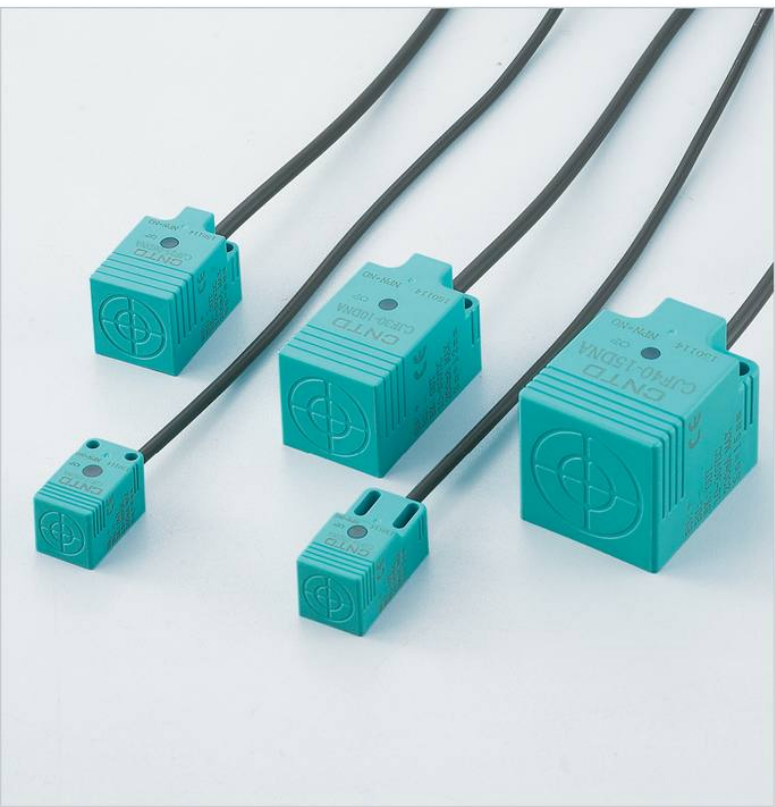




特点 Features

- 内置浪涌保护，电源反接保护和过流保护电路
- 寿命长，高可靠性，操作简单，经济实惠
- 红色LED状态指示灯，易于识别运行状态
- IP67防护等级(IEC规格)
- 可以代替微动开关或限位开关广泛使用
- Inside surge protection, reverse polarity protection, overcurrent protection
- Long use-life cycle and high reliability, easy install, enconomic price
- Red LED status indication, easy to confirm work situation
- Protection structure IP67(IEC standard)
- Replaceable for limit switches



选型说明 Model Designation

CJ F 18 □ - 05 D N A / □ □ - L2

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

序号 No	项目 Item	代号 Code	说明 Description
①	分类代号 Classification code	CJ	电感式 Inductive type
②	外形代号 Shape code	F	方形 Quadrate
③	尺寸代码 Size code	18	10=□10、11=□11、12=□12、17=□17、18=□18、25=□25、30=□30、40=□40
④	产品类别 Product category	无 None	标准型 Normal form
⑤	检测距离 Detection distance	05	05=5mm、06=06mm、07=07mm、08=8mm、12=12mm、15=15mm
⑥	工作电压 Operating voltage	A	90...250VAC
		D	10...30VDC
		E	20...60VDC
		J	5...10VDC
⑦	输出方式 Output mode	N	NPN
		P	PNP
		K	AC 二线 2 Wire
		L	DC 二线 2 Wire
⑧	输出状态 Output state	A	NO
		B	NC
		C	NO+NC
⑨	连接形式 Connection form	无	引线式自由出线端 Lead type free outlet end
		M	M12针式 直头 4芯 A编码 M12 pin straight head 4-core A coding
		M□□□□	M型接插件 M□□□□ M-type connector M□□□□
		D□□□□	DT型接插件 D□□□□ DT connector D□□□□
		A□□□□	AMP型接插件 A□□□□ AMP connector A□□□□
		S□□□□	SM型接插件 S□□□□ SM Connector S□□□□

⑩	电线材质 Wire material	无 None	PVC
		U	PUR
		VP	PVC+屏蔽 Shield
		UP	PUC+屏蔽Shield
⑪	引线长度 Lead length	L1-L5	L1表示1米线 (线长不仅限L5) L1 means 1 meter line (line length is not limited to L5)

国际认证规格 International Certification Specifications

认证规格 Certification specifications	规格 Specifications	文件No. Document
CCC	GB/T 14048.10	Please consult the YLCN Representative Office
TUV	EN 60947-5-2	
CE		

安全规格认证额定值 Safety Specification Certification Rating

CCC(GB/T 14048.10)、TUV(EN60947-5-2)

类型与额定值 Type and Rating
AC-140 24~250VAC 200mA
DC-13 10~30VDC 200mA

规格 Specifications

直流3线式 DC 3wire type

型号名 Model	CJF17-05DNA CJF17-05DNB CJF17-05DPA CJF17-05DPB	CJF18-05DNA CJF18-05DNB CJF18-05DPA CJF18-05DPB	CJF25-08DNA CJF25-08DNB CJF25-08DPA CJF25-08DPB	CJF30-12DNA CJF30-12DNB CJF30-12DPA CJF30-12DPB	CJF40-15DNA CJF40-15DNB CJF40-15DPA CJF40-15DPB
检测距离 Sensing distance	5mm	5mm	8mm	12mm	15mm
应差距离 Hysteresis	检测距离的10%以下 Max. 10% of sensing distance				
标准检测物 Standard sensing target	18×18×1mm (铁 Iron)	25×25×1mm (铁 Iron)	30×30×1mm (铁 Iron)	40×40×1mm (铁 Iron)	60×60×1mm (铁 Iron)
设定距离 Setting distance	0~3.5mm	0~3.5mm	0~5.6mm	0~8.4mm	0~10.5mm
工作电压 Working voltage	10-30VDC				
漏电流 Leakage current	10mA以下 Max.10mA				
应答频率(※1) Response frequency (※1)	500Hz	500Hz	350Hz	250Hz	100Hz
残留电压 Residual voltage	1.0V以下 Max. 1.0V				
温度的影响 Affection by Temp	在-25~+70℃温度范围内+20℃时的检测距离的±10%以内 Max. ±10% for sensing distance at am2ient temperature 20℃				
控制输出 Control output	200mA以下 Max. 200mA				
绝缘阻抗 Insulation resistance	50MΩ以上(500VDC为基准) Min. 50MΩ(at 500VDC megger)				
耐电压 Dielectric strength	1500VAC 50/60Hz1分钟 1500VAC 50/60Hz for 1minute				
耐振动 Vibration	10~55Hz(周期1分钟) 振幅1mm X, Y, Z各方向2小时 1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours				
耐冲击 Shock	500m/s ² (50G) X, Y, Z 各方向3次 500m/s ² (approx. 50G) X, Y, Z directions for 3 times				
显示灯 Indicator	动作指示灯(红色LED) Operation indicator(red LED)				
使用周围温度 Ambient temperature	-25~+70℃(未结冰状态 No icing)				
保护电路 Protection circuit	浪涌保护电路, 电源反接保护电路, 过载&短路保护电路 Surge protection circuit, Overcurrent protection circuit, Reverse polarity protection circuit				
连接线缆 Cable	φ3.8, 3P, 2m		φ4.8, 3P, 2m		
	AWG22, 芯线直径:0.1mm, 芯线数:25, 绝缘皮外径: φ1.25mm)		AWG22, 芯线直径:0.1mm, 芯线数:30, 绝缘皮外径: φ1.25mm)		
	AWG22, Core diameter: 0.1mm, Num2er of cores: 25, Insulator diameter: φ1.25		AWG22, Core diameter: 0.1mm, Num2er of cores: 30, Insulator diameter: φ1.25		
材质 Material	外壳: ABS, 一般型线缆(深灰色): 聚氯乙烯(PVC) Case: ABS, Standard Cable(Dark Grey): Polyvinyl chloride(PVC)				
防护等级 Protection	IP67				

(※1) 开关动作的应答频率为平均值。测定条件使用标准检测物, 检测物的间距为标准检测物的2倍, 设定距离为检测距离的1/2。

※ 标准产品和IEC标准的功能和规格是一样的。

(※1): The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

规格 Specifications

直流2线式 DC 2-wire type

型号名 Model	CJF17-05DLA CJF17-05DLB	CJF18-05DLA CJF18-05DLB	CJF25-08DLA CJF25-08DLB	CJF30-12DLA CJF30-12DLB	CJF40-15DLA CJF40-15DLB
检测距离 Sensing distance	5mm	5mm	8mm	12mm	15mm
应差距离 Hysteresis	检测距离的10%以下 Max. 10% of sensing distance				
标准检测物 Standard sensing target	18×18×1mm (铁 Iron)	25×25×1mm (铁 Iron)	30×30×1mm (铁 Iron)	40×40×1mm (铁 Iron)	60×60×1mm (铁 Iron)
设定距离 Setting distance	0~3.5mm	0~3.5mm	0~5.6mm	0~7.5mm	0~12.5mm
工作电压 Working voltage	10-30VDC				
漏电流 Leakage current	0.6mA以下 Max.0.6mA				
应答频率 (※1) Response frequency (※1)	500Hz	500Hz	350Hz	250Hz	100Hz
残留电压 Residual voltage	3.5V以下 Max. 3.5V				
温度的影响 Affection by Temp	在-25~+70℃温度范围内+20℃时的检测距离的±10%以内 Max. ±10% for sensing distance at ambient temperature 20℃				
控制输出 Control output	200mA以下 Max. 200mA				
绝缘阻抗 Insulation resistance	50MΩ以上(500VDC为基准) Min. 50MΩ(at 500VDC megger)				
耐电压 Dielectric strength	1500VAC 50/60Hz1分钟 1500VAC 50/60Hz for 1minute				
耐振动 Vibration	10~55Hz(周期1分钟) 振幅1mm X, Y, Z各方向2小时 1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours				
耐冲击 Shock	500m/s ² (50G) X, Y, Z 各方向3次 500m/s ² (approx. 50G) X, Y, Z directions for 3 times				
显示灯 Indicator	动作指示灯(红色LED) Operation indicator(red LED)				
使用周围温度 Ambient temperature	-25~+70℃(未结冰状态 No icing)				
储存温度 Storage temperature	-30~+80℃(未结冰状态 No icing)				
使用周围湿度 Ambient humidity	35~95%RH (未结露状态 No condensation)				
保护电路 Protection circuit	内置浪涌保护, 电源反接保护电路, 过流保护电路 Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit				
连接线缆 Cable	φ3.8, 2P, 2m		φ4.8, 2P, 2m		
	AWG22, 芯线直径:0.1mm, 芯线数:25, 绝缘皮外径: φ1.25mm) AWG22, Core diameter: 0.1mm, Number of cores: 25, Insulator diameter: φ1.25		AWG22, 芯线直径:0.1mm, 芯线数:30, 绝缘皮外径: φ1.25mm) AWG22, Core diameter: 0.1mm, Number of cores: 30, Insulator diameter: φ1.25		
材质 Material	外壳: ABS, 一般型线缆(深灰色): 聚氯乙烯(PVC) Case: ABS, Standard cable(Dark Grey): Polyvinyl chloride(PVC)				
防护等级 Protection	IP67				

(※1) 开关动作的应答频率为平均值。测定条件使用标准检测物, 检测物的间距为标准检测物的2倍, 设定距离为检测距离的1/2。

※ 标准产品和IEC标准的功能和规格是一样的。

(※1): The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

规格 Specifications

交流2线式 AC 2-wire type

型号名 Model	CJF25-08AKA CJF25-08AKB	CJF30-12AKA CJF30-12AKB	CJF40-15AKA CJF40-15AKB
检测距离 Sensing distance	8mm	12mm	15mm
应差距离 Hysteresis	检测距离的10%以下 Max. 10% of sensing distance		
标准检测物 Standard sensing target	30×30×1mm (铁 Iron)	40×40×1mm (铁 Iron)	60×60×1mm (铁 Iron)
设定距离 Setting distance	0~5.6mm	0~8.4mm	0~10.5mm
工作电压 Working voltage	90-250VAC		
漏电流 Leakage current	10mA以下 Max.10mA		
应答频率(※1) Response frequency(※1)	20Hz		
残留电压 Residual voltage	10V以下 Max. 10V		
温度的影响 Affection by Temp	在-25~+70℃温度范围内+20℃时的检测距离的±10%以内 Max. ±10% for sensing distance at ambient temperature 20℃		
控制输出 Control output	200mA以下 Max. 200mA		
绝缘阻抗 Insulation resistance	50MΩ以上(500VDC为基准) Min. 50MΩ(at 500VDC megger)		
耐电压 Dielectric strength	1500VAC 50/60Hz1分钟 1500VAC 50/60Hz for 1minute		
耐振动 Vibration	10~55Hz(周期1分钟) 振幅1mm X, Y, Z各方向2小时 1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
耐冲击 Shock	500m/s ² (50G) X, Y, Z 各方向3次 500m/s ² (approx. 50G) X, Y, Z directions for 3 times		
显示灯 Indicator	动作指示灯(红色LED) Operation indicator(red LED)		
使用周围温度 Ambient temperature	-25~+70℃(未结冰状态 No icing)		
储存温度 Storage temperature	-30~+80℃(未结冰状态 No icing)		
使用周围湿度 Ambient humidity	35~95%RH (未结露状态 No condensation)		
保护电路 Protection circuit	浪涌保护电路 Surge protection circuit		
连接线缆 Cable	φ4.8, 2P, 2m (AWG22, 芯线直径:0.1mm, 芯线数:30, 绝缘皮外径: φ1.25mm) (AWG22, Core diameter: 0.1mm, Number of cores: 30, Insulator diameter: φ1.25)		
材质 Material	外壳: ABS, 一般型线缆(深灰色): 聚氯乙烯(PVC) Case: ABS, Standard cable(Dark Grey): Polyvinyl chloride(PVC)		
防护等级 Protection	IP67		

(※1) 开关动作的应答频率为平均值。测定条件使用标准检测物, 检测物的间距为标准检测物的2倍, 设定距离为检测距离的1/2。

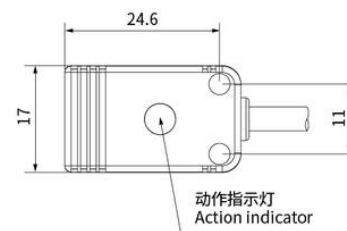
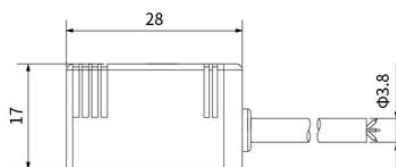
※ 标准产品和IEC标准的功能和规格是一样的。

(※1): The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

外观和尺寸 Appearance and Dimension

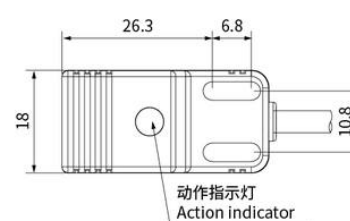
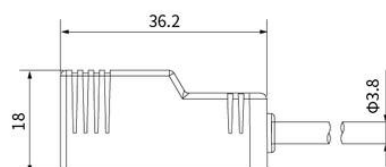
CJF17-05

方形接近开关
Square proximity
switch



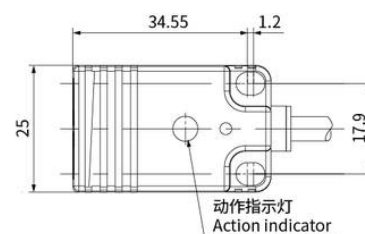
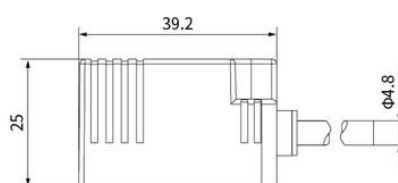
CJF18-05

方形接近开关
Square proximity
switch



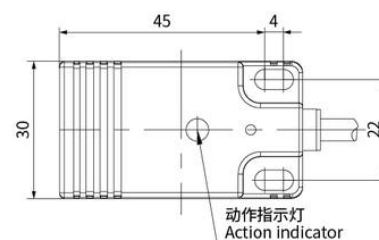
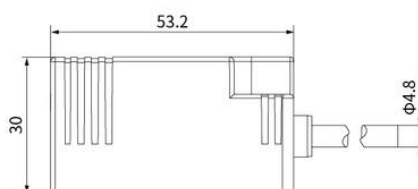
CJF25-08

方形接近开关
Square proximity
switch



CJF30-12

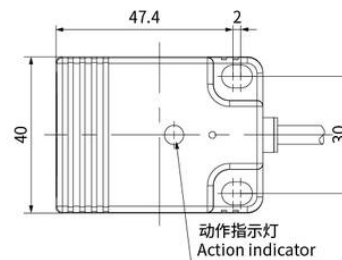
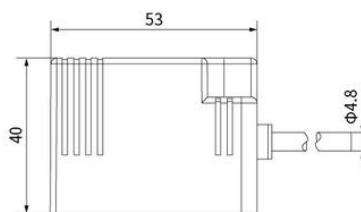
方形接近开关
Square proximity
switch



外观和尺寸 Appearance and Dimension

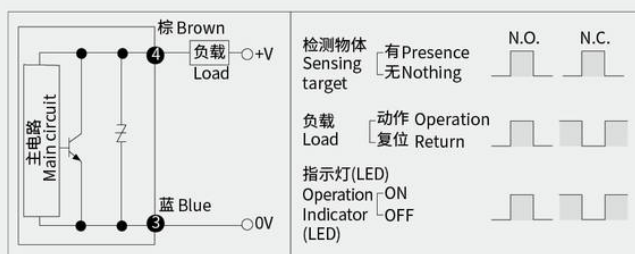
CJF40-15

方形接近开关
Square proximity
switch

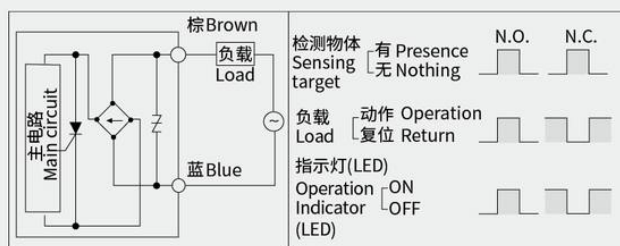


输出电路 Control Output Diagram

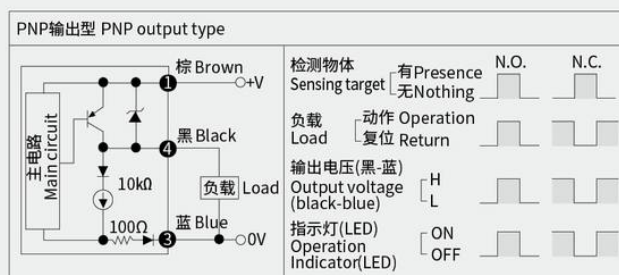
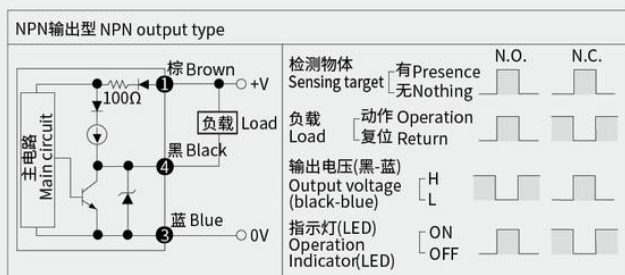
直流2线式 DC 2-wire type



交流2线式 AC 2-wire type

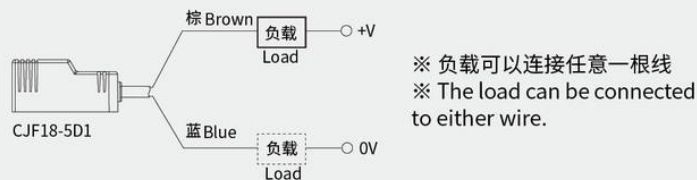


直流3线式 DC 3-wire type

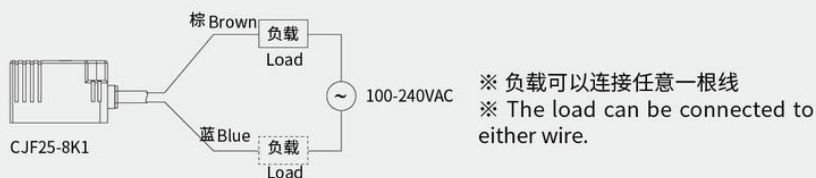


连接 Connections

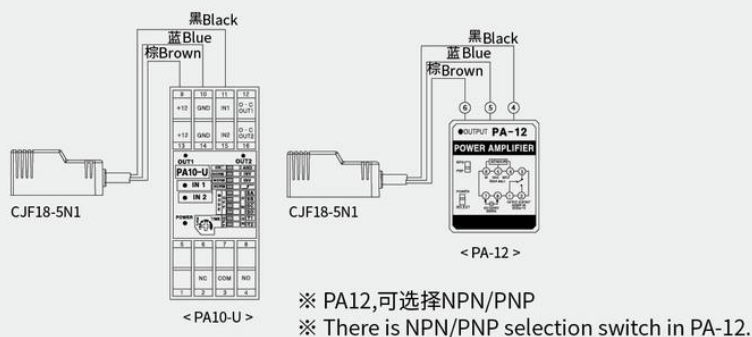
直流2线式 DC 2-wire type



交流2线式 AC 2-wire type



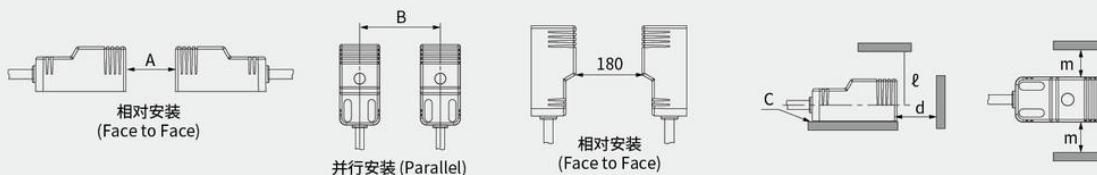
直流3线式 DC 3-wire type



正确使用 Proper Usage

相互干扰 Mutual-interference

当几个接近传感器安装在一起，会发生相互干扰引起传感器故障，一般两个传感器之间的间隔的距离如图
When several proximity sensors are mounted close to one another a malfunction of the may be caused due to mutual interference.
Therefore, be sure to provide a minimum distance between the two sensors as below chart indicates.



型号名Model	CJF17-05	CJF18-05	CJF25-08	CJF30-12	CJF40-15
项目Item					
A	30	48	30	60	120
B	36	40	40	50	70
C	5	5	5	5	5
φd	15	24	15	30	60
ℓ	24	33	25	30	45
m	18	20	20	25	35

使用注意事项 Using Precautions

本公司产品是作为工业产品而设计生产，严格遵守工业产品标准。我司明确声明，除非经过特殊设计并得到我司明确书面确认，我司产品不适用于以下应用场合：

- 要求极高可靠性的应用场合，包括核能、燃气、电力等要求长期稳定运行的系统。
- 要求极高安全性的应用场合，涉及人身安全与财产的情况。
- 苛刻条件、严酷环境的应用场合，包括室外、存在化学污染、电磁、振动或冲击影响的环境。
- 有火灾或爆炸风险的应用场合，包括存在易燃易爆性气体、强酸强碱化学品等物质的环境。
- 涉及军工用途、航天航空项目的应用场合。

The company's products are designed and produced as industrial products, in strict compliance with industrial product standards. We expressly declare that, unless specifically designed and expressly confirmed by us in writing, our products are not intended for the following applications:

- Applications that require high reliability, including nuclear, gas, electric and other systems that require long-term stable operation.
- Applications requiring very high security, situations involving personal safety and property.
- Applications in harsh conditions, harsh environments, including outdoor, chemical contamination, electromagnetic, vibration or shock effects.
- Applications where there is a risk of fire or explosion, including environments where flammable and explosive gases, strong acids and alkali chemicals are present.
- Applications involving military use and aerospace projects.



特点 Features

- 内置浪涌保护，电源反接保护和过流保护电路
- 寿命长，高可靠性，操作简单，经济实惠
- 红色LED状态指示灯，易于识别运行状态
- IP67防护等级(IEC规格)
- 可以代替微动开关或限位开关广泛使用
- Inside surge protection, reverse polarity protection, overcurrent protection
- Long use-life cycle and high reliability, easy install, enconomic price
- Red LED status indication, easy to confirm work situation
- Protection structure IP67(IEC standard)
- Replaceable for limit switches



选型说明 Model Designation

CJ F 10 □ - 05 D N A / □ □ - L2

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

序号 No	项目 Item	代号 Code	说明 Description
①	分类代号 Classification code	CJ	电感式 Inductive type
②	外形代号 Shape code	F	方形 Quadrate
③	尺寸代码 Size code	10	10=□10、11=□11、12=□12
④	产品类别 Product category	无 None	标准型 Normal form
⑤	检测距离 Detection distance	05	05=5mm、06=06mm、07=07mm
⑥	工作电压 Operating voltage	A	90...250VAC
		D	10...30VDC
		E	20...60VDC
		J	5...10VDC
⑦	输出方式 Output mode	N	NPN
		P	PNP
		K	AC 二线 2 Wire
		L	DC 二线 2 Wire
⑧	输出状态 Output state	A	NO
		B	NC
		C	NO+NC
⑨	连接形式 Connection form	无	引线式自由出线端 Lead type free outlet end
		M	M12针式 直头 4芯 A编码 M12 pin straight head 4-core A coding
		M□□□□	M型接插件 M□□□□ M-type connector M□□□□
		D□□□□	DT型接插件 D□□□□ DT connector D□□□□
		A□□□□	AMP型接插件 A□□□□ AMP connector A□□□□
		S□□□□	SM型接插件 S□□□□ SM Connector S□□□□

⑩	电线材质 Wire material	无 None	PVC
		U	PUR
		VP	PVC+屏蔽 Shield
		UP	PUC+屏蔽Shield
⑪	引线长度 Lead length	L1-L5	L1表示1米线 (线长不仅限L5) L1 means 1 meter line (line length is not limited to L5)

国际认证规格 International Certification Specifications

认证规格 Certification specifications	规格 Specifications	文件No. Document
CCC	GB/T 14048.10	Please consult the YLCN Representative Office
TUV	EN 60947-5-2	
CE		

安全规格认证额定值 Safety Specification Certification Rating

CCC(GB/T 14048.10)、TUV(EN60947-5-2)

类型与额定值 Type and Rating
AC-140 24~250VAC 200mA
DC-13 10~30VDC 200mA

规格 Specifications

型号名 Model	CJF10-05DLA CJF10-05DNA CJF10-05DNB CJF10-05DPA CJF10-05DPB	CJF11-06DLA CJF11-06DNA CJF11-06DNB CJF11-06DPA CJF11-06DPB	CJF12-07DLA CJF12-07DNA CJF12-07DNB CJF12-07DPA CJF12-07DPB
检测距离 Sensing distance	5mm	6mm	7mm
应差距离 Hysteresis	检测距离的10%以下 Max. 10% of sensing distance		
标准检测物 Standard sensing target	25×25×1mm (铁 Iron)		
设定距离 Setting distance	0~3.5mm	0~3.5mm	0~5.5mm
工作电压 Working voltage	10~30VDC		
漏电流 Leakage current	10mA以下 Max.10mA		
应答频率 (※1) Response frequency (※1)	500Hz	500Hz	400Hz
残留电压 Residual voltage	DC二线: 3.5V以下 Max. 3.5V DC三线: 1V以下 Max. 1.0V		
温度的影响 Affection by Temp	在-25~+70℃温度范围内+20℃时的检测距离的±10%以内 Max. ±10% for sensing distance at ambient temperature 20℃		
控制输出 Control output	200mA以下 Max. 200mA		
绝缘阻抗 Insulation resistance	50MΩ以上(500VDC为基准) Min. 50MΩ(at 500VDC megger)		
耐电压 Dielectric strength	1500VAC 50/60Hz1分钟 1500VAC 50/60Hz for 1minute		
耐振动 Vibration	10~55Hz(周期1分钟) 振幅1mm X, Y, Z各方向2小时 1mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hours		
耐冲击 Shock	500m/s ² (50G) X, Y, Z 各方向3次 500m/s ² (approx. 50G) X, Y, Z directions for 3 times		
显示灯 Indicator	动作指示灯(红色LED) Operation indicator(red LED)		
使用周围温度 Ambient temperature	-25~+70℃(未结冰状态 No icing)		
储存温度 Storage temperature	-30~+80℃(未结冰状态 No icing)		
使用周围湿度 Ambient humidity	35~95%RH (未结露状态 No condensation)		
保护电路 Protection circuit	浪涌保护电路, 过载&短路保护电路, 过电流保护电路, Surge protection circuit, Reverse polarity protection circuit, Overcurrent protection circuit		
连接线缆 Cable	φ3.8, 2P, 2m (AWG22, 芯线直径:0.1mm, 芯线数:25, 绝缘皮外径: φ1.25mm (AWG22, Core diameter: 0.1mm, Number of cores: 25, Insulator diameter: φ1.25)		
材质 Material	外壳: PBT, 一般型线缆(灰色): 聚氯乙烯(PVC) Case: PBT, Standard cable(Grey): Polyvinyl chloride(PVC)		
防护等级 Protection	IP67		

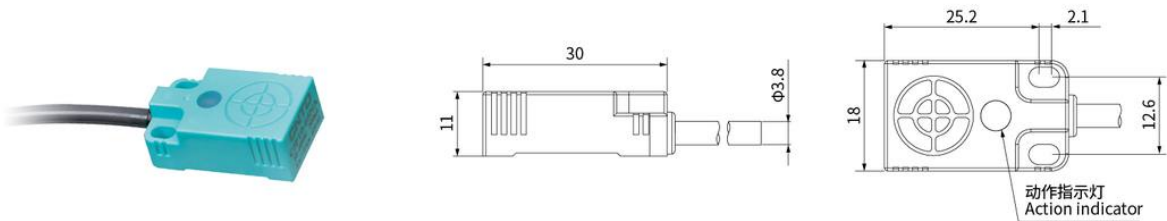
(※1) 开关动作的应答频率为平均值。测定条件使用标准检测物, 检测物的间距为标准检测物的2倍, 设定距离为检测距离的1/2。

※ 标准产品和IEC标准的功能和规格是一样的。

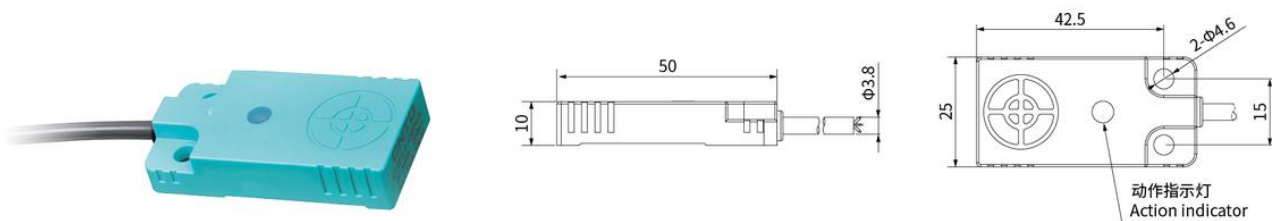
(※1): The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

外观和尺寸 Appearance and Dimension

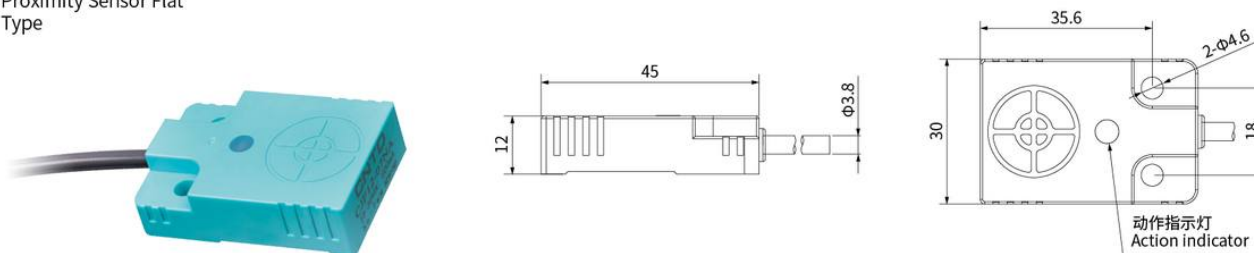
CJF10-05
扁平形接近开关
Proximity Sensor Flat Type



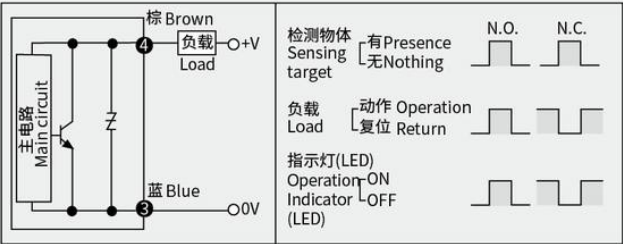
CJF11-06
扁平形接近开关
Proximity Sensor Flat Type



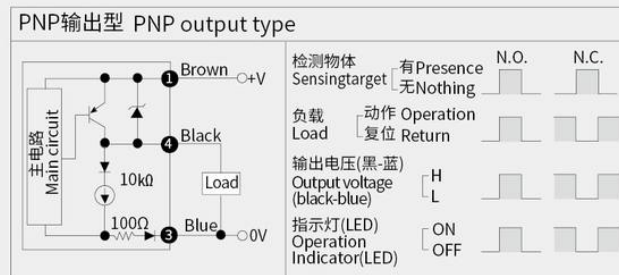
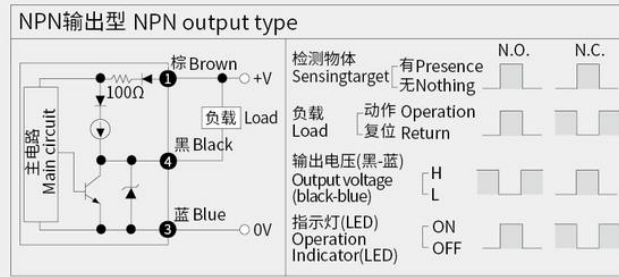
CJF12-07
扁平形接近开关
Proximity Sensor Flat Type



连接 Connections
直流2线式 DC 2-wire type



直流3线式 DC 3-wire type

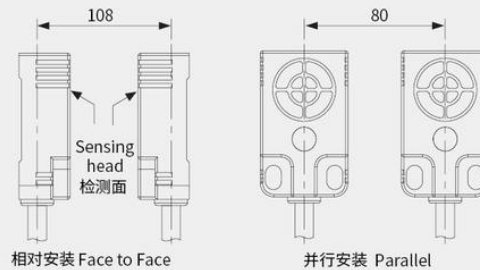


正确使用 Proper Usage

相互干扰 Mutual-interference

当几个接近传感器安装在一起，会发生相互干扰引起传感器故障，一般两个传感器之间的间隔距离如图

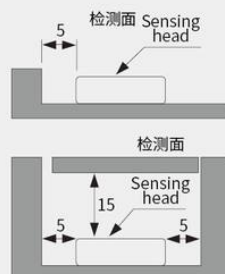
When several proximity sensors are mounted close to one another a malfunction of the sensor may be caused due to mutual interference. Therefore, be sure to provide a minimum distance between the two sensors as below chart indicates.



周围金属的影响 Influence by surrounding metals

当传感器安装在金属面板时，你必须要预防被检测物以外的金属物体，因此，要设定最小的间隔距离如图

When sensors are mounted on metallic panel, you must prevent the sensors from being affected by any metallic object except target. Therefore, be sure to provide a minimum distance as below chart indicates.



※ 接近传感器与周围金属高度相等时
※ When the height between the proximity sensor and surrounding metals is same.

※ 接近传感器与周围金属高度相等时
※ When the height between the proximity sensor and surrounding metals is different.

使用注意事项 Using Precautions

本公司产品是作为工业产品而设计生产，严格遵守工业产品标准。我司明确声明，除非经过特殊设计并得到我司明确书面确认，我司产品不适用于以下应用场合：

- 要求极高可靠性的应用场合，包括核能、燃气、电力等要求长期稳定运行的系统。
- 要求极高安全性的应用场合，涉及人身安全与财产的情况。
- 苛刻条件、严酷环境的应用场合，包括室外、存在化学污染、电磁、振动或冲击影响的环境。
- 有火灾或爆炸风险的应用场合，包括存在易燃易爆性气体、强酸强碱化学品等物质的环境。
- 涉及军工用途、航天航空项目的应用场合。

The company's products are designed and produced as industrial products, in strict compliance with industrial product standards. We expressly declare that, unless specifically designed and expressly confirmed by us in writing, our products are not intended for the following applications:

- Applications that require high reliability, including nuclear, gas, electric and other systems that require long-term stable operation.
- Applications requiring very high security, situations involving personal safety and property.
- Applications in harsh conditions, harsh environments, including outdoor, chemical contamination, electromagnetic, vibration or shock effects.
- Applications where there is a risk of fire or explosion, including environments where flammable and explosive gases, strong acids and alkali chemicals are present.
- Applications involving military use and aerospace projects.