

- **Fluid Sensors**

Flow sensors
Pressure sensors
Temperature sensors

- **Level Measurement**

Radar Wave Level Sensors
Guided Radar (TDR)
Ultrasonic Level Sensors
Rotating Paddle Level Switches
Vibrating Fork Level Switches
Float Level Switches

Linking your system

More information please visit us: www.ema-electronic.com



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ema reserve the right to change specifications without prior notice

Cata.NO.:C-PA17-EN-A

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Process Automation

- ***Fluid Sensors***

- ***Level Measurement***



CE RoHS Ex 
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About ema

ema Electronics Ltd. is a professional manufacturer in sensor and industrial switches, including Factory Automation, Process Automation and Human Machine Interfaces. Owing an outstanding R&D team which focus on core technique as well as being and devoted to development and innovation, we therefore provide our esteemed customers with All-in-One solutions as vertical integration including design, tooling, and production. We believe that the only way to offer the best industrial control system for customers is to be a total solution-provider. Through our enterprise concept, we can make our customers reduce the cost of operation, enhance the efficiency of work, and increase the quality plus the extra value of products.



Technical seminars/Conferences

We are ready to hold technical seminars in your company at any time.

Customization

Under certain situations, only custom design method can satisfy customers and meet their demand of application via our All-In-One solutions as vertical integration including design molding, tooling, assembly and production. turn capacity; we are able to absorb your ideas into design of customized products quickly.

Sales and technical support

Our laboratory could test on product in all kinds of industrial environment and customer's circumstances. Our partners could acquire demo kit, posters and other promotion materials to increase the sales.



After sale service

ema offer quick service and promised quality for all products. Repairs will be done immediately and you will receive a report after examination.

RoHS



Laws and rules regarding to the use of chemical raw materials has been gradually regulated in Europe, America, and China since July in 2006. EU(European Union) announced RoHS directive which restricts six kind of harmful substance, lead, mercury, cadmium, chromium , PBB, and PBDE to be applied to any electric and electronic machinery. Products are banned to be sold in those areas if violating the regulations. This directive aims to protect human's health and to recycle the discard motors and electronics equipments handling. Enterprises only focused on environment of producing in the past; however, nowadays many pay attention to the rules of environment security because of the importance of environmental protection consciousness from many countries. With the trend of global green concept, all ema products meet RoHS directive.

IP ranking

The first number Protection against solid bodies			The second number Protection against water		
IP		Request	IP		Request
0	○	No protection	0	○	No protection
1		Protection against penetration of solid bodies with dimensions of more than 50mm.	1		Vertical water droplets. No harmful ingress.
2		Protection against the penetration of solid bodies with dimensions of more than 12 mm.	2		Showering at 15°. No harmful ingress.
3		Protection against penetration of solid bodies with dimension of more than 2,5mm.	3		Showering at 60°. No harmful ingress.
4		Protection against penetration of solid bodies with dimension of more than 1mm.	4		Splashing from any direction. No harmful ingress.
5		Protection against dust(no harmful deposit)	5		Water jets from any direction 12.5l/min. No harmful ingress.
6		Total protection against dust(no penetration)	6		Large volumes of water 100l/min.No ingress.
			7		Immersion up to 1metre deep. No ingress
			8		Submersion at specified depths exceeding 1 metre. No ingress.
			9K		Protected against close-range high pressure, high temperature spray downs.

Explosion Certificate

Many manufacture factories would have concerns about security issues when using Level sensors, flammable gas, dust,oil refining,petrochemicals are all easy to cause safety accidents.So such industrial environment have a high demand for explosion-proof performance of Level Sensors.And many countries have developed a corresponding strictly standard,and only can be used in industrial environment after repeated experiments and tests.Ema's Ex-Proof Level Series has passed the examination and test of the National Explosion-proof Center, and obtained the authoritative certification of China National Quality Supervision and Test Center(CQST).The Ex-proof certification grade: Exd IICT6, which can be safely and stably applied to all kinds of dust and smoke environment to provide effective protection for the production .without loss.

Application

Ema's Ex-proof Level sensors are suitable for industrial environments with a higher proportion of dust, flammable and explosive gas,combustible substances of steam or mist (e.g:CH4,C2H2,C2H4,NH3,CO,C2H5OH...). When General non-Ex-proof level sensor works in this kind of environment,It would be very easy to cause short circuit or explosive accidents by water or dust enter into internal,then as a dangerous precedent for safety production.While our Level sensor can avoid water,smoke gas liquid and dust into inside of product with it's unique internal structure design and special material.It also obtained the highest IIC in all of the Ex-proof level and can effectively prevent the occurrence of safety accidents.

China National Quality Supervision and Test Center(CQST)'s grade guidelines:

Ex	d	II C	T6
China National Quality Supervision and Test Center (CQST)'s Certification	Electrical Equipment protection by flame proof housing"d" Notice: It can withstand the flammable mixture which have entered into the interior of the housing explosion but without loss. And through it can not ignite the Electrical Equipment housing of external explosive environment formed by one or more gas or steam through any bonding surfaces or holes in theIntrinsically safe "ia" means that the internal circuit inside the equipment under specified conditions, Electrical spark and thermal under normal or specified failure conditions can not ignite the specified explosive mixture instruments equipment. housing.	There are two types of Electrical Equipment that can not ignite surrounding explosive environment under specified conditions: I:Electrical Equipment under coal and pit. II:All Electrical Equipment for explosive gas environment except that under coal and pit. Type II can be divided into IIA,IIB and IIC,Equipment marked IIB can be used to the conditions of equipment marked IIA. While Equipment marked IIC can be used to the conditions of equipment marked IIA and IIB.	Maximum group temperature T6:85℃ Notice: When Electrical equipment works in the most unfavorable operating conditions within the specified range ,It may cause the surface temperature of the Electrical equipment up to the highest,which was ignited by the surrounding explosive environment. The maximum surface temperature should be below the flammable temperature.

You can easily find the data you are looking for

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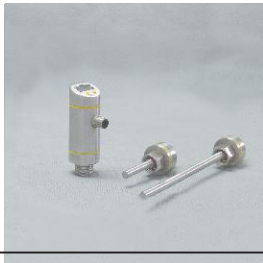
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ema Process Automation

Fluid

TB/TD
Remote Temperature Sensors



- Smart remote temperature sensor
- Used for long-distance measurement
- Three combined units: control monitor, cable, probe
- Users can set temperature range and switch point easily
- Programmable temperature sensors
- Can be set 2 units of temperature, °C and °F
- All stainless steel structure and the rating is up to IP68



Order NO.

TB control monitors







Order NO.	Thread Type	Thread	Temp Medium (°C/°F)	Supply Voltage (V)	Output 1	Output 2	Drawing No.
TB1004	External	G1/2" A	-40...+150/-40...+302	18-36VDC	PNP NO/NC NPN NO/NC	0-10V, 4-20mA	E3T04
TB1005	External	G1/2" A	-40...+150/-40...+302	18-36VDC	PNP NO/NC NPN NO/NC	PNP NO/NC NPN NO/NC	E3T04

TD probe units

Order NO.	Thread Type	Thread	Temp Medium (°C/°F)	Sensing element	Probe Length (mm)	Drawing No.
TD1000	Internal	M18×1.5	-40...+150/-40...+302	PT1000	45mm	E3T05
TD1001	Internal	M18×1.5	-40...+150/-40...+302	PT1000	160mm	E3T05
TD1002	Internal	M18×1.5	-40...+150/-40...+302	PT1000	260mm	E3T05
TD1003	Internal	M18×1.5	-40...+150/-40...+302	PT1000	360mm	E3T05

Accessories:

Type	Connector Order No.						Drawing No.
C	Q2	I	5	C	12		E3U11
I	C: Cable	Length Q2: 2M Q5: 5M Q10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC Shielded Wire	Size 12: M12	L: E3U12

Order No.	US0001	US0002	US0003	US0007	US0009	US0023
Type						
Drawing No.	E3U01	E3U02	E3U03	E3U07	E3U08	E3U09

Drawing

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Order NO.

TB control monitors

Order NO.	Thread Type	Thread	Temp Medium (°C/°F)	Supply Voltage (V)	Output 1	Output 2	Drawing No.
TB1004	External	G1/2" A	-40...+150/-40...+302	18-36VDC	PNP NO/NC NPN NO/NC	0-10V, 4-20mA	E3T04
TB1005	External	G1/2" A	-40...+150/-40...+302	18-36VDC	PNP NO/NC NPN NO/NC	PNP NO/NC NPN NO/NC	E3T04

TD probe units

Order NO.	Thread Type	Thread	Temp Medium (°C/°F)	Sensing element	Probe Length (mm)	Drawing No.
TD1000	Internal	M18×1.5	-40...+150/-40...+302	PT1000	45mm	E3T05
TD1001	Internal	M18×1.5	-40...+150/-40...+302	PT1000	160mm	E3T05
TD1002	Internal	M18×1.5	-40...+150/-40...+302	PT1000	260mm	E3T05
TD1003	Internal	M18×1.5	-40...+150/-40...+302	PT1000	360mm	E3T05

Accessories:

Type	Cable Order No.						Drawing No.
C	Q2	J	5	R	12		J: E3U10
I	C: Cable	Length Q2: 2M Q5: 5M Q10: 10M	J: J male/female	Pole 5: 5	R: PUR	Size 12: M12	

Technical parameters:

Sensing element: PT1000
Stainless steel 304
Stainless steel 316L
Connection: M12 Socket
Pressure rating(bar): 300
Voltage drop(V): <3.5
Power-on delay time (s): 1.5
sensing/display cycle time(ms): 200
Switching output accuracy(°C): ±0.2
Analogue output accuracy(°C): ±(0.2+0.4% measuring interval)

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Left page

- ① Main classification
- ② Series classification
- ③ Model classification
- ④ Certificates
- ⑤ Ordering code
- ⑥ Drawing page

Right page

- ⑦ Order Information
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- ⑨ Brand

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Fluid Sensors

- Flow sensors
- Pressure sensors
- Temperature sensors



EMA has owned three main series in the category of Fluid Sensors up to now: Temperature, Pressure, and Flow Sensors. These series with similar operating principles due to the similar structures, detecting, MCU processing, output and display units. By the signals sampled via probes, fluid sensors operate the

MCU (Multi Control Unit) to convert signals into digital ones which are displayed again as numerical values in a segmented display as 2-color LEDs. According to values set by the user, the values are converted to digital or analogue signals automatically. Users can control MCUs by using buttons on the housing. As long as the threshold value is reached, signals are generated. These outputs are the same with digital outputs (NPN / PNP outputs, hysteresis, NO / NC, window-function NO / NC); besides, pressure and temperature sensors generate analogue signals (0-10V, 4-20mA). This series is completely protected from overload, short-circuit and reverse polarity. Protection rating is IP68.



EMA's electronic flow sensors operate in accordance with theory of thermo-diffusion that the sensors are using a physical principle, flowing mediums absorption and heat transportation. There are two thermistors and one heater in the probes. This heat cause an increase in temperature in certain areas, and the increased part is detected by one probe of them. As long as the mediums passes by, the probe can cool down which is again detected by the thermistors. Absorption rate are put into relation to a rate of flow which is indicated on the unit. Flow direction and position of sensor does not matter because the unit works without mechanical parts.



When the pressure acts on the interface of the ceramic-diaphragm, the diaphragm is deformed slightly. It is furthermore connected to a Wheatstone bridge through a thick-film-resistor in the back of the diaphragm. Due to the Piezo resistive Effect from voltage dependant resistors, the electric bridge will produce a high-linear voltage signal with a direct ratio to pressure. Then it is converted to a standard voltage signal which is then transmitted to the system. The 3-digit-segment display shows the value of pressure and then the value will be compared to setting points by the user. Finally, this value is converted to signals for switching output(NPN,PNP) or for analogue output.



ema's temperature sensors detect the operating temperature by RTD probe and than transmits the data to an examining circuit. After processing, the current operating temperature is displayed through LED and converted automatically into a digital (NPN, PNP) or an analogue (0-10V, 4-20mA) signal.

Linking your system



Flow sensors



EMA's electronic flow sensors operate in accordance with theory of thermo-diffusion that the sensors are using a physical principle, flowing mediums absorption and heat transportation. There are two thermistors and one heater in the probes. This heat cause an increase in temperature in certain areas, and the increased part is detected by one probe of them. As long as the mediums passes by, the probe can cool down which is again detected by the thermistors. Absorption rate are put into relation to a rate of flow which is indicated on the unit. Flow direction and position of sensor do not matter because the unit works without mechanical parts.



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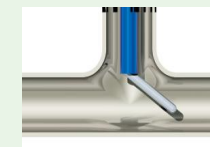
Features

FL series is an electronic device designed for monitoring a certain rate. Without mechanical components, this guarantees a reliable monitoring even in case of complex mediums over a long period. The purpose of FL series is to output a signal when the flow rate reaches the set-up range. Through control calculation, FL series can proceed to warn or activate the chain of protection system in order to protect the key equipments and to avoid unexpected damage in production. It can not only successfully reduce the possibility of breakdown and the cost of maintenance, but also keep the countless reliability of operational safety and of economic benefits. FL series is provide stable and steady service and are useable in hazardous areas by adapting to the theory of thermo-diffusion. It can be inserted into the tube or the container and set up the flow rate to an expected value. FL series is an electronic flow sensor meant for modern industry. It is applied widely in highly developed countries and has surpassed traditional flow switches.

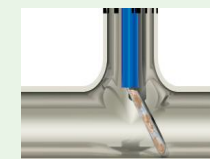


Electric flow sensor is more stable and durable than traditional mechanical switch

Mechanical Flow Switches



Detect the flow mediums by the swing amplitude of the mechanical paddles or probes.



No matter of paddles or probes, the detection will be affected by the low sensitivity due to the rusty probes under a long-term operation.



Serious rustiness even causes the break of paddles or probes, and then falling probes may clog up the pipes or damage the machines. It not only makes the mechanical flow switches operate falsely ,but also face the derivative problems on the maintenance of pipe system and of machines.

Smart Flow Sensors



Equipped with a mini probe, FL series does not effect the flow of mediums while detecting the flow rate.



The unit is also usable for applications with a slow rate of flow which causes a slow dissipation in temperature at the probe. On the contrary, fast rates of flow can also be detected very easily up to a maximum rate of flow.



Using stainless steel for the probe means no rust and more accurate readings.

Flow Sensors

Pressure Sensors

Temperature Sensors

Flow + Temperature Sensor

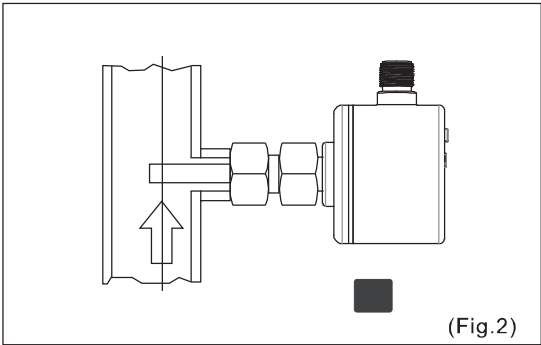
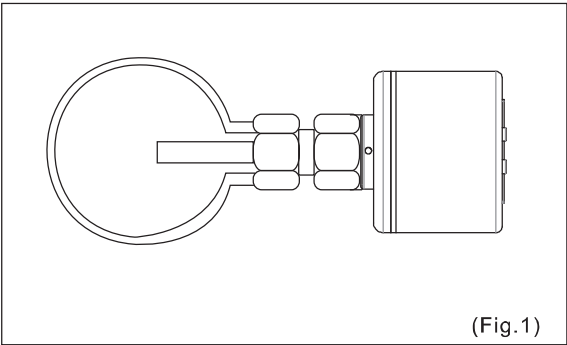
Flow + Temperature Sensor is the most progressive technique and is created exclusively to satisfy the demands of customers. It perfectly combines temperature sensor and flow sensor in one unit. The LED bar can display indication of the temperature and flow range as well as output warning signals separately. With features such as high precision, usage of very small space, user-friendly handling and impressive design it can be applied in all industries. Those deal with electricity, sewage disposal, petroleum, chemical engineering,metallurgy, glass, coolant system, machinery production and more.



- 1 Unique design in the world, programmable smart flow + temperature sensor
- 2 Users can set the range and switch point of flow rate and temperature through the buttons
- 3 Interactive visualization interface make it easier to monitor on-site
- 4 Built-in high precision sensor chip, widely used in detecting gas and liquid
- 5 Overload, short-circuit and reverse polarity power protection
- 6 Stainless stell housing

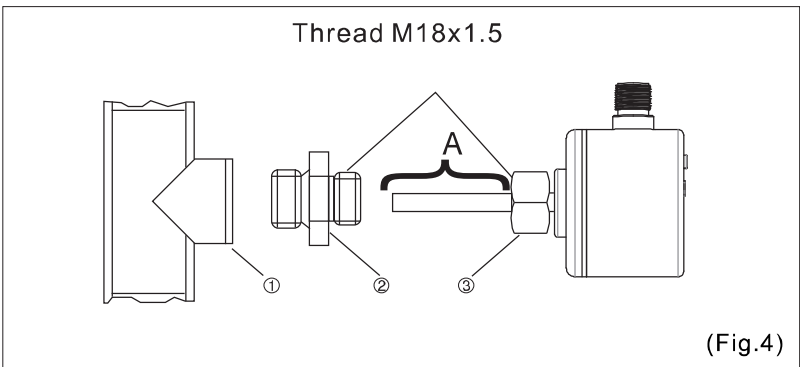
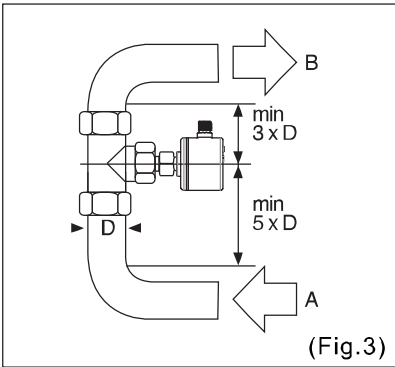
Installation

- 1. It is strongly suggested to install the sensor in the sides while installing it in the horizontal pipe.(Fig.1)
- It is supposed to clear up the sediments while installing the sensor in the bottom of the pipe.
- It is supposed to pay attention to the medium occupied the pipe while installing the sensor in the top of the pipe.
- 2. Please install the sensor in the place which the medium flows upward while installing it in the vertical pipe.(Fig.2)



Avoiding damage, the user should watch out for the minimum distance between the sensor and the curve, the valve and the cross section which changes.(Fig.3):

- Entrance (A) min.5xD
- Exit (B) min.3xD
- Diameter of the pipeline(D)



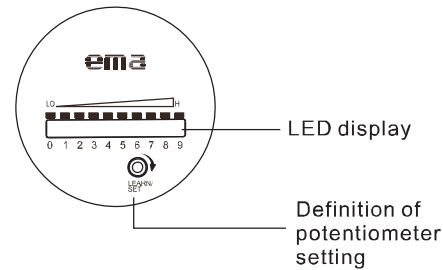
- 1. To screw the nut smoothly, please add the lubricant on the nut ③ and the threads. (Fig.4)
- Notice: It is disallowed to add lubricant on the sensor probe(A).
- 2. Screw a suitable adapter ② to the joint ①. (Fig.4)
- 3. Insert the sensor to the adapter and then screw the nut ③ (The biggest screwing torque: 50Nm). (Fig.4)

The depth of insertion: The minimum depth inserting to the pipeline is 12mm. To insure the correct depth, the user can use an adapter ②(Accessory; optional order).
Notice: The probe of sensor is not allowed to contact the wall of the pipe.

Menu setting and indication status

Control panel

Potentiometer type



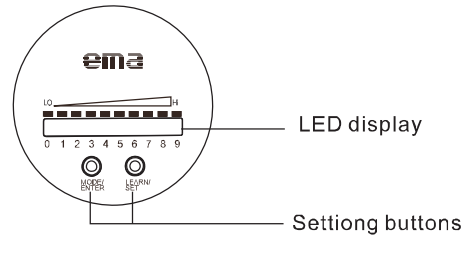
Definition of potentiometer setting

SP setting:
Rotate in clockwise direction,LED increase
Rotate in anticlockwise direction,
LED decrease

Display function (Operation mode)

	Overflow flow (LED flashes)
	SP setting (LED 1 display)
	Current flow in display range (LED bar green)
	Exceed flow range (LED full display)
LED = Red LED = Green	

Smart type



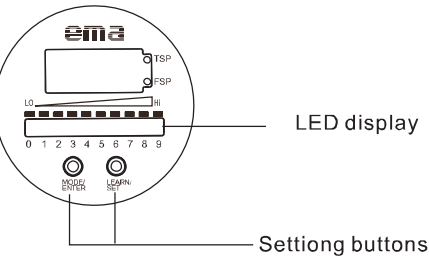
Button definition

MODE / ENTER: Selection / Confirmation
Learn/Set: Adjust to the biggest / smallest
flow; value setting(Keep pressing button
to scroll the display; Press button once
to increase the value progressive.)

Display (Operation)

	In the display range (LED bar Green)
	Over the flow range (LED 9 Flash)
	Current is too low (LED 0 Flash)
Switching point display (SP) : LED Orange: Flow>SP; LED Red: Flow<SP	

Flow+Temp. type



Button definition

MODE/ENTER: Selection / Confirmation
LEARN/SET: Adjust the setting rate
of flow/value, the tempereture SP
(display, output, calibration of temp-
erature, flow SP, and remote enable
function.)

Display (Operation)


	In the display range (LED bar Green)
	Over the flow range (LED 9 Flash)
	Current is too low (LED 0 Flash)
Switching point display (SP) : LED Orange: Flow>SP; LED Red: Flow<SP	



- Programmable flow sensor. User can set the flow range and switch point via buttons easily
- Sensible substance: gas, liquids
- Power protection: overload, shortcircuit, reverse polarity
- Medium temperature: -25°C~80°C
- Robust housing/probe stainless steel 316L
- Protection: IP68



Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I : E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded wire	Size 12: M12	L : E3U12

Order No.	US0001	US0002	US0003	US0007	US0009	US0023
Type						
	M18 x 1.5 – M12 x 1	M18 x 1.5 – G1/4"	M18 x 1.5 – G1/2"	M18 x 1.5 – Ø24mm	M18 x 1.5 – M18 x 1.5	M18 x 1.5 – G1/4"
Drawing No.	E3U01	E3U02	E3U03	E3U07	E3U08	E3U09

★ US0023 is used for low flow rate

Drawing

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Order NO.

FL60 Smart type

Order NO.	Thread Type	Thread	Sensible Range Liquid (cm/s)	Sensible Range gas (cm/s)	Output	Probe Length (mm)	Supply Voltage (V)	Drawing No.
FL6001	Internal	M18x1.5	3~300	200~3000	PNP NO/NC	45	20~36 DC	E3F01
FL6002	Internal	M18x1.5	3~300	200~3000	NPN NO/NC	45	20~36 DC	E3F01
FL6003	Internal	M18x1.5	3~300	200~3000	RELAY NO/NC	45	20~36 DC	E3F01
FL6004	Internal	M18x1.5	3~300	200~3000	RELAY NO/NC	45	85~265 AC	E3F01
FL6005	Internal	M18x1.5	3~60	200~800	4~20mA	45	20~36 DC	E3F01

FL60 Extra length probe

Order NO.	Thread Type	Thread	Sensible Range Liquid (cm/s)	Sensible Range gas (cm/s)	Output	Probe Length (mm)	Supply Voltage (V)	Drawing No.
FL6011	Internal	M18x1.5	3~300	200~3000	PNP NO/NC	100	20~36 DC	E3F01
FL6012	Internal	M18x1.5	3~300	200~3000	NPN NO/NC	100	20~36 DC	E3F01
FL6013	Internal	M18x1.5	3~300	200~3000	RELAY NO/NC	100	20~36 DC	E3F01
FL6014	Internal	M18x1.5	3~300	200~3000	RELAY NO/NC	100	85~265 AC	E3F01

FL61Titanium alloy probe

Order NO.	Thread Type	Thread	Sensible Range Liquid (cm/s)	Sensible Range gas (cm/s)	Output	Probe Length (mm)	Supply Voltage (V)	Drawing No.
FL6101	Internal	M18x1.5	3~300	200~3000	PNP NO/NC	45	20~36 DC	E3F01
FL6102	Internal	M18x1.5	3~300	200~3000	NPN NO/NC	45	20~36 DC	E3F01
FL6103	Internal	M18x1.5	3~300	200~3000	RELAY NO/NC	45	20~36 DC	E3F01
FL6104	Internal	M18x1.5	3~300	200~3000	RELAY NO/NC	45	85~265 AC	E3F01

Technical parameters:



Housing/Probe material: Stainless steel 316L
Connection: M12 Socket
Pressure rating [bar]: 300
Max. current load [mA]: 400
Voltage drop [V]: < 2.5
Power-on delay time [s]:<8
Output response time [s] : < 2
4...20mA Output accuracy: ± 10%
Medium temperature[°C]: -25...80





- Programmable smart flow + temperature sensor, user can set flow range and switch point via buttons easily
- Visual indication makes the control of this sensor easier
- Sensible substance: gas, liquids
- Power protection: overload, short-circuit, reverse polarity
- Medium temperature: -25°C~80°C
- Robust housing/probe stainless steel 316L
- Protection: IP68



Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I : E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded wire	Size 12: M12	L : E3U12
 L							

Order No.	US0001	US0002	US0003	US0007	US0009	US0023
Type	 M18 x 1.5 – M12 x 1	 M18 x 1.5 – G1/4"	 M18 x 1.5 – G1/2"	 M18 x 1.5 – Ø24mm	 M18 x 1.5 – M18 x 1.5	 M18 x 1.5 – G1/4"
Drawing No.	E3U01	E3U02	E3U03	E3U07	E3U08	E3U09

★ US0023 is used for low flow rate

Drawing

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Order NO.

Order NO.	Thread Type	Thread	Sensible Range Liquid (cm/s)	Sensible Range gas (cm/s)	Output	Probe Length (mm)	Supply Voltage (V)	Drawing No.
FL6201	Internal	M18×1.5	3~300	200~3000	PNP NO/NC	45	20~36 DC	E3F03
FL6202	Internal	M18×1.5	3~300	200~3000	NPN NO/NC	45	20~36 DC	E3F03

Technical parameters:

Housing/Probe material: Stainless steel 316L
Connection: M12 Socket
Pressure rating [bar]: 300
Max. current load [mA]: 2 × 400
Voltage drop [V]: < 2.5
Power-on delay time [s]: < 8
Output response time [s] : < 2
Temperature display accuracy[°C]: ± 0.5
Medium temperature[°C]: -25...80



- Setting by potentiometer
- No pressure lose
- Full pass flow tube
- Extremely wide flow range
- Different kinds of flow medium can be measured
- Simple indication, Highly reliability
- Robust housing/probe stainless steel 316L
- Protection: IP68



Accessories:

US0041



G1/2" – Ø24mm

E3U13

Drawing
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Order NO.

Order NO.	Thread Type	Thread	Sensible Range Liquid (cm/s)	Sensible Range gas (cm/s)	Output	Probe Length (mm)	Supply Voltage (V)	Drawing No.
FL6301	External	G1/2"A	3~300	200~3000	PNP/NPN NO	45	20~36 DC	E3F04
FL6302	External	G1/2"A	3~300	200~3000	PNP/NPN NC	45	20~36 DC	E3F04

Technical parameters:



Housing/Probe material: Stainless steel 316L
Connection: M12 Socket
Pressure rating [bar]: 300
Max. current load [mA]: 400
Voltage drop [V]: < 2.5
Power-on delay time [s]:<8
Output response time [s] : < 2
Medium temperature[°C]: –25...80
Liquid SP setting [cm/s]: Adjustable via potentiometer (Factory setting: 15)
Gas SP setting [cm/s]: Adjustable via potentiometer (Factory setting: 150)





- Used for long-distance flow measurement
- Three combined units: controller, cable, probe
- Users can set flow range and switch point via buttons easily
- Embedded high precision sensing chip and suitable for gas and liquid
- All stainless steel structure and protection rating is up to IP68



Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I : E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded wire	Size 12: M12	L : E3U12
 L							

Order No.	US0001	US0002	US0003	US0007	US0009	US0023
Type						
	M18 x 1.5 – M12 x 1	M18 x 1.5 – G1/4"	M18 x 1.5 – G1/2"	M18 x 1.5 – Ø24mm	M18 x 1.5– M18 x 1.5	M18 x 1.5– G1/4"
Drawing No.	E3U01	E3U02	E3U03	E3U07	E3U08	E3U09

★ US0023 is used for low flow rate


Drawing	
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Order NO.
Control monitors

Order NO.	Thread Type	Thread	Sensible Range Liquid (cm/s)	Sensible Range gas (cm/s)	Output	Probe Length (mm)	Supply Voltage (V)	Drawing No.
FL6401	External	G1/2"A	3~300	200~3000	PNP NO/NC	None	20~36 DC	E3F05
FL6402	External	G1/2"A	3~300	200~3000	NPN NO/NC	None	20~36 DC	E3F05
FL6403	External	G1/2"A	3~300	200~3000	RELAY NO/NC	None	20~36 DC	E3F05
FL6404	External	G1/2"A	3~300	200~3000	RELAY NO/NC	None	85~265 AC	E3F05

Probe

Order NO.	Thread Type	Thread	Sensible Range Liquid (cm/s)	Sensible Range gas (cm/s)	Output	Probe Length (mm)	Supply Voltage (V)	Drawing No.
FL6410	Internal	M18"x1.5	None	None	None	45	None	None

Type	Cable Order No.						Drawing No.
 J	C	02	J	5	R	12	J : E3U10
	C: Cable	Length 02: 2M 05: 5M 10: 10M	J :Jumper male/female	Pole 5: 5	R: PUR	Size 12: M12	

Technical Parameters




Housing/Probe material: Stainless steel 316L
Connection: M12 Socket
Pressure rating [bar]: 300
Max. current load [mA]: 400
Voltage drop [V]: < 2.5
Power-on delay time [s]:<8
Output response time [s] : < 2
Medium temperature[°C]: -25...80



- Output function: can be converted by dip switches
- Sensing substance: gas, liquid
- Display: LED
- Power protection: overload, reverse polarity
- Explosion proof classification: Exd II CT6



Accessories:

Order No.	US0001	US0002	US0003	US0007	US0009	US0023
Type						
	M18 x 1.5 – M12 x 1	M18 x 1.5 – G1/4"	M18 x1.5 – G1/2"	M18 x1.5 – Ø24mm	M18 x1.5– M18 x1.5	M18 x1.5– G1/4"
Drawing No.	E3U01	E3U02	E3U03	E3U07	E3U08	E3U09

★ US0023 is used for low flow rate

Drawing

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Order NO.

Order NO.	Thread Type	Thread	Sensible Range Liquid (cm/s)	Sensible Range gas (cm/s)	Output	Probe Length (mm)	Supply Voltage (V)	Drawing No.
FL2001	Internal	M18 x 1.5	3~300	200~3000	PNP NO/NC	45	20~36 DC	E3F06
FL2002	Internal	M18 x 1.5	3~300	200~3000	NPN NO/NC	45	20~36 DC	E3F06

Technical parameters:



Housing/Probe material: Stainless steel 316L
Connection: Terminal
Pressure rating [bar]: 300
Max. current load [mA]: 400
Voltage drop [V]: < 2.5
Power-on delay time [s]: <8
Output response time [s] : < 2
Medium temperature[°C]: -25...80





- This electronic flow sensors meet the standard of hygienic design
- Embedded high precision sensing chip and suitable for gas and liquids
- Elegant design, smooth surface, anti-acid, anti-alkali and anti-corrosion
- Users can set flow range and switch point via buttons easily
- All stainless steel structure and the rating is up to IP69K



Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I : E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded wire	Size 12: M12	L : E3U12
 L							

Order No.	US0063	US0064
Type	 Hygienic welding adapter	 Hygienic Tri Clamp adapter
Drawing No.	E3U17	E3U18

Drawing

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Order NO.

FL33 Sanitary Flow sensors

Order NO.	Thread Type	Thread	Sensible Range Liquid (cm/s)	Sensible Range gas (cm/s)	Output	Probe Length (mm)	Supply Voltage (V)	Drawing No.
FL3301	External	G1"A	3~300	200~3000	PNP NO/NC	45	20~36 DC	E3F02
FL3302	External	G1"A	3~300	200~3000	NPN NO/NC	45	20~36 DC	E3F02

FL331X Sanitary Flow and Temperature Sensors

Order NO.	Thread Type	Thread	Sensible Range Liquid (cm/s)	Sensible Range gas (cm/s)	Output	Probe Length (mm)	Supply Voltage (V)	Drawing No.
FL3311	External	G1"A	3~300	200~3000	PNP NO/NC	45	20~36 DC	E3F02
FL3312	External	G1"A	3~300	200~3000	NPN NO/NC	45	20~36 DC	E3F02

Technical parameters:

Housing/Probe material: Stainless steel 316L
Connection: M12 Socket
Pressure rating [bar]: 300
Max. current load [mA]: 400
Voltage drop [V]: < 2.5
Power-on delay time [s]: < 8
Output response time [s] : < 2
Medium temperature[°C]: -25...95

Linking your system



Features

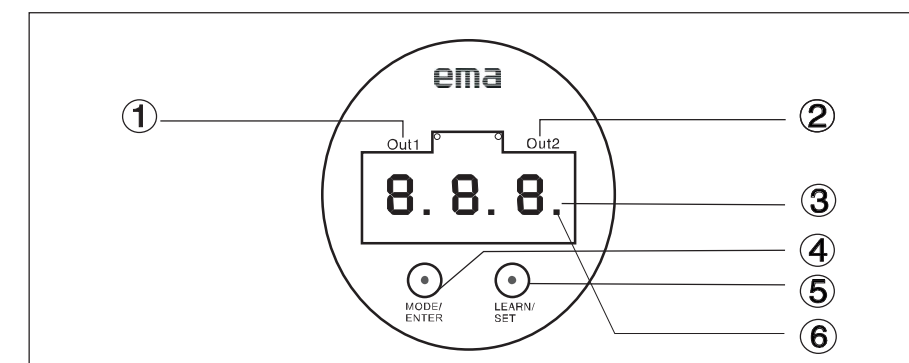
Pressure sensors are applied to a variety of fields in industrial automation such as water conservancy, hydroelectric industry, intelligent architecture, automation control, aviation, military industry, petrochemical industry, electric power, shipping, machinery tools, and more.

Applications



- Measure and control the pressure of gas and of liquid in the pipeline transportation systems.
- Monitor the pressure values of the oil of cutting machines.
- Monitor the pressure in the oiling cylinders, oil circuits, and oil pipes in order to secure the oil circuits and reach specify pressure
- Detect pressure of oil in pipes in wind power equipments
- Detect pressure of enzymes or other chemicals in containers.
- Monitor pressure of liquids in the containers, and warn while the pressure detected is over that set by users.
- Detect pressure in liquid waste processing systems.
- Measure and control the pressure of gas and of liquids.
- Detect pressure of materials in extracting systems controled by motors.

Controls and visual indication



①	Out1	Out1 output connected, LED light on
②	Out2	Out2 output connected, LED light on
③	7-segment LED	Displays system pressure, parameters and setting value
④	MODE/ENTER	Selection of parameter and acknowledgement of parameter value
⑤	LEARN/SET	Setting of learn mode and parameter value
⑥	Millesimal display	The value displayed should be multiplied by 10 when this dot flashes.

Pressure sensors



When the pressure acts on the interface of the ceramic-diaphragm, the diaphragm is deformed slightly. It is furthermore connected to a Wheatstone bridge through a thick film resistor in the back of the diaphragm. Due to the Piezo resistive Effect from voltage dependant resistors, the electric bridge will produce a high-linear voltage signal with a direct ratio to pressure. Then it is converted to a standard voltage signal which is then transmitted to the system. The 3-digit-segment display shows the value of pressure and then the value will be compared to setting points by the user. Finally, this value is converted to signals for switching output(NPN,PNP) or for analogue output(0-10V,4-20mA).



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Fuctions and features

By the probe, the pressure sensor can detect and then display the current system pressure (bar;Psi;Kgf;Psi) ; meanwhile, it can generate two signals according to the setting of output.

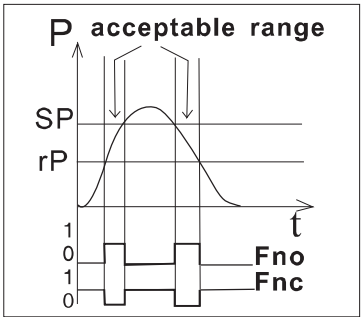
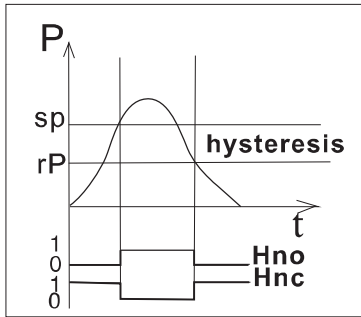
Output 1	Output 2
Hysteresis/N.O.(Hno)	Analogue output
Hysteresis function/N.C.(Hnc)	4~20mA(I)
window function/N.O.(Fno)	Analogue output
window function/N.C.(Fnc)	0~10V(U)

Hysteresis

The hysteresis keeps the switching state of the outputs stable. if the system pressure varies about the preset value.When the system pressure is increasing, the output switches when the switch-on point has been reached (SP1); when the system pressure is decreasing again, the output switch-off point (rP1) has been reached. The hysteresis can be adjusted:First the switch-on point is set, then the switch-on point with the different demand.

Window function :

The Window function enables the monitoring of a defined acceptable range. When the system press varies between the switch-on point (SP1) and the switch-off point(rP1). the output is switched (window function/NO) or not switched (window function/NC). The width of the Window can be set by means of the difference between SP1 and rP1. SP1=upper value, rP1=lower value.



Operating modes

Run mode:(Normal operating mode)

- When the supply voltage has been applied, the unit is in the Run mode .It monitors and switches the transistor output according to the set parameters.
- The output value of analogue signal is related to system presure
- The digit display indicates the current system pressure; the red LED indicates the switching state of the transistor output.

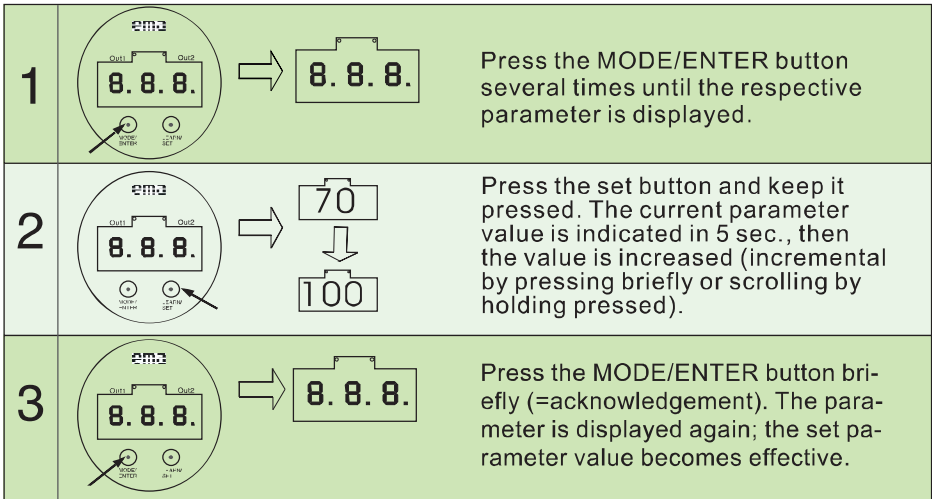
Display mode:(Indication of parameters and the set parameter values)

- When the “MODE/ENTER” button is pressed briefly, the unitpasses to the Display mode which allows parameter values to be read. The internal sensing , processing and output functions of the unit continue as if in Run mode.
- The parameter names are scrolled with each pressing of the “MODE/ENTER” button.
- when the “SET” button is pressed briefly, the correspond-ing parameter value is displayed for 5 sec.. After another 5 sec.The unit returns to the Run mode.

Programming mode:(Setting of the parameter values)

- The unit passes it the programming mode when after the selection of a parameter value (Display mode) the “LEARN/ SET” button is pressed until the display of the parameter value has been changed. Internally the unit remains in the operating mode .It continues its monitoring function with the existing parameters until the change has been terminated.
- You can change the parameter value by pressing the “LEARN/SET” button and confirm it by pressing the “MODE/ENTER” button. The unit returns to the Run mode when no button has been pressed for 5 seconds.

Programming



- Decrease parameter value:** Make the parameter value displayed reach the maximum setting of the parameter value, and then recycle from the minimum value to the maximum value
- Lock:** The device has automatically lock function.If no key pressed when it is in the run mode, it will automatically lock the pushbuttons,normally detect temperature fluctuations, and output control value.
- Unlock:** When it is in normal pressure display state(run mode),long press LEARN/SET, then press MODE/ENTER, maintaining 10 seconds, until display ULC the device is unlocked. All devices from the factory are locked.

Setting / Operation

Detecting security of device if the operation works effective. Fault situations:


OL	Too high pressure
LO	Too low pressure
Sc	Flashing = PNP or NPN output means overload or short circuit






- Programmable smart pressure sensor, user can set the pressure range and switch point via buttons easily
- Offering 4 units of pressure, Bar, Kg/cm², Mpa, and Psi, to be converted
- Power protection: overload, short-circuit, reverse polarity
- Delivers high accuracy, high stability and anticorrosive
- Protection:IP68



Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I:E1I38
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded Wire	Size 12: M12	L:E1I39

Order No.	US0004	US0005	US0006
Type			
	G1/4" – G1/2"	G1/4" – G1/4"	G1/4" – M20 x 1.5
Drawing No.	E3U04	E3U05	E3U06

Drawing	
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Order NO.

Order NO.	Thread (Internal)	Sensible Range (bar)	Supply Voltage (V)	Output 1	Output 2	Electric design	Drawing No.
PA1140	G¼"I	–1...1	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1141	G¼"I	2	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1142	G¼"I	5	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1143	G¼"I	10	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1144	G¼"I	20	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1145	G¼"I	50	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1146	G¼"I	100	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1147	G¼"I	200	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1148	G¼"I	250	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1149	G¼"I	400	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1150	G¼"I	600	18~36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P01
PA1160	G¼"I	–1...1	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1161	G¼"I	2	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1162	G¼"I	5	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1163	G¼"I	10	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1164	G¼"I	20	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1165	G¼"I	50	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1166	G¼"I	100	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1167	G¼"I	200	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1168	G¼"I	250	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1169	G¼"I	400	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1170	G¼"I	600	18~36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01


Technical parameters:
Probe material: Stainless steel 316L
Accuracy[%]: ≤ ±0.5
Current load [mA]: 300
Voltage drop [V]: < 2
Analogue output response time [ms] : < 3
Power-on delay time [s]:0.3
Medium temperature[°C]: –25...80
Pressure element: High-precision ceramic diaphragm






- Simple structure, Easy installation, No calibration required
- Unique way of digital calibration, high accuracy, high stability
- All stainless steel structure. Anti-resistant, anti-alkali/corrosion and shock resistant
- High precision ceramic components
- Analogue output 4-20 mA or 0-10 V
- Switching point can be set flexibly and easily
- Protection: IP68



Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I:E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded Wire	Size 12: M12	L:E3U12

Order No.	US0004	US0005	US0006
Type	 G1/4" – G1/2"	 G1/4" – G1/4"	 G1/4" – M20 x 1.5
Drawing No.	E3U04	E3U05	E3U06

Drawing

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Order NO.

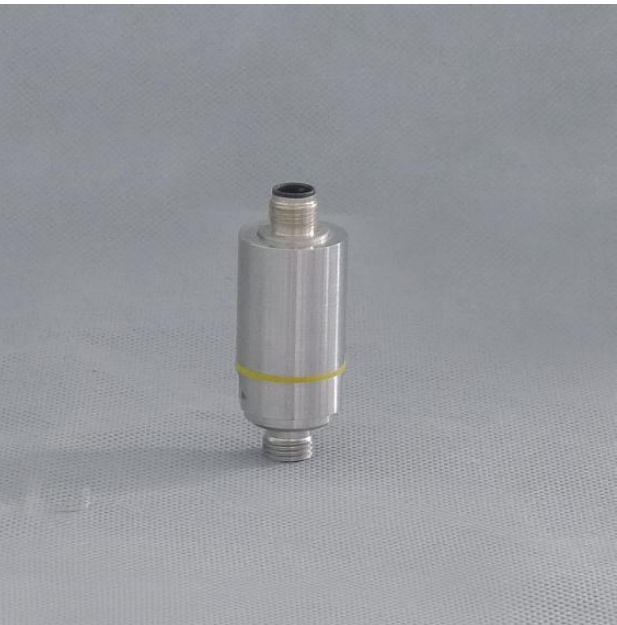
Order NO.	Thread Type	Thread	Sensible Range (bar)	Supply Voltage (V)	Output	Electric design	Drawing No.
PB1140	Internal	G¼"I	–1...1	18~36 DC	4~20mA	2	E3P03
PB1141	Internal	G¼"I	2	18~36 DC	4~20mA	2	E3P03
PB1142	Internal	G¼"I	5	18~36 DC	4~20mA	2	E3P03
PB1143	Internal	G¼"I	10	18~36 DC	4~20mA	2	E3P03
PB1144	Internal	G¼"I	20	18~36 DC	4~20mA	2	E3P03
PB1145	Internal	G¼"I	50	18~36 DC	4~20mA	2	E3P03
PB1146	Internal	G¼"I	100	18~36 DC	4~20mA	2	E3P03
PB1147	Internal	G¼"I	200	18~36 DC	4~20mA	2	E3P03
PB1148	Internal	G¼"I	250	18~36 DC	4~20mA	2	E3P03
PB1149	Internal	G¼"I	400	18~36 DC	4~20mA	2	E3P03
PB1150	Internal	G¼"I	600	18~36 DC	4~20mA	2	E3P03
PB1160	Internal	G¼"I	–1...1	18~36 DC	0~10V	3	E3P03
PB1161	Internal	G¼"I	2	18~36 DC	0~10V	3	E3P03
PB1162	Internal	G¼"I	5	18~36 DC	0~10V	3	E3P03
PB1163	Internal	G¼"I	10	18~36 DC	0~10V	3	E3P03
PB1164	Internal	G¼"I	20	18~36 DC	0~10V	3	E3P03
PB1165	Internal	G¼"I	50	18~36 DC	0~10V	3	E3P03
PB1166	Internal	G¼"I	100	18~36 DC	0~10V	3	E3P03
PB1167	Internal	G¼"I	200	18~36 DC	0~10V	3	E3P03
PB1168	Internal	G¼"I	250	18~36 DC	0~10V	3	E3P03
PB1169	Internal	G¼"I	400	18~36 DC	0~10V	3	E3P03
PB1170	Internal	G¼"I	600	18~36 DC	0~10V	3	E3P03

Technical parameters:
Probe material: Stainless steel 316L
Accuracy[%]: ≤ ±1
Current load [mA]: <30
Voltage drop [V]: < 2
Analogue output response time [ms] : < 3
Power-on delay time [s]:0.3
Medium temperature[°C]: –25...80
Pressure element: High-precision ceramic diaphragm

Order NO.

Order NO.	Thread Type	Thread	Sensible Range (bar)	Supply Voltage (V)	Output	Electric design	Drawing No.
PB2140	External	G¼"A	–1...1	18~36 DC	4~20mA	2	E3P04
PB2141	External	G¼"A	2	18~36 DC	4~20mA	2	E3P04
PB2142	External	G¼"A	5	18~36 DC	4~20mA	2	E3P04
PB2143	External	G¼"A	10	18~36 DC	4~20mA	2	E3P04
PB2144	External	G¼"A	20	18~36 DC	4~20mA	2	E3P04
PB2145	External	G¼"A	50	18~36 DC	4~20mA	2	E3P04
PB2146	External	G¼"A	100	18~36 DC	4~20mA	2	E3P04
PB2147	External	G¼"A	200	18~36 DC	4~20mA	2	E3P04
PB2148	External	G¼"A	250	18~36 DC	4~20mA	2	E3P04
PB2149	External	G¼"A	400	18~36 DC	4~20mA	2	E3P04
PB2150	External	G¼"A	600	18~36 DC	4~20mA	2	E3P04
PB2160	External	G¼"A	–1...1	18~36 DC	0~10V	3	E3P04
PB2161	External	G¼"A	2	18~36 DC	0~10V	3	E3P04
PB2162	External	G¼"A	5	18~36 DC	0~10V	3	E3P04
PB2163	External	G¼"A	10	18~36 DC	0~10V	3	E3P04
PB2164	External	G¼"A	20	18~36 DC	0~10V	3	E3P04
PB2165	External	G¼"A	50	18~36 DC	0~10V	3	E3P04
PB2166	External	G¼"A	100	18~36 DC	0~10V	3	E3P04
PB2167	External	G¼"A	200	18~36 DC	0~10V	3	E3P04
PB2168	External	G¼"A	250	18~36 DC	0~10V	3	E3P04
PB2169	External	G¼"A	400	18~36 DC	0~10V	3	E3P04
PB2170	External	G¼"A	600	18~36 DC	0~10V	3	E3P04



Technical parameters:
Probe material: Stainless steel 316L
Accuracy[%]: ≤ ±1
Current load [mA]: <30
Voltage drop [V]: < 2
Analogue output response time [ms] : < 3
Power-on delay time [s]:0.3
Medium temperature[°C]: –25...80
Pressure element: High-precision ceramic diaphragm



- Simple structure、 Easy installation、 No calibration required
- Unique way of digital calibration, high accuracy, high stability
- All stainless steel structure. Anti-resistant, anti-alkali/corrosion and shock resistant
- High precision ceramic element
- PNP or NPN NO/NC switching output
- Switching point can be adjusted by programmable unit



Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I:E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded Wire	Size 12: M12	L:E3U12
 L							
Order No.	US0004		US0005		US0006		
Type	 G1/4" – G1/2"		 G1/4" – G1/4"		 G1/4" – M20 x 1.5		
Drawing No.	E3U04		E3U05		E3U06		
Order No.	Programmable Unit Order No.						Drawing No.
UP0001			Pressure range:-1...+600 bar Connection: M12 Socket Power supply interface:24VDC				E3U14

Drawing

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Order NO.

Order NO.	Thread Type	Thread	Sensible Range (bar)	Supply Voltage (V)	Output	Electric design	Drawing No.
PC2140	External	G¼"A	–1...1	18~36 DC	PNP NO/NC	3	E3P05
PC2141	External	G¼"A	2	18~36 DC	PNP NO/NC	3	E3P05
PC2142	External	G¼"A	5	18~36 DC	PNP NO/NC	3	E3P05
PC2143	External	G¼"A	10	18~36 DC	PNP NO/NC	3	E3P05
PC2144	External	G¼"A	20	18~36 DC	PNP NO/NC	3	E3P05
PC2145	External	G¼"A	50	18~36 DC	PNP NO/NC	3	E3P05
PC2146	External	G¼"A	100	18~36 DC	PNP NO/NC	3	E3P05
PC2147	External	G¼"A	200	18~36 DC	PNP NO/NC	3	E3P05
PC2148	External	G¼"A	250	18~36 DC	PNP NO/NC	3	E3P05
PC2149	External	G¼"A	400	18~36 DC	PNP NO/NC	3	E3P05
PC2150	External	G¼"A	600	18~36 DC	PNP NO/NC	3	E3P05
PC2160	External	G¼"A	–1...1	18~36 DC	NPN NO/NC	3	E3P05
PC2161	External	G¼"A	2	18~36 DC	NPN NO/NC	3	E3P05
PC2162	External	G¼"A	5	18~36 DC	NPN NO/NC	3	E3P05
PC2163	External	G¼"A	10	18~36 DC	NPN NO/NC	3	E3P05
PC2164	External	G¼"A	20	18~36 DC	NPN NO/NC	3	E3P05
PC2165	External	G¼"A	50	18~36 DC	NPN NO/NC	3	E3P05
PC2166	External	G¼"A	100	18~36 DC	NPN NO/NC	3	E3P05
PC2167	External	G¼"A	200	18~36 DC	NPN NO/NC	3	E3P05
PC2168	External	G¼"A	250	18~36 DC	NPN NO/NC	3	E3P05
PC2169	External	G¼"A	400	18~36 DC	NPN NO/NC	3	E3P05
PC2170	External	G¼"A	600	18~36 DC	NPN NO/NC	3	E3P05

Technical parameters:

Probe material: Stainless steel 316L
Accuracy[%]: ≤ ±1
Current load [mA]: <30
Voltage drop [V]: < 2
Analogue output response time [ms] : < 3
Power-on delay time [s]:0.3
Medium temperature[°C]: –25...80
Pressure element: High-precision ceramic diaphragm





- This electronic pressure sensors meet the standard of sanitary design
- Embedded high-precision ceramic diaphragm
- Elegant design, smooth surface, anti-acid, anti-alkali and anti-corrosion
- Users can set pressure range and switch point via buttons easily
- All stainless steel structure and the rating is up to IP69K



Order NO.

Order NO.	Thread (External)	Sensible Range (bar)	Supply Voltage (V)	Output 1	Output 2	Electric design	Drawing No.
PA3201	G¾"A	-1...2	18-36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P02
PA3202	G¾"A	-1...5	18-36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P02
PA3203	G¾"A	-1...10	18-36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P02
PA3204	G¾"A	-1...20	18-36 DC	PNP NO/NC, NPN NO/NC	0~10V, 4~20mA	4	E3P02

Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I:E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded Wire	Size 12: M12	L:E3U12
 L							

Order No.	US0061	US0062
Type	 Hygienic welding adapter	 Hygienic Tri Clamp adapter
Drawing No.	E3U15	E3U16

Drawing

Page	>>> P. 50-53
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Technical parameters:
Probe material: Stainless steel 316L
Accuracy[%]: ≤ ±0.5
Max current load[mA]:300
Voltage drop [V]: < 2
Analogue output response time [ms] : < 3
Power-on delay time [s]:0.3
Medium temperature [°C]: -25...125(145 max/1h)
Pressure element: ceramic diaphragm

Linking your system



Overview

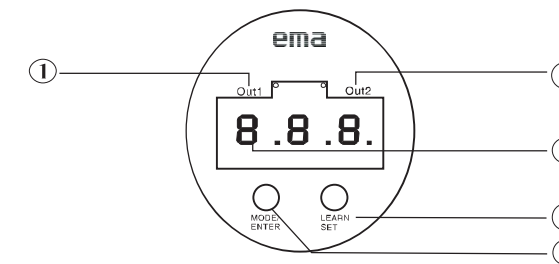
Temperature sensor adopts PT1000 thermal resistance detecting devices, mainly used to monitor the temperature and temperature compensation or overheat protection. Temperature sensor is a kind of widely used sensor. It is widely used in boiler system, cooling system, air condition system, warehouse temperature control system, process control system and so on.

Applications

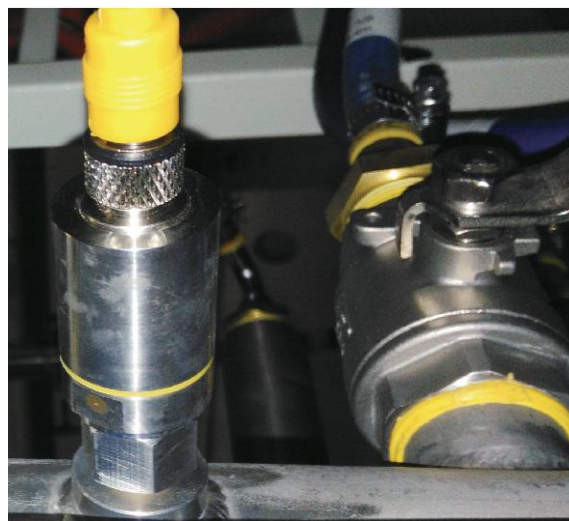


- Monitor temperature of cooling water of mould to increase or decrease the volume of flow of cooling water or to warn.
- Detect temperature of enzymes or other chemicals in containers.
- Detect temperature in liquid waste processing systems.
- Detect temperature of oil in pipes of wind power equipments.

Controls and visual indication



Temperature sensors



ema's temperature sensors detect the operating temperature by PT1000 devices and then transmits the data to an examining circuit. After processing, the current operating temperature is displayed through LED and converted automatically into a digital (NPN, PNP) or an analogue (0-10V, 4-20mA) signal.



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①	Out1	Out1 connected, LED light on
②	Out2	Out2 connected, LED light on
③	7-segment LED	displays system temperature, parameters and setting value
④	LEARN/SET	Setting of learn mode and parameter value
⑤	MODE/ENTER	Selection of parameter and acknowledgement of parameter value

Fuctions and features

By the probe, the temperature sensor can detect and then display the current system temperature (°C or °F) ; meanwhile, it can generate two signals according to the setting of output.

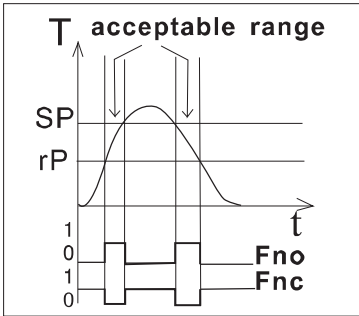
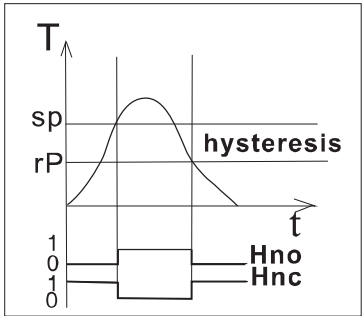
Output 1	Output 2	Measuring range	
Hysteresis/N.O.(Hno)	Analogue output	℃	-40~150
Hysteresis function/N.C.(Hnc)	4~20mA(1)		
window function/N.O.(Fno)	Analogue output	℉	-40~302
window function/N.C.(Fnc)	0~10V(U)		

Hysteresis

The hysteresis keeps the switching state of the outputs stable if the system temperature varies about the preset value. When the system temperature is rising, the output switches when the switch-on point has been reached (SP1); when the system temperature is falling again, the output switch-off point (rP1) has been reached. The hysteresis can be adjusted: first the switch-on point is set ,then the switch-on point with the requested difference.

Window function :

The window function enables the monitoring of a defined acceptable range. When the system temperature varies between the switch-on point (SP1) and the switch-off point (rP1) ,the output is switched (window function/NO) or not switched (window function/NC).The width of the window can be set by means of the difference between SP1 and rP1. SP1 = upper value, rP1=lower value.



Operating modes

Run mode:(Normal operating mode)

- When the supply voltage has been applied, the unit is in the run mode .it monitors and switches the transistor output acording to the set parameters. The value of the analog output depends on the system temperature.
- The LED display indicates the current system temperature,the red LED indicates the switching state of the transistor output.

Display mode:(Indication of parameters and the set parameter values)

- When the “MODE/ENTER” button is pressed briefly, the unit passes to the display mode which allows parameter values to be read. The internal sensing , processing and output functions of the unit continue as if in run mode.
- The parameter names are scrolled with each pressing of the “MODE/ENTER” button.
- when the “SET” button is pressed briefly, the corresponding parameter value is displayed for 5 sec.. After another 5 sec.The unit returns to the run mode.

Programming

1		Press the MODE/ENTER button several times until the respective parameter is displayed.
2		Press the set button and keep it pressed. The current parameter value is indicated in 5 sec., then the value is increased (incremental by pressing briefly or scrolling by holding pressed).
3		Press the MODE/ENTER button briefly (=acknowledgement). The parameter is displayed again; the set parameter value becomes effective.
Wait 5 sec. (the unit passes to the operating mode and the current measured value is indicated again), or start again		

- Decrease parameter value:** Make the parameter value displayed reach the maximum setting of the parameter value, and then recycle from the minimum value to the maximum value
- Lock:** The device has automatically lock function.If no key pressed when it is in the run mode, it will automatically lock the pushbuttons,normally detect temperature fluctuations, and output control value.
- Unlock:** When it is in normal pressure display state(run mode),long press LEARN/SET, then press MODE/ENTER, maintaining 10 seconds, until display ULC the device is unlocked. All devices from the factory are locked.

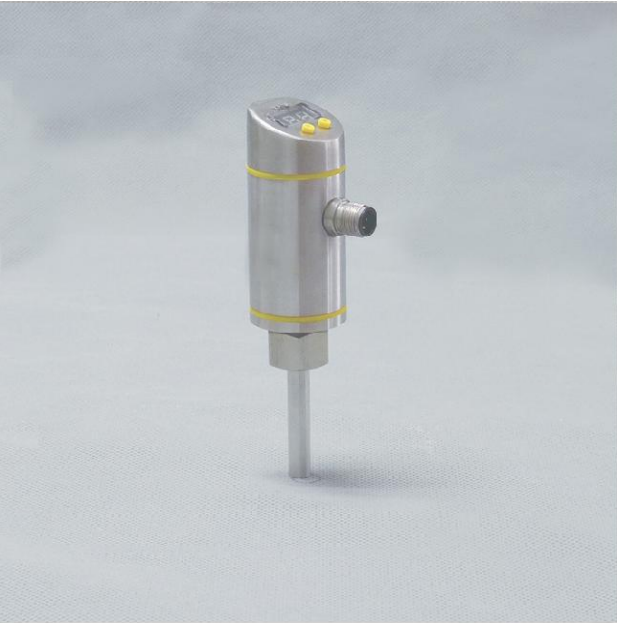
Setting / Operation

Detecting secure of device if the operation works effective. Fault situations:

HI	Temperature is too high
LO	Temperature is too low
Sc1	(Flashing) = short-circuit or overload in the switching output; the output is switched off.

Mounting and maintenance


- The probe is not allowed to touch the wall of pipe.
- This product should be mounted in the position which can sense the temperature.
- When this product is mounted in the bottom of the pipe, please clear the sediments; when on the top of the pipe, please make the mediumfull of the pipe.
- Please inspect the probe of the sensor regularly. If necessary, use vinegar to clear up the sediments stuck on the probe.



- Programmable temperature sensors
- Can be set 2 units of temperature, °C and °F
- High accuracy, High stability, Anti-corrosion
- Users can set temperature range and switch point easily via the buttons
- No calibration required and long lift-time
- All stainless steel structure and the rating is up to IP68



Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I:E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded Wire	Size 12: M12	L:E3U12

Order No.	US0001	US0002	US0003	US0007	US0009
Type	 M18 x 1.5 – M12 x 1	 M18 x 1.5 – G1/4"	 M18 x 1.5 – G1/2"	 M18 x 1.5 – Ø24mm	 M18 x 1.5 – M18 x 1.5
Drawing No.	E3U01	E3U02	E3U03	E3U07	E3U08

Drawing	
Page	>>> P. 50–53

Order NO.

Order NO.	Thread (Internal)	Medium Temperature (°C/°F)	Supply Voltage (V)	Output 1	Output 2	Probe Length (mm)	Drawing No.
TA1004	M18*1.5	- 40...+150/-40...+302	18~36 DC	PNP NO/NC NPN NO/NC	0~10V, 4~20mA	45	E3T01
TA1005	M18*1.5	- 40...+150/-40...+302	18~36 DC	PNP NO/NC NPN NO/NC	PNP NO/NC NPN NO/NC	45	E3T01
TA1006	M18*1.5	- 40...+150/-40...+302	18~36 DC	PNP NO/NC NPN NO/NC	0~10V, 4~20mA	100	E3T01
TA1007	M18*1.5	- 40...+150/-40...+302	18~36 DC	PNP NO/NC NPN NO/NC	PNP NO/NC NPN NO/NC	100	E3T01

Technical parameters:



Sensing element PT1000
Probe material: Stainless steel 316L
Connection: M12 Socket
Pressure rating[bar]: 300
Voltage drop[V]:<3.5
Power-on delay time [s] : 1.5
Sensing/display cycle time[ms]:200
Switching output accuracy[°C]: ± 0.2
Analogue output accuracy[°C]: ± (0.2+0.4% measuring interval)



- Smart remote temperature sensor
- Used for long-distance measurement
- Three combined units: control monitor, cable, probe
- Users can set temperature range and switch point easily
- Programmable temperature sensors
- Can be set 2 units of temperature, °C and °F
- All stainless steel structure and the rating is up to IP68



Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I:E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded Wire	Size 12: M12	L:E3U12
 L							

Order No.	US0001	US0002	US0003	US0007	US0009
Type	 M18 x 1.5 – M12 x 1	 M18 x 1.5 – G1/4"	 M18 x 1.5 – G1/2"	 M18 x 1.5 – Ø24mm	 M18 x 1.5 – M18 x 1.5
Drawing No.	E3U01	E3U02	E3U03	E3U07	E3U08

Drawing	
Page	>>> P. 50–53


Order NO.

TB control monitors

Order NO.	Thread Type	Thread	Medium Temperature (°C/°F)	Supply Voltage (V)	Output 1	Output 2	Drawing No.
TB1004	External	G1/2" A	- 40...+150/-40...+302	18~36 DC	PNP NO/NC NPN NO/NC	0~10V, 4~20mA	E3T04
TB1005	External	G1/2" A	- 40...+150/-40...+302	18~36 DC	PNP NO/NC NPN NO/NC	PNP NO/NC NPN NO/NC	E3T04

TD probe units

Order NO.	Thread Type	Thread	Medium Temperature (°C/°F)	Sensing element	Probe Length (mm)	Drawing No.
TD1000	Internal	M18"x1.5	- 40...+150/-40...+302	PT1000	45mm	E3T05
TD1001	Internal	M18"x1.5	- 40...+150/-40...+302	PT1000	160mm	E3T05
TD1002	Internal	M18"x1.5	- 40...+150/-40...+302	PT1000	260mm	E3T05
TD1003	Internal	M18"x1.5	- 40...+150/-40...+302	PT1000	360mm	E3T05

Type	Cable Order No.						Drawing No.
 J	C	02	J	5	R	12	J : E3U10
	C: Cable	Length 02: 2M 05: 5M 10: 10M	J : Jumper male/female	Pole 5: 5	R: PUR	Size 12: M12	

Technical parameters:

Sensing element :PT1000
Probe material: Stainless steel 316L
Connection: M12 Socket
Pressure rating[bar]: 300
Voltage drop[V]:<3.5
Power-on delay time [s] : 1.5
Sensing/display cycle time[ms]:200
Switching output accuracy[°C]: ± 0.2
Analogue output accuracy[°C]: ± (0.2+0.4% measuring interval)





- Simple structure、 Easy installation、 No calibration required
- Shock resistance and anti–corrosion
- Medium temperature: – 40... + 100 °C / – 40... + 212 °F
- High accuracy and high stability
- All stainless steel structure and the rating is up to IP68

QUALITY ASSURANCE

2 Years

QUALITY ASSURANCE

Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I:E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded wire	Size 12: M12	L:E3U12
 L							

Drawing	
Page	>>> P.50–53

Order NO.

Order NO.	Thread (External)	Medium Temperature (°C/°F)	Supply Voltage (V)	Output	Probe Length (mm)	Drawing No.
TC0102	G1/2" A	- 40~+100/-40...+212	18~36 DC	4~20mA	10	E3T03
TC0103	G1/2" A	- 40~+100/-40...+212	18~36 DC	0~10V	10	E3T03
TC0104	G1/4" A	- 40~+100/-40...+212	18~36 DC	4~20mA	60	E3T03
TC0105	G1/4" A	- 40~+100/-40...+212	18~36 DC	0~10V	60	E3T03

Technical parameters:

Sensing element :PT1000
Probe material: Stainless steel 316L
Connection: M12 Socket
Pressure rating[bar]: 300
Voltage drop[V]:<3.5
Power–on delay time [s] : 1.5
Sensing/display cycle time[ms]:200
Analogue output accuracy[°C]: <3
Accuracy [°C]: ±0.2



- This electronic temperature sensors meet the standard of hygienic design
- Can be set 2 units of temperature, °C or °F
- High accuracy、High stability、Anti-corrosion
- Users can set pressure range and switch point via buttons easily
- All stainless steel structure and the rating is up to IP69K

IP68

IP69K

CE



RoHS

QUALITY ASSURANCE

2 Years

QUALITY ASSURANCE

Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I:E3U11
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shielded Wire	Size 12: M12	L:E3U12
 L							

Order No.	US0061	US0062
Type	 Hygienic welding adapter	 Hygienic Tri Clamp adapter
Drawing No.	E3U15	E3U16

Drawing	
Page	>>> P. 50–53

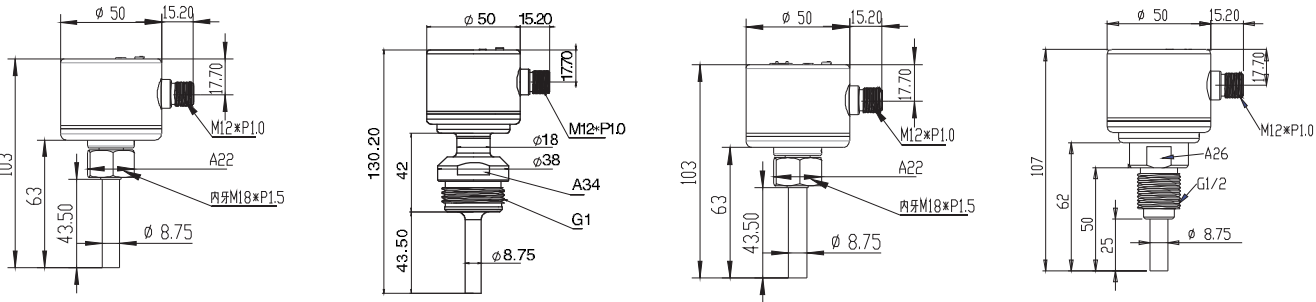
Order NO.

Order NO.	Thread (External)	Medium Temperature (°C/°F)	Supply Voltage (V)	Output 1	Output 2	Probe Length (mm)	Drawing No.
TA3201	G3/4"A	- 40...+150/-40...+302	18~36 DC	PNP NO/NC NPN NO/NC	0~10V, 4~20mA	45	E3T02
TA3202	G3/4"A	- 40...+150/-40...+302	18~36 DC	PNP NO/NC NPN NO/NC	PNP NO/NC NPN NO/NC	45	E3T02

Technical parameters:

Sensing element :PT1000
Probe material: Stainless steel 316L
Connection: M12 Socket
Pressure rating[bar]: 300
Voltage drop[V]:<3.5
Power-on delay time [ms]: 1.5
Sensing/display cycle time [ms]:200
Accuracy [°C]: ± 2

Flow sensors/Pressure sensors

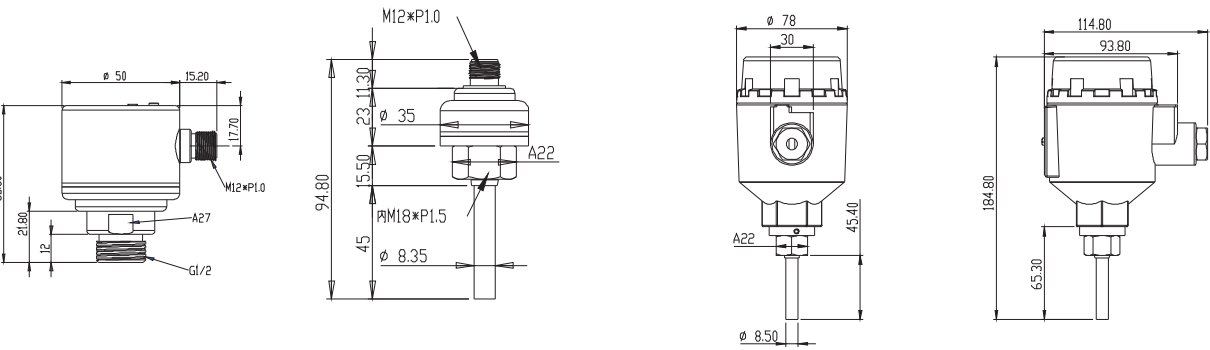


E3F01

E3F02

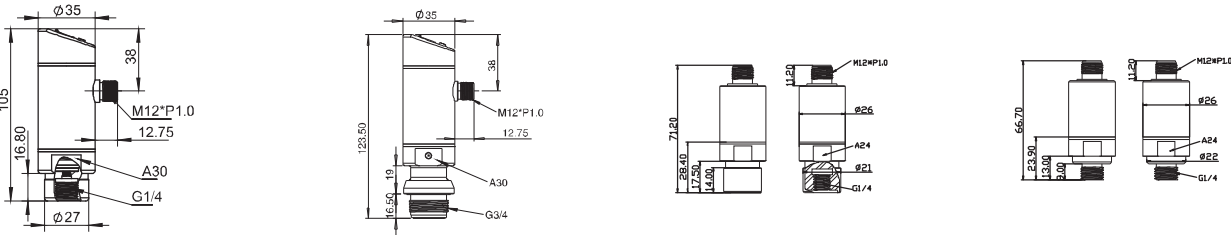
E3F03

E3F04



E3F05

E3F06



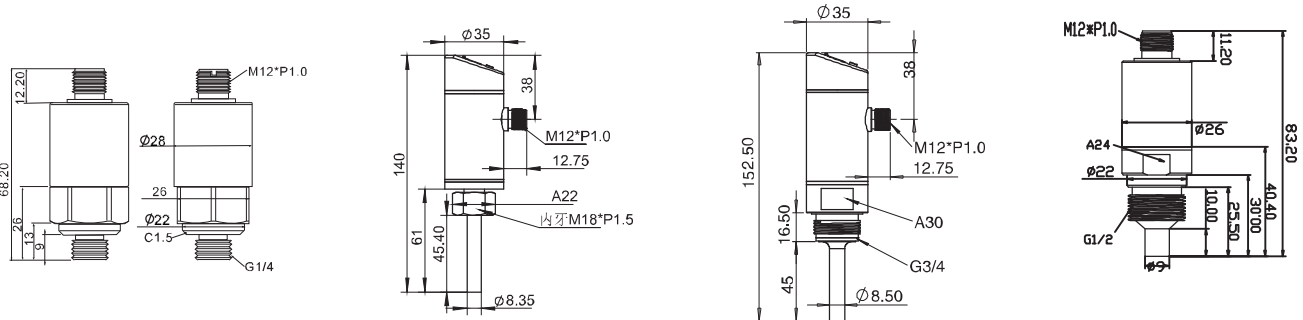
E3P01

E3P02

E3P03

E3P04

Pressure sensors /Temperature sensors

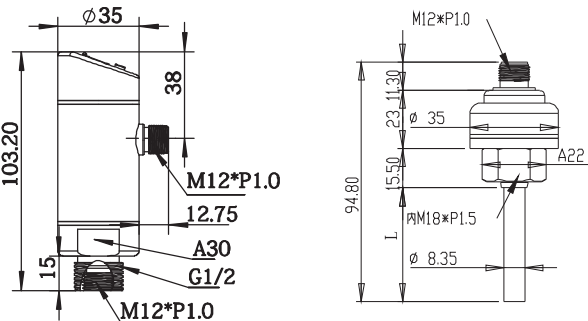


E3P05

E3T01

E3T02

E3T03

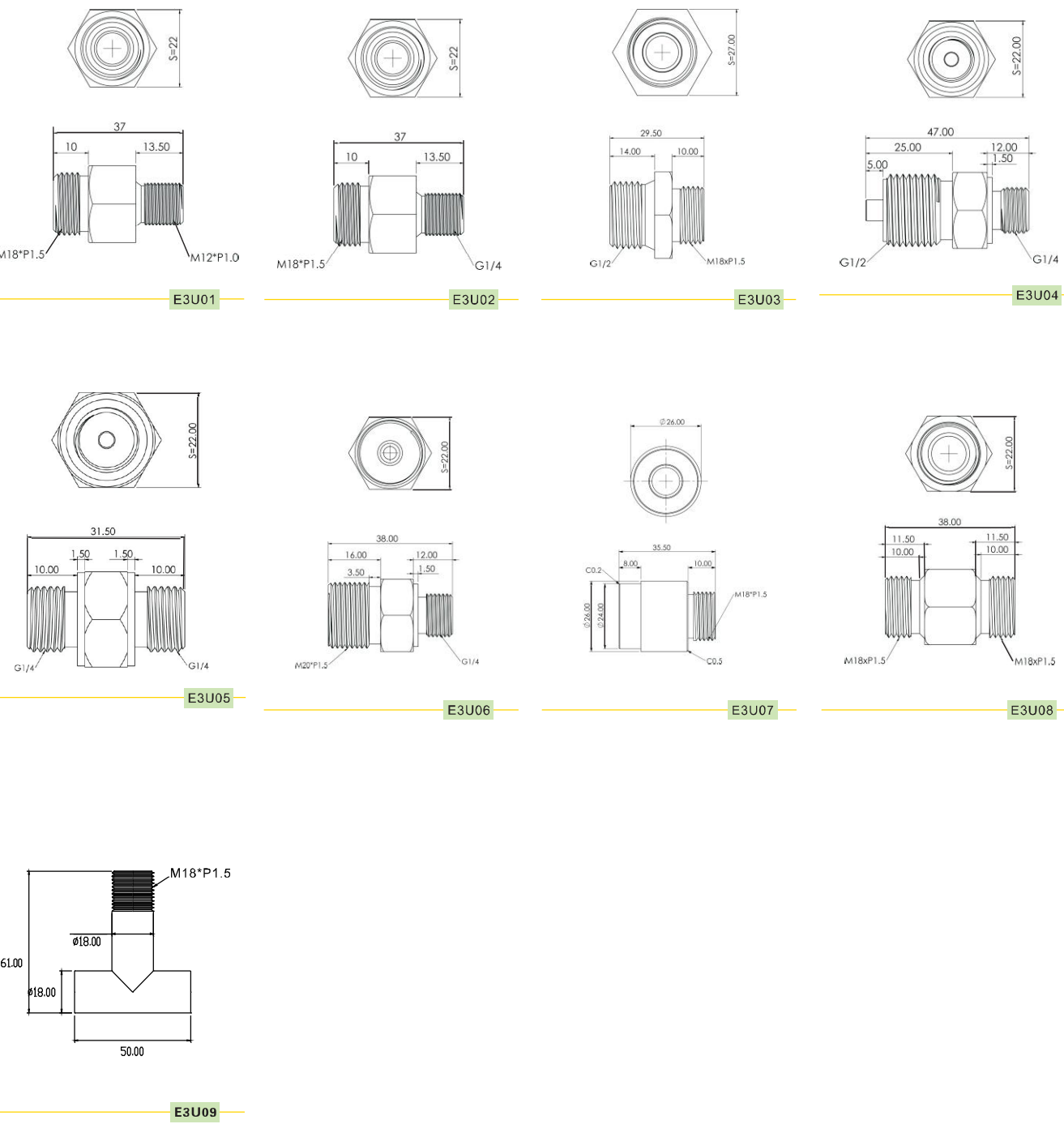


E3T04

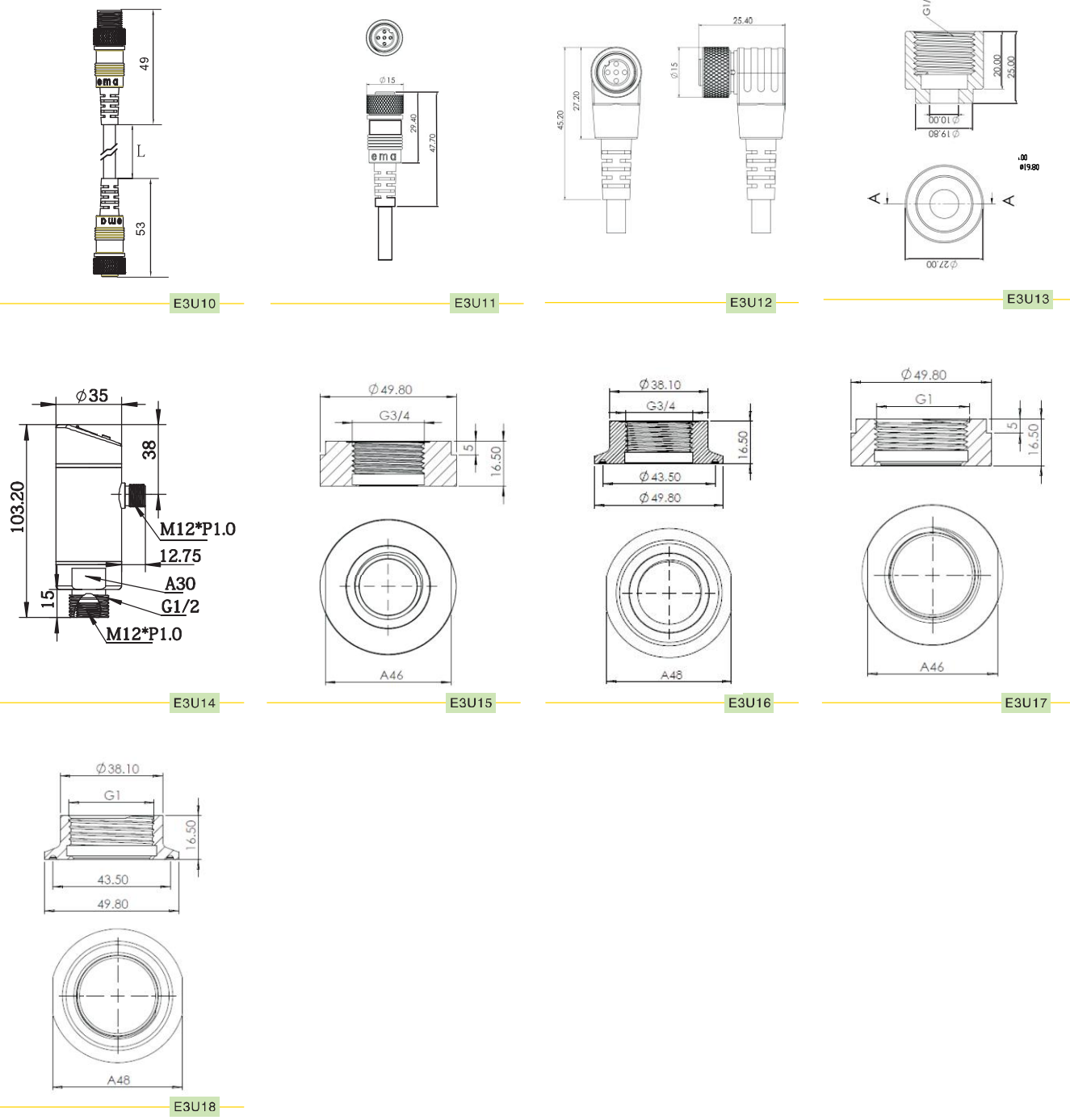
E3T05

Linking your system

Temperature sensors/Adapters



Adapters/sockets/Control unit



Linking your system

Linking your system

Level Measurement

- Radar Wave Level Sensors
- Guided Radar (TDR)
- Ultrasonic Level Sensors
- Rotating Paddle Level Switches
- Vibrating Fork Level Switches
- Float Level Switches
- Capacitive Proximity Sensors

Applications

Suitable for the applications in the field of chemical plastics, pharmaceutical manufacturing, fodder, grains, cement, fertilizer, power, fuel materials, hydraulic system, cooling water system, and so on.

Advantages of ema level switches...

Radar wave sensors / Guided radar (TDR): Solid, Powder, Liquid

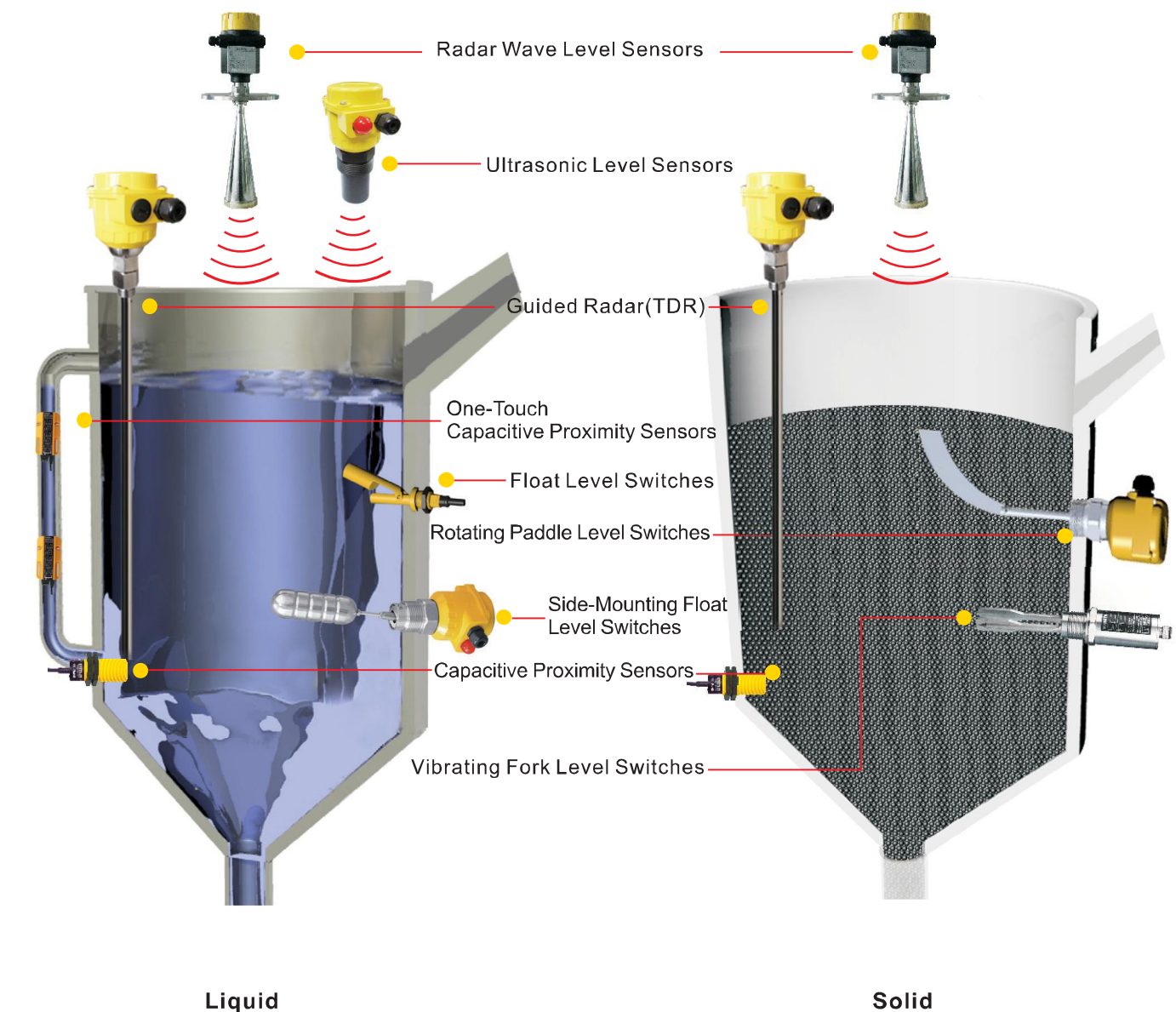
Ultrasonic level sensors: Liquid

Rotating paddle level switches: Granular solid, Powdery materials

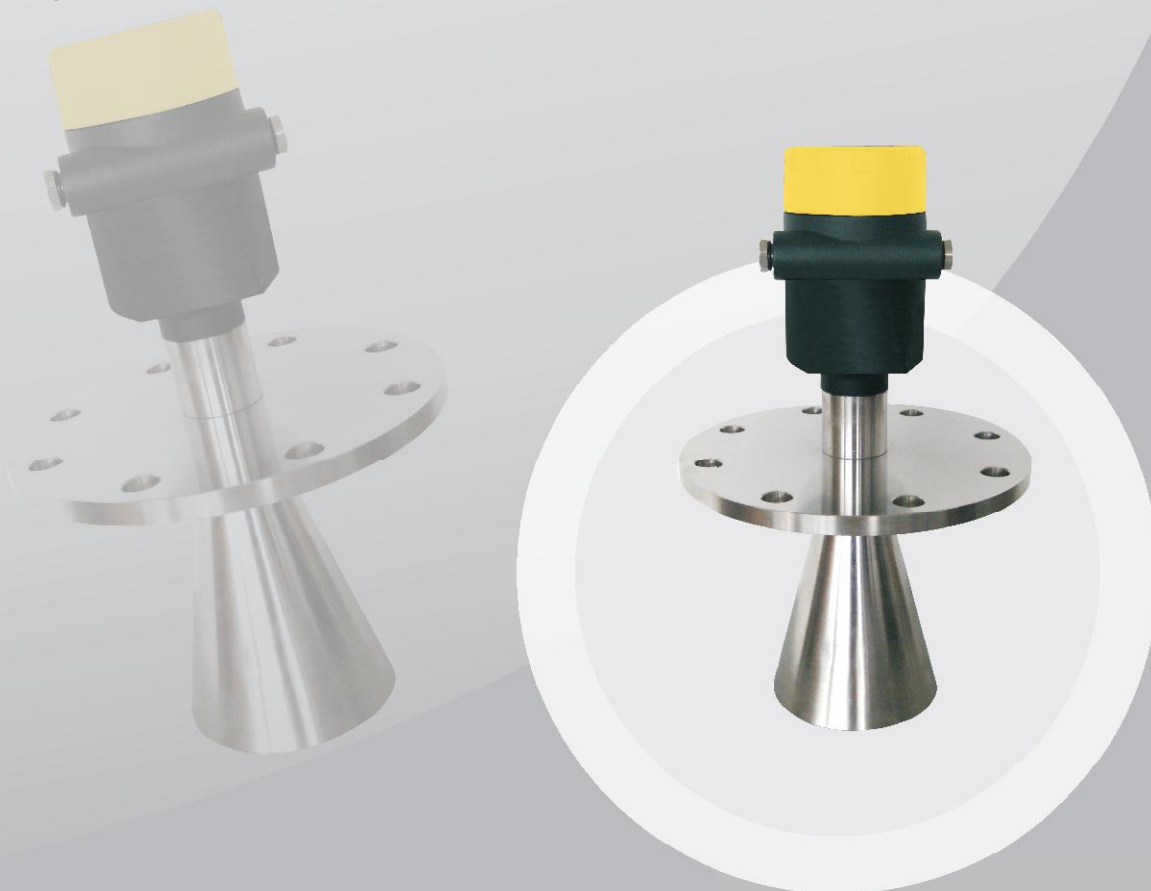
Vibrating Fork Level Switches: Granular solid, Bulk solid, Powdery materials, Liquid

Float level switches: Liquid

Vibrating fork level switches: Liquid, Granular solid



Linking your system



Radar Wave Level Sensors



Smart radar level transmitter is suitable for continuous, non-contact level measurement, analogue output 4...20MA, 2 wire, suitable for storage tanks, vessels, process vessels, etc. Suitable for complicated working places such as whatever changes in temperature, pressure, medium, steam, etc.



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Product Features



- Wide measuring range, high precision
- Non-contact measurement, suitable for complicated working places
- Able to detect solid, liquid
- Suitable for sticky liquid, circumstance of changes in temperature and pressure
- Two wire 4 - 20 mA and analogue output
- Support HART protocol
- The max. detecting range up to 70m

Operating principle

Radar wave level transmitter is based on the principle of "verticle view" measurement system, suitable for measuring the distance between measuring reference point(process connection) and material surface. The antenna transmitting microwave pulse signal and the signal reflected in material surface, and received by radar system, then the signal transmit to the electric devices. The microprocessor deal with the signal, and identify the microwave pulse signal produced by echo in the material surface.

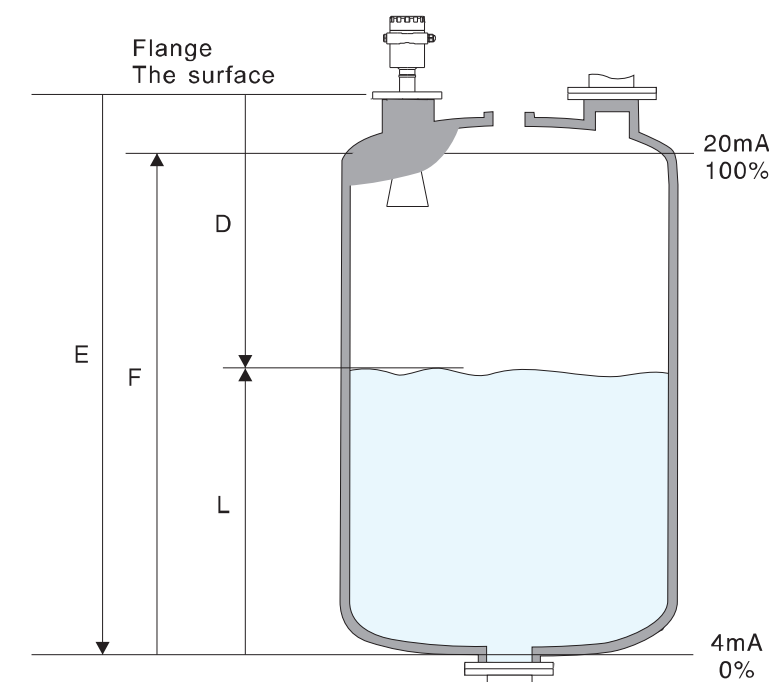
The distance D between reference point and material surface in proportion to the runtimet of pulse signal

$$D = c \cdot t / 2$$

C is equal to speed of light

Tank height E is known so the material level is:

$$L = E - D$$



Advantages and main applications

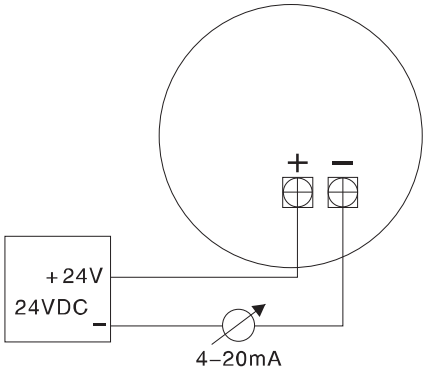
Advantages:

- 2 wire technology:
Good substitute pressure differential instruments and balancing float.
2 wire technology effectively help reduce cost of arrangement of wire, easy to relize compatible with existing systems.
- Non-contact measuring process
Measurement will not be effected by medium

Main applications:

- level measurement
- Distance measurement
- Storage indication
- Differential level measurement
- Water pump control

Wiring:



- Notice:**
- If the shape of tank bottom is cone or hollow, it can not measured below the level of material when it is lower then the upper point of the fillister. (Suggestion: Set the "0 point" at the upper point of anomalous part.)
 - The maximum value of measuring range should be greater than 100mm from the top of antenna in order not to effect the measurement by the corrosive media or the attachment to antenna.
 - The minimum measured distance is related to the antenna.
 - Foam can either absorb the microwave or reflect against the foam surface; therefore it is possible to measure the distance under certain conditions.
 - When the value is over the measuring range, the output of the device indicates 22mA.

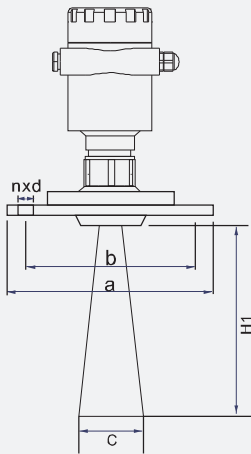
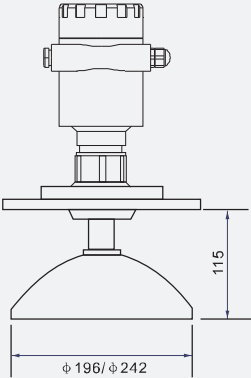
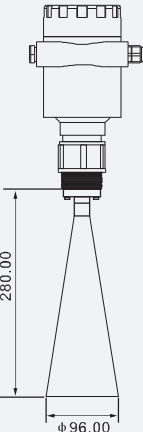
HART programming

When using the software, connect radar wave level switches with 24VDC voltage, and then to connect a 250Ohm resistance at the front end of the HART at the same time. If you use an integrated HART (internal resistance is 250 Ohm), additional resistance is unnecessary. HART adapter can be parallel connected with 4...20mA wire.

Antenna size comparison table

	a	b	nxd	C	H1
DN80	200	160	8x18	Φ76	227
DN100	220	180	8x18	Φ96	288
DN125	250	210	8x18	Φ121	620
DN150	285	240	8x22		
DN200	340	295	12x22		
DN250	405	355	12x26		

Dimensions (mm)		
	RCSA	RCSB
Model		
Product Type	Plastic probe	Antenna
Connection	G1½"、1½"NPT、Flange	
Cable Connection	M20×P1.5、½NPT	
Measuring Range(M)	10	30
Output(mA)	4-20/HART (2 wire/4wire)	
Launch Frequency(GHz)	26	
Power Supply(V)	24VDC、220VAC	
Current Consumption (mA)	< 22.5	
Accuracy(mm)	±5	±3
Operating Temperature(℃)	-40~120	-40~250
Operating Pressure(Mpa)	-0.1~0.3	-0.1~4. 0
Ambient Temperature(℃)	-40~80	
Ambient Pressure	Normal atmospheric pressure	
Protection Rating	IP67	
Antenna Material	PTFE	Stainless Steel 304、316
Housing Material	Aluminum Alloy	

Dimensions (mm)			
			
			
Model	RCSC		
Product Type	Antenna		
Connection	G1½"、1½"NPT、Flange		
Cable Connection	M20×P1.5、½NPT		
Measuring Range(M)	70	70	30
Output(mA)	4-20/HART (2 wire/4wire)		
Launch Frequency(GHz)	26		
Power Supply(V)	24VDC、220VAC		
Current Consumption (mA)	< 22.5		
Accuracy(mm)	±15	±15	±10
Operating Temperature(℃)	-40~250		
Operating Pressure(Mpa)	-0.1~4. 0	-0.1~4. 0	Normal atmospheric pressure
Ambient Temperature(℃)	-40~80		
Ambient Pressure	Normal atmospheric pressure		
Protection Rating	IP67		
Antenna Material	Stainless Steel 304、316		
Housing Material	Aluminum Alloy		

Order Information

RCSA,RCSF	Application: suitable for strong corrosive liquid.Max.sensing range is 10-20M.							
RC	S	A	01	1	1	S	1	Y
Series	Housing material	Antenna type	Connection	Length of antenna tube	Cable connection	Process temperture	Cable entrance	Display
RC	Radar Wave Level Sensors ,26GHz							
S	Housing protection classification S:Standard (Non-Ex-proof),Aluminium,IP67 E:EX (Exia IIC T6 Gb),Aluminum,IP67							
A	Antenna type / Material / Length A:Sealed probe , PVDF , 138mm							
01	Process connection / Material 01: Thread G1½"A 02: Thread 1½"NPT 03: FlangeDN50/PP 04: FlangeDN80/PP 05: FlangeDN100/PP							
1	Length of antenna tube 01: 100mm 02: 200mm							
1	Cable connection 1: Two wire 4~20mA 2: Two wire 24V DC/4~20mA/HART 3: Four wire 24V DC/4~20mA/HART 4: Four wire 220V DC/4~20mA/HART							
S	Seal/Process temperature S: Standard seal/-40~120℃/-40~320℃							
1	Cable entrance : 1: M20x1.5 2: ½NPT							
Y	On-site display : Y:With display							

Notice:
1. Flange execution standard reference to GB/T9119:2000、ISO7005-1:1992, dimension PN1.6MPa, thickness 10mm
2. The length of antenna should be extended at least 10mm in the tank.
3. If detecting strong corrosive liquid, it is better to choose RCSA/RCSF omniseal antenna(it is better than RCSB)
4. If RCSA measuring range is 0-10M, it is better to choose antennaΦ45, 10-20M chooseΦ75mm.

Order Information

RCSB	Application: temperature resistance, pressure resistance, suitable for low corrosive liquid.Max. sensing range is 30M									
RC	S	B	05	A	4	1	S	1	Y	
Series	Housing material	Antenna type	Process connection	Antenna diameter	material	Cable connection	Process temperture	Cable entrance	Display	Accessories
RC	Radar Wave Level Sensors ,26GHz									
S	Housing protection classification S:Standard (Non-Ex-proof),Aluminium,IP67 E:EX (Exia IIC T6 Gb),Aluminum,IP67									
B	Antenna type B: Horn shape									
05	Process connection / Material Suitable for horn shape 01: Stainless steel thread G1½"A 02: Stainless steel thread 1½ NPT 03: Stainless steel flange DN50 PN1.6C type 04: Stainless steel flange DN80 PN1.6C type 05: Stainless steel flange DN100 PN1.6C type 06: Stainless steel flange DN125 PN1.6C type 07: Stainless steel flange DN150 PN1.6C type 08: Stainless steel flange DN200 PN1.6C type									
A	Antenna diameter: A: Stainless steel horn antenna Φ76mm B: Stainless steel horn antenna Φ96mm C: Stainless steel horn antenna Φ121mm									
4	Antenna and flange material: 4: Stainless steel 304 6: Stainless steel 316									
1	Cable connection 1: Two wire 4~20mA 2: Two wire 24V DC/4~20mA/HART 3: Four wire 24V DC/4~20mA/HART 4: Four wire 220V DC/4~20mA/HART									
S	Seal/Process temperature S: Standard seal / Viton/-40~150℃/-40~302℉ H: High temperature seal / Kalrez /-40~250℃/-40~482℉									
1	Cable entrance 1: M20x1.5 2: ½NPT									
Y	On-site display Y:With display									
P	Accessories P: Dust cover T: PTFE / Teflon anti-corrossion coating (flange and aerial)									

Notice:
1. Flange execution standard reference to GB/T9119:2000、ISO7005-1:1992, dimension PN1.6MPa, thickness 10mm
2. If RCSB measuring range is 0-20M, it is better to choose antenna Φ76mm, 10-30M choose Φ96mm

Order Information

RCSC RCSD	Application: suitable for solid or strong dust in tanks, circumstance of easily crystal and foreting.Max. sensing range is 70M.									
RC	S	C	05	B	4	1	S	1	Y	
Series	Housing material	Antenna type	Process connection	Antenna diameter	material	Cable connection	Process temperture	Cable entrance	Display	Accessories
RC	Radar Wave Level Sensors ,26GHz									
S	Housing protection classification S:Standard (Non-Ex-proof),Aluminium,IP67 E:EX (Exia IIC T6 Gb),Aluminum,IP67									
C	Antenna type C: Horn D: Paraboloid type aerial									
05	Process connection / Material 01: Stainless steel thread G1½"A 02: Stainless steel thread 1½ NPT 03: Stainless steel flange DN50 PN1.6C type (DN50 only suitable for parabolic antenna) 04: Stainless steel flange DN80 PN1.6C type 05: Stainless steel flange DN100 PN1.6C type 06: Stainless steel flange DN125 PN1.6C type 07: Stainless steel flange DN150 PN1.6C type 08: Stainless steel flange DN200 PN1.6C type 09: Stainless steel flange DN250 PN1.6C type 10: Stainless steel universal flange DN80 PN1.6C type 11: Stainless steel universal flange DN100 PN1.6C type 12: Stainless steel universal flange DN125 PN1.6C type 13: Stainless steel universal flange DN150 PN1.6C type 14: Stainless steel universal flange DN200 PN1.6C type 15: Stainless steel universal flange DN250 PN1.6C type									
B	Antenna diameter: suitable for universal adapter A: Stainless steel horn antenna Φ76mm B: Stainless steel horn antenna Φ96mm C: Stainless steel horn antenna Φ121mm suitable for parabolic antenna D: Stainless steel parabolic antenna Φ196mm E: Stainless steel parabolic antenna Φ242mm									
4	Antenna and flange material: 4: Stainless steel 304 6: Stainless steel 316									
1	Cable connection 1: Two wire 4~20mA 2: Two wire 24V DC/4~20mA/HART 3: Four wire 24V DC/4~20mA/HART 4: Four wire 220V DC/4~20mA/HART									
S	Seal/Process temperature S: Standard seal / Viton/-40~150℃/-40~302℉ H: High temperature seal / Kalrez /-40~250℃/-40~482℉									
1	Cable entrance 1: M20x1.5 2: ½NPT									
Y	On-site display Y:With display									
P	Accessories P: dust cover T: With the function of sweeping									

Notice:
1. Flange execution standard reference to GB/T9119:2000、ISO7005-1:1992, dimension PN1.6MPa, thickness 10mm
2. If RCSC measuring range is 0-10M, it is better to choose antenna Φ76mm, 10-20M choose Φ96mm, 20-40M choose Φ121mm
3. If RCSD measuring range is 40-50M, it is better to choose antenna Φ196mm, 50-60M choose Φ242mm

Radar Wave Level Sensors

Guided Radar (TDR)

Ultrasonic Level Sensors

Rotating Paddle Level Sensors

Vibrating Fork Level Switches

Float Level Switches

Capacitive Level Switches

Order Information

RCSE	Application: Suitable for solid, normal pressure and temperature tanks. Max.sensing range is 30M									
RC	S	E	01	B	4	1	S	1	Y	
Series	Housing material	Antenna type	Process connection	Antenna diameter	material	Cable connection	Process temperture	Cable entrance	Display	Accessories
RC	Radar Wave Level Switch ,26GHz									
S	Housing protection classification S:Standard (Non-Ex-proof),Aluminium,IP67 E:EX (Exia IIC T6 Gb),Aluminum,IP67									
E	Antenna type E: Horn antenna									
01	Process connection / Material 01: Stainless steel thread G1½"A 02: Stainless steel thread 1½ NPT 03: Stainless steel flange DN80 PN1.6C type 04: Stainless steel flange DN100 PN1.6C type 05: Stainless steel flange DN125 PN1.6C type 06: Stainless steel flange DN150 PN1.6C type 07: Stainless steel flange DN200 PN1.6C type					08: Stainless steel flange DN250 PN1.6C type 09: Stainless steel universal flange DN80 PN1.6C type 10: Stainless steel universal flange DN100 PN1.6C type 11: Stainless steel universal flange DN125 PN1.6C type 12: Stainless steel universal flange DN150 PN1.6C type 13: Stainless steel universal flange DN200 PN1.6C type 14: Stainless steel universal flange DN250 PN1.6C type				
B	Antenna diameter: A: Stainless steel horn antenna Φ76mm B: Stainless steel horn antenna Φ96mm C: Stainless steel horn antenna Φ121mm									
4	Antenna and flange material: 4: Stainless steel 304 6: Stainless steel 316									
1	Cable connection 1: Two wire 4~20mA 2: Two wire 24V DC/4~20mA/HART 3: Four wire 24V DC/4~20mA/HART 4: Four wire 220V DC/4~20mA/HART									
S	Seal/Process temperature S: Standard seal / Viton/-40~150℃/-40~302°F H: High temperature seal / Kalrez /-40~250℃/-40~482°F									
1	Cable entrance 1: M20x1.5 2: ½NPT									
Y	On-site display Y:With display									
P	Accessories P: Dust cover T: With the function of sweeping									

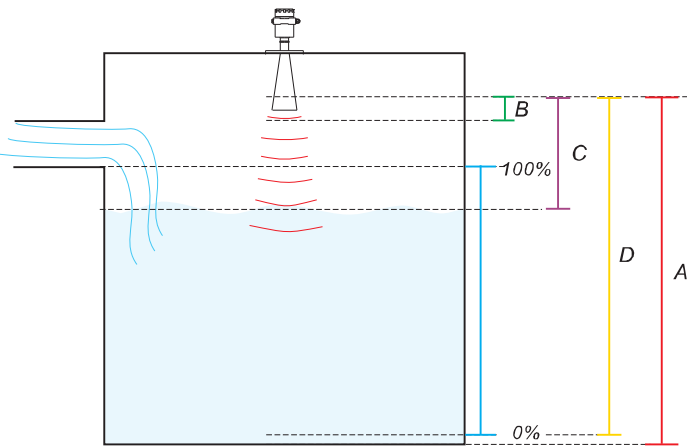
Notice:
1. Flange execution standard reference to GB/T9119:2000、ISO7005-1: 1992, dimension PN1.6MPa, thickness 10mm.
2. If RCSB measuring range is 0-10M, it is better to choose antenna Φ76mm, 10-20M choose Φ96mm, 10-30M choose Φ121mm,

Installation Requirements

Basic Requirements
When the antenna launch radar wave, there must be a beam angle between the lower part of antenna and the surface of material. In addition, there must be on obstacles around wave-launching area. Processing "Spurious wave reflection learning" if necessary, please also avoid the microwave and material flow crossing. While installing the device, notify that highest level should not be within inactive area. It should be kept a distance from the wall of tank. The device must be vertical toward the measured surface as possible. RA Series Radar Wave Level Transmitter is certified of Exd II CT6. When carrying out installation in hazardous area, please make sure that it must be grounded. It is necessary to follow the national's installation regulations of hazardous area by the experienced specialists. The housing of explosive-proof type radar wave level switch is made by cast-aluminum.

Notice there must be 200mm between the device and the tank.
(The frequency of radar wave is 26(GHz)

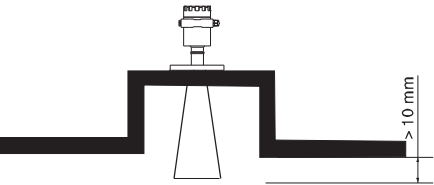
1. The surface
2. The center of tank or axis of symmetry



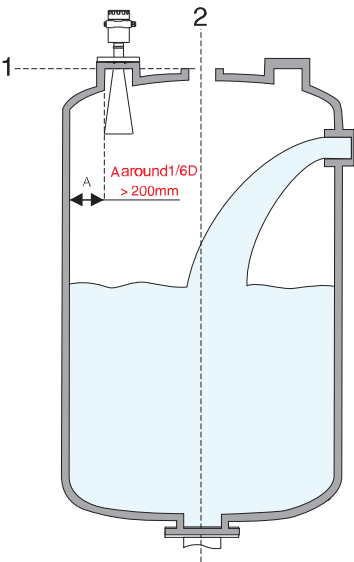
Requirement for the installation on the tank

Vessel Nozzles

Length of vessel nozzles
The length of antenna should be extended at least 10mm in the tank.
When the length of antenna is shorter than the tank fitting, it is necessary to be added the antenna extension.



If the media with good reflection properties, the tank nozzle can be slight extend below the antenna. The standard length of the tank nozzle suggested in the table below. Under such circumstance, the end of nozzle must be smooth. Furthermore, the device may have to process "Spurious wave reflection learning".

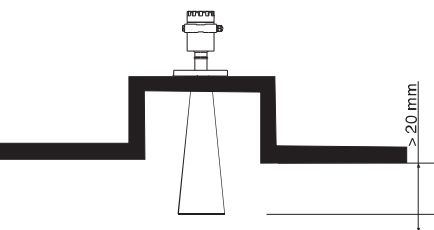


The unit measures the distance from the process connection of flange

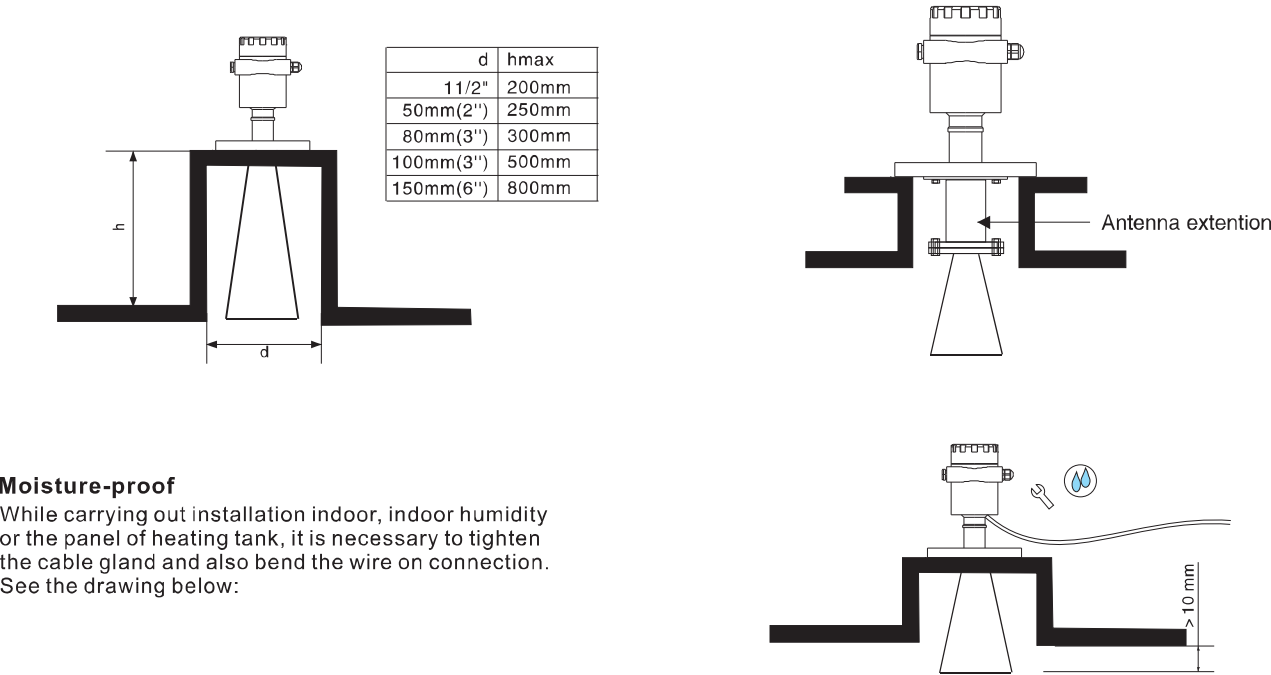
- A. Measuring range adjustment
- B. Inactive area
- C. Upper level adjustment
- D. Lower level adjustment

Notice: the highest level value must not be in the inactive area.

The effective part of antenna is the part of horn antenna. It should completely emit outside of the tank nozzle. Various length are available.if necessary to be added the antenna extension.



When the length of antenna is shorter than the tank fitting, it is necessary to be added the antenna extension.

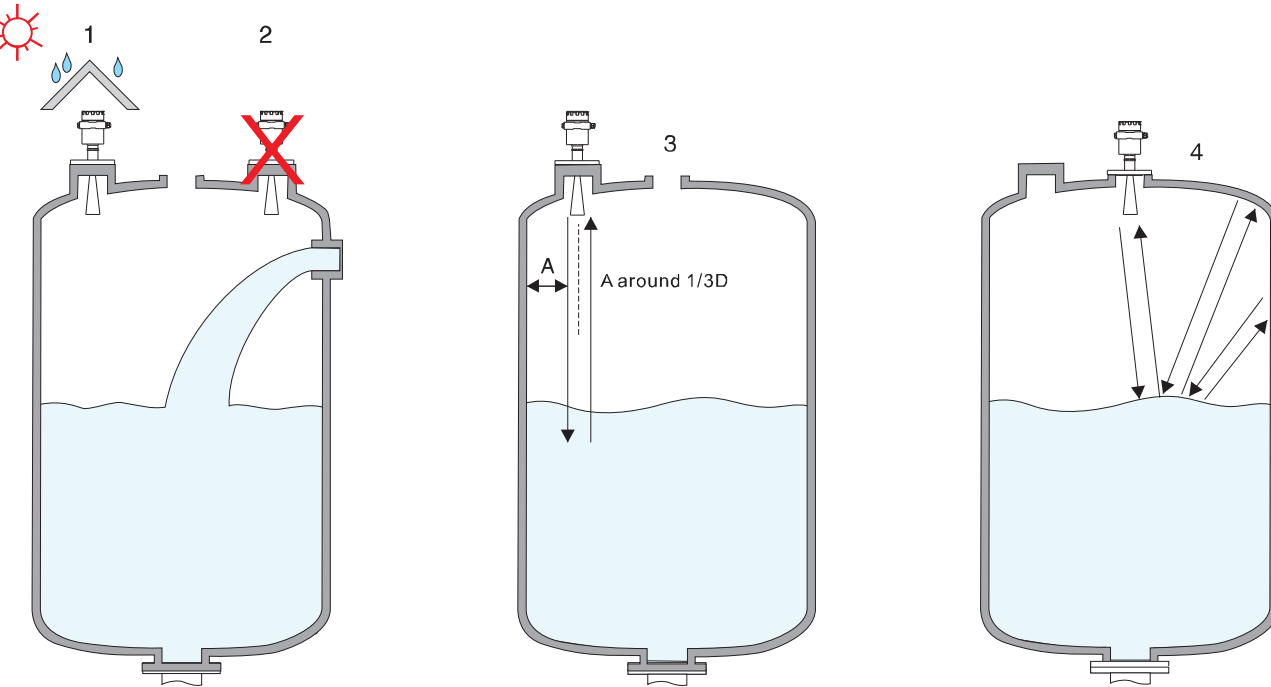


Common installation position

- 1.Right: sunshade and rainproof measures should be taken if installed outdoor.

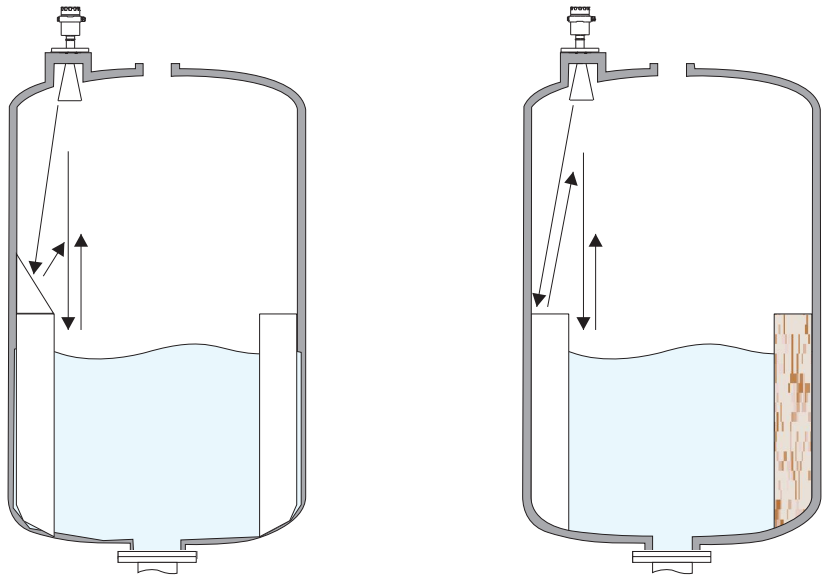
2. Wrong: do not install them in the up side of the material flow to ensure they are detecting the material surface but not material flow.
3. The antenna should be vertical to material surface and avoid to leaning to tank wall.

4. Wrong: The transmitter is installed in the top of arch or circular tank will cause multiple reflection, this should be avoided when install it.



Installation of baffle-board

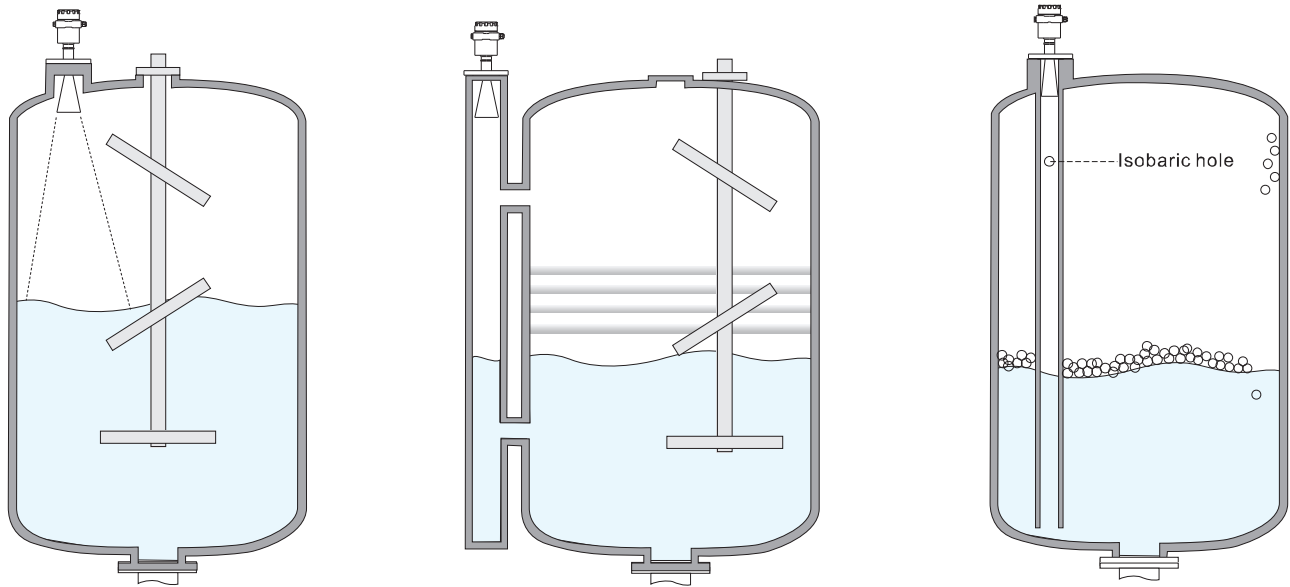
When there are some barriers in the tank will effect the measuring, it's better to install baffle-board to reflect the wave to other place, the device may have "Spurious wave reflection learn" if necessary.



Installation of tube

If stir in the tank, the devices must far away from the stir. The device need to have "Spurious wave reflection learn" after installation to avoid the effect of spurious wave. If there are bubble or wave generated by stir, so we should use this installation.

Using tube installation will avoid the effect of barriers, bubbles and waves to measurements. Due to material input, stir or any other process in the tank, there will be some bubbles on the surface of some medium to decay signal. If the bubbles cause measurement error, we suggest to install the device in the tube, or use our guide radar level sensors.



Linking your system



Product Features



- Adopts TDR technology
- Continuous level measurement combined with switching output for simple installation and for cost-saving
- Suitable for different working places and different shapes of tanks with a unique design
- Anti-interference; Anti-static properties; High stability
- Centralized signal, suppression of disturbance
- Support HART protocol
- Capable to detect substance with low-dielectric constants such as oil and hydrocarbon

Operating Principle

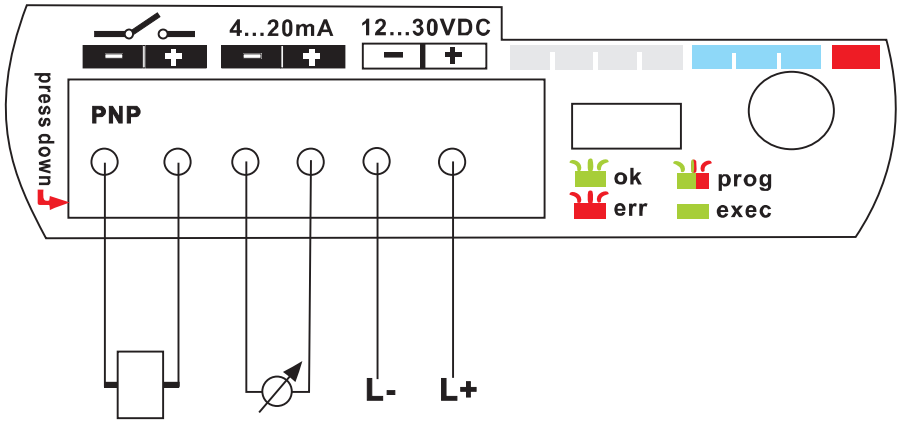
High frequency microwave pulse sent out by radar wave level transmitter is diffuse along the detect devices(steel tube or wire rope), when they meet the medium, dielectric constant changes and cause reflection, some pulse energy will be reflected back. Time interval of transmitted pulse and reflected pulse is in direct proportion to the distance.

Advantages

- Detection is not effected by below factors:
 - medium temperature
 - medium density
- Waves and foam do not affect the sensor
- Remote operation and display are provided
- The electric devices can be replaced when the lid closed

Connection

Terminals and control panel



Guide Radar Level Sensors



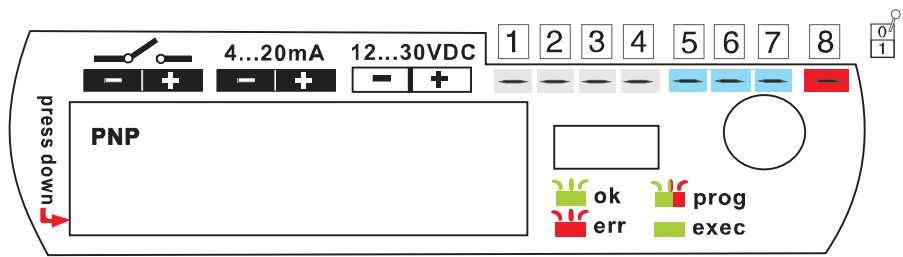
Guide radar level sensor is suitable for all kinds of liquid and powder, such as water, oil, ethyl alcohol, etc. also for mediums those dielectric constant large than 1.4, which can resist the interference from dust, smog, foam and steam.



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DIP switch setting

1、Control panel and the defination of buttons



- Green blinking: Measuring mode
- Red and green blinking alternately: Configuration
- Red blinking: error
- Green continuously blinking: operating

Dip Switch Position							
1	2	3	4	5	6	7	8

Dip Switch Setting	Description
--------------------	-------------

0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1

Function Group 1 Analog current Output

0	0	0	1	0	0	1	1
0	0	1	0	0	0	0	0
0	1	0	0	0	0	0	0
0	1	0	1	0	0	0	0
0	1	1	0	0	0	0	0

Function Group 2 Switching Outputs

0	0	1	0	0	1	0	1
0	0	1	1	0	1	0	1
0	1	0	0	0	0	0	0
0	1	0	1	0	0	0	0

Function Group 3 Disturbance Signal Suppression

0	0	0	1	0	1	1	1
0	0	1	0	0	0	0	0
0	0	1	1	0	0	0	0
0	1	0	0	0	0	0	0
0	1	0	1	0	0	0	0
0	1	1	0	0	0	0	0
1	0	0	0	0	0	0	0
1	0	0	1	0	0	0	0
1	0	1	0	0	0	0	0
1	1	0	0	0	0	0	0
1	1	0	1	0	0	0	0

Function Group 4 Reset

0	0	0	1	1	0	0	1
---	---	---	---	---	---	---	---

Function Group 5 Measure Probe Length

0	0	0	1	1	0	1	1
---	---	---	---	---	---	---	---

2.Enter into configuration mode

Change DIP switch position 8 to 1, entering into configuration mode, other switches position must be on 0, otherwise errors will indicate. The follow 3~11 steps should be operated in configuration mode.

Dip Switch Position							
1	2	3	4	5	6	7	8

Dip Switch Setting	Description
--------------------	-------------

0	0	0	0	0	0	0	1
---	---	---	---	---	---	---	---

3.Read the length of probe

Change DIP switch position 4.5.7 to 1 at the same time, then press confirmation button, the instrument will measure the length

Dip Switch Position							
1	2	3	4	5	6	7	8

Dip Switch Setting	Description
--------------------	-------------

0	0	0	1	1	0	1	1
---	---	---	---	---	---	---	---

4.Set lower range value

Fill the liquid into the tank up to the level where you want to position the lower range value 4mA, change 4, 7 switch position to 1 at the same time, then press confirmation button, the instrument will set the level as lower range value and output 4mA.

Dip Switch Position							
1	2	3	4	5	6	7	8

Dip Switch Setting	Description
--------------------	-------------

0	0	0	1	0	0	1	1
---	---	---	---	---	---	---	---

5.Set upper range value

Raise the liquid inside the tank up to the level where you want to position the upper range value 20mA, change 3.7 switch position to 1 at the same time, press confirmation button, the instrument will set the level as upper range value and output 20mA.

Dip Switch Position							
1	2	3	4	5	6	7	8

Dip Switch Setting	Description
--------------------	-------------

0	0	1	0	0	0	1	1
---	---	---	---	---	---	---	---

6.Set installation way

There are two kinds of installations, one is coaxial probe rod, the other is proberod, it should be set in advance according to different plications.

Dip Switch Position							
1	2	3	4	5	6	7	8

Dip Switch Setting	Description
--------------------	-------------

1	1	0	0	0	1	1	1
---	---	---	---	---	---	---	---

1	1	0	1	0	1	1	1
---	---	---	---	---	---	---	---

7.Set analog output response time

Analog output response can be set as 0.5s, 2s and 5s, DIP switch can be changed to different positions according to different applications, then press confirmation button to set it.

Dip Switch Position							
1	2	3	4	5	6	7	8

Dip Switch Setting	Description
--------------------	-------------

0	1	0	0	0	0	1	1
---	---	---	---	---	---	---	---

0	1	0	1	0	0	1	1
---	---	---	---	---	---	---	---

0	1	1	0	0	0	1	1
---	---	---	---	---	---	---	---

8.Set digital output starting value

Set the value to where you want to position digital output starting value, then change switch position 3, 6 to 1, press confirmation button to set it.

Dip Switch Position							
1	2	3	4	5	6	7	8

Dip Switch Setting	Description
--------------------	-------------

0	0	1	0	0	1	0	1
---	---	---	---	---	---	---	---

9.Set digital output closing value

Set the value to where you want to position digital output closing value, then change switch position 3, 4, 6 to 1, press confirmation button to set it.

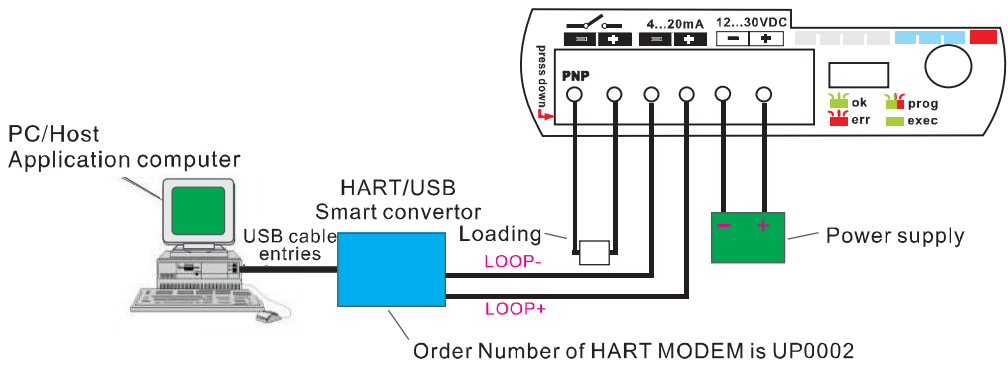
Note: The level of position digital output closing value should higher than or equal to that of digital output starting value

Dip Switch Position							
1	2	3	4	5	6	7	8

Dip Switch Setting	Description
--------------------	-------------

0	0	1	1	0	1	0	1
---	---	---	---	---	---	---	---

HART Configuration set



Connection	Connection picture for HART/USB converter with 4-wire system device
Set COM	Open guided radar configuration mode setting tools, set COM to the terminal position where the HART is in HOME table.
Make connection and read serial No.	Click "send" in the line of "get serial number" in "Basic configuration" table, connecting computer with instrument and then read serial No.
Set probe length	Enter probe length in the line of "set probe length" in "local assembly" table, and then press "start" button to add the set value in instrument, it is successful if "OK" indicates in "OK/Error code"
Set probe type	Enter probe type in the line of "set probe type" in "local assembly" table, 0 means probe rod mounting, 1 means coaxial probe rod mounting, which depends on different applications, and then press "start" button, it is successful if "OK" indicates in "OK/Error code".

Start-up time [s]	<6
Accuracy [mm]	± 3
Repeatability [mm]	<2
Resolution [mm]	<1
Probe length [mm]	1000 (standard)
Shock resistance [g]	50
Vibration resistance [g]	20
Housing material	Aluminum alloy
Probe material	Stainless steel (S316)/Teflon
O-ring material	FKM(Viton)
Protection classification	IP67

Order Infomation						
RB	1	A	01000	S	6	1
Series	Probe type	Output	Length of Probe	Protection type	Probe material	O-ring material
RB	Guided Radar Level Sensor (TDR)					
1	Probe type 1: Single rod 2: Coaxial probe 3: Wire rope					
A	Output A: 4-wire, 1 x 4~20mA & 1xDC PNP/HART					
01000	Length of probe Range of single rod: 100~3,000mm Range of coaxial probe: 100~6,000mm Range of wire rope: 100~20,000mm 01000=1,000mm 20000=20,000mm (standard length: 1000mm)					
S	Protection type S: Standard					
6	Probe material 6: Stainless steel 316 T: Teflon (suitable for single rod)					
1	O-ring material 1: FKM (Viton)					

Radar Wave
Level Sensors

Guided Radar
(TDR)

Ultrasonic
Level Sensors

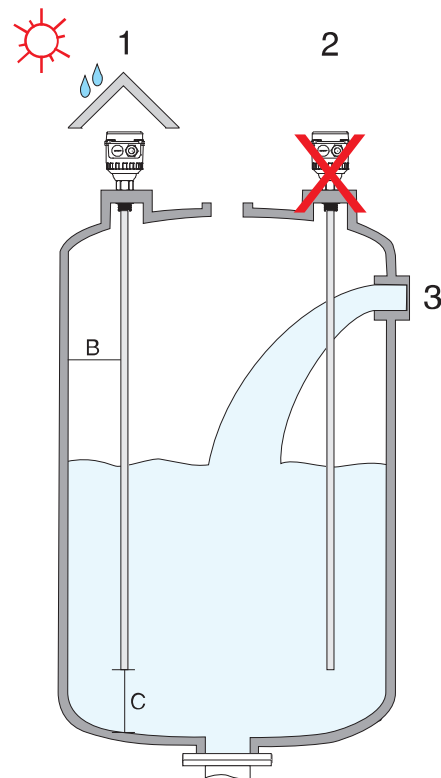
Rotating Paddle
Level Sensors

Vibrating Fork
Level Switches

Float
Level Switches

Capacitive
Level Switches

Install method



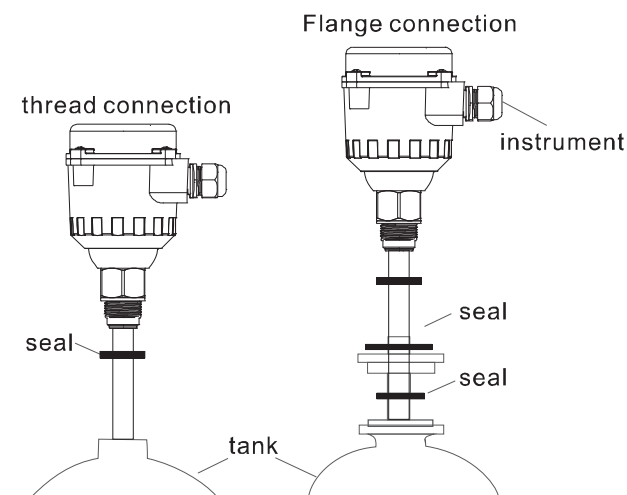
Selection of probe

single rod and wire type are suitable for
the sensing range is more than 6M

Installation position

- ◆ Do not install them around of the material flow
- ◆ It is better to keep a distance from wall of tank(B), in cases with adhesion, probe should keep about 100mm away from the adhesion.
- ◆ The probe should keep away from the installed devices
- ◆ The minimum distance between probe and bottom of the tank (C)
 - wire type: 150mm
 - probe type: 100mm
- ◆ When install outdoor, it is better to use a shade(1)

- ◆ The guided radar wave transmitter should be vertical installed in the top of tank.
- ◆ Protecting jacket must be used when installed in non-metallic tank.
- ◆ There should not be any soldering install, soldering install will cause unpredictable result.
- ◆ Please do not install them around material filling nozzle or vulnerable place, if installed around a place where liquid level changes strongly, protecting jacket is needed.
- ◆ When install or move the transmitter, please do not take the probe directly, please take the instrument parts or thread parts.



Effect of internal equipments of the tank

- ◆ During the installation and operating process, please make sure the whole probe keep a distance more than 300mm from internal equipments(such as limit switches, stands, etc.)
- ◆ The probe should not be contacted with any equipments in the measuring range.

Optimization selection

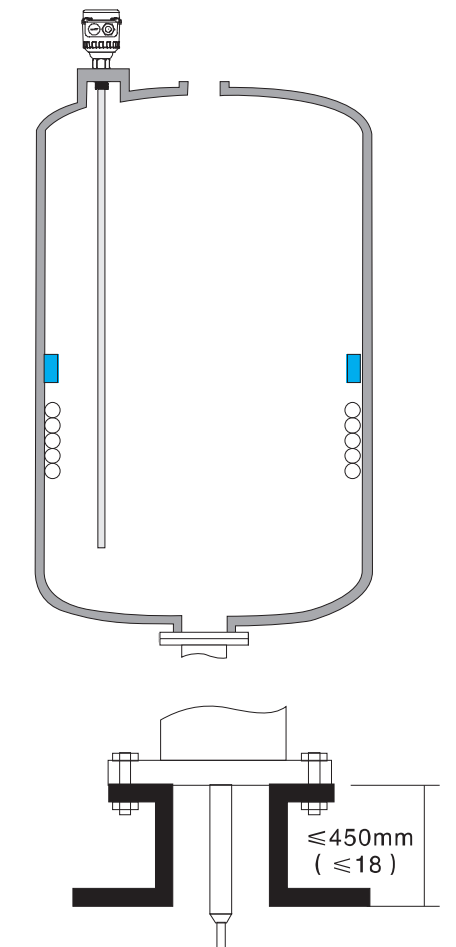
- ◆ Clutter echo suppression

Installation notice

- ◆ When install on the plastic tank, the diameter of tube is at least DN50/2".
- ◆ When the wire type install on tube whose height is 450mm, centering bracket must needed.
- ◆ When installed on narrow well, the diameter of narrow well should greater than 25mm.
- ◆ The diameter of nozzle should greater than 50mm, the height should less than 300mm.

Cleanness of probe

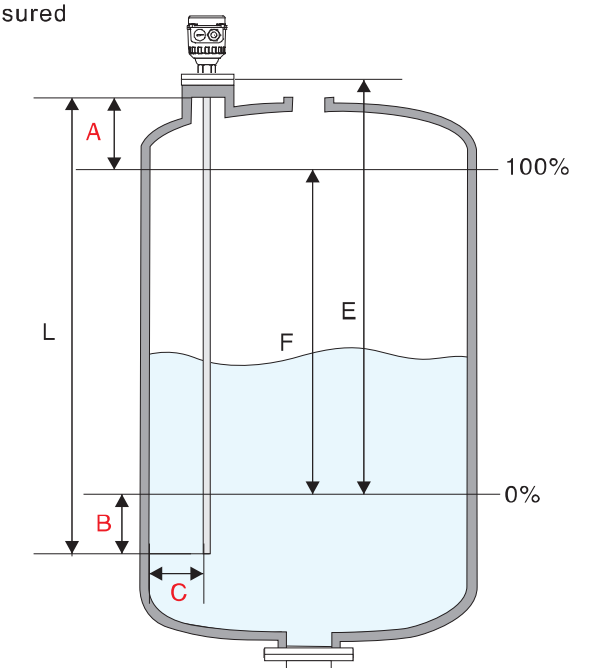
There are some burrs and accumulation on the probe during use, small quantity will not effect the measuring, if there are too much accumulations, they will lessen the measuring range. In some aggressive situation, generated crystallization will cause the measuring error. In this situation, please use non-contact measuring method, or clean the probe regularly



Inactive area

Top inactive area (=A) is the minimum distance between measurement reference point (flange) and top level of material,
bottom inactive area (=B) is the distance that can not be measured

F=measuring range
E=initial value(=0)
A=top inactive area
B=bottom inactive area
L=probe length
C=minimum distance between probe and tank wall



Linking your system



Product Features

- Wide measuring range, high precision, low-energy consumption
- Non-contact measurement, no moving parts
- Liquid measurement
- Adopt scientific echo tracking algorithm, capture the real echo effectively
- Adopt temperature compensation(speed, frequency) to make measurement more accuracy and stable
- Analogue output and switches output



Operating principle

Ultrasonic level transmitter operating principle is that it send out ultrasonic pulse and reflected by the medium, the reflected pulse is received by emitter and then transform into electric signal. The distance between emitter and material is in direct proportion to ultrasonic pulse time interval. The distance S and the speed of sound C and the time T can be represented as $S = C \cdot T / 2$.

Advantages and main applications

Advantages:

- Detection is not effected by below factors:
 - medium density
 - medium electric feature
- Waves and foam do not affect the sensor
- The electric devices can be replaced when the lid closed

Main applications:

- Level measurement
- Distance measurement
- Storage indication
- Differential level measure
- Water pump control

Ultrasonic Level Sensors



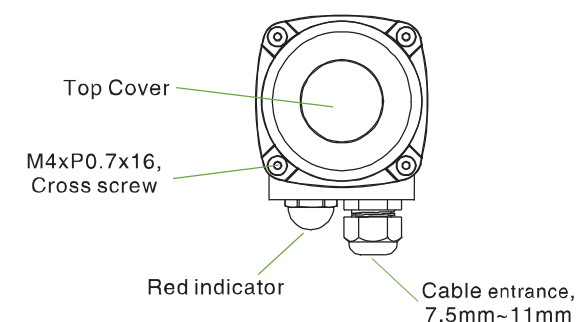
Ultrasonic level sensors is a kind of non-contact, low-cost, easy-installed level transmitter. It apply space technology to the livelihood industry, this level transmitter has less application limits than other transmitters, more durable, concise appearance, stable function, etc. Widely used in electric power, metallurgy, petrochemical, food industrial, water treatment, paper industrial and level measurement of corrosive liquid.



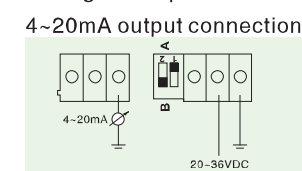
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Wiring Diagram

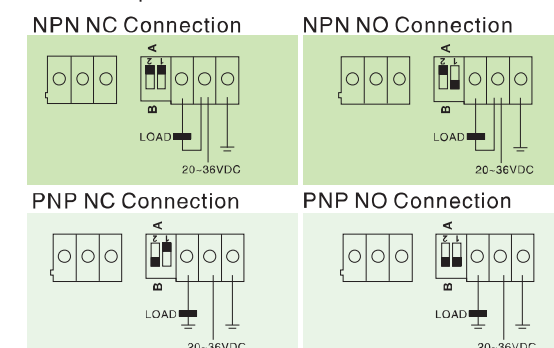
Wiring Diagram



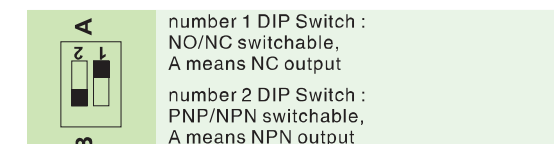
Analogue output connection



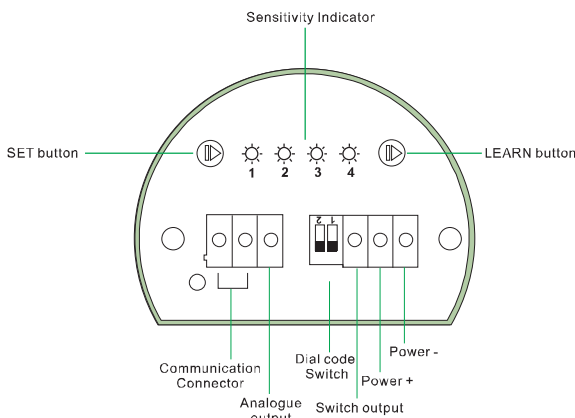
NO/NC Output Connection



Notice



Display



- Panel and Adjustment
 - The function of DIP Switch
 - number 1 DIP switch :NO/NC switching output, A means NC output ;
 - number 2 DIP switch :PNP/NPN switching output, A means NPN output.
- Buttons Functions
 - SET: Menu selection;
 - LEARN: Parameters learning.
- Indicators
 - The lamp lights on when there is a switching signals, otherwise the light is off.
- Communication connector
 - It is used for upgrade version, not for this product.

Functions Indication

SET

●

○

○

○

LEARN

Normally working, lamp 1 flashes

SET

●

●

○

○

LEARN

When the level is higher than Max. point, lamp 2 lights on

SET

●

○

●

○

LEARN

When the level is lower than Min. point, lamp 3 lights on

SET

●

○

○

●

LEARN

Connecting with control box, lamp 4 lights on

SET

○

○

○

○

LEARN

In operating mode:
press "LEARN" button to examine the adjustment of analogue output.

SET

○

○

●

●

LEARN

Press "LEARN" button, it starts to measure the altitude level and lamp 2.3.4 light on. (ASP is on the upper point and AEP is on the lower Point.)

SET

○

●

●

○

LEARN

Press "LEARN" button, it starts to measure the depth level and, lamp 2.3.4 light on. (Now AEP is on the upper point and ASP is on the lower point.)

SET

○

●

○

○

LEARN

Unlock Indication:

SET

○

●

○

○

LEARN

Press the two buttons in the meantime once for 5 seconds. The unit is unlock when Lamp 1 and 4 flash.

This Ultrasonic Level Switch does not support 485 protocols.

Functions and parameters adjustment

SET

●

○

○

○

LEARN

1. Set the Start Point(SP)

SET

○

○

○

○

LEARN

Press SET button, lamp 1 flashes

SET

○

○

○

○

LEARN

Press LEARN button, it starts to learn the current parameters and four lamps flash on in turn

SET

○

○

○

○

LEARN

When the setting is confirmed, lamp 2 and 3 flash

SET

○

○

○

○

LEARN

When the setting is in error, lamp 2 and 3 "flashing alternatively

SET

○

○

○

○

LEARN

2. Set the Restrict Point (RP)

SET

○

○

○

○

LEARN

Press SET button , lamp 2 flashes. The following steps are the same as setting the SP

SET

○

○

○

○

LEARN

3. Set the Analogue Start Point (ASP)

SET

○

○

○

○

LEARN

Press SET button, lamp 3 flashes. The following steps are the same as setting the SP

SET

○

○

○

○

LEARN

4. Set the Analogue End Point (AEP)

SET

○

○

○

○

LEARN

Press SET button, lamp 4 flashes. The following steps are the same as setting the SP

Notice: The frequency of lamp 1 flashes in normal working is different from the flashing frequency of adjusting the parameters.

Function

1.Switching output (See Picture 3 and Table 1)

Table 1:

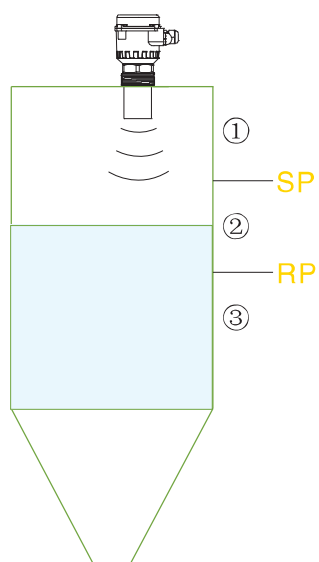
	Normal Open (NO)	Normal Closed (NC)
Position1-higher than SP	Yes	No
Position 2-between SP and RP	Delay	Delay
Position 3-below RP	No	Yes

Notice:

(1) The position of SP must be higher than RP. If the value of SP is lower than RP, the system will automatically adjust the value of RP 1 cm lower than that of SP.

(2) When the value of SP or RP is out of the measuring range, the learning function would be failed.

(3) The product features with overload protection. When the output current (PNP or NPN) is over 400mA, it will automatically switch off as a protection. After getting rid of overload, the protection can be removed.



(Picture.3)

2 .Analogue output (See Picture.4 and Table 2)

Table 2:

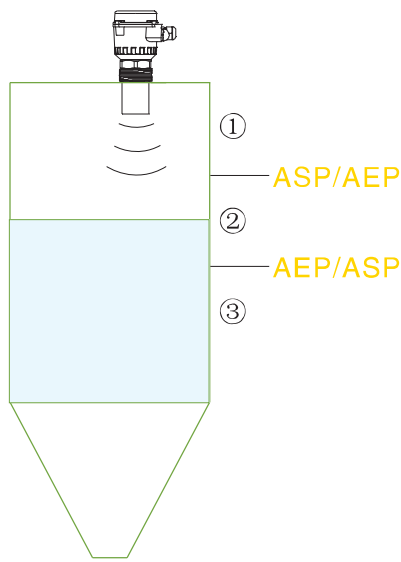
		Adjustment
Position 1	4mA	ASP on the upper point, AEP on the lower point
	20mA	AEP on the upper point, ASP on the lower point
Position 2	4~20mA is equally allocated from top to down.	ASP on the upper point, AEP on the lower point
	4~20mA is equally allocated from down to top .	AEP on the upper point, ASP on the lower point
Position 3	20mA	ASP on the upper point, AEP on the lower point
	4mA	AEP on the upper point, ASP on the lower point

Notice:

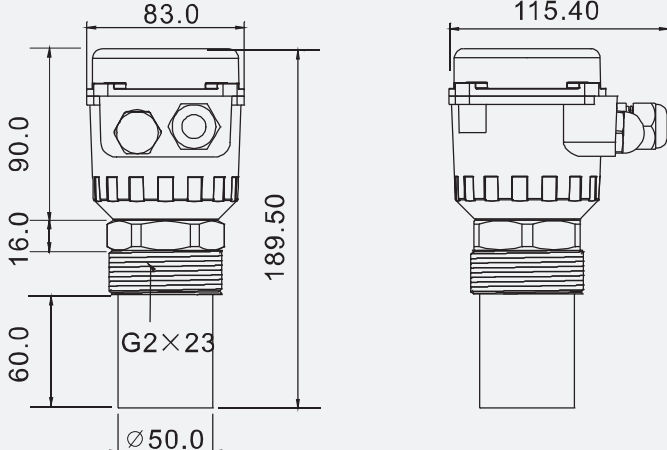
1.To ensure the accuracy, the values of ASP and AEP must keep in a proper distance.

2.It indicates Error while the value of ASP and AEP are out of the detecting range.

3.The value of ASP can be lower than AEP or higher than AEP.



(Picture. 4)

Diagram (mm)	
	
Model	VS0001
Type	Standard Type
Connection	G2"
Cable entrance	M20xP1.5
Sensing medium	Liquid
Button	two
Oppering voltage[VDC]	20...36
Voltage dropping[V]	<3.5
Anti-polarity protection	Yes
Overload protection	Yes
Temperature compensation	Yes
Autometric calibration	Yes
Watch-door dog(Door keeper)	Yes
Current consuming	50
Accuracy deviation [%]	±1%
Mininum Resolution [mm]	1
Output responsing [s]	1.5
Output	Three wire,4~20mA output
Analogue output load [ohm]	4...20mA,Max. (Ub-10V)*50
Switching output Max.load [mA]	400

Switch output specification	NO/ NC adjustable
	NPN/PNP adjustable
	SP/RP adjustable
Amblent temperature [°C]	-40~80
Storage temperature [°C]	-40~80
Protection rating	IP65
Resistance [MΩ]	>100(1500 VDC)
Shock resistance [g]	4
Housing material	Aluminum Alloy, ABS, PA+GF
Probe frequency(KHz)	50
Launch angle	<15°
Measuring range (M)	0.3~8
Inactive area(cm)	≤30

Radar Wave
Level Sensors

Guided Radar
(TDR)

Ultrasonic
Level Sensors

Rotating Paddle
Level Sensors

Vibrating Fork
Level Switches

Float
Level Switches

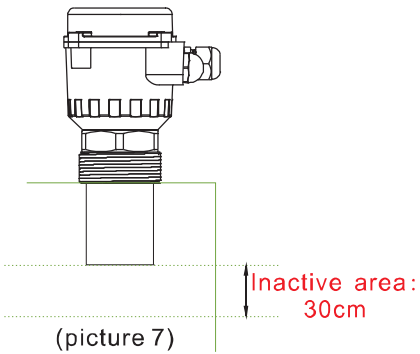
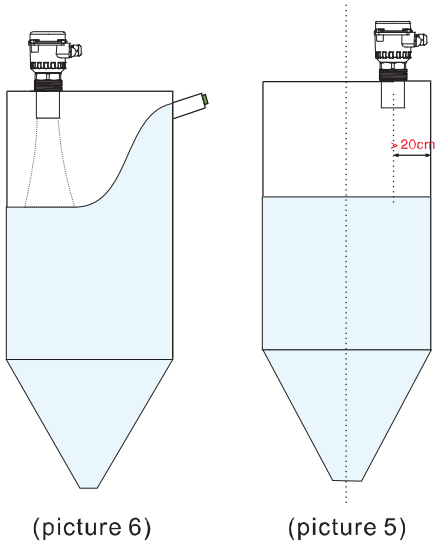
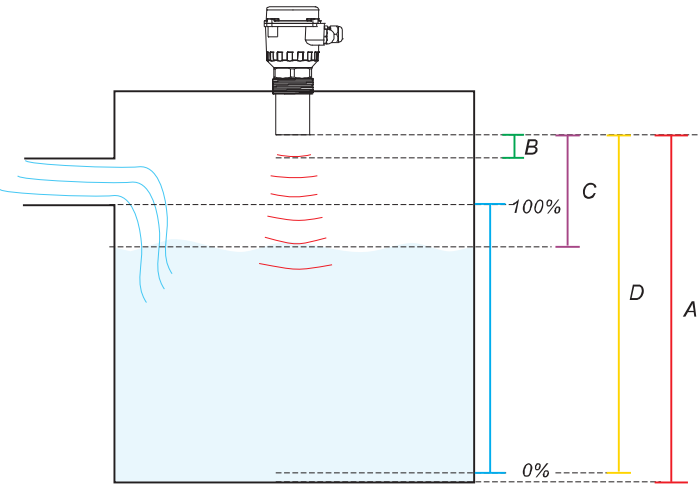
Capacitive
Level Switches

Order Information

Order No.	Housing material	Connection	Sensible range (M)	Cable entrance (mm)	Ambient temperature (°C)	Output	Protection
VS0001	Aluminum Alloy	G2"	0.3~8	M20 × P1.5	−40 ~ +80	Three wire, 4~20mA NPN/PNP	IP65

Installation Notice

- Please install the ultrasonic level sensor at position which is at least 20cm to the vessel wall. Do not install the device in the centerline of tank in order not to receive the false echoes. (See picture 5)
- Please mount the bottom line of probe being parallel to non-flowing medium. Do not mount the bottom of the device toward filling inlet. It is recommended to install a protective shield if necessary. (See picture 6)
- Excessively high or low pressure (Vacuum) may reduce the echoes. Please use it within the normal pressure range. Foam or the dust could cause the false echoes which may influence the measuring result. Under such condition, please choose RA series Radar wave level transmitter instead. Ultrasonic level switch is not suitable for the use under extreme temperature.
- The inactive area is the minimum measured distance between the transmitter face and the medium. When carry out the measurement in the inactive area, it may cause inaccuracy performance. The distance suggested in the table below. The distance should be greater than inactive area (see picture 7) and the measuring value is the distance between the target media and the probe.

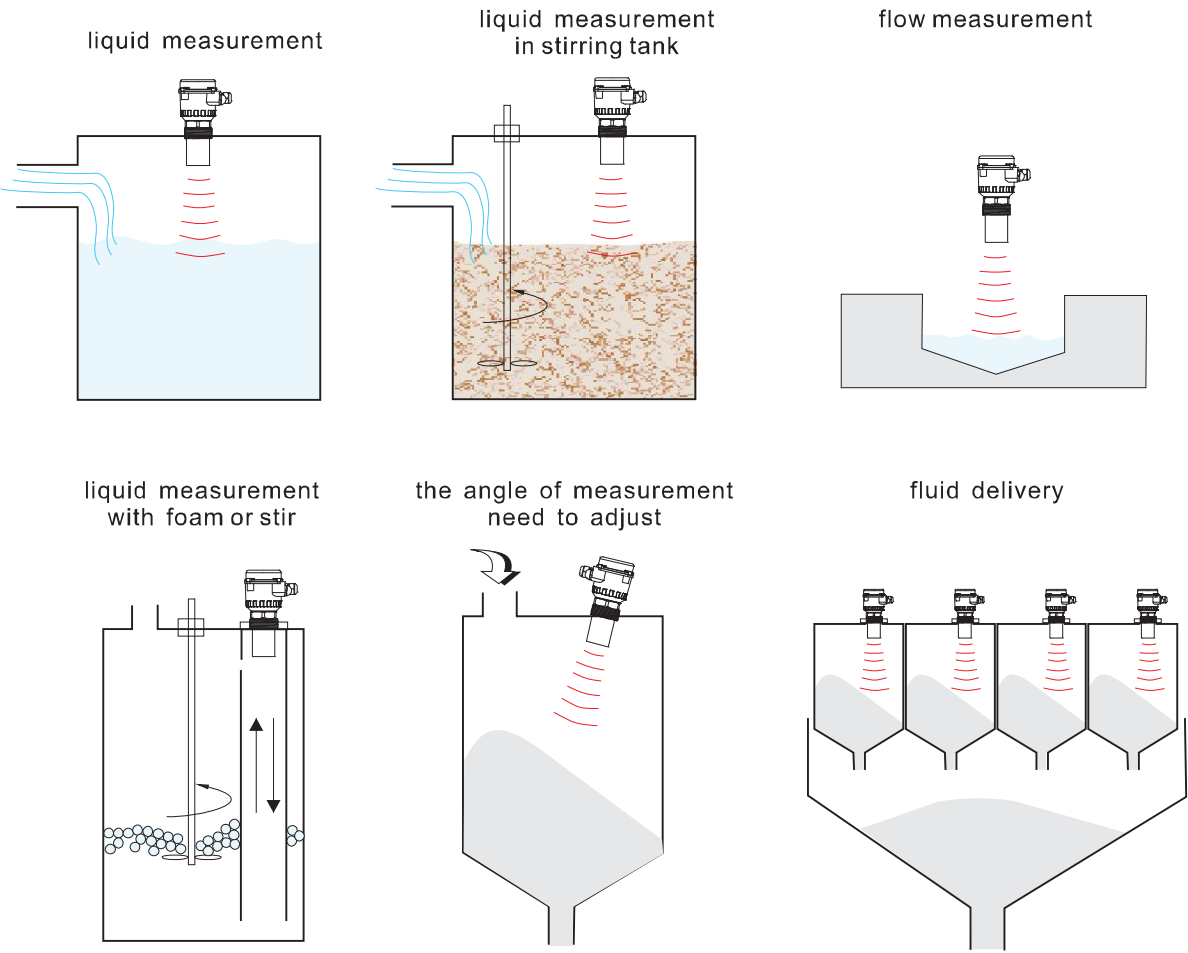


The unit measure the distance from the process connection of flange or thread

A. measuring range adjustment
B. Inactive area
C. Upper level adjustment
D. Lower level adjustment

Applications

- Water or waste water treatment equipment, such as suitable for tank, channel, pool, well, etc.
- Liquid raw material, such as oil, beverage, heavy oil, etc.
- Chemical raw material, such as solvent, paint, carbonic acid, water, resin, wax oil, etc.



Notice of install ation

- Please protect the probe against heavy shocking.
- Please clean the attached materials on the transmitter surface regularly and also keep the surface clean and smooth.



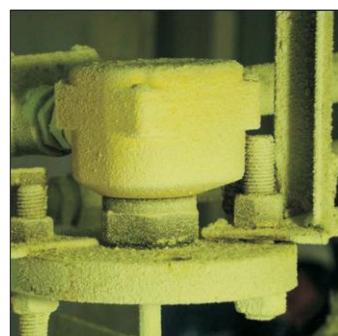
Electrical Connection

The installation must be installed by the experienced specialists;
It is necessaries to follow the national's installation regulations;
The power supply should be off before the connection.

Linking your system



Rotating Paddle Level Switches



The paddle of rotating paddle level switch is connected with clutch through shaft, the motor keep working when the paddle do not contact with material, and the motor will stop working when the paddle contact the material, at the same time, the electric instrument will send out a signal to measure the level of material, an indicator can also be installed to show the status of level switch.



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Product Features



Modular rotating paddle level switches:

- Unique oil-seal design can avoid dust infiltrate along the shaft
- Stable and reliable torque, and the torque can be adjusted
- Double bearing design, high loading strength
- Stainless steel shaft and metal reduction gear parts to ensure the strength and life of motor system
- Easy to check and maintain internal parts without dismantling from tank
- Able to detect small specific gravity material

Operating principle

The paddle of rotating paddle level switch is connected with clutch through shaft, the motor will keep working when the paddle do not contact with material, and the motor will stop working when the paddle contact the material, at the same time, the electric instrument will send out a signal to measure the level of material, an indicator can also be installed to show the status of level switch.

Product Features

Rotating paddle level switch is suitable for environmental protection, water treatment, electricity, chemical plastic, pharmacy, fodder, cement, chemical fertilizer, food industrial, etc.



Radar Wave
Level Sensors

Guided Radar
(TDR)

Ultrasonic
Level Sensors

Rotating Paddle
Level Sensors

Vibrating Fork
Level Switches

Float
Level Switches

Capacitive
Level Switches

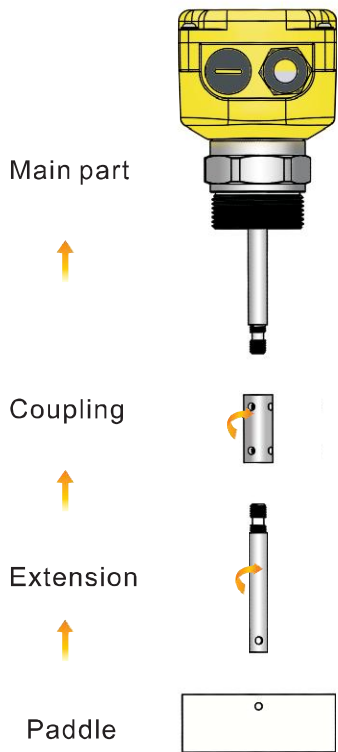
Trend of modular rotating paddle level switch

- 1. The users can assemble them due to different length and demands
- 2. Reduce the package and freight cost
- 3. Lower inventory
- 4. Shorten the delivery time, create more business opportunities
- 5. Reduce the maintenance cost, and change any parts of the instruments at will

Drawing Of Modular Type

How to order modular type?

A	Main part
+	
B	Coupling
+	
C	Extension
+	
D	Process Connection (optional)
+	
E	Paddle



Modular type of extension shaft length

(Unit:mm)

Main Part shaft length	Extension shaft length	Total length
50	150	200
	350	400
	550	600
	750	800
	950	1000
	1150	1200

Housing material

■ Metal house is sturdy and durable . Please select metal housing for high temperture type.



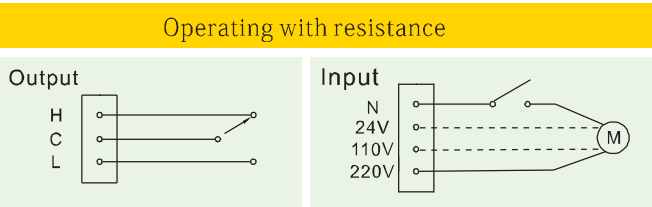
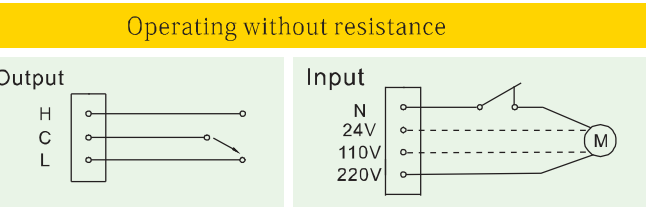
SRP plastic housing



SRT metal housing

Circuit principle

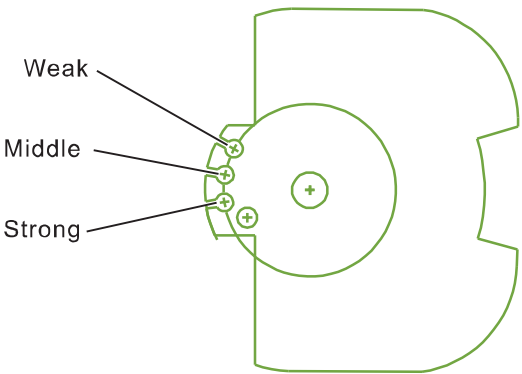
- 1.When the motor is on, C.L circuit closed means no resistance on paddle. When the motor is off, C.L circuit will be opened, meanwhile, C.H circuit closed means being resistance on paddle.
- 2.When operating without resistance,C.L circuit is closed and the motor start to work again.



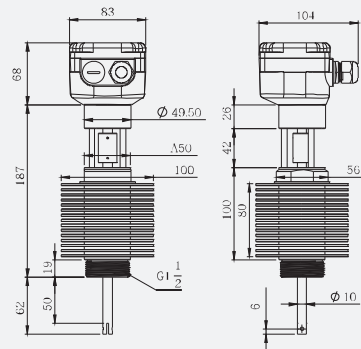
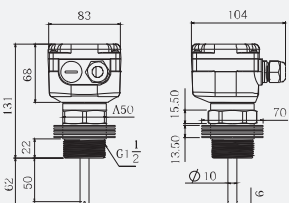
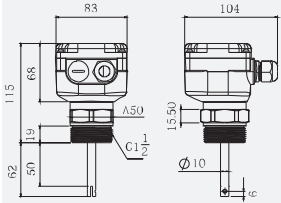
Torque adjustment

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 weak position on measuring light bulk solid, while the paddle is sensitivity. 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.

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

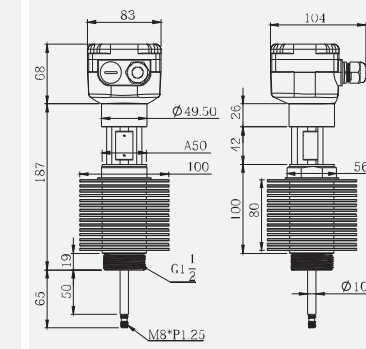
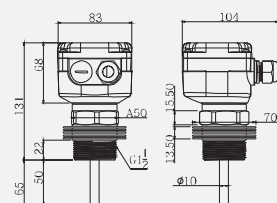
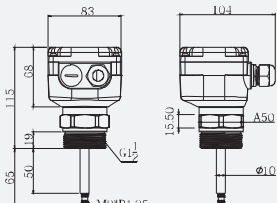


Dimensions (mm)



Model	SRP10/SRT10		
Type	Standard		
Cable entrance	M20xP1.5		
Detecting medium	Powder/Solid		
Power supply	24,110-120,220-240VAC/50-60Hz		
Applications	Chemical plastic, pharmacy, fodder, cement, chemical fertilizer, food industry, etc.		
Power consumption(W)	3		
Torque measurement(Kgf.cm)	0.5...1.0		
Appropriate specific gravity (g/cm³)	0.5		
Contacting rating	SPDT 5A/250VAC		
Paddle rotational speed	≤2 (RPM)		
Medium density	≥0.5g/cm³		
Sensitivity	Weak,Middle,Strong-3 level adjustable		
Output	Switching signal		
Reliability	No failure time is not less than 15,000 hours of continuous operation, >10000 times continuous operations		
Drop	Safe drop height ≤ 1.2M		
Length of main part shaft (mm)	50		
Storage temperature	-20~80℃		
Operating temperature	-20~80℃	MAX200℃	MAX450℃
House material	ABS/Aluminium	PA66/Aluminium	Aluminium

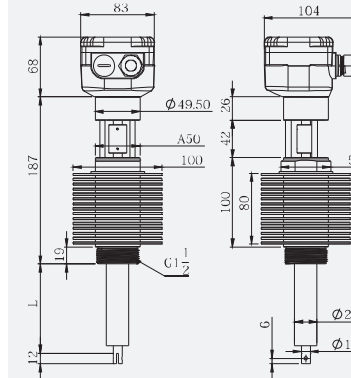
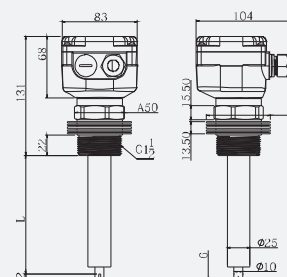
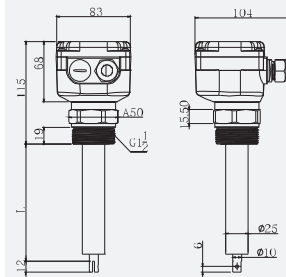
Dimensions (mm)



Model	SRP11/SRT11		
Type	Modular Standard		
Cable entrance	M20xP1.5		
Detecting medium	Powder/Solid		
Power supply	24,110-120,220-240VAC/50-60Hz		
Applications	Chemical plastic, pharmacy, fodder, cement, chemical fertilizer, food industry, etc.		
Power consumption(W)	3		
Torque measurement(Kgf.cm)	0.5...1.0		
Appropriate specific gravity (g/cm³)	0.5		
Contacting rating	SPDT 5A/250VAC		
Paddle rotational speed(RPM)	≤2		
Medium density(g/cm³)	≥0.5		
Sensitivity	Weak,Middle,Strong-3 level adjustable		
Output	Switching signal		
Reliability	No failure time is not less than 15,000 hours of continuous operation, >10000 times continuous operations		
Drop	Safe drop height ≤ 1.2M		
Storage temperature	-20~80℃		
Operating temperature	-20~80℃	MAX200℃	MAX450℃
House material	ABS/Aluminium	PA66/Aluminium	Aluminium

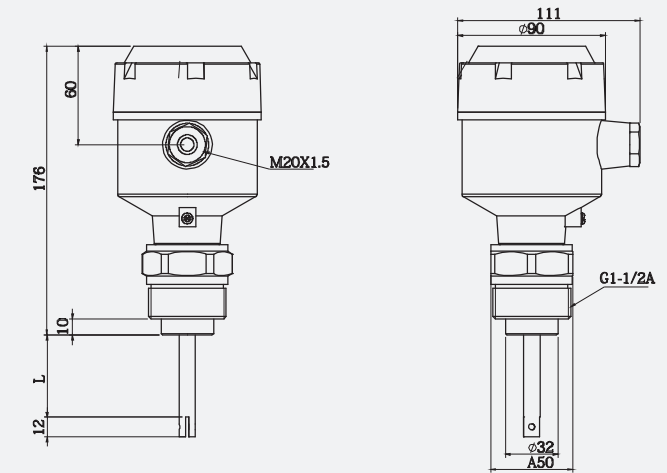
Notice: Extension shaft and steel wire can be selected as extension type connection part, please refer to P96.

Dimensions (mm)



Model	SRP50/SRT50	SRP60/SRT60	SRT70
Type	Shaft protection	High temperature Shaft protection	Ultra-high temperature shaft protection
Cable entrance	M20xP1.5		
Detecting medium	Powder/Solid		
Power supply	24,110-120,220-240VAC/50-60Hz		
Applications	Chemical plastic, pharmacy, fodder, cement, chemical fertilizer, food industry, etc.		
Power consumption(W)	3		
Torque measurement(Kgf.cm)	0.5...1.0		
Appropriate specific gravity (g/cm³)	0.5		
Contacting rating	SPDT 5A/250VAC		
Paddle rotational speed(RPM)	≤2		
Medium density(g/cm³)	≥0. 5		
Sensitivity	Weak,Middle,Strong-3 level adjustable		
Output	Switching signal		
Reliability	No failure time is not less than 15,000 hours of continuous operation, >10000 times continuous operations		
Drop	Safe drop height ≤ 1.2M		
Storage temperature	-20~80℃		
Operating temperature	-20~80℃	MAX200℃	MAX450℃
House material	ABS/Aluminium	PA66/Aluminium	Aluminium

Dimensions (mm)



Model	SRE
Type	EX-proof
Cable entrance	M20xP1.5
Detecting medium	Powder/Solid
Power supply	24,110-120,220-240VAC/50-60Hz
Applications	Chemical plastic, pharmacy, fodder, cement, chemical fertilizer, food industry, etc.
Power consumption(W)	3
Torque measurement(Kgf.cm)	0.5...1.0
Appropriate specific gravity (g/cm³)	0.5
Contacting rating	SPDT 5A/250VAC
Paddle rotational speed(RPM)	≤2
Medium density(g/cm³)	≥0. 5
Sensitivity	Weak,Middle,Strong-3 level adjustable
Output	Switching signal
Reliability	No failure time is not less than 15,000 hours of continuous operation, >10000 times continuous operations
Drop	Safe drop height ≤ 1.2M
Length of main part shaft(mm)	50
Operating temperature	-20~40℃
House material	Aluminium

Order Info for rotating paddle level switch


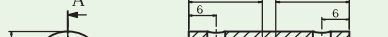
SR	P	10	C	B	0050	4
Series	Housing material	type	connection	power supply	main shaft length	shaft material
SR	Standard rotating paddle level switch			Shaft-protection rotating paddle level switch		
P	Housing material : P: plastic housing T: metal housing (aluminium alloy)			Housing material : P: plastic housing T: metal housing (aluminium alloy)		
10	Type : 10: standard 80°C 20: high temperature Max 200°C 30: extremely high temperature Max 450°C 11: modular standard 80°C 21: modular high temperature Max 200°C 31: modular ultra-high temperature Max 450°C			Type : 50: shaft-protection standard 60: high temperature shaft-protection Max 200°C 70: ultra-high temperature shaft protection Max 450°C		
C	Connection : A:3/4"PF B:G1" C:G1 ½"			Connection : C:G1 ½"		
B	Power supply : A: 24VAC B: 110-120VAC C: 220-240VAC D:24VDC			Power supply : A: 24VAC B: 110-120VAC C: 220-240VAC D:24VDC		
0050	Main shaft length(mm) 0050: L=50mm			Main shaft length(mm) 0200: L=200mm 0400: L=400mm 0600: L=600mm 0800: L=800mm		
4	Shaft material: 4: stainless 304 6: stainless 316			Shaft material: 4: stainless 304 6: stainless 316		

- Notice:
1. If the shaft length of extension type more than 1200mm, please select steel wire, suit able for vertical installation.
 2. Steel wire type is suitable for standard extension type, high temperature extension type, ultra-high temperature extension type.
 3. Ultra-temperature type only suitable for metal housing.
 4. Check the coupling/extension shaft/paddle material is the same.
 5. Confirm voltage, 24VAC, 110-120VAC , 220VAC or 24VDC.
 6. Check specific gravity of detected medium.
 7. Check the paddle size whether to meet the flange ot the hole of tank wall
 8. The shaft length tolerance is within ± 5mm.
 9. Extension type order information include main part and coupling, please selectively purchase the paddle, extension shaft and other accessories.

Order Info for EX-proof rotating paddle level switch

SR	E	10	C	C	0050	4
Series	Housing material	type	connection	power supply	main shaft length	shaft material
SR	Rotating paddle level switch					
E	Housing material : E:EX–proof/Aluminum Alloy					
10	Type : 10: standard 80°C 20: high temperature Max 200°C 11: modular– standard 80°C 21: modular high temperature Max 200°C			Type : 50: Shaft with shaft–protection tube 60: high temperature with shaft–protection Max 200°C		
C	Connection : C:G1 ½"			Connection : C:G1 ½"		
C	Power supply : A: 24 VAC B: 110 VAC C: 220 VAC D:24VDC					
0050	Main shaft length(mm) 0050: L=50mm			Main shaft length(mm) 0200: L=200mm 0400: L=400mm 0600: L=600mm 0800: L=800mm		
4	Shaft material: 4: stainless 304 6: stainless 316					

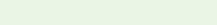
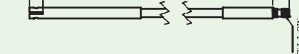
Coupling

Order no	SS304	SS316	Drawing
	S4S0	S6S0	

Extension shaft

Order no	SS 304	SS 316	Drawing
	L40150: L=150mm L40350: L=350mm L40550: L=550mm L40750: L=750mm L40950: L=950mm L41150: L=1150mm	L60150: L=150mm L60350: L=350mm L60550: L=550mm L60750: L=750mm L60950: L=950mm L61150: L=1150mm	

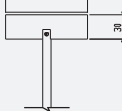
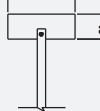
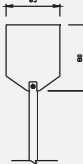
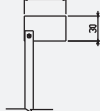
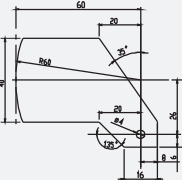
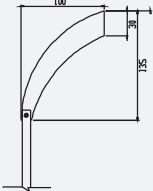
Wire

Order no	SS 304	Drawing
	<p>W41500: L=1500mm</p> <p>W42000: L=2000mm</p> <p>W42500: L=2500mm</p> <p>W43000: L=3000mm</p>	

Notice:

1. Modular extension type need to be used with coupling, extension shaft and paddle. Please confirm that all materials are the same.
2. Steel wire type need to be used with steel wire and paddle.

Paddle

Order no	T1	T2	T3	L1	L2	N1
Drawing						
Stainless 304	S4T1	S4T2	S4T3	S4L1	S4L2	S4N1
Stainless 316	S6T1	S6T2	S6T3	S6L1	S6L2	S6N1
Dimension	100×30×1.8	80×30×1.8	65×80×1.8	50×30×1.8	60×40×1.8	100×30×1.8

Connection

<p>Flange</p> 	<p>SS 304</p> <p>S4F0</p>	
<p>Fixture</p> 	<p>#45 steel</p> <p>S0C0</p>	

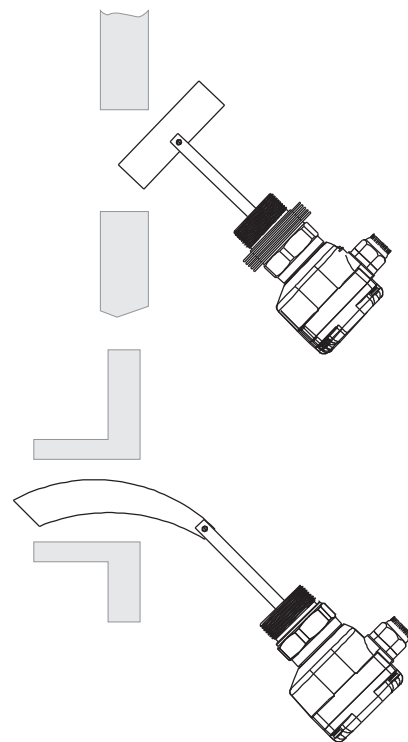
Tank installation example

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.

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 G1-1/2"-n11 threads. Finally, screw it tightly.

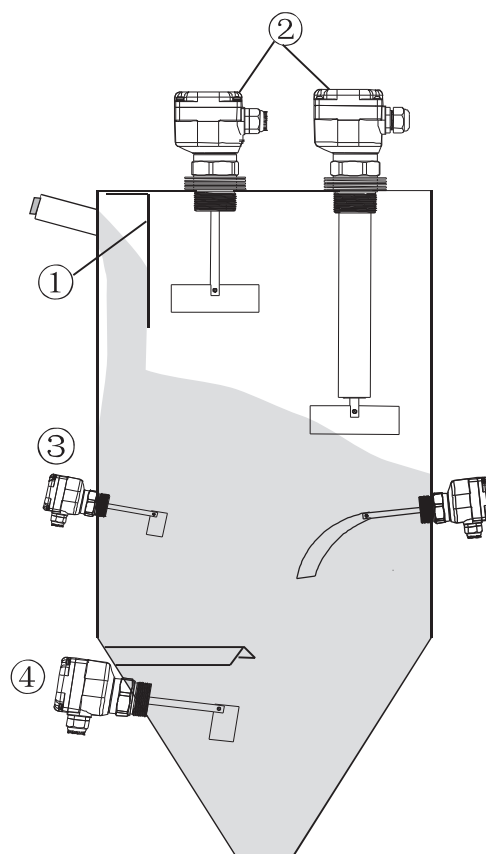


Installation notice

1. 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 side of the targeted object;
2. Please select high temperature type, when the temperature of targeted object is over 80°C.
3. The switch can be mounted directly without dismantling the paddles when select G1 1/2 fixture to mount it with a sickle shape paddle;
4. Make the connecting hole to cable headed below the instrumentation when mounting the switch vertically in the side 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);
5. 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.
6. Please add a protection cover for the probe when detecting the cakes with the diameter over 15mm or when installing this product under the entrance of the tank by 7M.
7. Mount the switch vertically in the surface or the side of the targeted object. when detect sticky powder.

Correct installation (as the right)

- ① Protection plate for feedstock
- ② Enough room for installation and debugging
- ③ The angle of horizontal installation
- ④ Protection plate for low material entrance

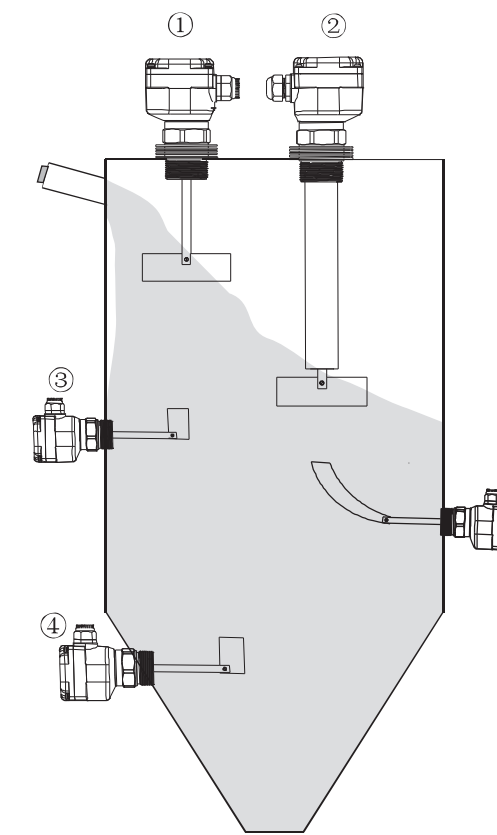


Wrong installation (as the right)

- ① Too close to the wall of the tank and material, there do not have a protection plate at the entrance of material
- ② The distance between 2 and 3 is too close, will effect the installation and debugging
- ③ Please notice the angle of horizontal installation, and the connecting hole to cable should head below
- ④ There should add a protection plate for probe when detecting the cakes with the diameter over 15mm to avoid the destruction to switches close tightly to the wall of the container or of the pipe.

Notice

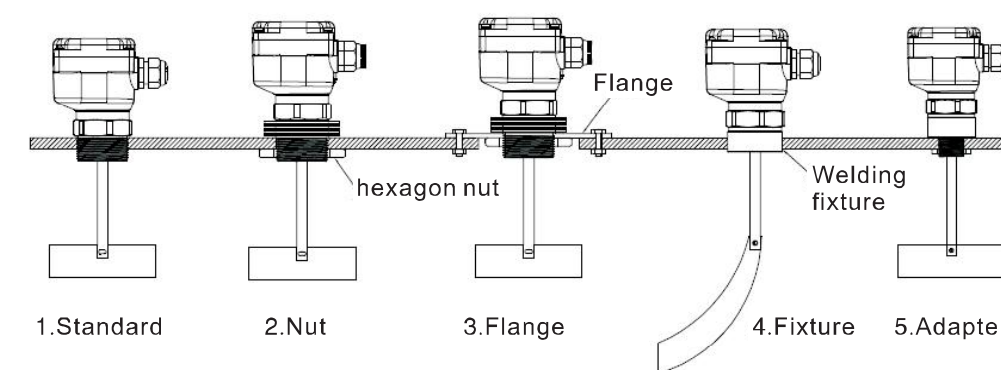
1. Make sure the mounting is based on the requirement conform to the restricted temperature, pressure, and other technical requirements.
2. Make sure the probe and the cable far away from the high voltage and such cable at least by 1 meter.
3. Make sure the airtightness of the module by adopting the circle cable which diameter is 6-7mm.
4. Make sure the wiring is correct and is close tightly to the wall of the container or of the pipe.



Mounting type

There are 5 mounting types available as following:

1. Standard mounting: Mount the switch directly by screwing tightly in the wall of the container which is applied to G1-1/2"-n11 threads.
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.
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.
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.
5. Adapter mounting: Link it to the adapter with G1-1/2"-n11 threads, and then link the adapter to the wall of the container. (The dimension of the thread for the adapter can be customized.)



Linking your system



Product Features



Vibrating fork level switches

- With Automatic learning function, it can learn different medium density by button without any adjustment
- Metallic structure, sturdy and durable
- The amplitude is large to reach more than 10mm, able to shake off hang-ups and avoid fault
- Ultra bright red LED will provide timely warning on site.
- High range of DC and AC input will not only reduce inventory effectively, but also be used widely.
- Suitable for detect the level of liquid, solid, powder, etc.

Applications

Vibrating fork level switch is suitable for environmental protection, water treatment, electricity, Chemical plastic, pharmacy, fodder, cement, chemical fertilizer, food industry, etc.



Vibrating Fork Level Switches



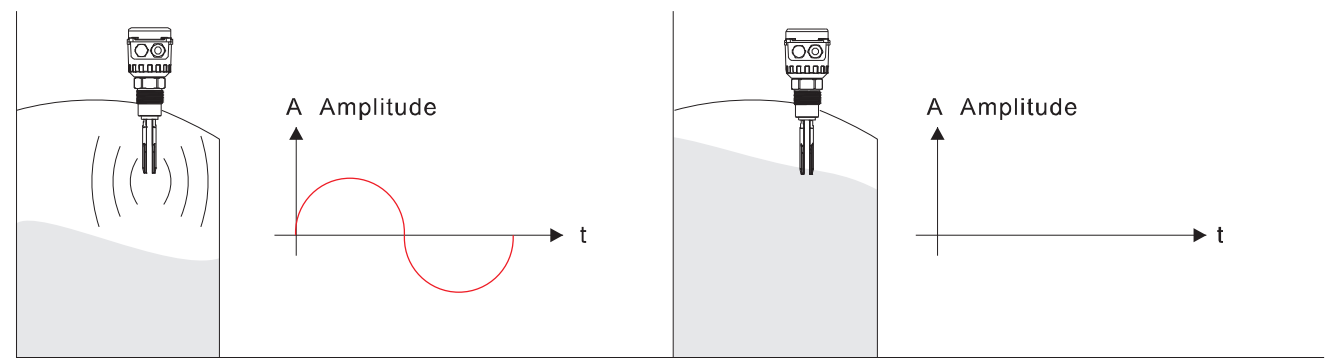
The vibrating fork level switch adopts the principle of damping effect and piezo-electric effect of vibrating fork. The sensing part of detection is composed of vibrating fork, a piezo-electric crystal oscillates the forks at their nature frequency, when the fork is effected by damping effect from medium, they will stop vibrating and the drive control circuit will send out signal. This product is suitable for harsh working conditions, they are



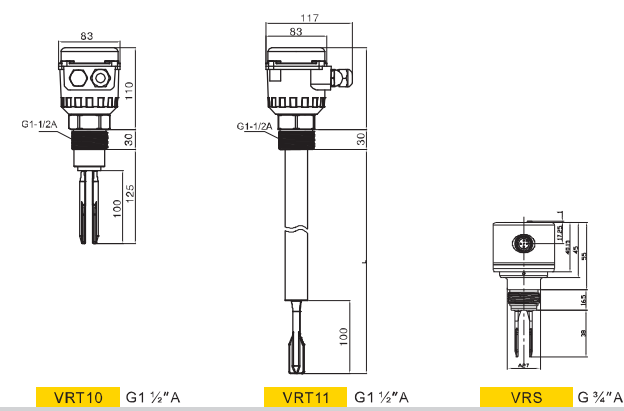
www.ema-electronic.com

Operating Principle

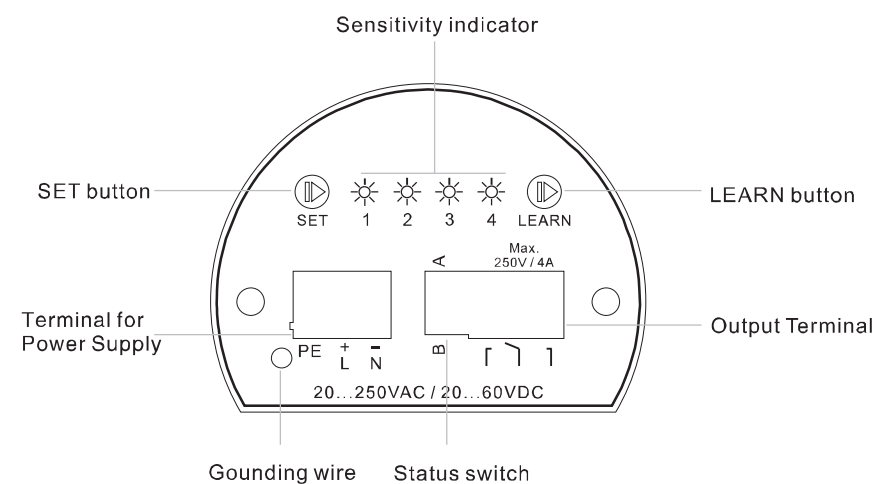
Vibrating fork level switch is suitable for environmental protection,water treatment, electricity,Chemical plastic, pharmacy, fodder, cement, chemical fertilizer, food industrial, etc.



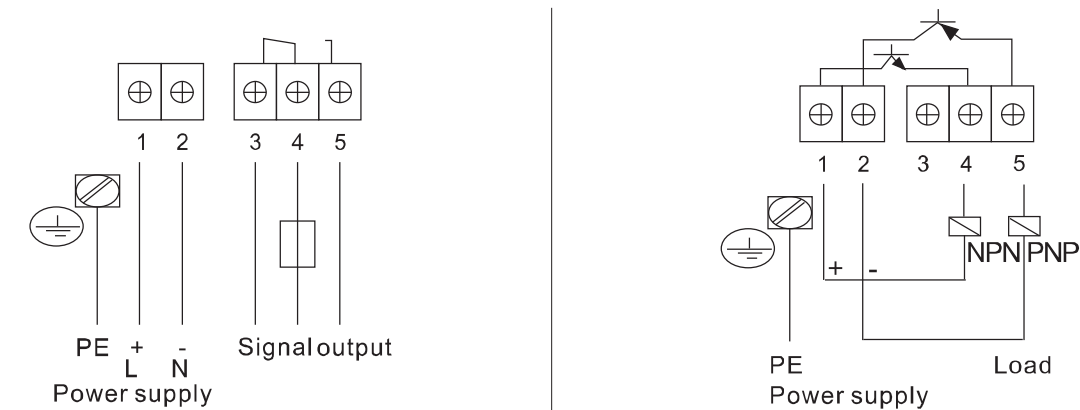
Dimension



VRT Panel



VRT Connection



Relay output:		NPN/PNP output:	
Power input	20~250VAC 50~60Hz 20~60VDC	Power input	20~60VDC
Signal output	4A/250VAC Max. 4A/60VDC Max.	Signal output	400mA Max.

Manual of VRT

Unlock:	Hold "SET" button, for 10 sec., until the four LED flash to status of unlock. After unlock, it is back to normal operating mode.
Lock	It is automatically locked if there is no button pressed in 60 sec.
NO/NC Setting	Press DIP switch to set NO or NC.
Learn Mode	Put fork part into the detected medium for 5 sec. and then operate "Unlock". After unlock, hold "LEARN" button for 5 sec., the LED1 ~ LED4 will flash orderly with frequency which is 1 time per sec. to start learning. If the four LEDs are all flash together, this learning is successful; if only the central two LEDs shine, this learning is failed and it is required to learn again.
Sensitivity Setting	Under status of unlock, press "SET" button to set sensitivity with checking the flash of LED1 to LED4. Sensitivity is from high to low by LED1 to LED4.

- Notice:
- The learning function of this type is not only to overcome the condition of the vibration absorption after the installation on the wall of tank but also to avoid of false operation caused by noise interference.
 - factory setting is based on the density of water (1g/cm³). When the density of detected object is higher than or equal to 1g/cm³, it can be used normally without setting learning function. Otherwise it needs to reset learning function when the density of detected object is lower than 1g/cm³.
 - Sensitivity is set as the highest value in the factory and suitable to be used under the stable wave of medium. If the wave of medium fluctuates bigger, it is required to lower the sensitivity to avoid any error in warning.
 - During installation, please try to avoid a significant shock position to prevent false alarm, if this can not be avoided, please re-learning at the installed location, or reset to the factory settings

Output of VRT Switch2

Switch2	A	B
Relay OUT		
NPN OUT		
PNP OUT		
Indicator		

VRS

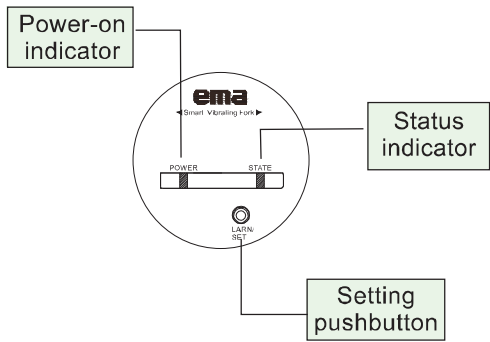


Figure. A

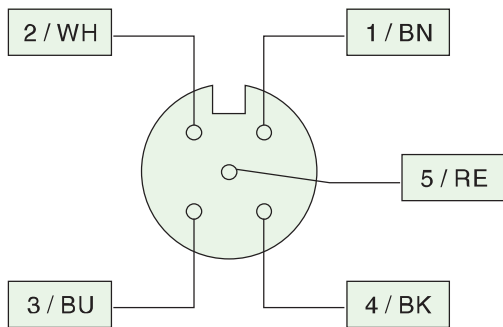


Figure. B

Manual of VRS

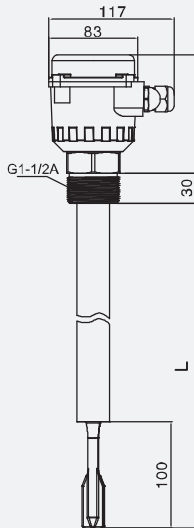
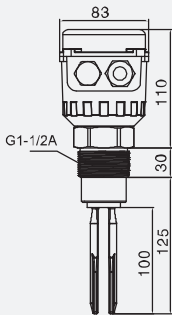
Unlock	"SET" button for 10 secs until alternate red and green lights flash. The unit unlocks and returns to the operation mode. The red and green light stop
Lock	It is automatically locked when there is no operation within 60 secs.
NO / NC setting	Under the unlock condition, hold "SET" button for 3 secs and then the alternate red and green lights flash. When the green LED flashes, release the button to enter NO / NC setting mode and then press "SET" button once to adjust the required status.
Learning mode	<p>Put the fork part into the detected medium with stability for 5 secs. Under the unlock condition, hold "SET" button for 3 secs and then the alternate red and green lights flash. When the red LED flashes, release the button. The red LED flashes once in a second orderly to express the status of waiting for learning. The red LED flashes and goes out twice to express the status of learning. The learning setting is successfully finished when the alternate red and green lights flash quickly. Otherwise, the red and green light flashes together and the user has to set the learning function again. To reset the learning, just press "SET" button again to enter second learning mode.</p> <p>Notice: To enter the second learning mode, please press "SET" button in 3 sec. after first learning finished. Otherwise the user shall be required to process the whole learning mode again to reset the setting. This function is to avoid of the false operation.</p>

- Notice:
1. The learning function of this type is not only to overcome the condition of the vibration absorption after the installation on the wall of tank but also to avoid of false operation caused by noise interference.
 2. factory setting is based on the density of water (1g/cm3). When the density of detected object is higher than or equal to 1g/cm3, it can be used normally without setting learning function. Otherwise it needs to reset learning function when the density of detected object is lower than 1g/cm3.

Status Indicators of VRS

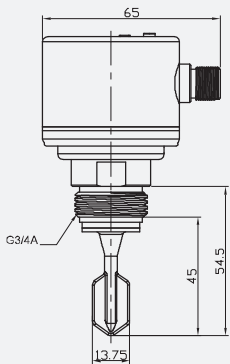
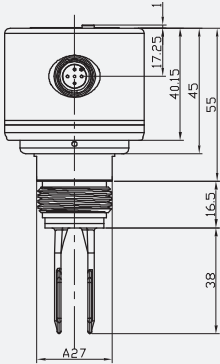
		Maximum		Minimum	
U~(AC)	U~(DC)				
		Green LED: Power on/off			
		Red LED: Operation			
		Setting pushbutton			

Dimensions(mm)



Model	VRT10		VRT11	
Type	Standard		Extension	
Connection	G1 ½"A		G1½"A	
Cable entrance	M20×P1.5			
Detecting medium	Liquid/Powder/Solid			
Applications	Suitable for all powder, solid and liquid through learning function			
Voltage	20~ 60VDC	20~ 250VAC	50/60Hz	
Response Time(s)	< 3			
Ambient temperature(℃)	-40...+70			
Storage temperature(℃)	-40...+85			
Medium temperature(℃)	-40...+150			
Opeating pressure(bar)	-1...+40			
House material	Aluminium alloy			
Fork material	Stainless steel 316L			
Output	PNP/NPN 400mA Max.			
Consumption	DC 3W Max AC 15W Max			
Standard Length(mm)	125	1200MAX		
Protection classification	IP67			

Dimensions(mm)



Model	VRS		
Type	Small		
Connection	G3/4" A		
Cable entrance	M12x1.5		
Detecting medium	Liquid/Powder/Solid		
Applications	Suitable for all powder, solid and liquid through learning function		
Voltage	18~36VDC		
Response Time(s)	< 3		
Ambient temperature(°C)	-40...+70		
Storage temperature(°C)	-40...+85		
Medium temperature(°C)	- 40...+120		
Opeating pressure(bar)	-1...+40		
House material	Stainless Stell 316L		
Fork material	Stainless steel 316L		
Output	PNP/NPN 200mA Max.		
Consumption	<1W Max		
Standard Length(mm)	45		
Protection classification	IP68		

Radar Wave
Level Sensors

Guided Radar
(TDR)

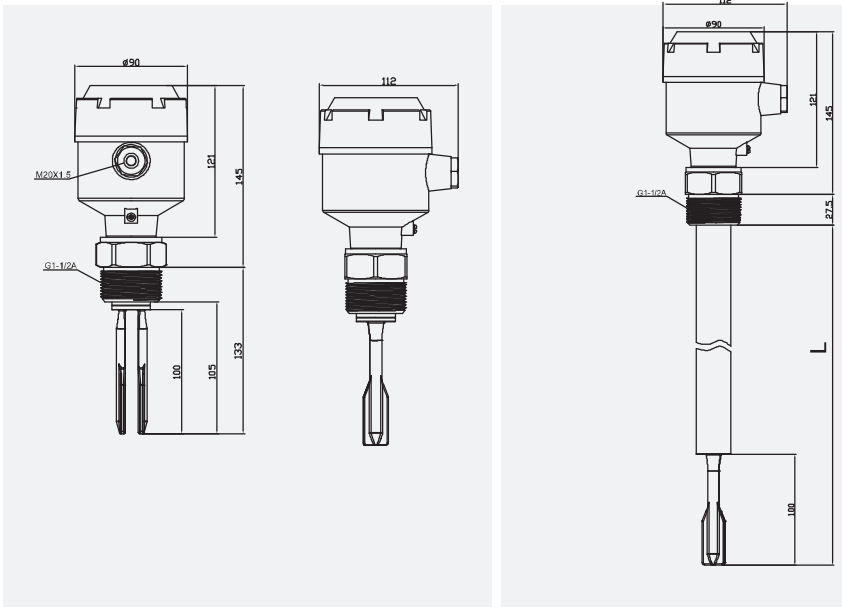
Ultrasonic
Level Sensors

Rotating Paddle
Level Sensors

Vibrating Fork
Level Switches

Float
Level Switches

Capacitive
Level Switches

Dimensions(mm)		
Model	VRE10	VRE11
Type	EX Standard	EX Extension
Connection	G1 1/2" A	
Cable entrance	G1 1/2" A	
Detecting medium	Liquid/Powder/Solid	
Applications	Suitable for all powder, solid and liquid through learning function	
Voltage	A:20~60VDC & 20~250VAC,50~60Hz (Relay output SPDT 4A/250VAC 4A/60VAC B: 20~60VDC(NPN/PNP)	
Response Time(s)	< 3	
Medium density	Auto-learning setting by pushbuttons	
Consumption	DC 3W Max AC 15W Max	
Sensitivity	4 levle adjustable	
Opeating pressure(bar)	-1...+40	
House material	Aluminium alloy	
Fork material	Stainless steel 316L	
Output		
	PNP/NPN 400mA Max.	
Standard Length(mm)	105	1200MAX
Protection classification	IP54	
Protection classification	EXd II CT6	

Order Information

VR	T	10	A	A	0125	6
Series	Housing material	Type	Connection	Power Supply	Length of fork	Fork Material

VR	Smart Vibrating Level Switches Series		
T	Housing material T: Aluminum		
10	Type 10: Standard VRT10	11	Type 11: Extension VRT11
A	Process connection A: G1½" A		
A	Power supply / Output A: 20-60VDC & 20-250VAC, Relay output SPDT 4A/250VAC or 4A/60VAC, 50/60Hz B: 20-60VDC, NPN & PNP output, 50/60Hz		
0125	Fork Length (mm) 0125: L = 125 mm	0200	Extension Length (mm) 0200: L = 200 mm 0400: L = 400 mm 0600: L = 600 mm 0800: L = 800 mm 1000: L = 1000 mm 1200: L = 1200 mm
6	Fork material 6: Stainless Steel 316L		

Notice:
The total length tolerance is within ±5mm

Order Information

VR	S	10	A	A	0045	6
Series	Housing material	Type	Connection	Power Supply	Length of main shaft	Shaft Material

VR	Smart Vibrating Level Switches		
S	Housing material S: Stainless steel 316L		
10	Type 10: Small fork VRS10	20	Type 20: Sanitary VRS20
A	Process connection A: G 3/4 "A		
A	Power supply / Output A: 18-36VDC Relay output B: 18-36VDC, NPN & PNP		
0045	Fork Length (mm) 0045: Small fork L = 45 mm		
6	Fork material 6: Stainless Steel 316L		

Order Information

VR	E	10	A	A	0105	6
Series	Housing material	Type	Connection	Power Supply	Length of fork	Fork Material

VR	Smart Vibrating Level Switches Series		
E	Housing materia E: EX proof		
10	Type 10: Standard VRE10	11	Type 11: Extension VRE11
A	Process connection A: G1½" A		
A	Power supply / Output A: 20-60VDC & 20-250VAC, Relay output SPDT 4A/250VAC or 4A/60VAC, 50/60Hz B: 20-60VDC, NPN & PNP output, 50/60Hz		
0105	Fork Length (mm) 0105: L = 105 mm	0200	Extension Length (mm) 0200: L = 200 mm 0400: L = 400 mm 0600: L = 600 mm 0800: L = 800 mm 1000: L = 1000 mm 1200: L = 1200 mm
6	Fork material 6: Stainless Steel 316L		

Radar Wave
Level Sensors

Guided Radar
(TDR)


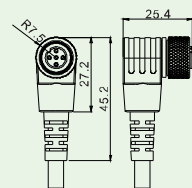
Ultrasonic
Level Sensors

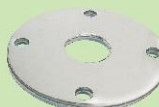
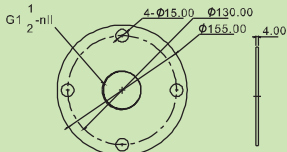
Rotating Paddle
Level Sensors


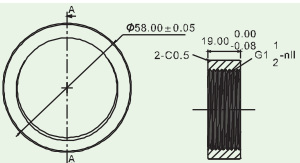
Vibrating Fork
Level Switches

Float
Level Switches

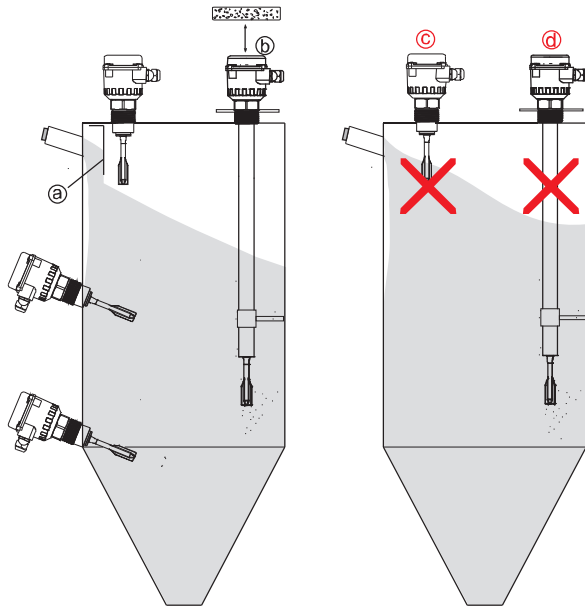
Capacitive
Level Switches

Accessories							
Cable	Connector Order NO.(Only for VRS)						Drawing
 L	C	02	L	5	C	12	
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector L: Angled	Pole 5: 5	Material R: PUR C: PVC S: PVC Shielded wire	Size 12: M12	

Type	Flange	Order No.	Drawing
VRT		S4F0	

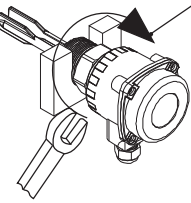
Type	Fixture	Order No.	Drawing
VRT		S0C0	


Installation Of VRT



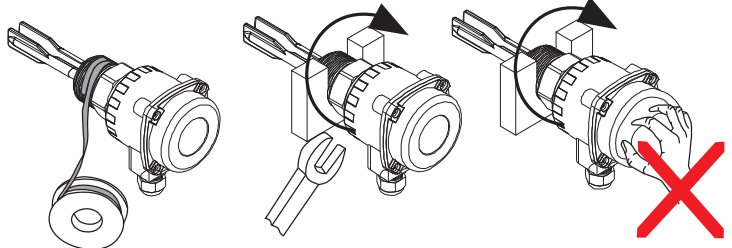
Correct mounting:
Ⓐ Next to the silo wall, but with enough distance from it and from material build-up, or shield to protect against flowing material.
Ⓑ Sufficient space for mounting and for adjusting. Avoid of the false warning from material flow. Protective hood against condensation in the housing.

Incorrect mounting:
Ⓒ Too close to the wall and material build-up.
Ⓓ In filling curtain.

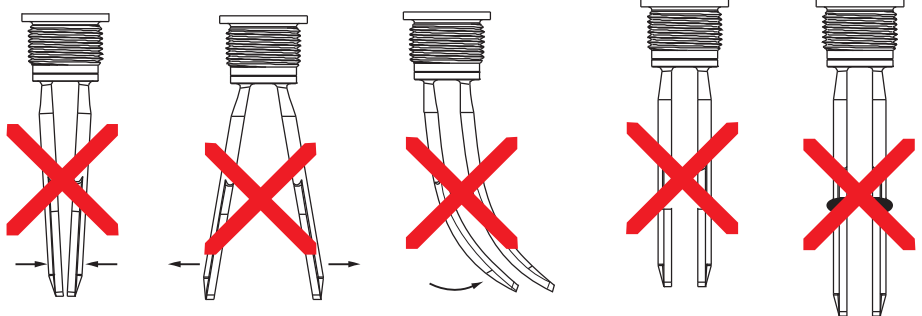


Mark on the hex nut. 

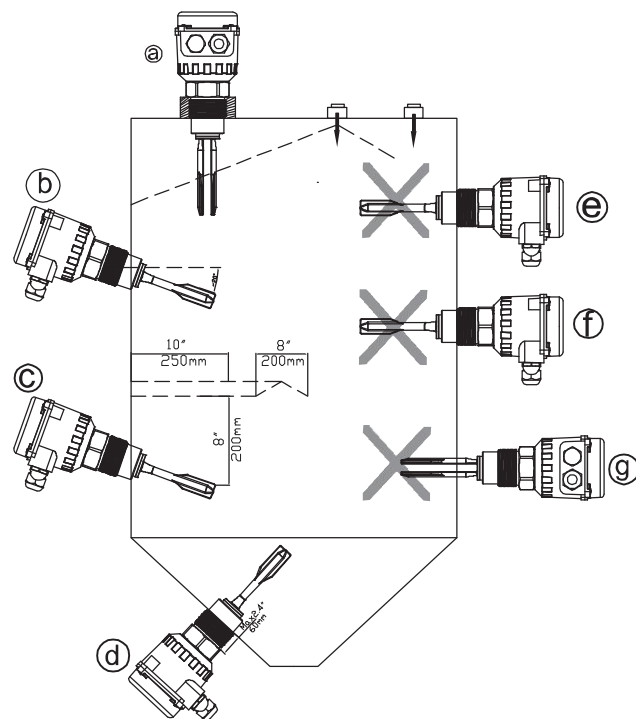
The top of the fork is marked.



Enclosed by PTFE thread seal tape.
Tightened by a wrench.
Not wrested by hands.

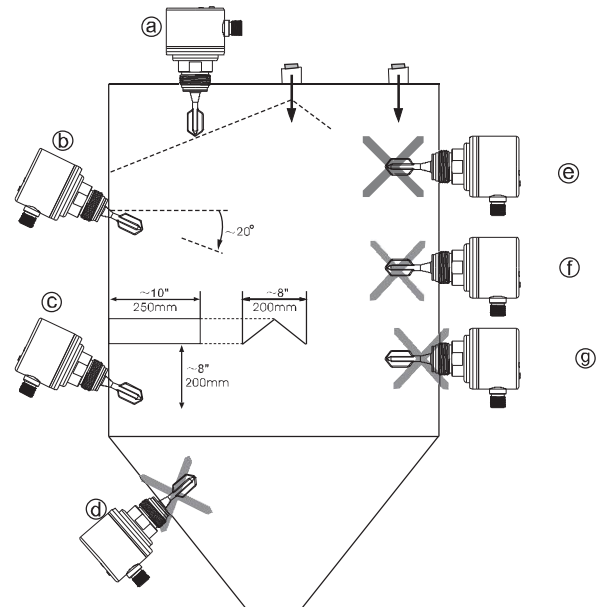


Do not:
damage the fork;
bend the fork;
shorten the fork;
and lengthen the fork.



- 1.The ideal installation for reducing the shock to materials and the hanging of materials is to make the switch horizontal at an angle of 15-20.
 - 2.Keep the switches away from the feed opening of the barrel to reduce the shock to materials, if unavoidable, a protection plate is necessary.
 - 3.The inlet of the connection box should be downward and the fixing nuts of power line must be tightened.
 - 4.The operators cannot use vibration rod to climb or hook any object when working within the barrel.
- Correct mounting:
- a Top-mounted, Fork is vertical towards bottom and mounted in any position far away from the feed opening of top side.
 - b Laterally mounted,Fork angled slightly downwards by 15~20 degree so as to reduce the shock and the hanging of the flowing materials.
 - c Laterally mounted with shield,With a shield, length approx. 10 in(250mm),width approx. 8 in(200mm),fork angled slightly downwards by 15~20 degree so as to reduce the shock of the flowing materials and prevent the improper stock from itself.
- Incorrect mounting:
- d In discharge hopper,Max. nozzle length 2.4 in (60mm),so that no build-up occurs which prevents the fork from oscillating. Laterally mounted in filling curtain or under the feed opening.
- Incorrect fork orientation
- e The surface of fork is subjected to high load caused by discharging material;
 - f It may cause false function due to residual material.
 - g The switch will not work normally when the distance of mounting nozzle and barrel is over 2.4"(60mm).

VRS Installation



- 1.The ideal installation for reducing the shock to materials and the hanging of materials is to make the switch horizontal at an angle of 15-20.
 - 2.Keep the switches away from the feed opening of the barrel to reduce the shock to materials, if unavoidable, a protection plate is necessary.
 - 3.The inlet of the connection box should be downward and the fixing nuts of power line must be tightened.
 - 4.The operators can not use vibration rod to climb or hook any object when working within the barrel.
- Correct mounting:
- a Top-mounted, Fork is vertical towards bottom and mounted in any position far away from the feed opening of top side.
 - b Laterally mounted,Fork angled slightly downwards by 15~20 degree so as to reduce the shock and the hanging of the flowing materials.
 - c Laterally mounted with shield,With a shield, length approx. 10 in(250mm),width approx. 8 in(200m),fork angled slightly downwards by 15~20 degree so as to reduce the shock of the flowing materials and prevent the improper stock from itself.
- Incorrect mounting:
- d In discharge hopper,Max. nozzle length 2.4 in (60mm),so that no build-up occurs which prevents the fork from oscillating.
 - e Laterally mounted in filling curtain or under the feed opening.
 - f Incorrect fork orientation, The surface of fork is subjected to high load caused by discharging material, It may cause false function due to residual material.
 - g The switch will not work normally when the distance of mounting nozzle and barrel is over 2.4"(60mm).

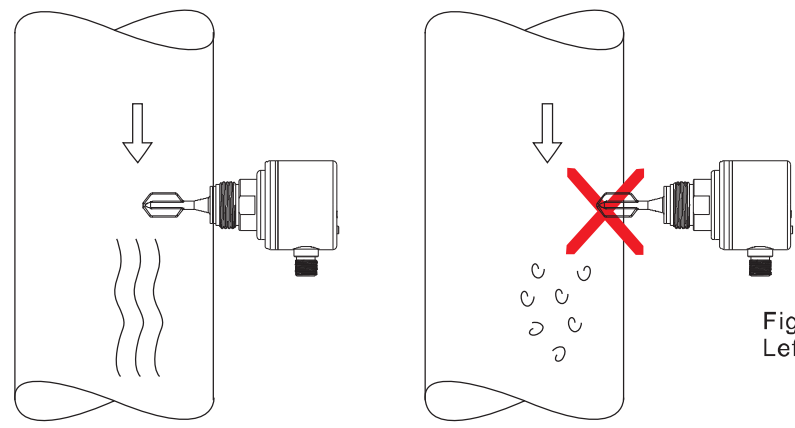
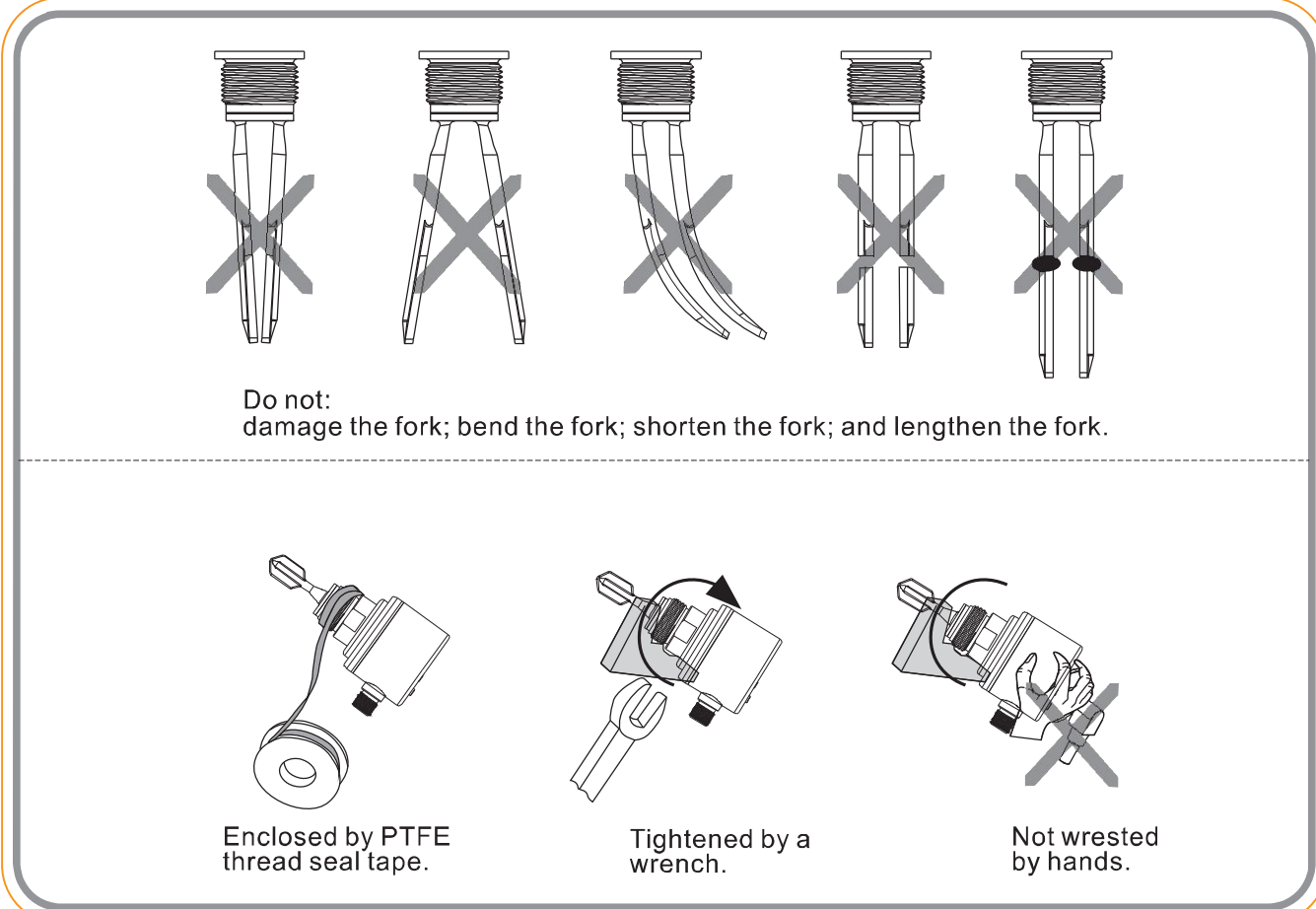


Figure: Mounting of VRS into the pipe. Left one is correct, but Right one is incorret.



Linking your system

Product Features



LS0 Float level switches:

- Concise structure, delicate design
- Durable operations, and perfect fuction, long service life, more than 2 million times
- Resistance to acid and alkali and anticorrosive

LS1 Float level switches:

- Stable operations, and perfect fuction, long lifetime
- Resistance to acid and alkali and anticorrosive
- Enhance the electromagnetic interference
- Stainless steel float material

Operating Principle

LS0 type: The magnetic reed switch is hermetically sealed in a stem, the float encases a sealed magnet is fixed on the tube relevant position of magnetic reed switch. Because of the buoyancy, the float will move up and down within limits along with the liquid level rises and falls, at the same time, with the magnet in it attracts the magnetic reed switch to generate switching action to control the level of liquid. The Normal Open or Normal Closed is determined by the installation of the float.

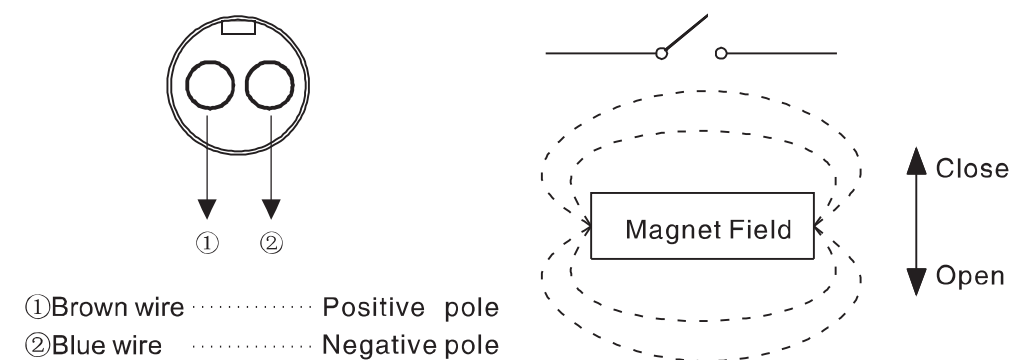
LS1 type: It is composed of detecting part and output part and operate on the basic buoyancy principle, As the float rises or falls with liquid level, The mutex movement between magnet before microswitch and the magnet at the end of float ball arm in the junction box will push the microswitch to generate two sets of "Normal Open" or "Normal Closed" signal output, one set is for user's control signal and another is for synchronous indicator light signal output.

Applications

They are extensively installed in the fuel tanks, oil-pressure equipments, chemical and cooling vessels, etc. Furthermore, they are mostly used to detect liquid substance such as water, oil and chemicals.

Wiring

Operating principle



Float Level Switches



LS series is featured for concise structure, delicate design, durable operations, and perfect fuction. They are extensively installed in the fuel tanks, oil-pressure equipments, chemical and cooling vessels, etc. Further more they are mostly used to detect substance such as water, oil and chemicals. When the liquid level up to the upper limit or down to the low limit, the controller will send out signal or control the pump or valve. Float level switch is suitable for detecting the level of small tanks. SPDT relay have the ability to control two 0.5 Amps loading, one normal open, the other one normal closed.

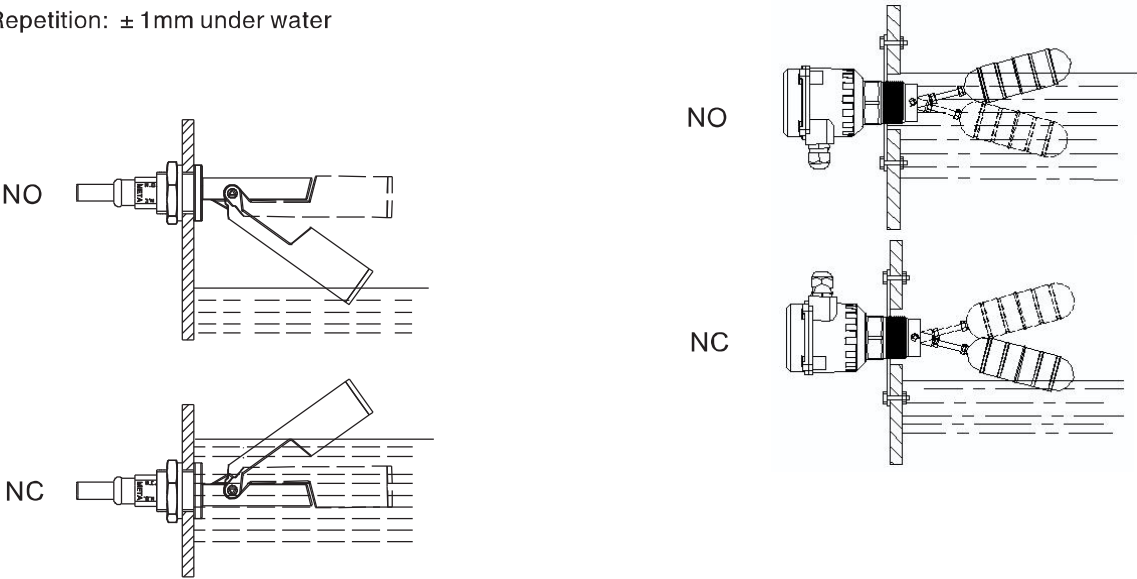


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Connection

LS series is outputted by magnet reed, and the user can choose the status of NC or NO by the way of mounting. It can connect to the control system such as PLC, Relay, etc.
Precision : ± 3mm under water
Repetition: ± 1mm under water

The type of output, NO or NC, is defined by the way of mounting. The contact of this product can connect to the other control units.

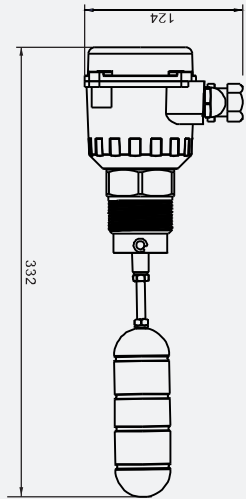
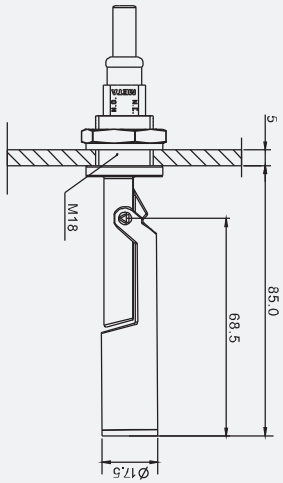


Accessories

Type	Flange	Order No.	Drawing
LS1001 LS1002		S4F0	

Type	Fixture	Order No.	Drawing
LS1001 LS1002		S0C0	

Dimensions (mm)

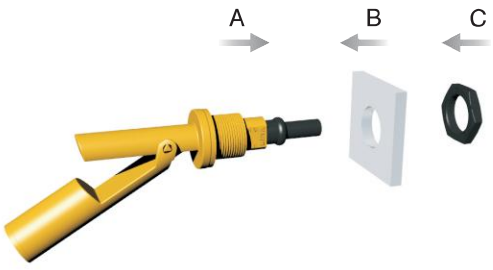


Model	LS0		LS1	
Order no	LS0001	LS0003	LS1001	LS1002
Type	Standard	Anti-strong acid / alkali	Standard	Standard
Connection	M18		G1 1/2" A	
Cable entrance	1M PVC Cable	1M PUR Cable	M20 × P1.5	
Electric Design	AC / DC		AC / DC	
Output	NO / NC		NO / NC	
Operating pressure	MAX.240VAC/200VDC		19~60VDC/14~250VAC	
Current loading	0.5A (240VAC/DC)		3(1)A/250VAC	
Switch Capacity	70W		--	
Sensing degree	± 30°		± 15°	
Ambient pressure (bar)	10		10	
Contact resistance (Ω)	80		--	
Storage humidity	20%~70%		20%~70%	
Operating humidity	20%~70%		20%~70%	
Operating temperature(°C)	-20~80	-20~100	-20~200	-20~200
Ambient temperature(°C)	-20~80	-20~100	-20~200	-20~200
Housing material	PBT	PP	Aluminium	Aluminium
Float material	PBT	PP	SS 304	SS 316

Notice : PP is suitable for condition of PH value from 0~14.

Mounting

LS0 Float Level Switches



A: Main part
B: Wall
C: Nut

LS1 Float Level Switches

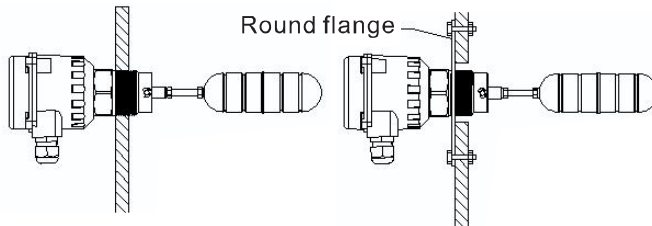
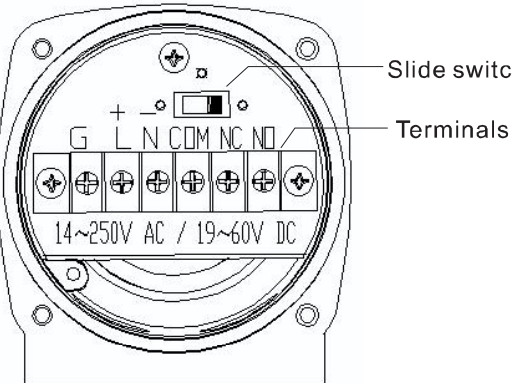


Fig.1 Standard mounting Fig.2 Mounting with flange

Terminal Mounting



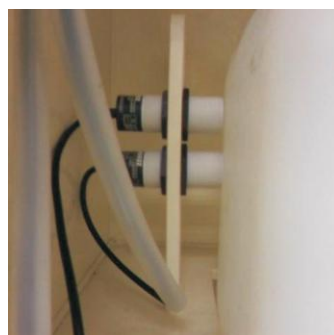
Slide switch
Terminals

Terminal	Sign	Description
1	G	Connect the ground wire to the housing
2	L+	DC: 19~60V, AC: 14~250V
3	N-	Connect terminal 2 to power "+" while inputting the DC.
4	COM	Common Terminal
5	NC	When this product is mounted on the wall of the tank with the indicator under, it is the status of NO output. Then choose type of indictor operation between continuous bright or continuous dim via slide switch.(Fig.3)
6	NO	When this product is mounted on the wall of the tank with the indicator upper, it is the sttus of NC output. Then choose type of indictor operation between continuous bright or continuous dim via slide switch. (Fig.4)

Linking your system



Capacitive Proximity Sensors



Capacitive proximity sensors belong to a sort of position sensors. Similar to the structure of a capacitor, the probe of sensor acts as one pole of capacitor and another pole is the sensing object. While the sensing object approaches a proximity sensor, the dielectric constant may change between object and sensor. Meanwhile, this causes the circuit to alter.



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Features



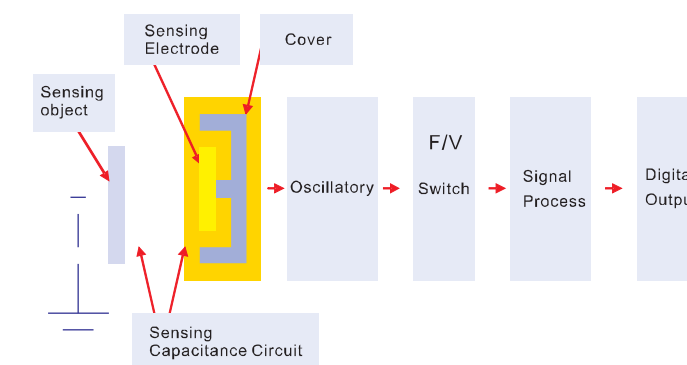
- Plastic thread type and cylinder type; Structure of sensors, durable working, and supply voltage AC/DC available
- Stable Operation: Without adjustable and mechanical components, proximity sensors don't be affected by the qualities of mediums and the variation of density, and it can work immediately after installation
- A variety of size and of outputs, easy installation, user-friendly handling .
- Operating temperature:-25~80(°C); High temperature type:-25~100(°C)
- Protection Classification: IP67
- Certification: CE and RoHS
- Sensing Objects: Solids and liquids
- Output: NPN, PNP, AC, DC, NO, NC
- Display: LED.
- Electric Protection: Overload, short-circuit, reverse polarity

Operating Principle

Capacitive proximity sensors belong to a sort of position sensors. Similar to the structure of a capacitor, the probe of sensor acts as one pole of capacitor and another pole is the sensing object. While the sensing object approaches a proximity sensor, the dielectric constant may change between object and sensor. Meanwhile, this causes the circuit to alter. The sensing objects of capacitive proximity sensors can be not only metals but also insulating solids, liquids, and powders. When detecting the low-k objects, proximity sensors can enhance the sensitivity by modifying clockwise the multipotentiometer behind the sensors; furthermore, a normal potentiometer makes a capacitive proximity sensor actuate in the position of sensing range by 70%~80%.

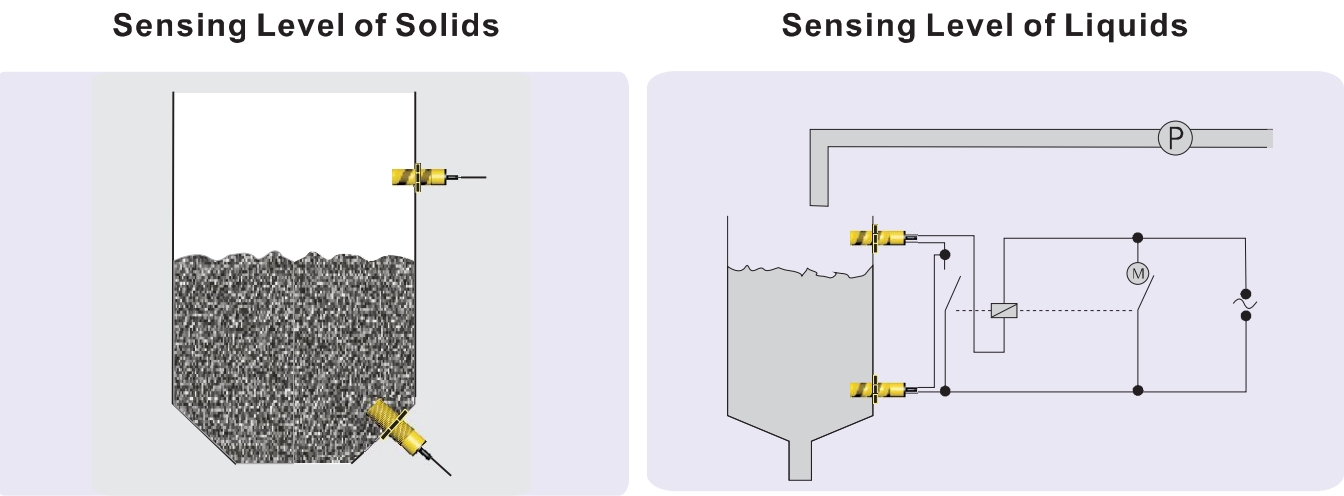
The sensing interface of capacitive proximity sensor is composed of two in-line metal electrodes, and it is similar to an open capacitors. These two electrodes constitute a capacitance with a series connection inside the RC oscillatory circuit. When the power is on, the RC oscillator stop working until a sensing object approaches the sensing interface due to the increasing volume of capacitance. Through the comparison between the signals handled by the post-circuit and the internal signals, a capacitive proximity sensor can detect the existence of objects. It can sense not only the metals but also the non-metals; moreover, the sensing range to the metals can acquire maximum value. The sensing range of the non-metals depends on the dielectric constants of the sensing materials. The higher dielectric constant, the longer sensing ranges.

Operation Procedure of Capacitive Proximity Sensors



Applications


Capacitive Proximity Sensors can sense metals and non-metals, such as liquids, solids in the funnels, the storage tanks, and the granaries. They are applied extensively in the industry; for example medical, semiconductor, timbering, papermaking, glass, plastics, foods, cement, chemistry engineering, and etc.




Sensitivity adjustment

- A

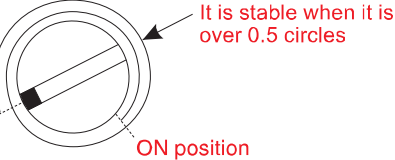
Without any target in front of the sensing face, turn the sensitivity potentiometer clockwise until the proximity sensor turns ON (LED light turns on).


- B

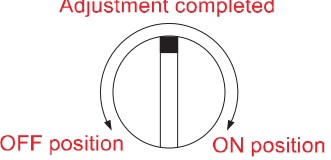
With a target in front of the sensing face, turn the sensitivity potentiometer anticlockwise from the ON position stated in A until the proximity sensor turns OFF (LED light turns off).


- C

If the difference between ON position and OFF position in B is more than 0.5 turns, the operation sensor is stable.

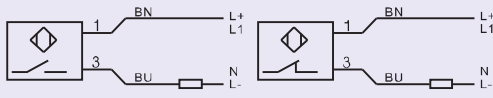
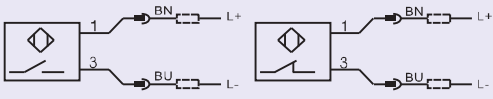
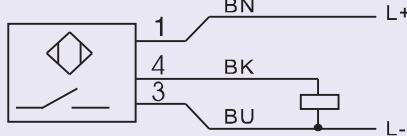
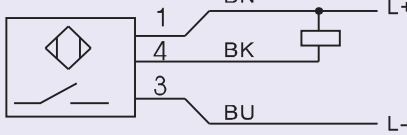
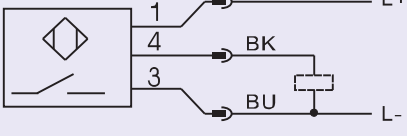
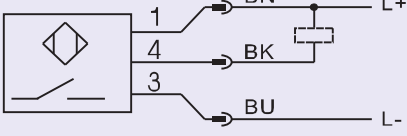

- D

If you set sensitivity potentiometer at center position between ON and OFF position, sensitivity setting is completed.

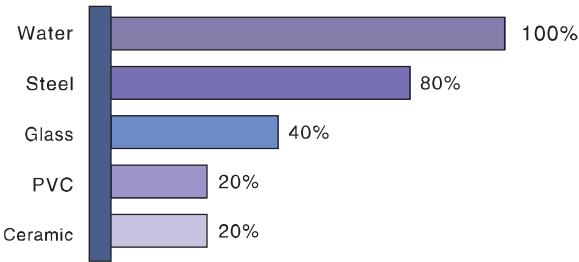


※ When there is distance fluctuation between proximity sensor and target, please adjust B with target at farthest from this unit.
※ Turning potentiometer clockwise is maximum and turning anticlockwise it is minimum. Number of adjustment should be 6 ± 2 revolution and if you turn right or left excessively, it is non-stop.



Connection





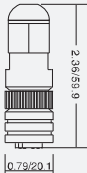
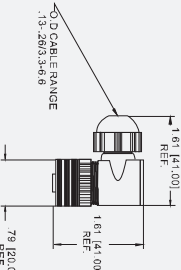
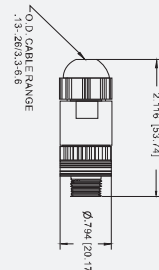
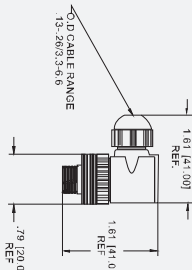
Electric Design	Connection	Wiring/Core Color	Connection
2-Wire	2M PVC	BN Brown BU Blue	
	M12 Socket	WH white BN Brown BU Blue BK Black	
3-Wire	2M PVC	BN Brown BU Blue BK Black	<div>PNP connection </div> <div>NPN connection </div>
	M12 Socket	WH white BN Brown BU Blue BK Black	<div>PNP connection </div> <div>NPN connection </div>

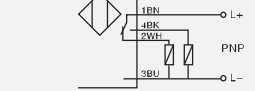
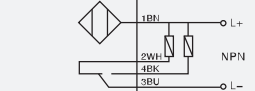


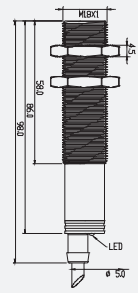
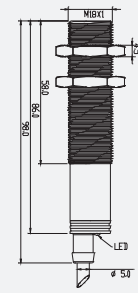
The relationship of object material and detecting distance



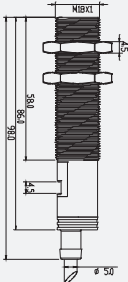
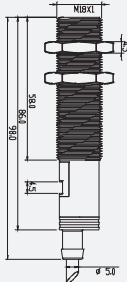





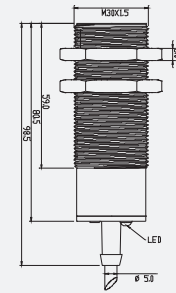
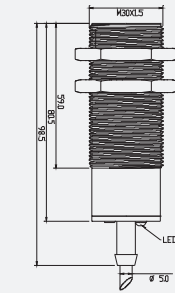
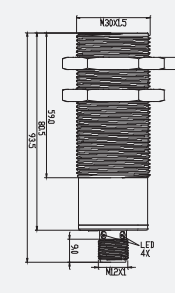
Accessories



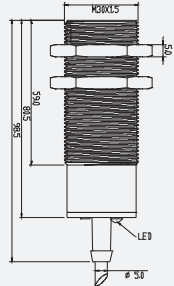
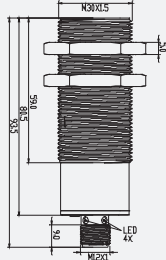
Type	Connector Order No.					
	C	02	L	5	C	12
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC shielded wire	Size 12: M12



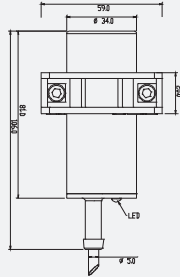
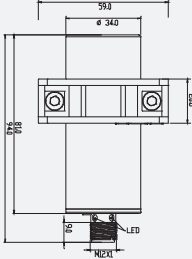
Type	Socket			
Order No.	US0013	US0014	US0015	US0016
Socket				
Spec.	M12 Straight, 4-Pole, Female	M12 Angled, 4-Pole, Female	M12 Straight, 4-Pole, Male	M12 Angled, 4-Pole, Male
Drawing No.				

Size	M18	
Specification	Cable	
Sensing Range	8mm	8mm
<div>four wire PNP connection</div>  <div>four wire NPN connection</div> 		
Three wire PNP NO	CA0004	
Three wire PNP NC	CA0005	
Three wire NPN NO	CA0006	
Three wire NPN NC	CA0007	
Four wire PNP NO/NC		CA0018
Four wire NPN NO/NC		CA0012
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	10~36DC	10~36DC
Current loading [mA]	250	250
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	YES
Overload protection	YES	YES
Voltage drop [V]	< 2.5	< 2.5
Consumed current [mA]	< 13(24VDC)	< 13(24VDC)
Real sensing range [mm]	8 ± 10%	8 ± 10%
Operating range [mm]	0~6.5	0~6.5
Switch-point drift [%/Sr]	-15~15	-15~15
Hysteresis [%/Sr]	1~15	1~15
Switching frequency [Hz]	40	40
Operating temperature [°C]	-25~80	-25~80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PBT+GF	PP+GF
Switching state display LED	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;3x0.34mm²	PVC-Cable /2m;4x0.34mm²
Accessory	Fixed nut and screw driver	
Dimensions (mm)		

Size	M18	
Specification	Cable	
Sensing Range	8mm	8mm
		
Two wire AC/DC NO	CA0001	
Two wire AC/DC NC	CA0002	
Two wire DC NO/NC		CA0008
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	20 ~ 250AC	10 ~ 36DC
Current loading (continuous) [mA]	250(~ 50°C)/200(~ 70°C)	250
Current loading (peak) [mA]	1.5 A(20 ms / 0.5 Hz)	
Minimum current loading [mA]	5	
Short-circuit protection	NO	Pulse
Reverse polarity protection	NO	YES
Overload protection	NO	YES
Voltage drop [V]	< 10 AC / < 8 DC	< 4.6
Leakage current [mA]	< 2.5(250 V AC)/ < 1.7(110 V AC) / < 1.5(24 V DC)	< 1(24VDC)
Real sensing range [mm]	8 ± 10%	8 ± 10%
Operating range [mm]	0 ~ 6.5	0 ~ 6.5
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15
Hysteresis [%/Sr]	1 ~ 15	1 ~ 15
Switching frequency [Hz]	25AC / 40DC	40
Operating temperature [°C]	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PBT+GF	PBT+GF
Switching state display LED	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;2x0.34mm²	
Accessory	Fixed nut and screwdriver	
Dimensions (mm)		

Size	M30		
Specification	Cable		Connector
Sensing Range	15mm	15mm	15mm
			
Three wire PNP NO	CB0004		CB0012
Three wire PNP NC	CB0005		CB0013
Three wire NPN NO	CB0006		CB0014
Three wire NPN NC	CB0007		CB0015
Four wire PNP NO/NC		CB0018	
Four wire NPN NO/NC		CB0022	
Sensing Surface	Non-flush	Non-flush	Non-flush
Operating voltage [V]	10 ~ 36DC	10 ~ 36DC	10 ~ 36DC
Current loading [mA]	250	250	250
Short-circuit protection	Pulse	Pulse	Pulse
Reverse polarity protection	YES	YES	YES
Overload protection	YES	YES	YES
Voltage drop [V]	< 2.5	< 2.5	< 2.5
Consumed current [mA]	< 13(24VDC)	< 13(24VDC)	< 13(24VDC)
Real sensing range [mm]	15 ± 10%	15 ± 10%	15 ± 10%
Operating range [mm]	0 ~ 12	0 ~ 12	0 ~ 12
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15	-15 ~ 15
Hysteresis [%/Sr]	1 ~ 15	1 ~ 15	1 ~ 15
Switching frequency [Hz]	40	40	40
Operating temperature [°C]	-25 ~ 80	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2		
Housing material	PBT+GF	PP+GF	PBT+GF
Switching state display LED	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;3x0.34mm²	PVC-Cable /2m;4x0.34mm²	M12 connector
Accessory	Fixed nut and screwdriver		
Dimensions (mm)			

Size	M30	
Specification	Cable	Connector
Sensing Range	15mm	15mm
		
Two wire DC NO/NC	CB0008	CB0016
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	10 ~ 36DC	10 ~ 36DC
Current loading (continuous)	250	250
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	YES
Overload protection	YES	YES
Voltage drop [V]	< 4.6	< 4.6
Leakage current [mA]	< 1(24VDC)	< 1(24VDC)
Real sensing range [mm]	15 ± 10%	15 ± 10%
Operating range [mm]	0 ~ 12	0 ~ 12
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15
Hysteresis [%/Sr]	1 ~ 15	1 ~ 15
Switching frequency [Hz]	40	40
Operating temperature [°C]	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PBT+GF	PBT+GF
Switching state display LED	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;2x0.34mm ²	M12 connector
Accessory	Fixed nut and screwdriver	
Dimensions (mm)		

Size	Φ34	
Specification	Cable	Connector
Sensing Range	20mm	20mm
		
Three wire PNP NO	CC0004	CC0012
Three wire PNP NC	CC0005	CC0013
Three wire NPN NO	CC0006	CC0014
Three wire NPN NC	CC0007	CC0015
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	10 ~ 36DC	10 ~ 36DC
Current loading [mA]	250	250
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	YES
Overload protection	YES	YES
Voltage drop [V]	< 2.5	< 2.5
Consumed current [mA]	< 13(24VDC)	< 13(24VDC)
Real sensing range [mm]	20 ± 10%	20 ± 10%
Operating range [mm]	0 ~ 16	0 ~ 16
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15
Hysteresis [%/Sr]	1 ~ 15	1 ~ 15
Switching frequency [Hz]	40	40
Operating temperature [°C]	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PBT+GF	PBT+GF
Switching state display LED	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;3x0.34mm ²	M12 Connector
Accessory	Fixed nut and screwdriver	
Dimensions (mm)		

Radar Wave
Level Sensors

Guided Radar
(TDR)


Ultrasonic
Level Sensors



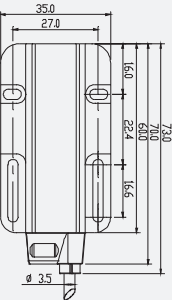
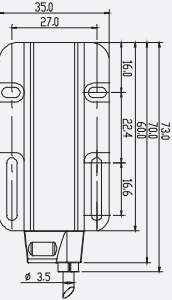
Rotating Paddle
Level Sensors

Vibrating Fork
Level Switches

Float
Level Switches

Capacitive
Level Switches

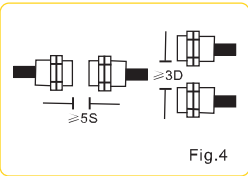
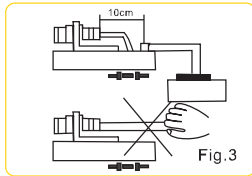
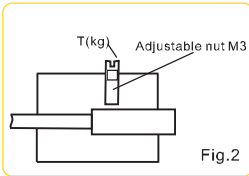
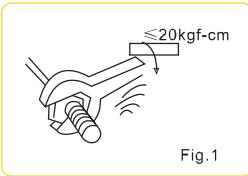
Size	Φ34	
Specification	Cable	Connector
Sensing Range	20mm	20mm
		
Two wire DC NO/NC	CC0008	CC0016
Sensing Surface	Non-flush	Non-flush
Operating voltage[V]	10 ~ 36DC	10 ~ 36DC
Current loading (continuous)	250mA	250mA
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	YES
Overload protection	YES	YES
Voltage drop[V]	< 4.6	< 4.6
Leakage current[mA]	< 1(24VDC)	< 1(24VDC)
Real sensing range[mm]	20 ± 10%	20 ± 10%
Operating range[mm]	0 ~ 16	0 ~ 16
Switch-point drift [%/Sr]	-15 ~ 15	-15 ~ 15
Hysteresis[%/Sr]	1 ~ 15	1 ~ 15
Switching frequency [Hz]	40	40
Operating temperature[°C]	-25 ~ 80	-25 ~ 80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PBT+GF	PBT+GF
Switching state display LED	Red(90°)	Red(90°)
Connection	PVC-Cable /2m;2x0.34mm²	M12 Connector
Accessory	Fixed nut and screwdriver	
Dimensions(mm)		

Size	35 × 70mm	
Specification	Cable	
Sensing Range	25mm	25mm
		
Three wire PNP NO/NC	CD0001	
Three wire PNP NO/NC		CD0002
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	10 ~ 36VDC	10 ~ 36VDC
Current loading [mA]	200mA	200mA
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	YES
Overload protection	YES	YES
Voltage drop [V]	< 2.5	< 2.5
Consumed current [mA]	< 30(24VDC)	< 30(24VDC)
Real sensing range [mm]	25 ± 10%	25 ± 10%
Operating range [mm]	0 ~ 20	0 ~20
Switch-point drift [%/Sr]	-15 ~ 15	-15~ 15
Hysteresis [%/Sr]	1 ~ 15	1 ~15
Switching frequency [Hz]	5	5
Operating temperature [°C]	-25 ~ 80	-25~ 80
Protection classification	IP67	IP67
Adjustment factors	Water=1 / Glass approx.0.4 / Ceramic approx .0.2 / PVC approx.0.2	
Housing material	PA+GF	
Function display	Switching state LED	Yellow(90°)
	Operating LED	Green(90°)
	Function LED	Red(90°)
Connection	PVC-Cable /2m;3x0.34mm²	
Dimensions(mm)		

Installation

Type	Mounting	Mounting Size	Mounting Direction
CA	Standard Mounting (with nut)	1、Nut: M18×1 2、Vent: 18.2<D<22(mm) 3、Non-flash mounting	
CB	Standard Mounting (with nut)	1、Nut: M30×1.5 2、Vent: 30.2<D<34(mm) 3、Non-flash mounting	
CC	Mounting Clamp	1、Vent: 34.2<D<40(mm) 2、Fixed Bolt: M5 3、Non-flash mounting	
CD	Fixture Wire	Mount the wire through the holes of sensor, and fix it to the tube.	

Installation Notice



- Mounting for thread type :Don` t twist the torque too hard (Fig.1)
- Mounting for cylinder type : To adjust the fixed screw and keep the torque in the range of 2-4kgf-cm. (Fig. 2)
- Lead protection: Please fasten the lead which is located 10cm far away the sensor by a clip in order to avoid the damage of sensor resulted from the lead affected by an external force. (Fig. 3)
- To prevent the mutual influences between the sensors: When mounting in facing way or apposed way, please follow the instruction in Fig.4 to avoid of the false operation from the mutual influences.
- Notice: S: Sensing distance D:Sensor diameter