

3-WIRE DC TYPE PROXIMITY SENSOR

INSTRUCTION MANUAL

MODEL NUMBERING SYSTEM

Model number printed on the wire

TLX - 1.2 L N 0.4 E J - 4 C I

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

③ T : Open collector type

③ C : Pre-leaded connector mode

(lead length 20cm)

⑦ 4 : The wire ordered is 4m long

Not available : standard 2m long

⑤ Output operation:

E1 : Approach-ON(N.O.)

E2 : Leave-ON(N.C.)

⑤ 04 : Sensing Distance 4mm

④ Output

N : NPN output

P : PNP output

③ L : Cylinder tube elongated model

G : Cylinder tube cut-short model

Not available : Standard

② 12 : Body or induction side O.D. 12mm

① TLX/XP : Metal cylinder shell series

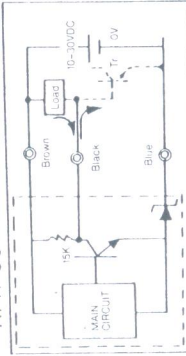
TL/XPC : Plastic corner post shell series

ABS/XPB : Plastic cylinder shell series

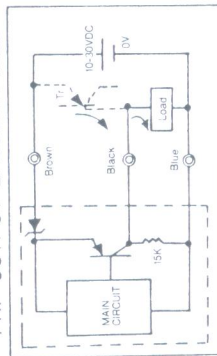
XPD : Spectral plastic shell series

OUTPUT CIRCUIT DIAGRAM

NPN OUTPUT L: 200mA Max.



PNP OUTPUT L: 200mA Max.



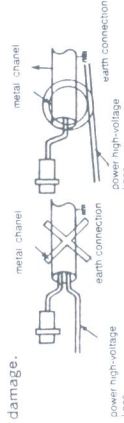
SPECIFICATIONS

- Standard target object: SPCC□×□×it
- : effector diameter or sensing surface
- Differential travel: Max. 10% of sensing distance
- Operating voltage: 10 to 30VDC(ripple not over 10%)
- Voltage drop: Max. 2V
- Load current: Max. 200mA(TLX-08---series L: 100mA)
- Current consumption: Max. 15mA (24VDC)
- Leakage current: Max. 10uA (24VDC)
- Delay in readiness: 100ms
- LED status indicator: yes (in the side or rear)
- Protection: IEC IP67 standard
- Operating temperature range: -25 to 70°C
- Storage temperature range: -25 to 70°C
- Temperature characteristic: within ±10% of sensing distance at 23°C
- Voltage characteristic: within ±2.5% of sensing distance at 24VDC
- Insulation Resistance: Min. 50MΩ (500VDC megger)
- Dielectric strength: 500VAC 50/60Hz for 1 minute
- Vibration Resistance: Double amplitude 1.5mm, 10 to 50Hz, 2 hours in each of X,Y,Z directions
- Shock resistance: 490m/s²(50G) 10 times in each X,Y,Z directions

HINTS ON CORRECT WIRING

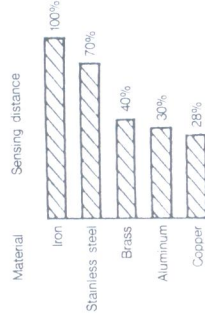
- In the event the power system under your control is a variable power source, that means the proximity switch does not share the same power source as dose the load. Be advised that the voltage acting upon the proximity switch must be greater than the load voltage, in the negative case the proximity switch will keep in status OFF, and signal can not be output, should it be that you are unable to change the power system, and that the load voltage have to exceed the voltage acting upon the proximity switch, please seek alternative by replacing with an open collector output mode of operation per specification.

- If a high voltage or power line runs near the proximity switch cable be sure to wire the switch cable through a metallic conduit to prevent the switch from malfunctioning or damage.



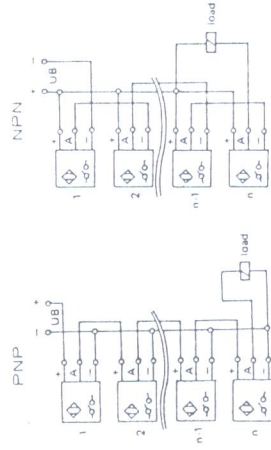
- Please use insulated transformer. Self-coupling transformer cannot be used (single wire coil).

- When detecting non ferrous materials, the distance is modified by multiplying the following correction coef to know the exact distance.

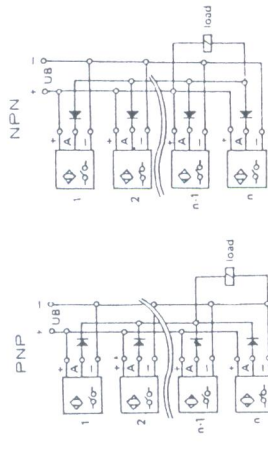


CONNECTION AND WIRING

Be mindful about residual voltage increments.



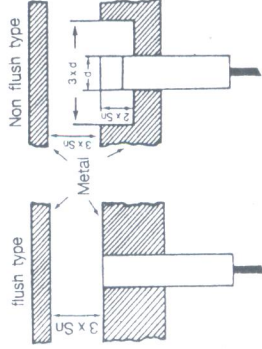
- Connection OR wiring: Be mindful about residual current increments, the output end must be series-connected with a diode protected proximity switch.



MOUNTING CONDITION

- Flush type: Since the sensing face of the proximity switch is a flush type, it can be buried in an iron or steel materials stockpile to prevent being affected by any surrounding metal objects.

- Non flush type: A space should be provided between the sensing face and the surrounding metals, or the sensing face should protrude to prevent surrounding interference.



d : effector diameter
Sn : Sensing Distance

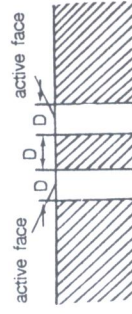
MUTUAL INTERFERENCE

A minimum distance must be observed when identical cylindrical rectangular sensors are mounted opposite each other or in parallel.

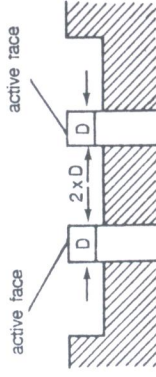
D : effector diameter

Sn : nominal sensing range

- Flush mountable sensors mounted in parallel



- Non-flush mountable sensors mounted in parallel



- Mount opposite each other



OTHER CONDITIONS

- Make sure that the power source is stable within the rated voltage.
- Avoid the use of the output at transient period (about 100ms after turning power on).
- Do not over-tighten the sensor with the attached nuts or screws.
- Make the lead wires as short as possible in the electrical noisy places. Do not wire the output lines lead them together in a duct.
- The sensing distance is changed when the sensing object is plated with metallic materials.
- Do not expose the sensor to the thinner or similar chemicals.
- Extension of the lead wire can be made up to 100m with the 0.3mm conductor cable.
- Do not pull the cord forcibly.
- Do not hit or damage the sensor head.

DC三線式近接開關（使用說明書）

技術洽詢專線：(02)26897705

■ 型號提示

型號列印在近接開關出線端約6cm處

TLX-1 2 L N 0.4 E1-A G I

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

① 系列別

XP/TLX：外殼金屬圓柱型系列

TL/XPC：外殼塑膠圓柱型系列

ABS/XPB：外殼塑膠圓柱型系列

XPD：外殼塑膠圓柱型系列

TLC：電壓出力型系列

②12：本體或感應面外徑尺寸12mm

③L：圓管加長型 G：圓管超短型 無：標準品

④輸出型式：

N：DC三線式NPN輸出 P：DC三線式PNP輸出

⑤04：感應距離4mm

⑥動作狀態：

E1：被測物靠近動作(N.O.)

E2：被測物離開動作(N.C.)

⑦4：電線長度4m(訂製品)

無：電線長度2M(標準品)除此一律訂製

⑧C：附加連接器(連接距離開關20cm處)

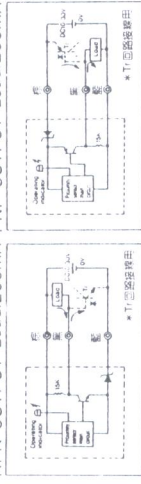
⑨T：集極開路(open collector)輸出方式(訂製品)

■ 規格說明：

- 標準輸出體：鐵□x□xH(厚度1mm)
- ：近接開關直徑或感應面尺寸
- 距離：輸出距離的10%以下
- 工作電壓：10~30VDC, ripple低於10%
- 殘留電壓：2V以下(Load: 200mA時)
- 負載電流：Max. 200mA(TLX-08系列為100mA)
- 消耗電流：15mA(於DC 24V)
- 漏電流：低於10μA(於DC 24V)
- 動作指示：E1紅色LED亮是ON, E2：紅色LED亮是OFF
- 電路保護：具備短路保護、逆極性保護(E2規格無此功能)
- 結構保護：IEC IP67(IP68為訂製品)
- 操作溫度及濕度：-25~70℃, 35~95%RH
- 溫度效應：標準溫度23℃時，而環境溫度在-20~70℃時，其檢測距離產生變化，而其設定距離為SnX±10%
- 電壓效應：標準電壓24VDC時，而操作電壓在10~30VDC時，其檢測距離產生變化，而其設定距離為SnX±2.5%
- 耐絕緣值：50MΩ以上(於500VDC時)
- 耐電壓(材質)：500VAC 50/60Hz持續1分鐘
- 耐衝擊：450m/s(約50G)
- 耐振動：10~55Hz, 1.5mm雙振幅

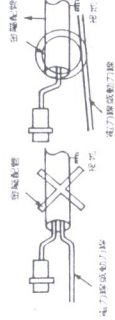
■ 輸出回路及接線：

NPN OUTPUT Load:200mA PNP OUTPUT Load:200mA

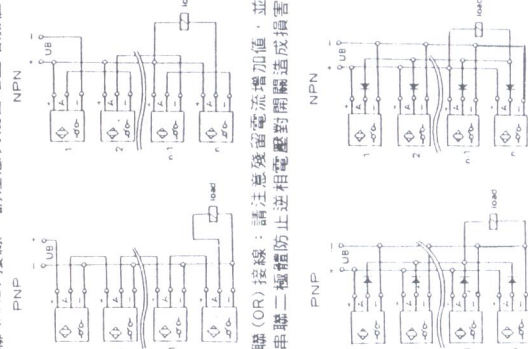


■ 配線提示：

- 當您控制的電源系統為雙電源方式時，亦即近接開關與負載電源不同，請注意提供近接開關的電壓必須大於負載電壓，否則近接開關將保持OFF狀態，信號無法輸出。如果您無法變更電源系統，而負載必須大於近接開關電壓，請您選擇集極開路(Open collector)輸出方式的規格替代。
- 欲延長近接開關的電線長度，請用截面積0.25至0.4mm²之電線，並注意線長度不可超過100M。
- 近接開關的電線不可與動力線或高壓線配置在一起，將近接開關單獨置入接地的金屬導管，否則信號將受干擾。



- 電線請選用絕緣變壓器，不可使用自耦變壓器。
- 如果使用市售SWITCHING POWER時，FRAME GROUND端，必需確實接地，否則會造成近接開關不能正常運作。
- 串聯(AND)接線：請注意其殘留電壓增加值

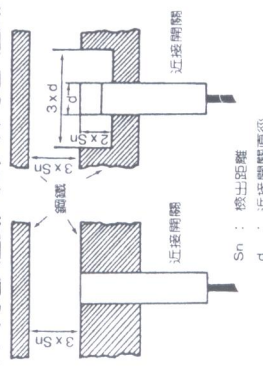


- 並聯(OR)接線：請注意殘留電壓增加值，並在輸出端必須串聯二極體防止逆相電壓對開關造成損害。

■ 安裝提示：

- 觸頭型(可埋入型式)：如圖(1)因檢測面齊平，故可埋設於鑄鐵中，而不受周圍之金屬影響。
- 凸出型(不可埋入型式)：如圖(2)檢測面必須與周圍之金屬保持足夠的空間或突出金屬表面，以免受到周圍金屬干擾而產生誤動作。

(1) (可埋入型式) (2) (不可埋入型式)



■ 修正係數：(參考值，非絕對值)

當被測物為非鐵金屬時，則感應距離將產生改變而縮短，如此勢必修正其修正係數 修正係數：

銅鐵=1，鋁值=0.95

白鐵=0.7，黃銅=0.4，鋁=0.3

紅銅=0.28

例：TLX-30N10E1輸出鋁的距離

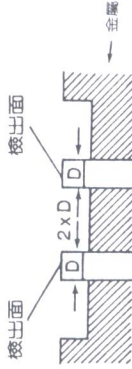
修正後輸出鋁之距離為：

SnX0.3(鋁係數)=10X0.3=3mm

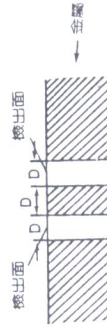
■ 相互干擾防止提示：

當兩個以上的近接開關對向，或平行裝設時，請保持足夠的間隔距離避免干擾產生。

1. 凸出型平行裝設時



2. 齊頭型平行裝設時



3. 對向安裝時



D：近接開關直徑

Sn：伸出距離

■ 定期維護檢查：

近接開關在正確的使用下，可以保持永久久的壽命及穩定性，故在使用期間，平日的定期檢查，維護是非常必要的，確保機器的正常操作。其檢查項目如下：

- (1)檢出物體時，開關位置是否在距離內，是否有鬆動現象，是否有歪斜不正，檢出物是否有變更。
- (2)配線或接線，是否接觸正常，或有無斷線疑慮。
- (3)感應面是否有金屬粉屑堆積。
- (4)使用溫度，及周遭環境條件是否正確。
- (5)安裝空間，是否有異樣，如振動、電氣漏電....。

■ 其他：

- 當通電後，開關須要100ms的前置時間，為達到開關穩定輸出，故於這段時間內，請勿操作開關。
- 避免使用於室外(如有遮蔽物除外)，可選購防水型(IP68)規格。
- 避免有機溶劑直接接觸。
- 防止檢測面受物體撞擊，因為感應部份非常脆弱。
- 當裝置或連轉中之開關電線不可過度拉扯、擺動。

