The selection is detailed on page 6

# CLS-60 Capacitive Level Switch

## **Functional characteristics**

Independent of material density, suitable for a variety of conductive, non-conductive liquid, solid particle switching control.

Can be used in high pressure, vacuum, high temperature, low temperature, strong vibration and applied to strong corrosive liquid and other harsh environment.

Small size, simple structure, good dynamic performance, high sensitivity, strong resolution.

No moving parts when working, reliable work.

Capacitive level switches are inexpensive, economical and durable.

## Product application

It is used to measure fly ash, solid particles, liquid, adhesive materials, especially for power plant dust collector ash level control, ash storage material level control

Overflow protection

High and low level alarms

Pump control or limit detection

Dry rotation or pump protection

## Working principle

In capacitive level measurement, the sensor and container form two electrodes of a capacitor. The capacitance change caused by the level change is converted into a switching signal. With the measured object as the medium, the capacitance between the sensor rod and the barrel wall (to the ground electrode) is detected by an induction rod. When the sensor rod is covered by the material, the capacitance increases. When the capacitor matching value set by the circuit inside the switch is reached, the line generates a highfrequency resonance, detects the resonance signal, and converts it into a switching action.

CLS series products have a new circuit design, upgrading the analog circuit to the digital intelligent circuit, which greatly improves the actual operation efficiency of users, enhances the stability of the use of products, and greatly improves the accuracy to cope with different material characteristics.

CLS series products are suitable for most solid/liquid measurement (including viscous materials), only one key calibration can set the appropriate alarm point, can detect the measured value and modify the alarm value, delay value, delay value, high and low alarm switch; In addition, the smart LCD can display the detection value in real time and set the alarm output value, delay value, delay value, high and low alarm switch to meet the different needs of users.



For more product information, please visit www.ludwig-schneider.com.cn



# **Product model**

Model number	CLS-60-A	CLS-60-B	CLS-60-C					
Product drawing								
Apply	Liquid/solid/particle	Liquid/solid/particle	Liquid/solid/particle					
Measuring range	High(HLFS) High or Low(LLFS) The low level can be adjusted onsite	High(HLFS) High or Low(LLFS) The low level can be adjusted onsite	High(HLFS) High or Low(LLFS) The low level can be adjusted onsite					
Probe material	PTFE	PTFE/PFA	PTFE/PFA					
Insulating material	PTFE	PTFE/PFA	PTFE/PFA					
Process connection	Thread from G1,1NPT/ flange/sanitary interface	Thread from G1,1NPT/ flange/sanitary interface	Thread from G1,1NPT/ flange/sanitary interface					
Process pressure	-1~40BAR (-100~4000 KPA)	-1~40BAR (-100~4000 KPA)	-1~40BAR (-100~4000 KPA)					
Process temperature	-40~80°C	-40~80°C	-40~280°C					
Process pressure	OBAR (OKPA)	-1-20BAR (-100-1000KPA)	-1-20BAR (-100-1000KPA)					
Signal output	Relay output	Relay output	Relay output					
Power source	20~46VDC/22-265VAC(50/60HZ)	20~46VDC/22-265VAC(50/60HZ)	20~46VDC/22-265VAC(50/60HZ)					
Power	Max.2W	Max.2W	Max.2W					
Sensitivity	10PF	10PF	10PF					
Identification	CE/ATEX/ISO9001	CE/ATEX/ISO9001	CE/ATEX/ISO9001					
Class of protection	IP65	IP65	IP65					



## Size mm







## **CLS** series practical application

When measuring the solid mass, compared with the rod type measuring probe, the cable type measuring probe is chosen first. Because the cable type measuring probe can track the movement of solids, the durability of the meter in abrasive and vigorous solids is significantly increased. The switching point is usually located on the weight, which has a high measurement sensitivity due to its large area, especially in media with small dielectric constants.

When the static capacitance level switch is installed on the side, it should not be installed near the feeding port to reduce the damage to the induction rod during the feeding impact. If the material is large or the RF admittance switch is in the position where the material is falling, a protective ceiling should be equipped to avoid mechanical overload. Install a protection baffle 200mm above the switch and install it at a slight Angle (about 20.30°) to avoid clumping. Plate type can be selected when measuring heavy materials, but it should be noted that the thickness of the barrel wall to the fixed flange should not exceed 25mm, otherwise the switch will be worried about wrong action.

#### Advantage

- The measuring probe can be shortened
- Insensitive to attachments · Easy to debug
- Solid construction

Installation method can only choose the top installation, the material is heavy, the switch point distance is far, can choose the steel cable probe, typical heavy solid such as cement, sand, packing, gravel. When installing the top, it is necessary to consider whether the position of the repose Angle can enable the induction rod to detect the raw material. When installing the cable type, it should be noted that the distance between the induction rod and the barrel wall should be at least 300mm. When a vibrator device is installed in the tank or conveying line, it is necessary to consider whether it will damage the internal parts of the switch.

#### Advantage

- Extremely strong construction
- Easy to debug

• The measuring probe can be shortened  $\cdot$  insensitive to attachments

The flexible cable probe prevents mechanical loads due to solids movement.

For solids with a small dielectric constant, it is recommended to mount on the side, as a horizontally mounted measuring rod can be quickly covered over its entire length, resulting in a much more reliable switching function. For this purpose, a protective top should be installed above the measuring rod to prevent damage to the measuring rod from falling media. If the measuring rod is tilted slightly down during installation, the deposited solid can easily slide down. Here, the medium must not be too thick and heavy.

#### Advantage

- Easy installation
- Wide range of applications
- Extremely robust construction · Maintenance free







# **CLS series practical application**



Electrostatic capacitance switches are also widely used in liquid measurement. They can be used to prevent overflows and dry runs. Mount anywhere (from top, side or bottom). Do not install it near the inlet and avoid the flow path of the liquid, so as to reduce the impact of the blanking sensor rod and cause interference. If the switch must be installed near the inlet, install a protective baffle 200mm above the switch. When multiple induction rods are installed at the same time, the distance between the switches should be more than 300mm. When the switch point is far away from the top installation, a steel cable probe can be selected, and the switch point is usually located on the weight. In the case of agitation, the delay of 0~30S can be selected, which can effectively avoid the interference caused by sputtering and fluctuation caused by agitation.

#### Advantage

- Insensitive to attachments
- Prevent overflow and dry operation
- Maintenance free
- Accurate to the point when mounted on the side or bent



If the switch points should be as precise as possible, it is recommended that they be mounted on the side, as a horizontally mounted measuring rod can be quickly covered over its entire length, resulting in a significantly more reliable switching function. The sensor rod should be tilted downward and maintained at an Angle of 20° from the horizontal line to optimize sensitivity and reduce damage to the switch caused by blanking impact. When maximum switching points need to be obtained as accurately as possible, a partially insulated measuring probe can also be installed, which will shortcircuit when the reported level is reached, so that the measuring probe can be switched reliably and reproducible.

#### Advantage

- Materials with high chemical stability
- Maintenance free
- Electroplated flange
- Easy to debug



Install standard type, the insulation part must be extended into the barrel more than 30mm, to avoid the connection pipe if there is accumulated material, may cause misoperation. When side loading, pay attention to the installation position. If the feed port is not fed from the center, it is necessary to consider the installation of the repose Angle  $\alpha$  and the corresponding point of the feed port, otherwise the liquid level switch is easy to occur. Used as a device to prevent overflow and dry operation in a medium prone to adhesion and conduction. Because of its mechanical construction with active shielding sections and active measurement peaks, even a few centimeters thick attachment cannot distort the measurement results. For raw materials with poor fluidity, the use of loading method can reduce the possibility of material accumulation on it to form a bridge, and the bridge phenomenon on the process interface can be excluded by using vertical installation method.

#### Advantage

- Easy installation
- Wide range of applications
- Extremely strong construction
- Maintenance free





CLS-6	o0-Sele	Ctio Selec	n co	ample	osition CLS-0	n 60	A	/ N /	L /	Ν	5	A	/ Z	7	S	8	Х	I.			
1.Model number A tetrafluorotype																					
		E	3	Antist	static type																
C High temperature					antist	atic type															
	2.Material		N	SUS304																	
				0	SUS31	16															
				Q	PTFE																
				T()	Other materials																
	3.1.Thread size			size	A G1/2																
					В	G1															
					С	1/2N	PT														
					D	1NPT															
					E	2NP1	-														
					<b>F</b> R1/2																
					T() Other specifications																
	3.2.Clo dimen		amp con	nection	G	50.5	mm														
			aimen	ISIONS		Н	H 64mm														
							77.5	mm													
						T()	Othe	r clamp s	izes												
				4.Fl	ange s	size	J	DN15													
							K	DN20													
						L	DN25											_			
						M	DN32											_			
					N	DN40															
					0	DN50			_					_							
						P	DN65		_	-					_	_					
						Q	DN80			_											
							R	DN100			_							_			
							5	DN125			-										
								DN150			_										
							()	Other flo	ange siz	zes											



**©** 400-860-9760



CLS-6	0-Sele	Selection	comp	ositi e CLS	on 5-60	A / N / C / E / Z / S / X 2 3 4 5 6 7						
4.Flange s	pecificatio	n A	150lb	)S								
		B	3001	05								
		С	PN10									
		D	PN16									
		Е	PN25	5								
		F	PN40	)								
		G	PN63	5								
		T( )	Othe	rspea	ificatio	ns						
	5.Stre	SS	Z	0~0	.8MPa							
	U 0~1.6					5MPa						
	V 0~2					0~2.5MPa						
	W 0~6					~6.8MPa						
		6.Power	source	S	220\	/AC						
				R	24VE	00						
		7.Len		gth	Х	50mm						
					Y	100mm						
					Z	150mm						
					Р	200mm						
					G	250mm						
					н	300mm						
					J	350mm						
					K	400mm						
					Ν	450mm						
					S	500mm						
					T()	Other length						

### Instructions:

CLS-60 PTFE rod type, material SUS304, thread size 1/2NPT(3.1,3.2,3.3 are one of the three options), flange specification DN25, pressure 0~0.8MPa, power supply 220VAC, length 50mm

## **Product certification**

Compliance and approval; Ludwig level meter meets key standards and certifications for process measurement technology; This guarantees the highest reliability in such Settings;

