Rotating Paddle Level Switches Manual

SRP/SRT Type

■ English

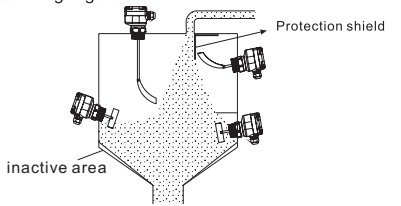


IP66 CE SGS RoHS

www.ema-electronic.com

■ Mounting

1.0 Mounting Figure



1.1 Please check the followings while mounting:

1.1.1 Mount the switch above inactive area;

1.1.2 The instrumentation cannot measure correctly when it is mounted within the blocked distance (Inactive area)

1.1.3 Mount the switch vertically in the surface or the sides of the targeted object;

1.1.4 Make the connecting hole to cable headed below the instrumentation when mounting the switch vertically in the sides of the targeted object. The nut which is used to fix the cable should be locked tightly in avoid of lacking.(As the figure above);

1.1.5 The switch can be mounted directly without dismantling the paddles when select fixture to mount it with a sickle shape paddle;

1.1.6 To reduce the shock of bulk solid,the switch can be mounted at 15℃-20℃ against the horizontal position when mounting it vertically in the sides of the targeted object;

1.1.7 Please select high temperature type when the temperature of targeted object is over 80℃.

1.1.8 This product is prohibited from mounting at the entrance of the tank; however,please add an extra protection shield on this product to avoid the shock.The falling materials might affect the operation of this product if it is required to do so.

1.1.9 Please add a protection shield or select shaft-protection type for the probe when detecting the bulks with the diameter over 15mm or when installing this product under the entrance of the tank by 7M.

2.0 Mounting type

There are 5 mounting types available as following:

2.1 Standard mounting: Mount the switch directly by screwing tightly in the wall of the container which is applied to the threads.

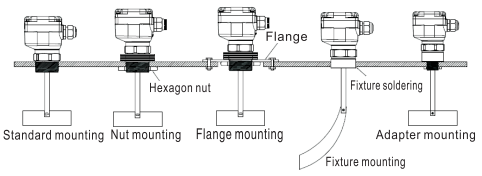
2.2 Nut mounting: Vent the wall of the container (50mm < N < 78mm, N is the diameter of the vent), and then screwing it tightly with hexagon nut in the inner wall.

2.3 Flange mounting: Vent the wall of the container (78mm < N < 115mm, N is the diameter of the vent), and then fixed the flange on the wall of container with nuts.

2.4 Fixture mounting: Vent the wall of the container (N = 58mm, N is the diameter of the vent), and then fix it to the fixture. Finally, solder the fixture to the vent.

2.5 Adapter mounting: Link it to the adapter with the threads,and then link the adapter to the wall of the container. (The dimension of the thread for the adapter can be customized.)

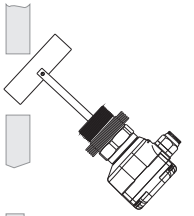
2.6 Mounting types :



3.0 Examples

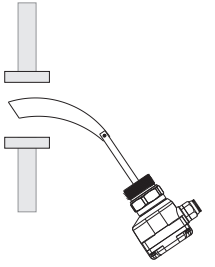
3.1 Standard mounting:

Insert one side of the paddle to the hole of container by 35° , and turn it to right position slowly after the other side of the paddle passed through half of the wall-thickness.

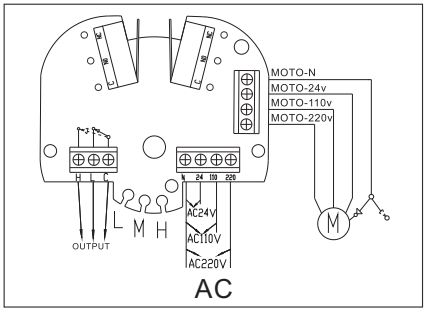


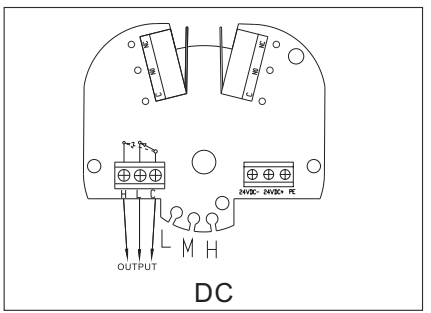
3.2 Fixture mounting :

It is recommended to select sickle shape paddle to mount the switch with fixture. Please solder the fixture on the wall of the container and then insert the paddle to the threads. Finally, screw it tightly.



4.0 Connection

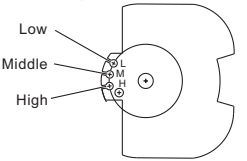




Notice:Please follow the drawing of wiring to connect up exactly!

5.0 Torque adjustment

Torsional spring is used to adjust the torque of rotating axis. The torsional spring can be set at strong position on measuring heavy solid, while the paddle is poor sensitive. Reversly it can be set at low position on measuring light bulk solid, when the sensitivity of paddle is increased.To shaft gear, open the bottom and then clip the torsional spring by a nose plier. Finally, move the torsional spring to the position matching the torque desired. As the following figure:

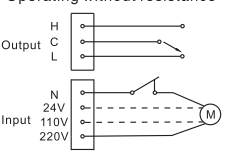


Notice:Please don't set the torque of torsional spring randomly to avoid the false operation.

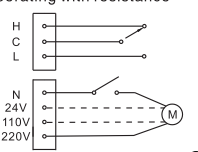
6.0 Circuit principle

- When the motor is on, C.L circuit is connected means no resistance on paddle. When the motor is off, C.L circuit is disconnected, meanwhile,C.H circuit is connected means being resistance on paddle.
- When operating without resistance,C.L circuit is connected and the motor start to work again.

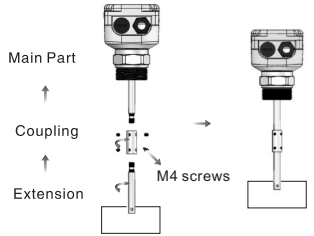
Operating without resistance



Operating with resistance



7.0 Modular Connection

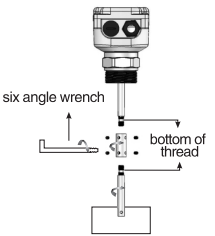


8.0 Three steps for modular installation

① First step: First tighten one end of coupling with the other end with thread of main part, tighten until to the bottom of thread

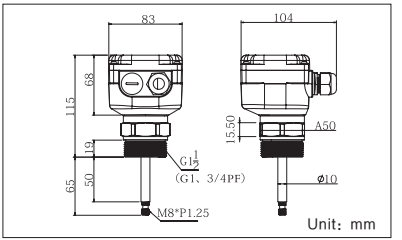
② Second step: Tighten one end of coupling with the other end with thread of extention, tighten until to the bottom of thread

③ Third step: Use inner six angle wrench to turn the four screws of M4 into the four thread holes of coupling, then install the paddle after completion



⚠ Be sure to tighten all 4 screws and not miss any screw to avoid the risk of the rod falling off. If the device vibrates greatly, it is recommend to use thread glue.

■ Dimensions



■ Safety requirements

- Protection classification: IP66
- In accordance with the CE certification standards
- Reliability: No failures time is not less than 15000 hours of continuous operation, >10000 times of continuous operations.

■ Installation Notice

- Please install, connect and operate properly per the manual.
- If there is error of installation and mis–operation ,it may cause associated danger.
- Be installed by the experienced specialists.
- Do not open inside module,if the module is opened,the warranty is invalid.
- Maintain regularly by the experienced specialists.

Technicial Parameters

Part No.	SRP10 SRP11 SRP50	SRT10 SRT11 SRT50	SRP20 SRP21 SRP60	SRT20 SRT21 SRT60	SRT30 SRT31
Housing material	ABS	Aluminium alloy	PA66	Aluminium alloy	Aluminium alloy
Application	Measurement for upper and lower level				
Rotating speed of paddle	2rpm				
Torque	0.5 / 0.7 / 1.0 kgf.cm(LOW/MID/HIGH)				
Medium density	≥0.5g/cm^3				
Sensitivity	three sections adjustable				
Ambient temperature	-20~80℃				
Power supply	AC24V / AC110V / AC220V / DC24V				
Power consumption	4W max.				
Output	Switching signal				
Operating temperature	-20~80℃		-20~200℃		-20~450℃
Mounting connection	3/4PF、G1、G1-1/2、coupling、flange、fixture				

Reliability requirements

- Shock and vibration resistance
- Drop: Safety height of drop≤1.2M

CAUTION

- Ensure to install the products per the regulated temperature, pressure and technicial requirment.
- Ensure the level switch and cable keep the distance from high voltage power supply or circuit at least 1M
- Use the cable with the diameter of 6~7mm to ensure the sealing of module switch.
- Ensure correct wiring and to be attached closely to the wall of the tube or container.

Ex-proof Rotating Paddle Level Switches Manual

SRE Type

English



IP66 CE RoHS Ex

www.ema-electronic.com

■Description

1. Introduction

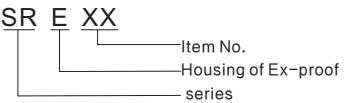
This product could control the level of solid for bulk, pellet, powder or the alarm of up and low level. It is suitable for harsh environment such as high pressure, strong and dusty area. It is widely used in metallurgy, petroleum, chemical industry, light industry, colliery, cement and food industry.

This Ex-proof product is verified and certified according to standard(s) for safety as below:GB3836.1-2010 Explosive atmospheres Part 1: Equipment-General requirements GB3836.2-2010 Explosive atmospheres Part 2: Equipment protection by flameproof enclosures “d”. The Ex-proof marking:ExdIICT6. It is suitable for the explosive gases and mixture endangered places that included IIA~IIC, temperature is from T1 to T6.

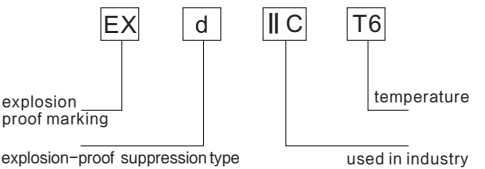
This Ex-proof product is verified and certified according to standard(s) for safety as below: GB/T 12476.1-2013 Electrical Apparatus for Use in the Presence of Combustible Dust - Part 1: General Requirements (IEC 61241-0:2004: MOD) and GB/T12476.5-2013 Electrical Apparatus for Use in the Presence of Combustible Dust - Part 5: Protection by Enclosures “tD”. The Ex-proof marking: Ex tD A20/A21 IP66 T90. It is used in Zone 20/21. Max. surface temperature is 90℃ for use in the presence of combustible dust in hazardous area.

2.Order information

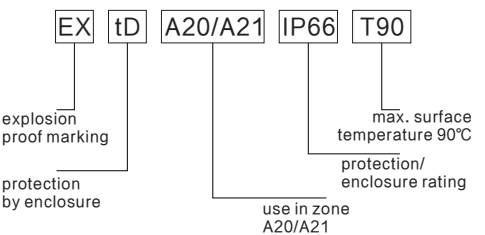
■ Order No. for sensor and the conception of explosion proof marking.



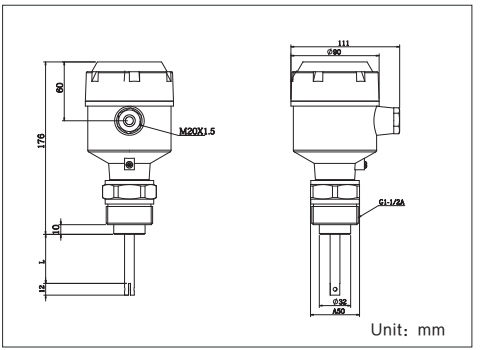
■ Atmospheres:



■ Dust:



■Dimensions



■ Operating principle and structure

The ex-proof rotating paddle switch use the motor to rotate the paddle slowly. When the material goes up and hindered rotation, the detection parts will move surrounded by the main parts. This move will let the micro control action give a signal that there is material first, then another action will cut off power of the micro-motor, and make it stop rotating. As long as the material is not changed, the situation will keep the same.
When the level goes down and paddle is not hindered, the detection parts will restore by spring tension. First, a micro control action, that is powered on the motor to make it rotate. Then another micro action give a signal that there is no material, as long as the there is no obstacle, the situation will keep the same.

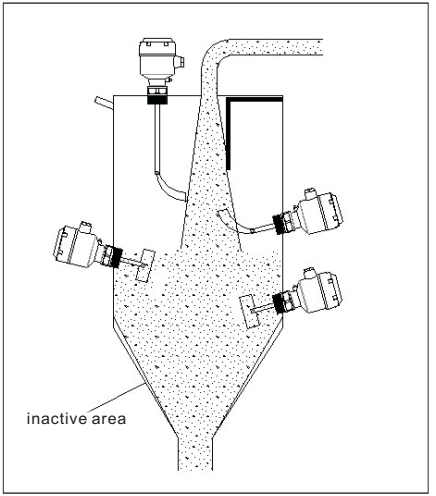
■Operations

■ Operations environment
Ambient temperature: -20℃...+70℃
Relative humidity:<80%

■ The installation and maintenance of this product is requested to abide by GB 3836.15-2010 Electrical apparatus for explosive gas atmospheres-Part 15: Electrical installation in hazardous areas (other than mines).
The installation and maintenance of this product is requested to by GB12476.2-2010 Electrical apparatus for use in the presence of combustible dust—Part 2: Selection and installation.

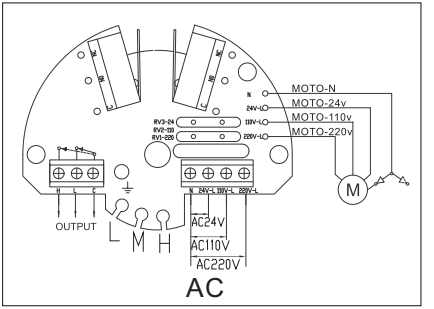
■ Please check the followings while mounting:
1.Mounting the switch above the covered.
2.The instrumentation cannot measure correctly when it is mounted within the blocked distance. (Inactive area)
3.Mount the switch vertically in the surface or the sides of the targeted object.
4.Make the connecting hole to cable headed below the instrumentation when mounting the switch vertically in the sides of the targeted object. The nut which is used to fix the cable should be locked tightly in avoid of lacking. (As the picture next page)
5.The switch can be mounted directly without dismantling the paddles when select fixture to mount it with a sickle shape paddle.
6.To reduce the shock of bulk soild, the switch can be mounted at 15℃-20℃ against the horizontal position when mounting it vertically in the sides of the targeted object.
7.The temperature of sensing object cannot be used over 80℃.
8.This product is prohibited from mounting at the entrance of the tank;however,please add an extra protection shield on this product to avoid the shock.The falling materials might affect the operation of this product if it is required to do so.
9.Please add a protection shield or select shaft-protection type for the probe when detecting the bulks with the diameter over 15mm or when installing this product under the entrance of the tank by 7M.
10.Do not mount it upside down.
11.Add the lubricant to rotating axle regularly.

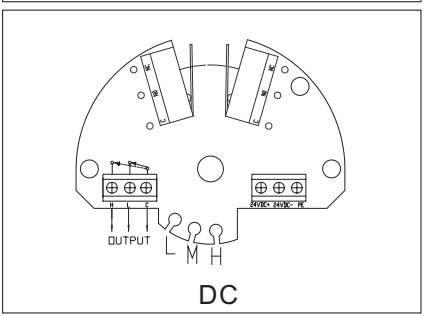
■ Installation



■ Terminal Connection

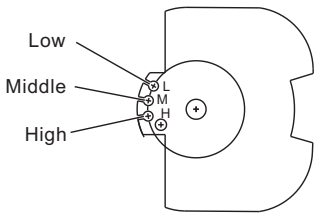
Terminal connection as the picture below：





5.0 Torque adjustment

Torsional spring is used to adjust the torque of rotating axis. The torsional spring can be set at strong position on measuring heavy solid, while the paddle is poor sensitive. Reversly it can be set at low position on measuring light bulk solid, when the sensitivity of paddle is increased.To shaft gear, open the bottom and then clip the torsional spring by a nose plier. Finally, move the torsional spring to the position matching the torque desired. As the following figure:



Notice:Please don't set the torque of torsional spring randomly to avoid the false operation.

Electrical connection

1.The unit must only be connected by an electrician.
2.The national and international regulations for the installation of electrical equipment must be observed.
Voltage supply to EN50178,SELV,PELV.
3.Disconnect power before connecting the unit.

■ Technicial parameters

Main shaft length	50mm
Power supply	AC24V/AC110V/AC220V/DC24V
Power consumption	≤4W
Paddle rotate	2rpm
Torque	0.5 / 0.7 / 1.0 kgf.cm(LOW/MID/HIGH)
Medium density	≥0.5g/cm³
Sensitivity	three sections adjustable
Connection	G1-1/2 thread, fixture, flange
Output	contact capacity 5A/250VAC
EX-proof marking	EXd IIC T6 EX tD A20/A21 IP66 T90
Protection classification	IP66

■ Rotating Paddle maintenance

1.Tighten the installation joint regularly to prevent loosening from affecting the normal operation of products. Semi-annual inspection is recommended.
2.Remove the materials and sundries on the outer surface of wiring cover, detection paddle, drive shaft and oil seal regularly to prevent crystal sundries from affecting the normal operation of products. Inspect powdery materials every two months; Granular materials are inspected every three months; Semi-annual inspection of block materials.
3.Check whether the connection between the drive shaft and the detection paddle is firm regularly, to prevent the loosening from affecting the normal operation of products, semi-annual inspection is recommended.
4.Check the bending deformation of the drive shaft and detection paddle regularly to prevent the deformation from affecting the normal operation of products, semi-annual inspection is recommended.