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接近传感器

Proximity Sensors



多种输出方式 Multiple output modes

体积小，安装方便 Small size, easy to install

IO-Link 接口，完成工业 4.0 场景 IO-Link interface, complete 4.0 industry scenes

心中无畏，只因梦想值得捍卫。

Fearless,
because the dream is worth defending.

/ 我们一直在路上 /
We've been on our way.....


Brief Introduction

企业简介

上海本焯电气科技有限公司其前身是一家集设计开发、生产、销售于一体的专业的传感器的制造商。我公司拥有独立的研发部门，专业的生产团队，并吸取众家之长，所设计的产品在品质、外观均可与任何厂家媲美。

我们产品涵盖电感接近传感器、电容式接近传感器、霍尔传感器、光电传感器、固态继电器、固态调压器及开关电源。我们一直致力于通过不断研发和质量管理，以高品质和多种类的产品及优质的服务来满足用户的需要。

公司以完善的组织架构和技术实力，保证了生产效率，以高度的灵活性为客户提供优质的服务，大部分产品通过欧共体 CE 认证，并始终贯彻执行“今天的质量，明天的市场”的质量方针，使企业得到了飞速的发展。

 在中国已被业界公认为传感器行业的领导品牌，并日益成为全球工控领域的知名品牌。

Shanghai Nature Beyond Electric Technology Co.,LTD is a sensor manufacturer, specialized in research and development, production and marketing. We have independent department and technical office for research and development. We also manage to accumulate other companies' strong points so that the products could compare with others about both the quality and the outward appearances.

Our products include inductive proximity sensors, capacitive proximity sensors, Hall sensors, photoelectric sensors, solid state relays, solid state voltage regulators and switching power supplies. We are committed to meeting the needs of our customers with high quality and diverse products and quality services through continuous research and development and quality management.

With perfect organizational structure and technical strength, the company guarantees production efficiency and provides customers with high-quality service with high flexibility. Most of the products have passed the CE certification of the European Community and have always implemented the "Today's Quality, Tomorrow's Market". The quality policy has enabled the company to develop rapidly.

QWIFM, has been the leading brand in sensor market and gained its global reputation among industrial areas.

Qualification

资质证书

高品质是赢得市场的保证，而有效的现代管理和质量体系是支撑高品质的前提，力求突破创新的精神，作为不断向前的动力追求精湛质量。

High-quality is an assurance to win the market, and effective modern management system and quality of support is a prerequisite for high-quality, and we strive to break the spirit of innovation, as the driving force for continuous pursuit of exquisite quality.



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Proximity Sensors

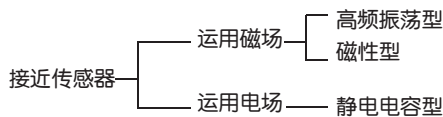
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接近传感器概念

接近传感器是利用传感器对接近物体的敏感特性，达到非接触状态下，检测物体的接近，控制开关的目的。在常用的接近传感器中，根据感应发生的原理不同，可将接近传感器分为高频振荡型、磁感应型、静电电容型。

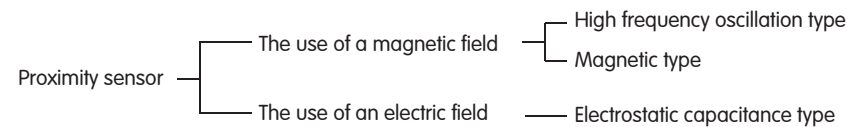
接近传感器类型



PROXIMITY SENSOR CONCEPT

The proximity sensor is the sensor sensitivity characteristics of the proximity object, to achieve a non-contact state, to detect the approaching of the object, the purpose of controlling the sensor. The proximity sensor, according to the principle of induction occurred, a proximity sensor is divided into a high-frequency oscillation type, a magnetic induction type, an electrostatic capacitance type.

PROXIMITY SENSOR TYPE



接近传感器型号说明 Code description

$\frac{1}{1}$ $\frac{M}{2}$ $\frac{12}{3}$ - $\frac{D1}{4}$ $\frac{N}{5}$ $\frac{A}{6}$ $\frac{04}{7}$ - $\frac{M1}{8}$ / $\frac{\text{田}}{9}$ - $\frac{\text{田}}{10}$

编号 N.o	构成 Composition	代码及含义 Code and definition
1	传感器种类 Sensor category	I: 电感式 C: 电容式 H: 霍尔式 X: 线性传感器 S: 磁性式 U: 超声波 A: 本质安全式 I: Inductance type C: Capacitance type H: Hall type X: Linear sensor S: Reed type U: Ultrasonic A: Intrinsically safe type
2	外形代号 Outward appearance code	M: 金属螺纹圆柱型 Q: 方形塑料 H: 光滑圆柱形 M: Cylinder type Q: Plastic Square type H: Smooth cylindrical
3	尺寸代号 Size code	12: M12 x 1 18: M18 x 1 30: M30 x 1.5
4	工作电压 Working voltage	D1:10-30VDC D2:5-24VDC D3:6-36VDC D4:10-60VDC D5:7.7-9VDC D6:15-30V D0: 特殊直流电压 : Special DC voltage A1:20-250VAC A2: 90-250VAC A3:380VAC U:24-240VDC/36-240VAC
5	输出形式 Output form	N: NPN 负逻辑输出 P: PNP 正逻辑输出 L: 直流二线制输出 J: 继电器触点输出 NP:NPN+PNP 双输出 PN: PNP+NPN 双输出 P1: PNP 可选 (选通线) N1:NPN 可选 (选通线) □ : 交流二线制输出 N: NPN Output P: PNP Output L: DC two-wire output J: Relay contact output NP: NPN+PNP double output PN: PNP+NPN Double output P1:PNP Optinal(the strobe line) N1:NPN Optinal(the strobe line) □ : AC two-wire output
6	输出状态 Output state	A: 常开 (NO) Normally open(NO) B: 常闭 (NC) Normally close (NC) C: 一常开 + 一常闭 X: NPN NO+PNP NC Y: PNP NO+NPN NC C:Normally open + Normally close MU: 模拟电压 Mimic voltage MI: 模拟电流 Mimic current
7	检测距离 Detection distance	04:4mm 15:15mm
8	连接器 Connector	M1:M12x1 直公头 Socket M2:M8x1 直公头 Socket
9	特殊要求 Special requiremenes	H: 耐高温 High temp resistance L: 远距离 Long-distance
10	引线长度 Lead length	无 :2m 5:5m 15:15m w: 弯插引线 Bending-plug cable z: 直插引线 Straight-plug cable

IM 系列

接近传感器

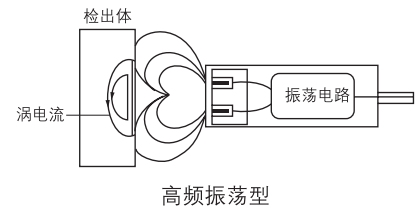
Proximity Sensors

接近传感器特点

- 检测时无机构接触，不易损坏、无磨损、误差小
- 不受周围工作环境影响，恶劣环境下仍能正常发挥作用
- 检测的重复精度高，可准确进行物体定位
- 反应频率快速，适用快速移动物体的检测

电感式传感器基本概念

电感式传感器是利用金属导体和交变电磁场的互感原理。位于传感器前端的检测线圈产生高频磁场，当金属物体接近该磁场，金属物体内部产生涡电流，导致磁场能量衰减，当金属物体不断靠近传感器感应面，能量被吸收而导致衰减，当衰减达到一定程度时，触发传感器开关输出信号，从而达到非接触式之检测目的。



标准检测体:

接近传感器的感应距离因检测体的大小、材质的不同而不同，随着检测体形状的增大，感应距离加长。而当体积达到某一值时，感应距离不再随检测体形状增大而加长，成为一固定值。通常将达到定长感应距离的最小检测体称为标准检测体。

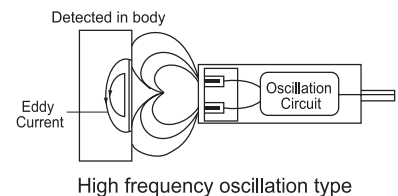
标准检测体一般是材料为铁 (St37)，其厚度 1mm 的正方形，边长取感应面直径和 3 倍感应距离中的大者。

PROXIMITY SENSOR CHARACTERISTICS

- Institutions contact detection, difficult to damage, wear, small errors
- Not influenced by ambient environment, Work normally under harsh environment
- High accuracy of repeated detection, accurate objects positioning
- Rapid reaction frequency, suitable for fast moving object detection

BASIC CONCEPT OF INDUCTIVE SENSORS

The inductive sensor is the use of metallic conductors and the mutual inductance of the alternating electromagnetic field principle. At the front end of the sensor detection coil generates a high-frequency magnetic field, when metal objects are close to the magnetic field, eddy current metal objects internal product, leading to the decay of the magnetic field energy, energy is absorbed when the metal special body constantly gets close to the sensor sensing face and cause decay. when the attenuation reached a certain extent, the trigger sensor sensors the output signal, so as to achieve the purpose of the non-contact type of detection.



Standard Specimen:

Sensing distance of the proximity sensor is decided by the size of the body, and different materials. With the increase of the detected shape, the sensing distance is lengthened. And when the volume reaches a certain value, the sensing distance is no longer increasing with the detected body and is lengthened into a fixed value. Generally, the minimum sized body with fixed sensing distance is called standard test body.

Of which, the material is iron (St37), the thickness is 1mm, the sensing face diameter and 3 feel shall be located in the larger edge length taken.

感应距离：

传感器动作时标准检测体和感应面的距离，对于常开就是从断开到接通，常闭就是从接通到断开。

标准感应距离是不考虑公差，操作温度，供电电压等情况下传感器动作的标准检测体和感应面的距离，是一个理论值。

有效感应距离是单个接近开关在特定的安装环境、温度、电压下测得的感应距离，一般为额定工作电压及室温下 ($23 \pm 5^\circ\text{C}$) 测得。

实际感应距离是在特定温度和电压条件下，单个接近传感器的感应距离，一般是在允许的环境温度 $-25^\circ\text{C} \sim +70^\circ\text{C}$ 内，输入电压在额定电压的 85% 到 110% 范围内测量得。

可靠感应距离是指在规定条件确保时，接近开关正确动作后其动作点距其感应面的一段距离。

感应距离的误差

传感器的感应距离和标准感应距离之间的误差，一般为 $\pm 10\%$ 。

衰减系数：

检测体影响传感器感应距离的因素。检测体的材料的性质起了重要作用，这可以用衰减系数来描述。衰减系数是指某一种材料的动作距离相对于铁 (St37) 减少了多少。衰减系数越小，则对于某种特定材料的动作距离就越小。

对于电容传感器特征参数是相对介电常数。

材料	铁	铜	黄	铜	铝	不锈钢	铸铁
衰减因子	1.0	0.25~0.45	0.35~0.50	0.30~0.45	0.60~1.00	0.65~0.75	0.93~1.05

SENSING DISTANCE:

Sensing distance of the proximity sensor detects the size of the body, of different materials with different. With the increase of the detected shape, the sensing distance is lengthened. And when the volume reaches a certain value, the sensing distance is no longer increases with the detected body shape is lengthened into a fixed value. Usually known as the standard specimen will reach the minimum detection distance of the fixed-length induction.

The sensor operation when the distance of the standard sample and the sensing surface, for the normally open is from off to on, the normally closed is from ON to OFF.

Standard sensing distance is not the body and sensing face of the sensor operatively standard detection distance, consider the case of tolerance, operating temperature, supply voltage is a theoretical value.

Effective sensing distance a single proximity sensors the measured specific installation environment, temperature, voltage sensing distance, not like for the rated working voltage and room temperature ($23 \pm 5^\circ\text{C}$) measured.

The actual sensing distance under specific temperature and voltage conditions, a single sensing distance proximity sensor, generally is within the allowable ambient temperature $-25^\circ\text{C} \sim +70^\circ\text{C}$, the input voltage in the range of 85% to 110% of rated voltage measurement was.

The reliable sensing distance specified conditions to ensure the correct operation of the proximity sensor sensing face of its action pitch some distance.

Sensing Distance Error:

Error between the sensing distance of the sensor and the standard sensing distance, is typically $\pm 10\%$.

Attenuation Coefficient:

Detect body factors affect the sensing distance of the sensor. The nature of the material of the detecting body plays an important role, which can be described attenuation coefficient. Attenuation coefficient refers to a movement distance of a material with respect to reducing the number of iron (ST37). The attenuation coefficient is smaller, the smaller a distance for the operation of certain materials.

The characteristic parameters of the capacitive sensor is the relative permittivity.

Material	Iron	Copper	Brass	Aluminum	Stainless steel	Nickel	Cast iron
Attenuation factor	1.0	0.25~0.45	0.35~0.50	0.30~0.45	0.60~1.00	0.65~0.75	0.93~1.05

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开关点偏移:

传感器实际动作位置与标准动作位置的偏差。

压降:

压降是指传感器接通时在传感器两端或者输出端测量得到的电压。

消耗电流:

传感器工作状态下的所需的电流。

漏电流:

传感器没有接通时, 在其负载中残留的电流, 称作漏电流。

回差:

检测体接近传感器感应面, 触发传感器动作的感应距离与检测体远离传感器时动作复归时的复归距离之差。

重复精度:

重复精度是指在外壳温度为 $(23 \pm 5^\circ\text{C})$, 相对湿度为随机的, 供电电压为额定测量电压 $\pm 5\%$, 在 8 个小时的范围内进行所产生的有效作用距离的变化量。

开关频率:

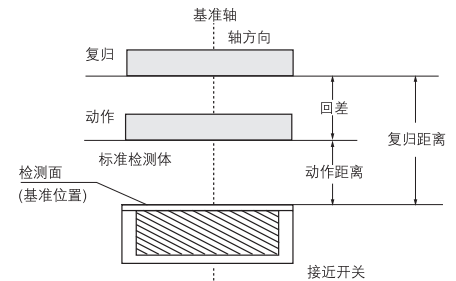
开关频率是指每秒钟传感器动作的最大次数。

极性保护:

直流传感器防止极性接反的保护功能。

浪涌保护:

浪涌主要指的是电路中超出正常工作电压的瞬间过电压, 它很可能使电路在浪涌的一瞬间烧坏。浪涌保护装置可以有效地吸收或分流突发的巨大能量, 以保护设备免于受损。



Switch-Point Drift:

The position deviation of the actual movement of the sensor position and the standard action.

Drop:

The pressure drop means when the sensor is switched on, the output voltage measured in both ends of the sensor.

Current Consumption:

The actual current when the sensor is working.

Leakage Current:

When the sensor is not turned on, the current remained is called leakage current.

Backlash:

Detect body proximity sensor sensing surface, triggering the sensing distance of the sensor moves away from the sensor detects body movements reversion reversion distance related.

Repeatability:

Repeat accuracy is in the housing temperature $(23 \pm 5^\circ\text{C})$, the relative humidity is random, the supply voltage for rated measuring voltage of $\pm 5\%$ within 8 hours, the amount of change in the effective distance.

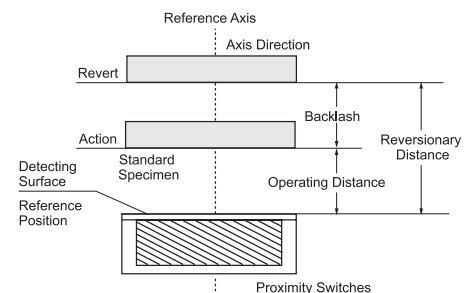
Switching Frequency:

The switching frequency is the maximum times of actions of the sensor in one second.

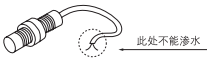
Polarity Protection: DC sensors prevent polarity reverse protection function.

Surge Protection:

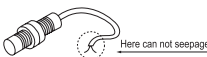
Surge is transient overvoltage circuit in excess of the normal operating voltage, it is likely to make the circuit in the surge of the moment burned out. Surge protection device can effectively absorb or divert huge energy burst, in order to protect the equipment from damage.



IP 防护等级系统

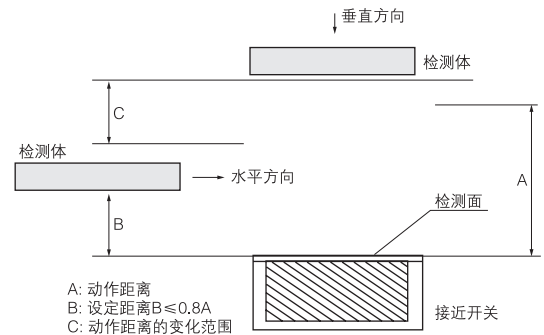
术语	说明																				
保护构造	<p>免受水、人体和固体异物损害的保护程度。构造以 IEC(国际电子技术委员会)的规格为标准。</p> <ul style="list-style-type: none"> ● 第一位数字表示的保护级别 <table border="1"> <thead> <tr> <th>第一位数字</th> <th>说明</th> </tr> </thead> <tbody> <tr><td>0</td><td>无保护</td></tr> <tr><td>1</td><td>防止人手接触内部的充电部分 (ø50mm)</td></tr> <tr><td>2</td><td>防止人手接触内部的充电部分 (ø12mm)</td></tr> <tr><td>3</td><td>防止厚度或直径大于 2.5mm 的固体物侵入内部充电部分</td></tr> <tr><td>4</td><td>防止厚度或直径大于 1.0mm 的固体物侵入内部充电部分</td></tr> <tr><td>5</td><td>防止影响操作的灰尘侵入</td></tr> <tr><td>6</td><td>完全防止灰尘侵入</td></tr> </tbody> </table> <p>注: IEC 规定有上述保护构造的测试方法, 产品规格指定的保护构造由这些测试决定。</p> <p>警告 尽管保护构造是指传感器包括电缆, 但电缆末端不防水、并未由指定保护包住。因此, 确保水不会从电缆末端侵入。</p> 	第一位数字	说明	0	无保护	1	防止人手接触内部的充电部分 (ø50mm)	2	防止人手接触内部的充电部分 (ø12mm)	3	防止厚度或直径大于 2.5mm 的固体物侵入内部充电部分	4	防止厚度或直径大于 1.0mm 的固体物侵入内部充电部分	5	防止影响操作的灰尘侵入	6	完全防止灰尘侵入				
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	<ul style="list-style-type: none"> ● IEC 标准 <p>IP □ □</p> <p>—— 第二位数字 ... 对水侵入的保护 —— 第一位数字 ... 对人体及固体异物保护</p> <ul style="list-style-type: none"> ● 第二位数字表示的保护级别 <table border="1"> <thead> <tr> <th>第二位数字</th> <th>说明</th> </tr> </thead> <tbody> <tr><td>0</td><td>无保护</td></tr> <tr><td>1</td><td>使垂直下落水滴无有害影响</td></tr> <tr><td>2</td><td>使宽于垂直方向 15°。下落水滴无有害影响</td></tr> <tr><td>3</td><td>使宽于垂直方向 60°。下落水滴无有害影响</td></tr> <tr><td>4</td><td>使任何方向内飞溅的水滴无有害影响</td></tr> <tr><td>5</td><td>使任何方向内喷射的水无有害影响</td></tr> <tr><td>6</td><td>使任何方向内喷射的水无法侵入</td></tr> <tr><td>7</td><td>使在特定的条件下浸在水中无水侵入</td></tr> <tr><td>8</td><td>在特定的压力下浸在水中仍可使用</td></tr> </tbody> </table> <ul style="list-style-type: none"> ● JEM 标准 <p>IP67g 除 IEC 标准的 IP67 保护构造之外的指定保护, 是指滴或气泡不可从任何方向进入。</p>	第二位数字	说明	0	无保护	1	使垂直下落水滴无有害影响	2	使宽于垂直方向 15°。下落水滴无有害影响	3	使宽于垂直方向 60°。下落水滴无有害影响	4	使任何方向内飞溅的水滴无有害影响	5	使任何方向内喷射的水无有害影响	6	使任何方向内喷射的水无法侵入	7	使在特定的条件下浸在水中无水侵入	8	在特定的压力下浸在水中仍可使用
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IP PROTECTION CLASS SYSTEM

Term	Explain																																				
Protection structure	<p>From the water, the degree of protection of the human body and solid different special damages. Constructed to the specifications of the IEC (International Electrotechnical Commission) standards.</p> <ul style="list-style-type: none"> ● The level of protection indicated by the first digit. <table border="1"> <thead> <tr> <th>The first digit</th> <th>Explain</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unprotected</td></tr> <tr><td>1</td><td>Prevent contact with human hands inside the charging part (50mm)</td></tr> <tr><td>2</td><td>To prevent contact with human hands the internal charging part (12mm)</td></tr> <tr><td>3</td><td>Invade the internal charging portion to prevent the solid matter of the thickness or diameter greater than 2.5mm</td></tr> <tr><td>4</td><td>Prevent objects of which the thickness is over 1.0mm from intruding into the inner charging part of sensor</td></tr> <tr><td>5</td><td>Prevent the intrusion of dust which will affect the operation</td></tr> <tr><td>6</td><td>Completely prevent dust intrusion</td></tr> </tbody> </table> <p>Note: IEC provides test methods, product specifications specify the protection structure of the protective structure is determined by these tests.</p> <ul style="list-style-type: none"> ● The level of protection indicated by the second digit. <table border="1"> <thead> <tr> <th>The second digit</th> <th>Explain</th> </tr> </thead> <tbody> <tr><td>0</td><td>Unprotected</td></tr> <tr><td>1</td><td>Vertically falling water droplets no harmful effects</td></tr> <tr><td>2</td><td>So that the width in the vertical direction 15°. The whereabouts of the water droplets no harmful effects</td></tr> <tr><td>3</td><td>So that the width in the vertical direction 60°. The whereabouts of the water droplets no harmful effects</td></tr> <tr><td>4</td><td>To any direction splashing droplets no harmful effects</td></tr> <tr><td>5</td><td>So that the water sprayed in any direction to no adverse effect</td></tr> <tr><td>6</td><td>Any direction injection water can not invade</td></tr> <tr><td>7</td><td>No intrusion of water under certain condition when immersed in the water</td></tr> <tr><td>8</td><td>Immersed in the water,can still be used under the specific pressure</td></tr> </tbody> </table> <p>Warning: Protection structure sensors including cables, but the end of the cable is not waterproof not specified.</p> 	The first digit	Explain	0	Unprotected	1	Prevent contact with human hands inside the charging part (50mm)	2	To prevent contact with human hands the internal charging part (12mm)	3	Invade the internal charging portion to prevent the solid matter of the thickness or diameter greater than 2.5mm	4	Prevent objects of which the thickness is over 1.0mm from intruding into the inner charging part of sensor	5	Prevent the intrusion of dust which will affect the operation	6	Completely prevent dust intrusion	The second digit	Explain	0	Unprotected	1	Vertically falling water droplets no harmful effects	2	So that the width in the vertical direction 15°. The whereabouts of the water droplets no harmful effects	3	So that the width in the vertical direction 60°. The whereabouts of the water droplets no harmful effects	4	To any direction splashing droplets no harmful effects	5	So that the water sprayed in any direction to no adverse effect	6	Any direction injection water can not invade	7	No intrusion of water under certain condition when immersed in the water	8	Immersed in the water,can still be used under the specific pressure
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检测体的位置设定

传感器的感应距离会因环境温度变化、电压变动等周围条件的稍有变动。因此，为使传感器稳定工作，检测体的最大接近位置需小于感应距离。使用标准检测时，设定实际感应距离应在动作距离的 80% 以下。此外，在检测体的形状小于标准检测体或使用铁以外的检测体时，因感应距离缩短，故设定实际感应距离也必须相应缩短。详细请参照说明书。

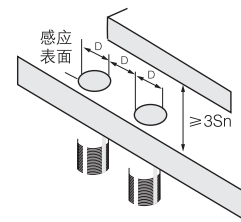


埋入式、准埋入式、非埋入式安装

接近传感器根据安装方法可分为埋入式和非埋入式。埋入式可埋入金属内使用。非埋入式则不可埋入金属内使用，但动作距离与埋入式相比，检测距离更长。

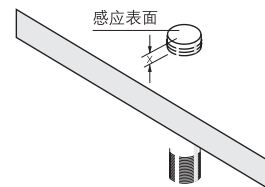
埋入式安装的接近开关

传感器安装时感应面可以和金属表面齐平。开关表面到其对面的金属物体的距离要 $\geq 3Sn$ ，邻近的两个开关间的距离必须 $\geq D$ 。



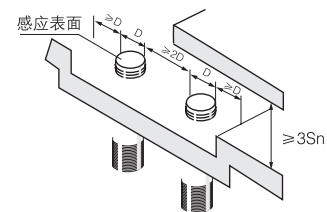
准埋入式安装的接近开关

感应表面到安装表面需要有一段距离是没有导磁材料的。满足这个条件时，其开关距离就是有效的，而且不受限制。尺寸“X”（见右图）指感应表面到其下面的导磁材料的最小距离。



非埋入式安装的接近开关

可以根据它们的头部来鉴别，非齐平式的感应表面周围的区域没有金属外壳。感应表面到金属安装介质的距离必须 $\geq 2Sn$ 。感应表面到对面的金属物体的距离必须 $\geq 3Sn$ ，另外两个邻近的接近开关距离必须 $\geq 2d$ 。



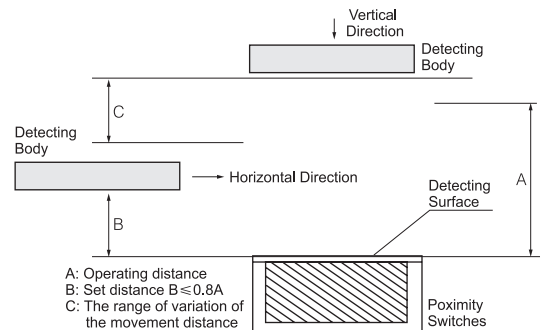
埋入式安装的电感传感器和电容传感器的优点为：它们有更好的机械保护性能，与非埋入式安装的传感器相比较，对于错误的电影响的灵敏度更低。

传感器连接方式

- 引线方式 —— 以电缆引线连接
- 端子方式 —— 以端子台连接
- 插件方式 —— 通过插件连接

SETTING A POSITION OF THE DETECTING BODY

The sensing distance of the sensor will be changed slightly due to changes of ambient temperature, voltage changes surrounding conditions. Therefore, in order to make the sensor steady work, the maximum approach position of the detecting body is required to be less than the sensing distance. Using standard detection, the setting the actual sensor distance should be 80% of the operation distance or less of the distance. In addition, when the sample detecting the shape of the body is less than the standard sample or use detected body with other material, the sensing distance is shortened, the actual sensing distance is set must also be reduced accordingly. For details, please refer to the manual.

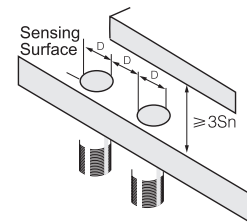


BURIED, QUASI-SUBMERGED AND NON-SUBMERGED INSTALLATION

Proximity sensor installation methods can be divided into embedded and non-embedded. The difference is that the embedded can be used to sense inside the metal, and the non-embedded can't. But the sensing distance is longer when compared with the embedded.

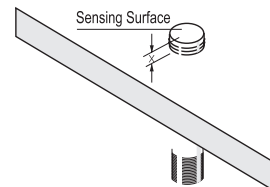
Flush-mounted proximity switches

Sensing face when the sensor is installed and the metal surface is flush. Switching distance of the surface of the metal objects to its opposite $\geq 3Sn$, the distance between two adjacent switch must be $\geq D$.



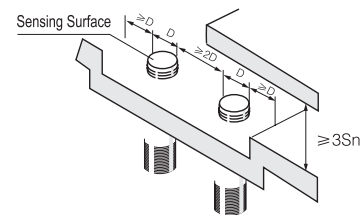
Quasi flush-mounted proximity switch

There must be some area between the inductive surface and mounting surface in order to make its sensing distance effective and without limit.



Non-submerged installation of proximity switch

According to their head to identify non-flush sensing surface area around the metal casing. Sensing surface to metal mounting medium distance must be $\geq 2Sn$. The distance of the sensing surface to the opposite side of the metal objects must be $\geq 3Sn$, proximity switch two adjacent distance must be $\geq 2d$.



The advantages of flush-mounted inductive sensor and capacitive sensor: they have a better mechanical protection performance, compared with the non-flush-mounted sensor, the lower for the error sensitivity to the influence of power.

SENSOR CONNECTION

- About way of leads —— Cable leads
- About way of terminals —— Terminal block
- About connection —— Connecting through socket

负载短路保护电路

带有负载短路保护电路的产品，当由于传感器的误动作、负载破损等引起电流超出传感器最大负载电流的 2 倍以上时，负载短路保护电路将切断负载电流，保护传感器的输出。

检测配线注意事项

采用蜂鸣器、灯等实验检查传感器的配线，可能会产生高电压、大电流。因此请不要采用此类检查方法。

LOAD SHORT-CIRCUIT PROTECTION CIRCUIT

With a load short-circuit protection circuit, when the load breakage caused by current exceeds the sensor maximum load current of more than 2 times, the load short circuit protection circuit will cut off the load current, protection of the sensor output due to the malfunction of the sensor.

DETECT WIRING NOTE

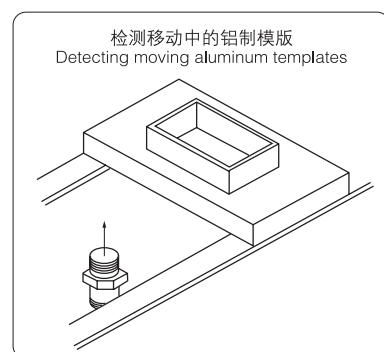
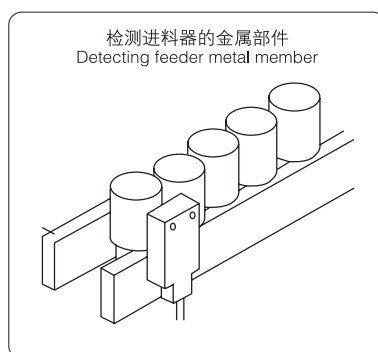
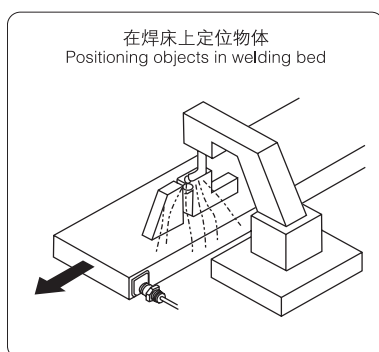
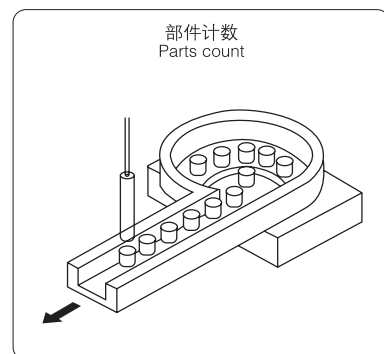
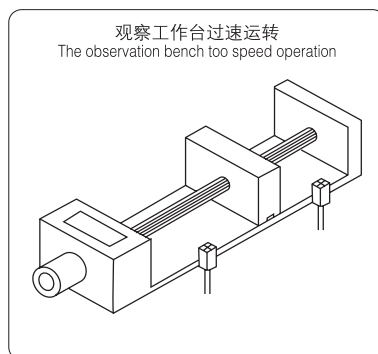
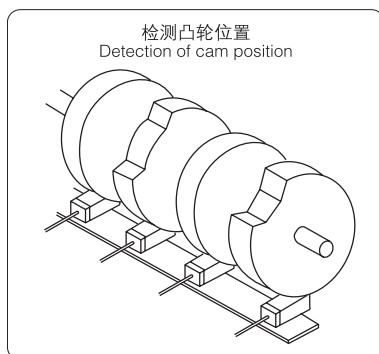
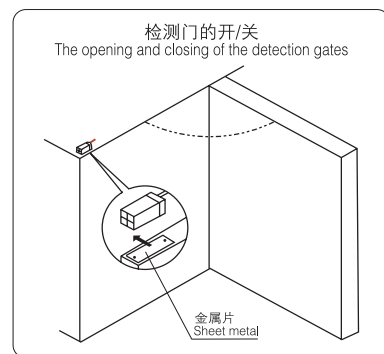
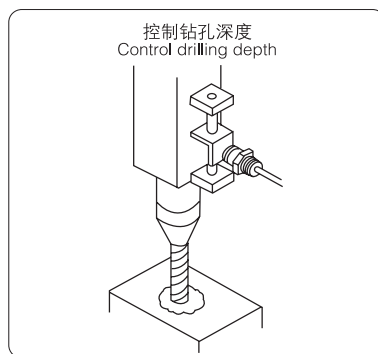
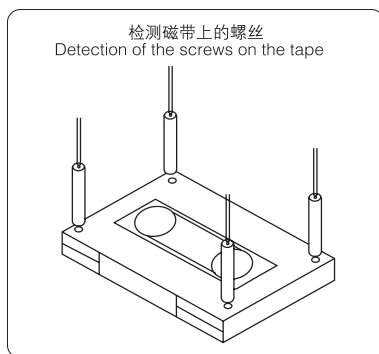
When detecting the wiring of sensors through buzzer, lights or other experimental methods, please be cautioned about the conditions of high voltage and high current. Suggest not using these methods.

应用实例

电感式传感器在航空、航天技术以及工业生产中都有广泛的应用。当被测对象是导电物体或可以固定在一块金属物上的物体时，一般都选用电感式传感器，因为它的响应频率高、抗环境干扰性能好、应用范围广、成本经济。

APPLICATION EXAMPLES

Inductive sensors are widely used in aviation, aerospace, technology, and industrial production. When the measured object is conductive objects or can be fixed on a metal object objects generally use inductive sensors because of its high frequency response, anti-environmental interference performance, a wide range of applications, the cost economy.



IM 系列

接近传感器

Proximity Sensors

产品接线图示

DC 2 线 2-Wire Type	NO	NC		
引线式 Leaded				
M8 连接器 M8 Connector				
M12 连接器 M12 Connector				
DC 3 线 3-Wire Type	NPN NO	NPN NC	PNP NO	PNP NC
引线式 Leaded				
M8 连接器 M8 Connector				
M12 连接器 M12 Connector				
DC 4 线 4-Wire Type	NPX: NPN NO+PNP NC		PNY: PNP NO+NPN NC	
引线式 Leaded				
M12 连接器 M12 Connector				
AC 2 线 2-Wire Type	SCR NO	SCR NC		
引线式 Leaded				
M12 连接器 M12 Connector				



结构分类：圆柱型
Structural category: Cylinder type

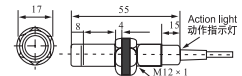
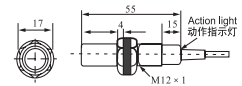
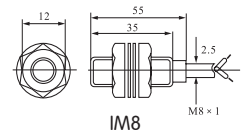
外形图例
Outward appearance illustration

具有短路保护、极性保护、过流保护
Short-circuit, polarity and over-current protections

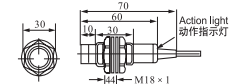
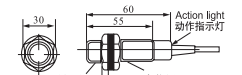
埋入式 / Flush

外形编号 Outward appearance code		IM8	IM12	IM18	IM30	
检测距离 Detection distance		2mm	4mm	8mm	16mm	
直流 DC10~30 VDC	NPN	NO	IM8-D1NA02-L	IM12-D1NA04-L	IM18-D1NA08-L	IM30-D1NA16-L
		NC				
		NO+NC				
VDC	PNP	NO	IM8-D1PA02-L	IM12-D1PA04-L	IM18-D1PA08-L	IM30-D1PA16-L
		NC				
		NO+NC				
二线制 Two wire system		NO				
		NC				
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO				
	NC					

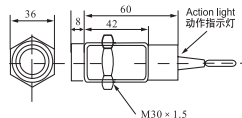
外形尺寸 / Overall Dimensions



IM12



IM18



IM30

非埋入式 / Non-Flush

外形编号 Outward appearance code		IM8	IM12	IM18	IM30	
检测距离 Detection distance		4mm	8mm	16mm	25mm	
直流 DC10~30 VDC	NPN	NO	IM8-D1NA04-L	IM12-D1NA08-L	IM18-D1NA16-L	IM30-D1NA25-L
		NC				
		NO+NC				
VDC	PNP	NO	IM8-D1PA04-L	IM12-D1PA08-L	IM18-D1PA16-L	IM30-D1PA25-L
		NC				
		NO+NC				
二线制 Two wire system		NO				
		NC				
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO				
	NC					

产品规格 / Specifications

外形编号 Outward appearance code		IM8	IM12	IM18	IM30
输出电流 Output current	DC	≤ 150mA	≤ 150mA	≤ 200mA	≤ 200mA
	SCR/ 继电器 Relay				
输出电压降 Output voltage drop	DC/AC	直流 (NPN PNP) 型: 1.5V 以下; 二线型: 3.9V 以下;			
消耗电流 Consumption current		10mA 以下			
标准检测物体 Standard detected object		8 × 8 × 1(A3 铁 iron)	12 × 12 × 1(A3 铁 iron)	18 × 18 × 1(A3 铁 iron)	30 × 30 × 1(A3 铁 iron)
重复精度 Repeated precision		0.01	0.01	0.01	0.05
响应频率 Response frequency	埋入式 Flush	800Hz	600Hz	500Hz	150Hz
	非埋入式 Non-flush	600Hz	500Hz	150Hz	100Hz
工作环境温度 Working environment temperature		-25°C ~ +70°C	-25°C ~ +70°C	-25°C ~ +70°C	-25°C ~ +70°C
绝缘电阻 Insulation resistance		≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ
外壳材料 Shell material		金属 Metal	金属 Metal	金属 Metal	金属 Metal
防护等级 Protection grade		IP67	IP67	IP67	IP67
短路保护电流 Current short-circuit protection		220mA(不含 AC 产品 Excluding AC output product)			

IM 系列 接近传感器 Proximity Sensors

www.qwifm.com (China)
www.qwdhc.com(International)



结构分类：圆柱型
Structural category: Cylinder type

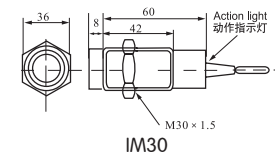
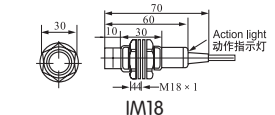
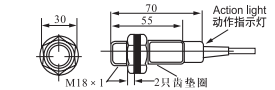
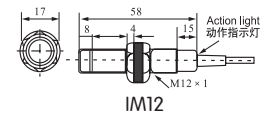
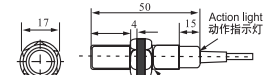
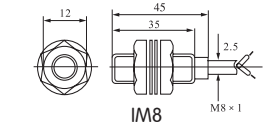
外形图例
Outward appearance illustration

具有短路保护、极性保护、过流保护
Short-circuit, polarity and over-current protections

埋入式 / Flush

外形编号 Outward appearance code			IM8	IM12	IM18	IM30	
检测距离 Detection distance			1mm	2mm	5mm	10mm	
直流 DC10~30 VDC	NPN	NO	IM8-D1NA01	IM12-D1NA02	IM18-D1NA05	IM30-D1NA10	
		NC	IM8-D1NB01	IM12-D1NB02	IM18-D1NB05	IM30-D1NB10	
	NPN	NO+NC		IM12-D1NC02	IM18-D1NC05	IM30-D1NC10	
		NC		IM8-D1PA01	IM12-D1PA02	IM18-D1PA05	IM30-D1PA10
	PNP	NO		IM8-D1PB01	IM12-D1PB02	IM18-D1PB05	IM30-D1PB10
		NC		IM12-D1PC02	IM18-D1PC05	IM30-D1PC10	
	二线制 Two wire system	NO		IM12-D1LA02	IM18-D1LA05	IM30-D1LA10	
		NC		IM12-D1LB02	IM18-D1LB05	IM30-D1LB10	
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO		IM12-A2A02	IM18-A2A05	IM30-A2A10	
		NC		IM12-A2B02	IM18-A2B05	IM30-A2B10	

外形尺寸 / Overall Dimensions



非埋入式 / Non-Flush

外形编号 Outward appearance code			IM8	IM12	IM18	IM30	
检测距离 Detection distance			2mm	4mm	8mm	15mm	
直流 DC10~30 VDC	NPN	NO	IM8-D1NA02	IM12-D1NA04	IM18-D1NA08	IM30-D1NA15	
		NC	IM8-D1NB02	IM12-D1NB04	IM18-D1NB08	IM30-D1NB15	
	NPN	NO+NC		IM12-D1NC04	IM18-D1NC08	IM30-D1NC15	
		NC		IM8-D1PA02	IM12-D1PA04	IM18-D1PA08	IM30-D1PA15
	PNP	NO		IM8-D1PB02	IM12-D1PB04	IM18-D1PB08	IM30-D1PB15
		NC		IM12-D1PC04	IM18-D1PC08	IM30-D1PC08	
	二线制 Two wire system	NO		IM12-D1LA04	IM18-D1LA08	IM30-D1LA15	
		NC		IM12-D1LB04	IM18-D1LB08	IM30-D1LB15	
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO		IM12-A2A04	IM18-A2A08	IM30-A2A15	
		NC		IM12-A2B04	IM18-A2B08	IM30-A2B15	

产品规格 / Specifications

外形编号 Outward appearance code	IM8	IM12	IM18	IM30
输出电流 DC Output current	≤ 150mA	≤ 150mA	≤ 200mA	≤ 200mA
SCR/ 继电器 Relay	≤ 100mA	≤ 200mA	≤ 300mA	≤ 300mA/1A
输出电压降 Output voltage drop DC/AC	直流 (NPN, PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下 DC < 3V, AC < 10V			
消耗电流 Consumption current	直流 (NPN, PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA, AC < 10mA			
标准检测物体 Standard detected object	8 × 8 × 1(A3 铁 iron)	12 × 12 × 1(A3 铁 iron)	18 × 18 × 1(A3 铁 iron)	30 × 30 × 1(A3 铁 iron)
重复精度 Repeated precision	0.01	0.01	0.02	0.05
响应频率 DC/AC Response frequency	1KHz/25Hz	800HZ/25HZ	500HZ/20HZ	500HZ/10HZ
工作环境温度 Working environment temperature	-25℃ ~ +70℃	-25℃ ~ +70℃	-25℃ ~ +70℃	-25℃ ~ +70℃
绝缘电阻 Insulation resistance	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ
外壳材料 Shell material	金属 Metal	金属 Metal	金属 Metal	金属 Metal
防护等级 Protection grade	IP67	IP67	IP67	IP67
可替代国内型号 Alternative model at home and abroad	E2E-X1R5 □□	E2E-X5M □□	E2E-X10M □	E2E-X18M □
短路保护电流 Current short-circuit protection	220mA(不含 AC 产品 Excluding AC output product)			

IQ 系列 接近传感器 Proximity Sensors

www.qwifm.com (China)
www.qwdhc.com(International)

角柱型 Angular column type



结构分类：圆柱型
Structural category: Cylinder type

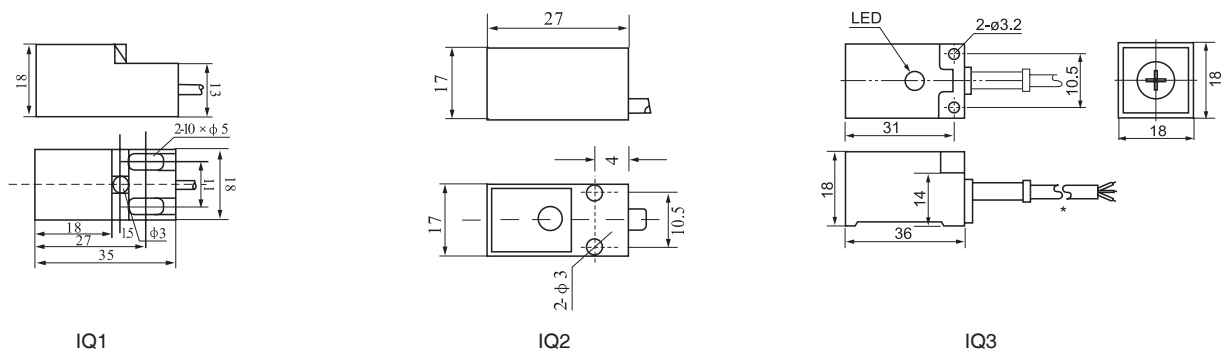
外形图例
Outward appearance illustration

具有短路保护、极性保护、过流保护
Short-circuit, polarity and over-current protections

埋入式 /Flush

外形编号 Outward appearance code		IQ1	IQ2	IQ3	
检测距离 Detection distance		5mm	5mm	5mm	
直流 DC10~30 VDC	NPN	NO	IQ1-D1NA05	IQ3-D1NA05	
		NC	IQ1-D1NB05	IQ3-D1NB05	
	PNP	NO	IQ1-D1PA05	IQ3-D1PA05	
		NC	IQ1-D1PB05	IQ3-D1PB05	
	二线制 Two wire system		NO	IQ2-D1LA05	IQ3-D1LA05
			NC	IQ2-D1LB05	IQ3-D1LB05
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO		IQ3-A2A05	
		NC		IQ3-A2B05	

外形尺寸/Overall Dimensions



产品规格 /Specifications

外形编号 Outward appearance code	IQ1	IQ2	IQ3
输出电流 DC Output current SCR	≤ 200mA	≤ 200mA	≤ 200mA
输出电压降 Output voltage drop DC/AC	直流 (NPN、PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下	DC < 3V、AC < 10V	DC < 3V、AC < 10V
消耗电流 Consumption current	直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下	DC < 15mA、AC < 10mA	DC < 15mA、AC < 10mA
标准检测物体 Standard detected object	20 × 20 × 1(A3 铁 iron)	20 × 20 × 1(A3 铁 iron)	20 × 20 × 1(A3 铁 iron)
重复精度 Repeated precision	0.02	0.02	0.05
响应频率 DC/AC Response frequency	700Hz	700KHz	700Hz/20Hz
工作环境温度 Working environment temperature	-25℃ ~+70℃	-25℃ ~+70℃	-25℃ ~+70℃
绝缘电阻 Insulation resistance	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ
外壳材料 Shell material	ABS 塑料 Plastic	ABS 塑料 Plastic	ABS 塑料 Plastic
防护等级 Protection grade	IP67	IP67	IP67
可替代国内型号 Alternative model at home and abroad	SN04-N	TL-Q5MC1	PL-05N PL-05P
短路保护电流 Current short-circuit protection	220mA(不含 AC 产品 Excluding AC output product)		



结构分类：插件件型

Structural category: Connector type

外形图例

Outward appearance illustration

具有短路保护、极性保护、过流保护

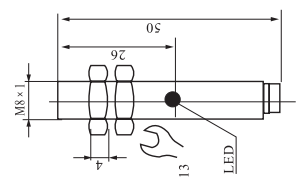
Short-circuit, polarity and

over-current protections

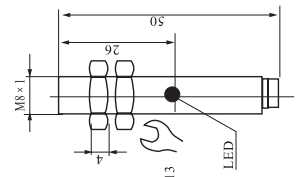
埋入式 /Flush

外形编号 Outward appearance code		IM8-□□□ M2-W	IM8-□□□ M2-Z	IM12-□□□ M1-W
检测距离 Detection distance		1mm	1mm	2mm
直流 DC10~30 VDC	NPN	NO	IM8-D1NA01-M2-W	IM8-D1NA01-M2-Z
		NC	IM8-D1NB01-M2-W	IM8-D1NB01-M2-Z
	NPN	NO+NC		
				IM12-D1NC02-M1-W
	PNP	NO	IM8-D1PA01-M2-W	IM8-D1PA01-M2-Z
		NC	IM8-D1PB01-M2-W	IM8-D1PB01-M2-Z
PNP	NO+NC			
			IM12-D1PC02-M1-W	
二线制 Two wire system	NO	IM8-D1LA01-M2-W	IM8-D1LA01-M2-Z	
	NC			
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO		IM12-A2A02-M1-W
	NC			IM12-A2B02-M1-W

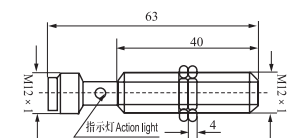
外形尺寸 /Overall Dimensions



IM8-□□□ M2-W



IM8-□□□ M2-Z



IM12-□□□ M1-W

非埋入式 /Non-Flush

外形编号 Outward appearance code		IM8-□□□ M2-W	IM8-□□□ M2-Z	IM12-□□□ M1-W
检测距离 Detection distance		2mm	2mm	4mm
直流 DC10~30 VDC	NPN	NO	IM8-D1NA02-M2-W	IM8-D1NA02-M2-Z
		NC	IM8-D1NB02-M2-W	IM8-D1NB02-M2-Z
	NPN	NO+NC		
				IM12-D1NC04-M1-W
	PNP	NO	IM8-D1PA02-M2-W	IM8-D1PA02-M2-Z
		NC	IM8-D1PB02-M2-W	IM8-D1PB02-M2-Z
PNP	NO+NC			
			IM12-D1PC04-M1-W	
二线制 Two wire system	NO	IM8-D1LA02-M2-W	IM8-D1LA02-M2-Z	
	NC			
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO	IM8-A1A02-M2-W	IM8-A1A02-M2-Z
	NC			IM12-A2A04-M1-W

产品规格 /Specifications

外形编号 Outward appearance code	IM8-□□□ M2-W	IM8-□□□ M2-Z	IM12-□□□ M1-W
输出电流 DC Output current SCR/ 继电器 Relay	150mA	150mA	200mA
输出电压降 Output voltage drop DC/AC	直流 (NPN, PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V		
消耗电流 Consumption current	直流 (NPN, PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA		
标准检测物体 Standard detected object	8 × 8 × 1(A3 铁 iron)	8 × 8 × 1(A3 铁 iron)	12 × 12 × 1(A3 铁 iron)
重复精度 Repeated precision	0.01	0.01	0.01
响应频率 DC/AC Response frequency	1KHz/10Hz	1KHz/10Hz	800HZ/10HZ
工作环境温度 Working environment temperature	-25℃ ~+65℃	-25℃ ~+65℃	-25℃ ~+65℃
绝缘电阻 Insulation resistance	≥ 50MΩ	≥ 50MΩ	≥ 50MΩ
外壳材料 Shell material	金属 Metal	金属 Metal	金属 Metal
防护等级 Protection grade	IP67	IP67	IP67
可替代国内型号 Alternative model at home and abroad	E2E-X1R5-M1	E2E-X2ME1-M1	E2E-X2E1-M1
短路保护电流 Current short-circuit protection	220mA(不含 AC 产品 Excluding AC output product)		



结构分类：接插件型

Structural category: Connector type

外形图例

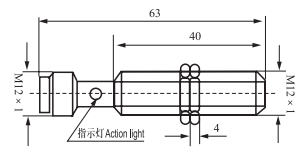
Outward appearance illustration

具有短路保护、极性保护、过流保护
Short-circuit, polarity and over-current protections

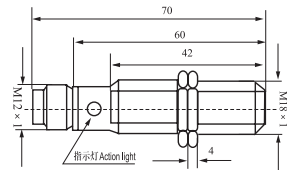
埋入式 / Flush

外形编号 Outward appearance code			IM12- □□□ -M1-Z	IM18- □□□ -M1-W	IM18- □□□ -M1-Z	
检测距离 Detection distance			2mm	5mm	5mm	
直流 DC10~30 VDC	NPN	NO	IM12-D1NA02-M1-Z	IM18-D1NA05-M1-W	IM18-D1NA05-M1-Z	
		NC	IM12-D1NB02-M1-Z	IM18-D1NB05-M1-W	IM18-D1NB05-M1-Z	
	NPN	NO+NC	IM12-D1NC02-M1-Z	IM18-D1NC05-M1-W	IM18-D1NC05-M1-Z	
		NO	IM12-D1PA02-M1-Z	IM18-D1PA05-M1-W	IM18-D1PA05-M1-Z	
	PNP	NC	IM12-D1PB02-M1-Z	IM18-D1PB05-M1-W	IM18-D1PB05-M1-Z	
		NO+NC	IM12-D1PC02-M1-Z	IM18-D1PC05-M1-W	IM18-D1PC05-M1-Z	
	二线制 Two wire system	NO	IM12-D1LA02-M1-Z	IM18-D1LA05-M1-W	IM18-D1LA05-M1-Z	
		NC	IM12-D1LB02-M1-Z	IM18-D1LB05-M1-W	IM18-D1LB05-M1-Z	
	交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO	IM12-A2A02-M1-Z	IM18-A2A05-M1-W	IM18-A2A05-M1-Z
		NC	IM12-A2B02-M1-Z	IM18-A2B05-M1-W	IM18-A2B05-M1-Z	

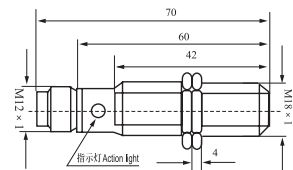
外形尺寸 / Overall Dimensions



IM12- □□□ -M1-Z



IM18- □□□ -M1-W



IM18- □□□ -M1-Z

非埋入式 / Non-Flush

外形编号 Outward appearance code			IM12- □□□ -M1-Z	IM18- □□□ -M1-W	IM18- □□□ -M1-Z	
检测距离 Detection distance			4mm	8mm	8mm	
直流 DC10~30 VDC	NPN	NO	IM12-D1NA04-M1-Z	IM18-D1NA08-M1-W	IM18-D1NA08-M1-Z	
		NC	IM12-D1NB04-M1-Z	IM18-D1NB08-M1-W	IM18-D1NB08-M1-Z	
	NPN	NO+NC	IM12-D1NC04-M1-Z	IM18-D1NC08-M1-W	IM18-D1NC08-M1-Z	
		NO	IM12-D1PA04-M1-Z	IM18-D1PA08-M1-W	IM18-D1PA08-M1-Z	
	PNP	NC	IM12-D1PB04-M1-Z	IM18-D1PB08-M1-W	IM18-D1PB08-M1-Z	
		NO+NC	IM12-D1PC04-M1-Z	IM18-D1PC08-M1-W	IM18-D1PC08-M1-Z	
	二线制 Two wire system	NO	IM12-D1LA04-M1-Z	IM18-D1LA08-M1-W	IM18-D1LA08-M1-Z	
		NC	IM12-D1LB04-M1-Z	IM18-D1LB08-M1-W	IM18-D1LB08-M1-Z	
	交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO	IM12-A2A04-M1-Z	IM18-A2A08-M1-W	IM18-A2A08-M1-Z
		NC	IM12-A2B04-M1-Z	IM18-A2B08-M1-W	IM18-A2B08-M1-Z	

产品规格 / Specifications

外形编号 Outward appearance code		IM12- □□□ -M1-Z	IM18- □□□ -M1-W	IM18- □□□ -M1-Z
输出电流 DC		≤ 150mA	≤ 200mA	≤ 200mA
Output current SCR		≤ 200mA	≤ 300mA	≤ 300mA
输出电压降 Output voltage drop DC/AC		直流 (NPN、PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V		
消耗电流 Consumption current		直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA		
标准检测物体 Standard detected object		12 × 12 × 1(A3 铁 iron)	18 × 18 × 1(A3 铁 iron)	18 × 18 × 1(A3 铁 iron)
重复精度 Repeated precision		0.01	0.02	0.02
响应频率 DC/AC Response frequency		800HZ/20HZ	500HZ/20HZ	500HZ/20HZ
工作环境温度 Working environment temperature		-25℃ ~ +65℃	-25℃ ~ +65℃	-25℃ ~ +65℃
绝缘电阻 Insulation resistance		≥ 50MΩ	≥ 50MΩ	≥ 50MΩ
外壳材料 Shell material		金属 Metal	金属 Metal	金属 Metal
防护等级 Protection grade		IP67	IP67	IP67
可替代国内型号 Alternative model at home and abroad		E2E-X5ME1-M1	E2E-X5E1-M1	E2E-X10ME1-M1
短路保护电流 Current short-circuit protection		220mA(不含 AC 产品 Excluding AC output product)		



结构分类：接插件型

Structural category: Connector type

外形图例

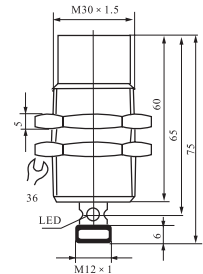
Outward appearance illustration

具有短路保护、极性保护、过流保护
Short-circuit, polarity and
over-current protections

埋入式 / Flush

外形编号 Outward appearance code	IM30- □□□ M1-W		IM30- □□□ M1-Z	
检测距离 Detection distance	10mm		10mm	
直流 DC10~30 VDC	NPN	NO	IM30-D1NA10-M1-W	IM30-D1NA10-M1-Z
		NC	IM30-D1NB10-M1-W	IM30-D1NB10-M1-Z
	NPN	NO+NC	IM30-D1NC10-M1-W	IM30-D1NC10-M1-Z
		NO	IM30-D1PA10-M1-W	IM30-D1PA10-M1-Z
	PNP	NC	IM30-D1PB10-M1-W	IM30-D1PB10-M1-Z
		NO+NC	IM30-D1PC10-M1-W	IM30-D1PC10-M1-Z
	二线制 Two wire system	NO	IM30-D1LA10-M1-W	IM30-D1LA10-M1-Z
		NC	IM30-D1LB10-M1-W	IM30-D1LB10-M1-Z
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO	IM30-A2A10-M1-W	IM30-A2A10-M1-Z
	NC	IM30-A2B10-M1-W	IM30-A2B10-M1-Z	

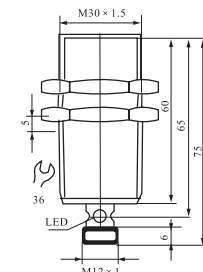
外形尺寸 / Overall Dimensions



IM30- □□□ M1-W

非埋入式 / Non-Flush

外形编号 Outward appearance code	IM30- □□□ M1-W		IM30- □□□ M1-Z	
检测距离 Detection distance	15mm		15mm	
直流 DC10~30 VDC	NPN	NO	IM30-D1NA15-M1-W	IM30-D1NA15-M1-Z
		NC	IM30-D1NB15-M1-W	IM30-D1NB15-M1-Z
	NPN	NO+NC	IM30-D1NC15-M1-W	IM30-D1NC15-M1-Z
		NO	IM30-D1PA15-M1-W	IM30-D1PA15-M1-Z
	PNP	NC	IM30-D1PB15-M1-W	IM30-D1PB15-M1-Z
		NO+NC	IM30-D1PC15-M1-W	IM30-D1PC15-M1-Z
	二线制 Two wire system	NO	IM30-D1LA15-M1-W	IM30-D1LA15-M1-Z
		NC	IM30-D1LB15-M1-W	IM30-D1LB15-M1-Z
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO	IM30-A2A15-M1-W	IM30-A2A15-M1-Z
	NC	IM30-A2B15-M1-W	IM30-A2B15-M1-Z	



IM30- □□□ M1-Z

产品规格 / Specifications

外形编号 Outward appearance code	IM30- □□□ M1-W	IM30- □□□ M1-Z
输出电流 DC Output current	≤ 200mA	≤ 200mA
SCR/ 继电器 Relay	≤ 300mA	≤ 300mA
输出电压降 Output voltage drop DC/AC	直流 (NPN、PNP) 型 3V 以下、二线型: 3.9V 以下、交流 AC 10V 以下 DC < 3V、AC < 10V	
消耗电流 Consumption current	直流 (NPN、PNP) 型 DC 12V 时 8mA、24V 时 15mA、交流 AC 10mA 以下 DC < 15mA、AC < 10mA	
标准检测物体 Standard detected object	30 x 30 x 1(A3 铁 Iron)	30 x 30 x 1(A3 铁 Iron)
重复精度 Repeated precision	0.05	0.05
响应频率 DC/AC Response frequency	500HZ/15HZ	500HZ/15HZ
工作环境温度 Working environment temperature	-25℃ ~ +65℃	-25℃ ~ +65℃
绝缘电阻 Insulation resistance	≥ 50MΩ	≥ 50MΩ
外壳材料 Shell material	金属 Metal	金属 Metal
防护等级 Protection grade	IP67	IP67
可替代国内型号 Alternative model at home and abroad	E2E-X18ME1-M1	E2E-X18ME1-M1
短路保护电流 Current short-circuit protection	220mA(不含 AC 产品 Excluding AC output product)	

IM 系列

传感器接插件

Sensor Connector

www.qwifm.com (China)
www.qwdhc.com(International)



类型

Structural category

外形图例

Outward appearance illustration

规格齐全、输出形式多、防尘、防震、使用方便、节省劳动成本
Complete specifications, output form, dust-proof, shock-proof, easy to use, saving labor costs

外形尺寸/Overall Dimensions

外形编号 Outward appearance code	PK01-Z-2	PK01-Z-3	PK01-W-2	PK01-W-3	PK01-W-2-4	PK01-W-3-4	PK02-Z-2
外形尺寸 Overall Dimensions							
	直形孔座接插电缆接插件 M8 x 1 Straight type connector with cables M8 x 1		弯形孔座接插电缆接插件 M8 x 1 Bent type connector with cables M8 x 1		弯形孔座接插电缆接插件 M8 x 1 Bent type connector with cables M8 x 1		直形孔座接插电缆接插件 M8 x 1 Straight type connector with cables M8 x 1
接插外形 Contact view							
应用 Application	DC 二线 AC 二线 NO/NC		NPN/PNP DC 二线 AC 二线 NO/NC		DC 二线 AC 二线 NO/NC		DC 二线 AC 二线 NO/NC

产品规格 /Specifications

接插件 Connector

外套颜色 Color for shell 黑 black
连接螺母材料 Material for connection nut Cu/Zn/Nickel plated

接触负载 Contact load

过流值 Over current [A] 4.0
额定电压 Rated voltage [V] 250

电缆 Wire 长度 Length

电缆外皮材料 cable serving color PVC
绝缘体颜色 insulator color black

输出显示 output display [LED]

通电指示 [LED] bn,bu,bk | bn,bu | bn,bu | bn,bu,bk,wh
power indicator 3 x 0.5 | 2 x 0.5 | 2 x 0.5 | 4 x 0.34
1

一般数据 common data

绝缘电阻 insulation resistance $\geq 10^9 \Omega$
环境温度范围：接插件 [° C] -25...+80
environment temperature scope
环境温度范围：电缆 [° C] -25...+80
environment temperature scope
防护等级 (DIN 40 050) IP67
protection level
电容量 (VDE 0110b)Capacitance 250VAC/300VDC,Gr.C

IM 系列 传感器接插件 Sensor Connector

www.qwifm.com (China)
www.qwdhc.com(International)



类型
Structural category

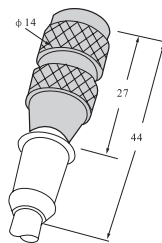
外形图例
Outward appearance illustration

规格齐全、输出形式多、防尘、防震、
使用方便、节省劳动成本
Complete specifications, output form,
dust-proof, shock-proof, easy to use,
saving labor costs

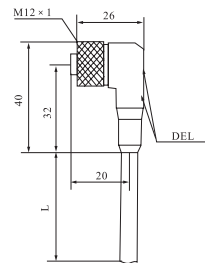
外形尺寸/Overall Dimensions

外形编号 Outward appearance code	PK02-Z-3	PK02-Z-4	PK02-W-2	PK02-W-3-N	PK01-W-3-P	PK02-W-4-N	PK02-W-4-P	PK03-3	PK03-4
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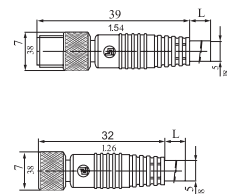
外形尺寸 Overall Dimensions



直形孔座接插电缆接插件 M12 x 1
Straight type connector with cables M12 x 1

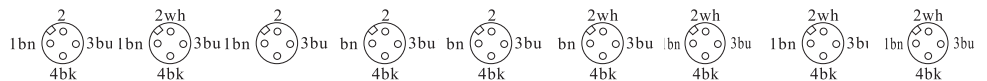


弯形孔座接插电缆接插件 M12 x 1
Bent type connector with cables M12 x 1



弯形孔座接插电缆接插件 M12 x 1
Bent type connector with cables M12 x 1

接插外形 Contact view



应用 Application

NPN/PNP	NPN/PNP	DC 二线 AC 二线	NPN	PNP	NPN	PNP	NPN/PNP	NPN/PNP
NO/NC	NO+NC	NO/NC	NO/NC	NO/NC	NO+NC	NO/NC	NO+NC	NO+NC

产品规格 /Specifications

接插件 Connector

外套颜色 Color for shell
连接螺母材料 Material for connection nut

黑 black
Cu/Zn/Nickel plated

接触负载 Contact load

过流值 Over current [A]
额定电压 Rated voltage [V]

4.0
250

电缆 Wire 长度 Length
电缆外皮材料 cable serving color
绝缘体颜色 insulator color

2m
PVC

输出显示 output display [LED]
通电指示 [LED]
power indicator

bn,bu,bk	bn,bu,bk,wh	YES	YES	YES	YES	YES	YES	YES
3 x 0.5	4 x 0.34							

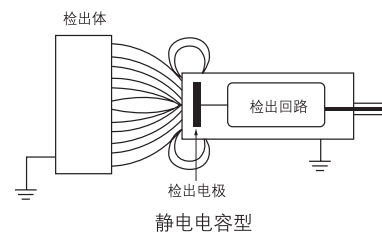
一般数据 common data

绝缘电阻 insulation resistance
环境温度范围：接插件 [° C]
environment temperature scope
环境温度范围：电缆 [° C]
environment temperature scope
防护等级 (DIN 40 050)
protection level
电容量 (VDE 0110b)Capacitance

$\geq 10^9 \Omega$
-25...+80
-25...+80
IP67
250VAC/300VDC,Gr.C

电容式传感器基本概念

电容式传感器的感应面由两个同轴金属电极构成，该两个电极构成一个电容，串联在 RC 振荡回路中。电源接通时，RC 振荡器不振荡，当一目标朝着传感器感应面靠近时，电容量增加，振荡器开始振荡。通过后级电路的处理转换成开关信号，从而起到了检测有无物体存在的目的。电容式传感器能检测金属物体，也能检测非金属物体，对金属物体可以获得最大的动作距离，对非金属物体动作距离决定于材料的介电常数，材料的介电常数越大，可获得的动作距离越大。



相对介电常数

对于电容传感器特征参数是相对介电常数。

相对介电常数，表征介质材料的介电性质或极化性质的物理参数。其值等于以被测物为介质与以真空为介质制成的同尺寸电容器容量之比，该值也是材料贮电能力的表征。也称为相对电容率。

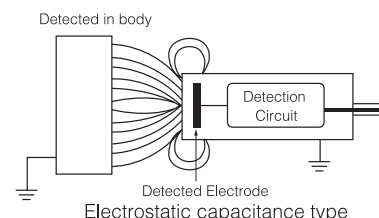
对于电容式传感器而言，不同介电常数的被检测物，感应距离和感应灵敏度不同，材料的介电常数越大，可获得的感应距离就越大。

常用材料介电常数表：

材料	介电常数	材料	介电常数	材料	介电常数	材料	介电常数
空气	1	聚乙烯	2.3	有机玻璃	3.2	硬纸	4.5
特氟龙	2	聚丙烯	2.9	环氧树脂粘合剂	3.6	石英砂	4.5
木材	2.7	电缆胶皮化合物	2.5	电木	3.6	玻璃	5
石蜡	2.2	软橡胶	2.5	石英玻璃	3.7	聚酰胺	5
汽油	2.2	硅	2.8	硬橡胶	4	云母	6
松节油	2.2	聚氯乙烯	2.9	油纸	4	大理石	8
变压器油	2.2	聚苯乙烯	3	纸板压制的碎屑	4	酒精	25.8
纸	2.3	赛璐络	3	陶瓷	4.4	水	80

BASIC CONCEPT OF CAPACITANCE SENSORS

The sensing surface of the capacitive sensor is constituted by two coaxial metal electrode, the two electrodes form a capacitor, in series with the RC oscillation circuit. When the power is turned on, the RC oscillator does not oscillate, when a target is closer toward the sensor sensing surface, the increase in capacitance, and the oscillator starts to oscillate. Is converted into a switching signal by the processing of the post-stage circuit, and thus play the purpose of detecting the presence of the object exists. Capacitive sensors can detect metal objects, can also detect non-metallic objects, metal objects can get maximum distance of the action, and non-metallic objects action distance determines the dielectric constant of the material, the larger the dielectric constant of the material, available action the greater the distance.



RELATIVE DIELECTRIC CONSTANT:

The characteristic parameters of the capacitive sensor is the relative permittivity.

The relative permittivity, Characterization of the dielectric properties of the dielectric material or the polarization properties of the physical parameters. Its value is equal to measured Chek medium and in a vacuum as a medium made of the same size the ratio of the capacitor capacity, this value is also the material characterization of the electrical storage capacity. Also known as the relative permittivity.

For capacitive sensors, The detected objects with different dielectric constants, the sensing distance and the sensitivity is different. When the dielectric constant is larger, the sensing distance would be longer.

Commonly used material permittivity table:

Material	Permittivity	Material	Permittivity	Material	Permittivity	Material	Permittivity
Air	1	Polyethylene	2.3	Plexiglass	3.2	Cardboard	4.5
Teflon	2	Polypropylene	2.9	Epoxy resin adhesive	3.6	Quartz sand	4.5
Timber	2.7	A cable Jiaopi compound	2.5	Bakelite	3.6	Glass	5
Paraffin	2.2	Soft rubber	2.5	Quartz glass	3.7	Polyamide	5
Gasoline	2.2	Silicon	2.8	Hard rubber	4	Mica	6
Turpentine	2.2	Polyvinylidene fluoride	2.9	Oil paper	4	Marble	8
Transformer oil	2.2	Polystyrene	3	Cardboard to suppress the debris	4	Alcohol	25.8
Paper	2.3	Celluloid network	3	Ceramics	4.4	Water	80

能被感应的典型材料:

固体: 木材、陶瓷、玻璃、纸张、塑料、石块、橡胶、冰、非铁材料和植物材料。

液体: 水、油、胶水和油漆。

粒状物体: 塑料粒子, 种子和盐。

粉状物体: 染料、皂粉, 沙子, 肥料, 糖。

Typical materials that can be induced in:

Solid: wood, ceramics, glass, paper, plastic, stone, rubber, ice, a non-ferrous material and plant material.

Liquids: water, oil, glue and paint.

Granular objects: plastic particles, seed and salt.

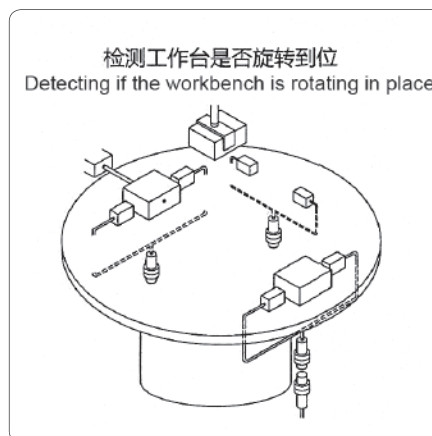
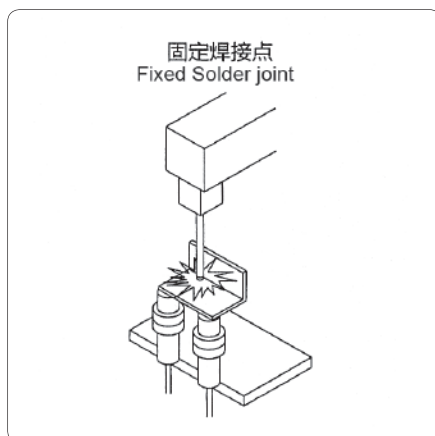
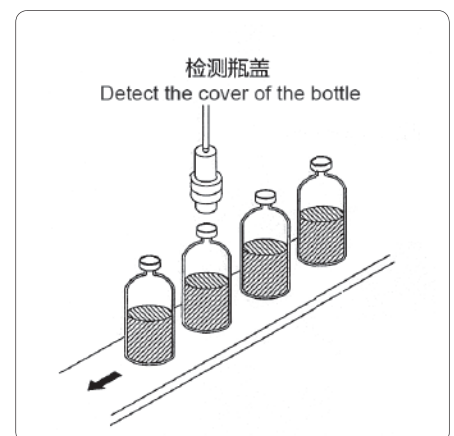
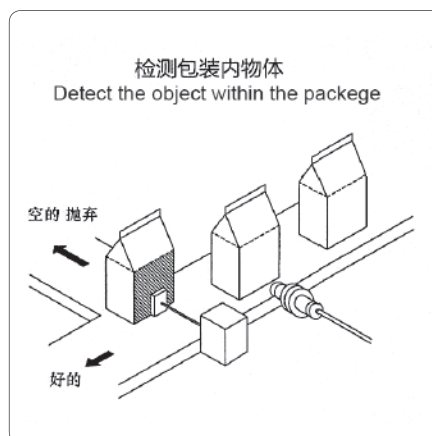
Powdery objects: dye, soap powder, sand, fertilizer, sugar.

应用实例

电容式传感器可感应固体或液体形式的导体或非导体材料, 它有许多种应用, 包括容器中的液位控制。如检测灌装机械的容器的容量。其它应用包括定位, 输送设备和储备系统中的材料的计数。

APPLICATION EXAMPLES

The capacitance type sensor can sense a conductor or non-conductor material of the solid or liquid form, it has a variety of applications, including the control of the liquid level in the container. Such as the detection capacity of the container filling and delicate machinery. Other applications include the count of the material in the positioning, conveying equipment and reserve system.

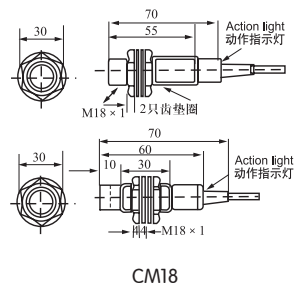




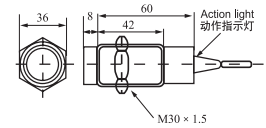
埋入式 /Flush

外形编号 Outward appearance code			CM18	CM30
检测距离 Detection distance			0-5mm	0-10mm
直流 DC10~30 VDC	NPN	NO	CM18-D1NA05	CM30-D1NA10
		NC	CM18-D1NB05	CM30-D1NB10
		NO+NC	CM18-D1NC05	CM30-D1NC10
	PNP	NO	CM18-D1PA05	CM30-D1PA10
		NC	CM18-D1PB05	CM30-D1PB10
		NO+NC	CM18-D1PC05	CM30-D1PC10
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO	CM18-A2A05	CM30-A2A10
		NC	CM18-A2B05	CM30-A2B10

外形尺寸 /Overall Dimensions



CM18



CM30

非埋入式 /Non-Flush

外形编号 Outward appearance code			CM18	CM30
检测距离 Detection distance			0-8mm	0-15mm
直流 DC10~30 VDC	NPN	NO	CM18-D1NA08	CM30-D1NA15
		NC	CM18-D1NB08	CM30-D1NB15
		NO+NC	CM18-D1NC08	CM30-D1NC15
	PNP	NO	CM18-D1PA08	CM30-D1PA15
		NC	CM18-D1PB08	CM30-D1PB15
		NO+NC	CM18-D1PC08	CM30-D1PC15
交流 AC90~250 VAC	SCR 可控硅 Control- lable silicon	NO	CM18-A2A08	CM30-A2A15
		NC	CM18-A2B08	CM30-A2B15

产品规格 /Specifications

外形编号 Outward appearance code	CM18	CM30
可检测体 Detectable object	导体及电介质 Conductor and dielectric body	
消耗电流 Consumption current	直流 (NPN, PNP) 型 DC12V 时 8mA, 24V 时 15mA, 交流型: 10mA 以下、DC < 15mA、AC < 10mA	
输出电流 Output current	直流: ≤ 200mA, 交流型: ≤ 200mA、	
输出电压降 Output voltage drop DC/AC	直流 (NPN, PNP) 3V 以下, 交流型: 20V 以下、DC < 3V、AC < 20V	
响应频率 DC/AC Response frequency	直流 50Hz, 交流型: 10Hz	
外壳材料 Shell material	ABS 树脂 / 金属 Resin, Metal	ABS 树脂 / 金属 Resin, Metal
工作环境温度 Working environment temperature	-25°C ~70°C	
绝缘电阻 Insulation resistance	≥ 50MΩ	
防护等级 Protection grade	IEC 标准 IP65 IEC standard IP65	
可替代国内型号 Alternative model at home and abroad	LJC18A3-□□	E2K-X15M □

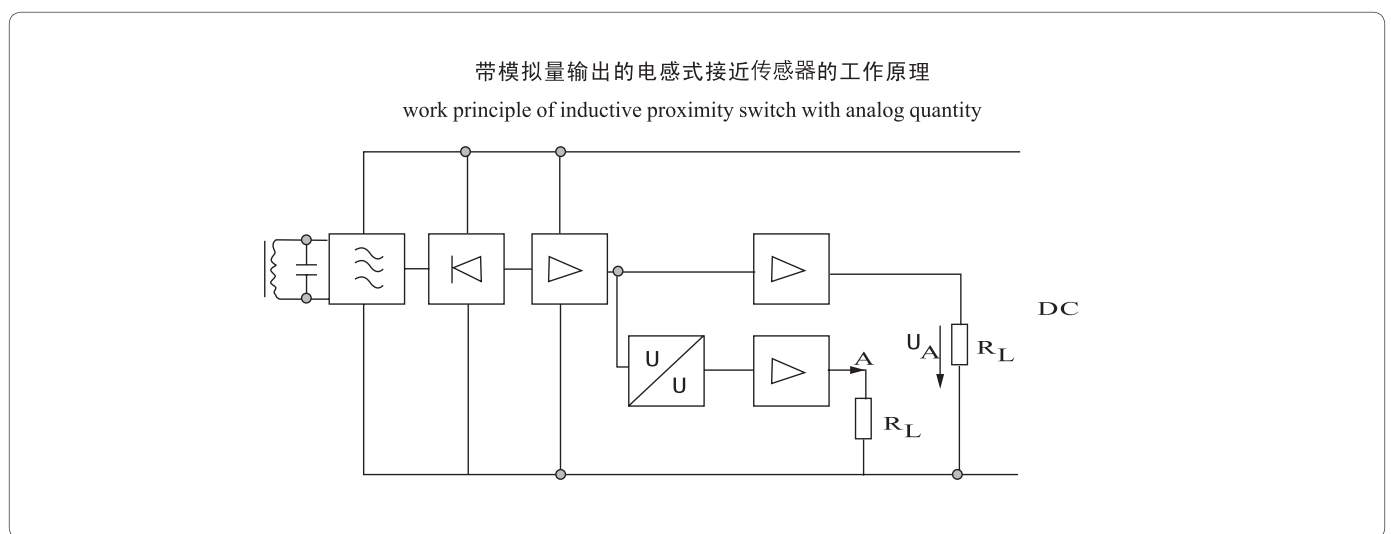
工作原理

带模拟量输出的电感式接近传感器与普通电感式接近传感器的工作原理相同，当一个金属物体靠近传感器的感应面时，振荡器系统的能量减小，能量减小的程度是物体和传感器之间距离的尺寸标志，在一个附加电器中能量损耗被转换成测量信号，经线性化处理后被放大。(图 5) 在输出端提供一个标准模拟信号 (0~5V 或 4~20mA...)

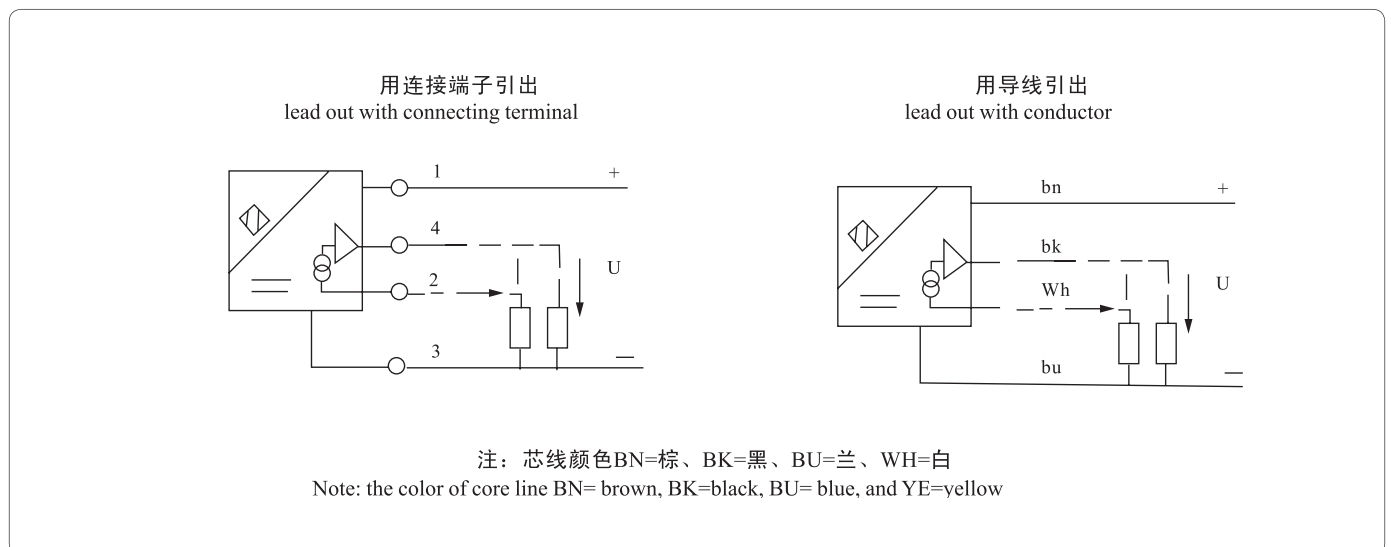
WORK PRINCIPLE

Inductive proximity sensor with analog quantity output has the similar work principle with general inductive proximity sensor. The energy of oscillator system decreases when a metal object approaches the inductive side. The energy decrease degree indicates the distance between the metal object and the sensor. The energy consumption is transformed into measuring signal in an additional device and magnified through linear treatment. (Fig. 5)

Provide a standard analog signal at output terminal (0~5V or 4~20mA)



接线示意图 / Installation and connection





分类：电感式位移量线性传感器
Category: Inductive displacement linear sensor

产品规格 / Specifications

外形编号	Outward appearance code	XM18		XM24		XM30	
可检测物体	Detectable object	金属 Metal		金属 Metal		金属 Metal	
检测距离	Detection distance	埋入式 : 5mm Flush type: 5mm	非埋入式 : 8mm Non-flush: 8mm	埋入式 : 8mm Flush type: 8mm	非埋入式 : 10mm Non-flush: 10mm	埋入式 : 10mm Flush type: 10mm	非埋入式 : 15mm Non-flush: 15mm
具备型号	电流型 Current type	XM18-D6PMI05	XM18-D6PMI08	XM24-D6PMI08	XM24-D6PMI10	XM30-D6PMI10	XM30-D6PMI15
Available Models	电压型 Voltage type	XM18-D6PMU05	XM18-D6PMU08	XM24-D6PMU08	XM24-D6PMU10	XM30-D6PMU10	XM30-D6PMU15
电压范围	Voltage range	15~30VDC					
功耗	检测时 At the time of detection	≤ 200mA...<4mA					
Consumption	无检测时 At the time of non-detection	≤ 20mA					
负载电阻	电流型 Current type	0~300Ω					
Consumption	电压型 Voltage type	≥ 2.2KΩ					
输出	电流型 Current type	4~20mA					
Output	电压型 Voltage type	0~5V/0~10V					
允许电压波动	Allowable voltage undulation	≤ 5%					
输出信号	Output signal	PNP 模拟 PNP Simulation					
线性误差	Linear error	± 5%					
环境温度	Ambient temperature	-10℃ ~+70℃					
外壳材料	Shell material	塑料、金属 Plastic, Metal					
防护等级	Protection grade	IP65					

输出特性图 / Output characteristic diagram

