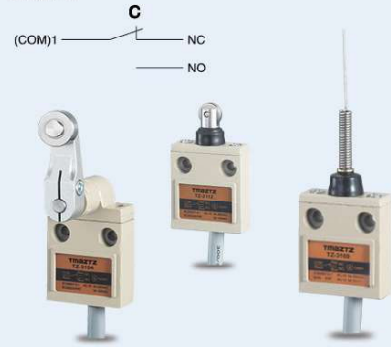


特征 Features

- 满足 IEC IP67 防护等级的高密封性。
- 三层密封构造：
柱塞部通过丁腈橡胶填料密封和隔膜密封，开关部通过丁腈橡胶帽密封；电缆入口通过封装材料密封。
- 标准型提供 3 和 5m 的电缆长度。
- 带柱塞的开关可实现并联安装。
- Sealing characteristics that meet IEC IP67 degree of protection.
- Triple-sealed construction:
Plunger section sealed via nitrile rubber packing seal and diaphragm; switch section sealed via nitrile rubber cap; cable entrance sealed via encapsulating material.
- Cable lengths of 3 and 5 m available on standard models.
- Multiple mounting possible with Switches with Plungers.

接触形式, Contact form



额定值 Ratings

额定电压 Rated voltage	非感性负载 Noninductive Load (A)				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
125 VAC 250 VAC	5 (0.1) 3	1.5 1	0.7 0.5	3 2	2.5 1.5	1.3 0.8		
8 VDC 14 VDC 30 VDC	5 (0.1) 5 (0.1) 4 (0.1)	2 2 2	4 3 3	5 4 3	4 3 3	3 3 3		
125 VDC 250 VDC	0.4 0.2	0.05 0.03	0.4 0.2	0.4 0.2	0.05 0.03			
浪涌电流 surge current	NC			20A 以下 (under)				
	NO			10A 以下 (under)				

特性 Characteristics

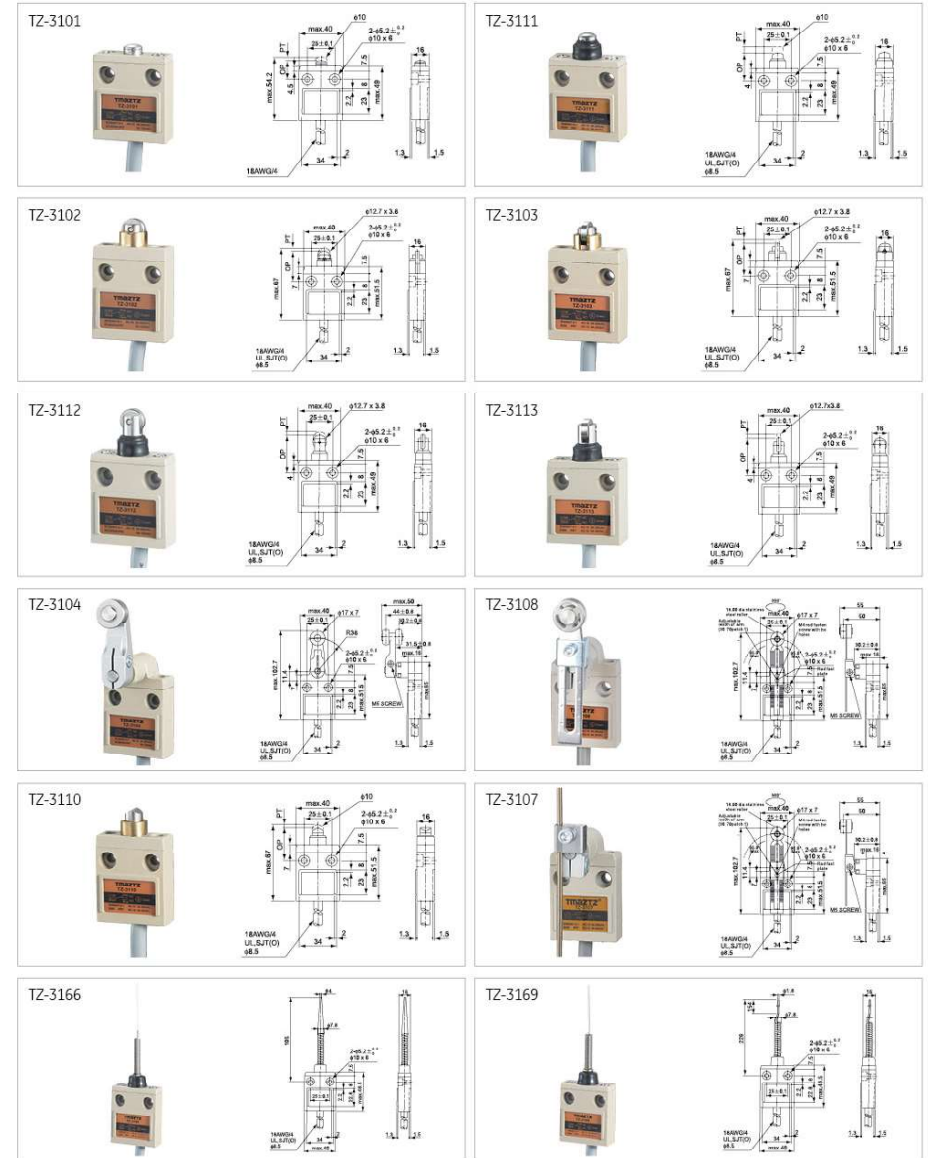
额定值 Rating	5A 125V, 3A 250VAC
操作速度 Operating speed	1mm-1m/s
动作频率 Operating frequency	机械: 120 次/分 电气: 30 次/分 Mechanical: 120 operations/min. Electrical: 30 operations/min.
触点电阻 Contact resistance	15mΩ 以下 15mΩ max(initial)
绝缘电阻 Insulation resistance	100mΩ 以上 (在 500VDC 以下) 100mΩ min(at 500VDC)
电介强度 Dielectric strength	端子与接地之间: 1500VAC, 50/60Hz, 持续 1 分钟 1500VAC, 50/60 Hz for 1 minute between terminals of the same polarity. 端子与无载电流金属零件之间: 1500VAC, 50/60Hz, 持续 1 分钟 1500VAC, 50/60 Hz for 1 minute between each terminal and ground.
振动 Vibration Frequency	该动作耐久: 10-55Hz, 1.5mm 双振幅 10 to 55Hz, 1.5mm double amplitude
冲击 shock	机械耐久: 1000m/s ² 以上 (约 100G 以上) 该动作耐久: 500m/s ² 以上 (约 50G 以上) Mechanical: Approx. 1000m/s ² (Approx. 100G) Electrical: Approx. 500m/s ² (Approx. 50G)
使用温度 Ambient temperature	-10°C ~ +70°C (没有结冰 With no icing)
湿度 Humidity	< 95% RH
重量 Weight	约 360g (电缆线长 3m) 约 540g (电缆线长 5m) Approx. 360g (cable length 3m) Approx. 540g (cable length 5m)
防水等级 Degree of protection	IP67

动作特性 Operating Characteristics

动作特性	型号 Model	TZ-3101	TZ-3102	TZ-3103	3104, 3107, 3108	TZ-3111	TZ-3112	TZ-3113	TZ-3166, 3169
动作力 OF 最大 (Max)		11.77N	11.77N	11.77N	5.69N	17.65N	17.65N	17.65N	1.47N
回复力 RF 最小 (Min)		4.41N	4.41N	4.41N	1.47N	4.41N	4.41N	4.41N	—
预行程 PT 最大 (Max)		1.8mm	1.8mm	1.8mm	25°	1.8mm	1.8mm	1.8mm	15°
过行程 OT 最小 (Min)		3mm	3mm	3mm	-0°	3mm	3mm	3mm	—
应差距离 MD 最大 (Max)		0.2mm	0.2mm	0.2mm	3°	0.2mm	0.2mm	0.2mm	—
动作位置 OP		15.7 ± 1mm	28.5 ± 1mm	28.5 ± 1mm	—	24.9 ± 1mm(S) mm	34.3 ± 1mm(S) mm	34.3 ± 1mm(S) mm	—

注: 3104 的动作特性用于长度 38mm 的摆杆。
NOTE: 3104 the action characteristic of the swing rod for length 38mm.

外观和尺寸 Appearance and Dimension



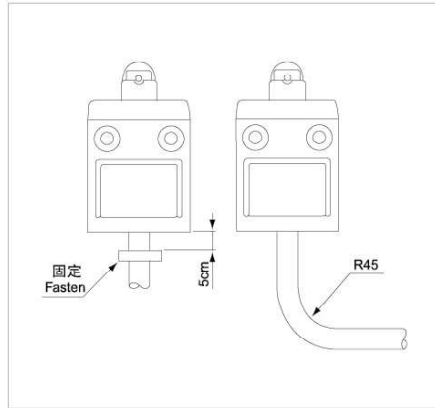
TZ-3 防水限位开关 Waterproof Limit Switch

TMazTZ
永得工控开关

配线注意事项 Fastening Of The Switch Cable

配线需注意于离开开关 5cm 处须加以固定，而电线之弯曲半径不得小于 R45cm，注意勿伤及电线绝缘体，以避免电线漏电等情形。

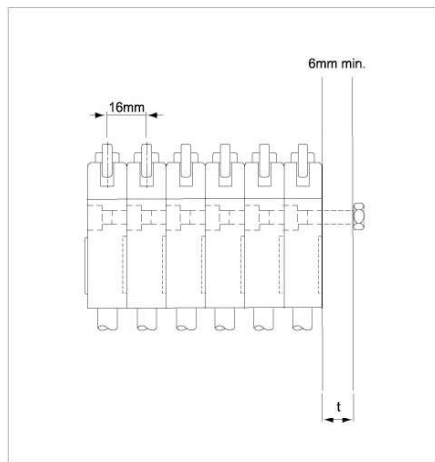
The switch bodies are filled with resin for sealing purposes. To avoid stressing the cable and switch body, fasten the switch at 5 cm or farther away from the switch body, should the wire be bent, the bending radius shall be at least 45mm.



多连接使用的场合 Switch Bank Mounting

需连接多组使用的场合时，最多可连接 6 组开关，连接时，开关表面之凹凸槽相互配合，另板厚 t 之尺寸应在 6mm 以上为适当。

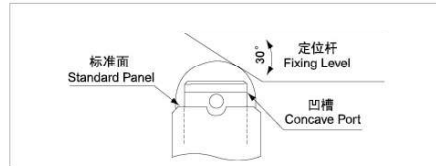
A maximum of six switches may be mounted together as a switch bank. During the installation, the convex part of the switch back. The mounting panel shall be 6mm or thicker.



安装注意事项 Installation

凸轮与定位杆等形状，频率及动作后移动等，将会影响使用寿命与精度，因此建议定位杆之角度约 30°，而定位杆之表面粗糙度，以上，硬度 HV400-500，在设定开关之行程时，凹沟必须高于标准面之上为最适当之位置。

The service life and accuracy of switches will be effected by the shape of actuator operation frequency & over travel. So the angular of the fixing level should be about 30°, the surface finish of the fixing level should be over, the hardness is from HV400~500. When installing, the position of the concave part should be above the standard panel.



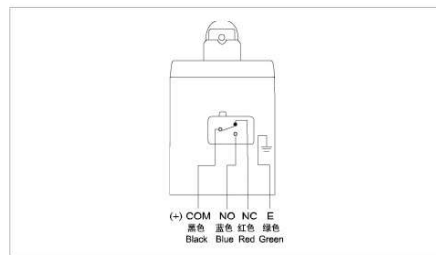
安装注意事项 Mounting

请依下表所示选择最适当之旋转扭力，施行锁紧作业，以避免伤害开关本体。

Recommended tightening torque according to the following form.

编号 Model	螺丝尺寸 Screw type	最适当之旋转扭力 Torque
1	M5 六角孔螺柱之固定螺丝 M5 fastening screws	43.4-52lb.in (50-60kgf.cm)
2	头部 M3.5 之安装螺丝 M3.5 installing screws	6.9-7.9lb.in (8-9kgf.cm)

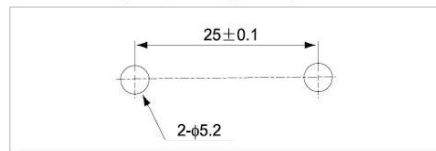
接点型式 Contact Types



装配孔之尺寸 Mounting Holes

安装板发生翻曲或凸起之状态，会造成安装上之不良，安装板请经筛选确认后，再予以使用。

Mount the switch body to a rigid mounting panel using two M5 screws.



T4N 小型安全限位开关 Miniature Safety Limit Switch

TMazTZ
永得工控开关

特征 Features

- 强制断开动作装置 (仅 NC 接点)，可以在发生接点熔断等故障时断开接点。
- 标准的镀金接点保证了接触的高可靠性，可用于标准负载及微小负载。
- 强化了顶部密封结构，以提高密封性能。
- 内置接点座具有速动型：1NC/1NO、2NC；慢动型：1NC/1NO、2NC
- Forced open action device (NC contacts only), it can disconnect the contact when the contact has fusing and other failures.
- Standardized gold-plated contacts provide high contact reliability. Can be used with both standard loads and microloads.
- Strengthened top seal structure improves the sealing performance.
- Built-in contact holder has fast-action type: 1NC/1NO; Slow-action: 1NC/1NO and 2NC



特性 Characteristics

保护等级 *1 Protection level*1	IP66
寿命 *2 Life*2	机械 Mechanical 100 万次以上 *5 More than 10,000,000 times*5
	电气 Electrical 50 万次以上 (AC250V 3A, 电阻负载) *3 30 万次以上 (AC250V 10A, 电阻负载) More than 300,000 times (AC250V 10A, resistive load)
操作速度 Operating speed	1 ~ 500mm/s (C4N-1120)
操作频率 Operating frequency	最大 30 次 /min Max. 30 times/min
接触电阻 Contact resistance	25mΩ 以下 25 mΩ or less
最小使用负载 *4 Minimum working load *4	DC5V 1mA 电阻负载 (N 标准参考值) 1mA resistive load below DC5V (N standard reference value)
额定绝缘电压 (UI) Rated insulation voltage (UI)	300V
防电击保护等级 Electric shock proof protection grade	Class II (双重绝缘)
污染度 (使用环境) Pollution degree (environmental conditions)	污染度 3 (EN60947-5-1) Pollution degree 3 (EN60947-5-1)
耐电压 Withstand voltage (EN60947-5-1)	同极端子间: 2.5kV Between homopolar terminals: 2.5kV
	异极端子间: 4kV Between heteropolar terminals: 2.5kV
绝缘电阻 Insulation resistance	各端子和非充电金属部件间: 6kV Between terminals and uncharged metal parts: 6kV
	100MΩ 以上 Above 100MΩ
接点间隙 Contact gap	最小 2 × 0.5mm 速动型、 最小 2 × 2mm 慢动型
	Minimum 2 × 0.5mm quick-action type, Minimum 2 × 2mm slow-action type
振动 Vibration	晃动作 Malfunction 10 ~ 55Hz 0.75mm 单振幅
	耐久 Duration 晃动作 Malfunction 1,000m/s ² 300m/s ²
环境温度 Ambient temperature	-20 ~ +70°C (无结冰、结露) -20 ~ +70°C (No ice or dew)
	环境湿度 Ambient humidity
质量 Weight	约 82g (T4N-1120) About 82g (T4N-1120)
	约 99g (T4N-5120) About 99g (T4N-5120)

- 注 1. 上述值为初始值。
2. 一旦接点连接标准负载后，就不可用于连接更小容量的负载。否则可能导致接点表面粗糙，从而失去接触可靠性。
(1) 保护等级是依据 IEC60947-5-1 规格的测试得出的。使用前务必在实际使用的环境、条件下来认真验证。开关本身具有防尘、防油构造，但应尽可能保持头部在没有颗粒粉尘、油污、化学品的污染下进行使用。否则可能导致密封磨损、损坏或故障。
耐久性的条件是使用环境温度 5°C ~ 35°C、使用环境湿度 40% ~ 70% RH。
其他详细条件请另行查询。
(2) 使用环境温度为 35°C 以上时，禁止使用 2 回路以上的 3A AC250V 负载。
(3) 这个值会因为开关频率、环境条件、可靠性等级等因素的影响而不同。请事先在实际负载上进行确认。
(4) 叉杆滚珠型的机械寿命为 1,000 万次以上。

型号说明 Model Designations

T4N - (4) (1) (2) (2)
① ② ③

项目 Item	代号 Code	说明 Description
① 导管 / 连接器尺寸 Conduit / connector size	1	Pg13.5 (1 导管型) Pg13.5 (1 conduit type)
	2	G1/2 (1 导管型) G1/2 (1 conduit type)
	4	M20 (1 导管型) M20 (1 conduit type)
	5	Pg13.5 (2 导管型) Pg13.5 (2 conduits type)
	6	G1/2 (2 导管型) G1/2 (2 conduits type)
	8	M20 (2 导管型) M20 (2 conduits type)
② 内置开关 Built-in switch	1	1NC/1NO (速动型) 1NC/1NO (quick-action type)
	2	2NC (速动型) 2NC (quick-action type)
	A	1NC/1NO (慢动型) 1NC/1NO (slow-action type)
③ 头部及传动杆 Head and driving rod	B	2NC (慢动型) 2NC (slow-action type)
	20	滚珠滚杆型 (树脂滚杆, 树脂滚珠) Roller lever (resin lever, resin ball)
	22	滚珠滚杆型 (金属滚杆, 树脂滚珠) Roller lever (metal lever, resin ball)
	25	滚珠滚杆型 (金属滚杆, 金属滚珠) Roller lever (metal lever, metal resin ball)
	2G	可调滚珠滚杆, Form Lock (金属滚杆, 树脂滚珠) Adjustable roller lever, Form Lock (metal lever, resin ball)
	2H	可调滚珠滚杆, Form Lock (金属滚杆, 橡胶滚珠) Adjustable roller lever, Form Lock (metal lever, rubber ball)
	2M	可调滚珠滚杆, Form Lock (金属滚杆, 金属滚珠) Adjustable roller lever, Form Lock (metal lever, metal resin ball)
	31	顶部柱塞型 Top plunger type
	32	顶部柱塞滚珠型 Top plunger ball type
	62	单侧悬臂滚珠型 (水平) Unilateral cantilever ball type (horizontal)
	72	单侧悬臂滚珠型 (垂直) Unilateral cantilever ball type (vertical)
	80	鬃须型 Whisker type
87	塑料棒型 Plastic stick type	

- Note 1. The above values are initial values.
2. Once the contact is connected to a standard load, it can not be used to connect a smaller load. If so, the contact may result in rough surface, thus losing contact reliability.
(1) The protection level is gotten based on test method of IEC60947-5-1. Please make sure its sealing under actual environmental conditions before use. The switch box has dust and oil resistance structure, but it should be used in places without dust, oil and chemicals. Otherwise it may lead to premature wear, damage or malfunction.
(2) The durability is for ambient temperature of 5°C ~ 35°C and humidity of 40% to 70% RH. For additional details, please contact us.
(3) When the ambient temperature is above 35°C, more than 2 circuits 3A 250VAC loads are prohibited.
(4) The values will vary with different switching frequency, environmental conditions, reliability level and other factors. Please confirm on the actual load in advance.
(5) The mechanical life of deadman lever type is more than 10,000,000 times.