



特点 Features

- 强制断开动作装置(仅NC接点), 可以在发生像接点熔断等故障时断开接点
- 强化顶部密封结构, 以提高密封性能
- 内藏接点座具有速动型: 1NC/1NO; 慢动型: 1NC/1NO、2NC
- Forced open action device (NC contacts only), to disconnect the contact when the contact has fusing and other failures
- Strengthened top seal structure improves the sealing performance
- Built-in contact holder has fast-action type: 1NC / 1NO; Slow-action: 1NC / 1NO and 2NC



Illustrative configurations; use the model designation below.

选型说明 Model Designation

C4B - □ □ □ N

① ② ③ ④

序号 No	项目 Item	代号 Code	说明 Description	强制断开有 / 无 Forced disconnection Yes/No
①	产品系列 Product series	C4B	设计代号 Design code	
②	导管 / 连接器 尺寸 Conduit/ connector size	1	Pg13.5(1 导管型 Conduit type)	
		4	M20(1 导管型 Conduit type)	
③	内藏开关 Hidden switch	1	1NC/1NO(速动型 Quick acting type)	
		3	1NC/1NO(慢动型 Slow motion type)	
		4	2NC(慢动型 Slow motion type)	
④	头部及传动杆 Head and drive rod	01	顶部柱塞型 Top plunger type	仅 NC 端有强制断开 Only NC end has forced disconnection
		02	顶部柱塞滚珠型 (横向)Top plunger ball type (transverse)	仅 NC 端有强制断开 Only NC end has forced disconnection
		03	顶部柱塞滚珠型 (垂直)Top plunger ball type (vertical)	仅 NC 端有强制断开 Only NC end has forced disconnection
		04	滚珠摆杆型 (树脂滚珠) Ball swinging rod type (resin ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		05	滚珠摆杆型 (金属滚珠) Ball swinging rod type (metal ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		07	可调棒式摆杆 (金属长条杆) Adjustable rod swing rod (metal long rod)	仅 NC 端有强制断开 Only NC end has forced disconnection
		08	可调滚珠摆杆 (树脂滚珠) Adjustable ball swing rod (resin ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		09	可调滚珠摆杆 (金属滚珠) Adjustable ball swing rod (metal ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		08H	可调滚珠摆杆 (橡胶滚珠) Adjustable ball swing rod (rubber ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		66	塑料棒型 Plastic rod type	无 None
		67	线圈盘簧型 Coil spring type	无 None
		68	金属棒型 Metal bar type	无 None
		69	触须型 Tentacle type	无 None

额定值 Ratings

额定电压(V) Rated voltage (V)		非感性负载(A) Non-inductive load (A)				感性负载(A) Inductive load (A)			
		阻性负载 Resistive load		灯负载 Lamp load		感性负载 Inductive load		电动机负载 Motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
AC	125	10		3		10		5	
	250	10		2		10		3	
	400	10		1.5		3		1.5	
DC	8	10		6		10		6	
	14	10		6		10		6	
	30	6		4		6		4	
	125	0.8		0.2		0.8		0.2	
	250	0.4		0.1		0.4		0.1	

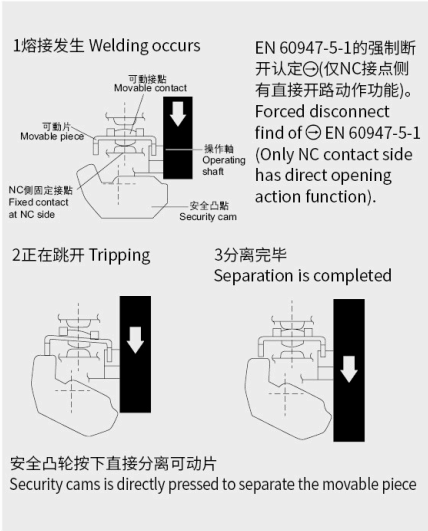
注1. 上述数值表示恒定电流。
注2. 所谓感性负载，是功率因数0.4以上(交流)、时间常数7ms以下(直流的负载)。
注3. 所谓灯负载就是有10倍浪涌电流的负载。
注4. 所谓电动机负载，就是有6倍浪涌电流的负载。

Note1: The above values represent constant current.
Note2: The so-called inductive load refers to the load with power factor of 0.4 or more (AC) and the time constant below 7ms (DC).
Note3: The so-called lamp load refers to the load with 10 times of surge current.
Note4: The so-called motor load is the load with 6 times of surge current.

强制断开构造 Forced Disconnecting Mechansim

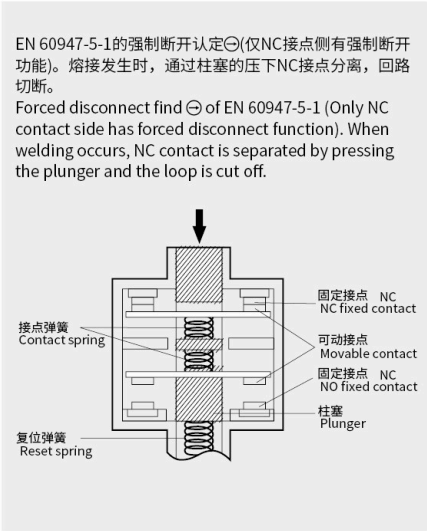
1NC/1NO接点(速动型)

1NC and 1NO contacts (snap-action)



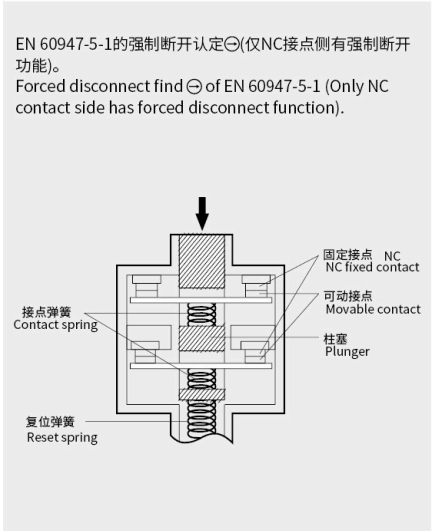
1NC/1NO接点(慢动型)

1NC and 1NO contacts (slow-action)



2NC接点(慢动型)

2NC contacts (slow-action)



接点形式 Contact form

型号 Model	接点 Contact	接点形式 Contact form	动作模式 Operation mode	说明 Explanation
C4B-□1	1NC/1NO (速动型) 1NC/1NO (Quick-action type)			仅NC接点(11-12)带强制断开功能，取得认证(端子No.11-12、13-14不可作异极使用) Only NC contact (11-12) has forced disconnect function and got the certification (terminal No.11-12,13-14 can not be used as different heteropoles)
C4B-□3	1NC/1NO (慢动型) 1NC/1NO (Slow-action type)			仅N C触点有强制断开功能。 两组触点不得用于不同极性电路。 NC11-12 direct opening only; do not use NC11-12 and NO23-24 for circuits of different polarities.
C4B-□4	2NC (慢动型) 2NC (Slow-action type)			两个NC接点(11-12、21-22)带强制断开功能，取得认证(端子No.11-12、21-22可以作异极使用) Two NC contacts (11-12, 21-22) have forced disconnect function and got the certification (terminal No.11-12,21-22 can be used as different heteropoles)

特性 Characteristics

保护等级 Protection level		IP66
寿命 Life	电气 Electrical	50万次以上(AC250V 6A、电阻负载) More than 500,000 times (AC250V 6A, resistive load)
操作速度 Operating speed		1mm~0.5m/s
操作频率 Operating frequency	机械 Mechanical	120次/min 120 times/min
	电气 Electrical	30次/min 30 times/min
额定频率 Rated frequency		50/60Hz
接触电阻 Contact resistance		25mΩ以下(初期值) 25mΩ or less (initial value)
绝缘电阻 Insulation resistance		100MΩ以上(在500VDC以下) 100MΩ min. (at 500VDC)
最小使用负载 Minimum working load		DC24V 10mA 以上 Min DC24V 10mA
耐电压 Withstand voltage (EN 60947-5-1)		同极端子间: 2.5kV(速动型)/4kV(慢动型) Between homopolar terminals: 2.5kV(snap-action)/4kV(slow-action) 异极端子间: 4kV(慢动型) Between heteropolar terminals: 4kV(slow-action) 带电金属部之间: 4kV Between charged metal parts: 4kV 各端子与不带电金属部之间: 6kV Between terminals and uncharged metal parts: 6kV
额定绝缘电压(Ui) Rated insulation voltage (Ui)		380V(EN 60947-5-1)
污染度(使用环境) Pollution degree (environmental conditions)		污染度3(EN 60947-5-1) Pollution degree 3 (EN 60947-5-1)
防触电保护等级 Electric shock protection grade		Class I (带接地端子) Class I (with ground terminal)
振动 Vibration	误动作 Malfunction	10~55Hz 0.75mm单振幅 10~55Hz 0.75mm single amplitude
冲击 Impact	耐久 Duration	1,000m/s ²
	误动作 Malfunction	300m/s ²
环境温度 Ambient temperature		使用时: -20~+80°C (没有结冰) Using: -20~+80°C (With no icing)
环境湿度 Ambient humidity		95%RH以下 Less than 95% RH

注1. 上述值为初始值。

注2. 有些型号中可能与上述内容不同, 请另外垂询。

*1.该保护结构基于标准(EN69047-5-1)规定的测试方法, 请根据使用环境、使用条件来事先确认密封性。

*2.寿命的条件为环境温度5~35°C、环境湿度40~70%RH时的数值。

Note 1. The above values are initial values.

Note 2. Values of some models may be different from the above, please contact us for details.

*1.The protection structure is tested based on method predetermined by standard (EN69047-5-1), please confirm the sealing in advance according to the operating environment and conditions.

*2.The conditions of life are the values under the ambient temperature of 5~35°C and humidity of 40 to 70% RH. For other detailed conditions, please contact us.

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 14048.5	请咨询昌得代表处 Please consult the CNTD Representative Office
TUV	EN 60947-5-1	
CE		

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

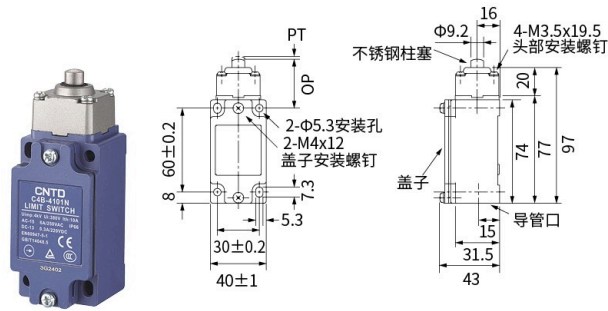
CCC(GB/T 14048.5)、TUV(EN 60947-5-1)

类型与额定值 Type and Rating
AC-15 6A/250V
DC-13 0.3A/220V

外观和尺寸 Appearance and Dimension

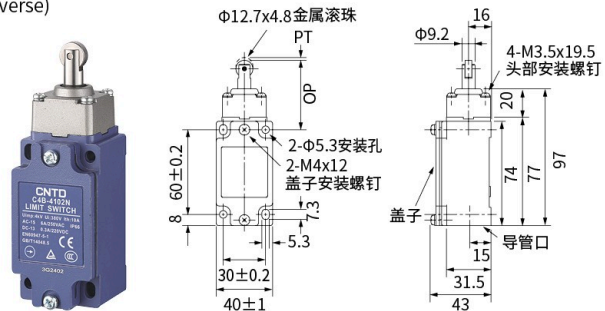
C4B-□□01N

顶部柱塞型
Top plunger type



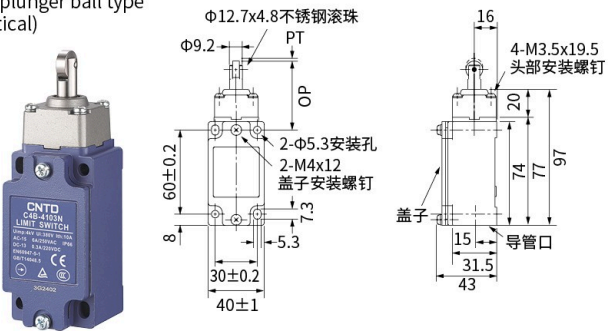
C4B-□□02N

顶部柱塞滚珠型 (横向)
Top plunger ball type
(transverse)



C4B-□□03N

顶部柱塞滚珠型 (垂直)
Top plunger ball type
(vertical)



动作特性 Operating characteristics		C4B-□□01N	C4B-□□02N	C4B-□□03N
动作力	OF(最大Max.)	18.63N	18.63N	18.63N
释放力	RF(最小Min.)	1.96N	1.96N	1.96N
预行程	PT(最大Max.)	2mm	2mm	2mm
	PT2*1*3	(3mm)	(3mm)	(3mm)
过行程	OT(最小Min.)	5mm	5mm	5mm
运动差异	MD(最大Max.)*2	1mm	1mm	1mm
强制断开行程	DOT(最小Min.)*4	3.2mm	3.2mm	3.2mm
强制断开动作力	DOF(最小Min.)*4	49.03N	49.03N	49.03N
总行程	TT*3	(7mm)	(7mm)	(7mm)
自由位置	FP(最大Max.)	38mm	51mm	51mm
动作位置	OP	35±1	48±1	48±1

注：2NC 接点的闭路 / 开路动作的同时性会有参差。

请检查接点的操作。

*1. 仅限慢动型。

*2. 仅限速动型。

*3. 为参考值。

*4. 必须提供以确保安全操作。

Note: The synchronicity of the closed circuit/open circuit action of the 2NC contact will vary.

Check contact operation.

*1. Slow motion type only.

*2. Speed limit only.

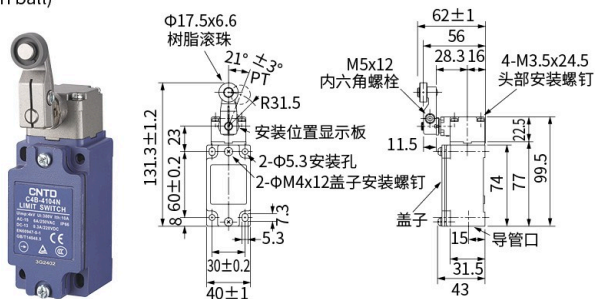
*3. Reference value.

*4. Must be provided to ensure safe operation.

外观和尺寸 Appearance and Dimension

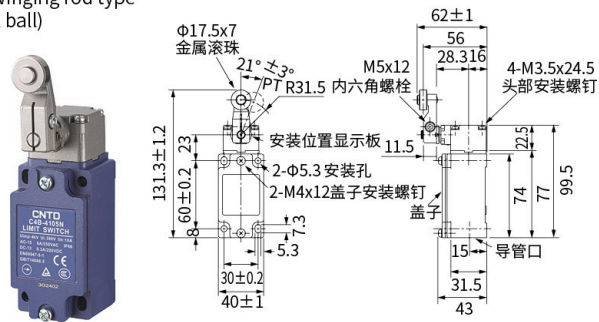
C4B-□□04N

滚珠摆杆型 (树脂滚珠)
Ball swinging rod type
(resin ball)



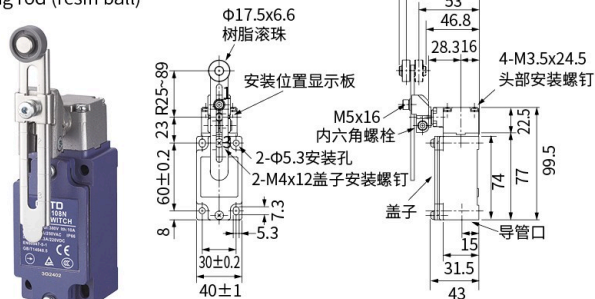
C4B-□□05N

滚珠摆杆型 (金属滚珠)
Ball swinging rod type
(metal ball)



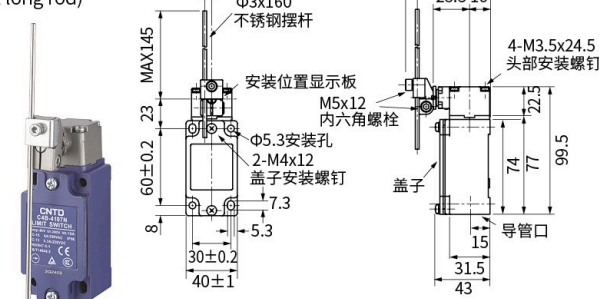
C4B-□□08N

可调滚珠摆杆 (树脂滚珠)
Adjustable ball
swinging rod (resin ball)



C4B-□□07N

可调棒式摆杆 (金属长条杆)
Adjustable rod swing rod
(metal long rod)



动作特性 Operating characteristics		C4B-□□04N	C4B-□□05N	C4B-□□08N	C4B-□□07N
动作力	OF(最大Max.)	9.41N	9.41N	9.41N	2.12N
释放力	RF(最小Min.)	1.47N	1.47N	1.47N	0.29N
预行程	PT*3	21°±3	21°±3	21°±3	21°±3
	PT2*4*6	(45°)	(45°)	(45°)	(45°)
过行程	OT(最小Min.)	50°	50°	50°	50°
运动差异	MD(最大Max.)*5	12°	12°	12°	12°
强制断开行程	DOT(最小Min.)*4*7	35°	35°	35°	35°
	DOT(最小Min.)*5*7	55°	55°	55°	55°
强制断开动作力	DOF(最小Min.)*7	19.61N	19.61N	19.61N	19.61N
总行程	TT*6	(75°)	(75°)	(75°)	(75°)

注: 2NC 接点的闭路 / 开路动作的同时性会有参差。

请检查接点的操作。

*1. 这些开关的动作特性是在将滚珠级别设定在 31.5mm 时测得。

*2. 这些开关的动作特性是在将杆式级别设定在 140mm 时测得。

*3. 动作特性左右相同。

*4. 仅限慢动型。

*5. 仅限速动型。

*6. 为参考值。

*7. 必须提供以确保安全操作。

Note: The synchronicity of the closed circuit/open circuit action of the 2NC contact will vary.

Check contact operation.

*1. The operating characteristics of these switches are measured when the ball level is set at 31.5mm.

*2. The operating characteristics of these switches are measured when the rod level is set at 140mm.

*3. The action characteristics are the same.

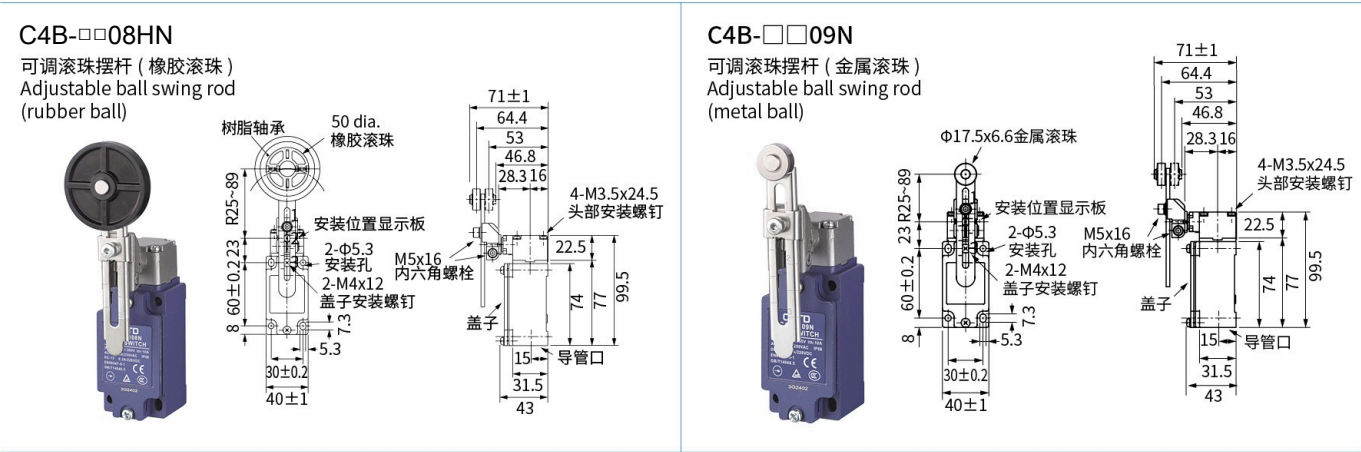
*4. Only slow motion type.

*5. Speed limit only.

*6. Reference value.

*7. Must be provided to ensure safe operation.

外观和尺寸 Appearance and Dimension



Operating characteristics: snap and slow action

动作特性 Operating characteristics		C4B-□□08HN	C4B-□□09N
操作力	OF最大Max.	9.41N	9.41N
释放力	RF最小Min.	1.47N	1.47N
预行程	PT*3	21°±3	21°±3
	PT2*4*6	(45°)	(45°)
过行程	OT最小Min.	50°	50°
运动差异	MD最大Max.*5	12°	12°
强制断开行程	DOT(最小Min.)*4*7	35°	35°
	DOT(最小Min.)*5*7	55°	55°
强制断开动作力	DOF(最小Min.)*7	19.61N	19.61N
总行程	TT*6	(75°)	(75°)

注：2NC 接点的闭路 / 开路动作的同时性会有参差。
请检查接点的操作。

- *1. 这些开关的动作特性是在将滚珠级别设定在 31.5mm 时测得。
- *2. 这些开关的动作特性是在将杆式级别设定在 140mm 时测得。
- *3. 动作特性左右相同。
- *4. 仅限慢动型。
- *5. 仅限速动型。
- *6. 为参考值。
- *7. 必须提供以确保安全操作。

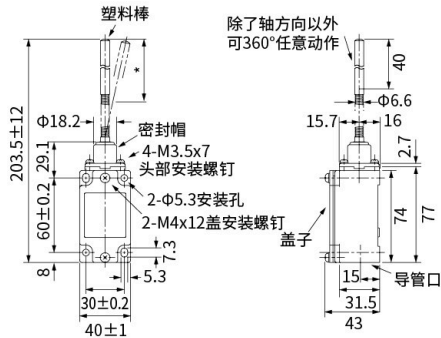
Note: The synchronicity of the closed circuit/open circuit action of the 2NC contact will vary.
Check contact operation.

- *1. The operating characteristics of these switches are measured when the ball level is set at 31.5mm.
- *2. The operating characteristics of these switches are measured when the rod level is set at 140mm.
- *3. The action characteristics are the same.
- *4. Only slow motion type.
- *5. Speed limit only.
- *6. Reference value.
- *7. Must be provided to ensure safe operation.

外观和尺寸 Appearance and Dimension

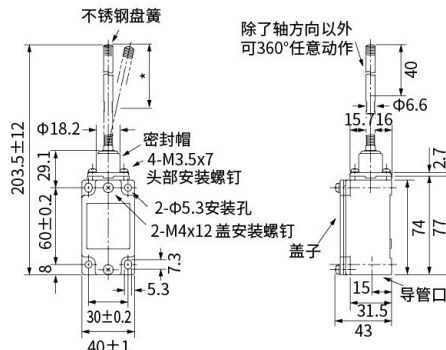
C4B-□□66N

塑料棒型
Plastic rod type



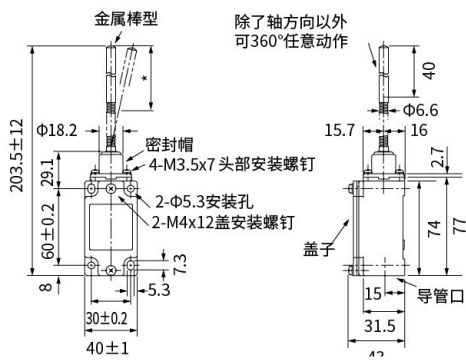
C4B-□□67N

线圈盘簧型
Coil spring type



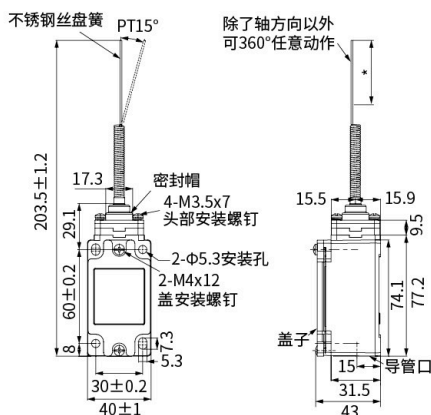
C4B-□□68N

金属棒型
Metal bar type



C4B-□□69N

触须型
Tentacle type



操作杆的使用范围是从尖端到引动器全长的 1/3 内。
The range of use for the operating lever is from the tip of the operating rod to within one third of the full length of the actuator.

动作特性 Operating Characteristics		C4B-□□66N	C4B-□□67N	C4B-□□68N	C4B-□□69N
动作力	OF(最大Max.)	1.5N	1.5N	1.5N	1.5N
释放力	RF(最小Min.)	-	-	-	-
预行程	PT(最大Max.)	15°±5°	15°±5°	15°±5°	15°±5°
过行程	OT(最小Min.)	-	-	-	-
运动差异	MD(最大Max.)	10°±2°	10°±2°	10°±2°	10°±2°
动作位置	OP	-	-	-	-
总行程	TT	-	-	-	-
强制断开行程	DOT(最小Min.)	-	-	-	-
强制断开动作力	DOF(最小Min.)	-	-	-	-

注: 2NC、2NC/1NO 及 3NC 接点的开路 / 闭路动作的同时性会有参差。
请检查接点的操作。
Note: The open/closed action of 2NC, 2NC/1NO, and 3NC contacts is inconsistent.
Check contact operation.

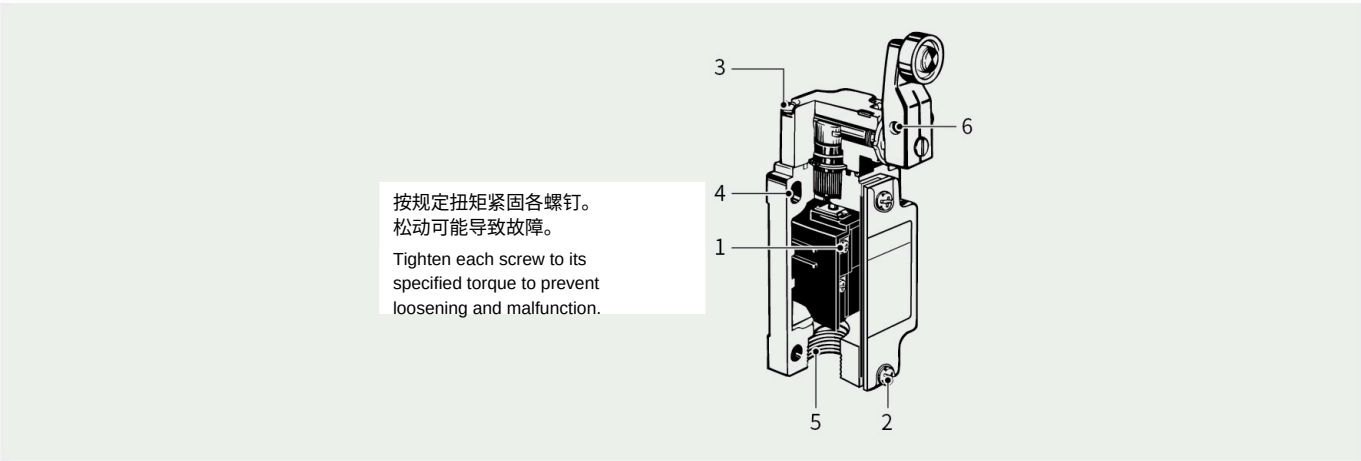
安全注意事项 Safety Precautions

请勿在油中、水中，或易受油、水影响的环境中使用本开关。
否则可能会导致油或水浸入开关内部。（开关的保护结构为 IP66，即放置水中一定时间后会发生进水）。
在完成布线后以及使用开关前，请务必安装外盖。此外，请勿在外盖打开的情况下接通开关电源。否则可能导致触电。

Do not use this switch in oil, water, or environments susceptible to oil or water.
Otherwise, it may cause oil or water to immerse inside the switch. The protective structure of the switch is IP66, which means that water ingress may occur after being placed in water for a certain period of time.
After completing the wiring and before using the switch, be sure to install the outer cover. In addition, do not turn on the switch power with the outer cover open. Otherwise, it may cause electric shock.

正确的紧固扭矩 Correct Tightening Torque

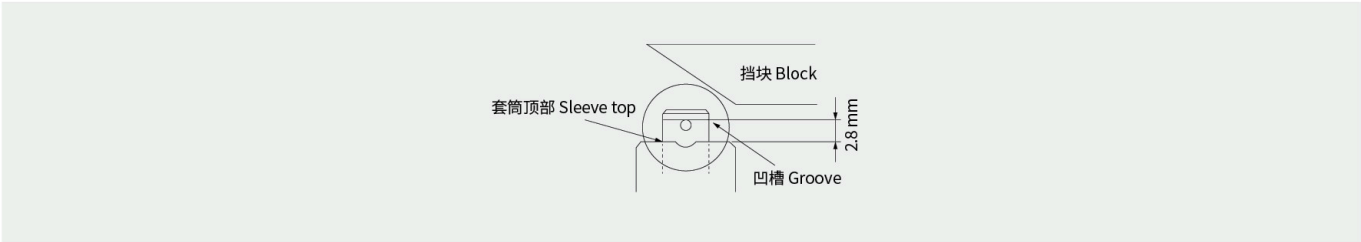
编号 Number	型号 Model	正确的紧固扭矩 Correct tightening torque
1	M3.5端子螺钉 M3.5 terminal screw	0.59~0.78N·m
2	外盖安装螺钉 Outer cover installation screws	1.18~1.37N·m
3	头部安装螺钉 Head mounting screws	0.78~0.88N·m
4	M5本体安装螺钉 M5 body mounting screws	4.90~5.88N·m
5	连接器 Connector	1.77~2.16N·m
6	摆杆安装螺钉(滚珠摆杆型) Swing rod installation screw (ball swing rod type)	4.90~5.88N·m



操作 Operate

操作方法、凸轮或挡块的形状、操作频率和超程都会显著影响使用寿命以及限位开关的精度。由于此原因，挡块角度必须在30°以下，挡块的表面粗糙度必须为6.3 S以上，且硬度必须为Hv 400到500。
为使柱塞型驱动杆正确移动，请调节挡块和凸轮到正确的设置位置。正确位置是柱塞凹槽与套筒顶部匹配的位置。

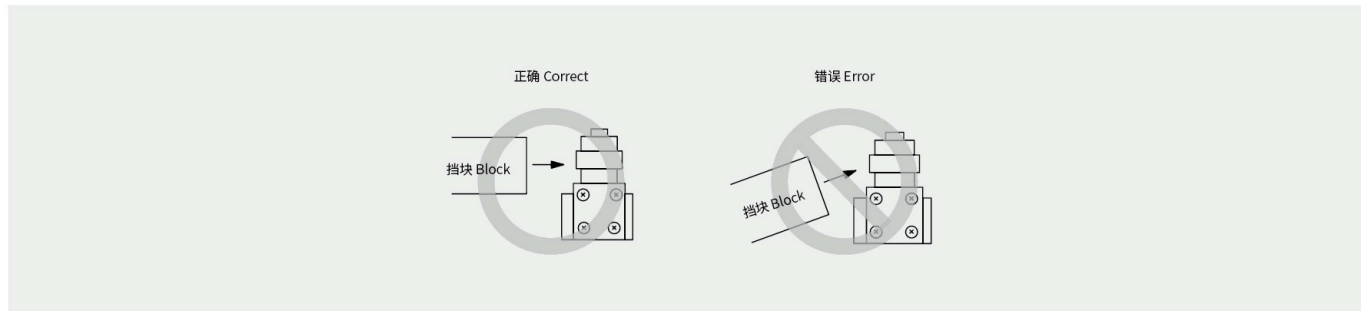
The operating method, shape of the cam or stop, operating frequency, and overtravel all significantly affect the service life and the accuracy of the limit switch. Due to this reason, the angle of the stop must be below 30 °, the surface roughness of the stop must be above 6.3 S, and the hardness must be Hv 400 to 500.
To ensure the correct movement of the plunger type drive rod, adjust the stop and cam to the correct setting position. The correct position is the position where the plunger groove matches the top of the sleeve.



其他 Other

开关上传动器 (滚珠) 的负载必须在水平方向上作用在传动器上, 否则传动器或旋转轴可能会变形或损坏。

The load of the actuator (ball) on the switch must be applied horizontally on the actuator, otherwise the actuator or rotating shaft may be deformed or damaged.



安装 Install

使用四颗 M5 螺钉和垫圈牢固地安装标准型号。请务必应用正确的扭矩以拧紧各螺钉。

Install the standard model securely using four M5 screws and washers. Please make sure to apply the correct torque to tighten each screw.

头部安装位置的变更 Change in Head Installation Position

拆下头部四个角部的螺钉, 即可在四个方向中任意方向重设头部。请确保没有异物从开关头部进入。

Remove the screws at the four corners of the head to reset the head in any of the four directions. Please ensure that no foreign objects enter the switch head.

接线注意事项 Wiring Precautions

请在断电状态下进行开关接线操作, 通电状态下接线可能会造成触电危险。

接线时务必注意, 不要让导线的细小碎片或其他微粒进入开关内部。

使用绝缘管和 M3.5 压接端子连接时, 按照图示正确放置压接端子, 避免压迫到外壳或外盖。适用的导线尺寸为 AWG20 至 AWG18 或 0.5 至 0.75mm²。

选用适当长度的导线以确保外盖平整关闭且牢固。切勿将压接端子塞进外壳缝隙, 这可能导致外壳损坏或变形。

为防止端子与开关外壳内部接触, 使用厚度不超过 0.5mm 的端子。

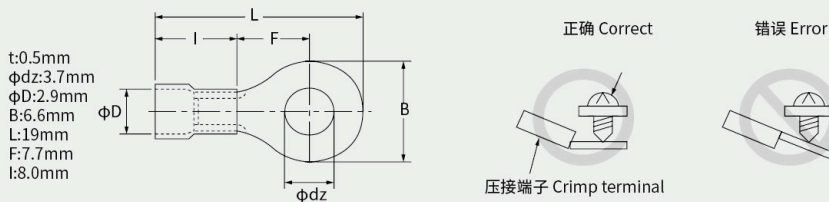
Always wire the switch with the power off to avoid the risk of electric shock.

Ensure no small wire fragments or particles enter the switch during wiring.

When connecting with an insulated tube and M3.5 crimp terminals, position the terminals as shown in the diagram to avoid pressing against the casing or cover. The suitable wire size is AWG20 to AWG18 or 0.5 to 0.75mm².

Use wires of appropriate length to ensure the cover closes smoothly and securely. Do not stuff the crimp terminals into gaps in the casing, as this may cause damage or deformation.

To prevent contact between the terminals and the interior of the switch housing, use terminals with a thickness of no more than 0.5mm.



导管接口 Conduit Interface

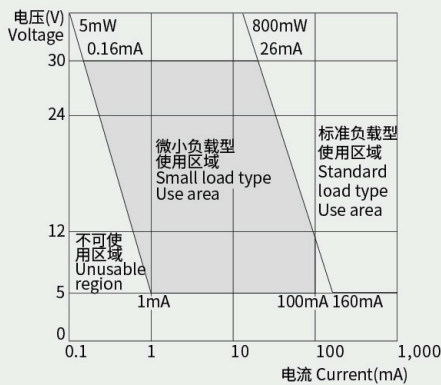
确认各连接器已在指定的扭矩范围内拧紧。
如果连接器过分拧紧可能会损坏外壳。
Confirm that all connectors have been tightened within the specified torque range.
If the connector is tightened too tightly, it may damage the housing.

使用注意事项 Using Precautions

开关接点可用于一般负载或微小负载。但是，已经连接过一般负载的接点，就不能用于连接更小容量的负载。否则，可能导致接触面的糙化，而且可能失去接触可靠性。
Switch contacts can be used for general loads or small loads. However, contacts that have already been connected to general loads cannot be used to connect smaller capacity loads. Otherwise, it may lead to roughness of the contact surface and loss of contact reliability.

微小负载型的使用 Applications Under Minimal Load

开关接点可用于一般负载或微小负载。但是，已经连接过一般负载的接点，就不能用于连接更小容量的负载。否则，可能导致接触面的糙化，而且可能失去接触可靠性。
如果在开关微小负载电路时使用一般负载用开关，可能会引起接触不良。下图为开关负载区域范围定义。本目录册内产品适用于 DC24V 10mA 以上范围，当使用负载小于 DC24V 10mA 以下时，可能存在由于电流过小无法击破触点表面氧化膜或硫化膜的现象，从而导致开关接触不良。所以当使用负载小于 DC24V 10mA 以下时，请咨询昌得电气科技有限公司进行产品定制。
请设置 CR 电路等吸收电路，防止震荡和抖动所导致的噪声和脉冲缺失，对于开关时会产生冲击电流的负载，请插入接点保护电路，以免导致耐久性降低。
Switch contacts can be used for general loads or small loads. However, contacts that have already been connected to general loads cannot be used to connect smaller capacity loads. Otherwise, it may lead to roughness of the contact surface and loss of contact reliability.
If a general load switch is used when switching a small load circuit, poor contact may be caused. The following diagram shows the switching load area range definition. The products in this catalog are suitable for DC24V 10mA or above. When the load is less than DC24V 10mA or below, the oxidized film or vulcanized film on the contact surface may be unable to be broken due to too small current, resulting in poor switch contact. Therefore, when the load is less than DC24V 10mA, please consult CNTD Electrical Technology Co., Ltd. for product customization.
Please set the absorption circuit such as CR circuit to prevent noise and pulse loss caused by shock and jitter, for the load that will produce impulse current on the switch, please insert the contact protection circuit to avoid reducing durability.



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.