MODEL KSV FOR CONDUCTIVE MEDIUM

Features

- Ignores heavy conductive build up
- Single probe/Mechanically strong

General Description

The KSV series of capacitance sensors are made specifically for point level detection of conductive medium. Applications include water, chemical solutions, acid based slurries, conductive granules, and sticky liquids.

Build up is one of the most common problems for capacitance sensors. Conventional Radio Frequency sensors solve this problem by using a guard probes (the second or third element to the electrode). But this complicated probe construction tends to make probes easily broken, particularly if twisted in agitated containers. Consequently, conventional RF sensors are installed vertically and limited to a fixed length, foamed in one piece.

The KSV series have overcome this limitation by using the Colpitts oscillation circuit and a single electrode. This circuit corrects for conductive build up by measuring its resistance. The single electrode can be mounted in virtually any position and is available with a number of standard mountings.

Operational Description

The electrode of the KSV is a part of the oscillation circuit. When the electrode is in the free air, the oscillation is stopped. When it is in medium, the oscillation is restored by measuring capacitance of medium and the relay is energized.

Applications

- Liquids (except for oil): Water, Caustic soda, Hydrochloric acid, nitric acid, Sulfuric acid, etc.
- Sticky conductive medium: Drainage, Dehydrated cake, Night soil, Sewage, Sludge, Slurry, etc.

Note

Refer to the KRV for dimension and specification.

Ignores Heavy Conductive Buildup

The characteristics of the KSV circuit are defined by:

①ω b> ω c: Oscillation stops (The electrode is in the air.)

②ω b< ω c: Oscillation starts (The electrode is in the medium.)

③ω b=1/(C+ΔC)・R

ω b: Frequency when the electrode is coated or covered by the medium.

ω c: Adjusted frequency when the electrode is in the air.

C : The stray capacitance of the electrode.

ΔC: The capacitance of the medium.

R : Resistance of the medium.

When a conductive resistance builds up forms on the electrode, ω b increases as R falls (③). This means ω b> ω c so that oscillation cannot start (①).

When actual medium level is covering the electrode, ω b decreases by taking in ΔC(③). This means ω b< ω c so that oscillation starts and the relay energizes.

In this way, by taking resistance of conductive build up and canceling capacitance of that, the KSV prevents false relay trips.

Value of capacitance and resistance of sensitivity are shown on Table 1.

Table 1

Sensitivity	Capacitance	Resistance
H	5 to 60PF	1.5kΩ or more
L	90 to 180PF	800Ω or more

Ordering Information

KSV	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	
											0	100/200V AC
											1	110/220V AC
											2	120/240V AC
											3	24V DC
												0 JIS F 15c (G1/2)
												3 with NPT 3/4” socket

KSV	2	N		H	4	R	S	F	0	250	4	0	= KSV-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.