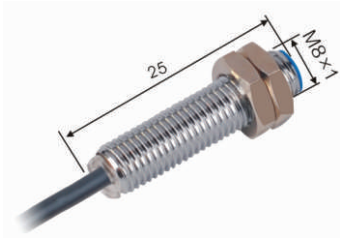
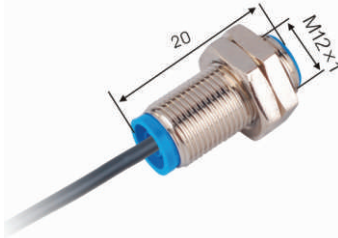
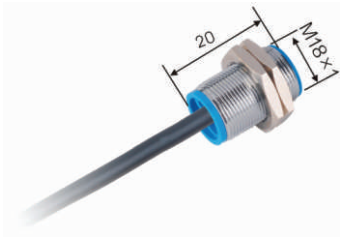
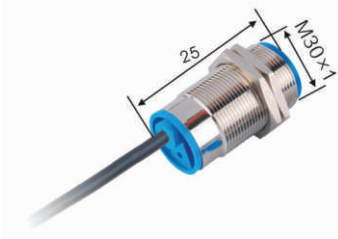


安全防爆型接近开关  
 SAFETY EXPLOSION-PROOF PROXIMITY SWITCH

| 结构分类 Structural category                |  | 防爆传感器 Namur sensor                                                                                                                                                    |             |                                                                                                                                                                                                                                                                                                                                                     |             |
|-----------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 外形编号Outward Appearance code             |  | AM8-3001LB                                                                                                                                                            | AM8-3002LB  | AM8-3005LB                                                                                                                                                                                                                                                                                                                                          | AM8-3008LB  |
| 外形图例<br>Outward appearance illustration |  |                                                                                      |             |                                                                                                                                                                                                                                                                  |             |
| 外形编号Outward Appearance code             |  | AM12-3002LB                                                                                                                                                           | AM12-3004LB | AM30-3010LB                                                                                                                                                                                                                                                                                                                                         | AM30-3015LB |
| 外形图例<br>Outward appearance illustration |  |                                                                                      |             |                                                                                                                                                                                                                                                                  |             |
| 额定检测距离 Rated sensing distance           |  |   |             |     |             |

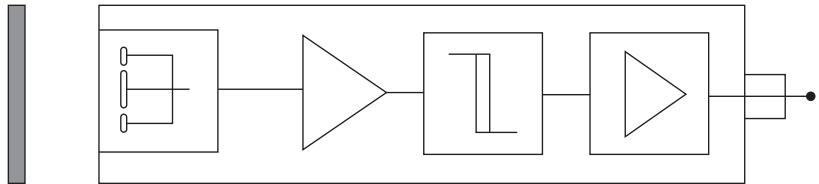
安全防爆型接近开关 Safety explosion-proof proximity switch

- 因NAMUR传感器为低电压供电，微电流输出，体积小等等，所以在具有防爆要求的特殊场合应用。
- With low-voltage power supply, micro-current output, small volume and other advantages, Namur sensors can be applied for special places with requirements of explosion proof.

| 标准检测体Q235(mm)<br>standard detecting object Q235 steel(mm) |                                                               | 12×12×1t                    | 12×12×1t                    | 18×18×1t                    | 30×30×1t                    |
|-----------------------------------------------------------|---------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 具备型号<br>Model                                             | 二线常闭 埋入<br>Two-wire normally close                            | AM8-3001LB                  | AM12-3002LB                 | AM18-3005LB                 | AM30-3010LB                 |
|                                                           | 二线常闭 非埋<br>Two-wire normally close                            | AM8-3002LB                  | AM12-3004LB                 | AM18-3008LB                 | AM30-3015LB                 |
| 技术参数<br>specifications                                    | 额定电压<br>rated voltage                                         | 8.2V                        | 8.2V                        | 8.2V                        | 8.2V                        |
|                                                           | 振荡电流 / 停荡电流<br>oscillating current / stop pscillating current | ≥2.2mA/≤1mA                 | ≥2.2mA/≤1mA                 | ≥2.2mA/≤1mA                 | ≥2.2mA/≤1mA                 |
|                                                           | 负载电阻<br>load resistance                                       | 1KΩ                         | 1KΩ                         | 1KΩ                         | 1KΩ                         |
|                                                           | 开关频率: 埋入 / 非埋<br>switch frequency, flusn / non-flsh           | 1.5Hz/1KHz                  | 1.5Hz/1KHz                  | 1Hz/700KHz                  | 300Hz/200KHz                |
|                                                           | 外壳材料<br>shell material                                        | 黄铜镀镍<br>Nickel-plated brass | 黄铜镀镍<br>Nickel-plated brass | 黄铜镀镍<br>Nickel-plated brass | 黄铜镀镍<br>Nickel-plated brass |
|                                                           | 防护等级<br>protection level                                      | IP67                        | IP67                        | IP67                        | IP67                        |
|                                                           | 工作环境温度<br>protection level                                    | -20℃~70℃                    | -20℃~70℃                    | -20℃~70℃                    | -20℃~70℃                    |
| 外接线圈<br>external wiring diagram                           |                                                               |                             |                             |                             |                             |

电容式接近开关  
 CAPACITANCE PROXIMITY SWITCH

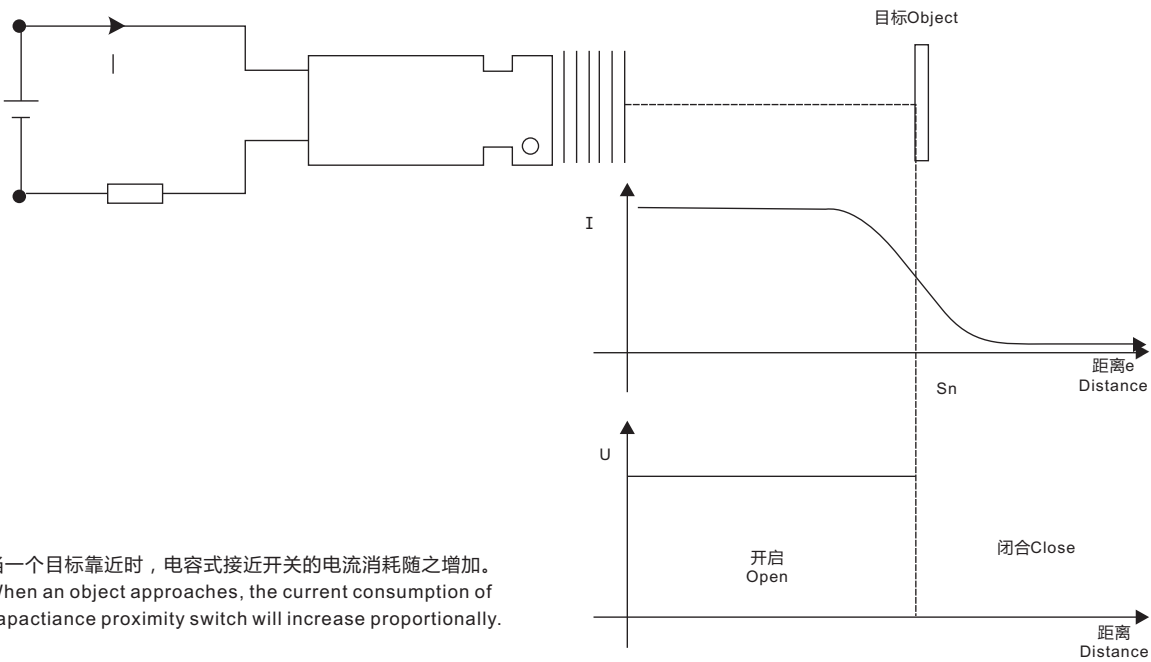
电容式接近开关的工作原理 Working principle of capacitance proximity switch

| 结构分类 Structural category                | 目标<br>Object                                                                        | 感应面<br>Inductive surface | RC振荡器<br>RC oscillator | 开关级<br>switching stage | 输出级<br>magnified output stage |
|-----------------------------------------|-------------------------------------------------------------------------------------|--------------------------|------------------------|------------------------|-------------------------------|
| 外形图例<br>Outward appearance illustration |  |                          |                        |                        |                               |

电容式接近开关 Capacitance proximity switch

- 电容式传感器的感应面由两个同轴金属电极构成，很象“打开”的电容电极，该两个电极构成一个电容，串接在RC震荡回路中。
- 电源接通时，RC振荡器不振荡，当一个目标朝着电容器的电极靠近时，电容器的容量增加，使振荡器开始振荡。通过后级电路的处理，将停振和振荡两种信号转换成开关信号，从而起到了检测有无物体存在的目的。该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 $\epsilon$ ，材料的介电常数越大，可获得的动作距离越大。
- The induction surface of capacitance sensor is composed of two coaxial mental electcrodes, which from a capacitor and connected on RC oscillation circuit, just like an open capacitor electrode.
- When connecting to power supply, RC oscillator does not work. When an object is clos eto capacitor electrode, the capacitor capacity will increase, and the oscillator will vibrate. Through the treatment of behind stage circuit, both signals of stop oscillation and oscillation will be converted to switch signs for checking the existence of object. this distance can be obtained, but to nonmetal object, the action distance is d etermined by material dielectric constant, the more dielectric constant, the more action distance will be obtained.

外形图例 Outward appearance illustration



当一个目标靠近时，电容式接近开关的电流消耗随之增加。  
 When an object approaches, the current consumption of  
 capactiance proximity switch will increase proportionally.

CAPACITANCE PROXIMITY SWITCH

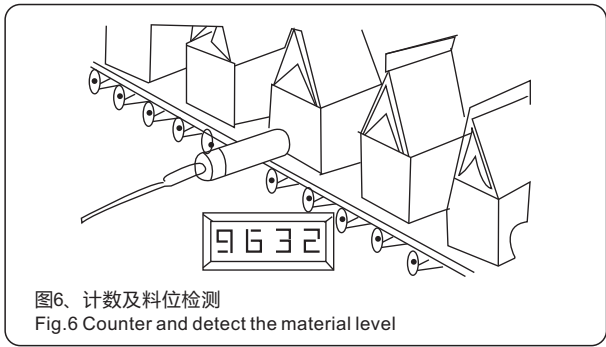
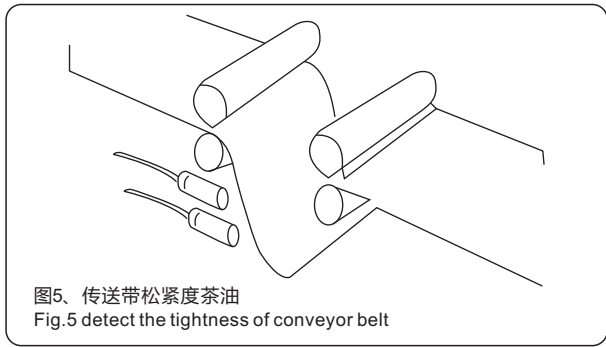
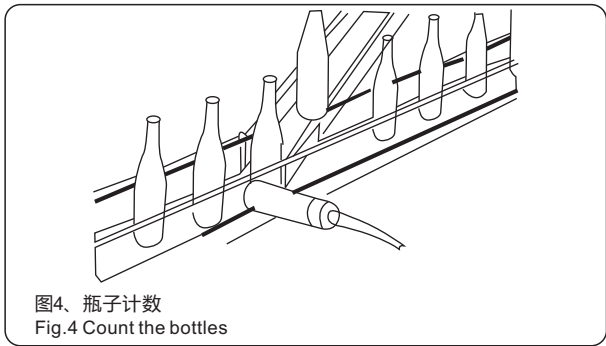
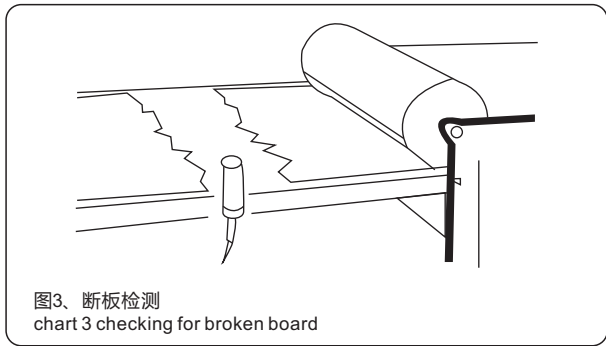
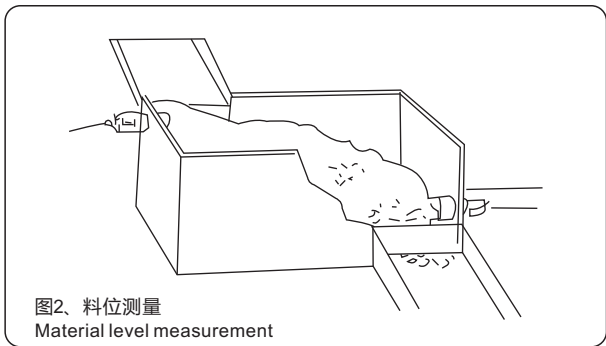
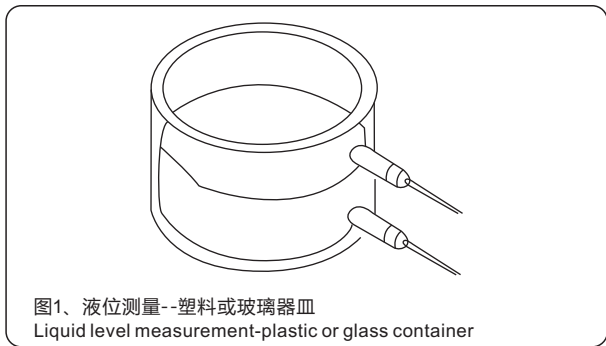
电容式接近开关

一些重要材料的介电常数如下表:

The dielectric constants foe some important materials are as; osted as below;

| 材料<br>Materials                     | 介电常数<br>Dielectric constant | 材料<br>Materials | 介电常数<br>Dielectric constant | 材料<br>Materials                  | 介电常数<br>Dielectric constant | 材料<br>Materials      | 介电常数<br>Dielectric constant |
|-------------------------------------|-----------------------------|-----------------|-----------------------------|----------------------------------|-----------------------------|----------------------|-----------------------------|
| 合成树脂粘接剂<br>Synthetic resin adhesive | 3.6                         | 苯乙烯 Styrene     | 3                           | 酒精 Alcohol                       | 25.8                        | 聚乙烯化合物<br>Polyvinyl  | 2.9                         |
| 云母 Mica                             | 6                           | 陶瓷 Porcelain    | 4.4                         | 玻璃 Glass                         | 5                           | 石英玻璃<br>Quartz glass | 3.7                         |
| 硬橡胶 Ebonite                         | 4                           | 石蜡 Petrolin     | 2.2                         | 硬纸 Cardboard                     | 4.5                         | 硅 Silicon            | 2.8                         |
| 大理石 Marble                          | 8                           | 石英沙 Quartz sand | 4.5                         | 电缆胶皮化合物<br>Cable rubber compound | 2.5                         |                      |                             |
| 纸 Paper                             | 2.3                         | 软橡胶 Soft rubber | 2.5                         | 汽油 Gasoline                      | 2.2                         |                      |                             |
| 有机玻璃<br>Organic glass               | 3.2                         | 水 Water         | 80                          | 木材 Wood                          | 2.7                         |                      |                             |

应用图例 application illustration



CAPACITANCE PROXIMITY SWITCH

电容式接近开关

结构分类 Structural category

电容式接近开关 Capacitance proximity switch

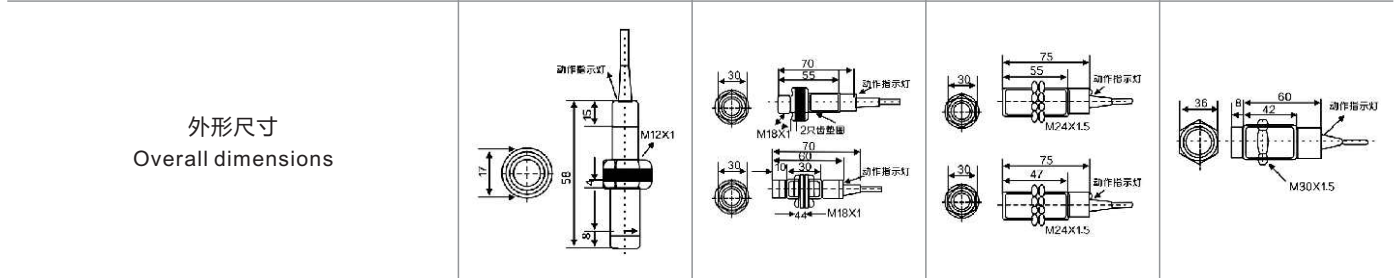
外形编号Outward Appearance code

CM12

CM18

CM24

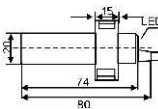
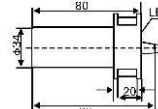
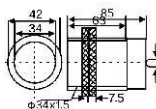
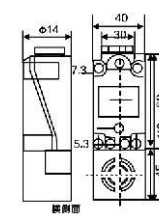
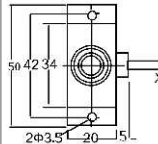
CM30



| 检测距离 DETECTION DISTANCE |                                            |     |       | 0-2mm       | 0-5mm       | 0-8mm       | 0-10mm      |
|-------------------------|--------------------------------------------|-----|-------|-------------|-------------|-------------|-------------|
| 埋入式<br>Flush            | 直流<br>DC<br>6-36<br>VDC                    | NPN | NO    | CM12-3002NA | CM18-3005NA | CM24-3008NA | CM30-3010NA |
|                         |                                            |     | NC    | CM12-3002NB | CM18-3005NB | CM24-3008NB | CM30-3010NB |
|                         |                                            |     | NO+NC | CM12-3002NC | CM18-3005NC | CM24-3008NC | CM30-3010NC |
|                         | 交流<br>AC<br>90-<br>250<br>VAC              | PNP | NO    | CM12-3002PA | CM18-3005PA | CM24-3008PA | CM30-3010PA |
|                         |                                            |     | NC    | CM12-3002PB | CM18-3005PB | CM24-3008PB | CM30-3010PB |
|                         |                                            |     | NO+NC | CM12-3002PC | CM18-3005PC | CM24-3008PC | CM30-3010PC |
|                         | SCR<br>可控硅<br>Control-<br>table<br>silicon |     | NO    | CM12-2002A  | CM18-2005A  | CM24-2008A  | CM30-2010A  |
|                         |                                            |     | NC    | CM12-2002B  | CM18-2005B  | CM24-2008B  | CM30-2010B  |
| 检测距离 DETECTION DISTANCE |                                            |     |       | 0-4mm       | 0-8mm       | 0-12mm      | 0-15mm      |
| 非埋入式<br>Non-Flush       | 直流<br>DC<br>6-36<br>VDC                    | NPN | NO    | CM12-3004NA | CM18-3008NA | CM24-3012NA | CM30-3015NA |
|                         |                                            |     | NC    | CM12-3004NB | CM18-3008NB | CM24-3012NB | CM30-3015NB |
|                         |                                            |     | NO+NC | CM12-3004NC | CM18-3008NC | CM24-3012NC | CM30-3015NC |
|                         | 交流<br>AC<br>90-<br>250<br>VAC              | PNP | NO    | CM12-3004PA | CM18-3008PA | CM24-3012PA | CM30-3015PA |
|                         |                                            |     | NC    | CM12-3004PB | CM18-3008PB | CM24-3012PB | CM30-3015PB |
|                         |                                            |     | NO+NC | CM12-3004PC | CM18-3008PC | CM24-3012PC | CM30-3015PC |
|                         | SCR<br>可控硅<br>Control-<br>table<br>silicon |     | NO    | CM12-2004A  | CM18-2008A  | CM24-2012A  | CM30-2015A  |
|                         |                                            |     | NC    | CM12-2004B  | CM18-2008B  | CM24-2012B  | CM30-2015B  |

|                                             |                                                             |                      |            |                      |
|---------------------------------------------|-------------------------------------------------------------|----------------------|------------|----------------------|
| 可检测体 Detectable object                      | 导体及介电体 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:300mA                                         |                      |            |                      |
| 可输出电压降 Output voltage drop DC/AC            | 直流(NPN PNP)3V以下, 交流型:7V以下、DC<3V、AC<7V                       |                      |            |                      |
| 响应频率 DC/AC Response frequency               | 直流:50Hz, 交流型:10Hz                                           |                      |            |                      |
| 外壳材料 Shell material                         | 金属 Metal                                                    | ABS树脂/金属 Resin,Metal | 金属 Metal   | 金属 Metal/ABS树脂 Resin |
| 工作环境温度 Working environment temperature      | -25℃~70℃                                                    |                      |            |                      |
| 绝缘电阻 Insulation resistance                  | 50MΩ                                                        |                      |            |                      |
| 防护等级 Protection grade                       | IEC标准IP54 IEC standard IP54                                 |                      |            |                      |
| 可替代国内型号 Alyemative model at home and abroad |                                                             | LJC18A3-□□           | LJC24A3-□□ | E2K-X15M□            |

# CAPACITANCE PROXIMITY SWITCH

| 结构分类 Structural category                    |                           |                                            |       | 电容式接近开关 Capacitance proximity switch                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|---------------------------------------------|---------------------------|--------------------------------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 外形编号Outward Appearance code                 |                           |                                            |       | CM20                                                                              | CM34                                                                              | CM35                                                                               | CMF37                                                                               | E2K                                                                                 |
| 外形图例<br>Outward appearance illustration     |                           |                                            |       |  |  |  |  |  |
| 外形尺寸<br>Overall dimensions                  |                           |                                            |       |  |  |  |  |  |
| 检测距离 DETECTION DISTANCE                     |                           |                                            |       |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| 埋入式<br>Flush                                | 直流<br>DC<br>6-36<br>VDC   | NPN                                        | NO    |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                                             |                           |                                            | NC    |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                                             |                           |                                            | NO+NC |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                                             | 交流<br>AC<br>90-250<br>VAC | PNP                                        | NO    |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                                             |                           |                                            | NC    |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                                             |                           |                                            | NO+NC |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                                             |                           | SCR<br>可控硅<br>Control-<br>lable<br>silicon | NO    |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                                             |                           |                                            | NC    |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| 检测距离 DETECTION DISTANCE                     |                           |                                            |       | 0-10mm                                                                            | 0-20mm                                                                            | 0-25mm                                                                             | 0-25mm                                                                              | 0-10mm                                                                              |
| 非埋入式<br>Non-Flush                           | 直流<br>DC<br>6-36<br>VDC   | NPN                                        | NO    | CM20-3010NA                                                                       | CM34-3020NA                                                                       | CM35-3025NA                                                                        | CM37-3025NA                                                                         | E2K-F10MC1                                                                          |
|                                             |                           |                                            | NC    | CM20-3010NB                                                                       | CM34-3020NB                                                                       | CM35-3025NB                                                                        | CM37-3025NB                                                                         | E2K-F10MC2                                                                          |
|                                             |                           |                                            | NO+NC | CM20-3010NC                                                                       | CM34-3020NC                                                                       | CM35-3025NC                                                                        | CM37-3025NC                                                                         | E2K-F10MC3                                                                          |
|                                             | 交流<br>AC<br>90-250<br>VAC | PNP                                        | NO    | CM20-3010PA                                                                       | CM34-3020PA                                                                       | CM35-3025PA                                                                        | CM37-3025PA                                                                         | E2K-F10MF1                                                                          |
|                                             |                           |                                            | NC    | CM20-3010PB                                                                       | CM34-3020PB                                                                       | CM35-3025PB                                                                        | CM37-3025PB                                                                         | E2K-F10MF2                                                                          |
|                                             |                           |                                            | NO+NC | CM20-3010PC                                                                       | CM34-3020PC                                                                       | CM35-3025PC                                                                        | CM37-3025PC                                                                         | E2K-F10MF3                                                                          |
|                                             |                           | SCR<br>可控硅<br>Control-<br>lable<br>silicon | NO    | CM20-2010A                                                                        | CM34-2020A                                                                        | CM35-2025A                                                                         | CM37-2025A                                                                          | E2K-F10MA0                                                                          |
|                                             |                           |                                            | NC    | CM20-2010B                                                                        | CM34-2020B                                                                        | CM35-2025B                                                                         | CM37-2025B                                                                          | E2K-F10MAC                                                                          |
| 可检测体 Detectable object                      |                           |                                            |       | 导体及介电体 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:300mA                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| 可输出电压降 Output voltage drop DC/AC            |                           |                                            |       | 直流(NPN PNP)3V以下, 交流型:7V以下、DC<3V、AC<7V                                             |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| 响应频率 DC/AC Response frequency               |                           |                                            |       | 直流(NPN-PNP) 50Hz, 交流型:10Hz                                                        |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| 外壳材料 Shell material                         |                           |                                            |       | ABS树脂 Resin                                                                       | ABS塑料 Plastic                                                                     | ABS塑料 Plastic                                                                      | ABS塑料 Plastic                                                                       | ABS塑料 Plastic                                                                       |
| 工作环境温度 Working environment temperature      |                           |                                            |       | -25℃~70℃                                                                          |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| 绝缘电阻 Insulation resistance                  |                           |                                            |       | 50MΩ                                                                              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| 防护等级 Protection grade                       |                           |                                            |       | IEC标准IP54 IEC standard IP54                                                       |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| 可替代国内型号 Alyemative model at home and abroad |                           |                                            |       |                                                                                   | E2K-C25□□                                                                         |                                                                                    |                                                                                     |                                                                                     |

# HALL SENSOR

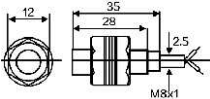
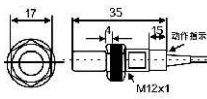
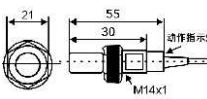
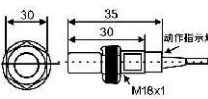
## 简介 BriefIntroduction

- SM系列霍尔传感器是由电压调整器，霍尔电压发生器，差分放大器，施密特触发器和集电极开路的输出级组成的磁敏传感器，其输入为磁感应强度、输出是一个数字电压讯号。
- SM series Hall sensor is a kind of magnct-sensitive scnsor consisting of voltage regulator, Hall voltage generator, differential amplifier, Schmidt trigger and the output pole of collector open circuit. Its input is the magnetic flux density. The output is adigital voltage signal.

## 特点 Features

- |                                                                                                                                      |                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>⬇ 电源电压范围宽</li> <li>⬇ 频率高</li> <li>⬇ 寿命长，体积小，安装方便</li> <li>⬇ 能直接和晶体管及TTL.MOS等逻辑电路接口</li> </ul> | <ul style="list-style-type: none"> <li>⬇ Wide mains voltage range</li> <li>⬇ High frequency</li> <li>⬇ Long service life, compact volume, and convenient installation</li> <li>⬇ Directly connect to transistor and logic circuit pore like, TTL.MOS</li> </ul> |
|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 型号及参数 Model and parameters

| 外形编号Outward Appearance code             |           | SM8                                                                                   | SM12                                                                                  | SM14                                                                                  | SM18                                                                                  |
|-----------------------------------------|-----------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 外形图例<br>Outward appearance illustration |           |   |   |   |   |
| 外形尺寸<br>Overall dimensions              |           |  |  |  |  |
| 检测距离Detection distance                  |           | 10mm                                                                                  | 10mm                                                                                  | 10mm                                                                                  | 10mm                                                                                  |
| 电源电压Mains voltage                       |           | 5~24VDC                                                                               | 5~24VDC                                                                               | 5~24VDC                                                                               | 5~24VDC                                                                               |
| 可检测物体Detectable object                  |           | 永磁体Permanent magnet                                                                   | 永磁体Permanent magnet                                                                   | 永磁体Permanent magnet                                                                   | 永磁体Permanent magnet                                                                   |
| 输出低电平电压Output low level voltage         |           | 200mV                                                                                 | 200mV                                                                                 | 200mV                                                                                 | 200mV                                                                                 |
| 输出高电平电流Output high level current        |           | 0.1uA                                                                                 | 0.1uA                                                                                 | 0.1uA                                                                                 | 0.1uA                                                                                 |
| 电源电流Mains current                       |           | 8mA                                                                                   | 8mA                                                                                   | 8mA                                                                                   | 8mA                                                                                   |
| 开关频率ON-OFF frequency                    |           | 320KHz                                                                                |                                                                                       |                                                                                       |                                                                                       |
| 工作点磁强度 Working point magnetic density   |           | 22mT                                                                                  |                                                                                       |                                                                                       |                                                                                       |
| 外壳材料Shell materia                       |           | 金属Metal                                                                               |                                                                                       |                                                                                       |                                                                                       |
| 环境温度Ambient temperature                 |           | -25℃-70℃                                                                              |                                                                                       |                                                                                       |                                                                                       |
| 防护等度Protection structure                |           | IEC标准 IP67 standard IP67                                                              |                                                                                       |                                                                                       |                                                                                       |
| 具备型号<br>Model available                 | NPN<br>NO | SM8-31010NA                                                                           | SM12-31010NA                                                                          | SM14-31010NA                                                                          | SM18-31010NA                                                                          |
|                                         | PNP NO    | SM8-31010PA                                                                           | SM12-31010PA                                                                          | SM14-31010PA                                                                          | SM18-31010PA                                                                          |
|                                         | NPN NC    |                                                                                       | SM12-31010NB                                                                          | SM14-31010NB                                                                          | SM18-31010NB                                                                          |
|                                         | PNP NC    |                                                                                       | SM12-31010PB                                                                          | SM14-31010PB                                                                          | SM18-31010PB                                                                          |