

# MODEL KRV

CAPACITANCE LEVEL SENSOR



## Features

- No adjustment required
- High sensitivity with dielectric constant as low as 1.1
- Ignores coatings and build up
- Detects solids, liquids, and interface of two immiscible liquids

## General Description

The KRV series of capacitance sensors are designed for point level detection of liquids, solids, powder, or interface between two immiscible liquids.

Radio Frequency sensors are typically used to detect liquids, but have a difficult time with solid or powder materials. The KRV series overcome this limitation by having a parallel LC circuit on its oscillator and five switch selected sensitivity ranges. The KRV series easily detect solid and powder materials such as plastic powder/pellet, fly ash, carbon black, and similar substances.

The KRV series reliably detect the interface between two immiscible liquids, oil and water as an example. The KRV can be set to operate in water but not in oil. Additionally, the KRV will ignore heavy oily build up on its electrode.

## Operational Description

When the electrode is in free air, the oscillation circuit synchronizes with the detection circuit. When the electrode is in the medium, the synchronization between the oscillation circuit and the detection circuit breaks with the capacitance of the medium being taken in. This difference is then converted into the relay output.

## Sensitivity Settings for Applications

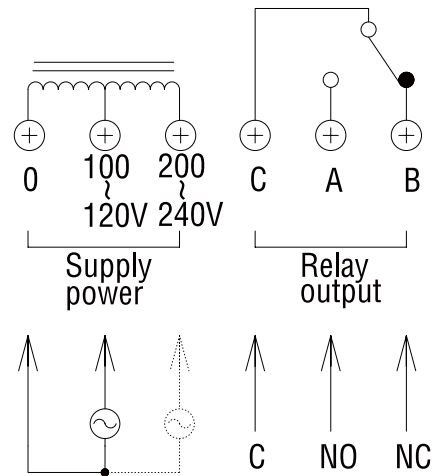
- "A" sensitivity: 0.5PF to 5PF,  $\infty$  to 100k $\Omega$   
For solids and liquids ( $\epsilon \leq 1.1$ ) such as Aluminum powder, Calcium carbonate, Cement, Fly ash, Ink, Paint, Plastic resin, etc.
- "B1" sensitivity: 2PF to 5PF, 100k $\Omega$  to 50k $\Omega$   
For solids and liquids ( $\epsilon \leq 2.2$ ) such as Coffee powder, Feed, Flour, Oil, Starch, etc.
- "B2" sensitivity: 5PF to 10PF, 50k $\Omega$  to 30k $\Omega$   
For solids and liquids ( $\epsilon \leq 3.0$ ) such as Grain, Sand, Sugar, Water, etc.
- "C" sensitivity: 200PF to 1000PF, 2k $\Omega$  to 200 $\Omega$   
For liquids and slurry ( $\epsilon \leq 50$ ) such as Dehydrated cake, Drainage, Night soil, Sewage, Slurry, etc.
- "D" sensitivity: 4000PF to 50000PF, 500 $\Omega$  to 2 $\Omega$   
For liquids ( $\epsilon \leq 90$ ) such as Chemical slurry, Quicklime (liquid), etc.

Note: Normally, NOHKEN will set the proper sensitivity range before shipment in accordance with your specified medium when ordering.

### Technical Information of Fluoro Plastic

- PTFE: Teflon® 4F (Poly Tetra Fluoro Ethylene), operating temp. 200°C Max.
- FEP : Teflon® 4-6F (fluorinated Ethylene Polypropylene), operating temp. 200°C Max.
- ETFE: Tefzel® (Ethylene Tetra Fluoro Ethylene), operating temp. 150°C Max.
- ECTFE: Halar® (Ethylene Chloro Tri Fluoro Ethylene), operating temp. 150°C Max
- PVDF: Kynar® 2F (Poly Vinylidene Fluoride), operating temp. 120°C Max.

### Wiring



### Ordering Information

KRV	For universal application	
	2	Standard
	3	Heavy duty
	5	Flat probe
	6	Wire extension
	9	High sensitivity
	N	Plug mounting
	F	Flange mounting
	T	with heat radiation fin
	P	FEP tubing (for 2F only)
	PT	FEP tubing with heat radiation fin (for 2F only)
	A	Foam detection
	H	New Housing
	0	Flat-face flange
	1	Raised-face flange
	4	Plug mounting
	J	JIS flange
	A	ANSI flange
	D	DIN flange
	G	G plug
	R	R plug
	T	NPT plug
	S	304 stainless steel
	S6	316 stainless steel
	F	Insulator, PTFE for 2, 3, 9, and PE for 5, 6.
	C	Ceramic insulator for high temp.
	0	Viton shield
	1	Thermiculite shield
	2	Kalrez shield
	3	Perfluore shield
	□□□□	Specify the probe length
	3	24V DC
	4	100-120/200-240V AC
	0	JIS F 15c (G1/2)
	3	with NPT 3/4" socket

KRV 2 N H 4 R S F 0 250 4 0 = KRV-2NH-4RSF0-250-40

- \* The mounting size should be specified when you order.
- \* The length of electrode and insulator should be specified in mm if required.
- \* The medium must be informed for sensitivity setting when you order.
- \* The operating temp, and pressure should be informed for correct model selection.

## Specifications

Model	2NH		2FH	3NH	3FH
Description	Standard			Heavy duty	
Drawing					
Mounting	R3/4		JIS5K25A	R1	JIS5K25A
Supply Power	KRV	100 to 120V AC / 200 to 240V AC or 24V DC			
	KSV	100/200, 110/220, 120/240V AC or 24V DC			
Power Consumption	KRV	Approx. 2.5VA Max.			
	KSV	Approx. 4VA Max.			
Relay Output	1 SPDT, 250V 3A AC, 30V 3A DC (Resistive) C-A: Normally Open contact C-B: Normally Closed contact				
Detection Time Delay	KRV	Adjustable between 0.5 to 10 seconds			
	KSV	Not provided			
Operating Temperature	Housing	-10°C to 55°C			
	Electrode	-20°C to 60°C			
Maximum Pressure	1MPa / 10bar			3MPa / 30bar	
Maximum Humidity	85% RH				
Material	Housing	ADC12			AC
	Electrode	304SS*			
	Insulator	PTFE*			
	O-ring	Viton*			
Cable Entry	JIS F 15c (G1/2)			G1/2	
Protection	IP65			IP54	
Length of Electrode	Standard	250mm			
	Option	50 to 4000mm			100 to 1000mm

\*Other materials are available.

\*Specification of products shall be changed by the application and operational condition.

### Technical Note

- The heat resistive type is optionally available up to 500°C.
- Form detection and insulated tube types are optionally available.

5FH Flat probe	6FH Wire extension	9NH	9FH
JIS5K50A	JIS5K50A	R1	JIS5K50A
100 to 120V AC / 200 to 240V AC or 24V DC			
100/200, 110/220, 120/240V AC or 24V DC			
Approx. 2.5VA Max.			
Approx. 4VA Max.			
1 SPDT, 250V 3A AC, 30V 3A DC (Resistive)			
C-A: Normally Open contact			
C-B: Normally Closed contact			
Adjustable between 0.5 to 10 seconds			
Not provided			
-10°C to 55°C			
-20°C to 60°C			
1MPa / 10bar	500kPa / 5bar	1MPa / 10bar	
85% RH			
ADC12			
304SS*			
PE*		PTFE*	
Viton*			
JIS F 15c (G1/2)			
IP65			
65mm	1000mm	250mm	
5 to 500mm	500 to 10000mm	50 to 4000mm	

