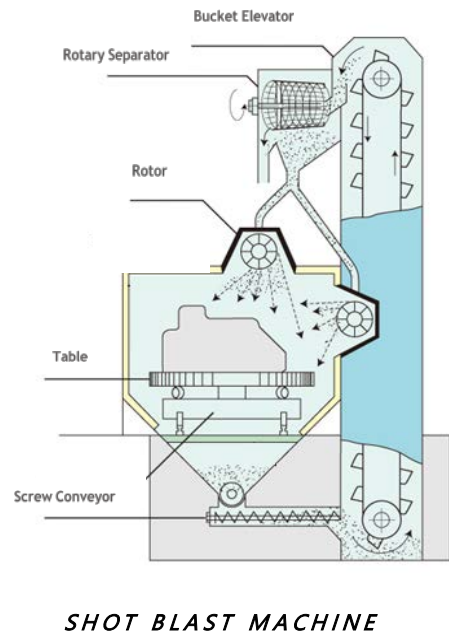
Abrasive media can be stainless steel grid, glass beads, sand, walnut shells, etc. depending on the application.



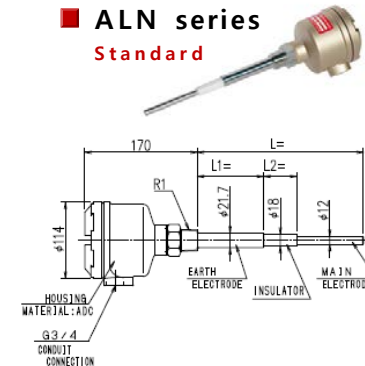
▶ LEVEL SWITCH FOR SHOT/SAND BLASTING

KANSAI Automation has been supplying a big amount of ALN series and BLX series for Shot and Sandblasting industry.

Level sensors are used for the storage tank of the abrasive media, blasting machine, feeding equipment, cyclone separator, dust collector, and others.



■ ALN series Standard



■ BLX series Standard



BLX series is for LARGE VOLUME ORDER
(Minimum order quantity : 20 units)

▶ SPEC EXAMPLES

For PLASTIC shot/sand

ALN (BLX) -111-1
Sensitivity: 1
Mounting: R1 screw
Length: 250mm
-Earth probe: 100mm
-Insulator: 50mm
-Main probe: 100mm
Probe material: SUS304
Insulator material: Polyacetal

For METALLIC shot/sand

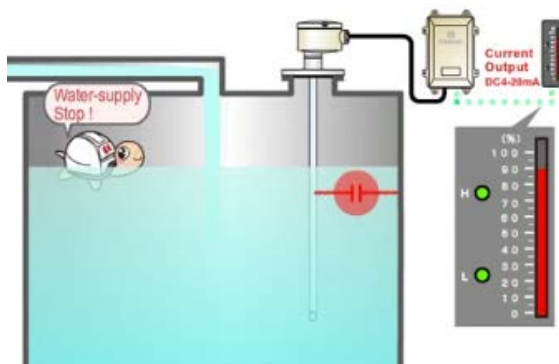
ALN (BLX) -111-2
Sensitivity: 2
Mounting: R1 screw
Length: 250mm
-Earth probe: 100mm
-Insulator: 50mm
-Main probe: 100mm
Probe material: SUS304
Insulator material: Polyacetal

Capacitance Level Meter

WORKING PRINCIPLE

Sensor measures the value of the capacitance between main electrode and the tank wall. The value of the capacitance changes according to rise or fall of the material level.

Measured value is converted into analog signal and then the sensor outputs DC4-20mA.



PRODUCT FEATURES

- ▶ No moving parts, hence stable operation, long service life, and easy maintenance
- ▶ Stable measurement during charging
- ▶ Can be used for any kind of material
- ▶ Insusceptible to dust

KLI series

Standard **Remote amplifier** type

Sensor + Amplifier



Technical Data

Power supply
AC105V/210V ±15% 50/60Hz

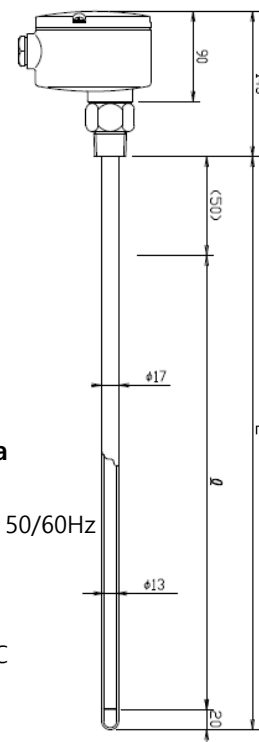
Output
DC4 – 20mA

Temperature
Sensor: -20~+80°C
Amplifier: -20~+60°C

Protection rating
IP67

NRE152

(Indicator)



APPLICATION EXAMPLE

Fuel oil tank

ALSO AVAILABLE

- Built-in amplifier type
- Wire probe type
- Other power supply
- Various mounting size
- Breakwater pipe type
- Explosion-proof type

Capacitance Level Meter

KLI-□□□-□

Blank = Standard
H = Heat Temperature

Alternative types of power supply amplifier
1 = Built in
3 = Outdoor type

Sensitivity
1 = 10~400 pF
2 = 20~1,500 pF
3 = 200~6,000 pF
4 = 6,000~30,000 pF
5 = Special

Electrode type
1 = Bare straight rod Type
2 = covered straight rod Type
3 = Bare wire type
4 = covered wire type
5 = Coaxial cable type
6 = Special

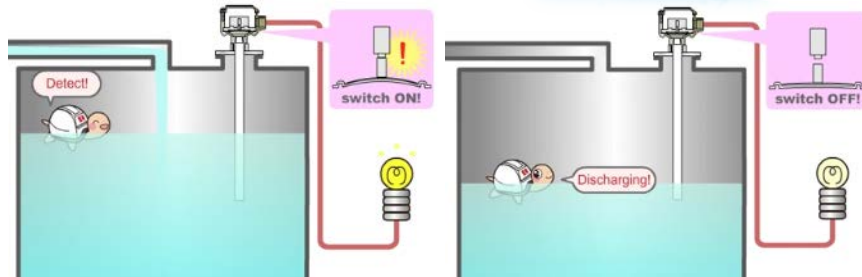
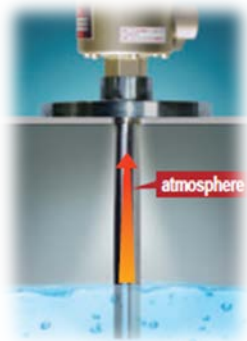


Diaphragm Level Switch

WORKING PRINCIPLE

When the liquid level rises in the tank, pressure increases inside the detection pipe. Then, diaphragm is pushed up, and the micro switch closes the contact to output ON.

When the liquid level lowers, the pressure inside the detection pipe decreases. Then, the diaphragm returns to the original position and the contact opens to output OFF.



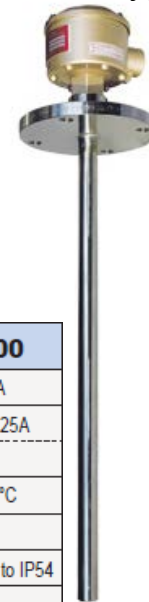
PRODUCT FEATURES

- ▶ For open tank
- ▶ No power supply needed
- ▶ Can be used for viscous or high-temperature liquid (Difficult for float type switch)
- ▶ Stable operation thanks to simply designed moving parts
- ▶ Switch does not touch the liquid (Only detection pipe touches the liquid)

KF-500 Body only type



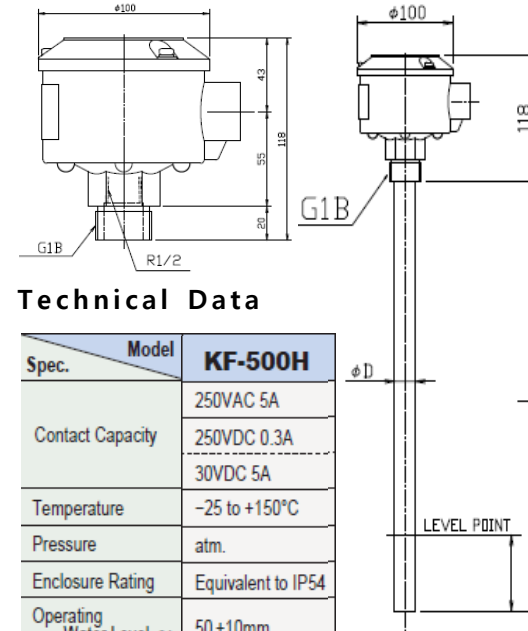
Body+Pipe type



Technical Data

Spec.	Model	KF-500
Contact Capacity		250VAC 5A
		250VDC 0.25A
		30VDC 5A
Temperature		-20 to +70°C
Pressure		atm.
Enclosure Rating		Equivalent to IP54
Operating Water Level *1		40±10mm
Breaking Water Level *1		30±10mm
Weight		0.6kg
Conduit Connection		G 3/4
Housing Material		ADC
Diaphragm		Silicon Rubber

KF-500H Heat resistant type



Technical Data

Spec.	Model	KF-500H
Contact Capacity		250VAC 5A
		250VDC 0.3A
		30VDC 5A
Temperature		-25 to +150°C
Pressure		atm.
Enclosure Rating		Equivalent to IP54
Operating Water Level *1		50±10mm
Breaking Water Level *1		40±10mm
Weight		0.6kg
Conduit Connection		G 3/4
Housing Material		ADC
Diaphragm		Silicon Rubber

APPLICATION EXAMPLE

Forepeak tank

Bilge well



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