

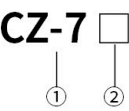


特点 Features

- 引动器种类广泛，其中包含动作位置可调整的款式 (如CZ-7121)
- 外壳包覆强化塑胶、防水、防油，较CMV型卧式限位开关有更高的机械强度，耐冲击
- Various actuators and some with adjustable operating position (such as CZ-7121)
- Shell covered with intensive plastic for water-proof and oil-proof. The mechanical strength is better than CMV series of horizontal limit switch



选型说明 Model Designation



序号 No	项目 Item	代号 Code	说明 Description
①	系列号 Serial number	CZ-7	标准型 Standard type
②	头部结构 Head structure	140	短压板型 Short platen type
		120	长压板型 Long platen type
		141	带滚轮短压板型 Short platen type with roller
		121	带滚轮长压板型 Long pressing plate type with roller
		144	高滚轮短压板型 High roller short pressing plate type
		124	高滚轮长压板型 High roller long pressing plate type
		100	低柱塞型 Low plunger type
		110	高柱塞型 High plunger type
		310	面板安装柱塞型 Panel mounted plunger type
		311	面板安装横向滚轮柱塞型 Panel mounted lateral roller plunger type
		312	面板安装竖向滚轮柱塞型 Panel mounted vertical roller plunger type
		166	塑料杆盘簧型 Plastic rod coil spring type

特性 Characteristics

操作速度 Operation speed	0.05mm/s-0.5m/s
动作频率 Operating frequency	电气:20次/分 Electrical: 20 operations/min.
接触电阻 Contact resistance	25mΩ 以下 (初期) 25mΩmax. (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	Minimum: 24VDC, 10mA
额定绝缘电压 UI Rated insulation voltage	380V
额定冲击耐受电压 Uimp Rated impulse withstand voltage	4kV
约定自由空气发热电流 Ith Convention free air heating current	10A
电介强度 Dielectric strength	非连续端子间1,000VAC, 50/60Hz持续1分钟 1000VAC, 50/60 Hz for 1 minute between terminals of the same polarity
	载电流与无载电流零件间1,500VAC, 50/60Hz持续1分钟 1500VAC, 50/60 HZ for 1 minute between current-carrying and non-current-carrying metal parts
	端子和接地之间1,500VAC, 50/60Hz持续1分钟 1500VAC, 50/60 HZ for 1 minute between each terminal and ground
振动 Vibration	误动作耐久:10至55Hz, 1.5mm双振幅 Malfunction Duration: 10-55Hz, 1.5mm double amplitude
冲击 Shock	机械耐久 :1,000m/Sec ² (约 100G' S) 误动作耐久 :100m/Sec ² (约 10G' S)*1 Mechanical durable: 1, 000m/Sec ² (about 100G' S) Malfunction: 100m/Sec ² (about 10G' S)*1
周围温度 Ambient temperature	使用时 :-20~+70℃ (没有结冰) Using: -20~+70℃ (With no icing)
湿度 Humidity	General purpose: 85%RH max.; sealed type: 95%RH max.
电气寿命 Electrical life	500,000次以上 (250V/6A阻性负载时) More than 500,000 times (250V/6A resistive load)
防护等级 Protection rating	IP64 (操作面) IP64 (Operating surface)

额定值 Ratings

额定电压 Rated Voltage	非电感性负载 Noninductive Load (A)				电感性负载 Inductive Load (A)			
	电阻性负载 Resistance Load		灯泡负载 Lamp Load		电感性负载 Inductive Load		马达负载 Motor Load	
	NC	NO	NC	NO	NC	NO	NC	NO
AC125V	10		3	1.5	10		5	2.5
AC250V	10		2.5	1.25	10		3	1.5
AC480V	3		1.5	0.75	2.5		1.5	0.75
DC8V	10		3	1.5	6		5	2.5
DC14V	10		3	1.5	6		5	2.5
DC30V	6		3	1.5	5		5	2.5
DC125V	0.5		0.4	0.4	0.05		0.05	0.05
DC250V	0.25		0.2	0.2	0.03		0.03	0.03

注:
1. 电感性负载: 功率因素=0.4;时间常数=7msec。
2. 灯泡负载之浪涌电流为稳定状态电流之10倍, 马达负载之浪涌电流为稳定状态电流之6倍。
3. 带弹簧系列产品, 操作体的使用范围为从弹簧的前端到弹簧全长的1/3以内。

NOTES:
1. Inductive load has a power factor of 0.4 min.(AC) and a time constant of 7 msec.max.(DC).
2. Lamp load has an inrush current of 10 times the steady-state current, while motor load has an inrush current of 6 times the steady-state current.
3. Product with spring, its usable range of operating part is within one third of the whole spring length from the front end of spring.

国际认证规格 International Certification Specifications

认证规格 Certification specifications	标准 Standard	文件No. Document
CCC	GB/T 14048.5	请联系昌得代表处 Please contact CNTD Representative Office
TUV	EN 60947-5-1	
CE		

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

CSA(C22.2 NO.14)

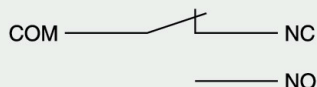
额定电压 Rated voltage	通电电流 On-current	电流 Current(A)		伏安 Voltamere(VA)	
		接通 Put on	断开 Disconnect	接通 Put on	断开 Disconnect
		60 30	6 3	7,200	720

CCC(GB/T 14048.5)、TUV(EN 60947-5-1)

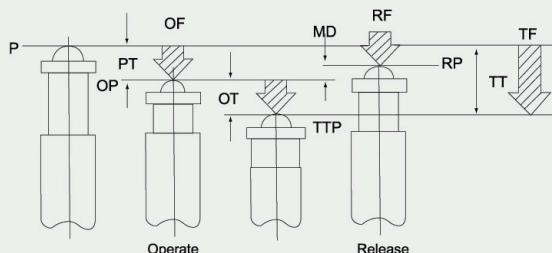
额定值 Rating

AC-15 250V/10A
DC-13 220V/0.3A

接点型式 Contact Form



动作特性 Operating Characteristics



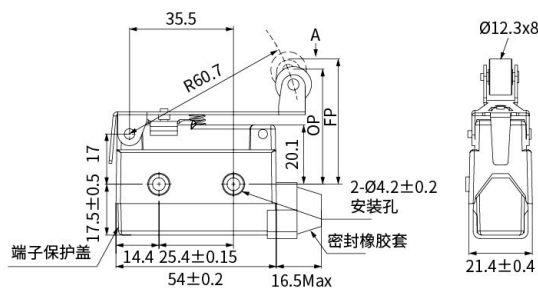
OF: 动作力
RF: 回复力
TF: 总行程动作力
FP: 自由位置
OP: 动作位置
RP: 返回位置
TTP: 总行程位置
PT: 预行程位置
OT: 过行程
MD: 响应差的行程
TT: 总行程

OF: Operating Force
RF: Releasing Force
TF: Total Force
FP: Free Position
OP: Operating Position
RP: Releasing Position
TTP: Total Travel Position
PT: Pre Travel
OT: Over Travel
MD: Movement Differential
TT: Total Travel

外观和尺寸 Appearance and Dimension

CZ-7121

带滚轮长压板型
Long pressing plate
type with roller

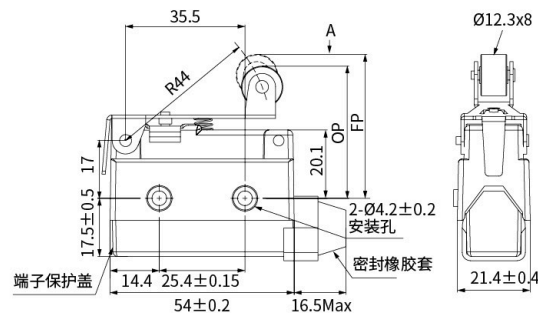


注: 动作特性针对从方向A操作开关时

动作特性 Operating Characteristics	CZ-7121
操作力 OF (最大Max.)	1.8N
回弹力 RF (最小Min.)	0.5N
预行程 PT (最大Max.)	11.0mm
过行程 OT (最小Min.)	3.0mm
行程移动分辨率 MD (最大Max.)	2.4mm
动作位置 OP(mm.)	40±1mm
自由位置 FP	-

CZ-7141

带滚轮短压板型
Short platen type
with roller



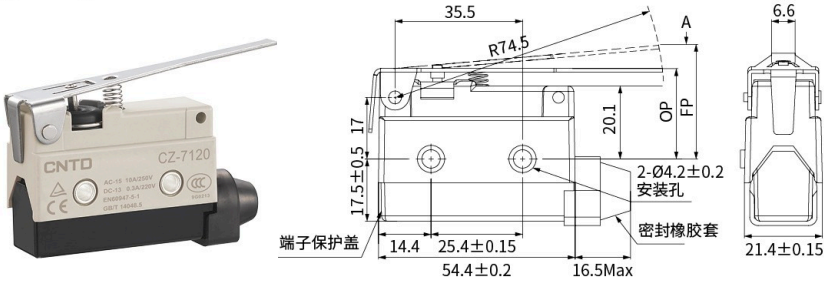
注: 动作特性针对从方向A操作开关时

动作特性 Operating Characteristics	CZ-7141
操作力 OF (最大Max.)	2.4N
回弹力 RF (最小Min.)	0.8N
预行程 PT (最大Max.)	6.5mm
过行程 OT (最小Min.)	2.0mm
行程移动分辨率 MD (最大Max.)	1.5mm
动作位置 OP(mm.)	40±1mm
自由位置 FP	46mm

外观和尺寸 Appearance and Dimension

CZ-7120

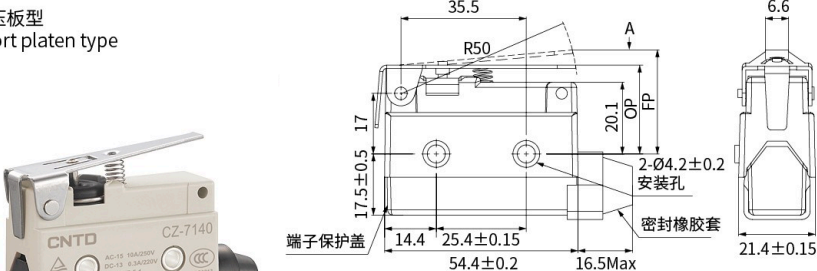
长压板型
Long platen type



动作特性 Operating Characteristics	CZ-7120
操作力 OF (最大Max.)	1.5N
回弹力 RF (最小Min.)	0.4N
预行程 PT (最大Max.)	13.5mm
过行程 OT (最小Min.)	4.0mm
行程移动分辨率 MD (最大Max.)	3.2mm
动作位置 OP(mm.)	25±1mm
自由位置 FP	35mm

CZ-7140

短压板型
Short platen type

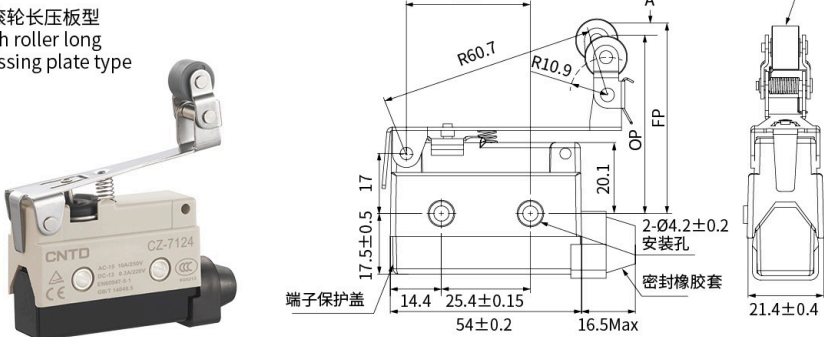


注: 动作特性针对从方向A操作开关时

动作特性 Operating Characteristics	CZ-7140
操作力 OF (最大Max.)	2.2N
回弹力 RF (最小Min.)	0.6N
预行程 PT (最大Max.)	8.5mm
过行程 OT (最小Min.)	2.5mm
行程移动分辨率 MD (最大Max.)	2.0mm
动作位置 OP(mm.)	25±1mm
自由位置 FP	32mm

CZ-7124

高滚轮长压板型
High roller long pressing plate type

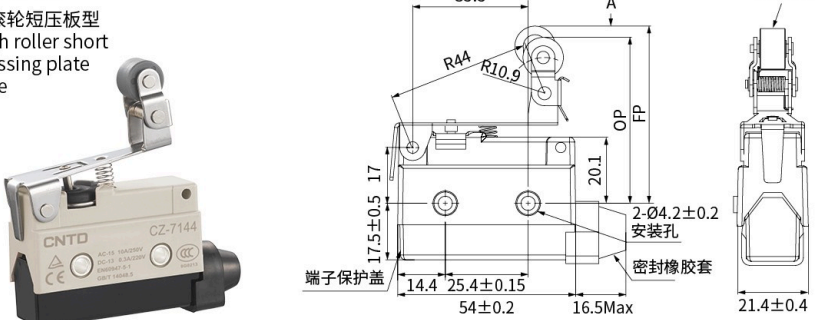


注: 动作特性针对从方向A操作开关时

动作特性 Operating Characteristics	CZ-7124
操作力 OF (最大Max.)	2N
回弹力 RF (最小Min.)	0.6N
预行程 PT (最大Max.)	11mm
过行程 OT (最小Min.)	3.0mm
行程移动分辨率 MD (最大Max.)	2.4mm
动作位置 OP(mm.)	50±1.2mm
自由位置 FP	-

CZ-7144

高滚轮短压板型
High roller short pressing plate type



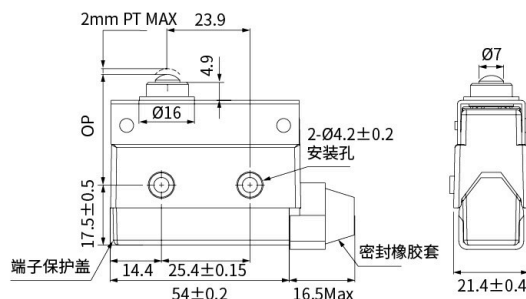
注: 动作特性针对从方向A操作开关时

动作特性 Operating Characteristics	CZ-7144
操作力 OF (最大Max.)	2.8N
回弹力 RF (最小Min.)	1N
预行程 PT (最大Max.)	6.5mm
过行程 OT (最小Min.)	2.0mm
行程移动分辨率 MD (最大Max.)	1.5mm
动作位置 OP(mm.)	50±1.2mm
自由位置 FP	56mm

外观和尺寸 Appearance and Dimension

CZ-7100

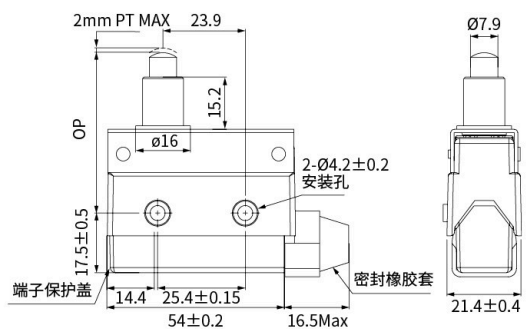
低柱塞型
Low plunger type



动作特性 Operating Characteristics	CZ-7100
操作力 OF (最大Max.)	6N
回弹力 RF (最小Min.)	1N
预行程 PT (最大Max.)	2mm
过行程 OT (最小Min.)	0.8mm
行程移动分辨率 MD (最大Max.)	0.8mm
动作位置 OP(mm.)	30.5 $\pm$ 0.8mm
自由位置 FP	-

CZ-7110

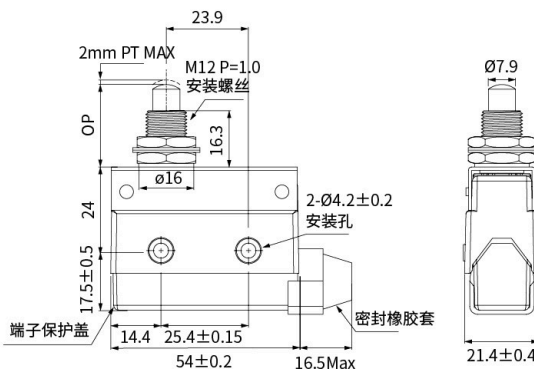
高柱塞型
High plunger type



动作特性 Operating Characteristics	CZ-7110
操作力 OF (最大Max.)	6N
回弹力 RF (最小Min.)	1N
预行程 PT (最大Max.)	2.0mm
过行程 OT (最小Min.)	5.0mm
行程移动分辨率 MD (最大Max.)	0.8mm
动作位置 OP(mm.)	44 $\pm$ 1.2mm
自由位置 FP	-

CZ-7310

面板安装柱塞型
Panel mounted
plunger type

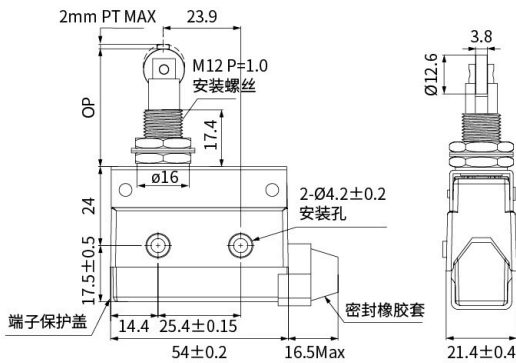


动作特性 Operating Characteristics	CZ-7310
操作力 OF (最大Max.)	6N
回弹力 RF (最小Min.)	1N
预行程 PT (最大Max.)	2.0mm
过行程 OT (最小Min.)	6.0mm
行程移动分辨率 MD (最大Max.)	0.8mm
动作位置 OP(mm.)	21.8 $\pm$ 1.2mm
自由位置 FP	-

外观和尺寸 Appearance and Dimension

CZ-7311

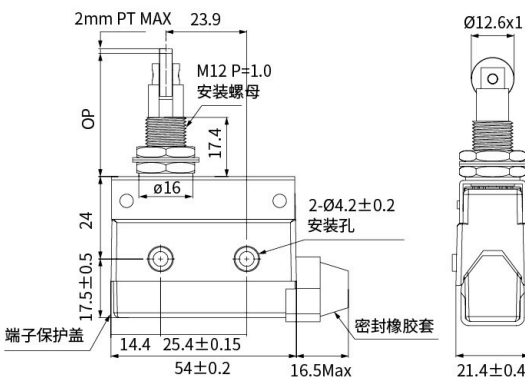
面板安装横向
滚轮柱塞型
Panel mounted
lateral roller
plunger type



动作特性	CZ-7311
Operating Characteristics	
操作力 OF (最大Max.)	6N
回弹力 RF (最小Min.)	1N
预行程 PT (最大Max.)	2.0mm
过行程 OT (最小Min.)	6.0mm
行程移动分辨率 MD (最大Max.)	0.8mm
动作位置 OP(mm.)	33.3±1.2mm
自由位置 FP	-

CZ-7312

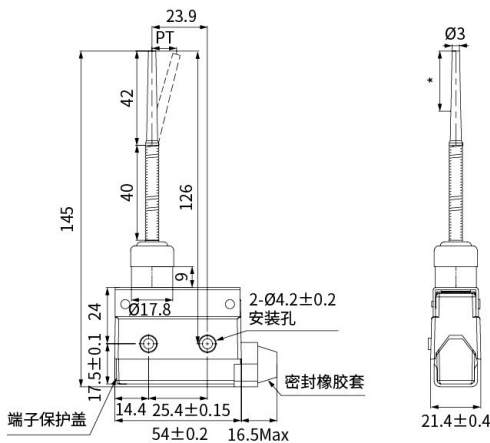
面板安装竖向
滚轮柱塞型
Panel mounted
vertical roller
plunger type



动作特性	CZ-7312
Operating Characteristics	
操作力 OF (最大Max.)	6N
回弹力 RF (最小Min.)	1N
预行程 PT (最大Max.)	2.0mm
过行程 OT (最小Min.)	6.0mm
行程移动分辨率 MD (最大Max.)	0.8mm
动作位置 OP(mm.)	33.3±1.2mm
自由位置 FP	-

CZ-7166

塑料杆盘簧型
Plastic rod coil
spring type



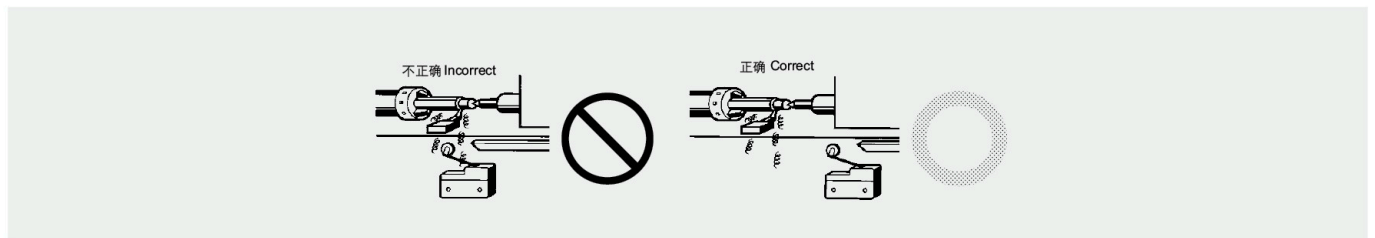
动作特性	CZ-7166
Operating Characteristics	
操作力 OF (最大Max.)	1.2N
回弹力 RF (最小Min.)	-
预行程 PT (最大Max.)	12±3°
行程移动分辨率 MD (最大Max.)	3±1°
动作位置 OP(mm.)	-
自由位置 FP	-

* 操作体的使用范围是从操作棒尖端到传动器全长的 1/3 内。
* The operating body is used from the tip of the operating rod to 1/3 of the full length of the actuator.

关于使用环境 About Using the Environment

在环境中频繁振动或受到冲击的情况下, 开关可能会出现由于摩擦而产生的微粒, 这些微粒可引起接触问题和性能退化, 例如接触不良和响应不稳定。在剧烈振动或强烈冲击的情况下, 接点可能会出现错误动作或遭受损害。为此, 应避免在易受振动和冲击影响的地点安装开关, 尤其是那些可能导致共振的位置。开关使用的物理接点在特定条件下可能受到环境中的硅气体影响。当电弧发生时, 这些硅气体可能与之反应, 在接点处形成氧化硅沉积, 导致接触困难。如果开关附近有使用硅基材料(如硅油、硅胶、硅质电缆等), 则应考虑采用接点保护电路来减少电弧产生, 并消除硅气体的释放。

In environments with frequent vibration or impact, switches may produce friction-generated particles, leading to contact issues and performance degradation, such as poor contact and unstable response. Extreme vibration or strong impacts can cause incorrect switch operations or damage. Therefore, avoid installing switches in vibration-prone or impact-prone areas, especially where resonance might occur. The physical contacts in switches can be affected by environmental silicon gases under certain conditions. When arcing occurs, these gases may react and form silica deposits at the contact points, causing contact difficulties. If silicone-based materials (like silicone oil, silicone rubber, silicon cables, etc.) are used near the switch, consider using contact protection circuits to reduce arcing and eliminate the release of silicon gases.



操作 Operate

请勿在会接触到热水(+60°C以上)的地方和水蒸气中使用。

请勿在油或水中使用开关。

导线出口的密封橡胶可适用于 $\phi 8.5 \sim \phi 10.5$ 的电缆。(使用 VCT1.25mm² 的两或三芯电缆。)

卸下端子保护盖时, 请插入螺丝起子并向打开方向用力。取下盖子时请勿用力过度。这样可能导致配合部分变形并降低紧固力。

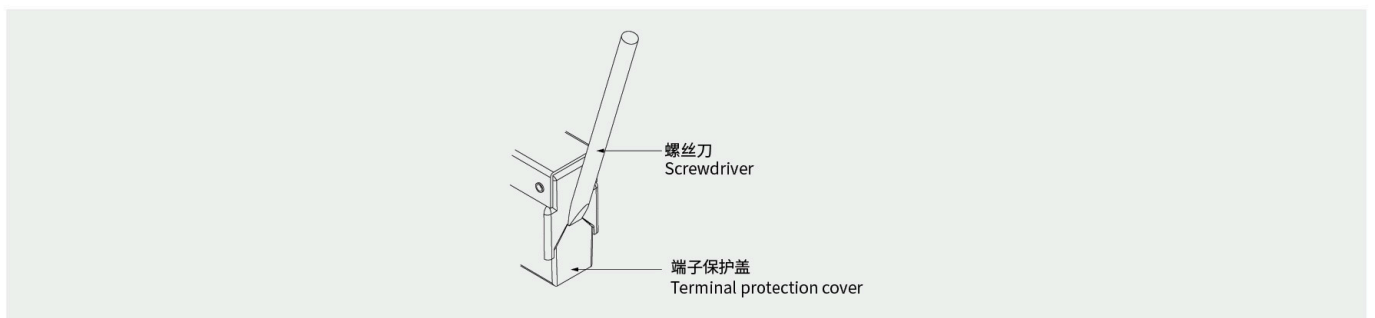
Do not use in areas that may come into contact with hot water (above +60 °C) or in water vapor.

Do not use the switch in oil or water.

The sealing rubber of the wire outlet can be applied to $\phi 8.5 \sim \phi 10.5$ cables. (Using VCT1.25mm²)

Two or three core cables

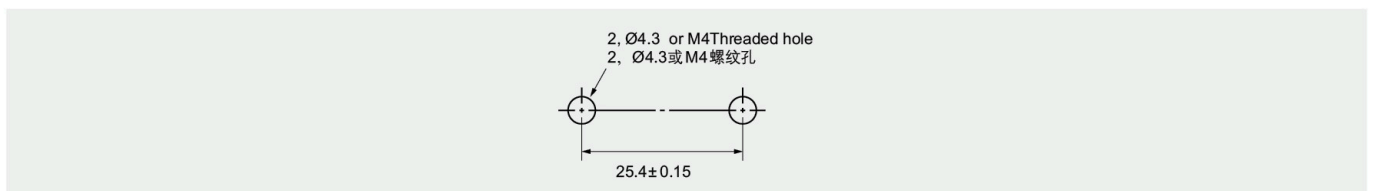
When removing the terminal protection cover, insert a screwdriver and apply force towards the opening direction. Do not use excessive force when removing the cover. This may cause deformation of the mating part and reduce the tightening force.



安装 Install

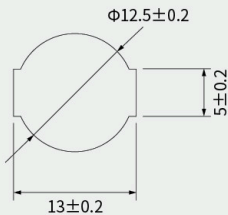
为使用螺丝在侧面上安装开关时, 请用 M4 螺丝拧紧开关并使用垫圈、弹簧垫圈等来确保安装牢固。

When installing the switch on the side with screws, please tighten the switch with M4 screws and use washers, spring washers, etc. to ensure secure installation.



将面板安装式柱塞型 (CZ-7311、CZ-7312 或 CZ-7310) 在侧面螺钉安装中使用, 请拆除驱动部位的六角螺母。
在面板上安装面板安装型开关时, 小心拧紧, 不要超过额定扭矩。
拧紧螺丝超过扭矩极限 4.91 N·m 可能造成柱塞型开关故障。

Install the panel mounted plunger type (CZ-7311, CZ-7312 or CZ-7310) onto the side screws when installing and using, please remove the hexagonal nut from the drive part.
When installing panel mounted switches on the panel, be careful to tighten them and do not exceed the rated torque.
Tightening the screws beyond the torque limit of 4.91 N·m may cause plunger type switch failure.



关于正确的紧固转矩 Regarding the Correct Tightening Torque

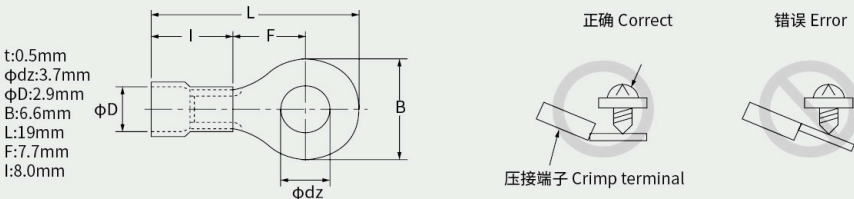
螺丝松动可能导致功能故障。确保拧紧每个螺丝至适当的紧固转矩, 如下表所示。
Loose screws may cause functional failure. Ensure that each screw is tightened to the appropriate tightening torque, as shown in the table below.

编号 Number	类型 Types of	正确紧固转矩 Correct tightening torque
1	端子螺钉 (M3.5) terminal screw	0.59 ~ 0.78 N·m
2	面板安装螺丝 Panel mounting screws	2.94-4.91N.m
3	侧面安装螺丝 Side mounting screws	1.18 ~ 1.47N·m

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.



适用导线 Applicable conductor

电线名称 Wire name	推荐使用电线 Wire is recommended		
	线芯数 Number of cores	导体 Conductor	成品外径 Nom OD
塑料橡皮绝缘软电线 Plastic rubber insulated flexible wire	2芯 2-core 3芯 3-core 4芯 4-core	0.5~0.75mm ²	圆形 Circular φ6~φ9
600V 塑料绝缘 塑料外皮电缆(VVF) 600V plastic insulation Plastic sheathed cable	2芯 2-core	φ1/φ1.2/φ1.6	

若电线含有硅油, 可能会导致接触不良。为确保电气设备的正常运行, 请避免使用含硅油的产品。
The presence of silicone oil in wire may result in inadequate contact. To ensure the proper functioning of electrical equipment, please refrain from using products containing silicone oil.

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。

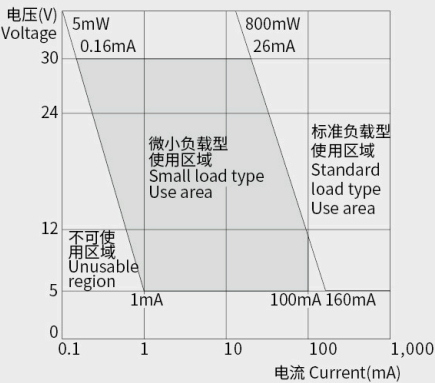
如果在开关微小负载电路时使用一般负载用开关, 可能会引起接触不良。下图为开关负载区域范围定义。本目录册内产品适用于 DC24V 10mA 以上范围, 当使用负载小于 DC24V 10mA 以下时, 可能存在由于电流过小无法击破触点表面氧化膜或硫化膜的现象, 从而导致开关接触不良。所以当使用负载小于 DC24V 10mA 以下时, 请咨询昌得电气科技有限公司进行产品定制。

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.