

● **Position Sensors**

- Inductive Proximity Sensors
- Capacitive Proximity Sensors
- Valve Proximity Sensors
- Speed Monitor

● **Control Switches**

- 16mm Control Switches
- 22 / 25 / 30mm Control Switches
- 16 / 22mm Stainless Steel Switches
- 30 / 50 / 70mm Multi-Layer Light Tower

*Linking your system*

More information please visit us: [www.ema-electronic.com](http://www.ema-electronic.com)



**ema**<sup>®</sup>  
ema Electronics Ltd.  
sales@ema-electronic.com

ema reserve the right to change specifications without prior notice

Cata.NO.:C-FA20-EN-A

Factory Automation

ema electronics

Catalogue



## **Factory Automation**

- **Position Sensors**
- **Control Switches**



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**About ema**

ema Electronics Ltd. is an experienced manufacturer in sensors technology and industrial switches, including factory automation, Process automation and Human Machine Interfaces. Owning an outstanding R&D team which focus on core tech-nique 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**

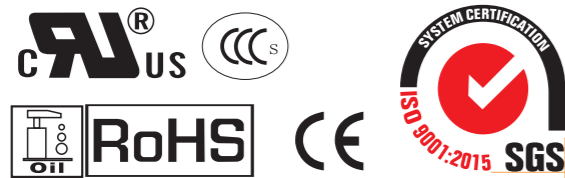
ema offer quick service and promised quality for all products. Repairs will be done immediately and you will receive a report after examination.

**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, every ema product meets RoHS directive.

**Certifications**



As a reliable partner for our customer, ema test our major products precisely for the safety and obtain related international compliances such as UL, Ulc,CCC, and CE as the best guarantee for our products.At the same time, we also acquire the certifications from international quality control

system including CQC ISO9001:2015, and systemize our quality control method. To follow RoHS directive of EU and the green concept, all products meet RoHS compliance.

**Awards**



product design award

2008

EMA as a professional manufacturer in sensing technology, Flow + Temperature Sensors has been awarded to 「iF product design award 2008」 which is one of top-three world famous industrial design competition. It is also marked as a “design Oscar” because all judges are composed of international and outstanding designers. In 2008, a jury of specialists evaluated 2771 entries from 35 different nations. The best of our F+T sensors were selected for an awards because of being able to convinced international judges of the highest caliber, who are extremely critical in the discussion with the standard of criteria, such as design quality, workmanship, degree of innovativeness and environmental compatibility. This award proves that the product of ema could meet customer's need with its workmanship and its innovative design which said “art of technology.” That is why we can get a highly agreement from those professional judges.

**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 penetration of solid bodies with dimensions of more than 12mm.	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 1 metre deep. No ingress
			8		Submersion at specified depths exceeding 1 metre. No ingress.
			9K		Protected against close-range high pressure, high temperature spray downs.

You can easily find the data you are looking for

ema Human Machine Interfaces | Control Switches | 16mm Indicators

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**Order information**

Order No.	Drawing No.	Order No.	Drawing No.
01P-RH40.Q	E5001	01P-CI40.S	E5004
01P-RI65.Q	E5001	01P-CI65.S	E5004
01P-RH40.S	E5002	01P-SI40.Q	E5005
01P-RI65.S	E5002	01P-SI65.Q	E5005
01P-CI40.Q	E5003	01P-SI40.S	E5006
01P-CI65.Q	E5003	01P-SI65.S	E5006

**Ordering Code**

01 P - R I 40 . Q + W + L 24 Y

I	II	III	IV	V	VI	VII	VIII	IX	X
I: Series code	01 Series with 16mm diameter mounting hole								
II: Main category	P=Indicators								
III: Front shape	C=Round	S=Square	R=Rectangular						
IV: Function code	I=Indicators								
V: Protection rating	40=Standard		65=Rubber-sealed						
VI: Terminal type	S=Soldering		Q=Plug-in						
VII: Cap color	R=Red, Y=Yellow, O=Orange, G=Light Green, V=Deep Green, B=Blue, W=White, K=Black								
VIII: Light source	L=LED lamp D=Incandescent lamp A=Discharged lamp Omission=Without lamp								
IX: Operating voltage	06=6VDC 12=12VDC 24=24VDC 11=110VAC 22=220VAC								
X: Extra code	If the color of lamps and lens are different, please add this code to indicate the color of lamp								

Note 1: Available colors of LED are red,yellow, green, blue,white  
The standard matches between cap and LED are as followed:  
R--Red LED Y--Yellow LED O--Orange LED G--Green LED V--Green LED B--Blue LED W--Yellow / White LED  
The standard matches between cap and lamp are as followed:  
W, R, Y, O--Red lamp G, B, V--Green lamp

**Drawing**

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**Position Sensors**

**6-69**

Inductive Proximity Sensors	8-47
Capacitive Proximity Sensors	48-61
Valve Proximity Sensors	62-65
Speed Monitor	66-69

**Control Switches**

**70-157**

16mm Control Switches	72-91
22 / 25 / 30mm Control Switches	92-127
16 / 22mm Stainless Steel Switches	128-135
30 / 50 / 70mm Multi-Layer Light Tower	136-157

Left page

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

Right page

- ⑦ Order Information
- ⑧ Category
- ⑨ Brand

## Position Sensors

- Inductive Proximity Sensors
- Capacitive Proximity Sensors
- Valve Proximity Sensors
- Speed Monitor



Inductive Proximity Sensors 8-47

Capacitive Proximity Sensors 48-61

Valve Proximity Sensors 62-65

Speed Monitor 66-69

Linking your system



## Inductive Proximity Sensors

Inductive proximity sensors are essential to modern applications in the field of industrial automation. Compared to mechanical proximity switches, inductive sensors offers several advantages: Non-contact and non-abrasion working, high switching frequency, and high accuracy. Besides, the units are resistant to shake, dust, and damp. Mostly common application: Position recognition in automation procedure. Inductive proximity sensors can detect all kinds of metals.



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### Features



- IC smart inductive proximity sensor. Through an orientation mode, user can set the sensing range and the warning point discretionarily
- Sensing objects: Metals
- Output: NPN, PNP, AC, DC, N/O, N/C
- Display: LED
- Electric Protection: Overload, short-circuit, reverse polarity
- Protection Classification: IP67
- Certification: CE and RoHS
- A variety of size and of outputs, easy installation, user-friendly handling
- Ambient temperature: -25~80°C; High temperature type: -25~120°C

### Summary

Inductive proximity sensors are essential to modern applications in the field of industrial automation. Compared to mechanical proximity switches, inductive sensors offers several advantages: Non-contact and non-abrasion working, high switching frequency, and high accuracy. Besides, units are resistant to shake, dust, and damp. Mostly common application: Position recognition in automation procedure.

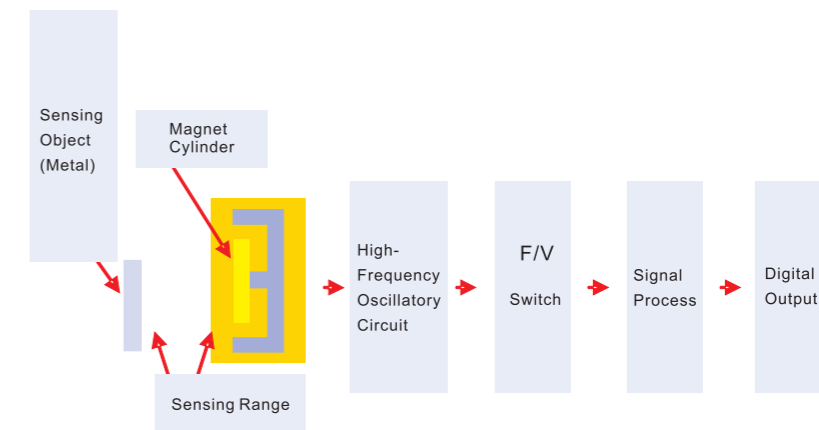
Inductive proximity sensors can detect all kinds of metals.

### Operating Principle

Inductive proximity sensors include coils and electromagnets, and these two components are combined to the inductive part of a LC tuned circuit which activates the oscillator. Coils and electromagnets generate a low frequency electromagnetic field (EMF), and it is radiated from the sensing surface of the sensor. When a conductive object such as metals enters EMF, the eddy current starts to be transmitted inside the conductor. By absorbing the energy from EMF, this eddy current increases to the degree which is too large to be outputted by an amplifier so that the oscillator stop working and EMF disappears. It has been a well-known eddy current oscillator in the past.

Inductive proximity sensors are a sort of position sensors and composed of LC high-frequency oscillator and amplified resistor. When the metals approach the oscillatory sensing interface, it can generate an electric magnet field and an eddy current appearing inside the objects. This current retroacts to the proximity sensor and weaken the oscillation amplitude as to change the parameters of internal circuit in order to detect whether any metal approaches and to control the output of switches. The sensing objects for inductive proximity sensors should be all metals or conductive materials.

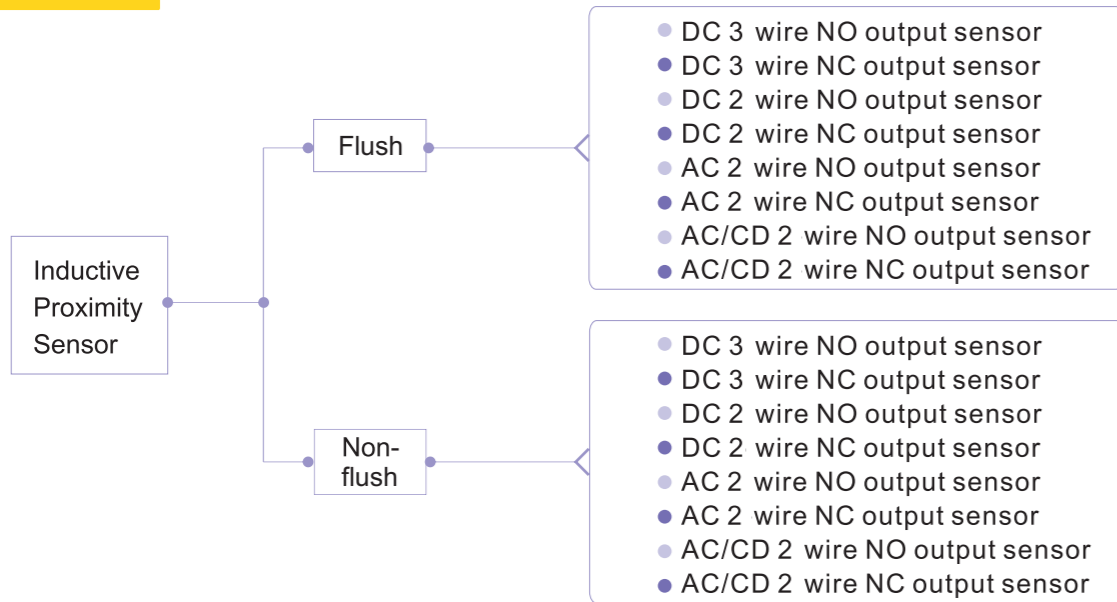
### Operation Procedure of Inductive Proximity Sensors



### Application

Inductive Proximity Sensors are usually applied to sense metals or conductive materials. Sensing range is determined by the size of sensors objects. The value of energy is determined by the size of the coils inside the sensors. The bigger sensors equip bigger coils which can offer and are possible to offer the longer sensing range. Therefore, this is better to choose an adequate sensor in size to match the sensing rangeneeded, and it can avoid any unstable condition happened.

**Type**



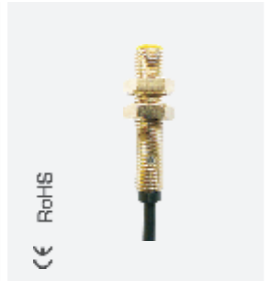



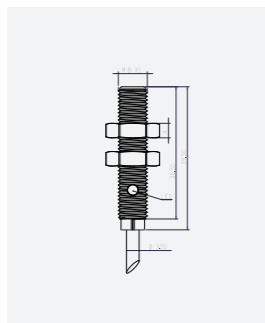
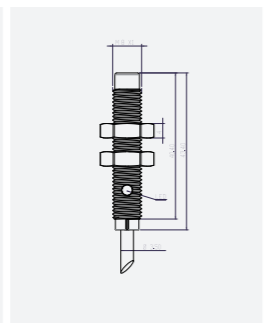
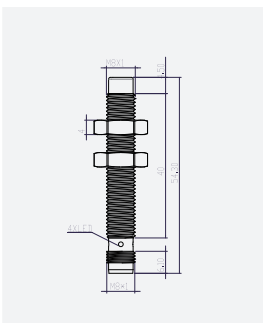
Note: In the following specification of products, "nf" =non flush, "f"=flush.

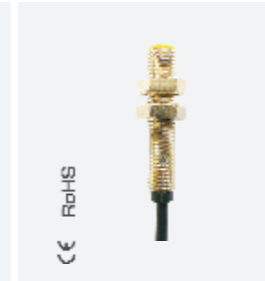

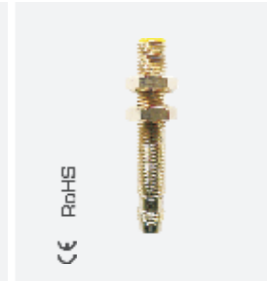
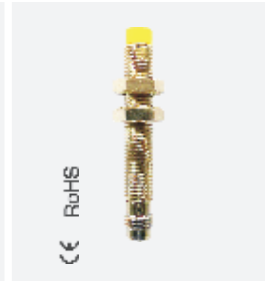
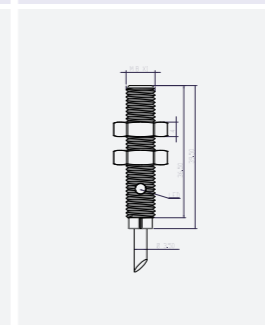
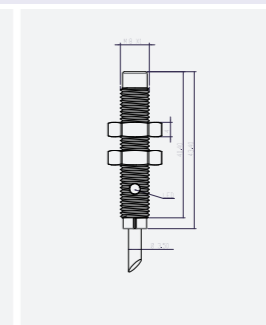
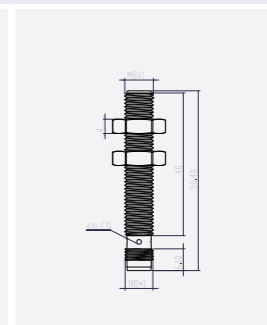
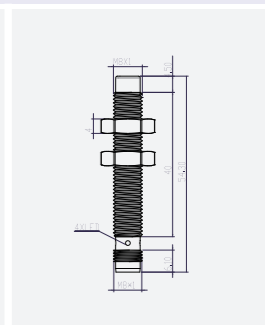
**Accessories**

Type	Drawing	Connector Order No.					
I		C	02	I	3	C	12
L		C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 2:2pin 3:3pin	Material R: PUR C: PVC S: PVC Shield	Size 8: M8 12: M12

**Connection**



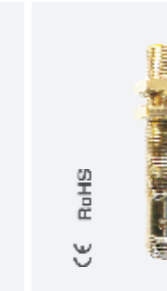
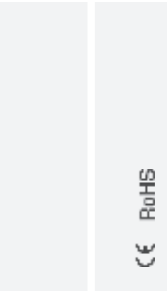
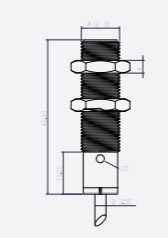
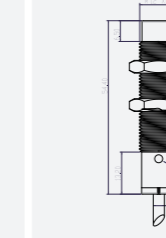
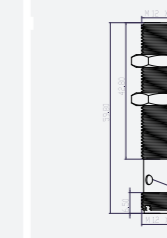

Electric Design	Size	Connection	Wire/Core Color	Wiring
2 Wire	M12	2M Cable	BN Brown BU Blue	
		Socket	WH white BN Brown BU Blue BK Black	
3 Wire	M8	2M Cable	BN Brown BU Blue BK Black	PNP connection NPN connection
		Socket	WH White BN Brown BU Blue BK Black	PNP connection NPN connection
	M12	2M PVC	BN Brown BU Blue BK Black	PNP connection NPN connection
		Socket	WH White BN Brown BU Blue BK Black	PNP connection NPN connection

Size	M8 Standard			
	Cable		Connector	
Standard	1.5mm	2.5mm	1.5mm	2.5mm
Sensing range	1.5mm	2.5mm	1.5mm	2.5mm
				
3 wire PNP NO	IA1001	IA1005	IA1009	IA1013
3 wire PNP NC	IA1002	IA1006	IA1010	IA1014
3 wire NPN NO	IA1003	IA1007	IA1011	IA1015
3 wire NPN NC	IA1004	IA1008	IA1012	IA1016
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	100	100	100	100
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	<2	<2	<2	<2
Current consumption[mA]	<10(24VDC)	<10(24VDC)	<10(24VDC)	<10(24VDC)
Real sensing range[mm]	1.5 ± 10%	2.5 ± 10%	1.5 ± 10%	2.5 ± 10%
Operating range[mm]	0...1.2	0...2	0...1.2	0...2
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	1300	1300	1300	1300
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Ambient humidity [%]	35...95	35...95	35...95	35...95
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.14 mm <sup>2</sup>		M8 Connector	
Accessories	Two fixed nuts			
Drawing				

Size	M8 Standard			
	Cable		Connector	
Standard	1.5mm	2.5mm	1.5mm	2.5mm
Sensing range	1.5mm	2.5mm	1.5mm	2.5mm
				
2 wire NO	IA1017	IA1019	IA1021	IA1023
2 wire NC	IA1018	IA1020	IA1022	IA1024
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	100	100	100	100
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	<8	<8	<8	<8
Current consumption[mA]	<10(24VDC)	<10(24VDC)	<10(24VDC)	<10(24VDC)
Real sensing range[mm]	1.5 ± 10%	2.5 ± 10%	1.5 ± 10%	2.5 ± 10%
Operating range[mm]	0...1.2	0...2	0...1.2	0...2
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	1300	1300	1300	1300
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Ambient humidity [%]	35...95	35...95	35...95	35...95
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.14 mm <sup>2</sup>		M8 Connector	
Accessories	Two fixed nuts			
Drawing				


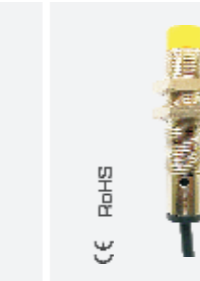
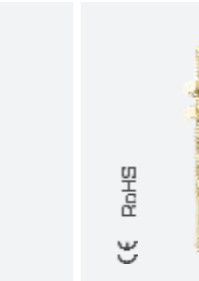
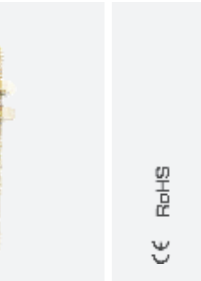
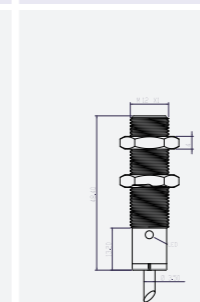
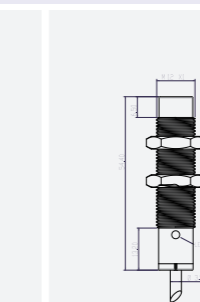
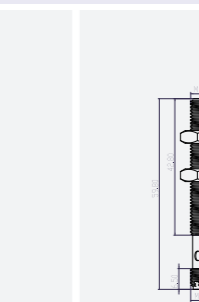
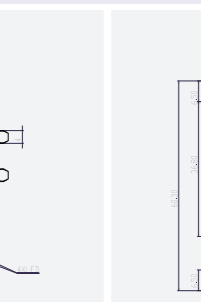
Inductive Proximity Sensors  
 Capacitive Proximity Sensors  
 Valve Proximity Sensors  
 Speed Monitor

Size	M12 Standard			
	Cable		Connector	
Standard	2mm	4mm	2mm	4mm
Sensing range	2mm	4mm	2mm	4mm
				
3 wire PNP NO	IB1001	IB1005	IB1009	IB1013
3 wire PNP NC	IB1002	IB1006	IB1010	IB1014
3 wire NPN NO	IB1003	IB1007	IB1011	IB1015
3 wire NPN NC	IB1004	IB1008	IB1012	IB1016
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	100	100	100	100
Short-circuit protection	Pulsed	Pulsed	Pulsed	Pulsed
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	IB1001,IB1002<2.5 IB1003,IB1004<3	IB1005,IB1006<2.5 IB1007,IB1008<3	IB1009,IB1010<2.5 IB1011,IB1012<3	IB1013,IB1014<2.5 IB1015,IB1016<3
Current consumption[mA]	<10(24VDC)	<10(24VDC)	<10(24VDC)	<10(24VDC)
Real sensing range[mm]	2 ± 10%	4 ± 10%	2 ± 10%	4 ± 10%
Operating range[mm]	0...1.6	0...3.2	0...1.6	0...3.2
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	3...20	3...20	3...20	3...20
Switching frequency [Hz]	1000	1000	1000	1000
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Ambient humidity [%]	35...95	35...95	35...95	35...95
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.14mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

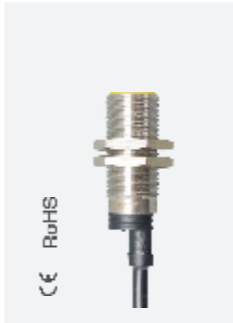



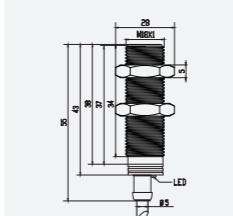
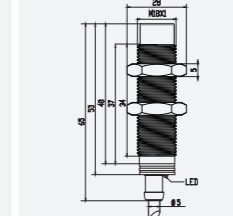
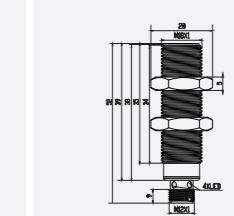
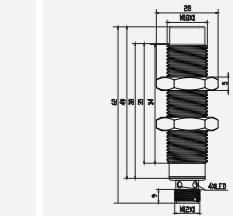
Size	M12 Standard			
	Cable		Connector	
Standard	2mm	4mm	2mm	4mm
Sensing range	2mm	4mm	2mm	4mm
				
2 wire NO	IB1017	IB1019	IB1021	IB1023
2 wire NC	IB1018	IB1020	IB1022	IB1024
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	100	100	100	100
Short-circuit protection	Pulsed	Pulsed	Pulsed	Pulsed
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	<4	<4	<4	<4
Leakage current	<0.6(24VDC)	<0.6(24VDC)	<0.6(24VDC)	<0.6(24VDC)
Real sensing range[mm]	2 ± 10%	4 ± 10%	2 ± 10%	4 ± 10%
Operating range [mm]	0...1.6	0...3.2	0...1.6	0...3.2
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	3...20	3...20	3...20	3...20
Switching frequency [Hz]	1000	1000	1000	1000
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Ambient humidity [%]	35...95	35...95	35...95	35...95
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.25mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Inductive Proximity Sensors  
Capacitive Proximity Sensors  
Valve Proximity Sensors  
Speed Monitor

Size	M12 Extra length			
Standard	Cable		Connector	
Sensing range	4mm	6mm	4mm	6mm
				
3 wire PNP NO	IB1101	IB1105	IB1109	IB1113
3 wire PNP NC	IB1102	IB1106	IB1110	IB1114
3 wire NPN NO	IB1103	IB1107	IB1111	IB1115
3 wire NPN NC	IB1104	IB1108	IB1112	IB1116
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	100	100	100	100
Short-circuit protection	Pulsed	Pulsed	Pulsed	Pulsed
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	IB1101,IB1102<2.5 IB1103,IB1104<3	IB1105,IB1106<2.5 IB1107,IB1108<3	IB1109,IB1110<2.5 IB1111,IB1112<3	IB1113,IB1114<2.5 IB1115,IB1116<3
Current consumption[mA]	<10(24VDC)	<10(24VDC)	<10(24VDC)	<10(24VDC)
Real sensing range[mm]	4 ± 10%	6 ± 10%	4 ± 10%	6 ± 10%
Operating range[mm]	0...3.2	0...4.8	0...3.2	0...4.8
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	3...20	3...20	3...20	3...20
Switching frequency [Hz]	1000	1000	1000	1000
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Operation humidity [%]	35...95	35...95	35...95	35...95
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.14mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Size	M12 Extra length			
Standard	Cable		Connector	
Sensing range	4mm	6mm	4mm	6mm
				
2 wire NO	IB1117	IB1119	IB1121	IB1123
2 wire NC	IB1118	IB1120	IB1122	IB1124
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	100	100	100	100
Short-circuit protection	Pulsed	Pulsed	Pulsed	Pulsed
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	<4	<4	<4	<4
Current consumption[mA]	<0.6(24VDC)	<0.6(24VDC)	<0.6(24VDC)	<0.6(24VDC)
Real sensing range[mm]	4 ± 10%	6 ± 10%	4 ± 10%	6 ± 10%
Operating range[mm]	0...2	0...4.8	0...3.2	0...3.2
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	3...20	3...20	3...20	3...20
Switching frequency [Hz]	1000	1000	1000	1000
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Ambient humidity [%]	35...95	35...95	35...95	35...95
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.14mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Size	M18 Standard			
Standard	Cable		Connector	
Sensing range	5mm	8mm	5mm	8mm
				
3 wire PNP NO	IC1001	IC1005	IC1009	IC1013
3 wire PNP NC	IC1002	IC1006	IC1010	IC1014
3 wire NPN NO	IC1003	IC1007	IC1011	IC1015
3 wire NPN NC	IC1004	IC1008	IC1012	IC1016
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5	< 2.5	< 2.5
Current consumption[mA]	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)
Real sensing range[mm]	5 ± 10%	8 ± 10%	5 ± 10%	8 ± 10%
Operating range[mm]	0...4	0...6.4	0...4	0...6.4
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	400	400	400	400
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				





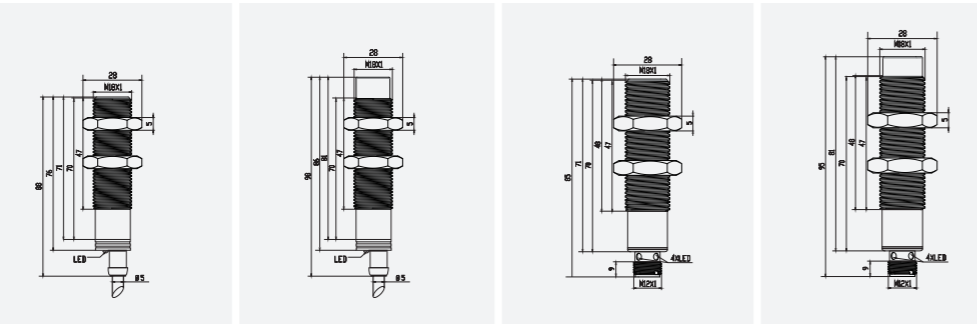
Size	M18 Standard			
Standard	Cable		Connector	
Sensing range	5mm	8mm	5mm	8mm
				
2 wire NO	IC1017	IC1019	IC1021	IC1023
2 wire NC	IC1018	IC1020	IC1022	IC1024
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 4.3DC	< 4.3DC	< 4.3DC	< 4.3DC
Current consumption[mA]	< 1(24VDC)	< 1(24VDC)	< 1(24VDC)	< 1(24VDC)
Real sensing range[mm]	5 ± 10%	8 ± 10%	5 ± 10%	8 ± 10%
Operating range[mm]	0...4	0...6.4	0...4	0...6.4
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	70	70	70	70
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

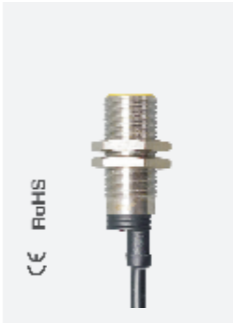



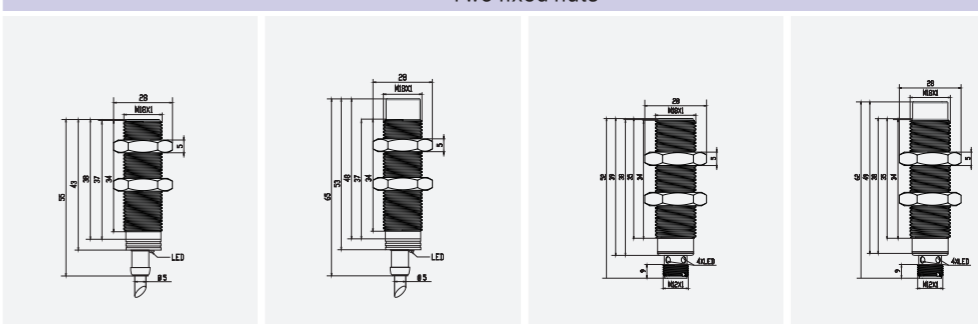
Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	M18 Standard			
	Cable		Connector	
Standard	5mm	8mm	5mm	8mm
Sensing range				
				
2 wire NO	IC1025	IC1027	IC1029	IC1031
2 wire NC	IC1026	IC1028	IC1030	IC1032
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	20...250AC/DC	20...250AC/DC	20...250AC/DC	20...250AC/DC
Current loading[mA]	250	250	250	250
Short-circuit protection	No	No	No	No
Overload protection	No	No	No	No
Voltage drop[V]	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC
Current consumption[mA]	< 2.5(250VAC)/ < 1.3(110VAC)/ < 0.8(24VDC)			
Real sensing range[mm]	5 ± 10%	8 ± 10%	5 ± 10%	8 ± 10%
Operating range[mm]	0...4	0...6.4	0...4	0...6.4
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	25AC/60DC	25AC/60DC	25AC/60DC	25AC/60DC
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Size	M18 Extra length			
	Cable		Connector	
Standard	7mm	12mm	7mm	12mm
Sensing range				
				
3 wire PNP NO	IC1101	IC1105	IC1109	IC1113
3 wire PNP NC	IC1102	IC1106	IC1110	IC1114
3 wire NPN NO	IC1103	IC1107	IC1111	IC1115
3 wire NPN NC	IC1104	IC1108	IC1112	IC1116
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5	< 2.5	< 2.5
Current consumption[mA]	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)
Real sensing range[mm]	7 ± 10%	12 ± 10%	7 ± 10%	12 ± 10%
Operating range[mm]	0...5.6	0...9.6	0...5.6	0...9.6
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	400	400	400	400
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				





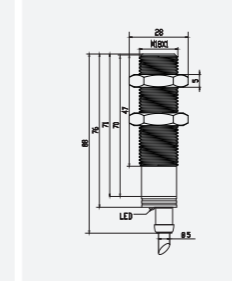
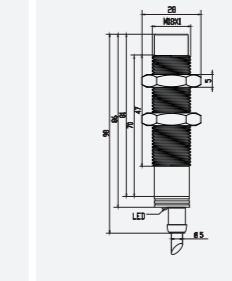
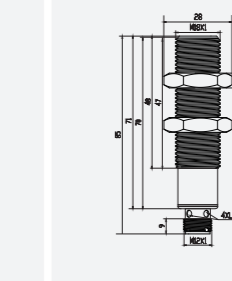
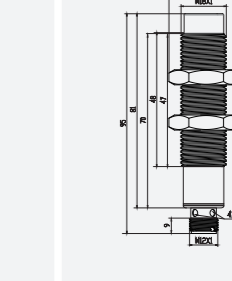
Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	M18 Extra length			
Standard	Cable		Connector	
Sensing range	7mm	12mm	7mm	12mm
				
2 wire NO	IC1117	IC1119	IC1121	IC1123
2 wire NC	IC1118	IC1120	IC1122	IC1124
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 4.3DC	< 4.3DC	< 4.3DC	< 4.3DC
Current consumption[mA]	< 1(24VDC)	< 1(24VDC)	< 1(24VDC)	< 1(24VDC)
Real sensing range[mm]	7 ± 10%	12 ± 10%	7 ± 10%	12 ± 10%
Operating range[mm]	0...5.6	0...9.6	0...5.6	0...9.6
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	70	70	70	70
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3×0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Size	M18 Extra length			
Standard	Cable		Connector	
Sensing range	7mm	12mm	7mm	12mm
				
2 wire NO	IC1125	IC1127	IC1129	IC1131
2 wire NC	IC1126	IC1128	IC1130	IC1132
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	20...250AC/DC	20...250AC/DC	20...250AC/DC	20...250AC/DC
Current loading[mA]	250	250	250	250
Short-circuit protection	No	No	No	No
Overload protection	No	No	No	No
Voltage drop[V]	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC
Current consumption[mA]	< 2.5(250VAC)/ < 1.3(110VAC)/ < 0.8(24VDC)			
Real sensing range[mm]	7 ± 10%	12 ± 10%	7 ± 10%	12 ± 10%
Operating range[mm]	0...5.6	0...9.6	0...5.6	0...9.6
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	25AC/60DC	25AC/60DC	25AC/60DC	25AC/60DC
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3×0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

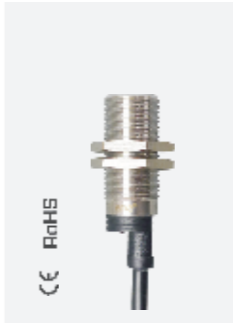



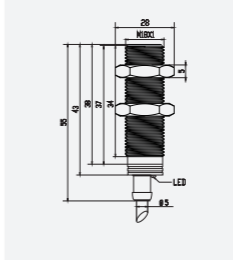
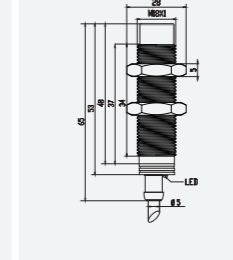
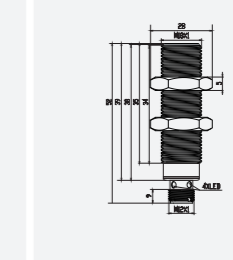
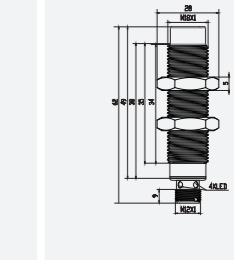
Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	M18 High temperature			
Standard	Cable		Connector	
Sensing range	5mm	8mm	5mm	8mm
				
3 wire PNP NO	IC1201	IC1205	IC1209	IC1213
3 wire PNP NC	IC1202	IC1206	IC1210	IC1214
3 wire NPN NO	IC1203	IC1207	IC1211	IC1215
3 wire NPN NC	IC1204	IC1208	IC1212	IC1216
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5	< 2.5	< 2.5
Current consumption[mA]	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)
Real sensing range[mm]	5 ± 10%	8 ± 10%	5 ± 10%	8 ± 10%
Operating range[mm]	0...4	0...6.4	0...4	0...6.4
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	400	400	400	400
Ambient temperature [°C/°F]	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	silicone-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				





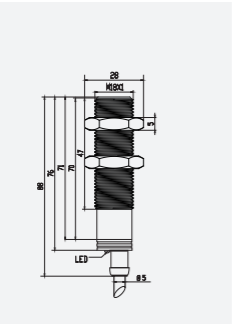
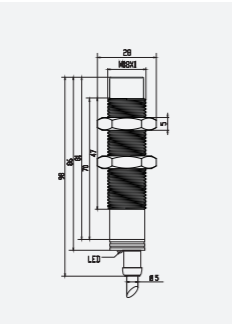
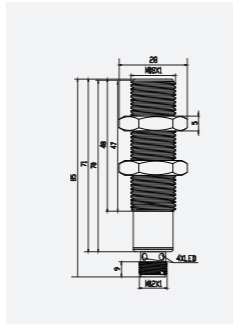
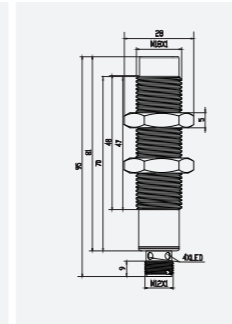
Size	M18 High temperature			
Standard	Cable		Connector	
Sensing range	5mm	8mm	5mm	8mm
				
2 wire NO	IC1217	IC1219	IC1221	IC1223
2 wire NC	IC1218	IC1220	IC1222	IC1224
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	4.3DC	4.3DC	4.3DC	4.3DC
Current consumption[mA]	< 1(24VDC)	< 1(24VDC)	< 1(24VDC)	< 1(24VDC)
Real sensing range[mm]	5 ± 10%	8 ± 10%	5 ± 10%	8 ± 10%
Operating range[mm]	0...4	0...6.4	0...4	0...6.4
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	70	70	70	70
Ambient temperature [°C/°F]	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	silicone-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Inductive Proximity Sensors


Capacitive Proximity Sensors

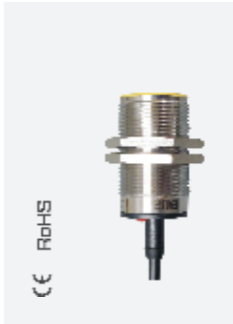



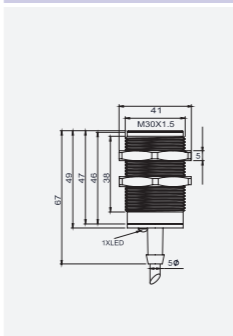
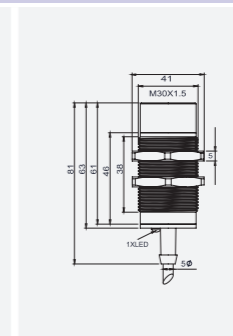
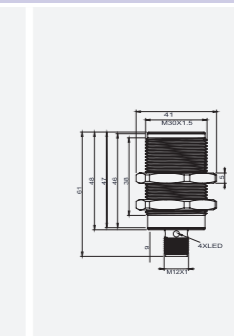
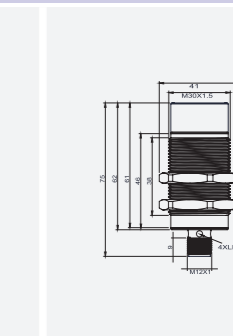
Valve Proximity Sensors

Speed Monitor

Size	M18 High temperature			
Standard	Cable		Connector	
Sensing range	5mm	8mm	5mm	8mm
				
2 wire NO	IC1225	IC1227	IC1229	IC1231
2 wire NC	IC1226	IC1228	IC1230	IC1232
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	20...250AC/DC	20...250AC/DC	20...250AC/DC	20...250AC/DC
Current loading[mA]	250	250	250	250
Short-circuit protection	No	No	No	No
Overload protection	No	No	No	No
Voltage drop[V]	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC
Current consumption[mA]	< 2.5(250VAC)/ < 1.3(110VAC)/ < 0.8(24VDC)			
Real sensing range[mm]	5 ± 10%	8 ± 10%	5 ± 10%	8 ± 10%
Operating range[mm]	0...4	0...6.4	0...4	0...6.4
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	25AC/60DC	25AC/60DC	25AC/60DC	25AC/60DC
Ambient temperature [°C/°F]	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	silicone-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Inductive Proximity Sensors  
Capacitive Proximity Sensors  
Valve Proximity Sensors  
Speed Monitor

Size	M30 Standard			
Standard	Cable		Connector	
Sensing range	10mm	15mm	10mm	15mm
				
3 wire PNP NO	ID1001	ID1005	ID1009	ID1013
3 wire PNP NC	ID1002	ID1006	ID1010	ID1014
3 wire NPN NO	ID1003	ID1007	ID1011	ID1015
3 wire NPN NC	ID1004	ID1008	ID1012	ID1016
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5	< 2.5	< 2.5
Current consumption[mA]	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)
Real sensing range[mm]	10 ± 10%	15 ± 10%	10 ± 10%	15 ± 10%
Operating range[mm]	0...8	0...12	0...8	0...12
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	100	100	100	100
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				



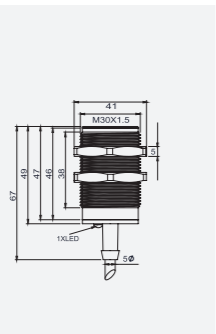
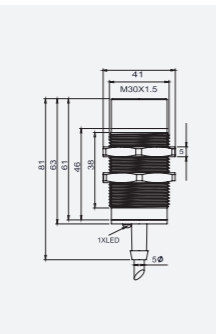
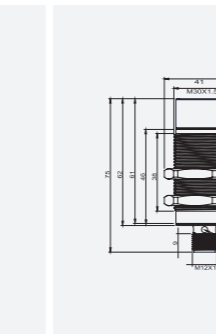
Size	M30 Standard			
Standard	Cable		Connector	
Sensing range	10mm	15mm	10mm	15mm
				
2 wire NO	ID1017	ID1019	ID1021	ID1023
2 wire NC	ID1018	ID1020	ID1022	ID1024
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 5	< 5	< 5	< 5
Current consumption[mA]	< 0.6(24VDC)	< 0.6(24VDC)	< 0.6(24VDC)	< 0.6(24VDC)
Real sensing range[mm]	10 ± 10%	15 ± 10%	10 ± 10%	15 ± 10%
Operating range[mm]	0...8	0...12	0...8	0...12
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	60	60	60	60
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				


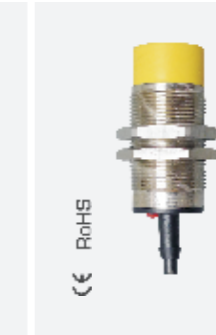

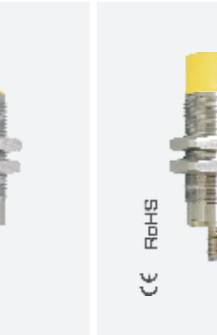
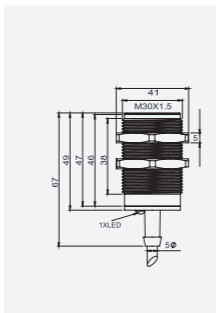
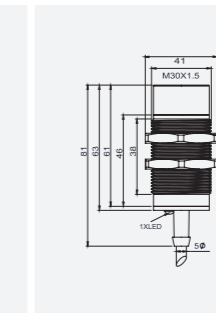
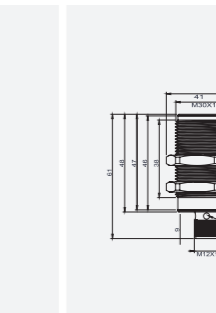
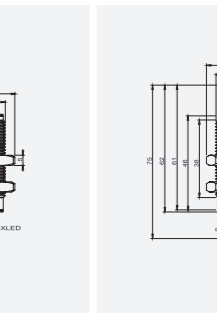
Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	M30 Standard			
	Cable		Connector	
Standard	10mm	15mm	10mm	15mm
Sensing range				
2 wire NO	ID1025	ID1027	ID1029	ID1031
2 wire NC	ID1026	ID1028	ID1030	ID1032
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	20...250AC/DC	20...250AC/DC	20...250AC/DC	20...250AC/DC
Current loading[mA]	250	250	250	250
Short-circuit protection	No	No	No	No
Overload protection	No	No	No	No
Voltage drop[V]	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC
Current consumption[mA]	< 2(250VAC)/ < 1.5(110VAC)/ < 0.6(24VDC)			
Real sensing range[mm]	10 ± 10%	15 ± 10%	10 ± 10%	15 ± 10%
Operating range[mm]	0...8	0...12	0...8	0...12
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	25AC/60DC	25AC/60DC	25AC/60DC	25AC/60DC
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Size	M30 Extra length			
	Cable		Connector	
Standard	15mm	22mm	15mm	22mm
Sensing range				
3 wire PNP NO	ID1101	ID1105	ID1109	ID1113
3 wire PNP NC	ID1102	ID1106	ID1110	ID1114
3 wire NPN NO	ID1103	ID1107	ID1111	ID1115
3 wire NPN NC	ID1104	ID1108	ID1112	ID1116
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5	< 2.5	< 2.5
Current consumption[mA]	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)
Real sensing range[mm]	15 ± 10%	22 ± 10%	15 ± 10%	22 ± 10%
Operating range[mm]	0...12	0...17.6	0...12	0...17.6
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	100	100	100	100
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				





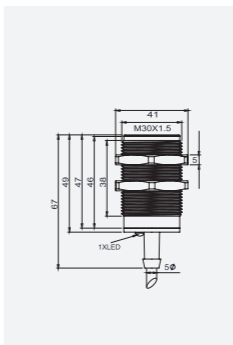
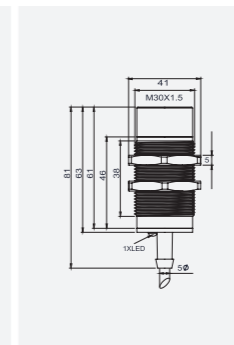
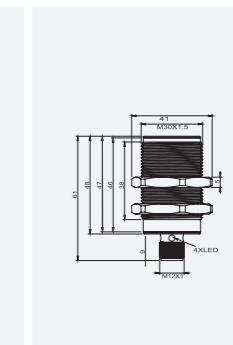
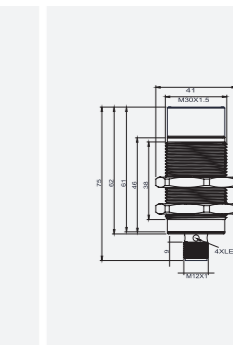
Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	M30 Extra length			
	Cable		Connector	
Standard	15mm	22mm	15mm	22mm
Sensing range	15mm		22mm	
				
2 wire NO	ID1117	ID1119	ID1121	ID1123
2 wire NC	ID1118	ID1120	ID1122	ID1124
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 5V	< 5V	< 5V	< 5V
Current consumption[mA]	< 0.6(24VDC)	< 0.6(24VDC)	< 0.6(24VDC)	< 0.6(24VDC)
Real sensing range[mm]	15 ± 10%	22 ± 10%	15 ± 10%	22 ± 10%
Operating range[mm]	0...12	0...17.6	0...12	0...17.6
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	60	60	60	60
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Size	M30 Extra length			
	Cable		Connector	
Standard	15mm	22mm	15mm	22mm
Sensing range	15mm		22mm	
				
2 wire NO	ID1125	ID1127	ID1129	ID1131
2 wire NC	ID1126	ID1128	ID1130	ID1132
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	20...250AC/DC	20...250AC/DC	20...250AC/DC	20...250AC/DC
Current loading[mA]	250	250	250	250
Short-circuit protection	No	No	No	No
Overload protection	No	No	No	No
Voltage drop[V]	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC
Current consumption[mA]	< 2(250VAC)/ < 1.5(110VAC)/ < 0.6(24VDC)			
Real sensing range[mm]	15 ± 10%	22 ± 10%	15 ± 10%	22 ± 10%
Operating range[mm]	0...12	0...17.6	0...12	0...17.6
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	25AC/60DC	25AC/60DC	25AC/60DC	25AC/60DC
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				





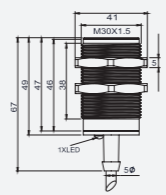
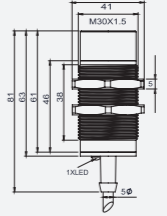
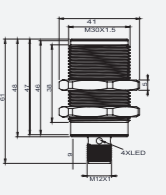
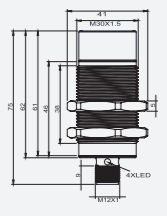
Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	M30 High temperature			
Standard	Cable		Connector	
Sensing range	10mm	15mm	10mm	15mm
				
3 wire PNP NO	ID1201	ID1205	ID1209	ID1213
3 wire PNP NC	ID1202	ID1206	ID1210	ID1214
3 wire NPN NO	ID1203	ID1207	ID1211	ID1215
3 wire NPN NC	ID1204	ID1208	ID1212	ID1216
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5	< 2.5	< 2.5
Current consumption[mA]	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)
Real sensing range[mm]	10 ± 10%	15 ± 10%	10 ± 10%	15 ± 10%
Operating range[mm]	0...8	0...12	0...8	0...12
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	100	100	100	100
Ambient temperature [°C/°F]	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	silicone-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Size	M30 High temperature			
Standard	Cable		Connector	
Sensing range	10mm	15mm	10mm	15mm
				
2 wire NO	ID1217	ID1219	ID1221	ID1223
2 wire NC	ID1218	ID1220	ID1222	ID1224
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Yes	Yes	Yes	Yes
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 5	< 5	< 5	< 5
Current consumption[mA]	< 0.6(24VDC)	< 0.6(24VDC)	< 0.6(24VDC)	< 0.6(24VDC)
Real sensing range[mm]	10 ± 10%	15 ± 10%	10 ± 10%	15 ± 10%
Operating range[mm]	0...8	0...12	0...12	0...12
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	60	60	60	60
Ambient temperature [°C/°F]	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	silicone-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Inductive Proximity Sensors



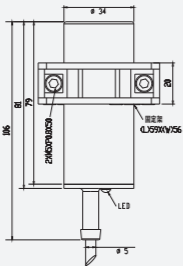
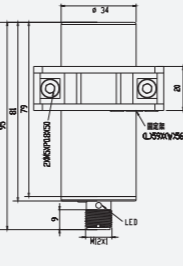
Capacitive Proximity Sensors



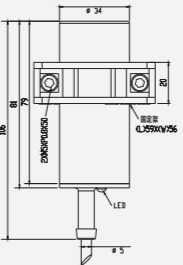
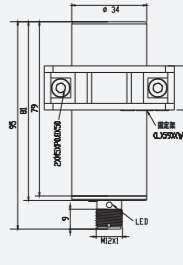
Valve Proximity Sensors

Speed Monitor

Size	M30 High temperature			
Standard	Cable		Connector	
Sensing range	10mm	15mm	10mm	15mm
				
2 wire NO	ID1225	ID1227	ID1229	ID1231
2 wire NC	ID1226	ID1228	ID1230	ID1232
Sensing surface	Flush	Non-flush	Flush	Non-flush
Operating voltage[V]	20...250AC/DC	20...250AC/DC	20...250AC/DC	20...250AC/DC
Current loading[mA]	250	250	250	250
Short-circuit protection	No	No	No	No
Overload protection	No	No	No	No
Voltage drop[V]	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC	< 6.5AC/ < 6DC
Current consumption[mA]	< 2(250VAC)/ < 1.5(110VAC)/ < 0.6(24VDC)			
Real sensing range[mm]	10 ± 10%	15 ± 10%	10 ± 10%	15 ± 10%
Operating range[mm]	0...8	0...12	0...8	0...12
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	25AC/60DC	25AC/60DC	25AC/60DC	25AC/60DC
Ambient temperature [°C/°F]	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248	-25...120/-13...248
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	Stainless steel ; Sensing surface: PBT			
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	silicone-cable/2m;3 × 0.34mm <sup>2</sup>		M12 Connector	
Accessories	Two fixed nuts			
Drawing				

Inductive Proximity Sensors  
Capacitive Proximity Sensors  
Valve Proximity Sensors  
Speed Monitor

Size	Ø34 Standard	
Standard	Cable	Connector
Sensing range	20mm	20mm
		
3 wire PNP NO	IE1001	IE1005
3 wire PNP NC	IE1002	IE1006
3 wire NPN NO	IE1003	IE1007
3 wire NPN NC	IE1004	IE1008
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC
Current loading[mA]	350	350
Short-circuit protection	Yes	Yes
Reverse polarity protection	Yes	Yes
Overload protection	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5
Current consumption[mA]	< 15(24VDC)	< 15(24VDC)
Real sensing range[mm]	20 ± 10%	20 ± 10%
Operating range[mm]	0...16	0...16
Switch-point drift [%Sr]	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15
Switching frequency [Hz]	100	100
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3×0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed bracket	
Drawing		



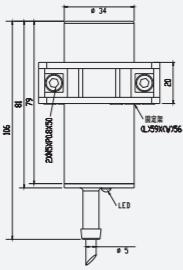
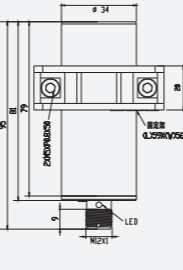
Size	Ø34 Standard	
Standard	Cable	Connector
Sensing range	20mm	20mm
		
2 wire NO	IE1009	IE1011
2 wire NC	IE1010	IE1012
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC
Current loading[mA]	350	350
Short-circuit protection	Yes	Yes
Reverse polarity protection	Yes	Yes
Overload protection	Yes	Yes
Voltage drop[V]	< 5.5	< 5.5
Current consumption[mA]	< 0.6(24VDC)	< 0.6(24VDC)
Real sensing range[mm]	20 ± 10%	20 ± 10%
Operating range[mm]	0...16	0...16
Switch-point drift [%Sr]	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15
Switching frequency [Hz]	50	50
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3×0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed bracket	
Drawing		



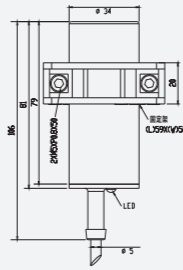
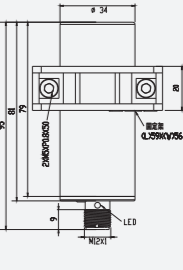
Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	Ø34 Standard	
Standard	Cable	Connector
Sensing range	20mm	20mm
		
2 wire NO	IE1013	IE1015
2 wire NC	IE1014	IE1016
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	20...250AC/DC	20...250AC/DC
Current loading[mA]	350	350
Short-circuit protection	No	No
Overload protection	No	No
Voltage drop[V]	< 6AC / < 5.5DC	< 6AC / < 5.5DC
Current consumption[mA]	< 2.5 (250V AC) / < 1.3 (110 V AC) / < 0.8 (24 V DC)	
Real sensing range[mm]	20 ± 10%	20 ± 10%
Operating range[mm]	0...16	0...16
Switch-point drift [%Sr]	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15
Switching frequency [Hz]	25 AC / 50 DC	25 AC / 50 DC
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	PVC-cable/2m; 3 × 0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed bracket	
Drawing		



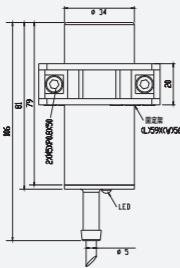
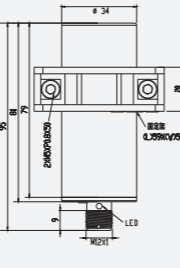
Size	Ø34 Extra length	
Standard	Cable	Connector
Sensing range	30mm	30mm
		
3 wire PNP NO	IE1101	IE1105
3 wire PNP NC	IE1102	IE1106
3 wire NPN NO	IE1103	IE1107
3 wire NPN NC	IE1104	IE1108
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC
Current loading[mA]	350	350
Short-circuit protection	Yes	Yes
Reverse polarity protection	Yes	Yes
Overload protection	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5
Current consumption[mA]	< 15(24VDC)	< 15(24VDC)
Real sensing range[mm]	30 ± 10%	30 ± 10%
Operating range[mm]	0...24	0...24
Switch-point drift [%Sr]	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15
Switching frequency [Hz]	100	100
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	PVC-cable/2m; 3 × 0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed bracket	
Drawing		



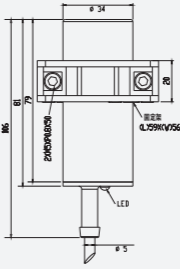
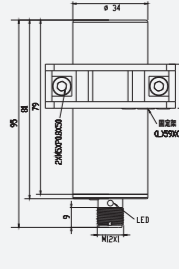
Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	Ø34 Extra length	
Standard	Cable	Connector
Sensing range	30mm	30mm
		
2 wire NO	IE1109	IE1111
2 wire NC	IE1110	IE1112
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC
Current loading[mA]	350	350
Short-circuit protection	Yes	Yes
Reverse polarity protection	Yes	Yes
Overload protection	Yes	Yes
Voltage drop[V]	< 5.5	< 5.5
Current consumption[mA]	< 0.6(24VDC)	< 0.6(24VDC)
Real sensing range[mm]	30 ± 10%	30 ± 10%
Operating range[mm]	0...24	0...24
Switch-point drift [%Sr]	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15
Switching frequency [Hz]	50	50
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed bracket	
Drawing		



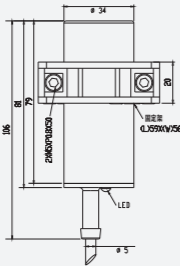
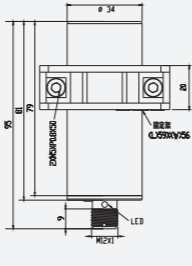
Size	Ø34 Extra length	
Standard	Cable	Connector
Sensing range	30mm	30mm
		
2 wire NO	IE1113	IE1115
2 wire NC	IE1114	IE1116
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	20...250AC/DC	20...250AC/DC
Current loading[mA]	350	350
Short-circuit protection	No	No
Overload protection	No	No
Voltage drop[V]	< 6AC / < 5.5DC	< 6AC / < 5.5DC
Current consumption[mA]	< 2.5 (250V AC) / < 1.3 (110 V AC) / < 0.8 (24 V DC)	
Real sensing range[mm]	30 ± 10%	30 ± 10%
Operating range[mm]	0...24	0...24
Switch-point drift [%Sr]	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15
Switching frequency [Hz]	25 AC / 50 DC	25 AC / 50 DC
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed bracket	
Drawing		



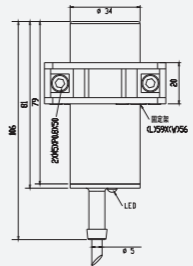
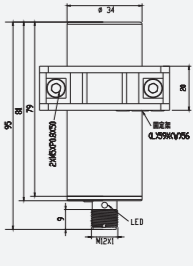
Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	Ø34 High temperature	
Standard	Cable	Connector
Sensing range	20mm	20mm
		
3 wire PNP NO	IE1201	IE1205
3 wire PNP NC	IE1202	IE1206
3 wire NPN NO	IE1203	IE1207
3 wire NPN NC	IE1204	IE1208
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC
Current loading[mA]	350	350
Short-circuit protection	Yes	Yes
Reverse polarity protection	Yes	Yes
Overload protection	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5
Current consumption[mA]	< 15(24VDC)	< 15(24VDC)
Real sensing range[mm]	20 ± 10%	20 ± 10%
Operating range[mm]	0...16	0...16
Switch-point drift [%Sr]	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15
Switching frequency [Hz]	100	100
Ambient temperature [°C/°F]	-25...120/-13...248	-25...120/-13...248
Protection classification	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	silicone-cable/2m;3 × 0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed bracket	
Drawing		



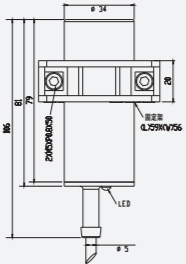
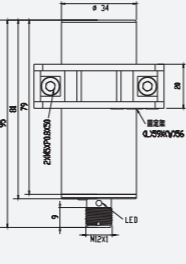
Size	Ø34 High temperature	
Standard	Cable	Connector
Sensing range	20mm	20mm
		
2 wire NO	IE1209	IE1211
2 wire NC	IE1210	IE1212
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC
Current loading[mA]	350	350
Short-circuit protection	Yes	Yes
Reverse polarity protection	Yes	Yes
Overload protection	Yes	Yes
Voltage drop[V]	< 5.5	< 5.5
Current consumption[mA]	< 0.6(24VDC)	< 0.6(24VDC)
Real sensing range[mm]	20 ± 10%	20 ± 10%
Operating range[mm]	0...16	0...16
Switch-point drift [%Sr]	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15
Switching frequency [Hz]	50	50
Ambient temperature [°C/°F]	-25...120/-13...248	-25...120/-13...248
Protection classification	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	silicone-cable/2m;3 × 0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed bracket	
Drawing		

Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	Ø34 High temperature	
Standard	Cable	Connector
Sensing range	20mm	20mm
		
2 wire NO	IE1213	IE1215
2 wire NC	IE1214	IE1216
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	20...250AC/DC	20...250AC/DC
Current loading[mA]	350	350
Short-circuit protection	No	No
Overload protection	No	No
Voltage drop[V]	< 6,5 AC / < 6 DC	< 6,5 AC / < 6 DC
Current consumption[mA]	< 2.5 (250V AC) / < 1.3 (110 V AC) / < 0.8 (24 V DC)	
Real sensing range[mm]	20 ± 10%	20 ± 10%
Operating range[mm]	0...16	0...16
Switch-point drift [%Sr]	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15
Switching frequency [Hz]	25 AC / 50 DC	25 AC / 50 DC
Ambient temperature [°C/°F]	-25...120/-13...248	-25...120/-13...248
Protection classification	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.5/Alumium approx 0.4/Copper approx 0.3	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	silicone-cable/2m;3 × 0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed bracket	
Drawing		

Inductive Proximity Sensors

Capacitive Proximity Sensors

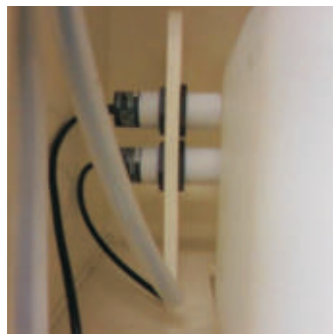
Valve Proximity Sensors

Speed Monitor

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



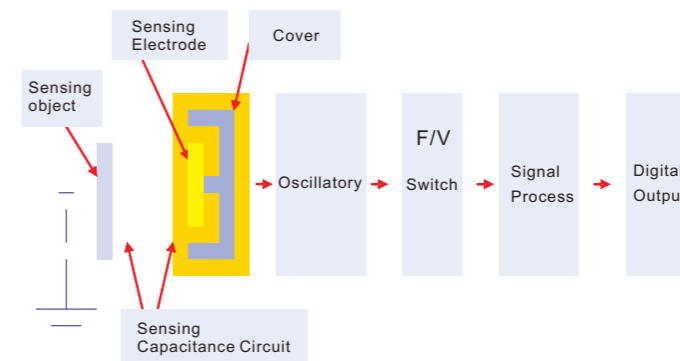
- Plastic thread type and cylinder type; Structure of sensors, durable working, and supply voltage AC/DC available
- Stable Operation: Without adjustable and mechanical components, proximity sensors don't be affected by the qualities of mediums and the variation of density, and it can work immediately 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 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.

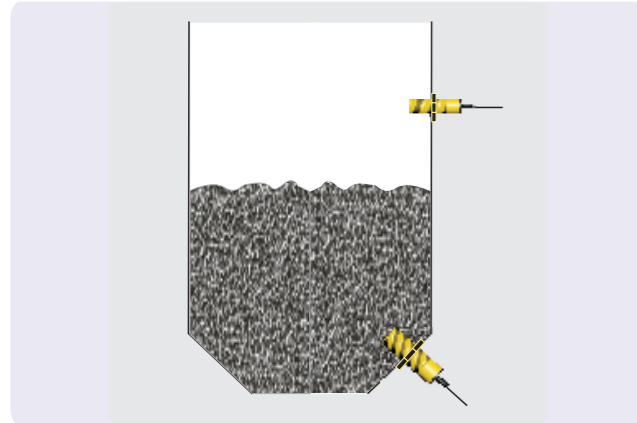
### Operation Procedure of Capacitive Proximity Sensors



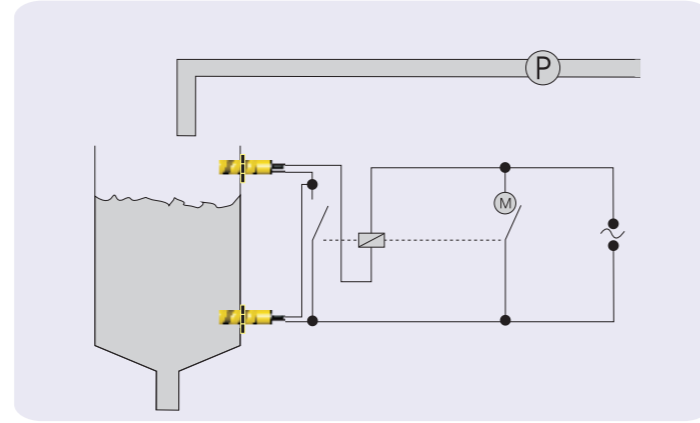
**Application**

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 timbering, papermaking, glass, plastics, foods, cement, chemistry engineering, and etc.

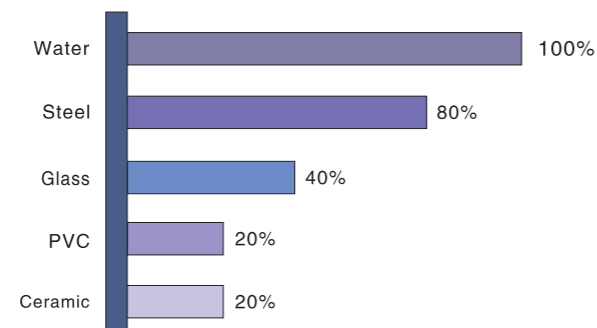
**Sensing Level of Solids**



**Sensing Level of Liquids**



**The relationship of object material and detecting distance**



**Accessories**

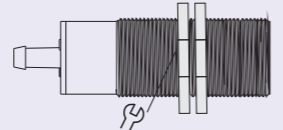
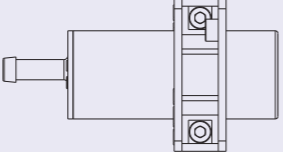
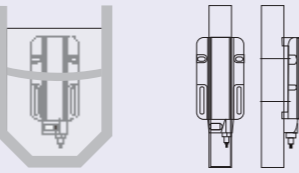
Type	Drawing	Connector Order No.					
I		C	02	I	4	C	12
L		C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC Shield	Size 12: M12

**Connection**

Electric Design	Connection	Wire/Core Color	Wiring
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	<p>PNP connection</p> <p>NPN connection</p>
	M12 Socket	WH white BN Brown BU Blue BK Black	<p>PNP connection</p> <p>NPN connection</p>

**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-flush mounting	

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

### Installation Notice



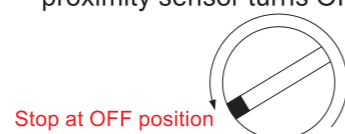
- Mounting for thread type :Don't twist the torque too hard (Fig.1)
- Mounting for cylinder type : To adjust the fixed screw and keep the torque in the range of 2-4kgf-cm. (Fig. 2)
- Lead protection: Please fasten the lead which is located 10cm far away the sensor by a clip in order to avoid the damage 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.

### Sensitivity adjustment

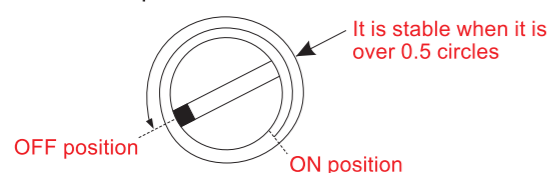
**A** Without any target in front of the sensing face, turn the sensitivity potentiometer clockwise until the proximity sensor turns ON (LED light turns on) .



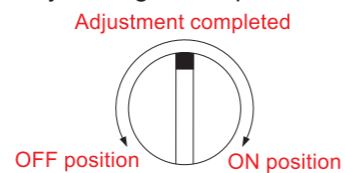
**B** With a target in front of the sensing face, turn the sensitivity potentiometer anticlockwise from the ON position stated in A until the proximity sensor turns OFF (LED light turns off) .



**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.




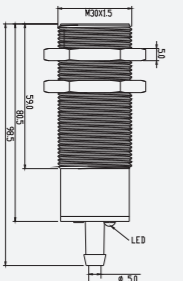
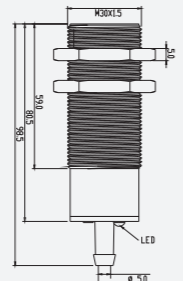
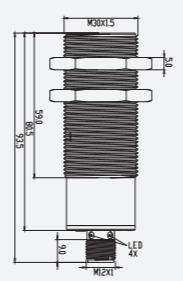






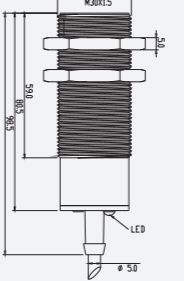
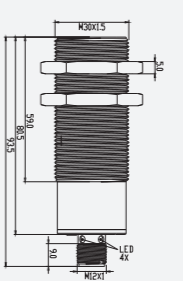
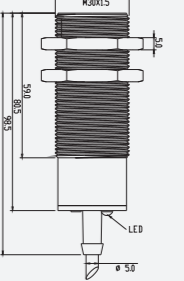
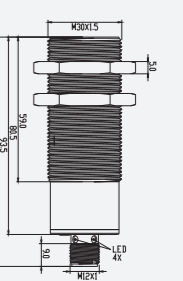
※ When there is distance fluctuation between proximity sensor and target, please adjust B with target at farthest from this unit.



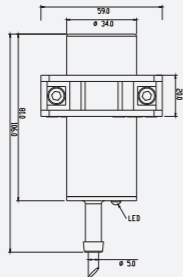
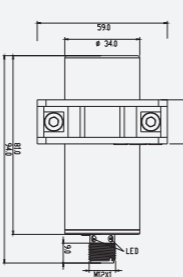
※ Turning potentiometer clockwise is maximum and turning anticlockwise it is minimum. Number of adjustment should be 6±2 revolution and if you turn right or left excessively, it is non-stop.



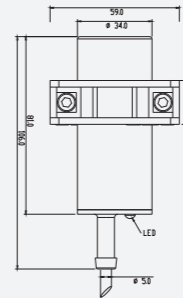
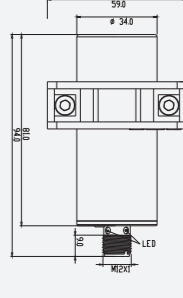
Size	M18	
Standard	Cable	
Sensing range	8mm	8mm
4 wire PNP wiring layout		
4 wire NPN wiring layout		
Number		
3 wire PNP NO	CA0004	
3 wire PNP NC	CA0005	
3 wire NPN NO	CA0006	
3 wire NPN NC	CA0007	
4 wire PNP NO/NC		CA0018
4 wire NPN NO/NC		CA0012
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC
Current loading[mA]	250	250
Short-circuit protection	Pulsed	Pulsed
Reverse polarity protection	Yes	Yes
Overload protection	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5
Current consumption[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
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Water=1/Glass approx 0.4/Ceramic approx 0.2/PVC approx 0.2	
Housing material	PBT	PP
Display LED	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>	PVC-cable/2m;4 × 0.34mm <sup>2</sup>
Accessories	Fixed nut,screw driver	
Drawing		


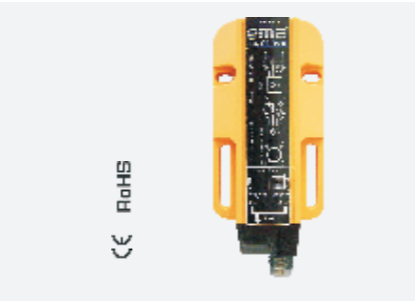
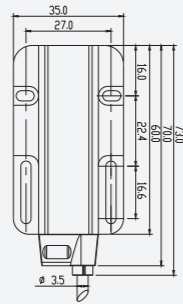
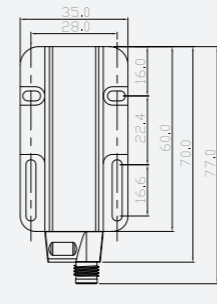
Size	M18	
Standard	Cable	
Sensing range	8mm	8mm
2 wire AC/DC NO	CA0001	
2 wire AC/DC NC	CA0002	
2 wire DC NO/NC		CA0008
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	20...250AC	10...36DC
Current loading continuous[mA]	250(...50°C)/200(...70°C)	250
Current loading temporary[mA]	1.5 A ( 20 ms / 0.5 Hz)	
Lowest current loading	5	
Short-circuit protection	No	Pluse type
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
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Water=1/Glass approx 0.4/Ceramic approx 0.2/PVC approx 0.2	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>	
Accessories	Fixed nut,screw driver	
Drawing		

Size	M30		
Standard	Cable		Connector
Sensing range	15mm	15mm	15mm
			
3 wire PNP NO	CB0004		CB0012
3 wire PNP NC	CB0005		CB0013
3 wire NPN NO	CB0006		CB0014
3 wire NPN NC	CB0007		CB0015
4 wire PNP NO/NC		CB0018	
4 wire NPN NO/NC		CB0022	
Sensing surface	Non-flush	Non-flush	
Operating voltage[V]	10...36DC	10...36DC	10...36DC
Current loading[mA]	250	250	250
Short-circuit protection	Pulsed	Pulsed	Pulsed
Reverse polarity protection	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5	< 2.5
Current consumption[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
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67
Adjustment factors	Water=1/Glass approx 0.4/Ceramic approx 0.2/PVC approx 0.2		
Housing material	PBT	PP	PBT
Display LED	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3 × 0.34mm <sup>2</sup>	PVC-cable/2m;4 × 0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed nut,screw driver		
Drawing			

Size	M30			
Standard	Cable	Connector	Cable	Connector
Sensing range	15mm	15mm	15mm	15mm
				
2 wire AC/DC NO	CB0001	CB0009		
2 wire AC/DC NC	CB0002	CB0010		
2 wire AC/DC NO/NC	CB0003	CB0011		
2 wire DC NO/NC			CB0008	CB0016
Sensing surface	Non-flush	Non-flush	Non-flush	Non-flush
Operating voltage[V]	20...250 AC	20...250 AC	10...36DC	10...36DC
Current loading continuous[mA]	250(...50°C)/200(...70°C)		250	250
Current loading temporary[mA]	1.5 A( 20 ms / 0.5 Hz)	1.5 A( 20 ms / 0.5 Hz)		
Lowest current loading	5	5		
Short-circuit protection	No	No	Pulsed	Pulsed
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	No	No	Yes	Yes
Voltage drop[V]	< 10 AC / < 8 DC	< 10 AC / < 8 DC	< 4.6	< 4.6
Leakage current[mA]	< 2.5 (250 V AC) / < 1.7 (110 V AC) / < 1.5 (24 V DC)		< 1(24VDC)	< 1(24VDC)
Real sensing range[mm]	15 ± 10%	15 ± 10%	15 ± 10%	15 ± 10%
Operating range[mm]	0...12	0...12	0...12	0...12
Switch-point drift [%Sr]	-15...15	-15...15	-15...15	-15...15
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	25AC / 40DC	25AC / 40DC	40	40
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Water=1/Glass approx 0.4/Ceramic approx 0.2/PVC approx 0.2			
Housing material	PBT	PBT	PBT	PBT
Display LED	Red(90°)	Red(90°)	Red(90°)	Red(90°)
Connection	PVC-cable/2m;2 × 0.34mm <sup>2</sup>	M12 Connector	PVC-cable/2m;2 × 0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed nut,screw driver			
Drawing				

Size	Ø34	
Standard	Cable	Connector
Sensing range	20mm	20mm
		
3 wire PNP NO	CC0004	CC0012
3 wire PNP NC	CC0005	CC0013
3 wire NPN NO	CC0006	CC0014
3 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	Pulsed	Pulsed
Reverse polarity protection	Yes	Yes
Overload protection	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5
Current consumption[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
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Water=1/Glass approx 0.4/Ceramic approx 0.2/PVC approx 0.2	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	PVC-cable/2m;3×0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed nut,screw driver	
Drawing		

Size	Ø34	
Standard	Cable	Connector
Sensing range	20mm	20mm
		
2 wire DC NO/NC	CC0008	CC0016
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	10...36DC	10...36DC
Current loading continuous[mA]	250	250
Short-circuit protection	Pulsed	Pulsed
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
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Water=1/Glass approx 0.4/Ceramic approx 0.2/PVC approx 0.2	
Housing material	PBT	PBT
Display LED	Red(90°)	Red(90°)
Connection	PVC-cable/2m;2×0.34mm <sup>2</sup>	M12 Connector
Accessories	Fixed nut,screw driver	
Drawing		

Size	35 x 70mm	
Standard	Cable	Connector
Sensing range	25mm	25mm
		
3 wire PNP NO/NC	CD0001	CD0003
3 wire NPN NO/NC	CD0002	CD0004
Sensing surface	Non-flush	Non-flush
Operating voltage[V]	10...36VDC	10...36VDC
Current loading[mA]	200mA	200mA
Short-circuit protection	Pulsed	Pulsed
Reverse polarity protection	Yes	Yes
Overload protection	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5
Current consumption[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
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67
Adjustment factors	Water=1/Glass approx 0.4/Ceramic approx 0.2/PVC approx 0.2	
Housing material	PA66+GF	
Switching state	display LED	Yellow(90°)
	operation LED	Green(90°)
	function LED	Red(90°)
Connection	PVC-cable/2m;4 x 0.14mm <sup>2</sup>	M8 Connector
Drawing		

Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Linking your system



## Valve Proximity Sensors



IV series, valve sensors, with target puck, can detect position of valve precisely by its inner IC and temperature compensation circuit which offering a more reliable operation. There are two proximity sensors equipped in one valve sensor. This valve sensor controls the open and close of valve accurately by detecting positions of nuts on the target disc.



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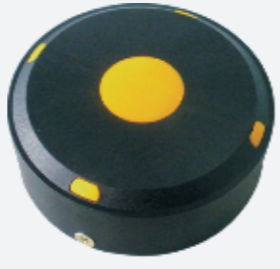
Size	40×30×25mm			
	Cable		Connector	
Standard	4mm	4mm	4mm	4mm
Sensing range	4mm	4mm	4mm	4mm
	CE RoHS	CE RoHS	CE RoHS	CE RoHS
3 wire PNP NO	IV0001		IV0005	
3 wire PNP NC	IV0003		IV0007	
3 wire NPN NO		IV0002		IV0006
3 wire NPN NC		IV0004		IV0008
Sensing surface	Non-flush	Non-flush	Non-flush	Non-flush
Operating voltage[V]	10-36DC	10-36DC	10-36DC	10-36DC
Current loading[mA]	250	250	250	250
Short-circuit protection	Pulsed	Pulsed	Pulsed	Pulsed
Reverse polarity protection	Yes	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes	Yes
Voltage drop[V]	< 2.5	< 2.5	< 2.5	< 2.5
Leakage current[mA]	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)	< 15(24VDC)
Real sensing range[mm]	4 ± 10%	4 ± 10%	4 ± 10%	4 ± 10%
Operating range[mm]	0...3.2	0...3.2	0...3.2	0...3.2
Switch-point drift [%Sr]	-10...10	-10...10	-10...10	-10...10
Hysteresis [%Sr]	1...15	1...15	1...15	1...15
Switching frequency [Hz]	1300	1300	1300	1300
Ambient temperature [°C/°F]	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176	-25...80/-13...176
Protection classification	IP67	IP67	IP67	IP67
Adjustment factors	Low carbon steel=1/stainless steel sprox 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2			
Housing material	PBT			
Display LED	Red:upside sensing face output Green:downside sensing face output			
Connection	PVC-cable/2m;4×0.14mm <sup>2</sup>		M12 Connector	
Accessories	two fixed nuts, two fixed screws			
Drawing				

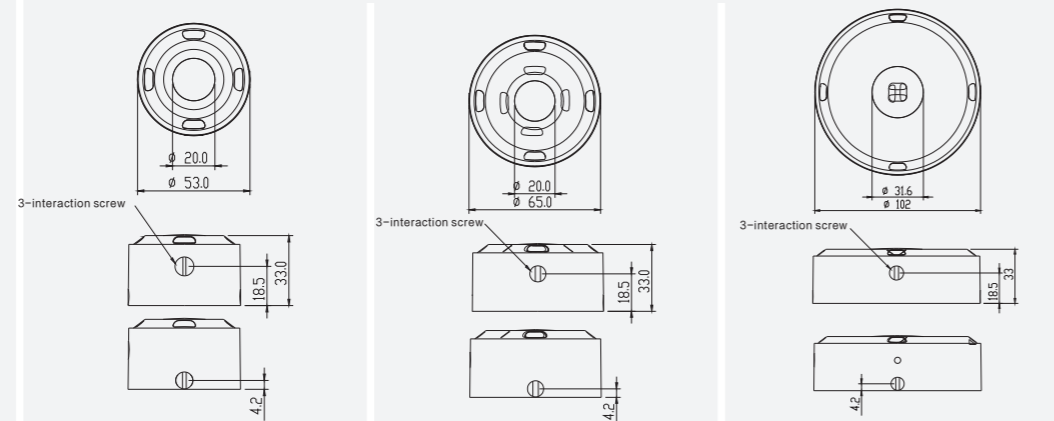
Inductive Proximity Sensors

Capacitive Proximity Sensors

Valve Proximity Sensors

Speed Monitor

Size	53mm	65mm	102mm
			
	CE RoHS	CE RoHS	CE RoHS
Order No.	US0024	US0025	US0026
Sensing face number[pcs]	3		
Sensing face angle[degree]	90		
Sensing face dimension[mm]	Φ8 Circular		
Adjustment factors	Low carbon steel=1/stainless steel approx 0.7/Brass approx 0.4/Alumium approx 0.3/Copper approx 0.2		
Ambient temperature [°C]	-25...80		
Protection classification	IP67		
Housing material	PA66;PVC[Yellow marks]		
Installation	Φ6 locking screw		





## Speed Monitor



This product can complete test and monitor the speed or pulse sequences by the collections of sensors. It can monitor rotating motion, straight-line motion, and all physical units converted to the pulse-group. It owns powerful and various functions for monitoring the excessive frequency, the speed rate, operation synchronization, and the reverse (slow/quick rate of rotation, and time-consuming synchronization or direction)



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## Features



- Smart speed monitor. User can easily set the frequency, rotation rate, pulse, and the warning signal
- Output: PNP, NPN, Relay, 0/4~20mA, 0~10V
- Display: LCD
- Power protection: overload, short-circuit, reverse polarity
- Mounting: DIN35
- Protection classification: IP50
- Certification: CE, RoHS

## Applications

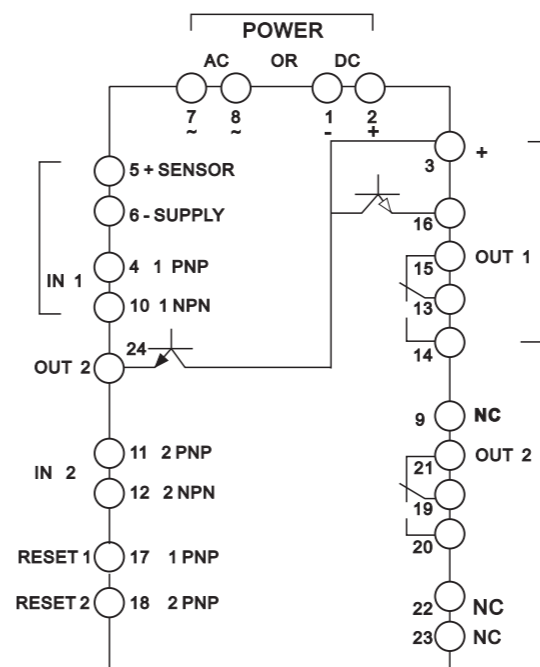
This product is applied to monitor rapid pulse-group and meantime the standard signal collected by the sensors can be displayed, detected, and recorded. It is used to broadly monitor the operation of the electric machinery, the rotation of the conveyor belt, the rotation of the wind turbines blades, and the direction of electric machinery.

## Operating principle

This product can complete test and monitor the speed or pulse sequences by the collections of sensors. It can monitor rotating motion, straight-line motion, and all physical units converted to the pulse-group. It owns powerful and various functions for monitoring the excessive frequency, the speed rate, operation synchronization, and the reverse (slow/quick rate of rotation, and time-consuming synchronization or direction).

## Connection

### 1.1 Dual channel input



### Wiring

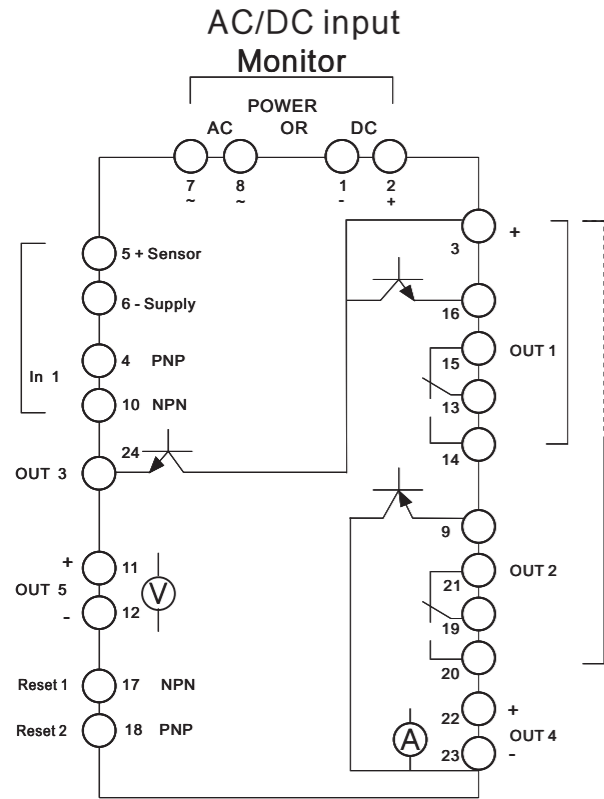
Lead	Function	Lead	Function
1	DC Supply voltage(L-)	13	Relay 1 (center contact)
2	DC Supply voltage(L+)	14	Relay 1 (NO contact)
3	Supply transistor outputs(L+)	15	Relay 1 (NC contact)
4	Sensor signal PNP	16	Transistor output 1 PNP
5	DC Sensor supply (L+)	17	Reset 1 PNP
6	DC Sensor supply (L-)	18	Reset 2 PNP
7	AC Supply voltage	19	Relay 2 (center contact)
8	AC Supply voltage	20	Relay 2 (NO contact)
9	NC	21	Relay 2 (NC contact)
10	Sensor signal NPN	22	NC
11	Sensor signal 2 NPN	23	NC
12	Sensor signal 2 NPN	24	Transistor output 2 PNP

Relay output (Out1/2)

Transistor output (Out1/2/3) Reset input (reset1 and reset2)

**Connection**

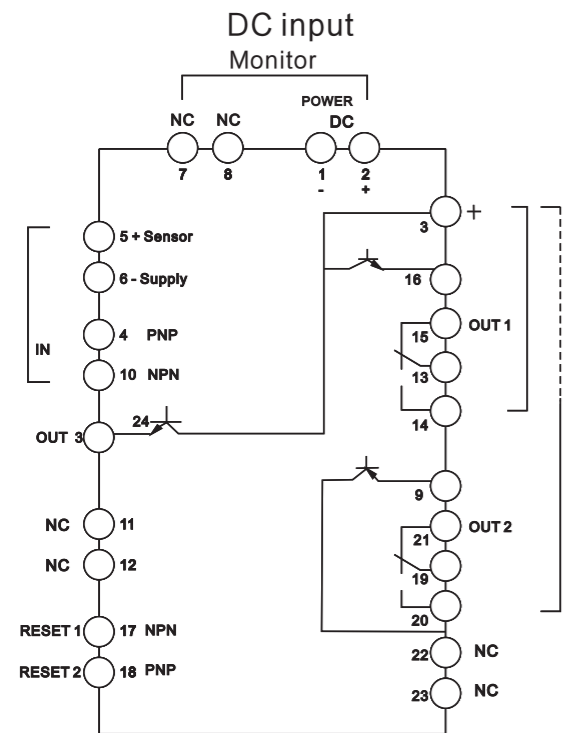
1.2 Single channel input



Relay output (Out1/2) Analogue output (Out4/5)  
Transistor output (Out1/2/3) Reset input (reset1 and reset2)

Wiring

Lead	Function	Lead	Function
1	DC Supply voltage(L-)	13	Relay 1 (center contact)
2	DC Supply voltage(L+)	14	Relay 1 (NO contact)
3	Supply transistor outputs(L+)	15	Relay 1 (NC contact)
4	Sensor signal PNP	16	Transistor output 1 PNP
5	DC Sensor supply (L+)	17	Reset 1 NPN
6	DC Sensor supply (L-)	18	Reset 2 PNP
7	AC Supply voltage	19	Relay 2 (center contact)
8	AC Supply voltage	20	Relay 2 (NO contact)
9	Transistor output(NPN)	21	Relay 2 (NC contact)
10	Sensor signal NPN	22	Analogue current output (+)
11	Analogue voltage output(L+)	23	Analogue current output (-)
12	Analogue voltage output(L-)	24	Transistor output 2 PNP



Relay output (Out1/2) Transistor output (Out1/2/3) Reset input (reset1 and reset2)

Wiring

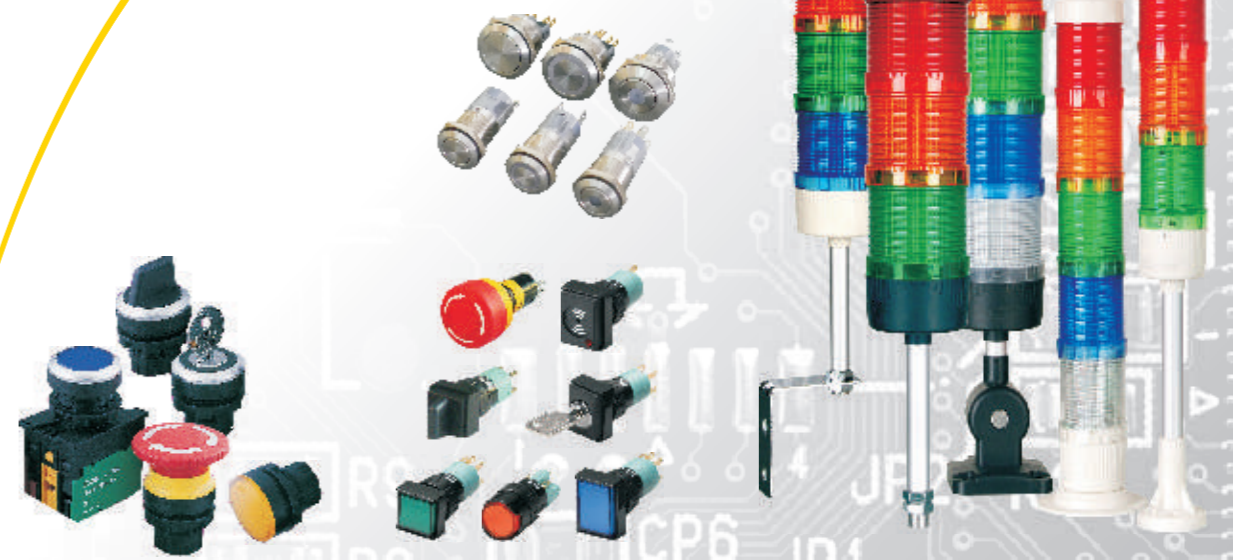
Lead	Function	Lead	Function
1	DC Supply voltage(L-)	13	Relay 1 (center contact)
2	DC Supply voltage(L+)	14	Relay 1 (NO contact)
3	Supply transistor outputs(L+)	15	Relay 1 (NC contact)
4	Sensor signal PNP	16	Transistor output 1 PNP
5	DC Sensor supply (L+)	17	Reset 1 NPN
6	DC Sensor supply (L-)	18	Reset 2 PNP
7	NC	19	Relay 2 (center contact)
8	NC	20	Relay 2 (NO contact)
9	Transistor output NPN	21	Relay 2 (NC contact)
10	Sensor signal NPN	22	NC
11	NC	23	NC
12	NC	24	Transistor output 2 PNP

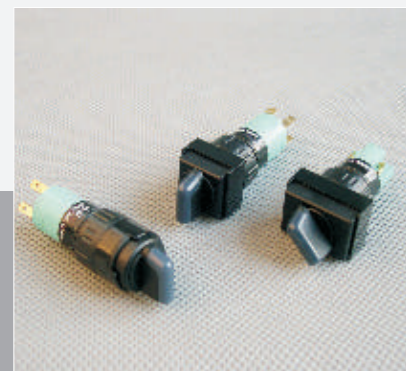
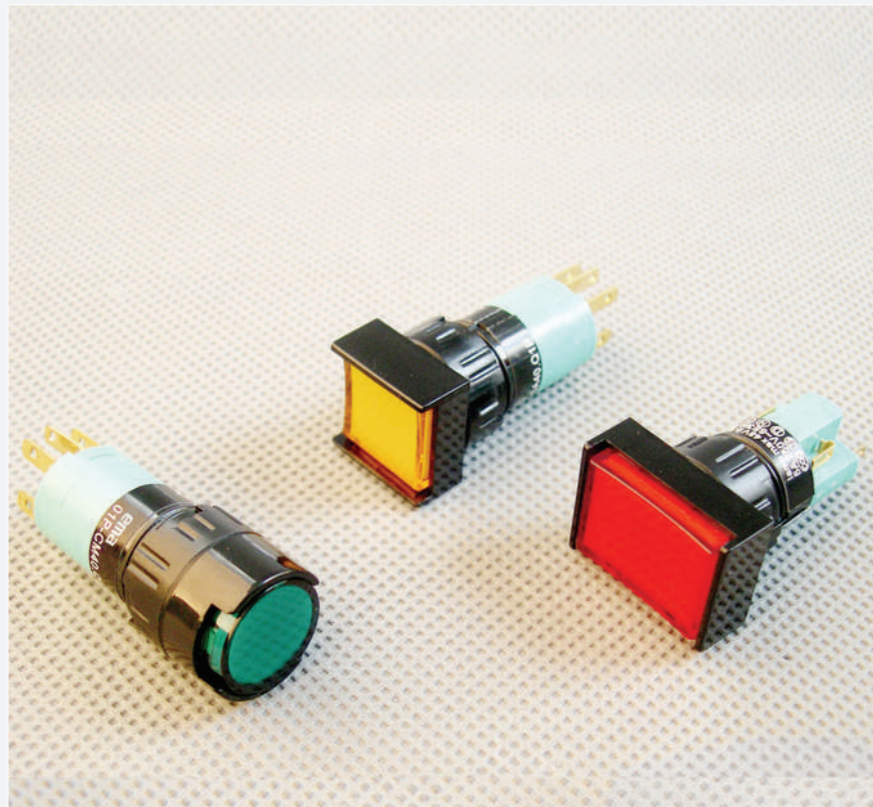
Order No.	SM1001	SM1003	SM1002
Model	Single channel input	Single channel input	Dual channel input
Applications	Detection of frequency, rotational rate speed, pulse & the cycle time		
Setting range [ Rotational rate/ Frequency ]	1...60000RPM/0.1...1000.0HZ		
Rated voltage[V]	230VAC(50-60HZ)/24VDC	24VDC	230VAC(50-60HZ)/24VDC
Voltage tolerance[%]	10%		
Contact loading	8A(1250VA/250VAC)		
Power consumption[VA]	5(3W)		
Analogue output	0/4...20mA ( 500 Ω ) ; 0...10V	-	-
Pulse input	PNP/NPN; Supply voltage:24VDC/15mA, Switch point for PNP:>12V On; <5V Off, Switch point for NPN:>15V Off;<5V on Input frequency (Max.): 5KHz (Corresponding min.pulse length/interval 0.1ms)		
Transistor output	PNP / NPN	PNP / NPN	PNP
Measuring error[% of the final value]	< 1%		
Switching function	Two switching points for monitoring the output is below/above setting range		
Max.relative air humidity [%]	75 ( 35°C )		
Ambient temperature[°C/°F]	-20...60/-4...140		
Storage temperature[°C/°F]	-25...80/-13...176		
Protection classification	IP50 / IP20		
Housing material	PBT+GF		
Function display	Switching State LED	Green (Light on under actuation of relay/connection of transistor)	
	Input signal LED	Red	
	Function LED	LCD Display:7/14 Segment	
Connection	Dual-chamber terminals		
Drawing			

Inductive Proximity Sensors  
Capacitive Proximity Sensors  
Valve Proximity Sensors  
Speed Monitor

## Control Switches

- 16mm Control Switches
- 22 / 25 / 30mm Control Switches
- 16 / 22mm Stainless Steel Control Switches
- 30 / 50 / 70mm Multi-Layer Light Tower

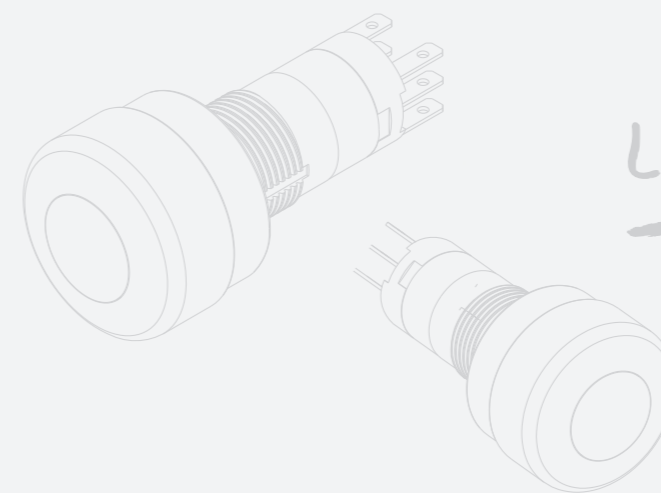




## 16mm control switches

## 16mm control switches

Indicators	76 - 77
Pushbutton switches	78 - 79
Selector switches	80 - 81
Emergency stop switches	82 - 83
Keylock switches	84 - 85
Buzzers	86 - 87
Accessories	88 - 91



Linking your system

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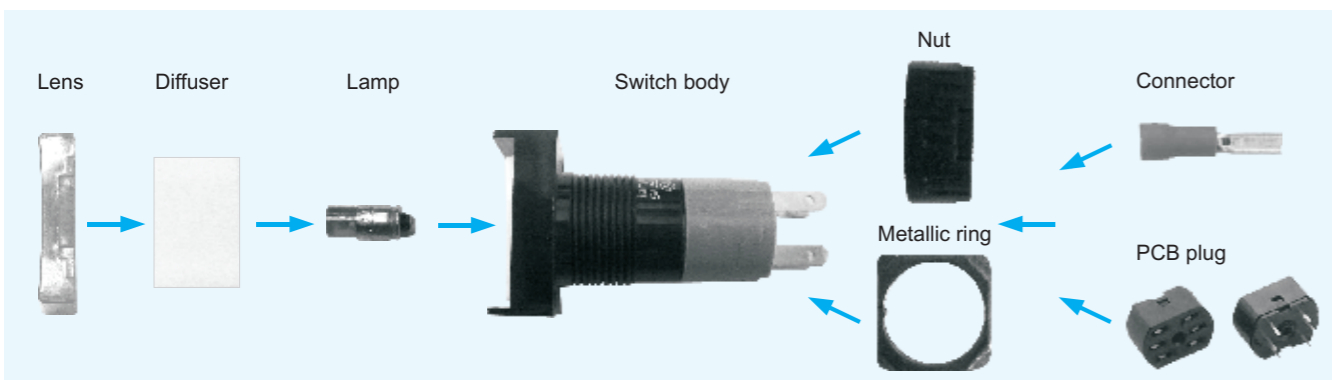
### Features

- Mounting hole diameter 16mm, there shapes are available: rectangular 18x24m/m, square 18x18m/m and round 18m/m.
- The rubber-sealed type IP65 provided to prevent the liquid penetration in front of panel.
- High bezel that prevents accidental touching
- Illuminated by midjet grooved T1 3/4 lamps including discharged and LED lamps
- Snap-action which accelerates on-off switching
- Normally closed and normally open contacts in each switch block
- High performance plastics resistant to high-temperature and oil-polluted environments
- UL 94V0 class plastics to make self-extinguished

### Technical Specifications

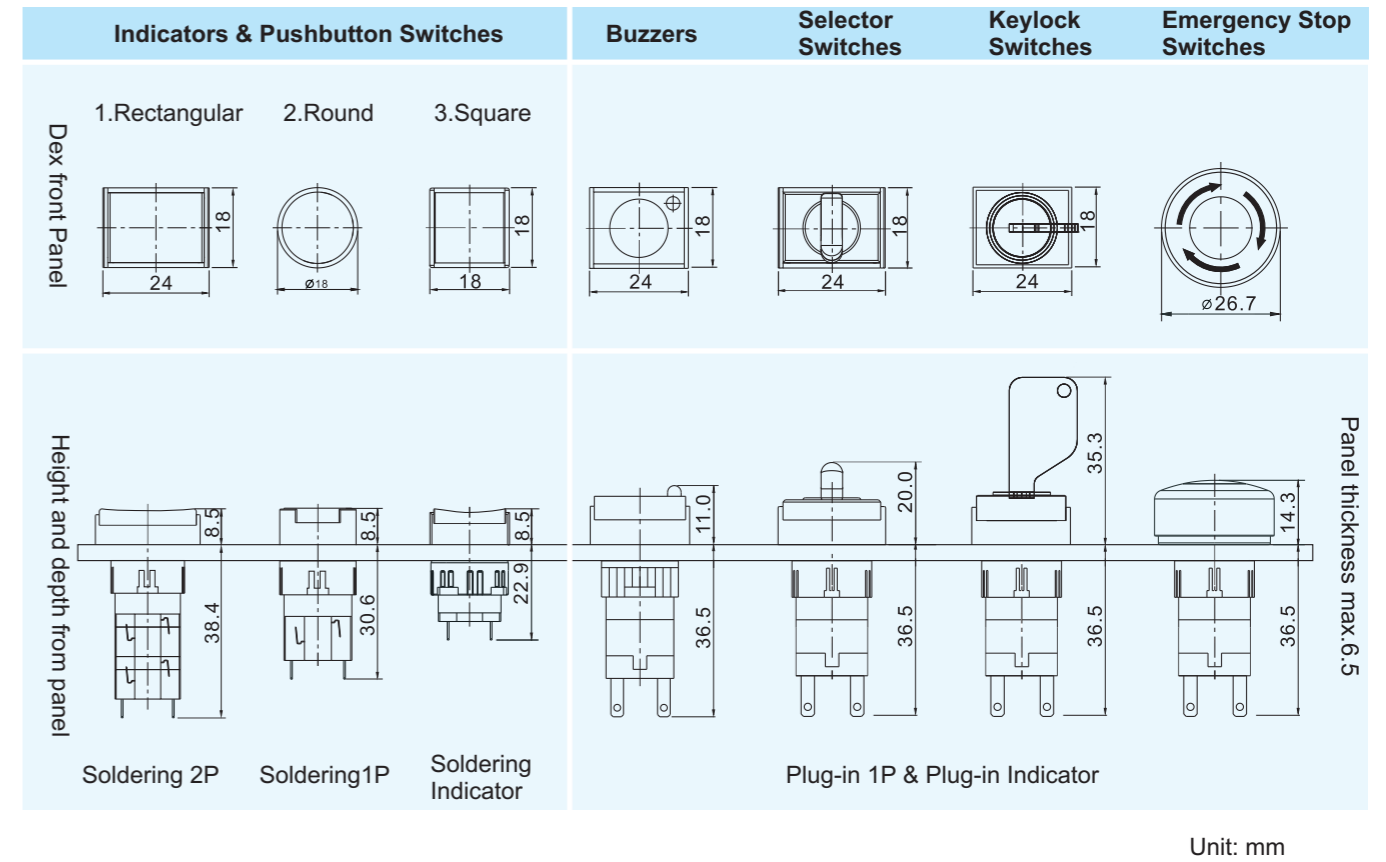
- Contact materials: gold flushed silver
- Breaking capacity: 250VAC/5A(p.f. ≥0.9)
- Contact resistance: < 50MΩ
- Electrical lifetime:
  - 5A/250VAC 50,000 operations
  - 4A/250VAC 60,000 operations
  - 2A/250VAC 200,000 operations
  - 1A/250VAC 400,000 operations
- Maximal insulation: 2500VAC,50Hz,1min between all terminals and plastic case
- Insulation resistance: ≥ 10<sup>4</sup>MΩ at 500VDC
- Soldering heat resistance: 300°C/5s
- Operating temperature: -25°C ~ +55°C
- Storage temperature: -40°C ~ +85°C
- Housing materials: high-performance plastics resistant to high temperature and Oil-polluted environments,self-extinguished.

### Mounting

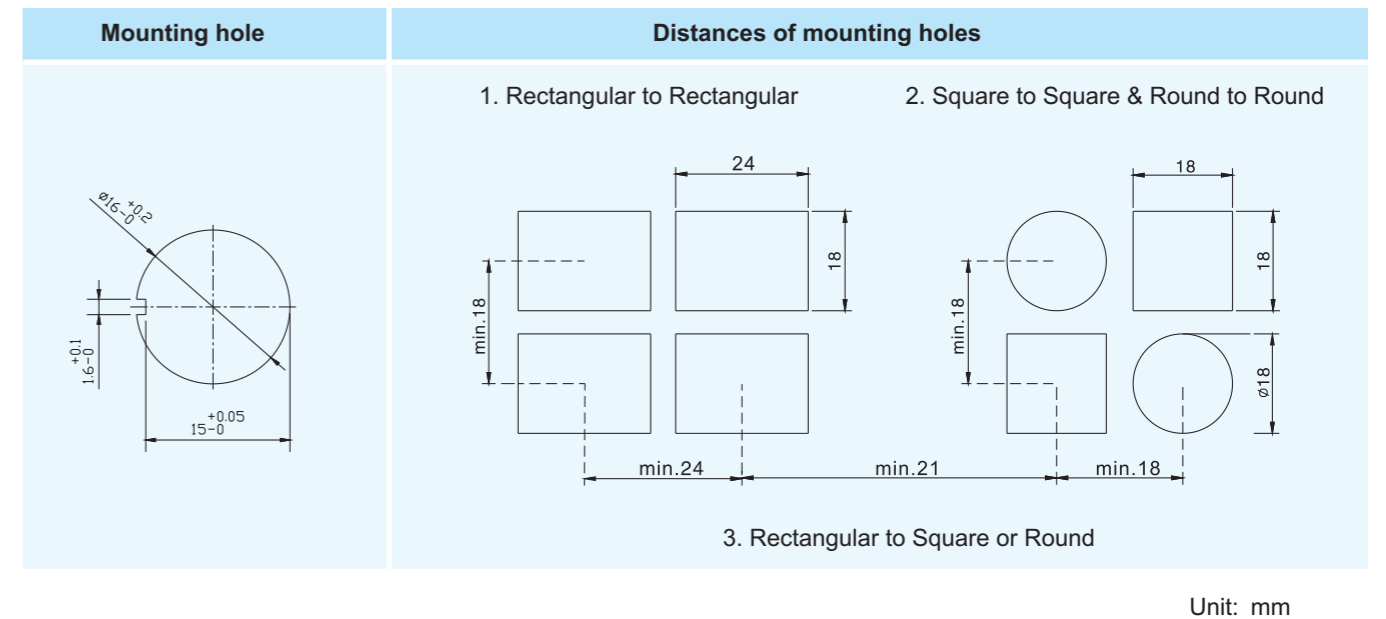


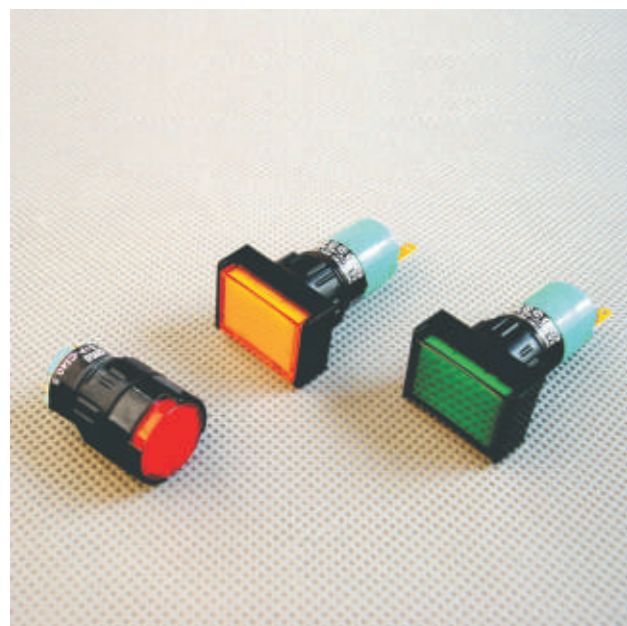
### Shapes and Panel mounting

#### ■ Apparent dimensions



#### ■ Panel mounting





- Mounting hole diameter 16mm  
Apparent shapes with rectangular 18X24mm, square 18X18mm and round 18mm
- Illuminated by midjet grooved T1 3/4 lamps including incandescent, discharged and LED lamps
- The lifetime of LED with high brightness up to 50000 hours



Coding Principle

01 P - R I 40 . Q + W + L 24 Y  
I II III IV V VI VII VIII IX X

I: Series code	01 Series with 16mm diameter mounting hole
II: Main category	P=Indicators
III: Front shape	C=Round S=Square R=Rectangular
IV: Function code	I=Indicators
V: Protection rating	40=Standard 65=Rubber-sealed
VI: Terminal type	S=Soldering Q=Plug-in
VII: Cap color	R=Red, Y=Yellow, O=Orange, G=Light Green, V=Deep Green, B=Blue, W=White, K=Black
VIII: Light source	L=LED lamp D=Incandescent lamp A=Discharged lamp Omission=Without lamp
IX: Operating voltage	06=6VDC 12=12VDC 24=24VDC 11=110VAC 22=220VAC
X: Extra code	If the color of lamps and lens are different, please add this code to indicate the color of lamp

Note 1: Available colors of LED are red,yellow, green, blue,white  
 The standard matches between cap and LED are as followed:  
 R→Red LED Y→Yellow LED O→Orange LED G→Green LED  
 V→Green LED B→Blue LED W→Yellow / White LED  
 The standard matches between cap and lamp are as followed:  
 W、R、Y、O→Red lamp G、B、V→Green lamp

Order information

Order No.	
01P-RI40.Q	01P-CI40.S
01P-RI65.Q	01P-CI65.S
01P-RI40.S	01P-SI40.Q
01P-RI65.S	01P-SI65.Q
01P-CI40.Q	01P-SI40.S
01P-CI65.Q	01P-SI65.S



- Mounting hole diameter 16mm  
Apparent shapes with rectangular 18X24mm, square 18X18mm and round 18mm
- High bezel that prevents accidental touching
- Illuminated by midget grooved T1 3/4 lamps including incandescent, discharged and LED lamps
- Snap-action which accelerates on-off switching
- Normally closed and normally open contacts in each switch block
- Actuating travel: 3mm
- Mechanical lifetime: Momentary 2X10<sup>6</sup> operations; Alternative 1X10<sup>6</sup> operations



01 P — R A 40 . Q 1P + W + L 24 Y  
I II III IV V VI VII VIII IX X XI

I: Series code	01 Series with 16mm diameter mounting hole	
II: Main category	P=Pushbutton Switches	
III: Front shape	C=Round	S=Square R=Rectangular
IV: Function code	M=Momentary	A=Alternative
V: Protection rating	40=Standard	65=Rubber-sealed
VI: Terminal type	S=Soldering	Q=Plug-in
VII: Contact mode	1P=1A1B	2P=2A2B
VIII: Cap color	R=Red, Y=Yellow, O=Orange, G=Light Green, V=Deep Green, B=Blue, W=White, K=Black	
IX: Light source	L=LED lamp D=Incandescent lamp A=Discharged lamp Omission=Without lamp	
X: Operating voltage	06=6VDC 12=12VDC 24=24VDC 11=110VAC 22=220VAC	
XI: Extra code	If the color of lamps and lens are different, please add this code to indicate the color of lamp	

Note 1: Available colors of LED are red,yellow, green, blue,white  
 The standard matches between cap and LED are as followed:  
 R→Red LED Y→Yellow LED O→Orange LED G→Green LED  
 V→Green LED B→Blue LED W→Yellow / White LED  
 The standard matches between cap and lamp are as followed:  
 W、R、Y、O→Red lamp G、B、V→Green lamp

Order information

Order No.	
01P-RM40.Q1P	01P-CA40.S1P
01P-RM65.Q1P	01P-CA65.S1P
01P-RA40.Q1P	01P-CM40.S2P
01P-RA65.Q1P	01P-CM65.S2P
01P-RM40.S1P	01P-CA40.S2P
01P-RM65.S1P	01P-CA65.S2P
01P-RA40.S1P	01P-SM40Q1P
01P-RA65.S1P	01P-SM65.Q1P
01P-RM40.S2P	01P-SA40.Q1P
01P-RM65.S2P	01P-SA65.Q1P
01P-RA40.S2P	01P-SM40.S1P
01P-RA65.S2P	01P-SM65.S1P
01P-CM40.Q1P	01P-SA40.S1P
01P-CM65.Q1P	01P-SA65.S1P
01P-CA40.Q1P	01P-SM40.S2P
01P-CA65.Q1P	01P-SM65.S2P
01P-CM40.S1P	01P-SA40.S2P
01P-CM65.S1P	01P-SA65.S2P

16mm Control Switches

22/25/30mm Control Switches

16/22mm Stainless Steel Switches

30/50/70mm Multi-Layer Light Tower



- Mounting hole diameter 16mm  
Apparent shapes with rectangular 18X24mm, square 18X18mm and round 18mm
- Snap-action which accelerates on-off switching
- Normally closed and normally open contacts in each switch block
- Actuating travel: 2 positions L 90° and V 90°
- Mechanical lifetime: 50000 operations



**Coding Principle**

01
S
—
R
A
40
.
Q
1P
\*
L

I    II    III    IV    V    VI    VII    VIII

I: Series code	01 Series with 16mm diameter mounting hole		
II: Main category	S=Selector Switches		
III: Front shape	C=Round	S=Square	R=Rectangular
IV: Function code	M=2 way Momentary	A=2 way Alternative	
V: Protection rating	40=Standard	65=Rubber-sealed	
VI: Terminal type	S=Soldering	Q=Plug-in	
VII: Contact mode	1P=1A1B	2P=2A2B	
VIII: Knob type	L=L type 90°	V=V type 90°	

**Order information**

Order No.	
01S-RM40.Q1P	01S-CA40.S1P
01S-RM65.Q1P	01S-CA65.S1P
01S-RA40.Q1P	01S-CM40.S2P
01S-RA65.Q1P	01S-CM65.S2P
01S-RM40.S1P	01S-CA40.S2P
01S-RM65.S1P	01S-CA65.S2P
01S-RA40.S1P	01S-SM40.Q1P
01S-RA65.S1P	01S-SM65.Q1P
01S-RM40.S2P	01S-SA40.Q1P
01S-RM65.S2P	01S-SA65.Q1P
01S-RA40.S2P	01S-SM40.S1P
01S-RA65.S2P	01S-SM65.S1P
01S-CM40.Q1P	01S-SA40.S1P
01S-CM65.Q1P	01S-SA65.S1P
01S-CA40.Q1P	01S-SM40.S2P
01S-CA65.Q1P	01S-SM65.S2P
01S-CM40.S1P	01S-SA40.S2P
01S-CM65.S1P	01S-SA65.S2P

16mm Control Switches

22/25/30mm Control Switches

16/22mm Stainless Steel Switches

30/50/70mm Multi-Layer Light Tower



- Mounting hole diameter 16mm, Front size is round diameter 26mm
- Cladding cover design to meet the requirement of European system
- There are only red LED and red discharged lamp available in illuminated emergency switch
- Snap-action which accelerates on-off switching
- Normally closed and normally open contacts in each switch block
- Mechanical lifetime: 50000 operations



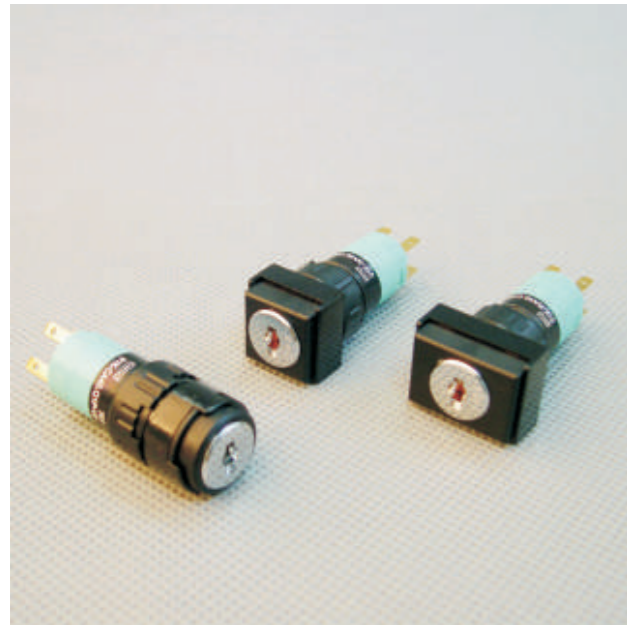
Coding Principle

01 S — C E 40 . Q 1P + R + L 12  
I II III IV V VI VII VIII IX X

I: Series code	01 Series with 16mm diameter mounting hole	
II: Main category	S=Emergency Stop Switches	
III: Front shape	C=Round	
IV: Function code	E=Rotate to reset	
V: Protection rating	40=Standard	65=Rubber-sealed
VI: Terminal type	S=Soldering	Q=Plug-in
VII: Contact mode	1P=1A1B	2P=2A2B
VIII: Light color	R=Red	
IX: Light source	L=LED lamp	Omission=Without lamp
X: Operating voltage	06=6VDC 12=12VDC 24=24VDC 11=110VAC 22=220VAC	

Order information

Order No.	
01S-CE40.Q1P	01S-CE65.S1P
01S-CE65.Q1P	01S-CE40.S2P
01S-CE40.S1P	01S-CE65.S2P



- Mounting hole diameter 16mm  
Apparent shapes with rectangular 18X24mm, square 18X18mm and round 18mm
- Snap-action which accelerates on-off switching
- Normally closed and normally open contacts in each switch block
- Actuating travel: 2 positions L 90° and V 90°
- Mechanical lifetime: 50000 operations



Coding Principle

01 K — R A 40 . Q 1P \* L2 \* 702  
I II III IV V VI VII VIII IX

I: Series code	01 Series with 16mm diameter mounting hole		
II: Main category	K=Keylock Switches		
III: Front shape	C=Round	S=Square	R=Rectangular
IV: Function code	M=2 Way Momentary	A=2 Way Alternative	
V: Protection rating	40=Standard	65=Rubber-sealed	
VI: Terminal type	S=Soldering	Q=Plug-in	
VII: Contact mode	1P=1A1B	2P=2A2B	
VIII: Inlet type	L1=L type 90° one inlet V1=V type 90° one inlet	L2=L type 90° two inlets V2=V type 90° two inlets	
IX: Key code	702=No. 702	168=No. 168	

Note: Key No.702 is the standard

Order information

Order No.	
01K-RM40.Q1P	01K-CA40.S1P
01K-RM65.Q1P	01K-CA65.S1P
01K-RA40.Q1P	01K-CM40.S2P
01K-RA65.Q1P	01K-CM65.S2P
01K-RM40.S1P	01K-CA40.S2P
01K-RM65.S1P	01K-CA65.S2P
01K-RA40.S1P	01K-SM40.Q1P
01K-RA65.S1P	01K-SM65.Q1P
01K-RM40.S2P	01K-SA40.Q1P
01K-RM65.S2P	01K-SA65.Q1P
01K-RA40.S2P	01K-SM40.S1P
01K-RA65.S2P	01K-SM65.S1P
01K-CM40.Q1P	01K-SA40.S1P
01K-CM65.Q1P	01K-SA65.S1P
01K-CA40.Q1P	01K-SM40.S2P
01K-CA65.Q1P	01K-SM65.S2P
01K-CM40.S1P	01K-SA40.S2P
01K-CM65.S1P	01K-SA65.S2P

16mm  
Control Switches

22/25/30mm  
Control Switches

16/22mm  
Stainless Steel  
Switches

30/50/70mm  
Multi-Layer  
Light Tower



- Mounting hole diameter 16mm  
Apparent shapes with rectangular 18X24mm, square 18X18mm and round diameter 18mm
- 70dB at a distance 30cm
- Current consumption Max. 7mA



Coding Principle

01 B — R I 40 . Q \* 24 FR  
I II III IV V VI VII VIII

I: Series code	01 Series with 16mm diameter mounting hole		
II: Main category	B=Buzzers		
III: Front shape	C=Round	S=Square	R=Rectangular
IV: Function code	C=Continuous	I=Intermittent	
V: Protection rating	40=Standard		
VI: Terminal type	S=Soldering	Q=Plug-in	
VII: Operating voltage	06=6VDC 12=12VDC 24=24VDC		
VIII: Light source	R=Red LED lamp FR=Flash LED Omission=Without lamp		


Note: Only rectangular shape can be assembled lamps.



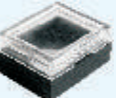
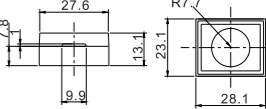
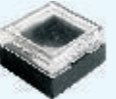
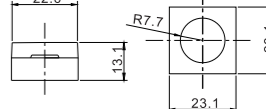

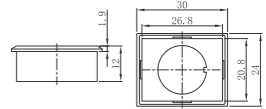

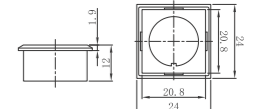

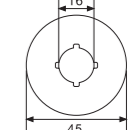

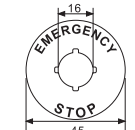
Order information

Order No.	
01B-RC40.Q *◇◇	01B-CC40.Q
01B-RI40.Q *◇◇	01B-CI40.Q
01B-RC40.S *◇◇	01B-CC40.S
01B-RI40.S *◇◇	01B-CI40.S
01B-RC40.Q	01B-SC40.Q
01B-RI40.Q	01B-SI40.Q
01B-RC40.S	01B-SC40.S
01B-RI40.S	01B-SI40.S

Note: ◇ Assembled lamps

**Accessories**

Order No.	Anti-twisting Ring	Description	Drawing
01Z-100		Enhance the anti-twisting torque	
Order No.	Rectangular cover	Description	Drawing
01Z-200.R		Suitable to rectangular cover	
Order No.	Square cover	Description	Drawing
01Z-200.S		Suitable to square cover	
Order No.	PCB Plug-in Base	Description	Drawing
01Z-300		Only for plug-in terminals	
Order No.	Blanking Plate	Description	Drawing
01Z-400		For blanking hole	 仅供16mm/m开孔用
Order No.	BA9s Lamp	Description	Drawing
L.T134-L06.R(Y/G/B/W)		LED Lamp Red(Yellow/Green/Blue/White), 6VDC/AC	
L.T134-L12.R(Y/G/B/W)		LED Lamp Red(Yellow/Green/Blue/White), 12VDC/AC	
L.T134-L24.R(Y/G/B/W)		LED Lamp Red(Yellow/Green/Blue/White), 24VDC/AC	
L.T134-L11.R(Y/G/B/W)		LED Lamp Red(Yellow/Green/Blue/White), 110 VAC	
L.T134-L22.R(Y/G/B/W)		LED Lamp Red(Yellow/Green/Blue/White), 220 VAC	
L.T134-A11.R(G)		Discharged Lamp Red(Green), 110VAC	
L.T134-A22.R(G)		Discharged Lamp Red(Green), 220VAC	

Order No.	Connector	Description	Drawing
01Z-500		Only for plug-in terminals	-
Order No.	Insulation Cover	Description	Drawing
01Z-600		Only for plug in terminals	-
Order No.	Dust-proof rectangular cover	Description	Drawing
01Z-700.R		Suitable to rectangular cover	
Order No.	Dust-proof square cover	Description	Drawing
01Z-700.S		Suitable to square cover	
Order No.	Cover	Description	Drawing
01Z-800.R		Suitable to rectangular flush mounting	
Order No.	Cover	Description	Drawing
01Z-800.S		Suitable to square flush mounting	
Order No.	Blank emergency stop label	Description	Drawing
01Z-900.0 01Z-900.0N		External diameter:45mm, "N" represents that 3M paster is not attached	
Order No.	Emergency-Stop label	Description	Drawing
01Z-900.1 01Z-900.1N		External diameter:45mm, "N" represents that 3M paster is not attached	

16mm Control Switches

22/25/30mm Control Switches

16/22mm Stainless Steel Switches

30/50/70mm Multi-Layer Light Tower

**Accessories**

Order No.	Mounting Tool	Description	Drawing
01Z-T01		Max.torque force : 0.5Nm	-
Order No.	Lens Remover	Description	Drawing
01Z-T02		Easily pull lens, lamps can be changed before mounting panels	-
Order No.	Lamp Remover	Description	Drawing
01Z-T03		Easily pull lenses	-
Order No.		Description	Drawing
01Z-K168		No.168 key	-
Order No.		Description	Drawing
01Z-K702		No.702 key	-
Order No.	Metallic Screw Nut	Description	Drawing
01Z-NU.M		Metallic screw nut can be used if the panel is excessively thick	-

16mm Control Switches

22/25/30mm Control Switches

16/22mm Stainless Steel Switches

30/50/70mm Multi-Layer Light Tower

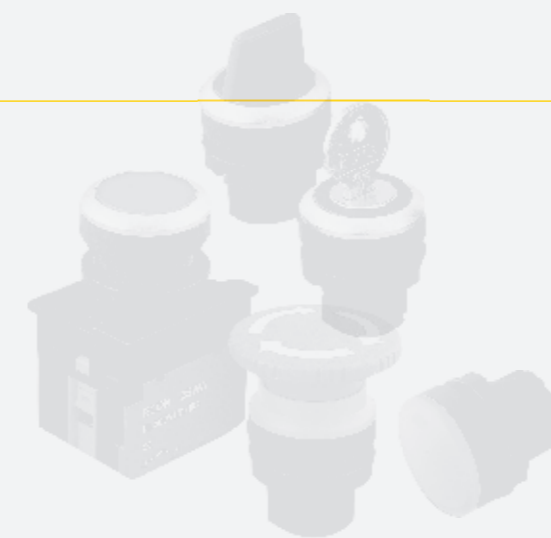


## 22/25/30mm control switches

The illuminated items are equipped with BA9s lamp. Customers could perceive most the delicate and precise design. The lifetime of incandescent lamps is less than 1,000 hours, discharged lamps less than 3,000 hours, but LED lamps could last for at least 50,000 hours. Based on that, the whole appearance appeal to customer's attention and maintenance costs are also highly saved. Besides, high brightness LEDs are also provided to enhance the brightness when used in 110VAC and 220VAC power voltage.

## 22/25/30mm control switches

22mm Eco indicators	100-101
22mm Eco Pushbutton Switches	102-103
22/25/30mm indicators	104-105
22/25/30mm Pushbutton Switches	106-111
22/25/30mm Selector Switches	112-115
22/25/30mm Emergency Stop Switches	116-117
22/25mm Foolproof E-stop switches	118-119
22/25/30mm Keylock Switches	120-121
22/25/30mm Buzzers	122-123
Accessories	124-127



Linking your system

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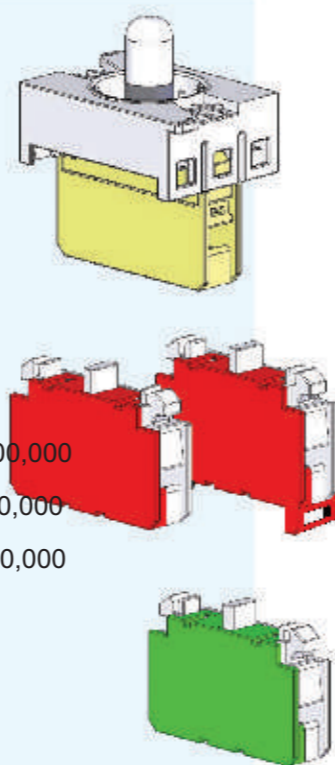
### Features

- 22、25 and 30mm mounting holes: to fulfill your intentions of choice and replacement.
- Whole series slim; delicate and light, up to the requirement of protection IP40 and IP65.
- Lower and flush housing actuators, highly increase the fine appearance of your panel.
- Flexible and module assembly, effectively decrease the cost of stock.
- Friendly handling and modular design, save your time for the installation.
- High quality elegant and sophisticated design, add the extra value and esthetic feeling into applications.
- Professional selection of engineering materials, overcome the harshest of your environment.
- Contact sliding mechanism, avoid the pollution of contacts and increase switching reliability.
- Approved by safety standards UL、ULc、CCC and CE, provide with fully safety assured products.
- This series meet RoHS directive and satisfy customers' green demands.



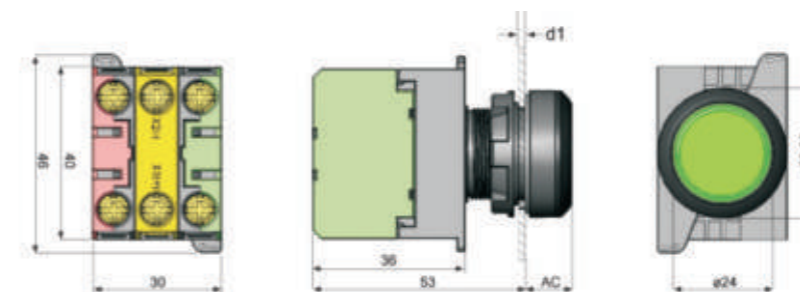
### Technical Specifications

- Safety standard CE/EN60947.5.1, CCC/GB14048.5-2008, UL 508
- Rated capacity  $U_i=600VAC, I_{th}=10A$
- Contact rating AC15:250VAC/6A DC13:250VDC/0.6A
- Contact resistance MAX.50mΩ
- Dielectric strength 2500VAC 50Hz, 1min
- Insulation resistance >100MΩ at 500VDC
- Vibration resistance 10g@40~500Hz
- Lamp lifetime Incandescent lamp: ≤ 1,000 hrs LED lamp: ≥ 50,000 hrs
- Mechanical lifetime pushbutton switches: momentary > 3,000,000 maintained > 500,000  
selector switches: momentary > 500,000 maintained > 500,000  
keylock switches: Momentary > 500,000 maintained > 500,000  
emergency stop switches: momentary > 3,000,000
- Electrical lifetime Contact block: AC15 250VAC/6A > 1,000,000  
DC13 250VDC/0.6A > 1,000,000
- Storage temperature -40°C ~ +80°C
- Operating temperature -25°C ~ +55°C



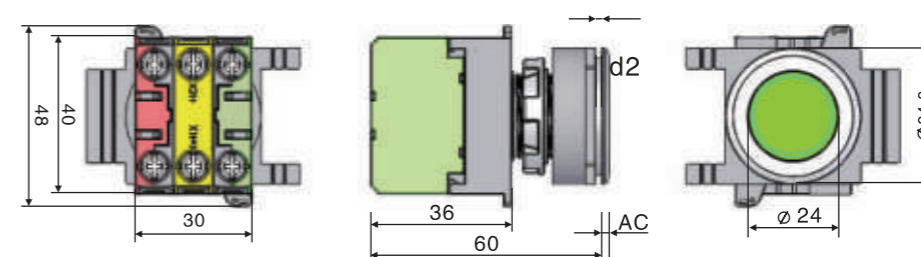
### Dimensions

#### Standard mounting



d1: panel thickness 1~6 units:mm

#### Flush mounting



d1: panel thickness 1~5 units:mm

### AC Size

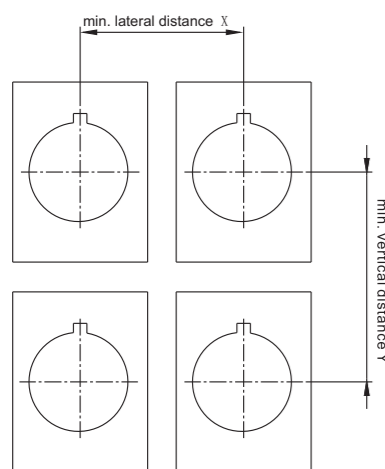
Actuator Type	Description	AC Size	Actuator Type	Description	AC Size
E2I0/H2I0	E2/H2 indicators full lens	11	-		
E2I1/H2I1	E2/H2 indicators flat lens	11	E3I1/H3I1	E3/H3 flush indicators flat lens	2
E2I2/H2I2	E2/H2 indicators raised lens	15	E3I2/H3I2	E3/H3 flush indicators raised lens	6
E2P1/H2P1	E2/H2 flat head /button*	11	E3P1/H3P1	E3/H3 flat head /button*	2
E2P2/H2P2	E2/H2 raised head /button*	15	E3P2/H3P2	E3/H3 raised head /button*	6
E2P3/H2P3	E2/H2 sunken head /button*	15	-		
E2P4/H2P4	E2/H2 mushroom head /button*	26.6/24.3	E3P4/H3P4	E3/H3 mushroom head /button*	17.6/15.3
E2P5/H2P5	E2/H2 high bezel head /button*	15	-		
E2R1/H2R1	E2/H2 mushroom emergency stop	26.6	E3R1/H3R1	E3/H3 mushroom emergency stop	17.6
E2E1/H2E1	E2/H2 Foolproof E-stop	38	-		
E2E2/H2E2	E2/H2 Foolproof E-stop	38	-		
E2E3/H2E3	E2/H2 Foolproof E-stop	61.8	-		
E2SK/H2SK	E2/H2 knob selector	24.5	E3SK/H3SK	E3/H3 flush knob selector	15.5
E2SL/H2SL	E2/H2 lever selector	24.5	E3SL/H3SL	E3/H3 flush lever selector	15.5
E2K/H2K	E2/H2 keylock	34	E3K/H3K	E3/H3 flush keylock	24
E2B/H2B	E2/H2 buzzers	10.5	E3B/H3B	E3/H3 buzzers	2

\* note: "head" means non-illuminated cap and "button" illuminated one

### Cut-out Dimensions

Cut-out Category	Cautions	Hole Dimension
A: 22 mm hole with locating groove	1. Only for standard mounting items 2. Suitable for the batch installation 3. Recommended hole size: 22.5mm	
B: 22mm round hole	1. Only for standard mounting 2. Need to remove the locating lug of the housing by flat screwdriver 3. Recommended hole size: 22.5mm	
C: 25mm round hole	1. Only for standard mounting 2. No need to remove the locating lug of the housing 3. Recommended hole size: 25.5mm	
D: 30mm round hole	1. Only for flush mounting 2. Flush mounting, use [recession frame] to assist position 3. Recommended hole size: 30.5mm	

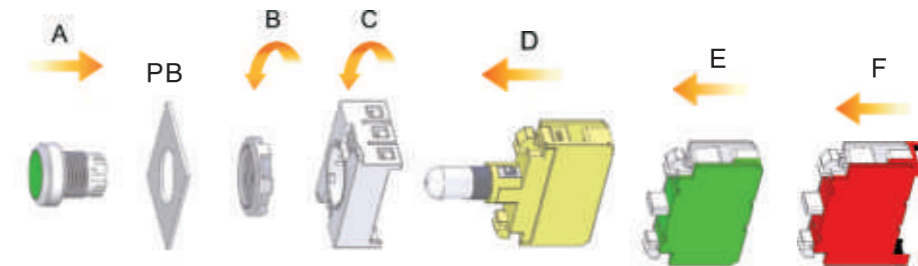
### Cut-out Arrangements



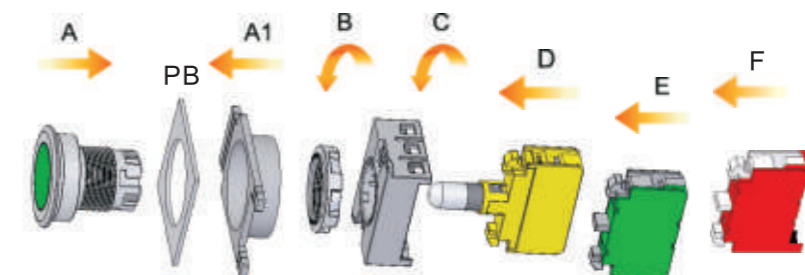
Actuator Type	min. lateral distance X(mm)	min. vertical distance Y(mm)
E2P4 to E2P4 E3P4 to E3P4 (mushroom to mushroom)	45	50
E2S-L to E2S-L two positions 90° E3S-L to E3S-L two positions 90° (lever to lever)	52	50
the others	45	50

### Installation Panel

#### Standard Mounting



#### Flush Mounting



※ Note: PB (Panel Board)

### How to handling

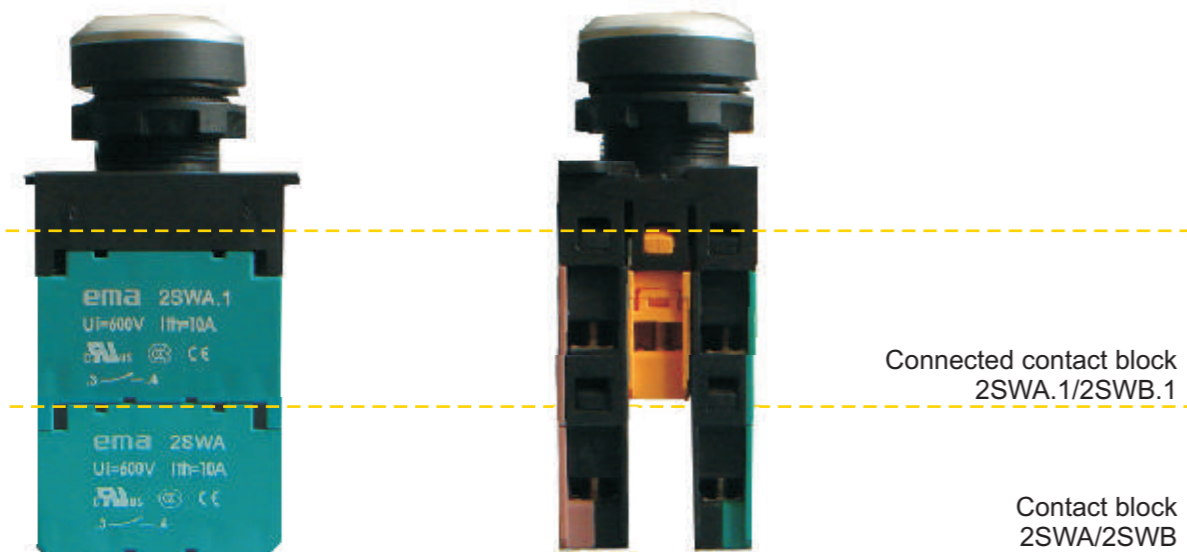
Sequence	Cautions
A : Put the actuator into cut-out hole A1: Flush mounting items need to add the recession frame onto the panel from the back	1. Refer to the dimensions of mounting hole (see page 96) to avoid forcing the actuator in damage 2. Every actuator comes with a rubber parking to be put between the actuator and the panel for the sake of anti-rotation 3. For flush mounting items, choose the accessory [recession frame] to assist position
B : Screw the nut right to settle actuator onto the panel	1. Do not force too much and the tightening torque must not exceed 3 Nm 2. Choose the [anti-twisting ring] 02Z-100 (see page 125) to enhance the anti-rotation torque while needed
C : Put in junction frame and rotate right to wedge in the actuator	Notice the directions of pulling wires while installed and arranged, it should point to the direction of right-hand rotation not to the left to avoid pulling the junction frame left
D : Install lamp holder into junction frame	Install lamp holder first while set-up illuminated items
E : Install contact block into junction frame	Notice the sequence of the contact block, while 3-position selector or keylock switches are installed
F : Add contact block	Choose the [contact block] 2SWA.1 or 2SWB.1 (see page 125)

### How to dismantling

Sequence	Cautions
1. Remove the contact block and lamp holder	1. Place the flat screwdriver under the edge of junction frame, push up to release the switch block and lamp holder 2. If contact block and lamp holder coexist, please remove the contact block first
2. Turn left to dismantle junction frame	-
3. Turn left to release screw nut and then take out the actuator from the cut-out hole	-

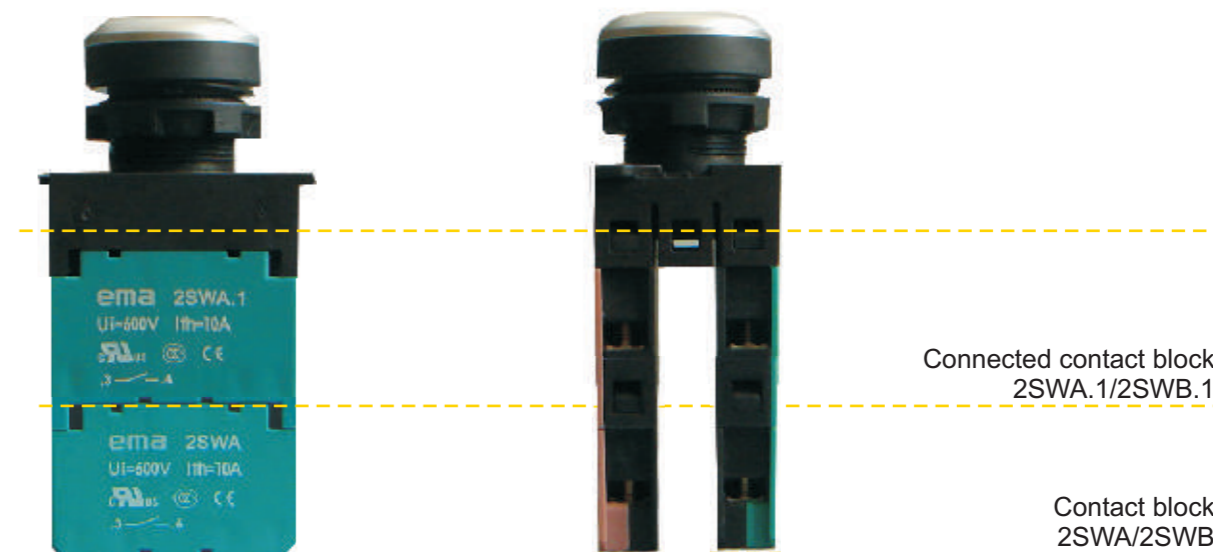
**Coding Principle Of ema Contact Block**

Coding principle of contact block for illuminated switch  
(Injection cut-off point of contact block is Left, another side is Right.)



1 Contact block	1NO	1A	Left 1A
	1NC	1B	Right 1B
2 Contact block	1NO/1NC	AB	Left 1A, Right 1B
	2NO	2A	Left 1A, Right 1A
	2NC	2B	Left 1B, Right 1B
3 Contact block	2NO+1NC	2A1B	Left 2A, Right 1B
	1NO+2NC	1A2B	Left 1A, Right 2B
	2NO+1NO	2A1A	Left 2A, Right 1A
	2NC+1NC	2B1B	Left 2B, Right 1B
4 Contact block	2NO+1NO/1NC	2AAB	Left 2A, Right AB
	2NO+2NC	2A2B	Left 2A, Right 2B
	1NO/1NO+2NC	AB2B	Left AB, Right 2B
	2NO+2NO	2A2A	Left 2A, Right 2A
	2NC+2NC	2B2B	Left 2B, Right 2B

Coding principle of contact block for non-illuminated switch  
(Injection cut-off point of contact block is Left, another side is Right.)



1 Contact block	1NO	1A	Left 1A
	1NC	1B	Right 1B
2 Contact block	1NO/1NC	AB	Left 1A, Right 1B
	2NO	2A	Left 1A, Right 1A
	2NC	2B	Left 1B, Right 1B
3 Contact block	2NO+1NC	2A+1B	Left 1A, Right 1A, Middle 1B
	1NO/1NC+1NC	AB+1B	Left 1A, Right 1B, Middle 1B
	3NO	3A	Left 1A, Right 1A, Middle 1A
	3NC	3B	Left 1B, Right 1B, Middle 1B
4 Contact block	2NO+1NO/1NC	2AAB	Left 2A, Right AB
	2NO+2NC	2A2B	Left 2A, Right 2B
	1NO/1NC+2NC	AB2B	Left AB, Right 2B
	2NO+2NO	2A2A	Left 2A, Right 2A
	2NC+2NC	2B2B	Left 2B, Right 2B



- Concise design, simple construction, reliable operation and long duration
- Long lifetime and brightness LED lamp embedded in E2C0 indicators
- Light and delicate design, up to the requirement of protection IP40
- The material of lightshade features with anti-abrasion and anti-shock
- Five different colors of indicators can be selected
- Voltage of 24VDC, 110VAC, 220 VAC are available



Coding Principle

Economic indicator light: E2C0W

E	2	C	0	W	3	L
---	---	---	---	---	---	---

Part No.	Code Description
E	Protection classification: E=IP40 standard
2	Mouncting size: 2=22mm standard mounting
C0	Type of indicator: economic indicator
W	Cap color: R=red Y=yellow G=green B=blue W=white
3	Type of light: 3=24VDC 4=110VAC 5=220VAC
L	light source: L=LED

E2C0 indicators	Drawing	Color	Built-in LED Part No.
		○	E2C0W◇L
		●	E2C0R◇L
		●	E2C0Y◇L
		●	E2C0G◇L
		●	E2C0B◇L

Remarks :1. ◇Lamp Voltage: 3=24VDC, 4=110VAC, 5=220VAC





- Concise design, simple construction, reliable operation and long duration
- E2P0 Economic pushbutton switches provide intergrated contact 1NO/1NC
- Light and delicate design, up to the requirement of protection IP40
- Non-illuminated momentary switches



Coding Principle

Eco Pushbutton: E2P0

E	2	P	0	R	A	B
---	---	---	---	---	---	---

Part No.	Code Description
E	Protection classification: E=IP40 standard
2	Mouncting size : 2=22mm standard mounting
P0	Type of indicator : economic indicator
R	Cap color : R=red Y=yellow G=green B=blue W=white
AB	Contact mode : AB=1NO/1NC

E2P0 Flat Head	Drawing	Color	Momentary Part No.
		○	E2P0WAB
		●	E2P0RAB
		●	E2P0YAB
		●	E2P0GAB
		●	E2P0BAB





- Elegant and sophisticated design, add the extra value and esthetic feeling into applications
- Professional selection of engineering materials, overcome the harshest of your environment
- Friendly handling and modular design, save your time for the installation
- Flexible and module assembly, effectively decrease the cost of stock
- Whole series slim; delicate and light, up to the requirement of protection IP40 and IP65
- Lower and flush mounting actuators, highly increase the fine appearance of your panel
- 22,25 and 30mm mounting holes, fulfill your intentions of choice and replacement



Coding Principle

Indicators E2I/E3I	E	2	I	0	W	3	L	Y
--------------------	---	---	---	---	---	---	---	---

Part No.	Code Description
E	Classification : E=IP40 Standard H=IP65 Rubber-sealed
2	Mounting size : 2=22mm、 25mm Standard mounting 3= 30mm Flush mounting
I0	Cap style : I0=Full lens, I1=Flat lens, I2=Raised lens
W	Cap color : R=Red, Y=Yellow, G=Green, B=Blue, W=White
3	Operating voltage : 1=6VDC, 2=12VDC, 3=24VDC, 4=110VAC, 5=220VAC
L	Light source : A=Discharged lamp, L=LED lamp, Omission=Without lamp
Y	Extra code : If the color of lamps and lens are different, please add this code to indicate the color of lamp.
Note	E3I0 full lens style is not available

E2I0 Full Lens	Drawing	Color	Built-in LED Part No.	Built-in Incand Part No.
		○	E2I0W◇L	E2I0W◇D
		●	E2I0R◇L	E2I0R◇D
		●	E2I0Y◇L	E2I0Y◇D
		●	E2I0G◇L	E2I0G◇D
		●	E2I0B◇L	E2I0B◇D
E2I1 Flat Lens	Drawing	Color	Built-in LED Part No.	Built-in Incand Part No.
		○	E2I1W◇L	E2I1W◇D
		●	E2I1R◇L	E2I1R◇D
		●	E2I1Y◇L	E2I1Y◇D
		●	E2I1G◇L	E2I1G◇D
		●	E2I1B◇L	E2I1B◇D
E2I2 Raised Lens	Drawing	Color	Built-in LED Part No.	Built-in Incand Part No.
		○	E2I2W◇L	E2I2W◇D
		●	E2I2R◇L	E2I2R◇D
		●	E2I2Y◇L	E2I2Y◇D
		●	E2I2G◇L	E2I2G◇D
		●	E2I2B◇L	E2I2B◇D
E3I1 Flush Flat Lens	Drawing	Color	Built-in LED Part No.	Built-in Incand Part No.
		○	E3I1W◇L	E3I1W◇D
		●	E3I1R◇L	E3I1R◇D
		●	E3I1Y◇L	E3I1Y◇D
		●	E3I1G◇L	E3I1G◇D
		●	E3I1B◇L	E3I1B◇D
E3I2 Flush Raised Lens	Drawing	Color	Built-in LED Part No.	Built-in Incand Part No.
		○	E3I2W◇L	E3I2W◇D
		●	E3I2R◇L	E3I2R◇D
		●	E3I2Y◇L	E3I2Y◇D
		●	E3I2G◇L	E3I2G◇D
		●	E3I2B◇L	E3I2B◇D

Remarks :1. ◇Lamp Voltage:1=6VDC, 2=12VDC, 3=24VDC, 4=110VAC, 5=220VAC  
 2. Discharged lamps powered by 110VAC、 220VAC are available only.  
 3. Please change "E" to "H" for protection rating IP65.  
 4. Please add \*M in the last of order no. if you would like to change the black plastic front ring to the metal ring.  
 5. Please add 'R,'Y,'G,'B,'W,'K,'E if plastic ring of red, yellow, blue, white, black, grey to be replaced.



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- Professional selection of engineering materials, overcome the harshest of your environment
- Friendly handling and module design, save your treasure time while installation
- Flexible and module assembly, effectively decrease the cost of stock
- Whole series slim; delicate and light, up to the requirement of protection IP40 and IP65
- Lower and flush mounting actuators, highly increase the fine appearance of your panel
- 22, 25 and 30mm mounting holes, fulfill your intentions of choice and replacement



Coding Principle

Pushbutton Switches E2P/E3P	E	2	P	1	W	1	A	3	L	Y	.	A
-----------------------------	---	---	---	---	---	---	---	---	---	---	---	---

Part No.	Code Description
E	Classification : E=IP40 Standard H=IP65 Rubber-sealed
2	Mounting size : 2=22mm、25mm Standard mounting 3= 30mm Flush mounting
P1	Cap style : Non-illumination P1=Flat head, P2=Raised head, P3=Sunken head P4=Mushroom head, P5=High bezel head Illumination P1=Flat button, P2=Raised button, P3=Sunken button P4=Mushroom button, P5=High bezel button
W	Cap color : R=Red, Y=Yellow, G=Green, B=Blue, W=White, K=Black
1A	Contact mode : A=1NO B=1NC, provide 1A,2A,3A,1B,2B,3B,AB,2A1B,1A2B,2B1B,2AAB,AB2B,2A2A,2B2B
3	Operating voltage : 1=6VDC, 2=12VDC, 3=24VDC, 4=110VAC, 5=220VAC
L	Light source : A=Discharged lamp, L=LED lamp, Omission=Without lamp
Y	Extra code : If the colors of lamp and lens are different, please add this code to tell the color of lamp.
.A	Function mode : M=Momentary, A=Alternative, Omission=non-illuminated


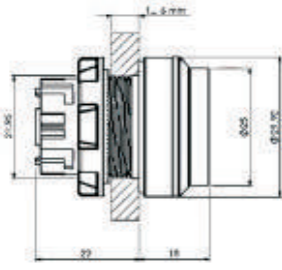

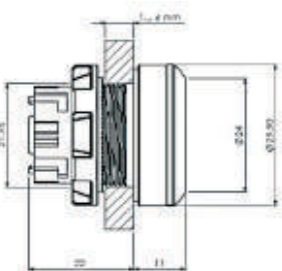

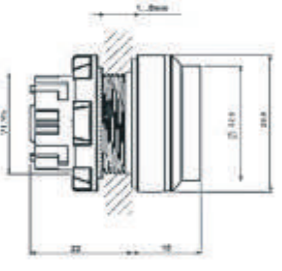

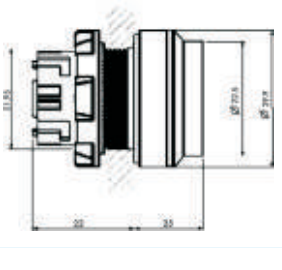
E2P1 Flat Head	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E2P1W□□	-
		●	E2P1R□□	-
		●	E2P1Y□□	-
		●	E2P1G□□	-
		●	E2P1B□□	-
		●	E2P1K□□	-
		●	E2P1K□□	-
E2P2 Raised Head	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E2P2W□□	-
		●	E2P2R□□	-
		●	E2P2Y□□	-
		●	E2P2G□□	-
		●	E2P2B□□	-
		●	E2P2K□□	-
		●	E2P2K□□	-
E2P3 Sunken Head	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E2P3W□□	-
		●	E2P3R□□	-
		●	E2P3Y□□	-
		●	E2P3G□□	-
		●	E2P3B□□	-
		●	E2P3K□□	-
		●	E2P3K□□	-
E2P4 Mushroom Head	Drawing	Color	Momentary Part No.	Alternative Part No.
		●	E2P4R□□.M1	E2P4R□□.A1
		●	E2P4Y□□.M1	E2P4Y□□.A1
		●	E2P4G□□.M1	E2P4G□□.A1
		●	E2P4K□□.M1	E2P4K□□.A1
		-	-	-
		-	-	-
		-	-	-


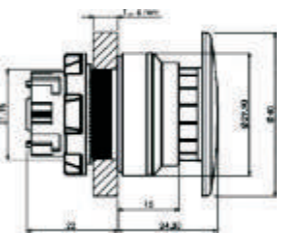

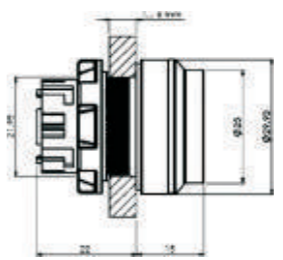

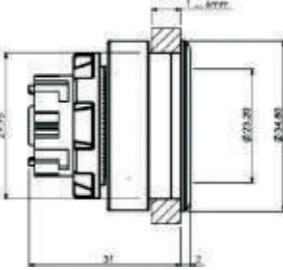

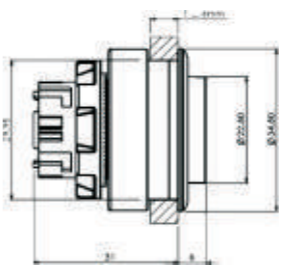
16mm Control Switches

22/25/30mm Control Switches

16/22mm Stainless Steel Switches


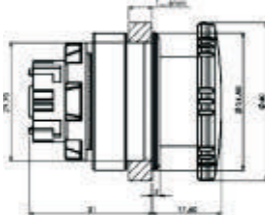





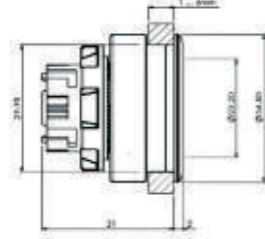






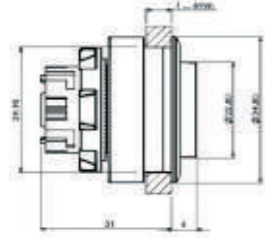






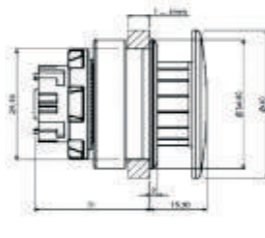





30/50/70mm Multi-Layer Light Tower

E2P5 High Bezel Head	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E2P5W□□	-
		●	E2P5R□□	-
		●	E2P5Y□□	-
		●	E2P5G□□	-
		●	E2P5B□□	-
		●	E2P5K□□	-
E2P1 Flat Button	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E2P1W□□◇L.M	E2P1W□□◇L.A
		●	E2P1R□□◇L.M	E2P1R□□◇L.A
		●	E2P1Y□□◇L.M	E2P1Y□□◇L.A
		●	E2P1G□□◇L.M	E2P1G□□◇L.A
		●	E2P1B□□◇L.M	E2P1B□□◇L.A
		●	E2P1K□□◇L.M	E2P1K□□◇L.A
E2P2 Raised Button	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E2P2W□□◇L.M	E2P2W□□◇L.A
		●	E2P2R□□◇L.M	E2P2R□□◇L.A
		●	E2P2Y□□◇L.M	E2P2Y□□◇L.A
		●	E2P2G□□◇L.M	E2P2G□□◇L.A
		●	E2P2B□□◇L.M	E2P2B□□◇L.A
		●	E2P2K□□◇L.M	E2P2K□□◇L.A
E2P3 Sunken Button	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E2P3W□□◇L.M	E2P3W□□◇L.A
		●	E2P3R□□◇L.M	E2P3R□□◇L.A
		●	E2P3Y□□◇L.M	E2P3Y□□◇L.A
		●	E2P3G□□◇L.M	E2P3G□□◇L.A
		●	E2P3B□□◇L.M	E2P3B□□◇L.A
		●	E2P3K□□◇L.M	E2P3K□□◇L.A

E2P4 Mushroom Button	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E2P4W□□◇L.M0	E2P4W□□◇L.A0
		●	E2P4R□□◇L.M0	E2P4R□□◇L.A0
		●	E2P4Y□□◇L.M0	E2P4Y□□◇L.A0
		●	E2P4G□□◇L.M0	E2P4G□□◇L.A0
		●	E2P4B□□◇L.M0	E2P4B□□◇L.A0
		●	E2P4K□□◇L.M0	E2P4K□□◇L.A0
E2P5 High Bezel Button	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E2P5W□□◇L.M	E2P5W□□◇L.A
		●	E2P5R□□◇L.M	E2P5R□□◇L.A
		●	E2P5Y□□◇L.M	E2P5Y□□◇L.A
		●	E2P5G□□◇L.M	E2P5G□□◇L.A
		●	E2P5B□□◇L.M	E2P5B□□◇L.A
		●	E2P5K□□◇L.M	E2P5K□□◇L.A
E3P1 Flush Flat Head	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E3P1W□□	-
		●	E3P1R□□	-
		●	E3P1Y□□	-
		●	E3P1G□□	-
		●	E3P1B□□	-
		●	E3P1K□□	-
E3P2 Flush Raised Head	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	E3P2W□□	-
		●	E3P2R□□	-
		●	E3P2Y□□	-
		●	E3P2G□□	-
		●	E3P2B□□	-
		●	E3P2K□□	-

- Remarks :
- Contact Mode: 1A=1NO, 1B=1NC, 2A=2NO, 2B=2NC, AB=1NO+1NC and etc.
  - ◇ Lamp Voltage: 1= 6VDC, 2= 12VDC, 3= 24VDC, 4= 110VAC, 5= 220VAC  
L=LED lamp, Omission=Without lamp
  - Highlight-background ◇ L in columns of "alternative part no." = This two codes could be omitted, and that stands for the part no. of the alternative pushbutton switches without lamp.
  - Pushbutton without lamp could be attached the 3rd contact. Please add extra A or B code following the contact mode to present the mode of the 3rd contact, A means 1 normally open and B1 normally close.
  - Please change "E" to "H" for protection rating IP65.
  - Please add \*M in the last of order no. if you would like to change the black plastic front ring to the metal ring.
  - Please add 'R', 'Y', 'G', 'B', 'W', 'K', 'E' if plastic ring of red, yellow, blue, white, black, grey to be replaced.

16mm Control Switches  
22/25/30mm Control Switches  
16/22mm Stainless Steel Switches  
30/50/70mm Multi-Layer Light Tower

E3P4 Flush Mushroom Head	Drawing	Color	Momentary Part No.	Alternative Part No.
			E3P4R□□.M1	E3P4R□□.A1
			E3P4Y□□.M1	E3P4Y□□.A1
			E3P4G□□.M1	E3P4G□□.A1
			E3P4K□□.M1	E3P4K□□.A1
		-	-	-
E3P1 Flush Flat Button	Drawing	Color	Momentary Part No.	Alternative Part No.
			E3P1W□□◇L.M	E3P1W□□◇L.A
			E3P1R□□◇L.M	E3P1R□□◇L.A
			E3P1Y□□◇L.M	E3P1Y□□◇L.A
			E3P1G□□◇L.M	E3P1G□□◇L.A
			E3P1B□□◇L.M	E3P1B□□◇L.A
E3P2 Flush Raised Button	Drawing	Color	Momentary Part No.	Alternative Part No.
			E3P2W□□◇L.M	E3P2W□□◇L.A
			E3P2R□□◇L.M	E3P2R□□◇L.A
			E3P2Y□□◇L.M	E3P2Y□□◇L.A
			E3P2G□□◇L.M	E3P2G□□◇L.A
			E3P2B□□◇L.M	E3P2B□□◇L.A
E3P4 Flush Mushroom Button	Drawing	Color	Momentary Part No.	Alternative Part No.
			E3P4W□□◇L.M0	E3P4W□□◇L.A0
			E3P4R□□◇L.M0	E3P4R□□◇L.A0
			E3P4Y□□◇L.M0	E3P4Y□□◇L.A0
			E3P4G□□◇L.M0	E3P4G□□◇L.A0
			E3P4B□□◇L.M0	E3P4B□□◇L.A0

- Remarks :
- Contact Mode: 1A=1NO, 1B=1NC, 2A=2NO, 2B=2NC, AB=1NO+1NC and etc.
  - ◇ Lamp Voltage: 1= 6VDC, 2= 12VDC, 3= 24VDC, 4= 110VAC, 5= 220VAC  
L=LED lamp, Omission=Without lamp
  - Highlight-background◇L in columns of "alternative part no." = This two codes could be omitted, and that stands for the part no. of the alternative pushbutton switches without lamp.
  - Pushbutton without lamp could be attached the 3rd contact. Please add extra A or B code following the contact mode to present the mode of the 3rd contact, A means 1 normally open and B1 normally close.
  - Please change "E" to "H" for protection rating IP65.
  - Please add \*M in the last of order no. if you would like to change the black plastic front ring to the metal ring.
  - Please add 'R', 'Y', 'G', 'B', 'W', 'K', 'E' if plastic ring of red, yellow, blue, white, black, grey to be replaced.



- Elegant and sophisticated design, add the extra value and esthetic feeling into applications
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- Friendly handling and module design, save your treasure time while installation
- Flexible and module assembly, effectively decrease the cost of stock
- Whole series slim; delicate and light, up to the requirement of protection IP40 and IP65
- Lower and flush mounting actuators, highly increase the fine appearance of your panel
- 22、 25 and 30mm mounting holes, fulfill your intentions of choice and replacement



Coding Principle

Selector Switches E2S/E3S	E	2	S	1	K	1	A	3	L	Y	.V	.I
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Part No.	Code Description
E	Classification : E=IP40 Standard H=IP65 Rubber-sealed
2	Mounting size : 2=22mm、 25mm Standard mounting 3= 30mm Flush mounting
S1	Handling type : S1=2 Positions, momentary 45° ; S2=2 Positions, maintained 90° S3=3 Positions, left maintained 45° right maintained 45° S4=3 Positions, left momentary 45° right momentary 45° S5=3 Positions, left maintained 45° right momentary 45°
K	Handle type : K=Short handle (knob), L=Long handle (lever)
1A	Contact mode : A=1NO B=1NC, provide 1A,2A,3A,1B,2B,3B,AB,2A1B,1A2B,2B1B,2AAB,AB2B,2A2A,2B2B
3	Operating voltage : 1=6VDC,2=12VDC,3=24VDC,4=110VAC,5=220VAC
L	Light source : L=LED lamp, Omission=Without lamp
Y	Lamp color : While LED lamp installed, please add this code to identify the color of LED R=Red, Y=Yellow, G=Green, B=Blue, W=White
.V	Handle shape : V=V shape, Omission= L shape(only for S2 handling type)
.I	Handle appearance : I=Transparent, Omission=Non-transparent

E2SK Knob Selector	Drawing	Handling Type	Part No.
		2 positions, momentary 45°	E2S1K□□
		2 positions, maintained 90°	E2S2K□□
		2 positions, maintained 90° _V shape	E2S2K□□.V
		3 positions, left main.right main. 45°	E2S3K□□
		3 positions, left mome.right mome.45°	E2S4K□□
		3 positions, left main.right mome. 45°	E2S5K□□

E2SK Knob Selector	Drawing	Handling Type	Part No.
		2 positions, momentary 45°	E2S1K□□◇L△.I
		2 positions, maintained 90°	E2S2K□□◇L△.I
		2 positions, maintained 90° _V shape	E2S2K□□◇L△.V.I
		3 positions, left main.right main. 45°	E2S3K□□◇L△.I
		3 positions, left mome.right mome.45°	E2S4K□□◇L△.I
		3 positions, left main.right mome. 45°	E2S5K□□◇L△.I

E3SK Flush Knob Selector	Drawing	Handling Type	Part No.
		2 positions, momentary 45°	E3S1K□□
		2 positions, maintained 90°	E3S2K□□
		2 positions, maintained 90° _V shape	E3S2K□□.V
		3 positions, left main.right main. 45°	E3S3K□□
		3 positions, left mome.right mome.45°	E3S4K□□
		3 positions, left main.right mome. 45°	E3S5K□□


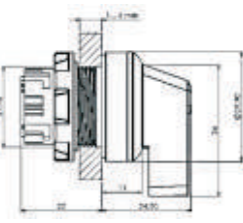






E3SK Flush Knob Selector	Drawing	Handling Type	Part No.
		2 positions, momentary 45°	E3S1K□□◇L△.I
		2 positions, maintained 90°	E3S2K□□◇L△.I
		2 positions, maintained 90° _V shape	E3S2K□□◇L△.V.I
		3 positions, left main.right main. 45°	E3S3K□□◇L△.I
		3 positions, left mome.right mome.45°	E3S4K□□◇L△.I
		3 positions, left main.right mome. 45°	E3S5K□□◇L△.I


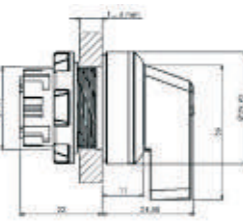






16mm Control Switches


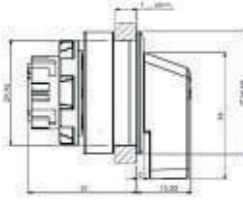






22/25/30mm Control Switches


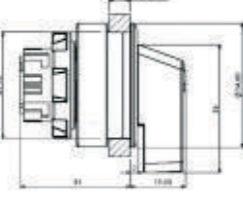






16/22mm Stainless Steel Switches

30/50/70mm Multi-Layer Light Tower

E2SL Lever Selector	Drawing	Handling Type	Part No.
		 2 positions, momentary 45°	E2S1L□□
		 2 positions, maintained 90°	E2S2L□□
		 2 positions, maintained 90° _V shape	E2S2L□□.V
		 3 positions, left main.right main. 45°	E2S3L□□
		 3 positions, left mome. right mome.45°	E2S4L□□
		 3 positions, left main.right mome. 45°	E2S5L□□

E2SL Lever Selector	Drawing	Handling Type	Part No.
		 2 positions, momentary 45°	E2S1L□□◇L△.I
		 2 positions, maintained 90°	E2S2L□□◇L△.I
		 2 positions, maintained 90° _V shape	E2S2L□□◇L△.V.I
		 3 positions, left main.right main. 45°	E2S3L□□◇L△.I
		 3 positions, left mome.right mome.45°	E2S4L□□◇L△.I
		 3 positions, left main.right mome. 45°	E2S5L□□◇L△.I

E3SL Flush Lever Selector	Drawing	Handling Type	Part No.
		 2 positions, momentary 45°	E3S1L□□
		 2 positions, maintained 90°	E3S2L□□
		 2 positions, maintained 90° _V shape	E3S2L□□.V
		 3 positions, left main.right main. 45°	E3S3L□□
		 3 positions, left mome.right mome.45°	E3S4L□□
		 3 positions, left main.right mome. 45°	E3S5L□□

E3SL Flush Lever Selector	Drawing	Handling Type	Part No.
		 2 positions, momentary 45°	E3S1L□□◇L△.I
		 2 positions, maintained 90°	E3S2L□□◇L△.I
		 2 positions, maintained 90° _V shape	E3S2L□□◇L△.V.I
		 3 positions, left main.right main. 45°	E3S3L□□◇L△.I
		 3 positions, left mome.right mome.45°	E3S4L□□◇L△.I
		 3 positions, left main.right mome. 45°	E3S5L□□◇L△.I

- Remarks:
- Handling type: M= Momentary, A= Alternative ; mome.= Momentary, main.= Alternative
  - Contact mode: 1A=1NO, 1B=1NC, AB=1NO+1NC, 2A=2NO, 2B=2NC and etc.  
Note that the sequence of contact blocks should be consistent with the handling type, in this situation, AB means left A contact and right B, BA means left B contact and right A.
  - ◇Lamp Voltage:1=6VDC, 2=12VDC, 3=24VDC, 4=110VAC, 5=220VAC  
L=LED lamp, A=Discharged lamps  
Discharged lamps powered by 110 VAC、220VAC are available only. Omission=without lamp.
  - △Light source color : R=Red, Y=Yellow, G=Green, B=Blue, W=White.
  - Pushbutton without lamp could be attached the 3rd contact. Please add extra A or B code following the contact mode to present the mode of the 3rd contact, A means 1 normally open and B1 normally close.
  - Please change "E" to "H" for protection rating IP65.
  - Please add \*M in the last of order no. if you would like to change the black plastic front ring to the metal ring.
  - Please add 'R, 'Y, 'G, 'B, 'W, 'K, 'E if plastic ring of red, yellow, blue, white, black, grey to be replaced.



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- Professional selection of engineering materials, overcome the harshest of your environment
- Friendly handling and module design, save your treasure time while installation
- Flexible and module assembly, effectively decrease the cost of stock
- Whole series slim; delicate and light, up to the requirement of protection IP40 and IP65
- Lower and flush mounting actuators, highly increase the fine appearance of your panel
- 22、 25 and 30mm mounting holes, fulfill your intentions of choice and replacement



**Coding Principle**

Pushbutton Switches E2P/E3P							
E	2	R	1	R	1	B	

Part No.	Code Description
E	Classification : E=IP40 Standard H=IP65 Rubber-sealed
2	Mounting size : 2=22mm、 25mm Standard mounting 3= 30mm Standard mounting
R1	Reset mode : R1=Rotate to reset
R	Cap color : R=Red
1B	Contact mode : A=1NO B=1NC, provide 1A,2A,3A,1B,2B,3B,AB,2A1B,1A2B,2B1B,2AAB,AB2B,2A2A,2B2B

E2R1 Emergency Stop Switches	Drawing	Color	Reset Mode	Part No.
			rotate to reset	E2R1R□□
E3R1 Emergency Stop Switches	Drawing	Color	Reset Mode	Part No.
			rotate to reset	E3R1R□□

- Remarks:
1. □□ Contact Mode: 1A=1NO, 1B=1NC, 2A=2NO, 2B=2NC, AB=1NO+1NC and etc.
  2. Please change “E” to “H” for protection rating IP65.
  3. Please add \*M in the last of order no. if you would like to change the yellow plastic front ring to the metal ring.



- 3 models meet with EN IEC 60947-5-5: rotate to reset, pull to reset, key to rest
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- 22/25mm mounting holes, fulfill your intentions of choice and replacement



Coding Principle

E-stop Switch	E	2	E	1	R	1	B	3	L	R	.I
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Part No.	Code Description
E	Classification : E=IP40 Standard H=IP65 Rubber-sealed
2	Mounting size : 2=22mm、25mm Standard mounting
E1	Reset mode : E1=rotate to reset E2=pull to reset E3=key to reset
R	Cap color : R=Red
1B	Contact mode : A=1NO B=1NC, provide 1A,2A,3A,1B,2B,3B,AB,2A1B,1A2B,2B1B,2AAB,AB2B,2A2A,2B2B
3	Operating voltage : 1=6VDC,2=12VDC,3=24VDC,4=110VAC,5=220VAC
L	Light source:L=LED lamp,Omission=Without lamp
R	Lamp color:R=Red LED
.I	Lamp type:I=Illuminated Omission=Non-illuminated
Notice	E1:With lamp or without lamp E2:No lamp for E2、E3

E2E1 Non-illuminated	Drawing	Color	Reset Mode	Part No.
		●	rotate to reset	E2E1R□□
E2E1 Illuminated	Drawing	Color	Reset Mode	Part No.
		●	rotate to reset	E2E1R□□◇LR.I
E2E2 Push-Pull	Drawing	Color	Reset Mode	Part No.
		●	pull to reset	E2E2R□□
E2E3 Keylock	Drawing	Color	Reset Mode	Part No.
		●	key to reset	E2E3R□□

Remarks:

1. □□ Contact Mode: 1A=1NO, 1B=1NC, provide 1A,2A,3A,1B,2B,3B,AB,2A1B,1A2B,2B1B,2AAB,AB2B,2A2A,2B2B
2. ◇ Lamp Voltage:1=6VDC, 2=12VDC, 3=24VDC, 4=110VAC, 5=220VAC
3. Illuminated switch includes a red LED
4. Please change “E” to “H” for protection rating IP65



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- 22、 25 and 30mm mounting holes, fulfill your intentions of choice and replacement



Coding Principle

Keylock Switches E2K/E3K	E	2	K	1	W	1	A	.	V
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Part No.	Code Description
E	Classification : E=IP40 Standard H=IP65 Rubber-sealed
2	Mounting size : 2=22mm、 25mm Standard mounting 3= 30mm Flush mounting
K1	Handling type : K1=2 Positions, momentary 45° ; K2=2 Positions, maintained 90° K7=3 Positions, left momentary 45° right maintained 90° K8=3 Positions, left maintained 90° right maintained 90°
W	Key pull :W=Three inlets, I=One inlet, V=Two inlets
1A	Contact mode : A=1NO B=1NC, provide 1A,2A,3A,1B,2B,3B,AB,2A1B,1A2B,2B1B,2AAB,AB2B,2A2A,2B2B
.V	Handle shape : V= V shape, omission= L shape(only for S2 handing type)

E2K keylock	Drawing	Handling Type	Part No.
		2 positions, momentary 45°, one inlet	E2K1□□
		2 positions, maintained 90°, one inlet	E2K2□□
		2 positions, maintained 90°, two inlets	E2K2V□□
		2 positions, maintained 90°, one inlet _V shape	E2K2□□.V
		2 positions, maintained 90°, two inlets _V shape	E2K2V□□.V
		3 positions, left mome.45° right main. 90°, one inlet	E2K7□□
		3 positions, left mome.45° right main. 90°, two inlets	E2K7V□□
		3 positions, left main.45° right main. 90°, two inlet	E2K8□□
		3 positions, left main.45° right main. 90°, two inlets	E2K8V□□
		3 positions, left main.45° right main. 90°, three inlets	E2K8W□□

E3K Flush Keylock	Drawing	Handling Type	Part No.
		2 positions, momentary 45°, one inlet	E3K1□□
		2 positions, maintained 90°, one inlet	E3K2□□
		2 positions, maintained 90°, two inlets	E3K2V□□
		2 positions, maintained 90°, one inlet _V shape	E3K2□□.V
		2 positions, maintained 90°, two inlets _V shape	E3K2V□□.V
		3 positions, left mome.45° right main. 90°, one inlet	E3K7□□
		3 positions, left mome.45° right main. 90°, two inlets	E3K7V□□
		3 positions, left main.45° right main. 90°, two inlet	E3K8□□
		3 positions, left main.45° right main. 90°, two inlets	E3K8V□□
		3 positions, left main.45° right main. 90°, three inlets	E3K8W□□

- Remarks :
1. Handling type: M= Momentary, A= Maintained; mome.= Momentary, main.= Maintained
  2. □□Contact mode: 1A=1NO, 1B=1NC, AB=1NO+1NC, 2A=2NO, 2B=2NC and etc.  
Note that the sequence of contact blocks should be consistent with the handling type, in this situation, AB means left A contact and right B, BA means left B contact and right A.
  3. (I,V,W) key-pull type: I= One inlet, V= Two inlets, W= Three inlets, " . " means "plug-out" points of keys.
  4. Please change "E" to "H" for protection rating IP65.
  5. Please add \*M in the last of order no. if you would like to change the black plastic front ring to the metal ring.
  6. Please add 'R, 'Y, 'G, 'B, 'W, 'K, 'E if plastic ring of red, yellow, blue, white, black, grey to be replaced.



- Elegant and sophisticated design, add the extra value and esthetic feeling into applications
- Professional selection of engineering materials, overcome the harshest of your environment
- Friendly handling and module design, save your treasure time while installation
- Flexible and module assembly, effectively decrease the cost of stock
- Whole series slim; delicate and light, up to the requirement of protection IP40 and IP65
- Lower and flush mounting actuators, highly increase the fine appearance of your panel
- 22、25 and 30mm mounting holes, fulfill your intentions of choice and replacement



Coding Principle

Buzzers E2B	E	2	B	1	.	0	6
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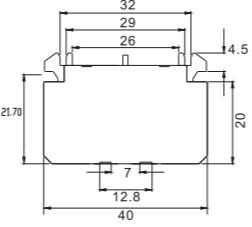


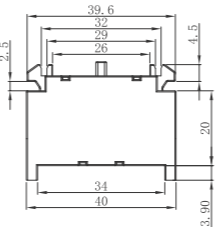


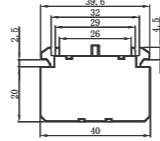

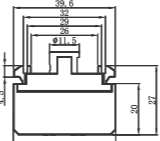

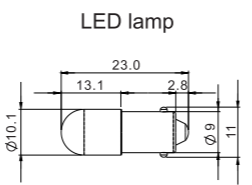




Part No.	Code Description
E	Classification : E=IP40 Standard H=IP65 Rubber-sealed
2	Mounting size : 2=22mm、25mm Standard mounting 3= 30mm Flush mounting
B1	Tone mode : B1=Continuous, B2=Intermittent
.06	Operating voltage : 06=6VDC, 12=12VDC, 24=24VDC, 11=110VAC, 22=220VAC


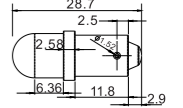


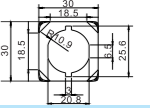

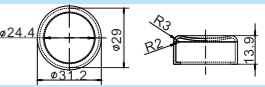

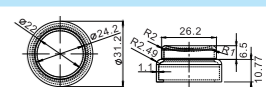

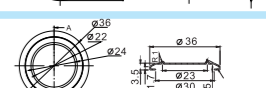

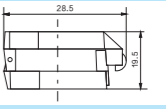

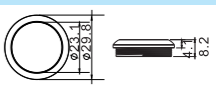

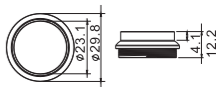

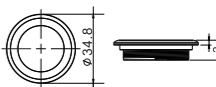

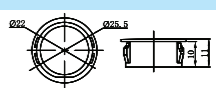

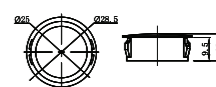

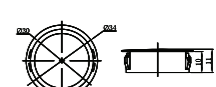
E2B DC Buzzer	Drawing	Voltage	Continuous Part No.	Intermittent Part No.
		6VDC	E2B1.06	E2B2.06
		12VDC	E2B1.12	E2B2.12
		24VDC	E2B1.24	E2B2.24
		-	-	-
		-	-	-
		-	-	-
E2B AC Buzzer	Drawing	Voltage	Continuous Part No.	Intermittent Part No.
		110VAC	E2B1.11	E2B2.11
		220VAC	E2B1.22	E2B2.22
		-	-	-
		-	-	-
		-	-	-
		-	-	-
E3B DC Buzzer	Drawing	Voltage	Continuous Part No.	Intermittent Part No.
		6VDC	E3B1.06	E3B2.06
		12VDC	E3B1.12	E3B2.12
		24VDC	E3B1.24	E3B2.24
		-	-	-
		-	-	-
		-	-	-
E3B AC Buzzer	Drawing	Voltage	Continuous Part No.	Intermittent Part No.
		110VAC	E3B1.11	E3B2.11
		220VAC	E3B1.22	E3B2.22
		-	-	-
		-	-	-
		-	-	-
		-	-	-

Remarks:1. Sound maximum 100dB at a distance 70 cm.  
 2. A buzzer by flush mounting is only offered a metal cover.  
 3. Please change “E” to “H” for protection rating IP65.

16mm Control Switches  
 22/25/30mm Control Switches  
 16/22mm Stainless Steel Switches  
 30/50/70mm Multi-Layer Light Tower

Accessories

Order No.	Contact block	Description	Drawing
2SWA		2SWA1: 1 normally open, green.3 — .4	
2SWB		2SWB1: 1 normally close, red.1 — .2	
Order No.	Connected contact block	Description	Drawing
2SWA.1		2SWA1: 1 normally open, green.3 — .4	
2SWB.1		2SWB1: 1 normally close, red.1 — .2	
Order No.	Auxiliary	Description	Drawing
2SWC		2SWC:suitable to only IA or IB	
Order No.	Lamp Holder	Description	Drawing
2LH		X1(+)-X2(-) Make the right connection, while polarized LED lamps installed.	
Order No.	Lamp	Description	Drawing
L.BA9S-L06.R(Y/G/B/W)		LED Lamp Red(Yellow/ Green/Blue/White), 6VDC/AC	 <p>LED lamp</p>
L.BA9S-L12.R(Y/G/B/W)		LED Lamp Red(Yellow/ Green/Blue/White), 12VDC/AC	
L.BA9S-L24.R(Y/G/B/W)		LED Lamp Red(Yellow/ Green/Blue/White), 24VDC/AC	
L.BA9S-L11.R(Y/G/B/W)		LED Lamp Red(Yellow/ Green/Blue/White), 110 VAC	
L.BA9S-L22.R(Y/G/B/W)		LED Lamp Red(Yellow/ Green/Blue/White), 220 VAC	

Order No.	Lamp	Description	Drawing
L.BA9S-A11.R(G)		Discharged Lamp Red(Green),110VAC	 <p>Incandescent lamp</p>
L.BA9S-A22.R(G)		Discharged Lamp Red(Green),220VAC	
Order No.	Anti-twisting Ring	Description	Drawing
02Z-100		Only for standard mounting to increase anti-twisting torque while working.	
Order No.	Protective Cap	Description	Drawing
02Z-200.F		F=Suitable to flat head/button pushbutton	
02Z-200.P		P=Suitable to raised head/button pushbutton	
02Z-200.M		M=Suitable to flush flat head/button pushbutton	
Order No.	Protective cover	Description	Drawing
02Z-201		For flat head/button switches	
Order No.	Metallic Front Ring	Description	Drawing
02Z-300.L		L=Low ring (suitable to standard mounting spec.)	
02Z-300.H		H=High ring (suitable to standard mounting spec.)	
02Z-300.F		F=Flat ring (suitable to flush mounting spec.)	
Order No.	Blind Plug	Description	Drawing
02Z-400.22		22= Suitable to 22mm mounting hole	
02Z-400.25		25= Suitable to 25mm mounting hole	
02Z-400.30		30= Suitable to 30mm mounting hole	


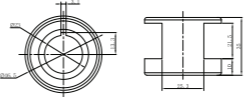

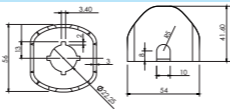

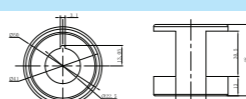

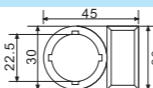

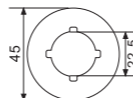



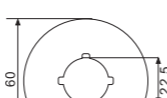



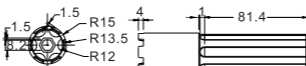

16mm Control Switches

22/25/30mm Control Switches

16/22mm Stainless Steel Switches

30/50/70mm Multi-Layer Light Tower

Accessories

Order No.	Metal Emergency Protective Cover	Description	Drawing
02Z-500.R		For mushroom emergency stop switches	
Order No.	Plastic Emergency Protective Cover	Description	Drawing
02Z-501.R		For mushroom and foolproof emergency stop switches	
Order No.	Metal Emergency Protective High-length Cover	Description	Drawing
02Z-502.R		For foolproof E-stop switches	
Order No.	Plate	Description	Drawing
02Z-600.22		Suitable to 22mm mounting hole	
Order No.	Emergency stop ring	Description	Drawing
02Z-900.0 02Z-900.0N		External diameter: 45mm, "N" represents that 3M paster is not attached.	
02Z-900.1 02Z-900.1N		External diameter: 45mm, "N" represents that 3M paster is not attached.	
02Z-901.0 02Z-901.0N		External diameter: 60mm, "N" represents that 3M paster is not attached.	
02Z-901.1 02Z-901.1N		External diameter: 60mm, "N" represents that 3M paster is not attached.	
Order No.	Nut Fixer	Description	Drawing
02Z-T01		Fixing torque ranges from 2 to 3 Nm, maximum torque not exceeding 3 Nm.	
Order No.	Key	Description	Drawing
02Z-K268		No.268 key is suitable for key switch and key type emergency stop switch	-

Accessories

Order No.	22mm Switch box	Description	Dimension (x*y*z)	Center hole dist (a*b)	Drawing
02Z-700.1		1 hole, white IP65	73x73x66	59x40	
02Z-700.2		2 hole, white IP65	105x73x66	92x40	
02Z-700.3		3 hole, white IP65	139x73x66	125x40	
02Z-700.4		4 hole, white IP65	172x73x66	158x40	
02Z-700.5		5 hole, white IP65	205x73x66	191x40	
					Unit:mm
Order No.	22mm Switch box	Description	Dimension (x*y*z)	Center hole dist (a*b)	Drawing
02Z-701.1		1 hole, yellow IP65	73x73x66	59x40	
02Z-701.2		2 hole, yellow IP65	105x73x66	92x40	
02Z-701.3		3 hole, yellow IP65	139x73x66	125x40	
02Z-701.4		4 hole, yellow IP65	172x73x66	158x40	
02Z-701.5		5 hole, yellow IP65	205x73x66	191x40	
					Unit:mm

16mm Control Switches

22/25/30mm Control Switches

16/22mm Stainless Steel Switches

30/50/70mm Multi-Layer Light Tower



## 16/22mm Flush mounting stainless steel control switches

This series adopts flush-mounting design above the panel. Thanks to stainless steel housing, the switch features high strength and abrasion resistance. The appearance is beautiful and small. The touch is smoothly moving. Upon round shape, the illuminated items are equipped with high-brightness LEDs, that lifetime offers 50,000 hours at least. Embedded sealing struction, the protection rating up to IP67. The products can widely used for machinery, instrument, automation, transpotation, smart building, aviation, military, medical devices and more.

## 16/22mm Flush Mounting Stainless Steel Control Switches

16mm Control Switches

132-133

22mm Control Switches

134-135

*Linking your system*

[www.ema-electronic.com](http://www.ema-electronic.com)



### Features

- Support 16m/m、22m/m flush-mounting holes
- Flat and round shape. Metal texture. Beautiful appearance
- Red/Yellow/Green/Blue/White LEDs color for your choice
- Illuminated light mode: Single dot、Ring
- Abrasion resistance, high strength, and high hardness with stainless steel housing
- Embedded high-brightness LEDs. Long lifetime
- The protection rating in front of panel up to IP67

### Applications

- Industry: Machinery、Instrument、Factory equipment
- Public Field: Ticket-gate machine、Vendor machine、Car parking entrance
- Control System: Panel control、Smart device

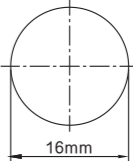
### Technical Specifications

- Connected setting: Connect block 2.8 x 0.5mm
- Contact rating: 16mm: 250VAC/3A, 22mm: 250VAC/5A
- Contact resistance:  $\leq 50m\Omega$
- Insulation resistance:  $\geq 100m\Omega$
- Dielectric strength: 2000VAC 50Hz, 1m
- Mechanical lifetime: More than 1,000,000
- Electrical lifetime: More than 50,000
- Thickness of panel: 1...6mm
- Nut torque: 5...14N/m
- Operating pressure: 5.5N
- LED lifetime: 50,000 h
- Pushbutton material: Stainless steel
- Housing material: Stainless steel
- Storage temperature: -40°C ~ +80°C
- Operation temperature: -25°C ~ +55°C

### Installation Panel

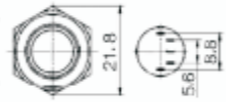
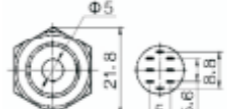
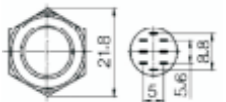
- Mounting Sequence: Put the actuator through the panel hole. Tighten the nut below the panel. The torque is 5...14 N/m
- The thickness of panel is 1...8mm

### Hole Dimension

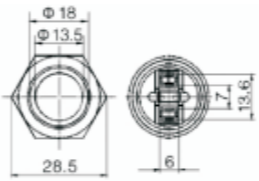
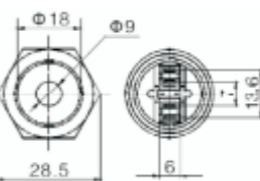
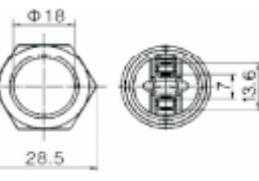
Cut-out Category	Hole Dimension
A: 16mm round hole	
B: 22mm round hole	

### Front view and bottom of contact block

#### 16m/m mounting hole

Illuminated Ring	Illuminated Single dot	Non-Illuminated
		

#### 22m/m mounting hole

Illuminated Ring	Illuminated Single dot	Non-Illuminated
		



- 16mm and 22mm flush mounting
- Stainless steel housing for abrasion resistance, high strength, high hardness
- Offer illuminated and non-illuminated metal switches
- Light mode: Single dot and ring
- Round and flush head shape. Beautiful appearance
- Protection up to IP67 above front panel




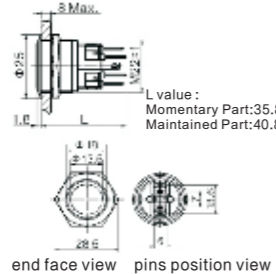

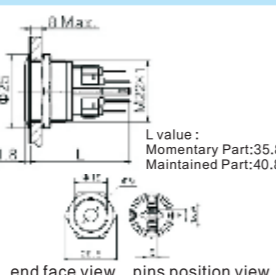

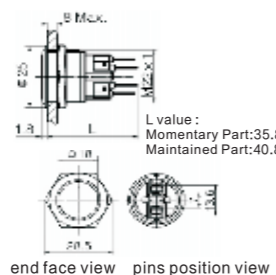
Coding Principle

Pushbutton Switches M1/M2 | M | 2 | P | 1 | G | A | B | 3 | L | 1 | . | M

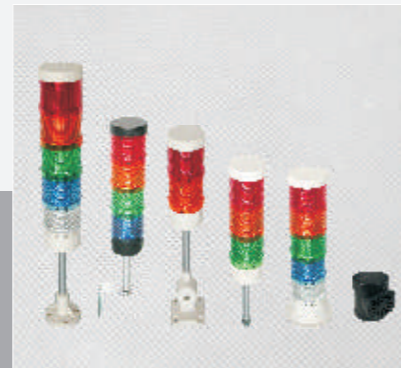
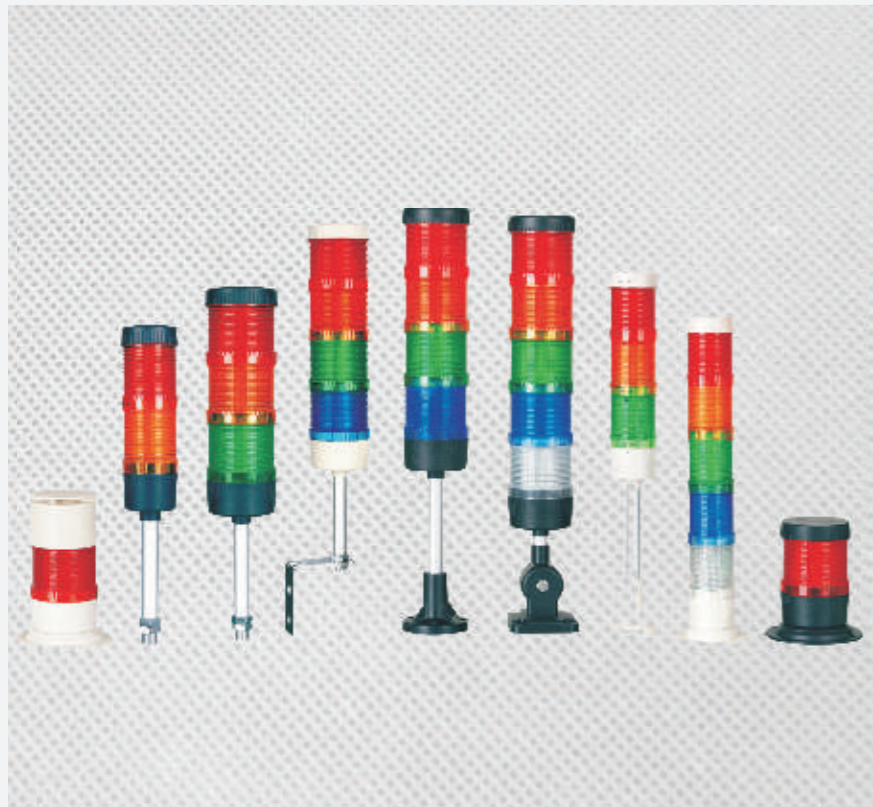
Part No.	Code Description
M	Classification : M=Flush mounting stainless steel control switches
2	Mounting size : 1=16m/m 2=22m/m
P1	Cap style : P1=Flat button
G	Light color : R=Red, Y=Yellow, G=Green, B=Blue, W=White, S=Stainless steel surface
AB	Contact mode : AB=1NO/1NC, 2A2B=2NO/2NC
3	Operating voltage : 3=24VDC, 4=110VAC, 5=220VAC
L	Light source : L=LED lamp
1	Light mode : 1=Ring, 2=Central dot
.M	Function mode : M=Momentary, A=Alternative

M1P1 Ring/Illuminated	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	M1P1W□□◇L 1.M	M1P1W□□◇L 1.A
		●	M1P1R □□◇L 1.M	M1P1R □□◇L 1.A
		●	M1P1Y □□◇L 1.M	M1P1Y □□◇L 1.A
		●	M1P1G □□◇L 1.M	M1P1G □□◇L 1.A
		●	M1P1B □□◇L 1.M	M1P1B □□◇L 1.A
M1P1 Dot/Illuminated	Drawing	Color	Momentary Part No.	Alternative Part No.
		○	M1P1W□□◇L 2.M	M1P1W□□◇L 2.A
		●	M1P1R □□◇L 2.M	M1P1R □□◇L 2.A
		●	M1P1Y □□◇L 2.M	M1P1Y □□◇L 2.A
		●	M1P1G □□◇L 2.M	M1P1G □□◇L 2.A
		●	M1P1B □□◇L 2.M	M1P1B □□◇L 2.A
M1P1 Non-Illuminated	Drawing	Color	Momentary Part No.	Alternative Part No.
		Stainless steel	M1P1S □□.M	M1P1S □□.A
		-	-	-
		-	-	-
		-	-	-
		-	-	-

Remark: 1. □□Contact Mode: AB=1NO/1NC, 2A2B=2NO/NC  
2. ◇ Lamp Voltage: 3=24VDC, 4=110VAC, 5=220VAC  
L=LED lamp

M2P1 Ring/Illuminated	Drawing	Color	Momentary Part No.	Alternative Part No.
	 L value: Momentary Part:35.8 Maintained Part:40.8 end face view pins position view	○	M2P1W□□◇L 1.M	M2P1W□□◇L 1.A
		●	M2P1R □□◇L 1.M	M2P1R □□◇L 1.A
		●	M2P1Y □□◇L 1.M	M2P1Y □□◇L 1.A
		●	M2P1G □□◇L 1.M	M2P1G □□◇L 1.A
		●	M2P1B □□◇L 1.M	M2P1B □□◇L 1.A
M2P1 Dot/Illuminated	Drawing	Color	Momentary Part No.	Alternative Part No.
	 L value: Momentary Part:35.8 Maintained Part:40.8 end face view pins position view	○	M2P1W□□◇L 2.M	M2P1W□□◇L 2.A
		●	M2P1R □□◇L 2.M	M2P1R □□◇L 2.A
		●	M2P1Y □□◇L 2.M	M2P1Y □□◇L 2.A
		●	M2P1G □□◇L 2.M	M2P1G □□◇L 2.A
		●	M2P1B □□◇L 2.M	M2P1B □□◇L 2.A
M2P1 Non-Illuminated	Drawing	Color	Momentary Part No.	Alternative Part No.
	 L value: Momentary Part:35.8 Maintained Part:40.8 end face view pins position view	Stainless steel	M2P1S □□.M	M2P1S □□.A
		—	—	—
		—	—	—
		—	—	—
		—	—	—

Remark: 1. □□Contact Mode: AB=1NO/1NC, 2A2B=2NO/NC  
2. ◇Lamp Voltage: 3=24VDC, 4=110VAC, 5=220VAC



## Multi-Layer Light Tower

Each light element can be mounted or replaced by user easily. No tool is necessary. Use of high-luminance LEDs (Light Emitting Diodes) to enhance the extra brightness for 05 series light tower. It can extend life-time of the operation so as to provide no requirement for maintenance.

## Multi-Layer Light Tower

Φ 30 mm	144-145
Φ 50 mm	146-147
Φ 70 mm	148-149
50/70mm White housing module	150-151
Φ 50 mm Integrated Aluminum alloy	152-153
Accessories	154-155
Drawing	156-157



Linking your system

[www.ema-electronic.com](http://www.ema-electronic.com)

### Features

- Size: Φ30mm, Φ50mm, Φ70mm
- 5 stands selectable
- Long lifetime and brightness LEDs
- 360° view: excellent visibility with no block and no shadow
- Modular design for installation without tools
- Patent design for advancing brightness and easy installation
- The frequency of alarm: 60~80 times/min
- Buzzer volume: 85 ± 10 or 120 ± 10 dB/M
- Materials of construction: Layer-PC, lampshade-ABS , Stand-AL
- Materials in protection of corrosive
- Confirmative to CE
- Meets EEC RoHS Directive
- Protection rating: IP54, IP65



### The meaning of colors

According to Machinery Directive IEC/EN 60204-1, the different colors of the light modular elements specify the meaning for the operating status. All selection of the colors are based on the demands of the user.



**Red**  
Dangerous status - immediate action



**Yellow**  
Abnormal status - in monitor or action



**Green**  
Normal status - no action



**Blue**  
Discontinuity status - action mandatory



**White**  
Other status - can be identified by the user

### Max. power

LED Light Module	0550		0570	
	ultra bright	standard	ultra bright	standrd
	Red, Yellow	1.2W	Red, Yellow	1W
	Green, Blue, White	1.7W	Green, Blue, White	1.2W
Buzzer	0550 buzzer	0.5W	0570 buzzer	0.75W
	0570 music buzzer	12W	0570 120dB buzzer	DC=5W
		Black, White		DC<200mA
		Black, White		AC<20mA

### LED makes your products more competitive

Use of high-luminance LEDs (Light Emitting Diodes) to enhance the extra brightness for 05 series light tower. It can extend life-time of the operation so as to provide no requirement for maintenance.

#### Benefits of LED:

- Long life-time up to 50,000 hours
- Working in high-speed condition
- Anti-shock
- Durable and reliable
- Energy saving



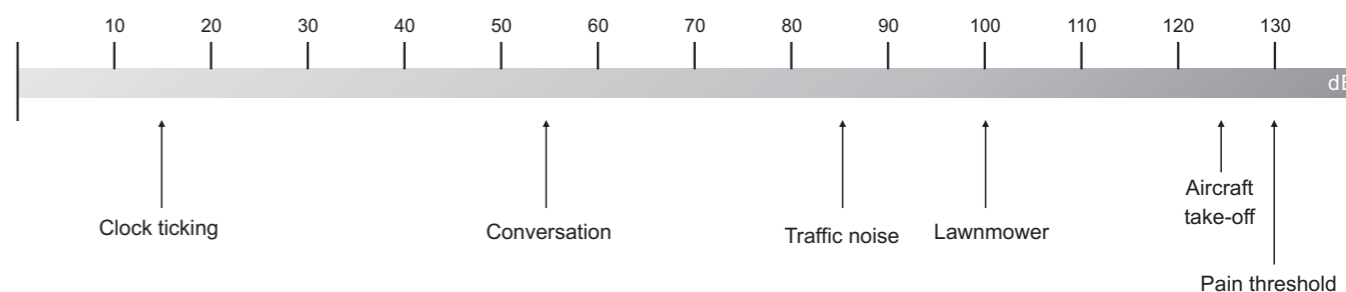
### Table of operating range

dB is the unit of Volumn, higher dB means louder volumn, if dB increases 10 each time, then volumn will be ten times than that of before. That is, voulum power of 20dB is ten times than that of 10dB, volumn power of 30dB is ten times than that of 20dB. If 10dB sent out by 10 sound source at the same time, then the power will be ten times than that of 10dB, that is 20dB.

Distance(M)	Level of sound dB(A)																																									
	1	2	3	5	10	20	30	50	100	200	300	500	1000	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	85	80	75	70	65								
1	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	85	80	75	70	65	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	85	80	75	70	65
2	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	79	74	69	64	59	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	79	74	69	64	59
3	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	75	70	65	60	55	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	75	70	65	60	55
5	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	71	66	61	56	51	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	71	66	61	56	51
10	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	65	60	55	50	45	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	65	60	55	50	45
20	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	64	59	54	49	44	39	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	64	59	54	49	44	39
30	90	88	86	84	82	80	78	76	74	72	70	68	66	64	62	60	55	50	45	40	35	90	88	86	84	82	80	78	76	74	72	70	68	66	64	62	60	55	50	45	40	35
50	86	84	82	80	78	76	74	72	70	68	66	64	62	60	58	56	51	46	41	36		86	84	82	80	78	76	74	72	70	68	66	64	62	60	58	56	51	46	41	36	
100	80	78	76	74	72	70	68	66	64	62	60	58	56	54	52	50	45	40				80	78	76	74	72	70	68	66	64	62	60	58	56	54	52	50	45	40			
200	74	75	70	68	66	64	62	60	58	56	54	52	50	48	46	44	39					74	75	70	68	66	64	62	60	58	56	54	52	50	48	46	44	39				
300	70	68	66	64	62	60	58	56	54	52	50	48	46	44	42	40						70	68	66	64	62	60	58	56	54	52	50	48	46	44	42	40					
500	66	64	62	60	58	56	54	52	50	48	46	44	42	40	38							66	64	62	60	58	56	54	52	50	48	46	44	42	40	38						
1000	60	58	56	54	52	50	48	46	44	42	40	38										60	58	56	54	52	50	48	46	44	42	40	38									

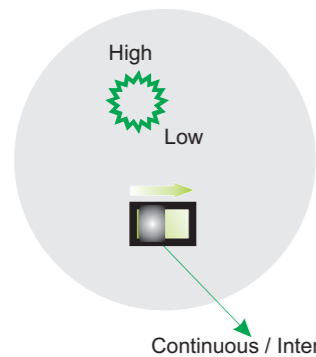
### Examples of noise

Enviornmental noise comes from four sources 1. Noise Sent out from traffice vehicles. include automobile,train and plane 2. Factory noise. for example,blower, turbine,loom and punching machine 3. Construction noise, like pile driving engine, excavating machineand concrete mixer4.Social life noise, for example, noise sent out from high voulmn horn, recorder.



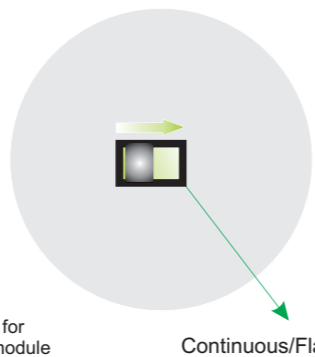
### Buzzer

Switchable Continuous/intermittent buzzer and adjustable volume up to  $85 \pm 10$  or  $120 \pm 10$  dB/M at a distance of 1 meter which is more helpful for operators even in a noisy environment. The frequency of buzzer is 60~80 beeps per minute.



### Switchable continuous/flashing light

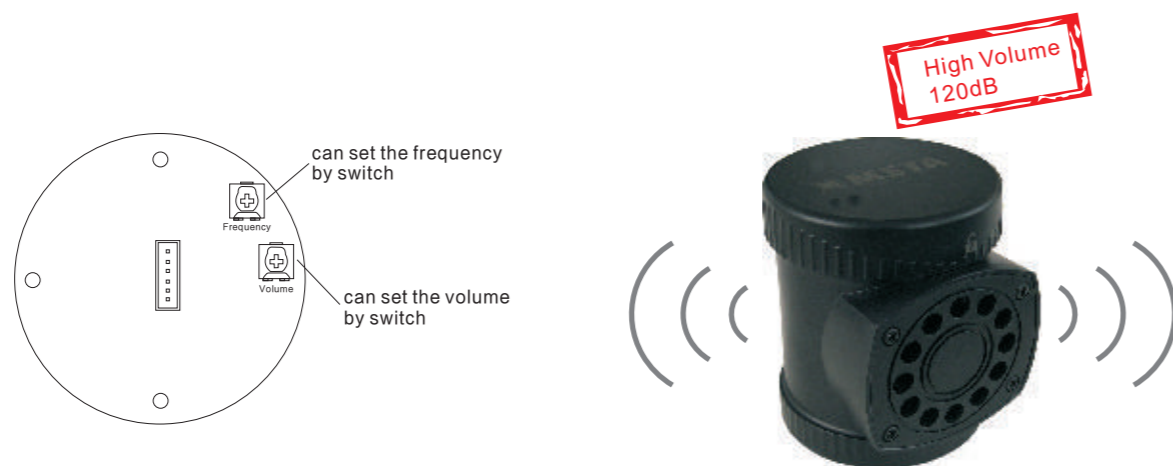
Flashing light module can be switched by user manually to increase its agility and reduce your inventory.



Notice: Not available for 30mm flashing light module

### Innovative 70mm buzzer with high volume

When using multi-layer light towers in the field with loud area or outdoors, customers express the demand of the buzzer with louder volume. ema develop an innovative  $\Phi 70$ mm buzzer up to 120dB/M with voltage in 12~24VDC. This new model enhances the volume of buzzer extremely. Moreover, it can be installed in any position and there is no limit to be installed on the top of tower. This new feature provides customers with more flexible, convenient options on installation. The volume and the mode of signaling of this buzzer can be adjusted by a switch inside.



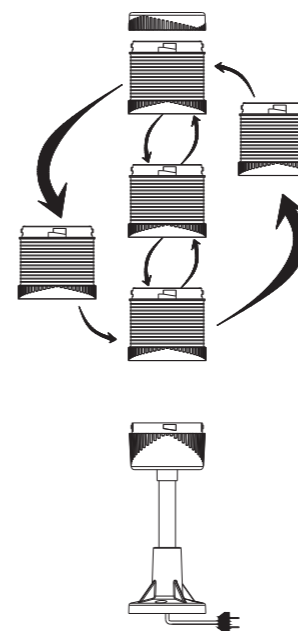
### Wide range of voltage

O5 Series with DC voltage offer reversal polarity protection to secure your connection. A wide range rated voltage of 12~24VDC or 85~275VAC can support you in promotion of your system to worldwide.



### Modular design

Each light element can be mounted or replaced by user easily. No tool is necessary.



### Easy installation

Thanks for modular design, the user can turn the light element slightly until it cannot move.

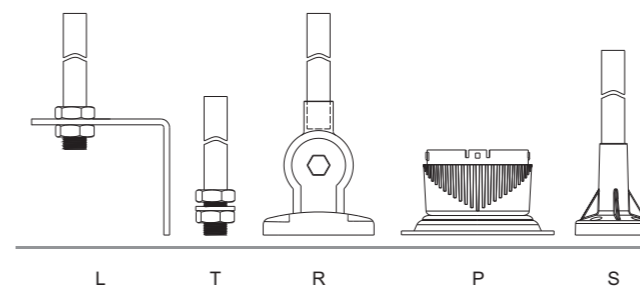


Align "♣" on lamp holder to "▲" on groove, wrest toward left to "♣", open the top cover of the stand.

Align "♣" on lamp shade to "▲" on groove, wrest toward right until hearing "click", and the mounting is finished.

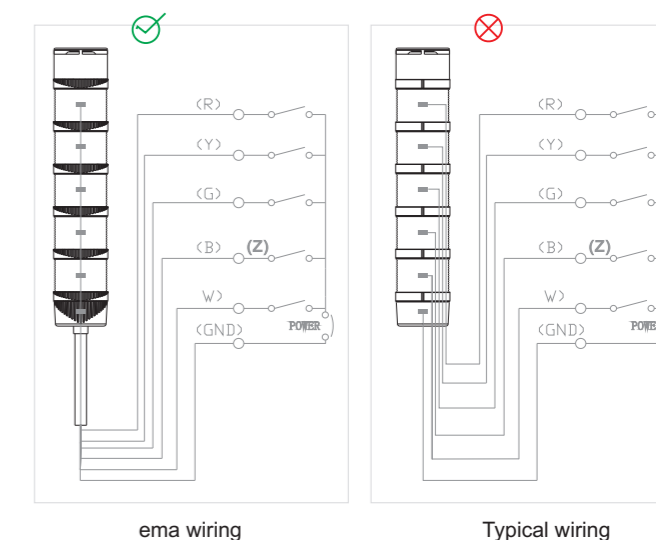
### Easy mounting

Easy and quick selections of mounting with integrated stands. Custom length of stand is available.



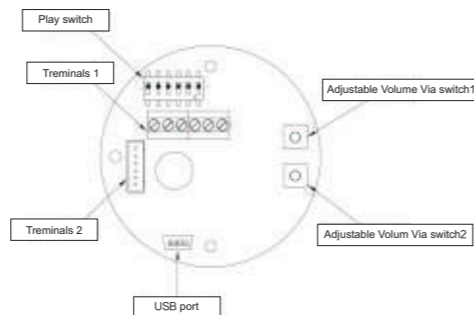
### Easy connection

No need to wire the cable from the top light element to the end. It is convenient to open the cap of stand for wiring - Save material cost and installation time.



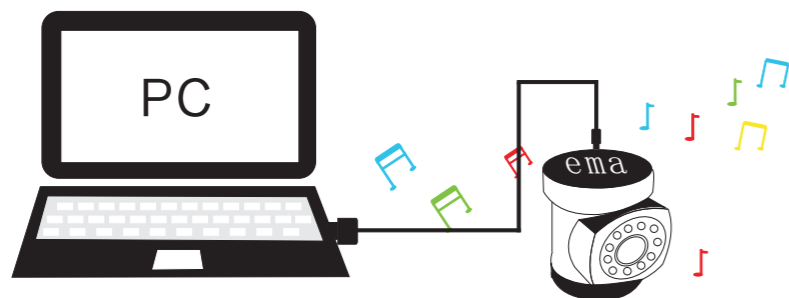
Φ 70mm Music Buzzer

**NEW**



You can input any voice into ema music buzzer as you wish! No matter it is human voice, pop music, tone , melody, natural sound or even symphony. What is more, who software is needed to DIY this audible device. Music buzzer could be used for much more condition for example the warning in different condition/area/equipments. Furthermore, the user can choose any melody or voice as an alarm to play under any failure circumstance. Each light tower module has sound and muffler features. You can flexibly adjust the position and create various combinations of light module and alarm. No other buzzer makes DIY the songs this much fun.

Incredible audible device – the volume of 70mm ema Music Buzzer is up to  $85 \pm 10\text{dB/M}$ . A variety of music can make the alarm highly recognizable compared to the general tone which commonly use in most industrial environment. In brief, ema Music Buzzer provide the user the quick response for the failure when there is a personally music coming out in the air. What is more, it is easy and flexible to be assembled in any layer of light tower, either in the top or button or in the middle of light tower. The volume of the buzzer sound can be adjusted through the DIP switches. The product is flexible and feature with wide range of 12 ~ 24VDC voltage which is perfectly save your inventory. That is no need to worry about different voltage if you have ema Music Buzzer. The function about the ema Music buzzer is a great hit. The accessory 1.5 meter USB cable is available. (Order no.: UP0007)

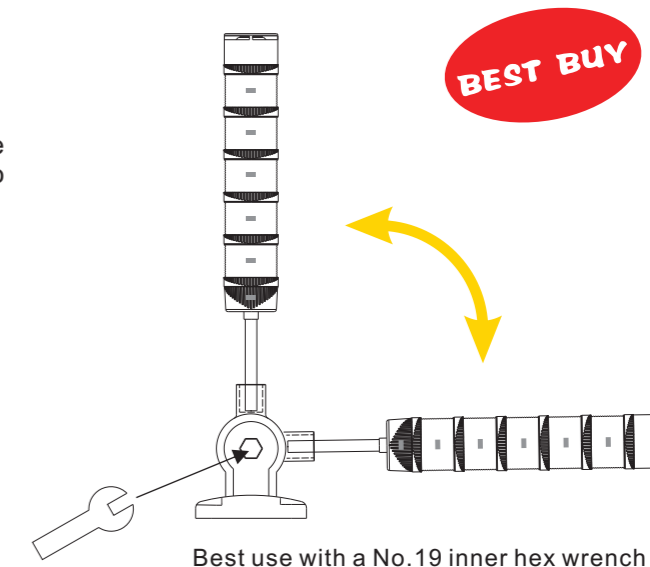


Application examples:

1. Different area in factory (such as area A and area B)
2. Different type/function equipments
3. Different malfunctions
4. Different language for different countries

Best Choice: R type bracket

ema R type bracket is designed to provide the convenience for machine delivery and to avoid the damage during the shipping.



How to select the modular light tower

①select the buzzer(optional)

+

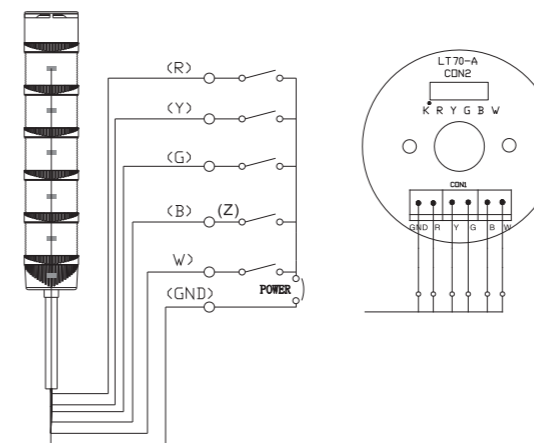
②select the light module

+

③select the bracket



Wiring instruction



input voltage connect with GND(black wire) and W(white wire) buzzer2(Continuous)  
 input voltage connect with GND(black wire) and B(blue wire) buzzer2(Intermittent)  
 input voltage connect with GND(black wire) and G(green wire)Green module light on  
 input voltage connect with GND(black wire) and Y(yellow wire) Yellow module light on  
 input voltage connect with GND(black wire) and R(red wire) Red module light on

PLC can be connected with anode or cathode

Notice:When you use the PLC to control continuous light(DC 12~24V and AC85~275V), it is ideal method to use RELAY to protect PLC .



- Indicator with long life lights, insert 8 ultra bright LED diode
- Modular design for installation without tools
- Patent design for advancing brightness and easy installation
- Good looking and well practical stand
- The frequency of alarm: 60~80 times per minute
- Main material:light module-PC,bracket-ABS, tube-Aluminum
- Materials in protection of corrosive
- Protection rating:IP54、IP65



For the convenience of your inventory control and the alternation of accessories, you can choose themodule. Also it is unnecessary for you to buy the whole set of the product while the circuit or only certain light element is out of work .Our module design makes your inventory and maintenance expense lowest.

Type of Stand

Bracket Shape	S Type	T Type	L Type	R Type
<p>Drawing H means the real length of tube h means customers selected tube length</p>				

LED Light Module Drawing No.: M4(Page 156)

05	30	Y	DW	L	H
Series	Size	Layer color	Power supply	Type of light	Protection
05	Φ30mm	■ R=Red	DW=12~24VDC	L=Continuous	H=IP65
		■ Y=Yellow		F=Flashing	Omission=IP54
		■ G=Green			
		■ B=Blue			
		■ W=White			

Notice:1. AW85~275VDC is available only for ultra-bright type  
2.30mm flashing type light module can not be set to lighting type, need be ordered separately

Stand Module

05	30	TB	S	01	K	H
Series	Size	Stand	Type of Stand	Length	Body color	Protection
05	Φ30mm	TB	S=S Type	01=10mm	W=White	H=IP65
			T=T Type	10=100mm	K=Black	Omission=IP54
			L=L Type	25=250mm		
			R=R Type			

Notice:30mm type bracket is connected with a 0.5m cable.

Light Tower Module Drawing No.: M1(Page 156)

05	30	RYG	DW	S10	W	L	H
Series	Size	Layer color	Power supply	Type of Stand	Body color	Type of light	Protection
05	Φ30mm	■ R=Red	DW=12~24VDC	S01、S10、S25	W=White	L=Continuous	H=IP65
		■ Y=Yellow		T01、T10、T25	K=Black	F=Flashing	Omission=IP54
		■ G=Green		L01、L10、L25			
		■ B=Blue		R01、R10、R25			
		■ W=White					

16mm Control Switches

22/25/30mm Control Switches

16/22mm Stainless Steel Switches

30/50/70mm Multi-Layer Light Tower



- Long life-time and brightness LED lamp embedded
- Modular design for installation without tools
- Patent design for advancing brightness and easy installation
- Good looking and well practical stand
- The frequency of alarm: 60~80 times per minute
- Buzzer volume: 85±10 dB/M
- Materials in protection of corrosive
- Protection rating: IP54, IP65



For the convenience of your inventory control and the alternation of accessories, you can choose the module. Also it is unnecessary for you to buy the whole set of the product while the circuit or only certain light element is out of work. Our module design makes your inventory and maintenance expense lowest.

Type of Stand

Bracket Shape	S Type	T Type	L Type	R Type	P Type
<p><b>Drawing</b></p> <p>H means the real length of tube h means customers selected tube length</p>					

LED Light Module Drawing No.:M5(Page 156)

05	50	Y	DW	L	E	H
Series	Size	Layer color	Power supply	Type of light	LED brightness	Protection
05	φ50mm	■ R=Red	DW=12~24VDC	L=Continuous	Omission=extra	H=IP65
		■ Y=Yellow	AW=85~275VAC	F=Flashing	E=standard	Omission=IP54
		■ G=Green				
		■ B=Blue				
		■ W=White				

Notice:1. AW85~275VDC is available only for ultra-bright type  
2.LE or LEH is standard type with 6 LEDs embedded

Buzzer Module Drawing No.:M7(Page 156)

05	50	Z	DW	F	K	H
Series	Size	Buzzer	Power supply	Type of Tone	Body color	Protection
05	φ50mm	□ Z	DW=12~24VDC	F=Continuous, Intermittent can be adjusted	W=White	H=Protection
			AW=85~275VAC		K=Black	Omission=IP54

Stand Module

05	50	TB	S	01	K	H
Series	Size	Stand	Type of Stand	Length	Body color	Protection
05	φ50mm	TB	S=S Type	01=10mm	W=White	H=Protection
			T=T Type	10=100mm	K=Black	Omission=IP54
			L=L Type	25=250mm		
			R=R Type			
			P=P Type			

Light Tower Module Drawing No.:M2(Page 156)

05	50	RYG	DW	S10	W	L	H
Series	Size	Layer color	Power supply	Type of Stand	Body color	Type of light	Protection
05	φ50mm	■ R=Red	DW=12~24VDC	S01,S10,S25	W=White	L=Continuous	H=Protection
		■ Y=Yellow	AW=85~275VAC	T01,T10,T25	K=Black	F=Flashing	Omission=IP54
		■ G=Green		L01,L10,L25			
		■ B=Blue		R01,R10,R25			
		■ W=White		P			
		□ Z=Buzzer					

16mm Control Switches  
22/25/30mm Control Switches  
16/22mm Stainless Steel Switches  
30/50/70mm Multi-Layer Light Tower



- Long life-time and brightness LED lamp embedded
- Modular design for installation without tools
- Patent design for advancing brightness and easy installation
- Good looking and well practical stand
- The frequency of alarm: 60~80 times per minute
- Buzzer volume: 85±10 or 120±10 dB/M
- Materials in protection of corrosive
- Protection rating:IP54、IP65



For the convenience of your inventory control and the alternation of accessories, you can choose the module. Also it is unnecessary for you to buy the whole set of the product while the circuit or only certain light element is out of work .Our module design makes your inventory and maintenance expense lowest.

Type of Stand

Bracket Shape	S Type	T Type	L Type	R Type	P Type
<b>Drawing</b> H means the real length of tube h means customers selected tube length					

LED Light Module Drawing No.:M6(Page 156)

05	70	Y	DW	L	E	H
Series	Size	Layer color	Power supply	Type of light	LED brightness	Protection
05	φ70mm	■ R=Red	DW=12~24VDC	L=Continuous	Omission=extra	H=IP65
		■ Y=Yellow	AW=85~275VAC	F=Flashing	E=standard	Omission=IP54
		■ G=Green				
		■ B=Blue				
		■ W=White				

Notice:1. AW85~275VDC is available only for ultra-bright type  
2.LE or LEH is standard type with 12 LEDs embedded

Buzzer Module Drawing No.:M8(Page 156)

05	70	Z	DW	F	K	H
Series	Size	Buzzer	Power supply	Type of Tone	Body color	Protection
05	φ70mm	□ Z=85 ± 10dB	DW=12~24VDC	F=Continuous, Intermittent can be adjusted	W=White	H=IP65
			AW=85~275VAC		K=Black	Omission=IP54

Music Buzzer and 120dB Buzzer Drawing No.:M9(Page 156)

05	70	P	DW	A	K	H
Series	Size	Music Buzzer	Power supply	Soud Section	Body color	Protection
05	φ70mm	P=MP3	DW=12~24VDC	A=5 Section	K=Black	H=IP65
					W=White	Omission=IP54

Notice:music buzzer can be used with a 1.5m USB wire, order No.: UP0007

05	70	S	DW	F	K	H
Series	Size	120dB Buzzer	Power supply	Type of Tone	Body color	Protection
05	φ70mm	S=120 ± 10dB	DW=12~24VDC	F=Volume、frequency	K=Black	H=IP65
			AW=85~275VAC		W=White	Omission=IP54

Stand Module

05	70	TB	S	01	K	H
Series	Size	Stand	Type of Stand	Length	Body color	Protection
05	φ70mm	TB	S=S Type	01=10mm	W=White	H=IP65
			T=T Type	10=100mm	K=Black	Omission=IP54
			L=L Type	25=250mm		
			R=R Type			
			P=P Type			

Light Tower Module Drawing No.:M3(Page 156)

05	70	RYG	DW	S10	W	L	H
Series	Size	Layer color	Power supply	Type of Stand	Body color	Type of light	Protection
05	φ70 mm	■ R=Red	DW=12~24VDC	S01,S10,S25	W=White	L=Continuous	H=IP65
		■ Y=Yellow	AW=85~275VAC	T01,T10,T25	K=Black	F=Flashing	Omission=IP54
		■ G=Green		L01,L10,L25			
		■ B=Blue		R01,R10,R25			
		■ W=White		P			
		□ Z=Buzzer					

16mm Control Switches  
22/25/30mm Control Switches  
16/22mm Stainless Steel Switches  
30/50/70mm Multi-Layer Light Tower



- White and transparent housing
- Long life-time and brightness LED lamp embedded
- Modular design for installation without tools
- Patent design for advancing brightness and easy installation
- Good looking and well practical stand
- The frequency of alarm: 60~80 times per minute
- Materials in protection of corrosive
- Protection rating:IP54、IP65



For the convenience of your inventory control and the alternation of accessories, you can choose the module. Also it is unnecessary for you to buy the whole set of the product while the circuit or only certain light element is out of work. Our module design makes your inventory and maintenance expense lowest.

Type of Stand

Bracket Shape	S Type	T Type	L Type	R Type	P Type
<p><b>Drawing</b></p> <p>H means the real length of tube h means customers selected tube length</p>					

50mm LED Light Module Drawing No.:M5(Page 156)

05	50	W	R	DW	L	H
Series	Size	Body color	LED color	Power supply	Type of light	Protection
05	Φ50mm	W=白	R=Red	DW=12~24VDC	L=Continuous	H=IP65
			Y=Yellow	AW=85~275VAC	F=Flashing	Omission=IP54
			G=Green			
			B=Blue			
			Omission=White			

Notice:1.AW85~275VDC is available only for ultra-bright type

70mm LED Light Module Drawing No.:M6(Page 156)

05	70	W	R	DW	L	H
Series	Size	Body color	LED color	Power supply	Type of light	Protection
05	Φ70 mm	W=White	R=Red	DW=12~24VDC	L=Continuous	H=IP65
			Y=Yellow	AW=85~275VAC	F=Flashing	Omission=IP54
			G=Green			
			B=Blue			
			Omission=White			

Light Tower Module

05	70	W	RYG	DW	S10	K	L	H
Series	Size	Layer color	LED color	Power supply	Type of Stand	Body color	Type of light	Protection
05	Φ50mm	W=White	R=Red	DW=12~24VDC	S01、S10、S25	W=White	L=Continuous	H=IP65
	Φ70 mm		Y=Yellow	AW=85~275VAC	T01、T10、T25	K=Black	F=Flashing	Omission=IP54
			G=Green		L01、L10、L25			
			B=Blue		R01、R10、R25			
			Omission=White		P			

16mm Control Switches

22/25/30mm Control Switches

16/22mm Stainless Steel Switches

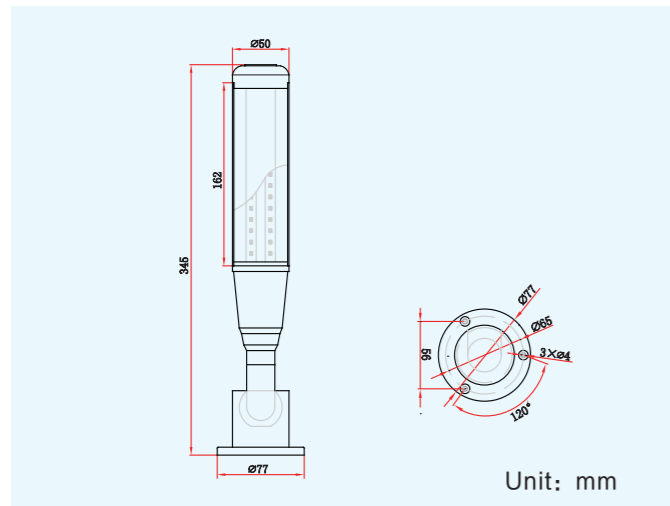
30/50/70mm Multi-Layer Light Tower



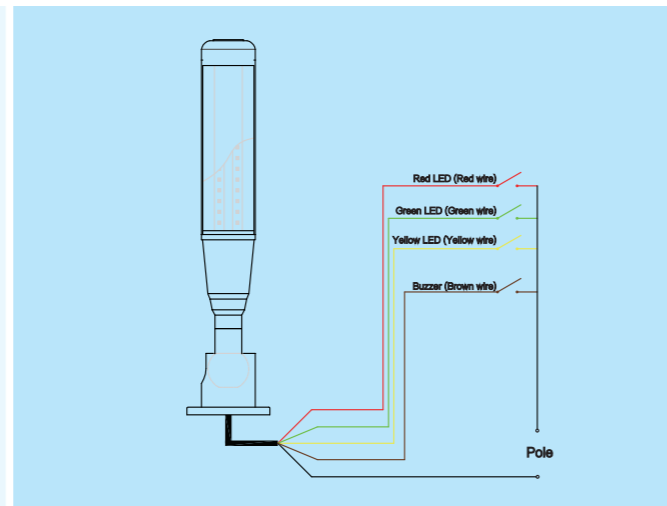
- Size: Φ50mm
- Compact structure. Red/Yellow/Green colors with 50cm wire.
- Use LED as light source
- Transparent housing for the recognition
- Housing material: Aluminum alloy
- Cover of lamp material: Polycarbonate
- Lamp lifetime: 50000 hrs
- Buzzer volume: 80 ± 10 db/M
- Protection rating: IP40、IP54



Drawing




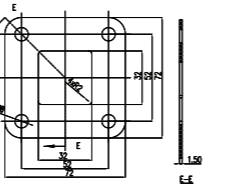

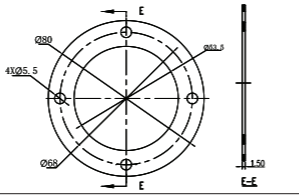

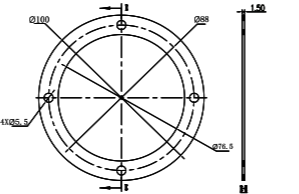

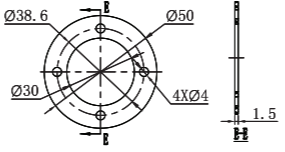

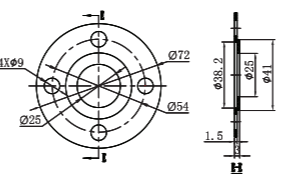

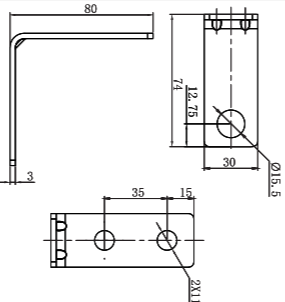

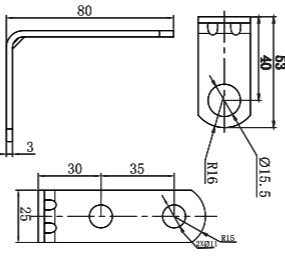
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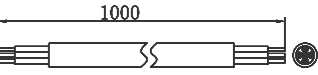

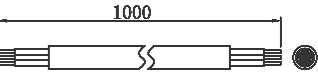

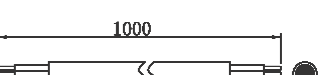

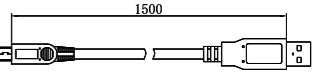


50mm Light Module

05	50	RYGZ	24	R00	A	L	P
Series	Size	LED color	Power supply	Type of Stand	Housing material	Type of light	Wiring
05	50=50mm	■ R=Red	24=24VDC	R00=R type	A=Aluminum alloy	L=Continuous	P=PNP 24VDC Positive
		■ Y=Yellow					N=NPN 24VDC Negative
		■ G=Green					
		□ Z=Buzzer					

Notice: The order of LED color (from top to bottom) – red, yellow, green  
Buzzer: continuous tone

Order No.	Gasket	Description	Drawing
05R01		Waterproof gasket for R type bracket, 1.5mm thickness, silicon rubber, suitable for 0530/0550/0570	
05P01		Waterproof gasket for P type bracket, 1.5mm thickness, silicon rubber, suitable for 0550	
05P02		Waterproof gasket for P type bracket, 1.5mm thickness, silicon rubber, suitable for 0570	
05S01		Waterproof gasket for S type bracket, 1.5mm thickness, silicon rubber, suitable for 0530/0550	
05S02		Waterproof gasket for S type bracket, 1.5mm thickness, silicon rubber, suitable for 0570	
Order No.	L type bracket	Description	Drawing
05TBL		L type bracket, L:80mm, W:74mm, H:30mm, T:3mm, suitable for 0530/0550/0570	
05TBL1		L type bracket, L:80mm, W:53mm, H:25mm, T:3mm, suitable for 0530/0550/0570 Standard type with L shape bracket	

Order No.	Wire	Description	Drawing
C01N4C		1M, 4 core PVC wire	
C01N5C		1M, 5 core PVC wire	
C01N6C		1M, 6 core PVC wire	
UP0007		1.5M USB cable for music buzzer	

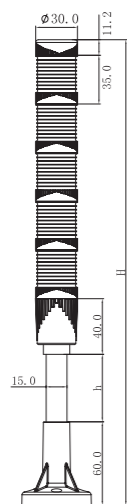
16mm Control Switches

22/25/30mm Control Switches

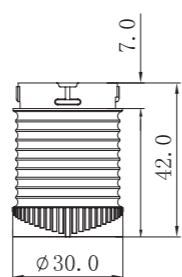
16/22mm Stainless Steel Switches

30/50/70mm Multi-Layer Light Tower

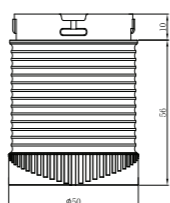
Drawing



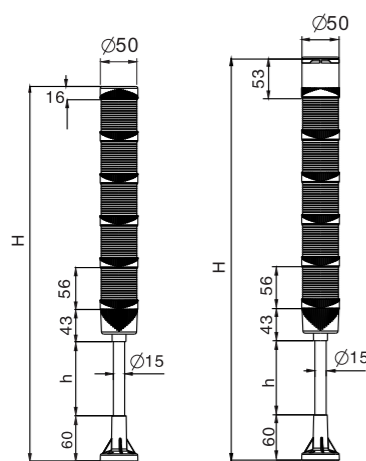
M1



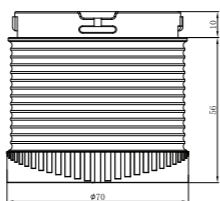
M4



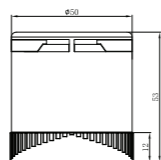
M5



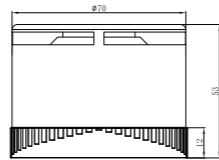
M2



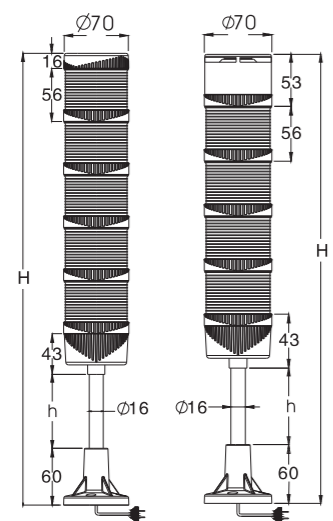
M6



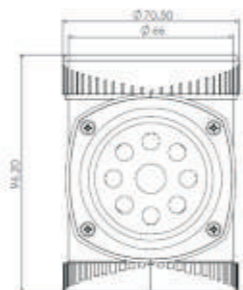
M7



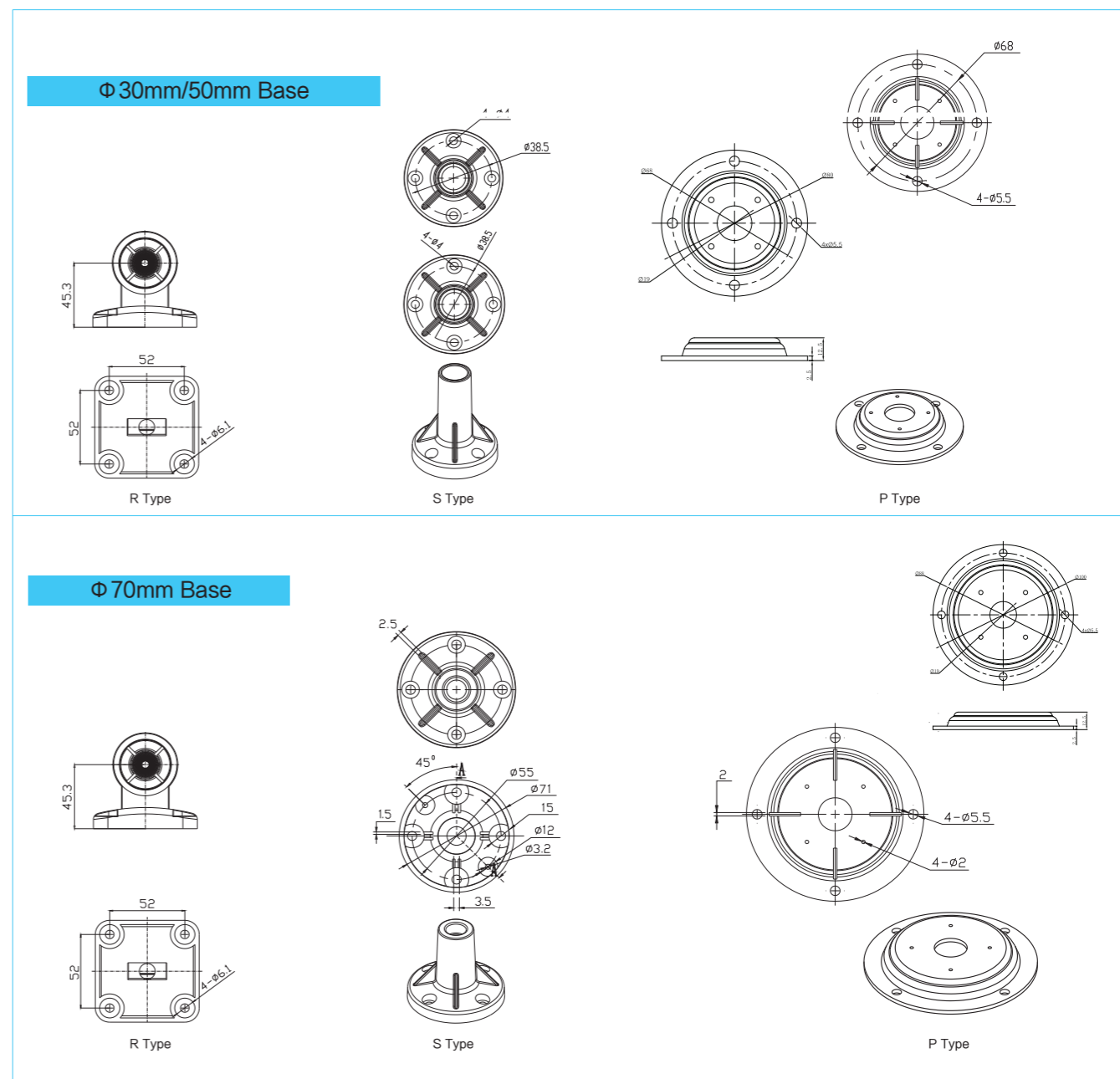
M8



M3



M9



- **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](http://www.ema-electronic.com)



**ema**

ema Electronics Ltd.  
sales@ema-electronic.com

ema reserve the right to change specifications without prior notice

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

**ema**

## Process Automation

- **Fluid Sensors**
- **Level Measurement**



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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 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	IIC	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°C  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

ema Process Automation Fluid TB/TD Remote Temperature Sensors

ema® www.ema-electronic.com <<<

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*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

Accessories:

Type	Connector	Order No.	Drawing No.
C	Q2	I 5 C 12	E3U11
I	C: Cable Length: 02: 2M 05: 5M 10: 10M	L: Straight L: Angled	L: E3U12

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

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)

ema | 40

Left page

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

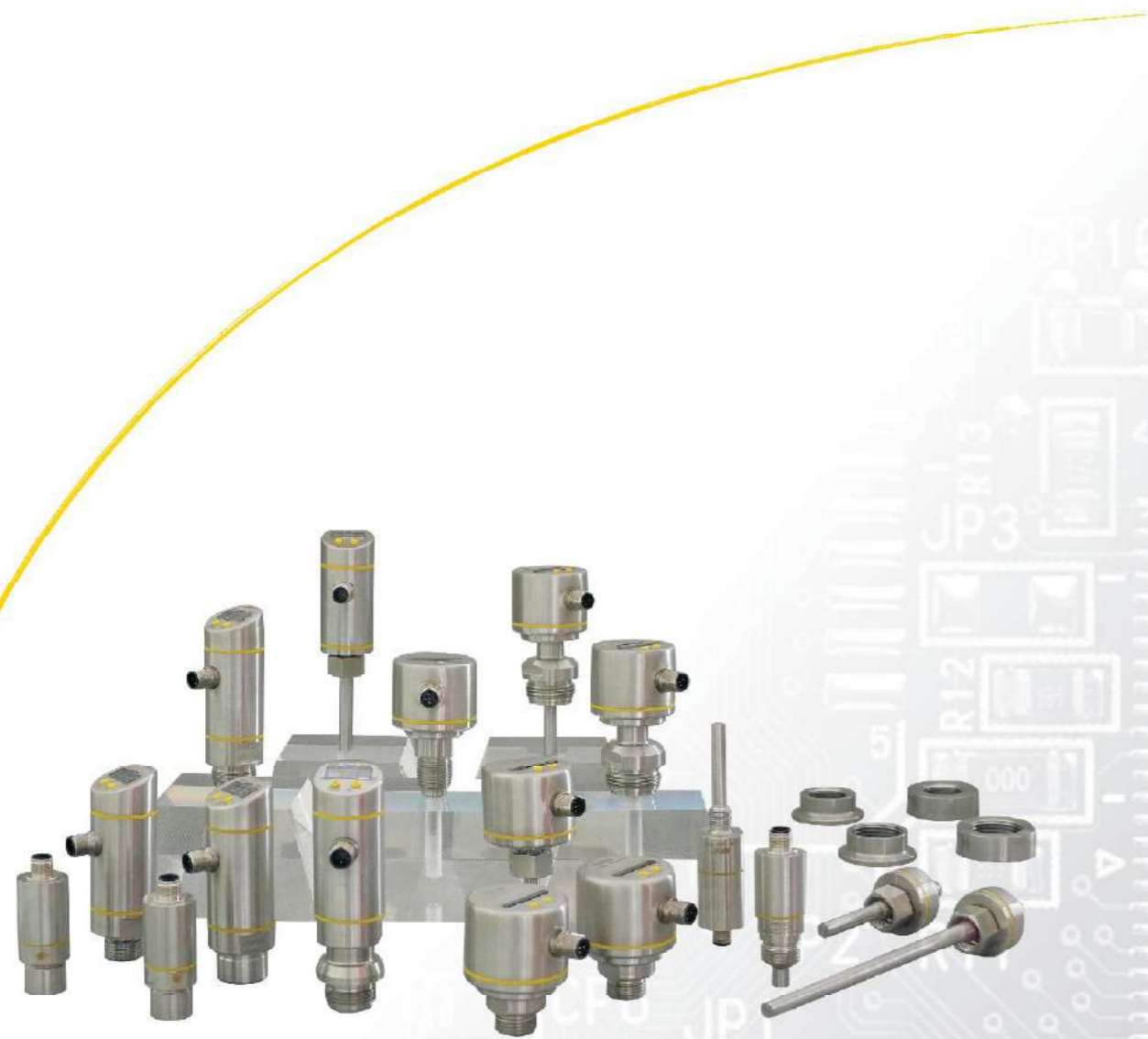
Right page

- ⑦ Order Information
- ⑧ Category
- ⑨ Brand

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Ultrasonic Level Sensors	78-85
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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.



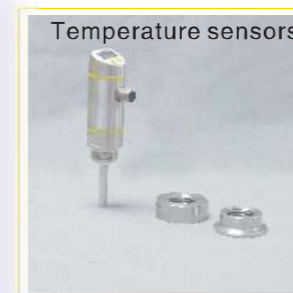
Flow sensors

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 does not matter because the unit works without mechanical parts.



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.



Temperature sensors

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**

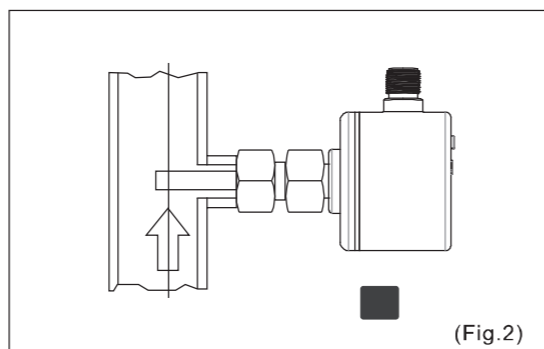
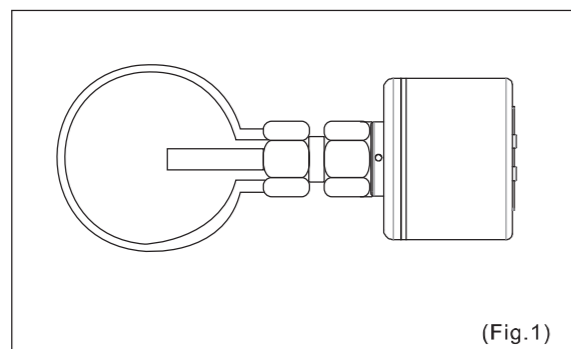
**Flow + Temperature Sensor** is the most progressive technique and is created exclusively to satisfy the demands of customers. It perfectly combines temperature sensor and flow sensor in one unit. The LED bar can display indication of the temperature and flow range as well as output warning signals 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 steel housing

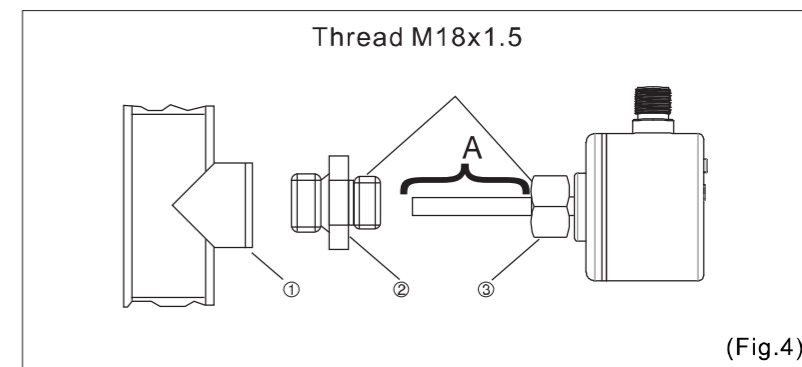
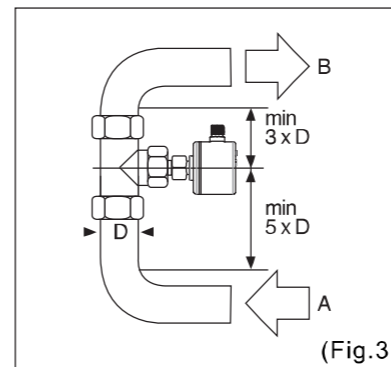
**Installation**

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)

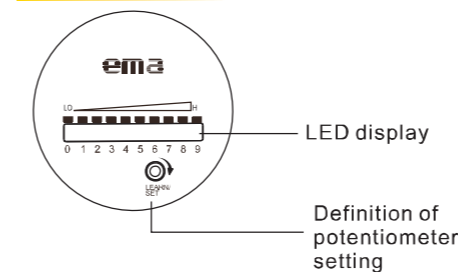
The depth of insertion: The minimum depth inserting to the pipeline is 12mm. To insure the correct depth, the user can use an adapter ②(Accessory; optional order).

**Notice:** The probe of sensor is not allowed to contact the wall of the pipe.

**Menu setting and indication status**

Control panel

Potentiometer type



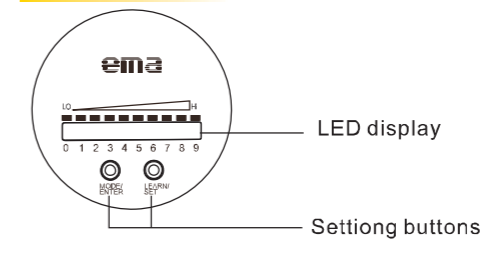
Definition of potentiometer setting

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)

Smart type



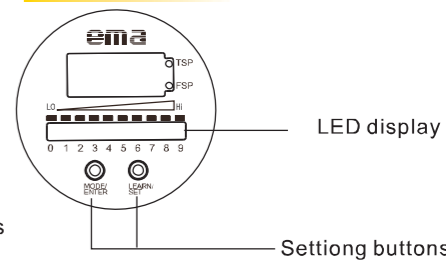
Button definition

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 temperature SP (display, output, calibration of temperature, 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	

Flow Sensors

Pressure Sensors

Temperature Sensors



- 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
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.

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

FL61 Titanium 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.
	C	02	I	5	C	12	I : E3U11
I	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	M18x1.5	3~300	200~3000	PNP NO/NC	45	20~36 DC	E3F03
FL6202	Internal	M18x1.5	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 x 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

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

Drawing

Page

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**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.
	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.

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.
	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						
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.
	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.	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

Flow Sensors

Pressure Sensors

Temperature Sensors

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

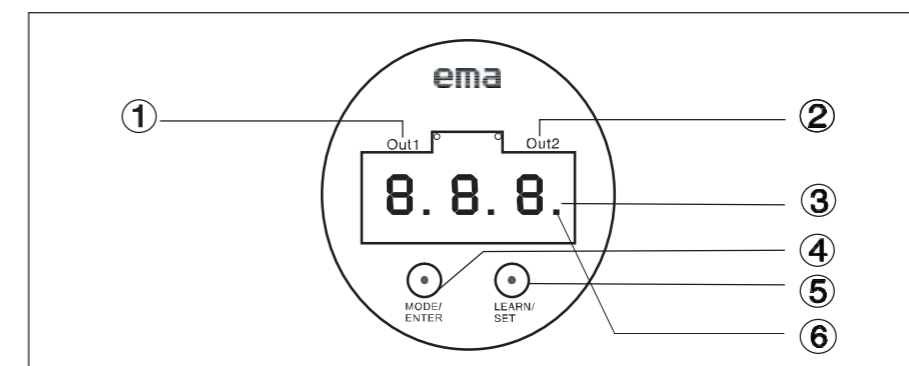
Pressure sensors are applied to a variety of fields in industrial automation such as water conservancy, hydroelectric industry, intelligent architecture, automation control, aviation, military industry, petrochemical industry, electric power, shipping, machinery tools, and more.

### 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 controlled 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.

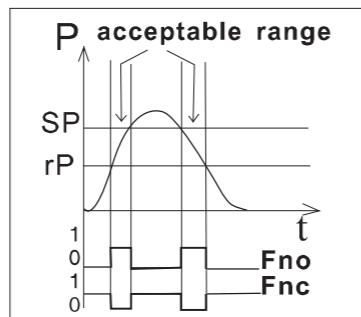
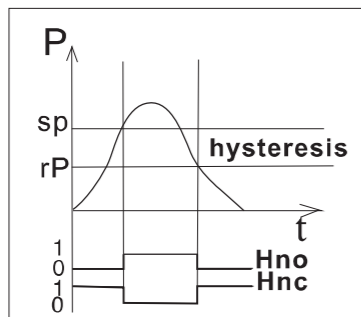
Output 1	Output 2
Hysteresis/N.O.(Hno)	Analogue output
Hysteresis function/N.C.(Hnc)	4~20mA(I)
window function/N.O.(Fno)	Analogue output
window function/N.C.(Fnc)	0~10V(U)

**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**

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.

- **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/cm<sup>2</sup>, 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:E1138
	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:E1139
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

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	G 1/4" I	-1...1	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1141	G 1/4" I	2	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1142	G 1/4" I	5	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1143	G 1/4" I	10	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1144	G 1/4" I	20	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1145	G 1/4" I	50	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1146	G 1/4" I	100	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1147	G 1/4" I	200	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1148	G 1/4" I	250	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1149	G 1/4" I	400	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1150	G 1/4" I	600	18-36 DC	PNP NO/NC, NPN NO/NC	0-10V, 4-20mA	4	E3P01
PA1160	G 1/4" I	-1...1	18-36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1161	G 1/4" I	2	18-36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1162	G 1/4" I	5	18-36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1163	G 1/4" I	10	18-36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1164	G 1/4" I	20	18-36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1165	G 1/4" I	50	18-36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1166	G 1/4" I	100	18-36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1167	G 1/4" I	200	18-36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1168	G 1/4" I	250	18-36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1169	G 1/4" I	400	18-36 DC	PNP NO/NC, NPN NO/NC	PNP NO/NC, NPN NO/NC	4	E3P01
PA1170	G 1/4" 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

Flow Sensors

Pressure Sensors

Temperature Sensors




- 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
L	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

Flow Sensors

Pressure Sensors

Temperature Sensors

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

Flow Sensors  
Pressure Sensors  
Temperature Sensors

Drawing

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**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							
	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

Flow Sensors  
Pressure Sensors  
Temperature Sensors





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

Drawing

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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**

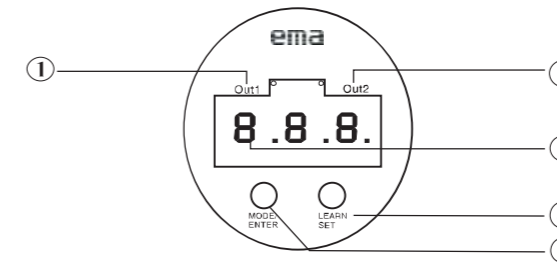


- Monitor temperature of cooling water of mould to increase or decrease the volume of flow of cooling water or to warn.
- Detect temperature of enzymes or other chemicals in containers.
- Detect temperature in liquid waste processing systems.



- Detect temperature of oil in pipes of wind power equipments.

**Controls and visual indication**



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

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

Measuring range

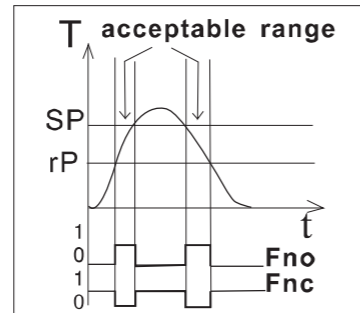
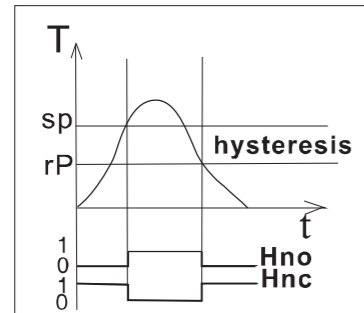
°C	-40~150
°F	-40~302

**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 according 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.

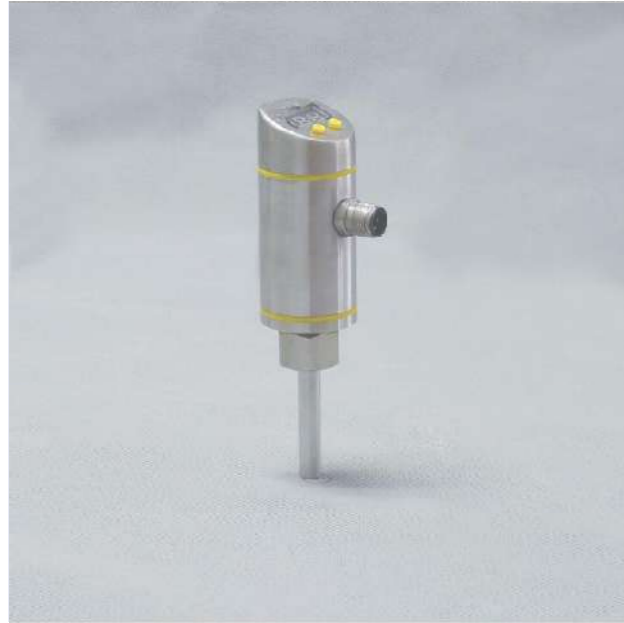
**Setting / Operation**

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**



- 1.The probe is not allowed to touch the wall of pipe.
- 2.This product should be mounted in the position which can sense the temperature.
- 3.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.
- 4.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.
	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

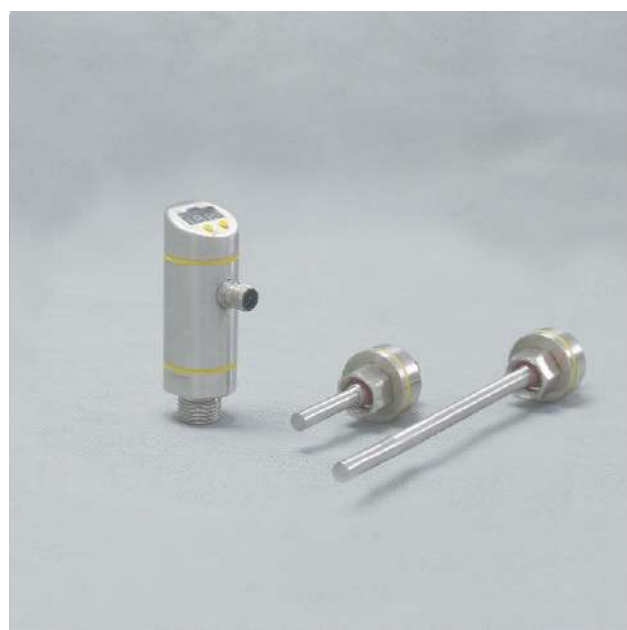
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Order NO.

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
L	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

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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



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

Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I:E3U11
 L	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

Drawing

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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



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

Accessories:

Type	Connector Order No.						Drawing No.
 I	C	02	I	5	C	12	I:E3U11
 L	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.	US0061	US0062
Type	 Hygienic welding adapter	 Hygienic Tri Clamp adapter
Drawing No.	E3U15	E3U16

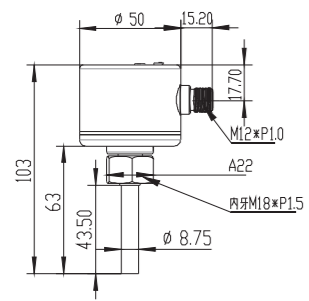
Drawing

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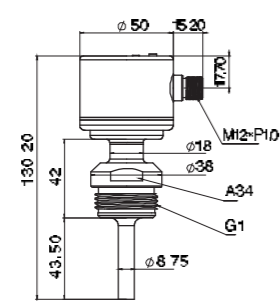
**Technical parameters:**

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

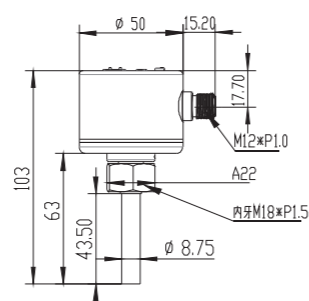
Flow sensors/Pressure sensors



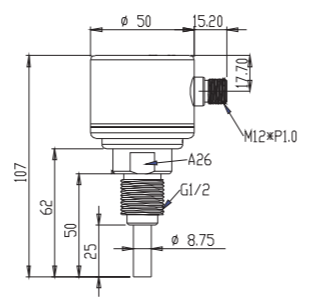
E3F01



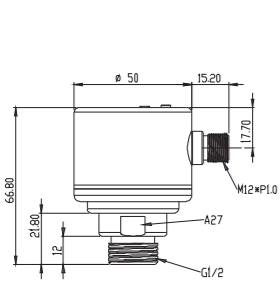
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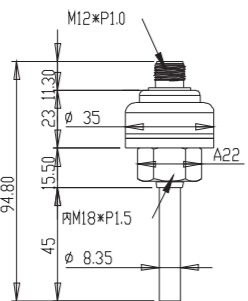
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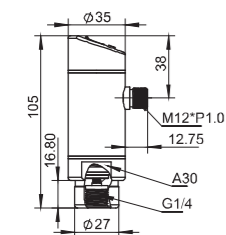
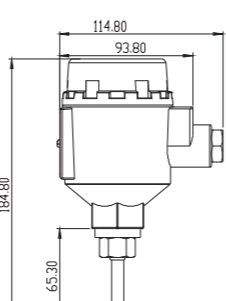
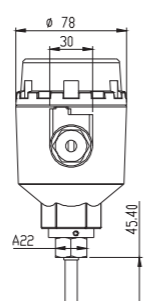
E3F04



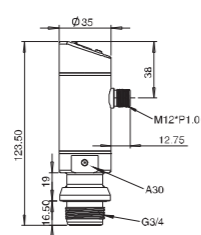
E3F05



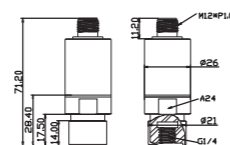
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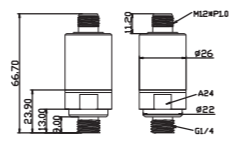
E3P01



E3P02

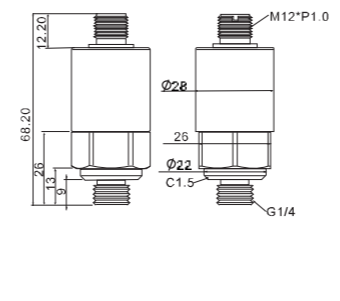


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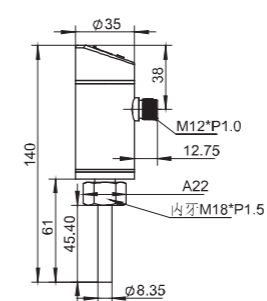


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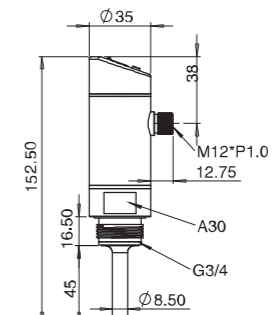
Pressure sensors /Temperature sensors



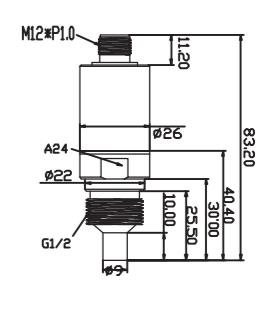
E3P05



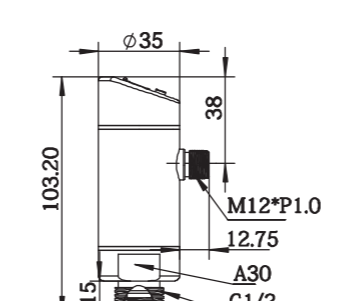
E3T01



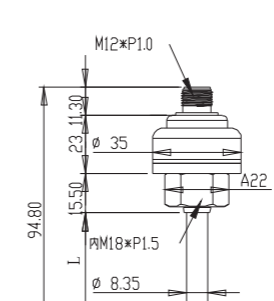
E3T02



E3T03



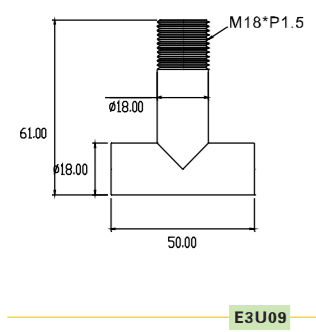
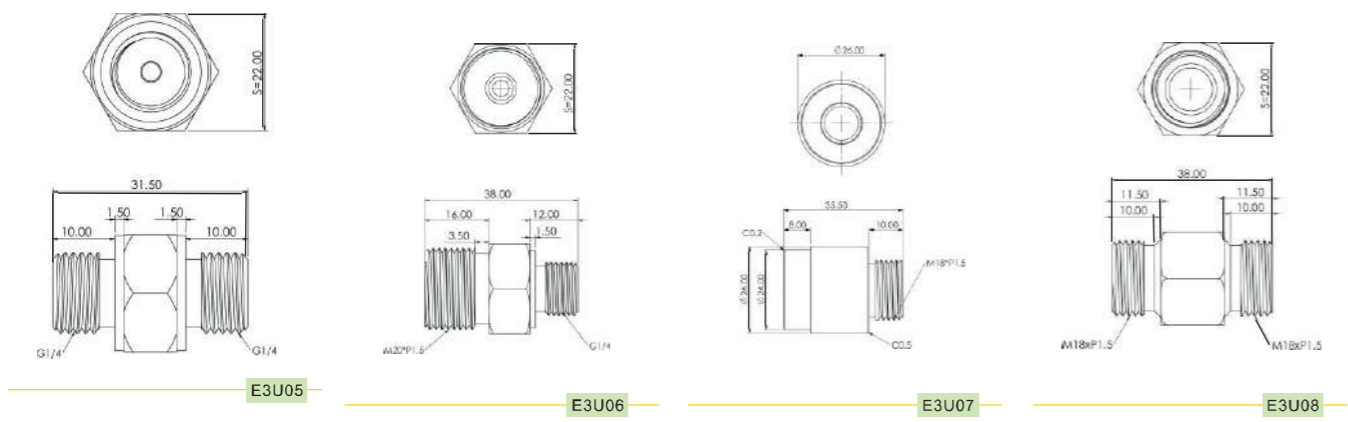
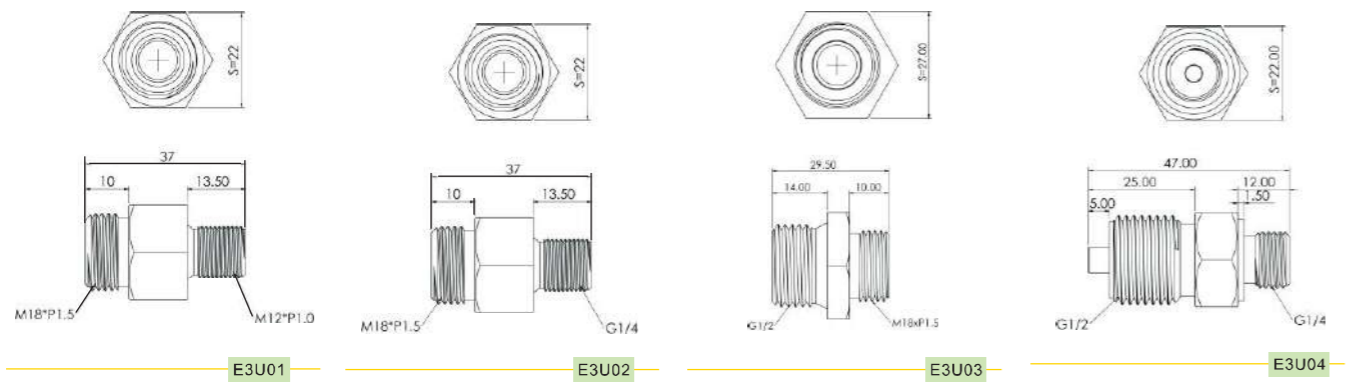
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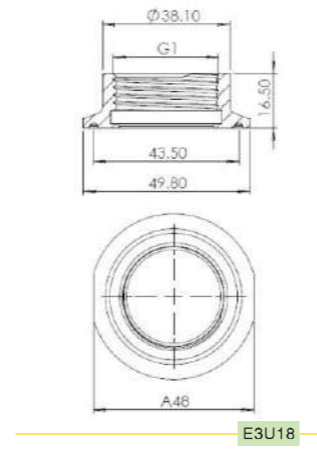
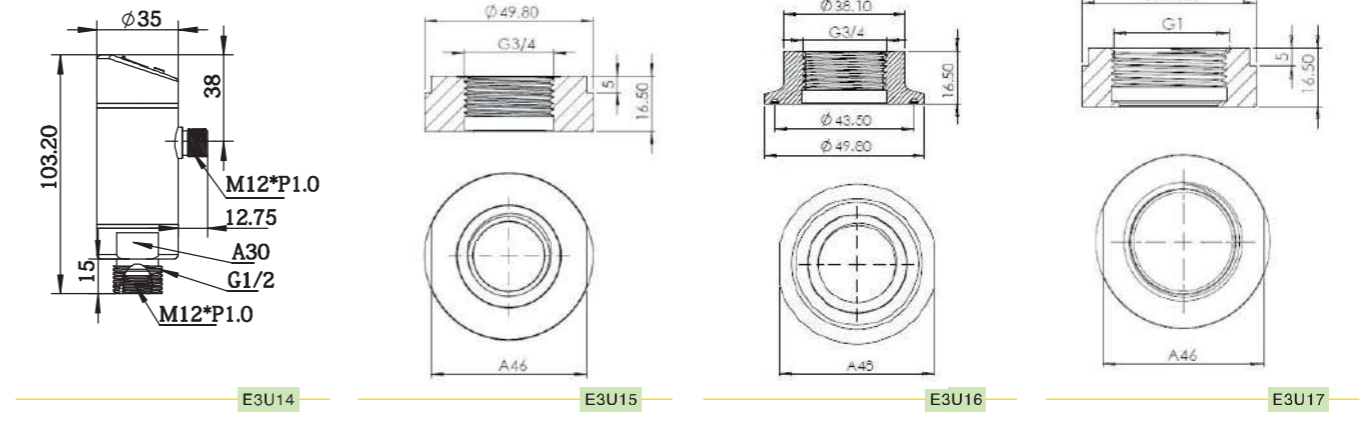
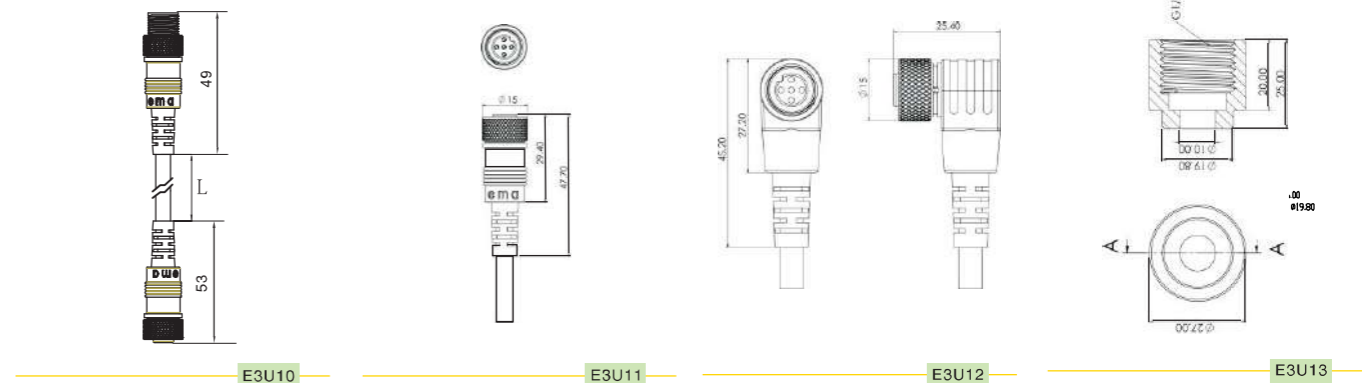
E3T05

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

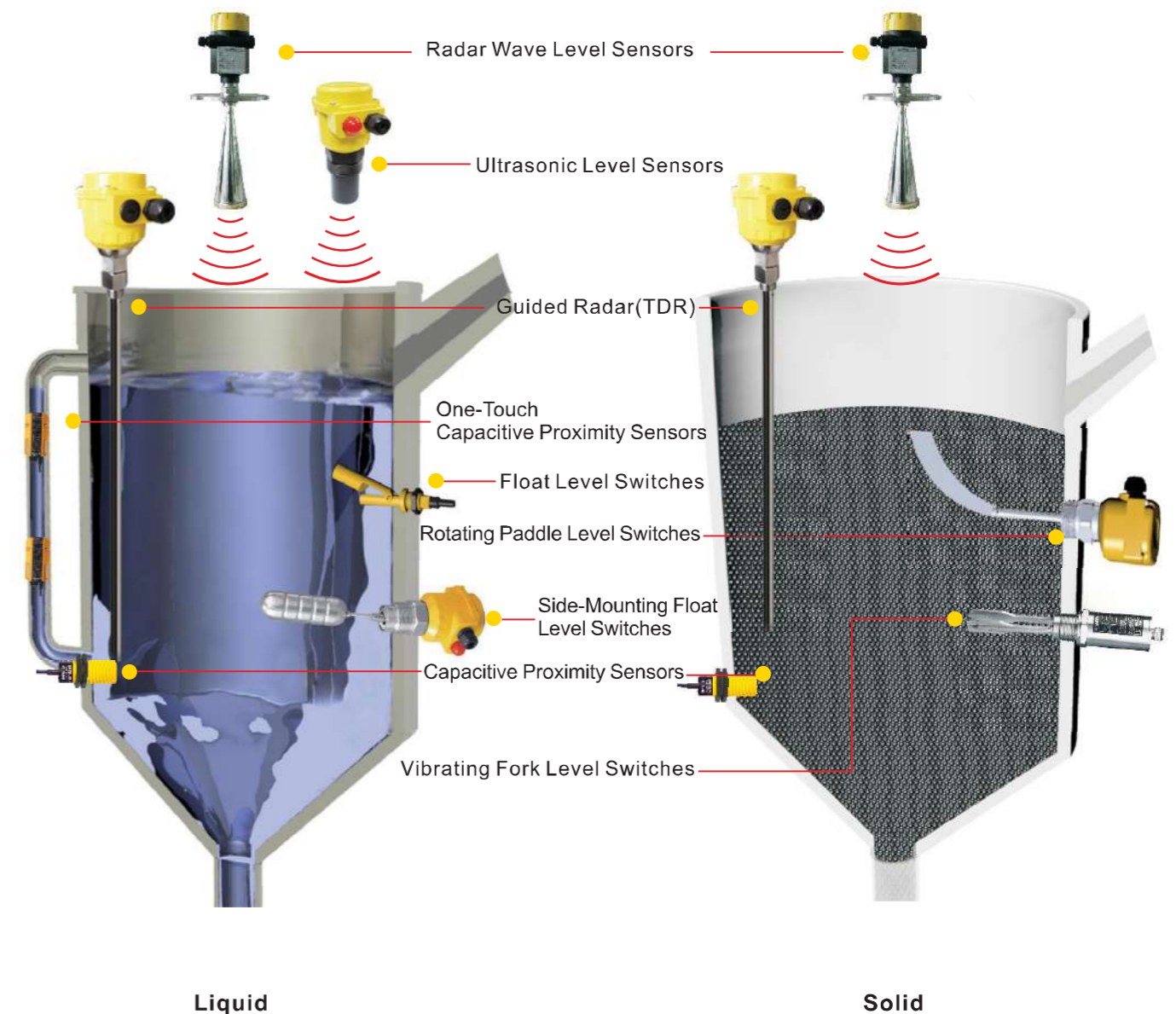
Ultrasonic level sensors: Liquid

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.



www.ema-electronic.com

### 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.

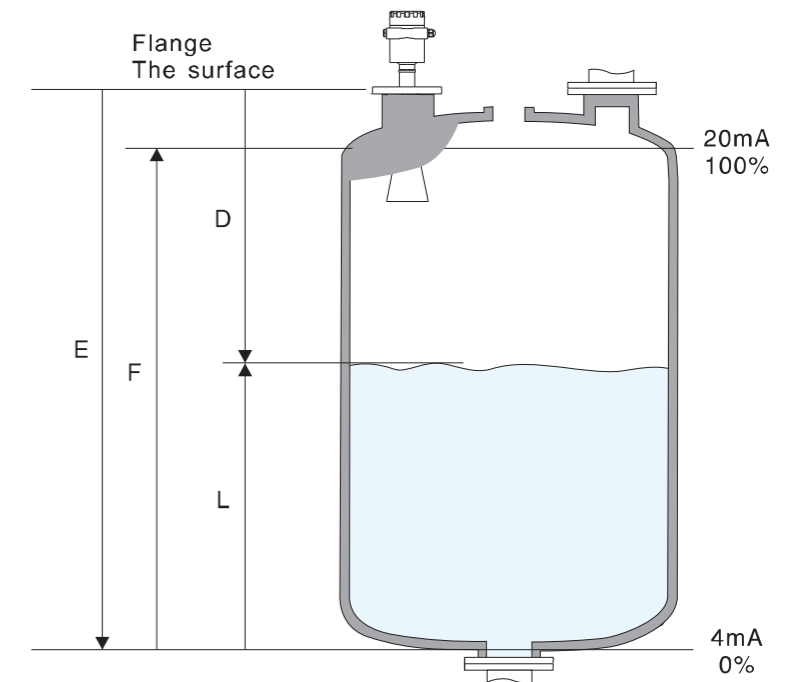
The distance D between refernce point and material surface in proportion to the runtimet of pulse signal

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

C is equal to speed of light

Tank height E is known so the material level is:

$$L = E - D$$



### Advantages and main applications

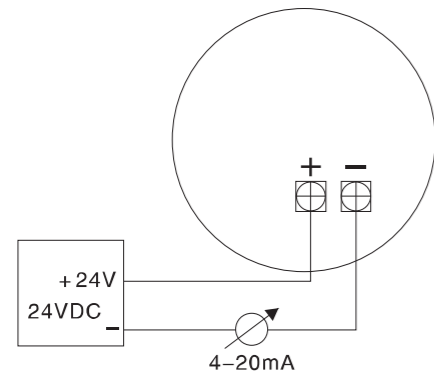
#### Advantages:

- 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 than 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
DN80	200	160	8x18
DN100	220	180	8x18
DN125	250	210	8x18
DN150	285	240	8x22
DN200	340	295	12x22
DN250	405	355	12x26

C	H1
Φ76	227
Φ96	288
Φ121	620

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

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)			
<b>Model</b>	RCSC	RCSD	RCSE
<b>Product Type</b>	Antenna		
<b>Connection</b>	G1½"、1½"NPT、Flange		
<b>Cable Connection</b>	M20×P1.5、½NPT		
<b>Measuring Range(M)</b>	70	70	30
<b>Output(mA)</b>	4-20/HART (2 wire/4wire)		
<b>Launch Frequency(GHz)</b>	26		
<b>Power Supply(V)</b>	24VDC、220VAC		
<b>Current Consumption (mA)</b>	< 22.5		
<b>Accuracy(mm)</b>	±15	±15	±10
<b>Operating Temperature(°C)</b>	-40~250		
<b>Operating Pressure(Mpa)</b>	-0.1~4.0	-0.1~4.0	Normal atmospheric pressure
<b>Ambient Temperature(°C)</b>	-40~80		
<b>Ambient Pressure</b>	Normal atmospheric pressure		
<b>Protection Rating</b>	IP67		
<b>Antenna Material</b>	Stainless Steel 304、316		
<b>Housing Material</b>	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 temperature	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°C/-40~320°C							
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 RCSE)
4. If RCSA measuring range is 0-10M, it is better to choose antennaΦ45, 10-20M chooseΦ75mm.

Radar Wave Level Sensors  
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Ultrasonic Level Sensors  
Rotating Paddle Level Sensors  
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Float Level Switches  
Capacitive Level Switches

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 temperature	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°C/-40~302°F H: High temperature seal / Kalrez /-40~250°C/-40~482°F									
1	Cable entrance 1: M20x1.5 2: ½NPT									
Y	On-site display Y: With display									
P	Accessories P: Dust cover T: PTFE / Teflon anti-corrosion 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 temperature	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°C/-40~302°F H: High temperature seal / Kalrez /-40~250°C/-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 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

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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 temperature	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					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					
	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										
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°C/-40~302°F H: High temperature seal / Kalrez /-40~250°C/-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,

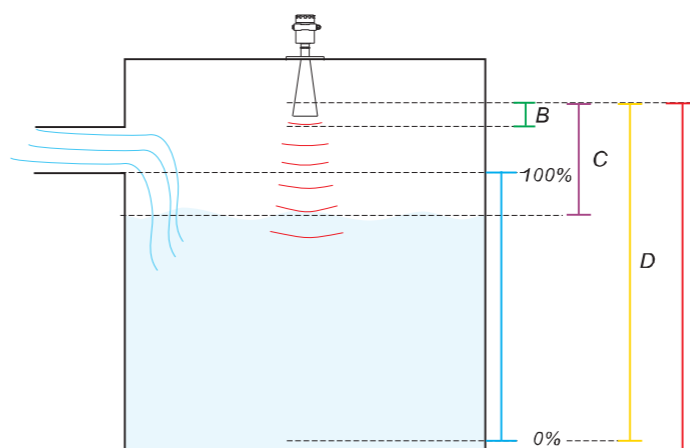
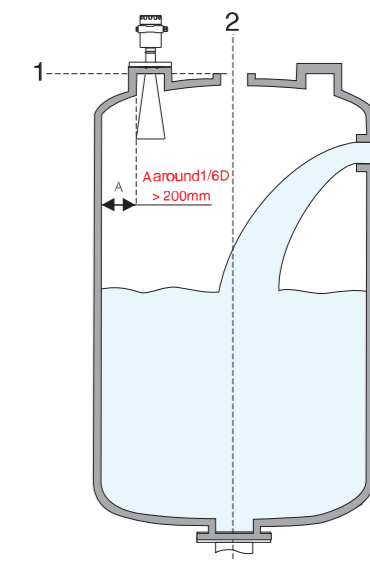
Installation Requirements

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



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

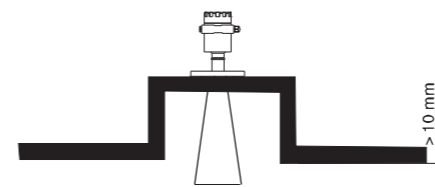
Notice: the highest level value must not be in the inactive area.

Requirement for the installation on the tank

Vessel Nozzles

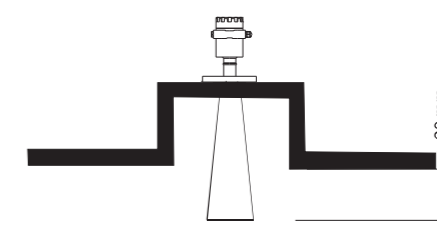
Length of vessel nozzles

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.



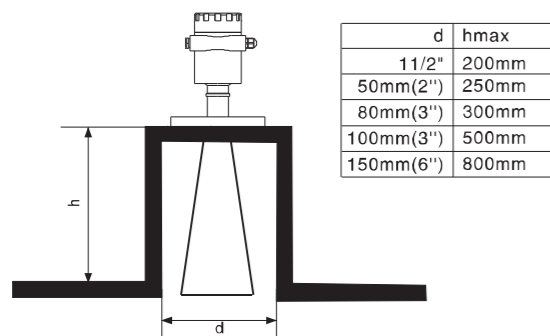
If the media with good reflection properties, the tank nozzle can be slight extend below the antenna. The standard length of the tank nozzle suggested in the table below. Under such circumstance, the end of nozzle must be smooth. Furthermore, the device may have to process "Spurious wave reflection learning".

The 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.



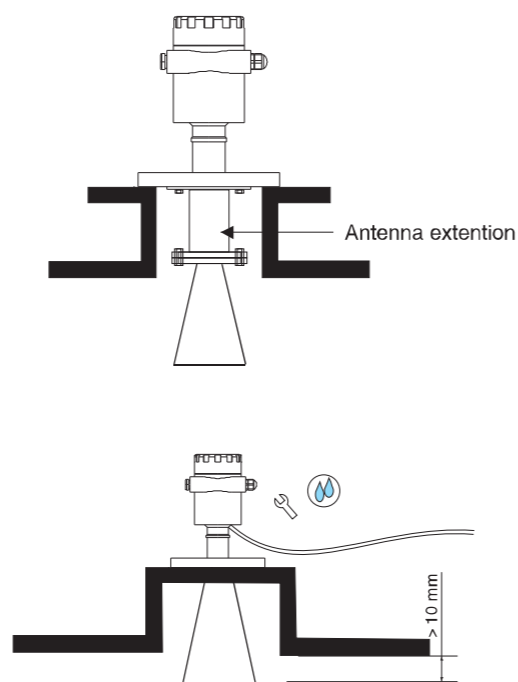
When the length of antenna is shorter than the tank fitting, it is necessary to be added the antenna extension.

Radar Wave Level Sensors  
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**Moisture-proof**

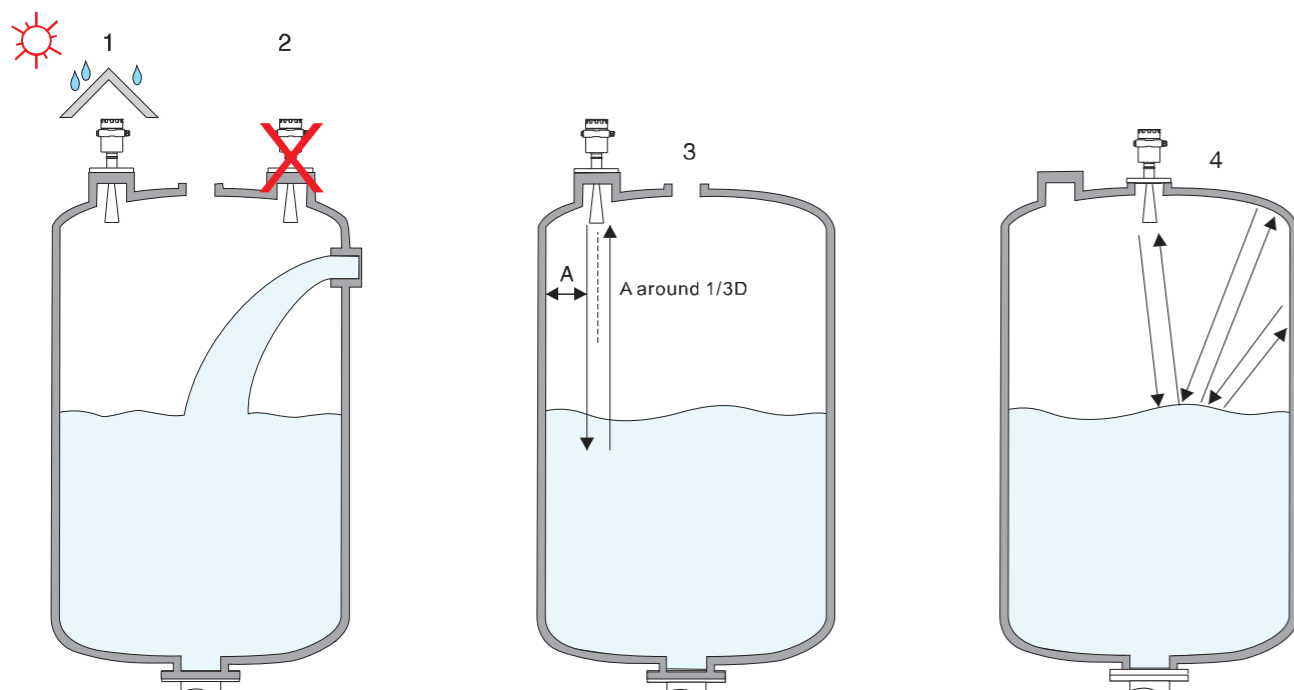
While carrying out installation indoor, indoor humidity or the panel of heating tank, it is necessary to tighten the cable gland and also bend the wire on connection. See the drawing below:



**Common installation position**

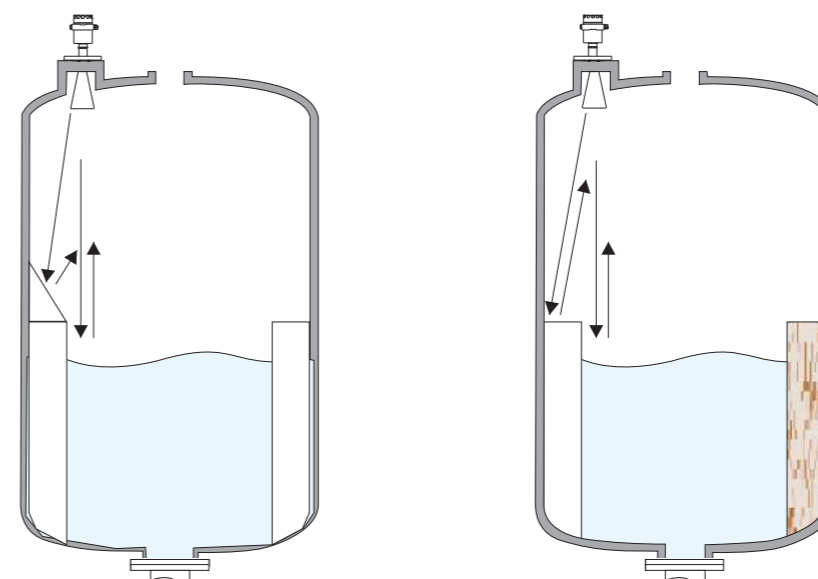
1. Right: sunshade and rainproof measures should be taken if installed outdoor.
2. Wrong: do not install them in the up side of the material flow to ensure they are detecting the material surface but not material flow.

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**

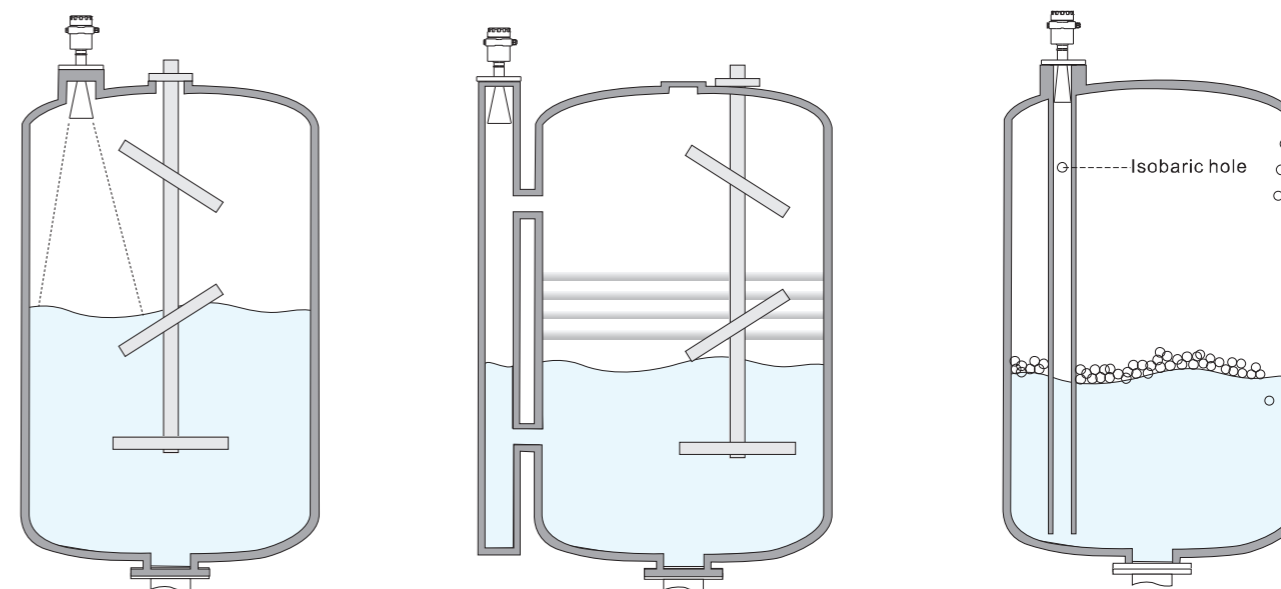
When there are some barriers in the tank will effect the measuring, it's better to install baffle-board to reflect the wave to other place, the device may have "Spurious wave reflection learn" if necessary.



**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**

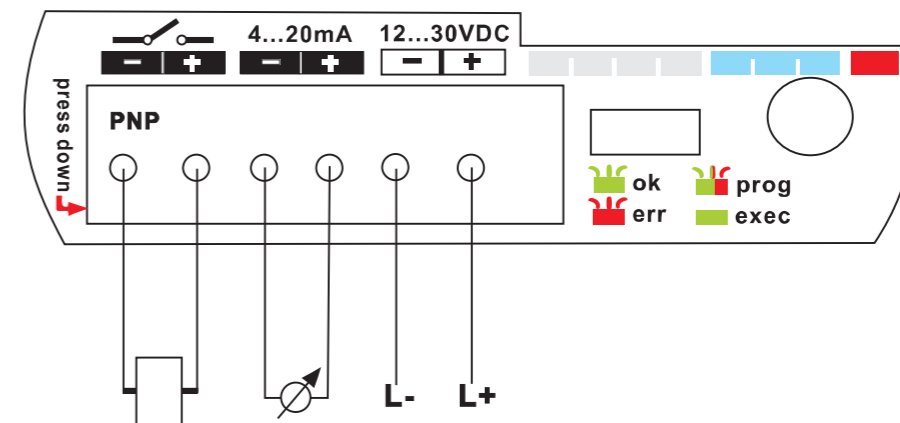
High frequency microwave pulse sent out by radar wave level transmitter is diffuse along the detect devices (steel tube or wire rope), when they meet the medium, dielectric constant changes and cause reflection, some pulse energy will be reflected back. Time interval of transmitted pulse and reflected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

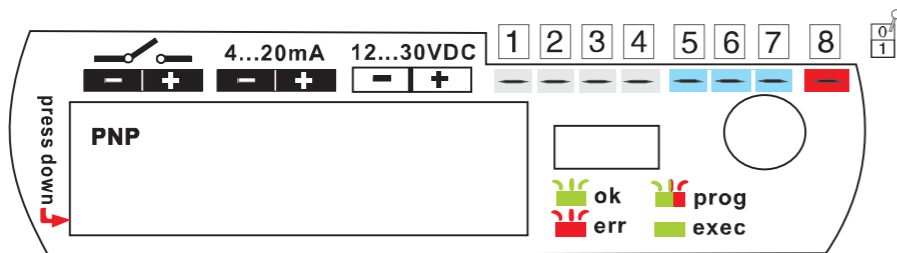


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Radar Wave Level Sensors  
Guided Radar (TDR)  
Ultrasonic Level Sensors  
Rotating Paddle Level Sensors  
Vibrating Fork Level Switches  
Float Level Switches  
Capacitive Level Switches

DIP switch setting

1. Control panel and the definition 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
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1
<b>Function Group 1</b> 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	1	1
0	1	0	1	0	0	0	0
0	1	1	0	0	0	0	0
<b>Function Group 2</b> Switching Outputs							
0	0	1	0	0	1	0	1
0	0	1	1	0	0	0	0
0	1	0	0	0	0	0	0
0	1	0	1	0	0	0	0
<b>Function Group 3</b> Disturbance Signal Suppression							
0	0	0	1	0	0	0	0
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
<b>Function Group 4</b> Reset							
0	0	0	1	1	0	0	1
<b>Function Group 5</b> 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
0	0	0	0	0	0	0	1
<b>Dip Switch Setting</b> Description							
0	0	0	0	0	0	0	1
Configuration mode							

**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
0	0	0	1	1	0	1	1
<b>Dip Switch Setting</b> Description							
0	0	0	1	1	0	1	1
Measure probe length							

**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
0	0	0	1	0	0	1	1
<b>Dip Switch Setting</b> Description							
0	0	0	1	0	0	1	1
Lower range value[4mA];span 0%							

**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
0	0	1	0	0	0	1	1
<b>Dip Switch Setting</b> Description							
0	0	1	0	0	0	1	1
Upper range value [20mA];span 100%							

**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
1	1	0	0	0	1	1	1
<b>Dip Switch Setting</b> Description							
1	1	0	1	0	1	1	1
Coaxial probe							
1	1	0	0	1	0	1	1
Single rod probe							

**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
0	1	0	0	0	0	0	0
0	1	0	1	0	0	1	1
0	1	1	0	0	0	0	0
<b>Dip Switch Setting</b> Description							
0	1	0	0	0	0	0	0
Response time 0.5s							
0	1	0	1	0	0	1	1
Response time 2s							
0	1	1	0	0	0	0	0
Response time 5s							

**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
0	0	1	0	0	1	0	1
<b>Dip Switch Setting</b> Description							
0	0	1	0	0	1	0	1
Set digital output starting value							

**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
0	0	1	1	0	1	0	1
<b>Dip Switch Setting</b> Description							
0	0	1	1	0	1	0	1
Switches-off threshold							

**10. Set digital output mode**

There are NO/NC for digital output mode, users can set NO or NC according to their requirements.

Dip Switch Position							
1	2	3	4	5	6	7	8
0	1	0	1	0	1	0	1
<b>Dip Switch Setting</b> Description							
0	1	0	1	0	1	0	1
NC							
0	1	0	0	0	1	0	1
NO							

**11. Disturbance signal suppression scanning**

Change switch position 4,6,7 to 1, the instrument will scan disturbance signal automatively after pressing

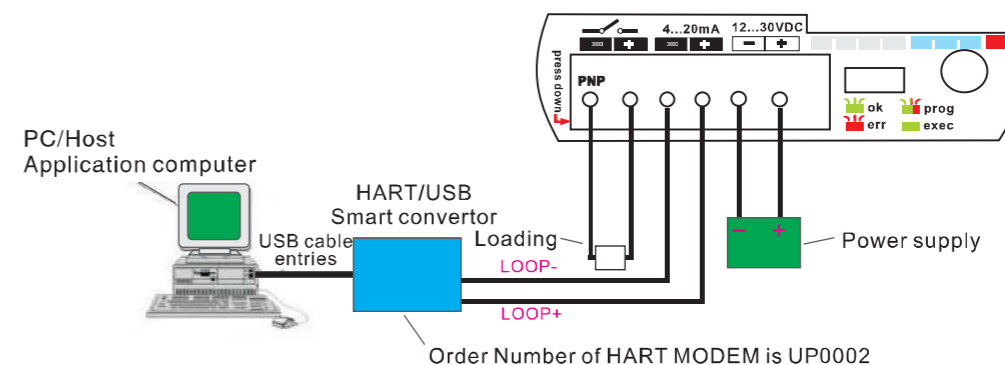
Dip Switch Position							
1	2	3	4	5	6	7	8
0	0	0	1	0	1	1	1
<b>Dip Switch Setting</b> Description							
0	0	0	1	0	1	1	1
Switch-on threshold							

**12. Return to measuring mode**

Change all switch positions to 0 after setting all of these, then

Dip Switch Position							
1	2	3	4	5	6	7	8
0	0	0	0	0	0	0	0
<b>Dip Switch Setting</b> Description							
0	0	0	0	0	0	0	0
Return to measuring mode							

HART Configuration set



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

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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 Information

RB	1	A	01000	S	6	1
Series	Probe type	Output	Length of Probe	Protection type	Probe material	O-ring material

<b>RB</b>	Guided Radar Level Sensor (TDR)
<b>1</b>	Probe type 1: Single rod 2: Coaxial probe 3: Wire rope
<b>A</b>	Output A: 4-wire, 1 x 4~20mA & 1xDC PNP/HART
<b>01000</b>	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)
<b>S</b>	Protection type S: Standard
<b>6</b>	Probe material 6: Stainless steel 316 T: Teflon (suitable for single rod)
<b>1</b>	O-ring material 1: FKM (Viton)

Radar Wave  
Level Sensors

Guided Radar  
(TDR)

Ultrasonic  
Level Sensors

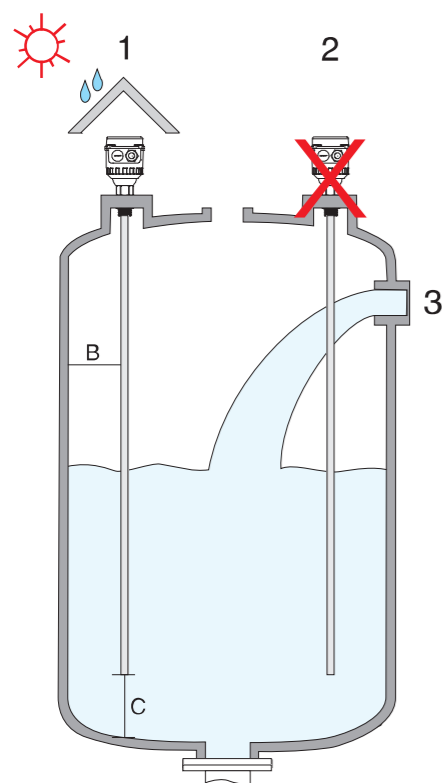
Rotating Paddle  
Level Sensors

Vibrating Fork  
Level Switches

Float  
Level Switches

Capacitive  
Level Switches

Install method



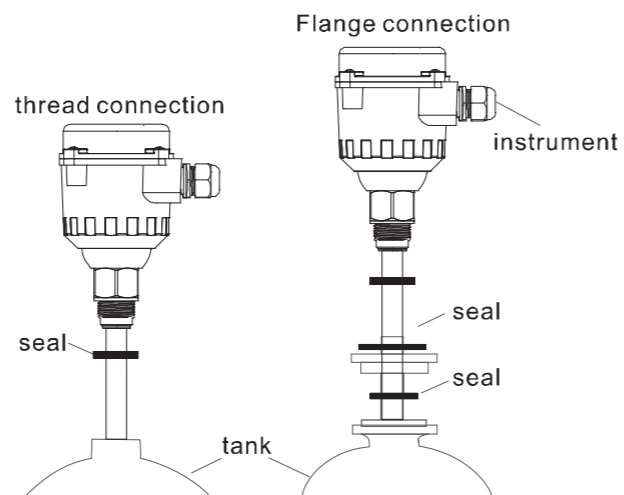
**Selection of probe**

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**

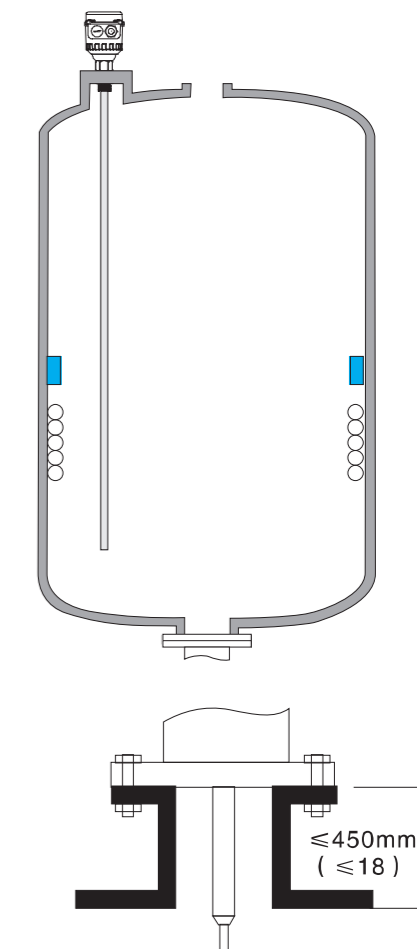
- ◆ Clutter echo suppression

**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**

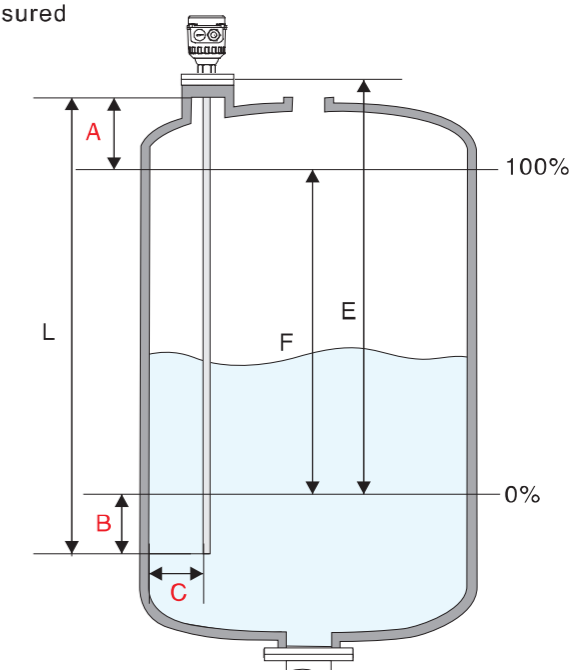
There are some burrs and accumulation on the probe during use, small quantity will not effect the measuring, if there are too much accumulations, they will lessen the measuring range. In some aggressive situation, generated crystallization will cause the measuring error. In this situation, please use 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  $S=C*T/2$ .

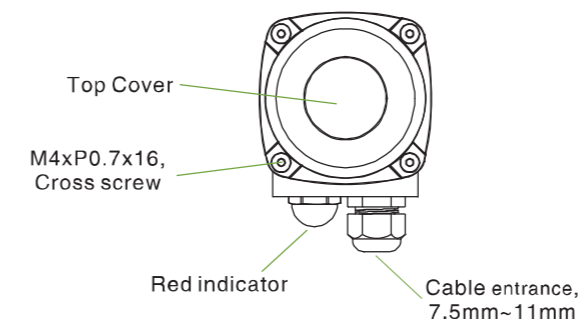
**Advantages and main applications**

- 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

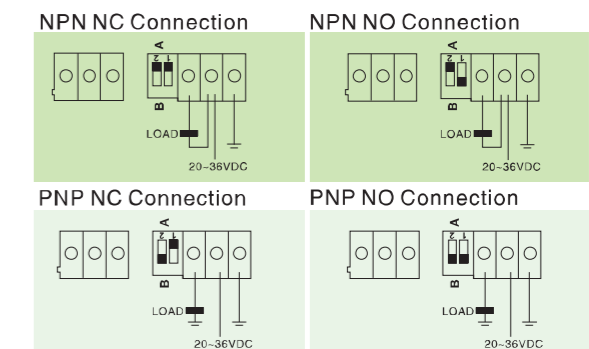
- Main applications:**
- Level measurement
  - Distance measurement
  - Storage indication
  - Differential level measure
  - Water pump control

**Wiring Diagram**

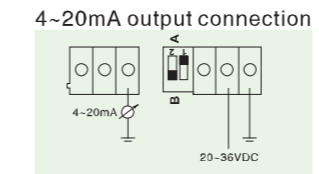
■ Wiring Diagram



■ NO/NC Output Connection



■ Analogue output connection



■ Notice

**A** number 1 DIP Switch : NO/NC switchable, A means NC output  
**B** number 2 DIP Switch : PNP/NPN switchable, A means NPN output

**Ultrasonic Level Sensors**



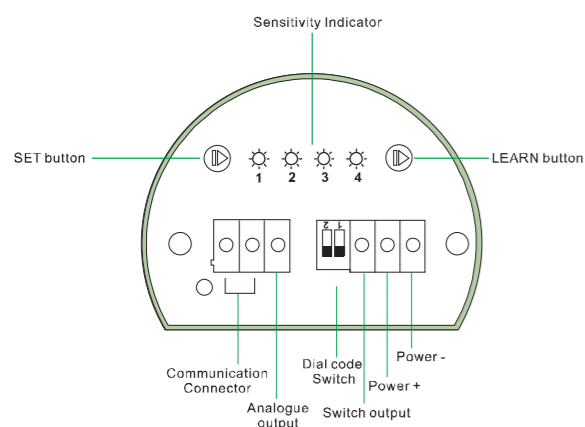
Ultrasonic level sensors is a kind of non-contact, low-cost, easy-installed level transmitter. It apply space technology to the livelihood industry, this level transmitter has less application limits than other transmitters, more durable, concise appearance, stable function, etc. Widely used in electric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



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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

Functions Indication

	Normally working, lamp 1 flashes
	When the level is higher than Max. point, lamp 2 lights on
	When the level is lower than Min. point, lamp 3 lights on
	Connecting with control box, lamp 4 lights on

This Ultrasonic Level Switch does not support 485 protocols.

	In operating mode: press "LEARN" button to examine the adjustment of analogue output.
	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.)
	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.)
	Unlock Indication: Press the two buttons in the meantime once for 5 seconds. The unit is unlock when Lamp 1 and 4 flash.

Functions and parameters adjustment

Functions and parameters adjustment (under unlock status)

	1. Set the Start Point(SP) Press SET button, lamp 1 flashes		2. Set the Restrict Point (RP) Press SET button , lamp 2 flashes. The following steps are the same as setting the SP
	Press LEARN button, it starts to learn the current parameters and four lamps flash on in turn		3. Set the Analogue Start Point (ASP) Press SET button, lamp 3 flashes. The following steps are the same as setting the SP
	When the setting is confirmed, lamp 2 and 3 flash		4. Set the Analogue End Point (AEP) Press SET button, lamp 4 flashes. The following steps are the same as setting the SP
	When the setting is in error, lamp 2 and 3 "flashing alternatively		

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

Function

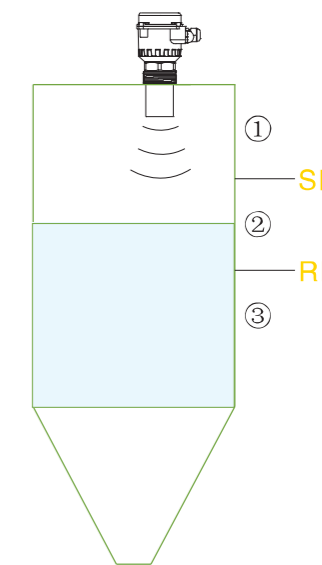
1.Switching output (See Picture 3 and Table 1)

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:

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

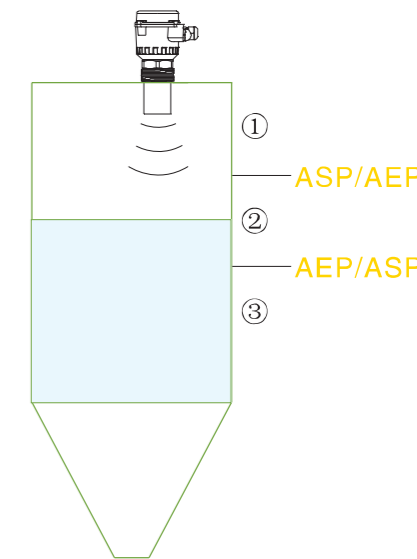
2 .Analogue output (See Picture.4 and Table 2)

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:

- To ensure the accuracy, the values of ASP and AEP must keep in a proper distance.
- It indicates Error while the value of ASP and AEP are out of the detecting range.
- The value of ASP can be lower than AEP or higher than AEP.



(Picture. 4)

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

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

Radar Wave  
Level Sensors

Guided Radar  
(TDR)

Ultrasonic  
Level Sensors

Rotating Paddle  
Level Sensors

Vibrating Fork  
Level Switches

Float  
Level Switches

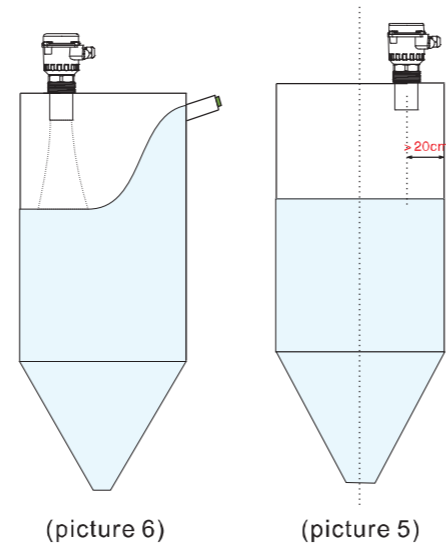
Capacitive  
Level Switches

Order Information

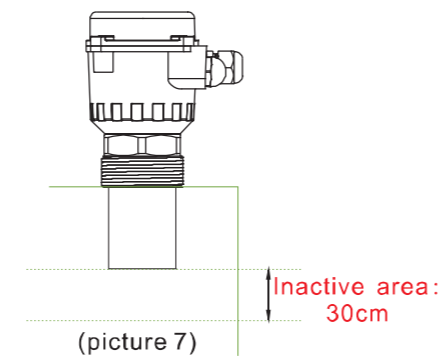
Order No.	Housing material	Connection	Sensible range (M)	Cable entrance (mm)	Ambient temperature (°C)	Output	Protection
VS0001	Aluminum Alloy	G2"	0.3~8	M20 × P1.5	-40 ~ +80	Three wire, 4~20mA NPN/PNP	IP65

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.



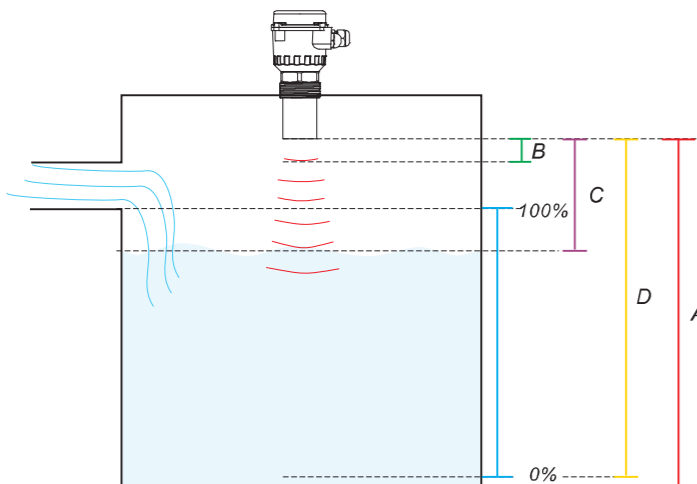
(picture 6) (picture 5)



(picture 7)

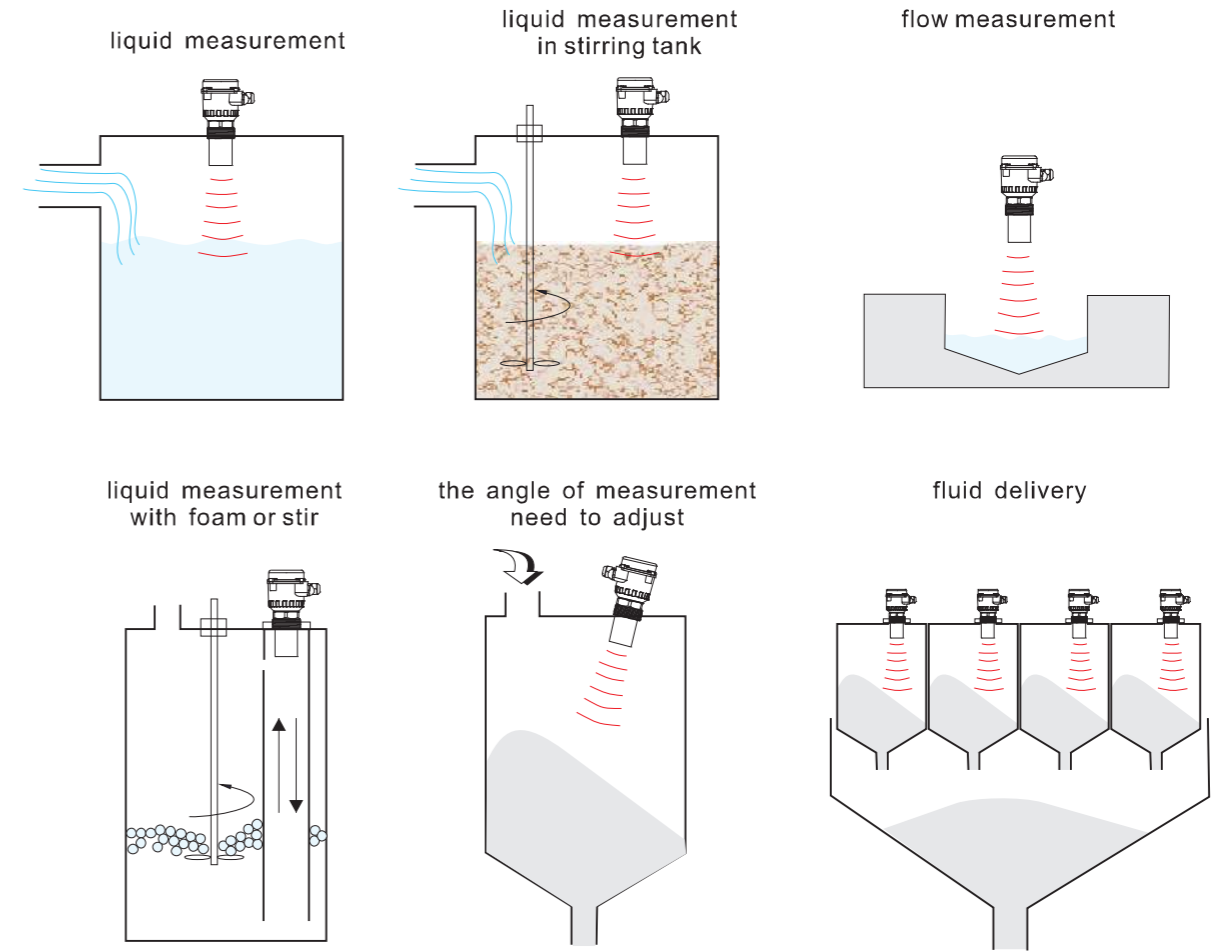
The unit measure the distance from the process connection of flange or thread

- 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 installation

- 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.

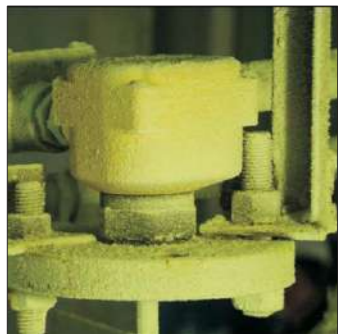
**Electrical Connection**  
The installation must be installed by the experienced specialists; It is necessary to follow the national's installation regulations; The power supply should be off before the connection.

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 Ultrasonic Level Sensors  
 Rotating Paddle Level Sensors  
 Vibrating Fork Level Switches  
 Float Level Switches  
 Capacitive Level Switches

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.



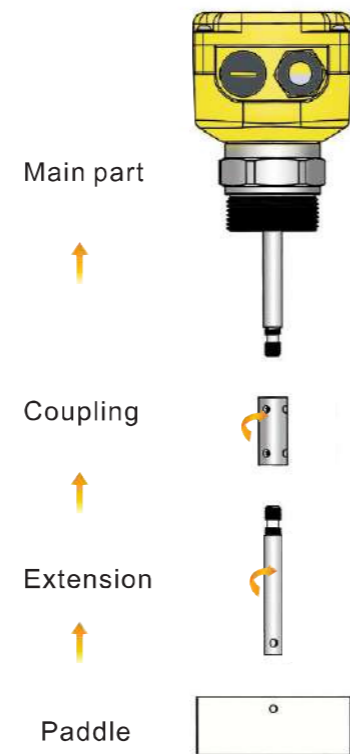
**Trend of modular rotating paddle level switch**

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 temperature type.



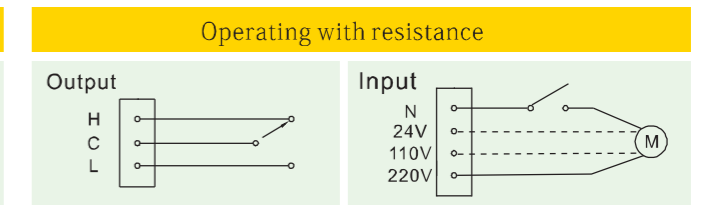
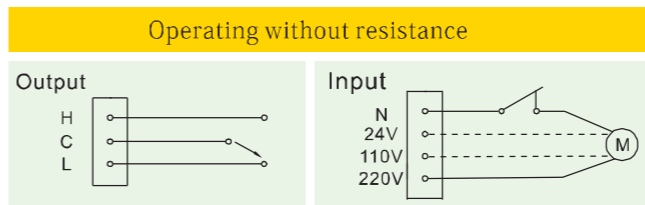
SRP plastic housing



SRT metal housing

**Circuit principle**

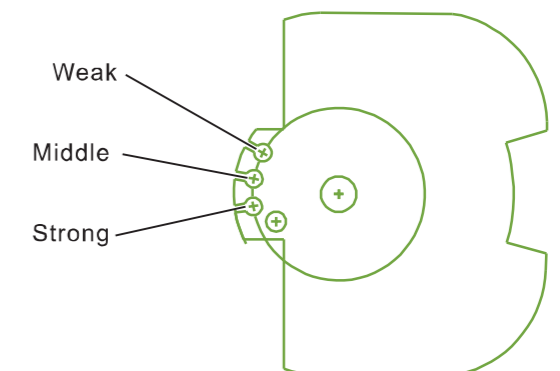
1. When the motor is on, C.L circuit closed means no resistance on paddle. When the motor is off, C.L circuit will be opened, meanwhile, C.H circuit closed means being resistance on paddle.
2. When operating without resistance, C.L circuit is closed and the motor start to work again.



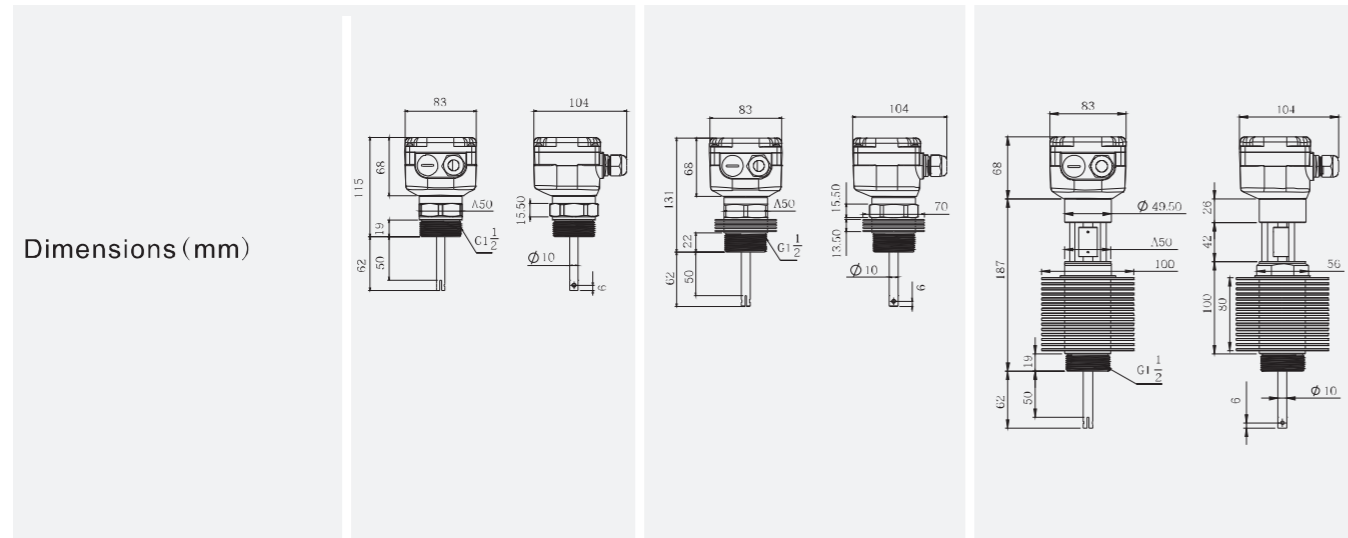
**Torque adjustment**

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.

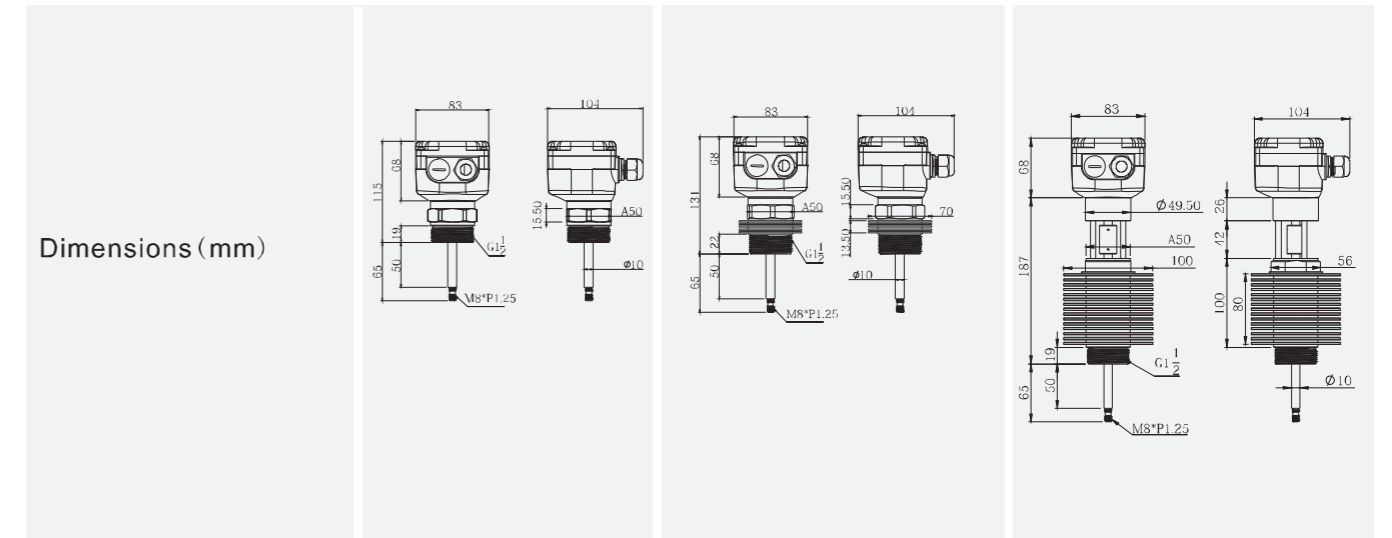
Notice: Please don't set the torque of torsional spring randomly to avoid the false operation.



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Model	SRP10/SRT10	SRP20/SRT20	SRT30
Type	Standard	High temperature	Ultra-temperature
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/cm <sup>3</sup> )	0.5		
Contacting rating	SPDT 5A/250VAC		
Paddle rotational speed	≤2 (RPM)		
Medium density	≥0.5g/cm <sup>3</sup>		
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°C		
Operating temperature	-20~80°C	MAX200°C	MAX450°C
House material	ABS/Aluminium	PA66/Aluminium	Aluminium

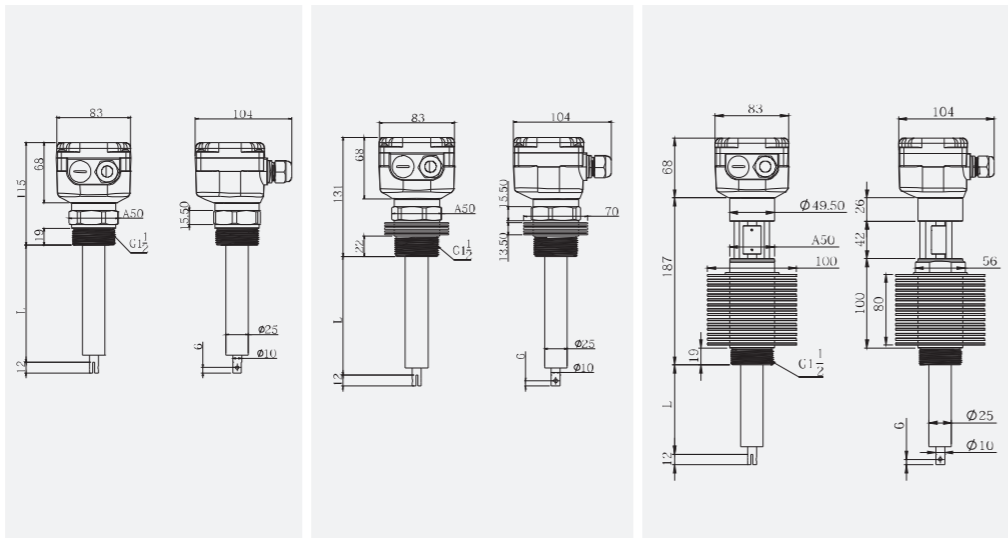


Model	SRP11/SRT11	SRP21/SRT21	SRT31
Type	Modular Standard	Modular high temperature	Modular ultra-high temperature
Cable entrance	M20xP1.5		
Detecting medium	Powder/Solid		
Power supply	24, 110-120, 220-240VAC/50-60Hz		
Applications	Chemical plastic, pharmacy, fodder, cement, chemical fertilizer, food industry, etc.		
Power consumption(W)	3		
Torque measurement(Kgf.cm)	0.5...1.0		
Appropriate specific gravity (g/cm <sup>3</sup> )	0.5		
Contacting rating	SPDT 5A/250VAC		
Paddle rotational speed(RPM)	≤2		
Medium density(g/cm <sup>3</sup> )	≥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°C		
Operating temperature	-20~80°C	MAX200°C	MAX450°C
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.

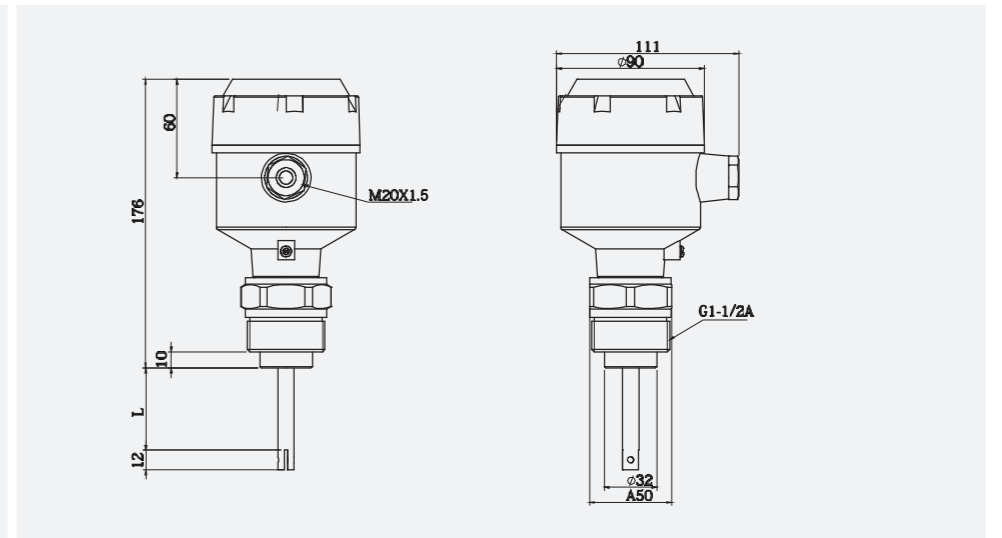
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Float Level Switches  
Capacitive Level Switches

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/cm <sup>3</sup> )	0.5		
Contacting rating	SPDT 5A/250VAC		
Paddle rotational speed(RPM)	≤2		
Medium density(g/cm <sup>3</sup> )	≥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°C		
Operating temperature	-20~80°C	MAX200°C	MAX450°C
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/cm <sup>3</sup> )	0.5
Contacting rating	SPDT 5A/250VAC
Paddle rotational speed(RPM)	≤2
Medium density(g/cm <sup>3</sup> )	≥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°C
House material	Aluminium

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Capacitive Level Switches

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
<b>SR</b>	Standard rotating paddle level switch			Shaft-protection rotating paddle level switch		
<b>P</b>	Housing material : P: plastic housing T: metal housing (aluminium alloy )			Housing material : P: plastic housing T: metal housing (aluminium alloy )		
<b>10</b>	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		
<b>C</b>	Connection : A:3/4"PF B:G1" C:G1 1/2"			Connection : C:G1 1/2"		
<b>B</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		
<b>0050</b>	Main shaft length(mm) 0050: L=50mm			Main shaft length(mm) 0200: L=200mm 0400: L=400mm 0600: L=600mm 0800: L=800mm		
<b>4</b>	Shaft material: 4: stainless 304 6: stainless 316			Shaft material: 4: stainless 304 6: stainless 316		

Notice:


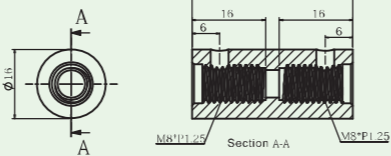
1. If the shaft length of extension type more than 1200mm, please select steel wire, suit able for vertical installation.
2. Steel wire type is suitable for standard extension type, high temperature extension type, ultra-high temperature extension type.
3. Ultra-temperature type only suitable for metal 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 of 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
<b>SR</b>	Rotating paddle level switch					
<b>E</b>	Housing material : E:EX-proof/Aluminum Alloy					
<b>10</b>	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		
<b>C</b>	Connection : C:G1 1/2"			Connection : C:G1 1/2"		
<b>C</b>	Power supply : A: 24 VAC B: 110 VAC C: 220 VAC D:24VDC					
<b>0050</b>	Main shaft length(mm) 0050: L=50mm			Main shaft length(mm) 0200: L=200mm 0400: L=400mm 0600: L=600mm 0800: L=800mm		
<b>4</b>	Shaft material: 4: stainless 304 6: stainless 316					

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**Coupling**

Order no	SS 304	SS 316	Drawing
	S4S0	S6S0	

**Extension shaft**

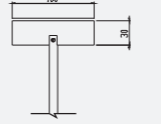
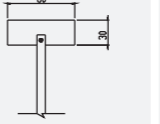
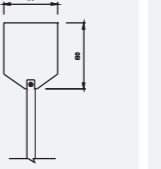
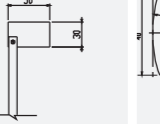
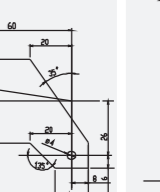
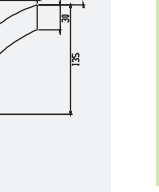
Order no	SS 304	SS 316	Drawing
	L40150: L=150mm L40350: L=350mm L40550: L=550mm L40750: L=750mm L40950: L=950mm L41150: L=1150mm	L60150: L=150mm L60350: L=350mm L60550: L=550mm L60750: L=750mm L60950: L=950mm L61150: L=1150mm	

**Wire**

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

- 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**

Flange	SS 304	Drawing
	S4F0	
Fixture	#45 steel	Drawing
	S0C0	

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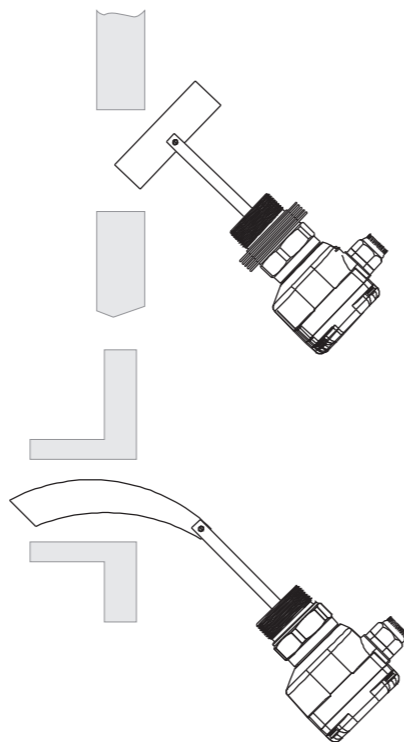
**Tank installation example**

**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.

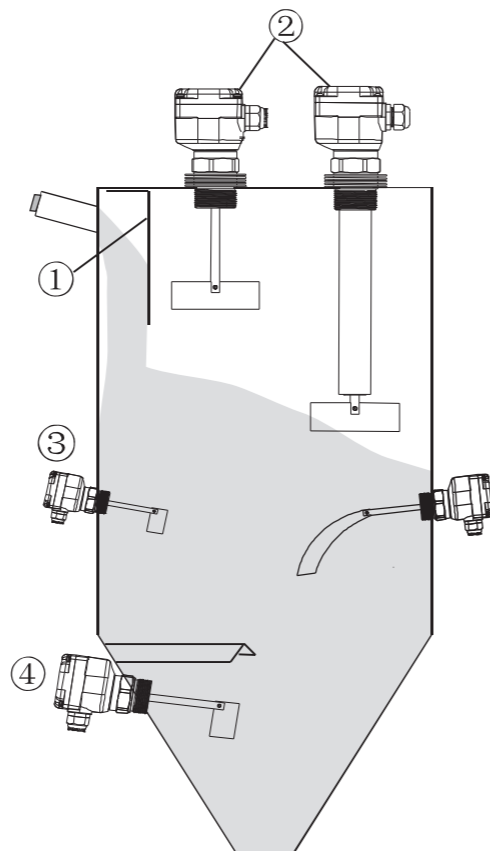
**Fixture mounting :**

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)**

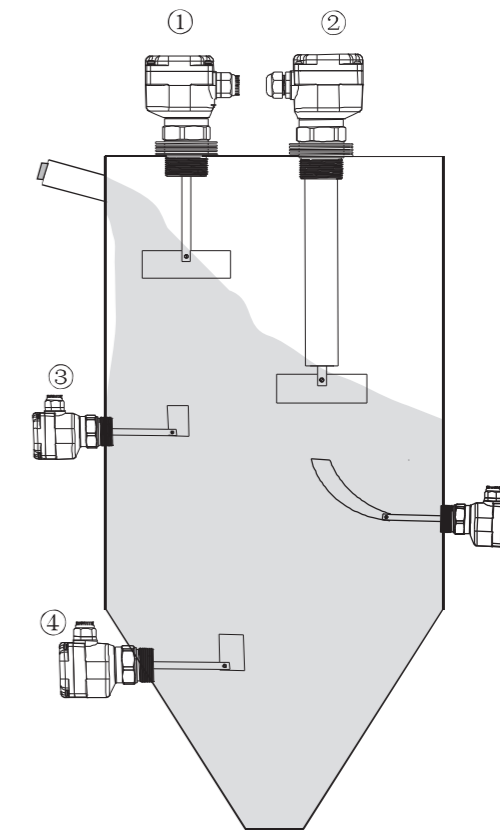
- ① Protection plate for feedstock
- ② Enough room for installation and debugging
- ③ The angle of horizontal installation
- ④ Protection plate for low material entrance

**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**

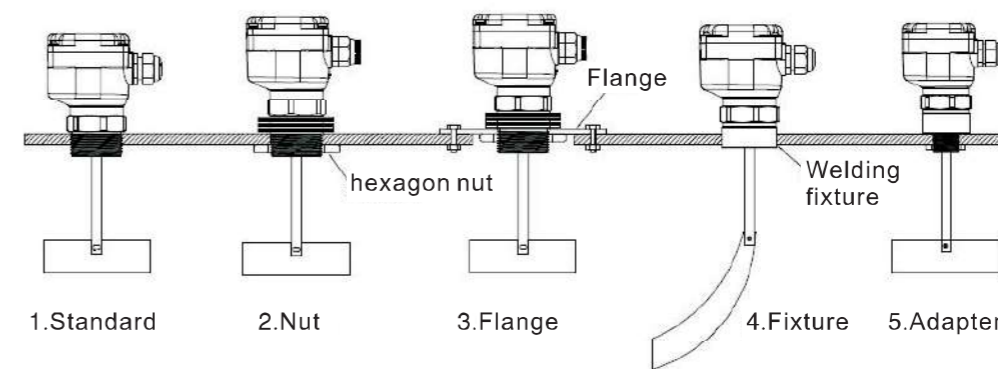
1. Make sure the mounting is based on the requirement conform to the restricted temperature, pressure, and other technical requirements.
2. Make sure the probe and the cable far away from the high voltage and such cable at least by 1 meter.
3. Make sure the airtightness of the module by adopting the 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



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Guided Radar (TDR)

Ultrasonic Level Sensors

Rotating Paddle Level Sensors

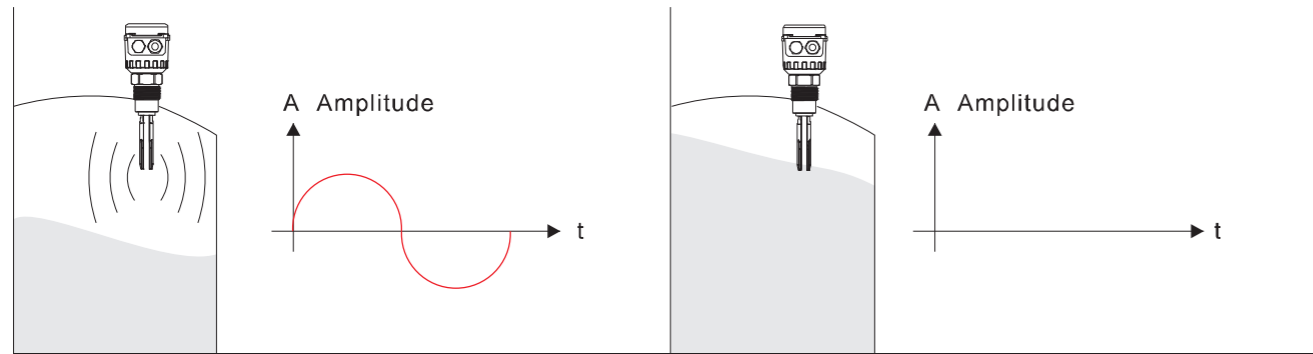
Vibrating Fork Level Switches

Float Level Switches

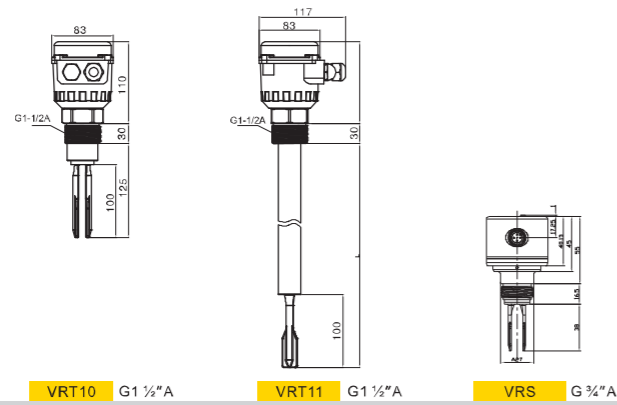
Capacitive Level Switches

**Operating Principle**

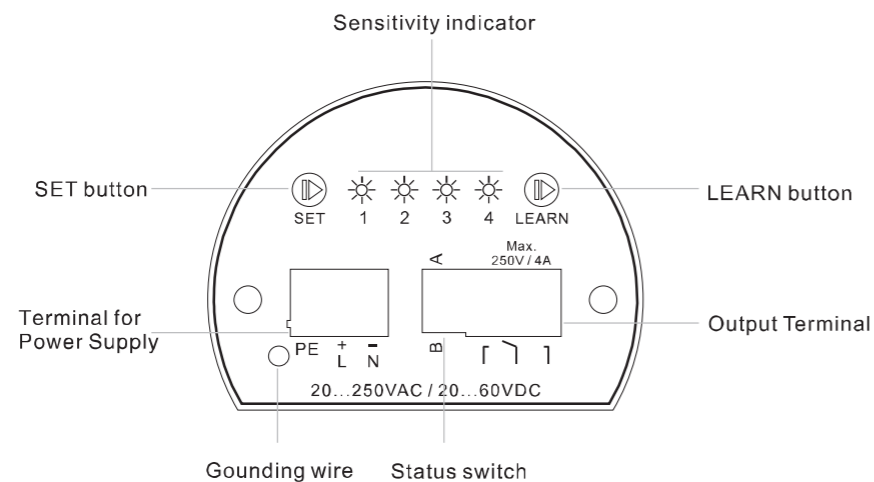
Vibrating fork level switch is suitable for environmental protection, water treatment, electricity, Chemical plastic, pharmacy, fodder, cement, chemical fertilizer, food industrial, etc.



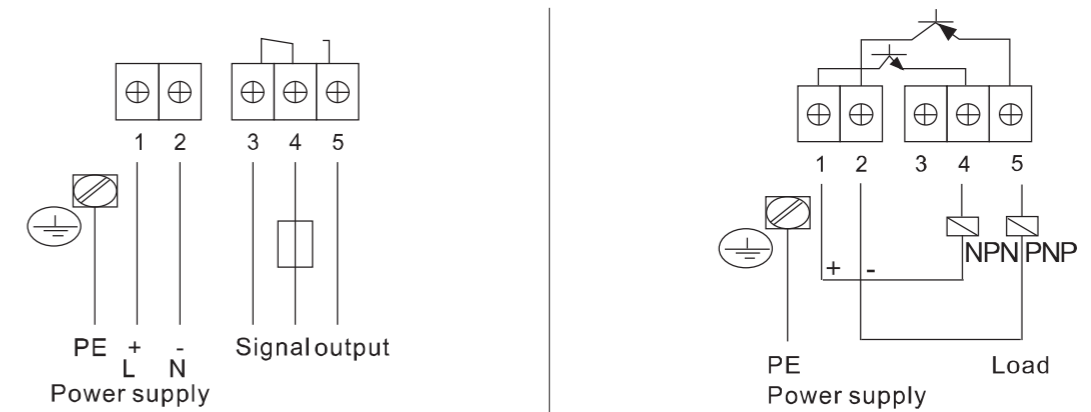
**Dimension**



**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/cm<sup>3</sup>). When the density of detected object is higher than or equal to 1g/cm<sup>3</sup>, 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/cm<sup>3</sup>.
- 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

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Output of VRT Switch2

Switch2	A	B
Relay OUT		
NPN OUT		
PNP OUT		
Indicator		

VRS

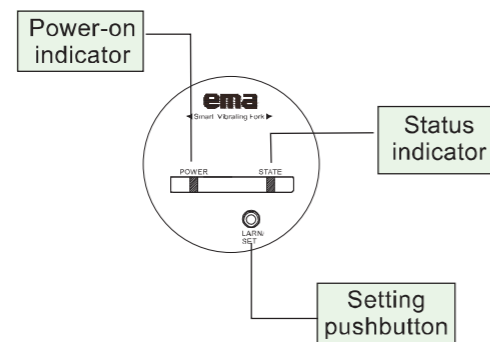


Figure. A

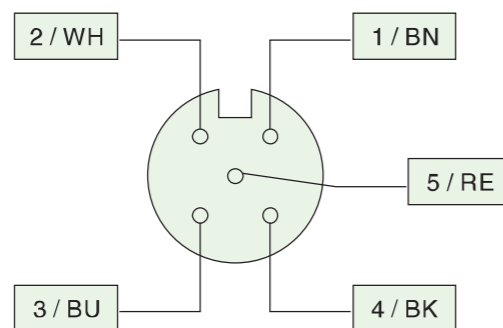


Figure. B

Manual of VRS

<b>Unlock</b>	"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
<b>Lock</b>	It is automatically locked when there is no operation within 60 secs.
<b>NO / NC setting</b>	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.
<b>Learning mode</b>	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 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. <b>Notice:</b> 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.

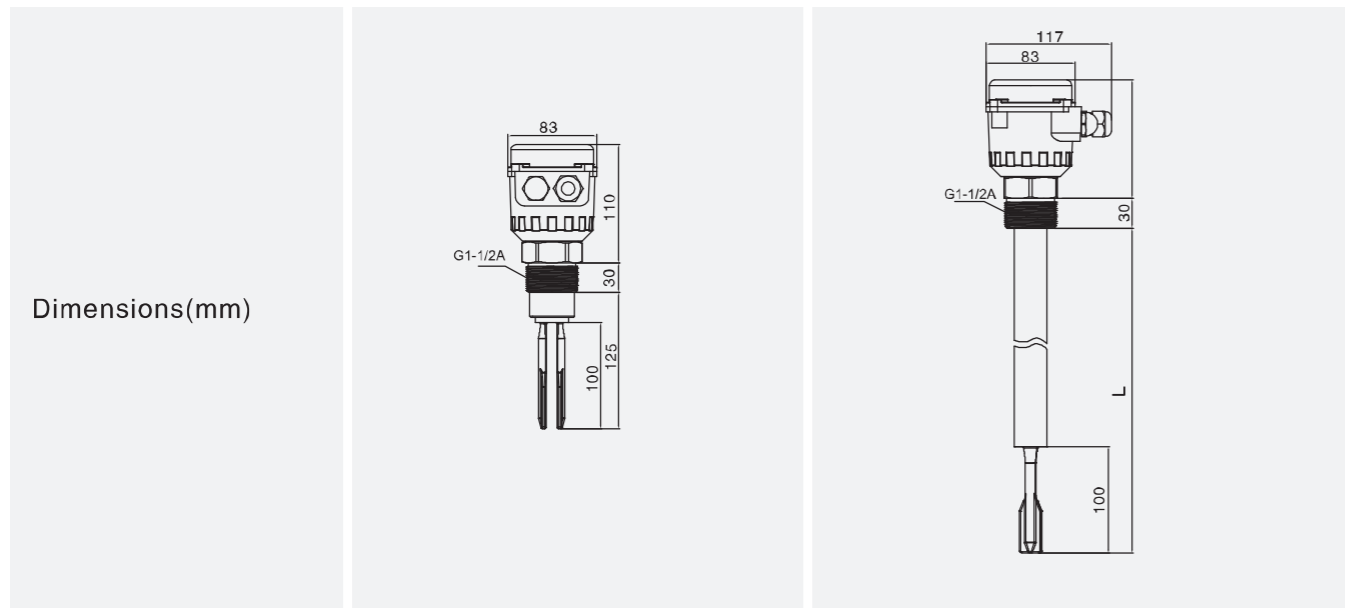
Notice:

- 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/cm<sup>3</sup>). When the density of detected object is higher than or equal to 1g/cm<sup>3</sup>, 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/cm<sup>3</sup>.

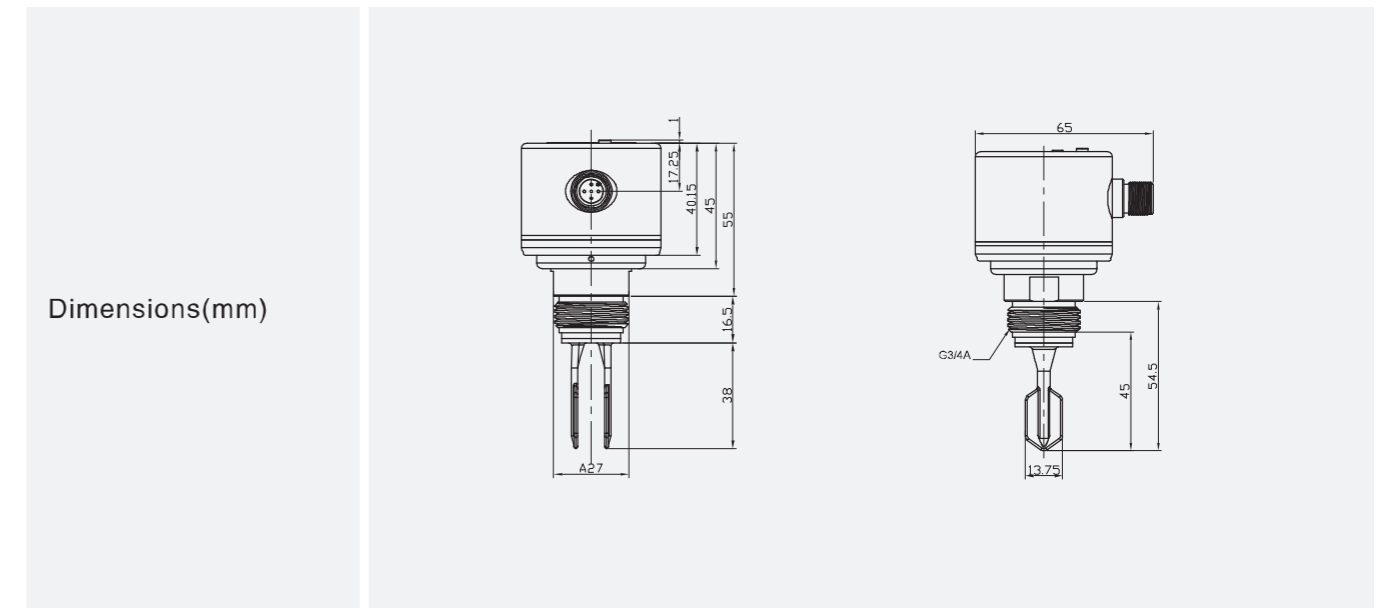
Status Indicators of VRS

		Maximum		Minimum	
U~(AC)	U~(DC)				
50...60Hz					
		Green LED: Power on/off			
		Red LED: Operation			
		Setting pushbutton			

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

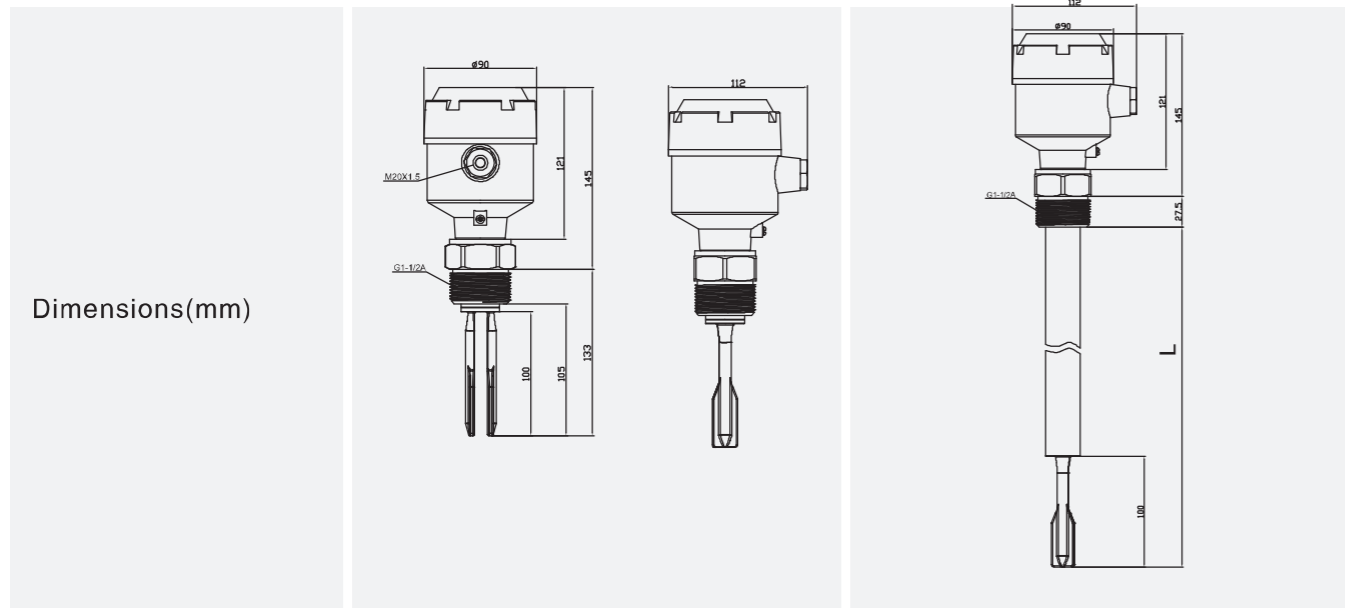


Model	VRT10	VRT11
Type	Standard	Extension
Connection	G1 1/2" A	G1 1/2" A
Cable entrance	M20 x P1.5	
Detecting medium	Liquid/Powder/Solid	
Applications	Suitable for all powder, solid and liquid through learning function	
Voltage	20~ 60VDC 20~ 250VAC 50/60Hz	
Response Time(s)	< 3	
Ambient temperature(°C)	-40...+70	
Storage temperature(°C)	-40...+85	
Medium temperature(°C)	-40...+150	
Operating 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	



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
Operating pressure(bar)	-1...+40
House material	Stainless Steel 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  
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Capacitive Level Switches



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 level adjustable	
Operating 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: G1 1/2" 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

Radar Wave Level Sensors  
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Order Information

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

<b>VR</b>	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

<b>VR</b>	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: G1 1/2" 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


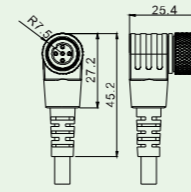
Rotating Paddle Level Sensors

Vibrating Fork Level Switches


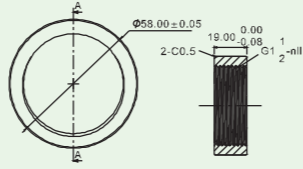
Float Level Switches

Capacitive Level Switches

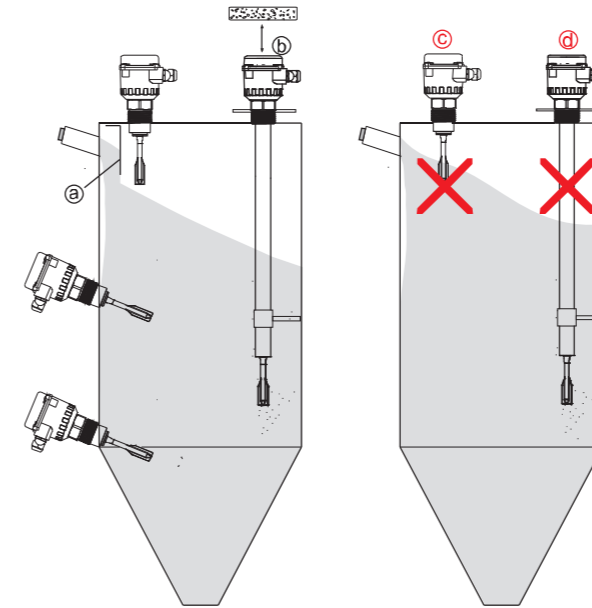
Accessories

Cable	Connector Order NO. (Only for VRS)						Drawing
	C	02	L	5	C	12	
L	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	

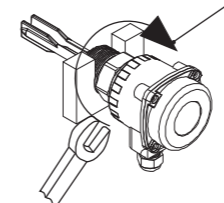
Type	Fixture	Order No.	Drawing
VRT		S0C0	


Installation Of VRT



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

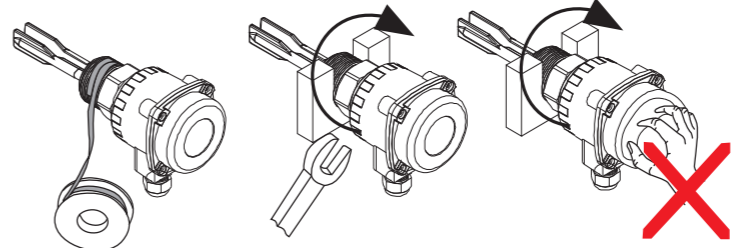
**Incorrect mounting:**  
 (c) Too close to the wall and material build-up.  
 (d) In filling curtain.



Mark on the hex nut. 

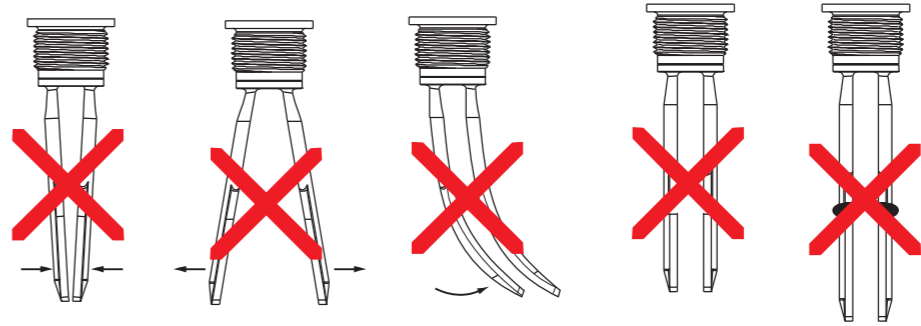
The top of the fork is marked.

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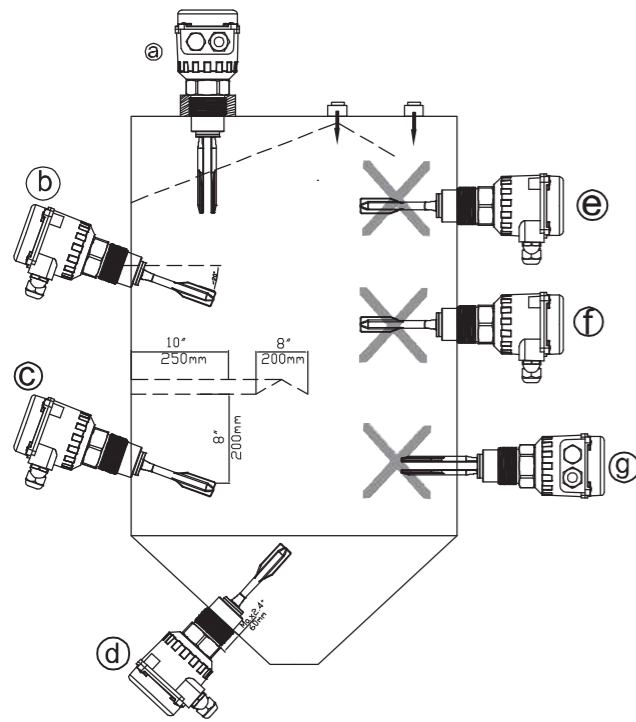


Enclosed by PTFE thread seal tape.  
Tightened by a wrench.  
**Not wrested by hands.**

---



**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.

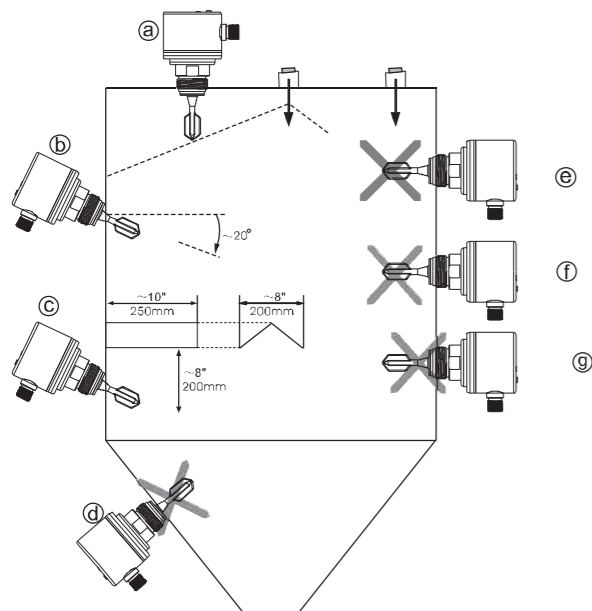
**Correct mounting:**

- **Correct mounting:**
- ① Top-mounted, Fork is vertical towards bottom and mounted in any position far away from the feed opening of top side.
- ② Laterally mounted, Fork angled slightly downwards by 15~20 degree so as to reduce the shock and the hanging of the flowing materials.
- ③ 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:**

- ④ 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**
- ⑤ The surface of fork is subjected to high load caused by discharging material;
- ⑥ It may cause false function due to residual material.
- ⑦ 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:**

- **Correct mounting:**
- ① Top-mounted, Fork is vertical towards bottom and mounted in any position far away from the feed opening of top side.
- ② Laterally mounted, Fork angled slightly downwards by 15~20 degree so as to reduce the shock and the hanging of the flowing materials.
- ③ 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:**

- ④ In discharge hopper, Max. nozzle length 2.4 in (60mm), so that no build-up occurs which prevents the fork from oscillating.
- ⑤ Laterally mounted in filling curtain or under the feed opening.
- ⑥ 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.
- ⑦ The switch will not work normally when the distance of mounting nozzle and barrel is over 2.4"(60mm).

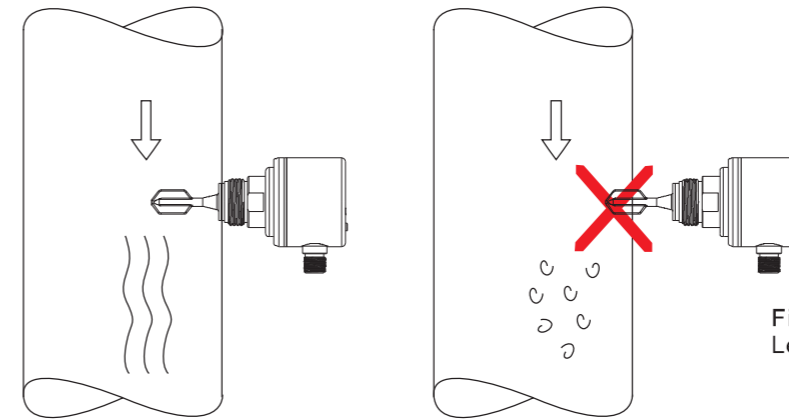


Figure: Mounting of VRS into the pipe. Left one is correct, but Right one is incorrect.

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

---

Enclosed by PTFE thread seal tape.

Tightened by a wrench.

Not wrested by hands.

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**

**Float Level Switches**

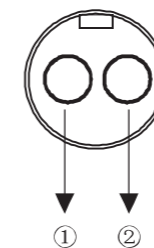


LS series is featured for concise structure, delicate design, durable operations, and perfect fuction. They are extensively installed in the fuel tanks, oil-pressure equipments, chemical and cooling vessels, etc. Further more they are mostly used to detect substance such as water, oil and chemicals. 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.

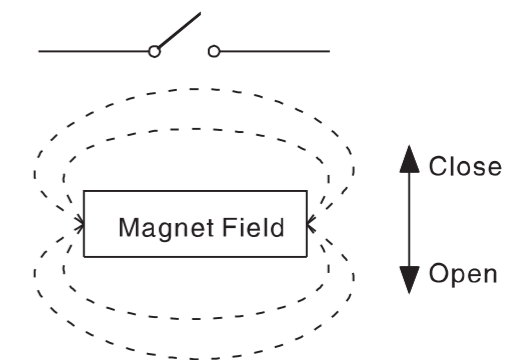


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**Operating principle**



- ① Brown wire ..... Positive pole
- ② Blue wire ..... Negative pole



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 Capacitive Level Switches

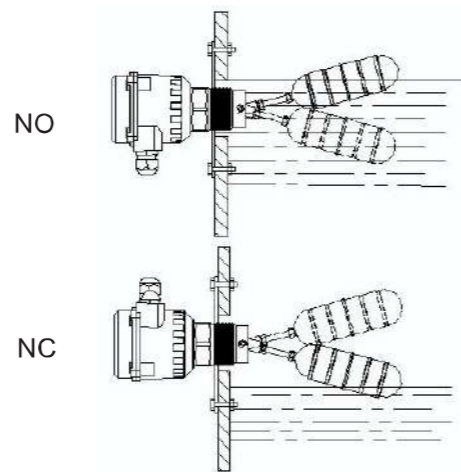
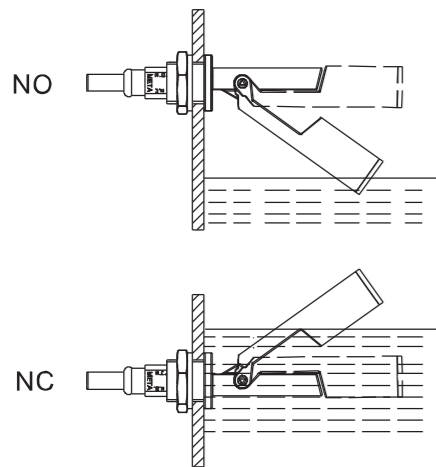
**Connection**

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	

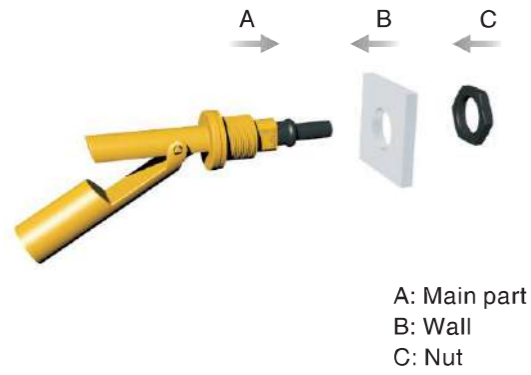
Dimensions (mm)	LS0		LS1	
Model	LS0		LS1	
Order no	LS0001	LS0003	LS1001	LS1002
Type	Standard	Anti-strong acid / alkali	Standard	Standard
Connection	M18		G1 1/2" A	
Cable entrance	1M PVC Cable	1M PUR Cable	M20 × P1.5	
Electric Design	AC / DC		AC / DC	
Output	NO / NC		NO / NC	
Operating pressure	MAX.240VAC/200VDC		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.

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Mounting

LS0 Float Level Switches



LS1 Float Level Switches

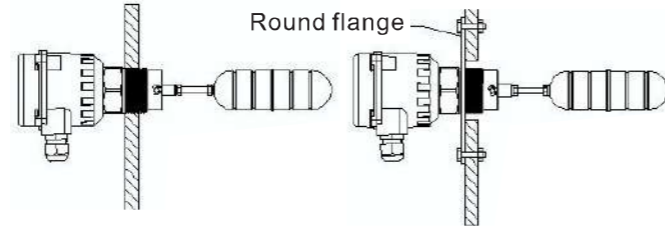
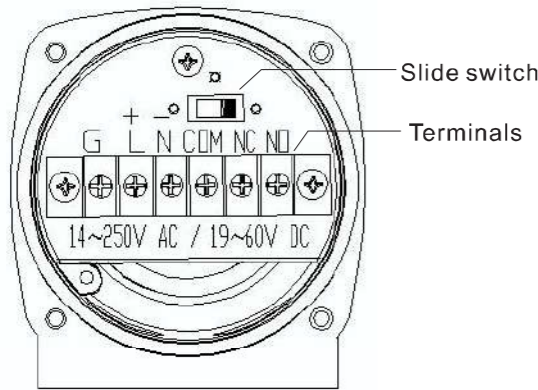


Fig.1 Standard mounting Fig.2 Mounting with flange

Terminal Mounting



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 indicator 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 status of NC output. Then choose type of indicator operation between continuous bright or continuous dim via slide switch. (Fig.4)

Radar Wave Level Sensors

Guided Radar (TDR)

Ultrasonic Level Sensors

Rotating Paddle Level Sensors

Vibrating Fork Level Switches

Float Level Switches

Capacitive Level Switches

Linking your system



Features



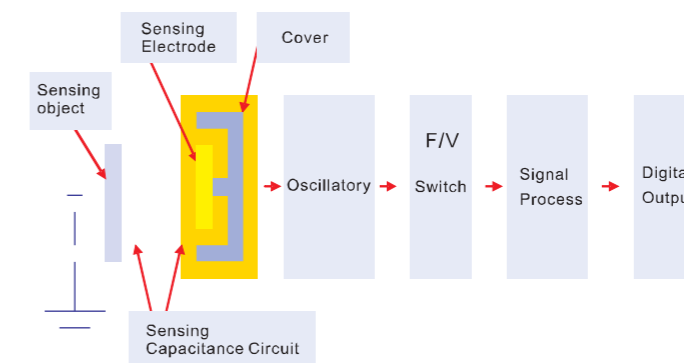
- Plastic thread type and cylinder type; Structure of sensors, durable working, and supply voltage AC/DC available
- Stable Operation: Without adjustable and mechanical components, proximity sensors don't be affected by the qualities of mediums and the variation of density, and it can work immediately 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



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.



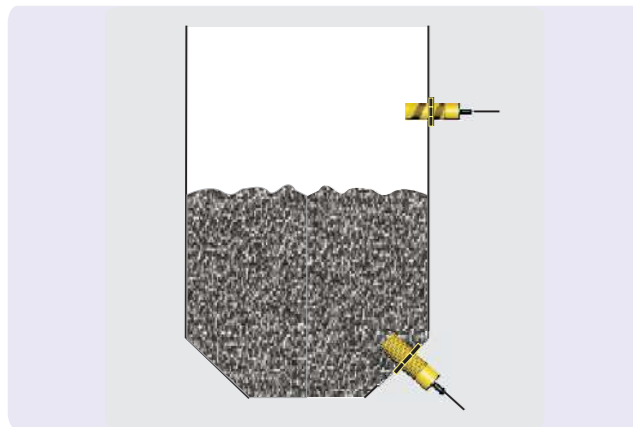
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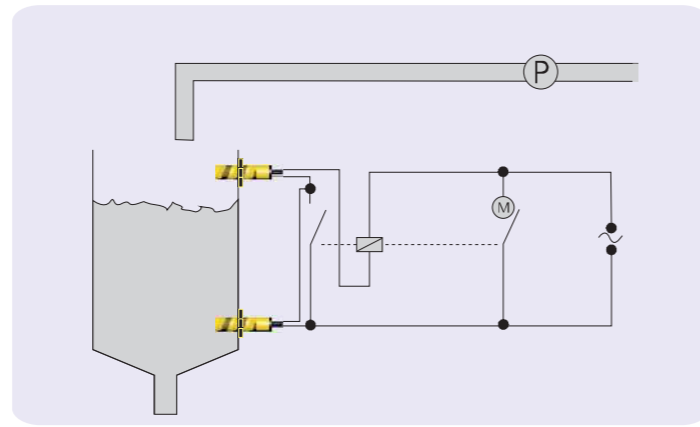
Applications

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.

Sensing Level of Solids



Sensing Level of Liquids



Sensitivity adjustment

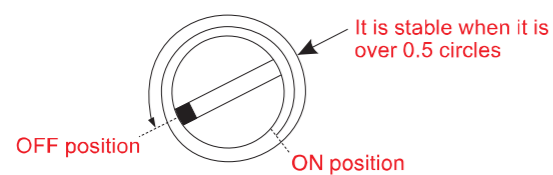
**A** Without any target in front of the sensing face, turn the sensitivity potentiometer clockwise until the proximity sensor turns ON (LED light turns on).



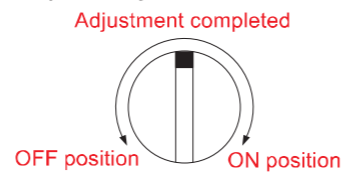
**B** With a target in front of the sensing face, turn the sensitivity potentiometer anticlockwise from the ON position stated in A until the proximity sensor turns OFF (LED light turns off).



**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.

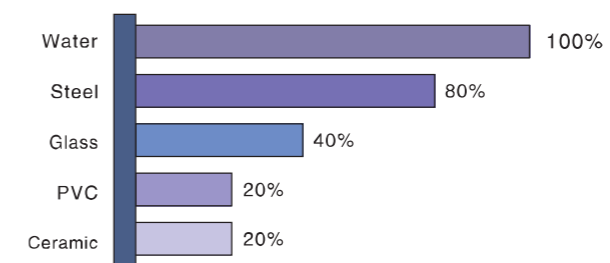


- ※ When there is distance fluctuation between proximity sensor and target, please adjust B with target at farthest from this unit.
- ※ Turning potentiometer clockwise is maximum and turning anticlockwise it is minimum. Number of adjustment should be 6 ± 2 revolution and if you turn right or left excessively, 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	PNP connection  NPN connection 
	M12 Socket	WH white BN Brown BU Blue BK Black	PNP connection  NPN connection 





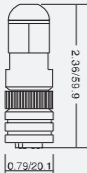
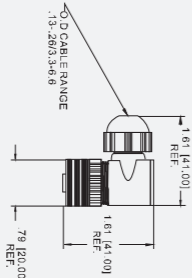
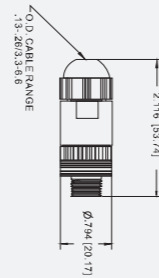
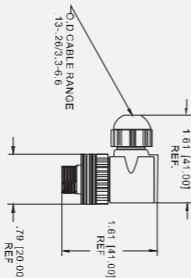
The relationship of object material and detecting distance

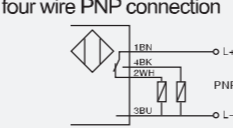
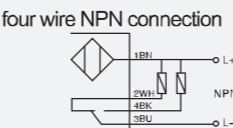


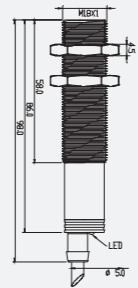
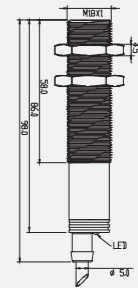


Radar Wave Level Sensors  
Guided Radar (TDR)  
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Rotating Paddle Level Sensors  
Vibrating Fork Level Switches  
Float Level Switches  
Capacitive Level Switches



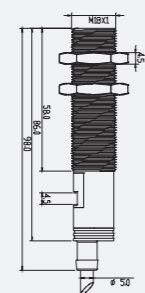
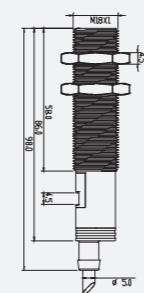
Accessories




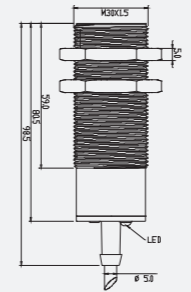
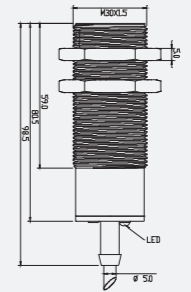
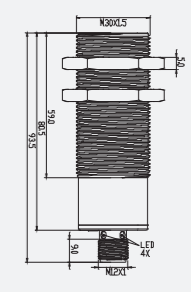
Type	Connector Order No.					
	C	02	L	5	C	12
	C: Cable	Length 02: 2M 05: 5M 10: 10M	Connector I: Straight L: Angled	Pole 4: 4 5: 5	Material R: PUR C: PVC S: PVC shielded wire	Size 12: M12

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.				



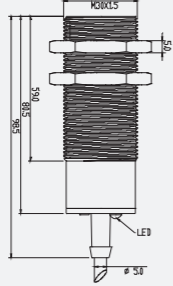
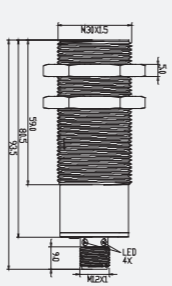
Size	M18	
Specification	Cable	
Sensing Range	8mm	8mm
 		
Three wire PNP NO	CA0004	
Three wire PNP NC	CA0005	
Three wire NPN NO	CA0006	
Three wire NPN NC	CA0007	
Four wire PNP NO/NC		CA0018
Four wire NPN NO/NC		CA0012
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	10~36DC	10~36DC
Current loading [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;3x0.34mm <sup>2</sup>	PVC-Cable /2m;4x0.34mm <sup>2</sup>
Accessory	Fixed nut and screw driver	
Dimensions (mm)		


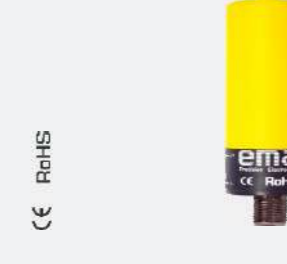
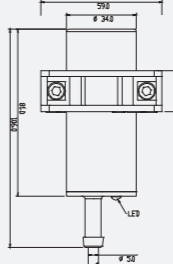
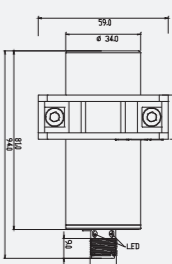
Radar Wave Level Sensors  
Guided Radar (TDR)  
Ultrasonic Level Sensors  
Rotating Paddle Level Sensors  
Vibrating Fork Level Switches  
Float Level Switches  
Capacitive Level Switches

Size	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;2x0.34mm <sup>2</sup>	
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;3x0.34mm <sup>2</sup>	PVC-Cable /2m;4x0.34mm <sup>2</sup>	M12 connector
Accessory	Fixed nut and screwdriver		
Dimensions (mm)			

Radar Wave Level Sensors  
Guided Radar (TDR)  
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Vibrating Fork Level Switches  
Float Level Switches  
Capacitive Level Switches

Size	M30	
Specification	Cable	Connector
Sensing Range	15mm	15mm
		
<b>Two wire DC NO/NC</b>	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 <sup>2</sup>	M12 connector
Accessory	Fixed nut and screwdriver	
Dimensions (mm)		

Size	Φ34	
Specification	Cable	Connector
Sensing Range	20mm	20mm
		
<b>Three wire PNP NO</b>	CC0004	CC0012
<b>Three wire PNP NC</b>	CC0005	CC0013
<b>Three wire NPN NO</b>	CC0006	CC0014
<b>Three wire NPN NC</b>	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 <sup>2</sup>	M12 Connector
Accessory	Fixed nut and screwdriver	
Dimensions (mm)		

Radar Wave Level Sensors

Guided Radar (TDR)



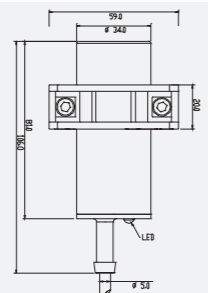
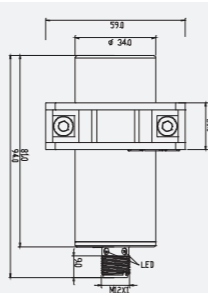
Ultrasonic Level Sensors



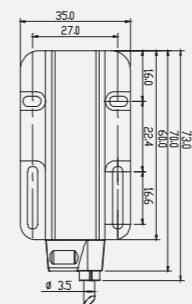
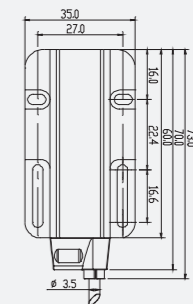
Rotating Paddle Level Sensors

Vibrating Fork Level Switches

Float Level Switches

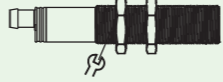
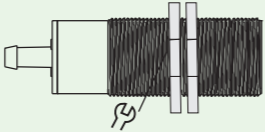
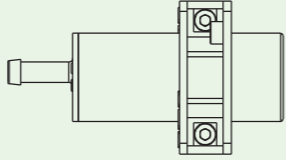
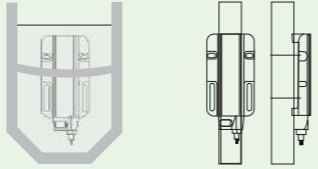
Capacitive Level Switches

Size	Φ34	
Specification	Cable	Connector
Sensing Range	20mm	20mm
		
<b>Two wire DC NO/NC</b>	<b>CC0008</b>	<b>CC0016</b>
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;2x0.34mm <sup>2</sup>	M12 Connector
Accessory	Fixed nut and screwdriver	
Dimensions(mm)		

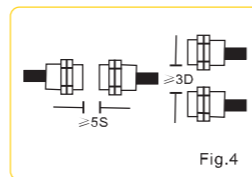
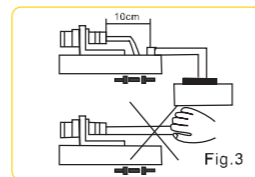
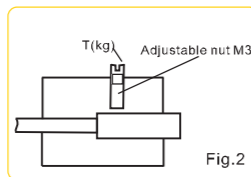
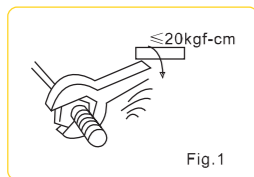
Size	35 × 70mm	
Specification	Cable	
Sensing Range	25mm	25mm
		
<b>Three wire PNP NO/NC</b>	<b>CD0001</b>	<b>CD0002</b>
Sensing Surface	Non-flush	Non-flush
Operating voltage [V]	10 ~ 36VDC	10 ~ 36VDC
Current loading [mA]	200mA	200mA
Short-circuit protection	Pulse	Pulse
Reverse polarity protection	YES	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;3x0.34mm <sup>2</sup>	
Dimensions(mm)		

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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

Radar Wave Level Sensors

Guided Radar (TDR)

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