

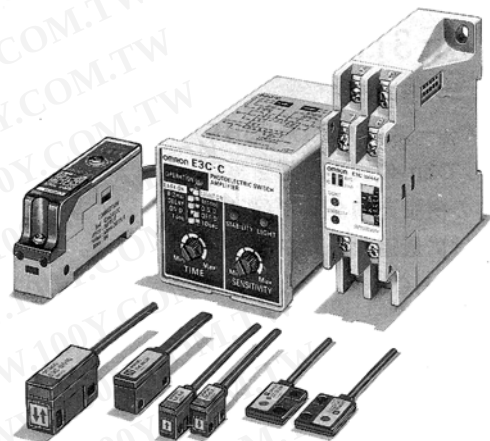
# E3C 型小型頭光電開關（放大器分離型光電開關）

**A** 小型化省空間，可緊密安裝，附干擾防止機能

E  
3  
C

- 感應器輸入表示燈，因此容易設定

勝特力材料 886-3-5753170  
勝特力電子(上海) 86-21-54151736  
勝特力電子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)



## ■ 特點

- 感應器部（汎用型）

| 型狀 | 檢出方式  | 用途  | 檢出距離    | 型式          |
|----|-------|-----|---------|-------------|
|    | 透過型   | 小型  | 10cm    | E3C-S10 型   |
|    |       |     | 50cm    | E3C-S50 型   |
|    |       |     | 1m      | E3C-1 型     |
|    |       |     | 2m      | E3C-2 型     |
|    |       | 細小型 | 20cm    | E3C-S20W 型  |
|    |       | 側視型 | 30cm    | E3C-S30W 型  |
|    |       |     |         | E3C-30T 型   |
|    | 擴散反射型 | 小型  | 10cm    | E3C-DS10 型  |
|    |       | 細小型 | 5cm     | E3C-DS5W 型  |
|    |       | 側視型 | 10cm    | E3C-DS10T 型 |
|    | 限定反射型 | 小型  | 3±0.3cm | E3C-LS3R 型  |

- 感應器部（Mark 檢出用反射型）

| 型狀 | 檢出方式        | 檢出距離      | 型式          |
|----|-------------|-----------|-------------|
|    | Mark 檢出用反射型 | 1±0.2cm   | E3C-VS1G 型  |
|    |             | 3±0.5cm   | E3C-VS3R 型  |
|    |             | 3.5±0.5cm | E3C-VM35R 型 |
|    |             | 7±1cm     | E3C-VS7R 型  |

- 放大器部

| 型狀 | 電源 | 用途    | 計時功能                         | 動作模樣                     | 自己診斷輸出 | 型式         |
|----|----|-------|------------------------------|--------------------------|--------|------------|
|    | AC | 汎用型   | —                            | 入光 ON<br>遮光 ON<br>(可以切換) | —      | E3C-A 型    |
|    |    |       | 多重計時                         |                          | —      | E3C-C 型    |
|    | DC | 細小型   | OFF delay<br>0/40ms<br>有切換開關 |                          | 有診斷輸出  | E3C-JC4P 型 |
|    |    | 小型    | —                            |                          | —      | E3C-GE4 型  |
|    |    | 表面端子型 | —                            |                          | —      | E3C-WH4F 型 |

## 規格

| 分類        | 感應部  |                                                                                                        |           |         |                 | 放大部                      |                                            |                                                    |
|-----------|------|--------------------------------------------------------------------------------------------------------|-----------|---------|-----------------|--------------------------|--------------------------------------------|----------------------------------------------------|
| 項目        | 型式   | E3C-S10 型<br>E3C-S20W 型<br>E3C-1 型<br>E3C-DS5W 型<br>E3C-DS10T 型<br>E3C-DS10 型                          | E3C-S50 型 | E3C-2 型 | E3C-LS3R 型      | E3C-S30T 型<br>E3C-S30W 型 | E3C-A 型<br>E3C-C 型                         | E3C-JC4P 型<br>E3C-GE4 型<br>E3C-WE4 型<br>E3C-WH4F 型 |
| 光源 (發光波長) |      | 紅色發光二極體<br>E3C-1 型 E3C-2 型 E3C-DS10T、E3C-DS10 (950nm)<br>E3C-S10 型 E3C-S50 型 E3C-S20W、E3C-DS5W (925nm) |           |         | 紅外發光二極體 (680nm) | 紅外發光二極體 (940nm)          | —                                          |                                                    |
| 顯示燈       |      | 入光顯示 (紅色)<br>(E3C-DS10T 型無)                                                                            |           |         |                 | 入光顯示 (紅色、投光器側)           | 入光顯示 (紅色)<br>動作顯示 (紅色)<br>安定 level 顯示 (綠色) | 入光顯示 (紅色)<br>安定 level 顯示 (綠色)                      |
| 感應調整      |      | —                                                                                                      |           |         |                 |                          | 付旋鈕                                        | 4 回轉付旋鈕                                            |
| 連接方式      |      | 纜線引出式                                                                                                  |           |         |                 | 端子式                      | 端子台入力<br>code 引出                           | 端子式                                                |
| 材質        | 外殼   | 聚碳酸酯                                                                                                   | ABS 樹脂    | 亞鉛模鑄    | 聚碳酸酯            | ABS 樹脂                   |                                            |                                                    |
|           | 透視蓋  | 聚碳酸酯                                                                                                   | 壓克力       | 聚碳酸酯    |                 |                          | —                                          | 聚碳酸酯                                               |
|           | 安裝金具 | 鐵*                                                                                                     | —         | 鐵       | —               |                          |                                            |                                                    |

\* E3C-1 型用

## 額定 / 性能

| 檢出方式<br>型式 |      | 透過型                                        |                                          |             |                                         |                                         |          |
|------------|------|--------------------------------------------|------------------------------------------|-------------|-----------------------------------------|-----------------------------------------|----------|
| 項目         |      | E3C-S10 型                                  | E3C-S20W 型                               | E3C-S50 型   | E3C-S30T 型<br>E3C-S30W 型                | E3C-1 型                                 | E3C-2 型  |
| 檢出距離       |      | 10cm                                       | 20cm                                     | 50cm        | 30cm                                    | 1m                                      | 2m       |
| 最小檢出物體     |      | 不透明體 2mm                                   |                                          | 不透明體 3mm    | 不透明體 2mm                                | 不透明體 4mm                                | 不透明體 8mm |
| 指示角        |      | 10~60°                                     |                                          | 10~40°      |                                         | 3~20°                                   | 3~15°    |
| 使用距離       | 白熱燈泡 | 受光面照度 3,000lx 以下                           |                                          |             |                                         |                                         |          |
| 使用距離       | 太陽光  | 受光面照度 10,000lx 以下                          |                                          |             |                                         |                                         |          |
| 使用距離溫度     |      | -25~+70℃（不結冰時）                             |                                          |             |                                         |                                         |          |
| 使用距離濕度     |      | 35~85RH                                    |                                          |             |                                         |                                         |          |
| 振動         |      | 耐久：10~55Hz<br>複振幅 1.5mm<br>X、Y、Z 各方向 2h    | 耐久：10~500Hz<br>複振幅 1.5mm<br>X、Y、Z 各方向 2h |             | 耐久：10~55Hz<br>複振幅 1.5mm<br>X、Y、Z 各方向 2h | 耐久：10~55Hz<br>複振幅 1.5mm<br>X、Y、Z 各方向 2h |          |
| 衝擊         |      | 耐久：500m/s <sup>2</sup> {50G} X、Y、Z 各方向 3 次 |                                          |             |                                         |                                         |          |
| 保護構造       |      | IEC 規格 IP64                                | IEC 規格 IP50                              | IEC 規格 IP64 | IEC 規格 IP60                             | IEC 規格 IP66                             |          |

| 檢出方式<br>型式 |      | 擴散反射型                                      |             |                                   | 限定反射型                        |
|------------|------|--------------------------------------------|-------------|-----------------------------------|------------------------------|
| 項目         |      | E3C-DS5W 型                                 | E3C-DS10T 型 | E3C-DS10 型                        | E3C-LS3R 型                   |
| 檢出距離       |      | 5cm                                        | 10cm        |                                   | 3±0.3mm                      |
| 標準檢出物體     |      | 白畫用紙 10×10cm                               |             |                                   | 白畫用紙 1×1cm                   |
| 應差距離       |      | 20% 以下                                     |             |                                   | ±3% 以下                       |
| 使用距離       | 白熱燈泡 | 受光面照度 3,000lx 以下                           |             |                                   |                              |
| 使用距離       | 太陽光  | 受光面照度 10,000lx 以下                          |             |                                   |                              |
| 使用距離溫度     |      | -25~+70℃（不結冰時）                             |             |                                   |                              |
| 使用距離濕度     |      | 35%~85%RH                                  |             |                                   |                              |
| 振動         |      | 耐久：10~500Hz 複振幅 1.5mm X、Y、Z 各方向 2h         |             | 耐久：10~55Hz 複振幅 1.5mm X、Y、Z 各方向 2h |                              |
| 衝擊         |      | 耐久：500m/s <sup>2</sup> {50G} X、Y、Z 各方向 3 次 |             |                                   | 耐久：500m/s <sup>2</sup> {50G} |
| 保護構造       |      | IEC 規格 IP50                                |             | IEC 規格 IP64                       | IEC 規格 IP64                  |

## 放大部構造

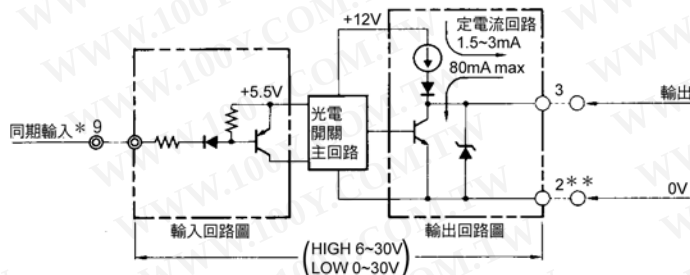
| 項目        | 型式  | E3C-A 型                                          | E3C-C 型                                          | E3C-JC4P 型                  | E3C-GE4 型                                      | E3C-WE4 型                                             | E3C-WH4F 型                                                             |                                                            |
|-----------|-----|--------------------------------------------------|--------------------------------------------------|-----------------------------|------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------|
| 電源電壓      |     | AC 100~240V±10% (50/60Hz)                        |                                                  |                             | DC 12~24±10% 漣波 (p-p)1V 以下                     |                                                       |                                                                        |                                                            |
| 消耗電力 (電流) |     | 3W 以下                                            |                                                  |                             | 50mA 以下                                        |                                                       |                                                                        |                                                            |
| 應答時間      | 無接點 | 1ms 以下 / 2ms 以下 (切換)                             |                                                  |                             | 1ms                                            | 1ms 以下 / 2ms 以下 (切換)                                  |                                                                        |                                                            |
|           | 有接點 | 20ms 以下                                          |                                                  |                             | —                                              |                                                       |                                                                        |                                                            |
| 控制輸出      | 無接點 | 輸出電流 1.5~4mA<br>負載電流 80mA DC 24V<br>(殘留電壓 1V 以下) |                                                  |                             | NPN 集極開路輸出<br>負載電流 100mA DC24V<br>(殘留電壓 1V 以下) | 輸出電流 1.5~4mA<br>負載電流 80mA<br>DC 24V<br>(殘留電壓 1.2V 以下) | 輸出電流 1.5~4mA<br>負載電流 80mA 以下<br>DC 24V<br>(殘留電壓 0.7V 以下)<br>NPN 集極開路輸出 | 負載電流 100mA 以下<br>DC 40V 以下<br>(殘留電壓 0.7V 以下)<br>NPN/PNP 切換 |
|           | 有接點 | AC 220V 1A cosφ=1 (阻抗負載)                         |                                                  |                             | —                                              |                                                       |                                                                        |                                                            |
| 外部脈衝輸入    |     | —                                                | H=6~30V<br>阻抗 OPEN<br>L=0~2V                     | —                           |                                                |                                                       |                                                                        |                                                            |
| 計時功能      |     | —                                                | ON delay<br>OFF delay<br>ONE-shot 切換<br>(1s、10s) | OFF delay<br>(0/40ms 有切換開關) | —                                              |                                                       |                                                                        |                                                            |
| 使用溫度範圍    |     | -10~+55℃ (不結冰時)                                  |                                                  |                             |                                                |                                                       |                                                                        |                                                            |
| 使用濕度範圍    |     | 35% ~ 85%RH                                      |                                                  |                             |                                                |                                                       |                                                                        |                                                            |
| 振動        |     | 耐久：10~55Hz 複振幅 1.5mm<br>X、Y、Z 各方向 2h             |                                                  |                             | 耐久：10~500Hz 複振幅<br>1.5mm X、Y、Z 各方向 2h          | 耐久：10~55Hz 複振幅 1.5mm X、Y、Z 各方向 2h                     |                                                                        |                                                            |
| 衝擊        |     | 耐久：300m/s <sup>2</sup> {30G}                     |                                                  |                             |                                                |                                                       |                                                                        |                                                            |
| 保護構造      |     | IEC 規格 IP20                                      |                                                  |                             |                                                |                                                       |                                                                        |                                                            |

# E3S-C

A  
E  
3  
C

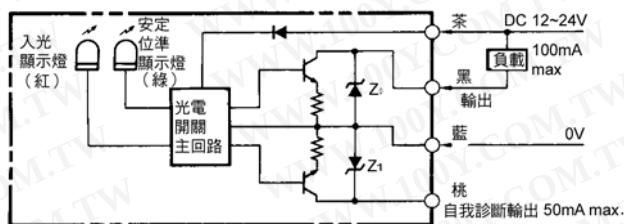
## ■ 輸出回路圖

E3C-A/C 型

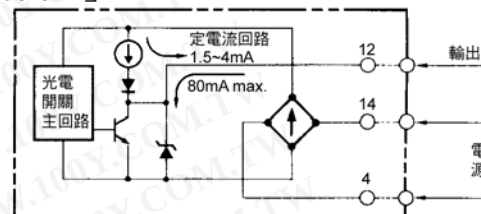


\* 同時入力之機能只有 E3C-C 才有  
 \* E3C-A/C 有 1C 出力接點 (端子號碼請參照圖示)

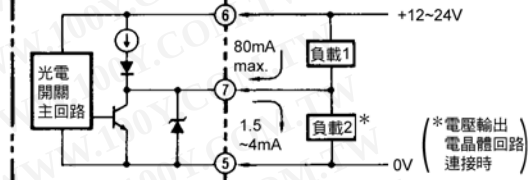
E3C-JC4P 型



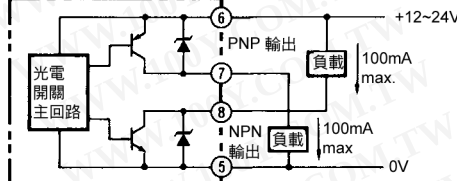
E3C-GE4 型



E3C-WE4 型



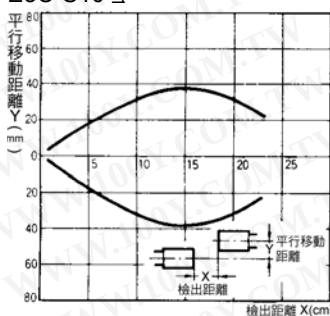
E3C-WH4F 型



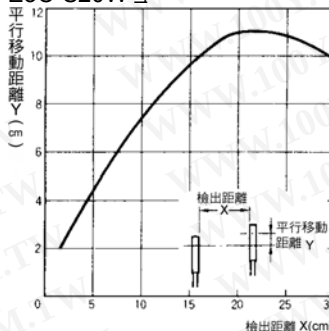
## 特性曲線

■ 平行移動距離特性 (代表例)

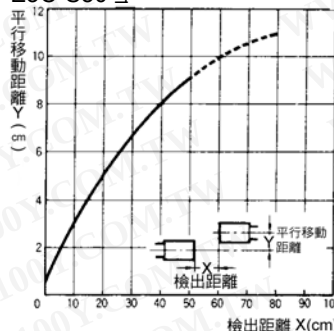
E3C-S10 型



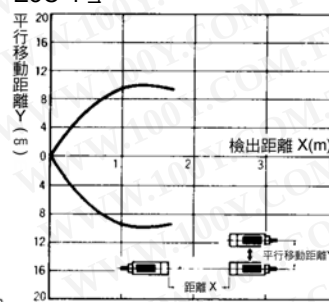
E3C-S20W 型



E3C-S50 型

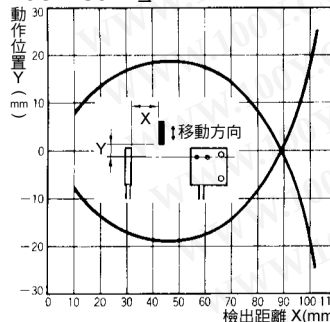


E3C-1 型

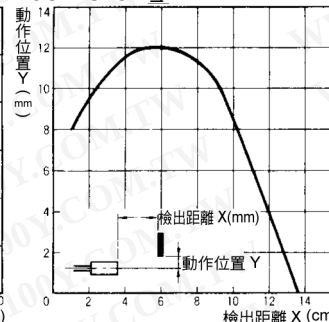


● 動作領域特性 (代表例)

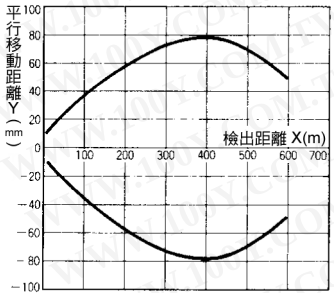
E3C-DS5W 型



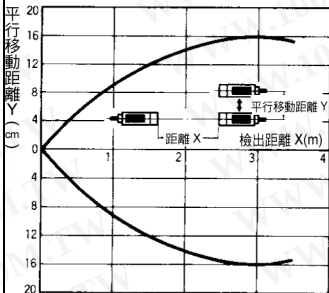
E3C-DS10T 型



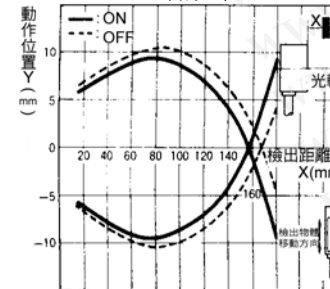
E3C-S30T/S30W 型



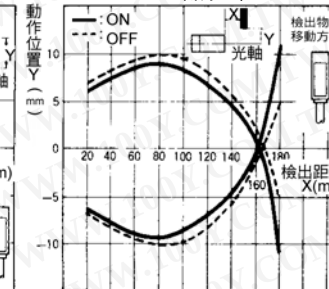
E3C-2 型



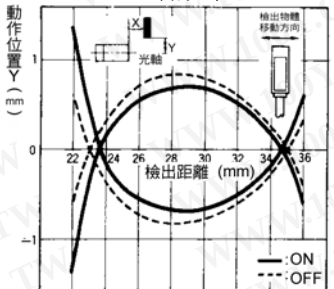
E3C-DS10 型 (例 1)



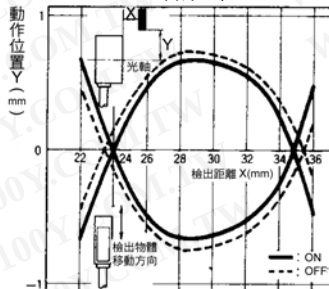
E3C-DS10 型 (例 2)



E3C-LS3R 型 (例 1)



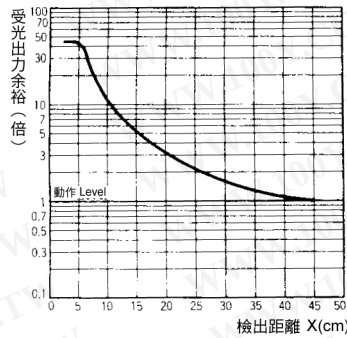
E3C-LS3R 型 (例 2)



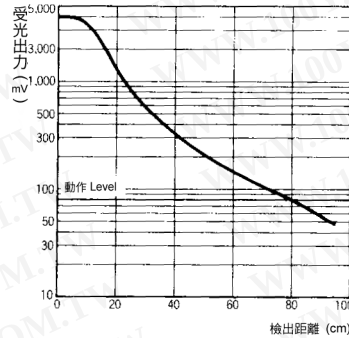


● 受光輸出餘裕度一設定距離特性

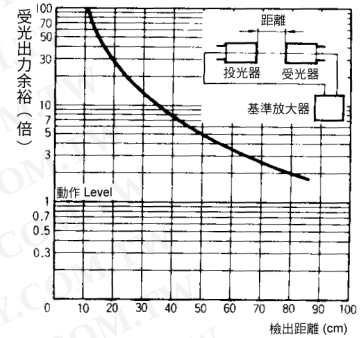
E3C-S20W 型 (代表例)



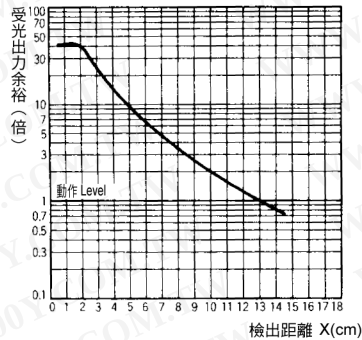
E3C-S30T/-30W 型 (代表例)



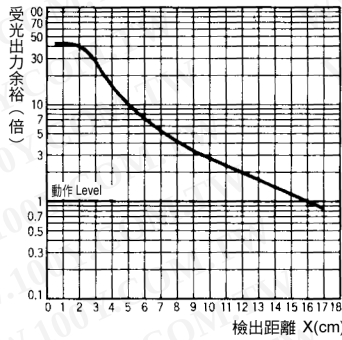
E3C-S50 型 (代表例)



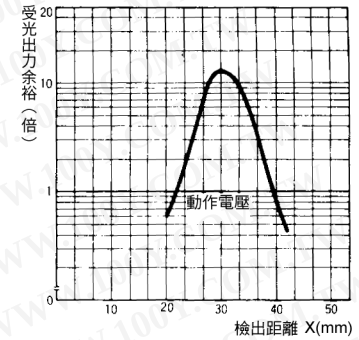
E3C-DS5W 型 (代表例)



E3C-DS10T 型 (代表例)

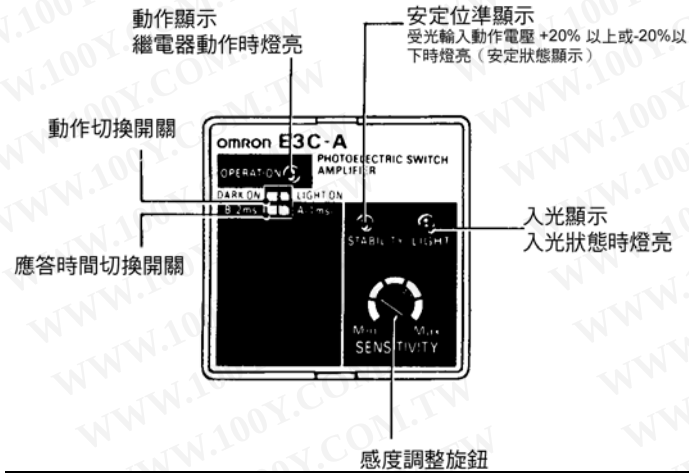


E3C-LS30R 型 (代表例)



■ 動作

E3C-A 型 / 基本動作型



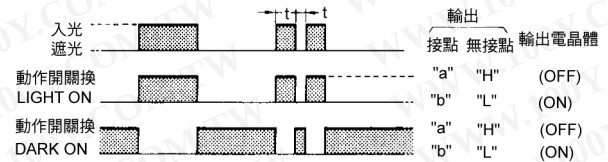
● 開關選定方法

動作切換

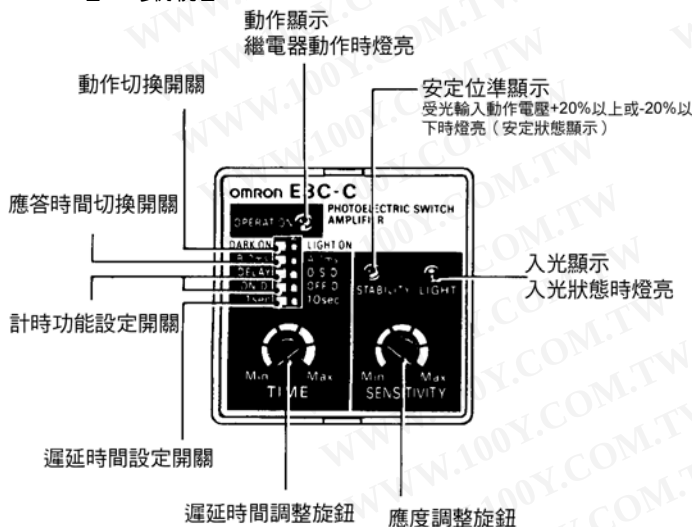
DARK ON [ ] LIGHT ON [ ] ← 遮光時 Relay ON, 無接點輸出在 "H"  
 DARK ON [ ] LIGHT ON [ ] ← 入光時 Relay ON, 無接點輸出在 "H"

應答時間切換 (由應答速度的切換可以構成異相波型)

2ms (B) [ ] 1ms (A) ← 應答時間 2ms  
 2ms (B) [ ] 1ms (A) ← 應答時間 1ms



E3C-C 型 / 多機能型



● 開關選定方法

動作切換

DARK ON [ ] LIGHT ON [ ] ← 遮光時 Relay ON, 無接點輸出 "H"  
 DARK ON [ ] LIGHT ON [ ] ← 入光時 Relay ON, 無接點輸出在 "H"

應答時間切換 (由應答速度的切換可以構成異相波型)

2ms (B) [ ] 1ms (A) ← 應答時間 2ms  
 2ms (B) [ ] 1ms (A) ← 應答時間 1ms

遲延時間設定

1sec [ ] 10sec ← 0.1 秒 ~ 1 秒設定可能  
 1sec [ ] 10sec ← 1 秒 ~ 100 秒設定可能

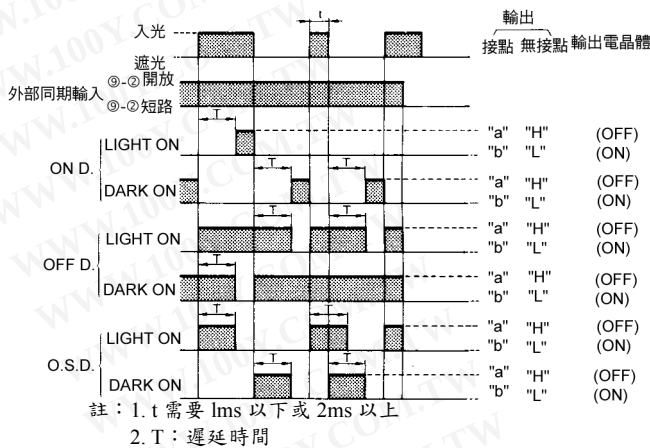


切換開關設定後, 可由旋鈕做遲延時間的微調整 (向右轉遲延時間增加)

## E3S-C

### 計時器功能設定

|                          |                                                                                                                                                                                                                                                                                                                                  |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ON delay                 | DARK ON <input type="checkbox"/> LIGHT ON <input type="checkbox"/> ← 希望位置設定<br>2ms(B) <input type="checkbox"/> 1ms(A) ← 希望位置設定<br>DELAY <input type="checkbox"/> O.S.D <input type="checkbox"/><br>ON D <input type="checkbox"/> OFF D <input type="checkbox"/><br>1sec <input type="checkbox"/> 10sec ← 希望位置設定                  |
| OFF delay                | DARK ON <input type="checkbox"/> LIGHT ON <input type="checkbox"/> ← 希望位置設定<br>2ms(B) <input type="checkbox"/> 1ms(A) ← 希望位置設定<br>DELAY <input type="checkbox"/> O.S.D <input type="checkbox"/><br>ON D <input type="checkbox"/> OFF D <input type="checkbox"/><br>1sec <input type="checkbox"/> 10sec ← 希望位置設定                  |
| ONE-SHOT delay<br>(觸發延遲) | DARK ON <input type="checkbox"/> LIGHT ON <input type="checkbox"/> ← 希望位置設定<br>2ms(B) <input type="checkbox"/> 1ms(A) ← 希望位置設定<br>DELAY <input type="checkbox"/> O.S.D <input type="checkbox"/><br>ON D <input type="checkbox"/> OFF D <input type="checkbox"/> ← 無作用，放置於哪一個位置均可<br>1sec <input type="checkbox"/> 10sec ← 希望位置設定 |

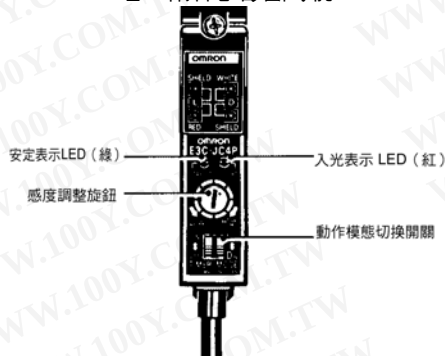


### 外部同期輸入動作

外部同期輸入端子 (9) 開放時，(HIGH) 輸出 Relay 隨輸入信號 (入光、遮光) 計時動作。

外部同期輸入端子 (9) 為 OV，端子 (2) 短路時，(LOW) 輸出 Relay 與輸入信號輸出狀態沒有關係，變成 OFF，做為禁止信號動作。

### E3S-JC4P 型 / 附自診斷功能



### E3S-JC4P 型

| 模態切換開關     | LIGHT ON | DARK ON |
|------------|----------|---------|
| 電晶體輸出之動作狀態 | 入光時 ON   | 遮光時 ON  |
| 時序圖        |          |         |

### E3C-GE4 / 基本動作型

安定位置顯示  
受光輸入動作電壓 +20% 以上或  
-20% 以下時燈亮  
安定狀態下顯示  
入光顯示  
入光狀態時燈亮



### ● 選定方法

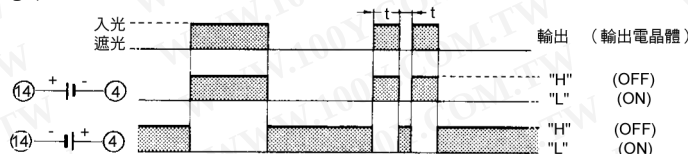
#### 動作切換

|       |            |
|-------|------------|
| ⑭ - ④ | 遮光時輸出在 "H" |
| ⑭ + ④ | 入光時輸出在 "H" |

應答時間切換 (由應答速度的切換可以構成異性波型)

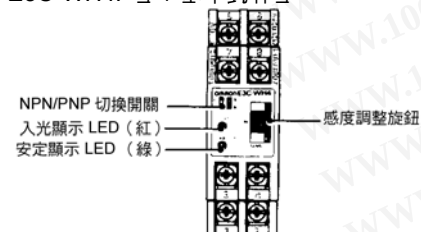
|           |          |
|-----------|----------|
| ⑧- OV 短路* | 應答時間 2ms |
| ⑧- 開放     | 應答時間 1ms |

\* 電源 OV

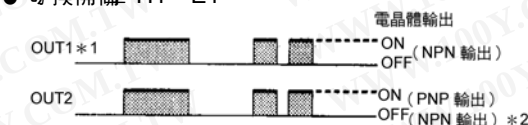


### E3C-WE4 型

### E3C-WH4F 型 / 基本動作型



### ● 切換開關 H1、E1



### ● 切換開關 H2、E2



\* 1. OUT1 僅 E3C-WH4F 型有，E3C-WE4 型無  
2. E3C-WE4 型時，成 NPN 輸出



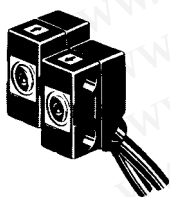


# E3S-C

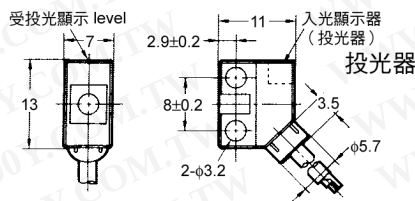
勝特力材料 886-3-5753170  
 勝特力电子(上海) 86-21-54151736  
 勝特力电子(深圳) 86-755-83298787  
[Http://www.100y.com.tw](http://www.100y.com.tw)

A  
E  
3  
C

E3C-S50 型

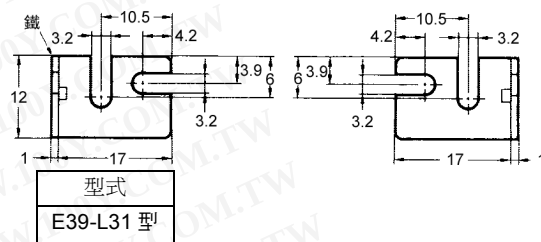


纜線：外徑  $\phi 2.4$   
 (1C $\times$ 12/0.18) 標準 2m  
 重量：約 50g



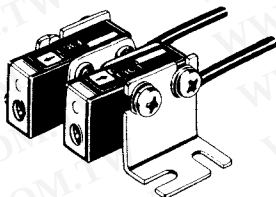
CAD 檔 E3C-15

另裝金具 (另售)

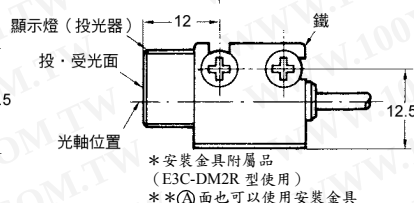
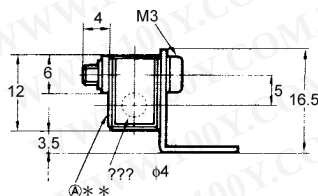


註：安裝金具 (另售) 投光 / 受光部安裝用請訂購 2 個

E3C-1 型



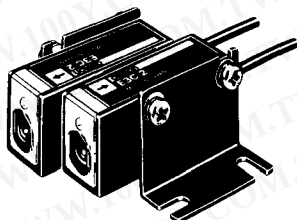
纜線：外徑  $\phi 2.4$   
 (1C $\times$ 12/0.18) 標準 2m  
 重量：約 60g



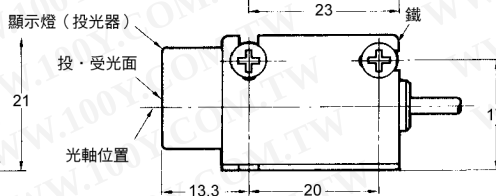
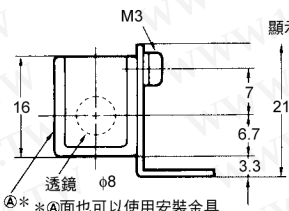
\* 安裝金具附屬品  
 (E3C-DM2R 型使用)  
 \*\* ①面也可以使用安裝金具

CAD 檔 E3C-01

E3C-2 型



纜線：外徑  $\phi 2.4$   
 (1C $\times$ 12/0.18) 標準 2m  
 重量：約 120g

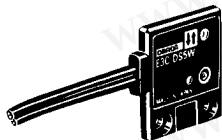


另裝金具  
 (E3C-2 附 2 個)  
 型式  
 E39-L42 型

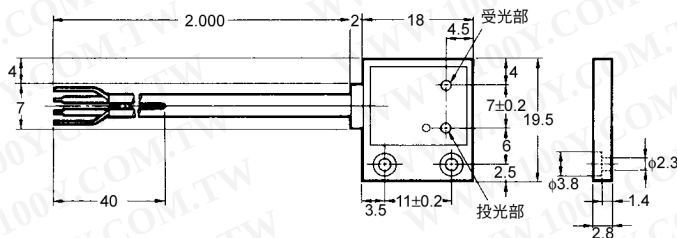
CAD 檔 E3C-02

## ● 感應器 / 反射型

E3C-DS5W 型

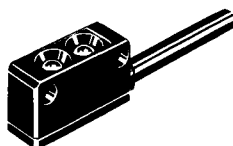


纜線：外徑 1.8 $\times$ 3.6  
 (2C $\times$ 7/0.18) 標準 2m  
 重量：約 50g

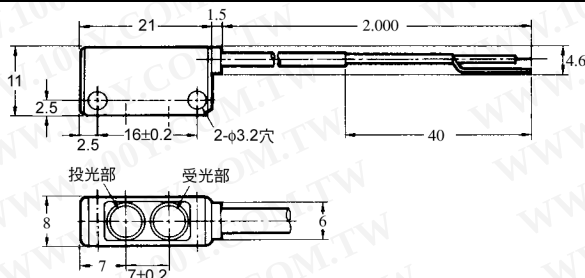


CAD 檔 E3C-06

E3C-DS10T 型

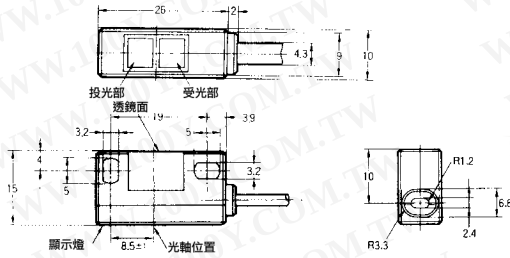


纜線：外徑 2.4 $\times$ 4.3  
 (2C $\times$ 12/0.18) 標準 2m  
 重量：約 50g



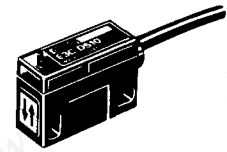
CAD 檔 E3C-05

E3C-DS10 型



另裝金具 (另售)

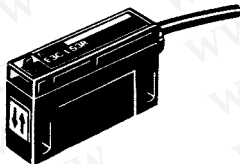
| 型式              |
|-----------------|
| E39-L42 型 (1 條) |



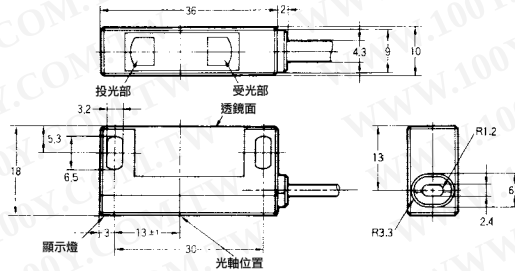
纜線：外徑 2.4x4.3  
(2C×I2/0.18) 標準 2m

CAD 檔 E3C-04 重量：約 50g

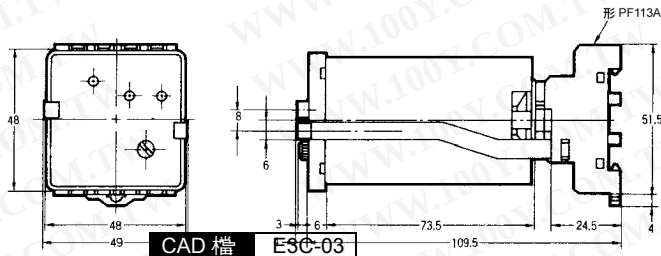
E3C-LS3R 型



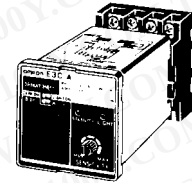
纜線：外徑 2.4x4.3  
(2C×I2/0.18) 標準 2m  
重量：約 50g



CAD 檔 E3C-09



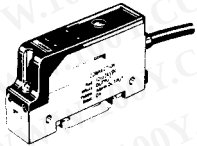
E3C-A 型 (連接座在附屬)  
E3C-C 型 (連接座在附屬)



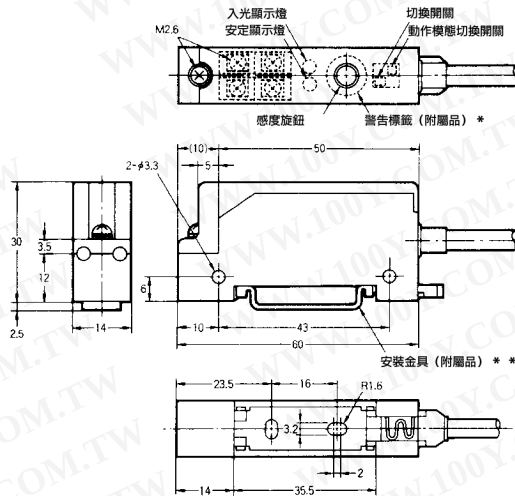
註：外觀尺寸是接 PFII3A  
連接座時的狀態

重量：約 220g

E3C-JC4P 型



纜線：聚脂絕緣圓柱形纜線  
(φ4.5 18/0.124 蕊) 標準 2m  
重量：約 80g



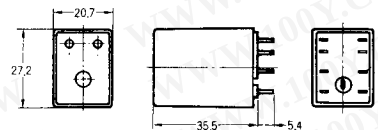
CAD 檔 E3C-08

\* 感度旋鈕調整後，防止誤操作請使用  
\* \* DIN 鋁軌安裝時，可不用

E3C-GE4 型 (SOCKET 另售)



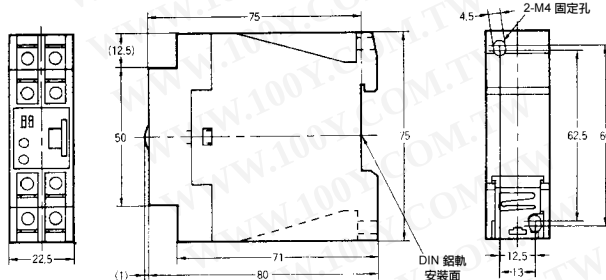
重量：約 15g



連接座  
請使用 PYF08A 表面連接  
PY08 裡面連接

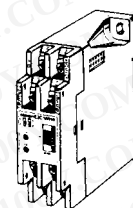
CAD 檔 E3C-20

E3C-WE4 型  
E3C-WH4F 型



CAD 檔 E3C-19

重量：約 100g





## Photoelectric Sensor

## E3C

### Small Sensing Head

- Compact sensing head available in a wide variation of designs features installation in a narrow space.
- Mutual interference preventive function allows side-by-side mounting of two sensors.
- Light indicator provided in the sensing head.

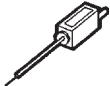


### Ordering Information

#### ■ Sensor Units

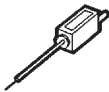
##### Through-beam (Separate) Sensors

| Model            | E3C-S10                                                                             | E3C-S20W                                                                            | E3C-S30T                                                                              | E3C-S30W                                                                              |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Appearance       |  |  |  |  |
| Sensing distance | 10 cm                                                                               | 20 cm                                                                               | 30 cm                                                                                 | 30 cm                                                                                 |

| Model            | E3C-S50                                                                             | E3C-1                                                                               | E3C-2 | E3C-S5                                                                                | E3C-S5A                                                                               |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Appearance       |  |  |       |  |  |
| Sensing distance | 50 cm                                                                               | 1 m                                                                                 | 2 m   | 5 cm                                                                                  | 5 cm                                                                                  |

##### Diffuse Reflective Sensors

| Model            | E3C-DS5W                                                                            | E3C-DS10                                                                            | E3C-DS10T                                                                             |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Appearance       |  |  |  |
| Sensing distance | 5 cm                                                                                | 10 cm                                                                               | 10 cm                                                                                 |

| Model            | E3C-DM2R                                                                            | E3C-DM5 | E3C-DS1 | E3C-DM5A                                                                              | E3C-DS1A |
|------------------|-------------------------------------------------------------------------------------|---------|---------|---------------------------------------------------------------------------------------|----------|
| Appearance       |  |         |         |  |          |
| Sensing distance | 2 mm                                                                                | 5 mm    | 1 cm    | 5 mm                                                                                  | 1 cm     |

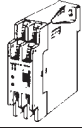
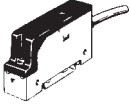
## Definite Reflective Sensor

|                  |                                                                                  |
|------------------|----------------------------------------------------------------------------------|
| Model            | E3C-LS3R                                                                         |
| Appearance       |  |
| Sensing distance | 3±0.3 cm                                                                         |

## Mark Sensor

|                  |                                                                                   |          |                                                                                     |          |
|------------------|-----------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------|----------|
| Model            | E3C-VS1G                                                                          | E3C-VS3R | E3C-VM35R                                                                           | E3C-VS7R |
| Appearance       |  |          |  |          |
| Sensing distance | 1±0.2 cm                                                                          | 3±0.5 cm | 3.5±0.5 cm                                                                          | 7±1 cm   |

## ■ Amplifier Units

| Type           |             | AC operation                                                                      |                              | DC operation                                                                      |                                                                                     |                                                                                     |
|----------------|-------------|-----------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                |             | Standard                                                                          | Multi-function               | Slim top                                                                          | Miniature                                                                           | Cable connection                                                                    |
| Model          |             | E3C-A                                                                             | E3C-C                        | E3C-WH4F                                                                          | E3C-GE4<br>(NPN output)<br>E3C-GF4<br>(PNP output)                                  | E3C-JC4P<br>(NPN output)<br>E3C-JB4P<br>(PNP output)                                |
| Appearance     |             |  |                              |  |  |  |
| Mounting       |             | Surface/DIN track with socket (see note)                                          |                              | DIN track                                                                         | Surface/DIN track with socket (see note)                                            | DIN track                                                                           |
| Output         | Relay       | Yes                                                                               | Yes                          | No                                                                                | No                                                                                  | No                                                                                  |
|                | Solid-state | Yes                                                                               | Yes                          | Yes                                                                               | Yes                                                                                 | Yes                                                                                 |
| Timer function |             | No                                                                                | Yes (ON/OFF, one-shot delay) | No                                                                                | No                                                                                  | Yes (OFF-delay)                                                                     |
| Gate function  |             | No                                                                                | Yes                          | No                                                                                | No                                                                                  | No                                                                                  |

**Note:** E3C-A and E3C-C include DIN track-mount socket PF113A.

# Specifications

## ■ Ratings/Characteristics Sensor Units (with E3C Amplifier)

| Item                | E3C-S10                                  | E3C-S20W | E3C-S50              | E3C-30T<br>E3C-30W       | E3C-1                | E3C-2                |
|---------------------|------------------------------------------|----------|----------------------|--------------------------|----------------------|----------------------|
|                     | Through-beam                             |          |                      |                          |                      |                      |
| Sensing distance    | 10 cm                                    | 20 cm    | 50 cm                | 30 cm                    | 1 m                  | 2 m                  |
| Standard object     | 2 mm (opaque object)                     |          | 3 mm (opaque object) | 0.3 dia. (opaque object) | 4 mm (opaque object) | 8 mm (opaque object) |
| Indicator           | Light indicator (red)                    |          |                      |                          |                      |                      |
| Enclosure ratings   | IEC IP64                                 | IEC IP50 | IEC IP64             | IEC IP60                 | IEC IP66             | IEC IP66             |
| Material            | Plastic                                  |          |                      |                          |                      | Metal                |
| Light source        | Infrared LED                             |          |                      |                          |                      |                      |
| Ambient temperature | Operating: -25°C to 70°C (with no icing) |          |                      |                          |                      |                      |

| Item                | E3C-DS5W                                 | E3C-DS10T | E3C-DS10                   | E3C-LS3R            |
|---------------------|------------------------------------------|-----------|----------------------------|---------------------|
|                     | Diffuse reflective                       |           |                            | Definite reflective |
| Sensing distance    | 5 cm                                     | 10 cm     |                            | 3±0.3 cm            |
| Standard object     | 10 x 10 cm (white mat paper)             |           | 5 x 5 cm (white mat paper) | 1 x 1 cm (see note) |
| Indicator           | Light indicator (red)                    |           |                            |                     |
| Enclosure ratings   | IEC IP50                                 |           | IEC IP64                   |                     |
| Material            | Plastic                                  |           |                            |                     |
| Light source        | Infrared LED                             |           |                            | Red LED             |
| Ambient temperature | Operating: -25°C to 70°C (with no icing) |           |                            |                     |

| Item                | E3C-S5                                   | E3C-DM2R            | E3C-DM5 | E3C-DS1             | E3C-S5A                         | E3C-DM5A                   | E3C-DS1A            |
|---------------------|------------------------------------------|---------------------|---------|---------------------|---------------------------------|----------------------------|---------------------|
|                     | Through-beam                             | Diffuse reflective  |         |                     | Through-beam                    | Diffuse reflective         |                     |
| Sensing distance    | 5 cm                                     | 2 mm                | 5 mm    | 1 cm                | 5 cm                            | 5 mm                       | 1 cm                |
| Standard object     | 2 mm (opaque object)                     | 1 x 1 cm (see note) |         | 2 x 2 cm (see note) | 2 mm (opaque object) (see note) | 1 x 1 cm (white mat paper) | 2 x 2 cm (see note) |
| Differential travel | ---                                      | 20% max.            |         |                     | ---                             | 20% max.                   |                     |
| Indicator           | Light indicator (red)                    |                     |         |                     | ---                             |                            |                     |
| Enclosure ratings   | IEC IP64                                 |                     |         |                     |                                 |                            |                     |
| Material            | Plastic                                  |                     |         |                     |                                 |                            |                     |
| Ambient temperature | Operating: −25°C to 70°C (with no icing) |                     |         |                     |                                 |                            |                     |

Note: 90% reflection white mat paper

| Item                    | E3C-VS1G                                                                                   | E3C-VS3R                            | E3C-VM35R                                | E3C-VS7R                                 |
|-------------------------|--------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------|------------------------------------------|
|                         | Retroreflective for mark sensor                                                            |                                     |                                          |                                          |
| Sensing distance        | 1±0.2 cm                                                                                   | 3±0.5 cm                            | 3.5±0.5 cm                               | 7±1.0 cm                                 |
| Min. sensing mark width | 0.9 mm (center of Sensing distance)                                                        | 1.6 mm (center of Sensing distance) | 0.2 mm (center of Sensing distance)      | 0.6 mm (center of Sensing distance)      |
| Ambient illumination    | Incandescent lamp: 1,000 lx max. Sunlight: 3,000 lx max.                                   |                                     |                                          |                                          |
| Ambient temperature     | Operating: -10°C to 70°C (with no icing)                                                   |                                     | Operating: -25°C to 70°C (with no icing) | Operating: -10°C to 70°C (with no icing) |
| Ambient humidity        | Operating: 35% to 85%                                                                      |                                     |                                          |                                          |
| Enclosure ratings       | IEC IP64                                                                                   |                                     | IEC IP50                                 |                                          |
| Vibration resistance    | Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hrs each in X, Y, and Z directions |                                     |                                          |                                          |
| Shock resistance        | Destruction: 500 m/s <sup>2</sup> (approx. 50G)                                            |                                     |                                          |                                          |



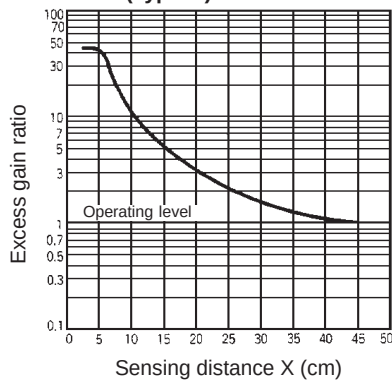
## Amplifier Units

| Item                           |                     | E3C-A                                    | E3C-C                                                 | E3C-WH4F                                  | E3C-G□4         | E3C-J□4P                      |
|--------------------------------|---------------------|------------------------------------------|-------------------------------------------------------|-------------------------------------------|-----------------|-------------------------------|
| Power supply voltage           |                     | 100 to 240 VAC ±10%, 50/60 Hz            |                                                       | 12 to 24 VDC ±10%, ripple (p-p): 1 V max. |                 |                               |
| Current consumption            |                     | 3 W max.                                 |                                                       | 50 mA max.                                |                 |                               |
| Output                         | DC solid-state load | 80 mA max.                               |                                                       | 100 mA max.                               |                 |                               |
|                                | Relay output        | 1 A at 220 VAC, cosφ = 1                 |                                                       | ---                                       |                 |                               |
|                                | DC voltage drop     | 1 V max.                                 |                                                       | 0.7 V max.                                | 1.2 V max.      | 0.7 V max.                    |
| Alarm output                   |                     | ---                                      |                                                       |                                           |                 | 50 mA                         |
| Response time                  |                     | 1/2 ms max. selectable                   |                                                       |                                           |                 | 1 ms                          |
| Timer function                 |                     | ---                                      | ON/OFF, one-shot delay (selectable): 1 or 10 s max.   | ---                                       |                 | OFF-delay (selectable): 40 ms |
| Sensitivity adjustment         |                     | Adjustable                               |                                                       |                                           |                 |                               |
| Operation mode                 |                     | Switch selectable                        |                                                       |                                           | Wire selectable | Switch selectable             |
| Indicators                     |                     | Light (red) and stability (green)        | Light (red), stability (green) and operation (yellow) | Light (red) and stability (green)         |                 |                               |
| Mutual interference protection |                     | Provided                                 |                                                       |                                           |                 |                               |
| Enclosure rating               |                     | IEC IP40 (excluding terminals)           |                                                       |                                           |                 | IEC IP50                      |
| Material                       |                     | Plastic                                  |                                                       |                                           |                 |                               |
| Ambient temperature            |                     | Operating: −10°C to 55°C (with no icing) |                                                       |                                           |                 |                               |

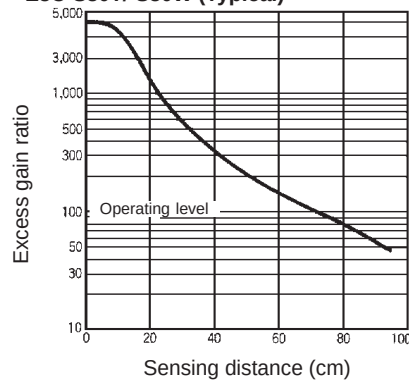
## Engineering Data

### Excess Gain Ratio

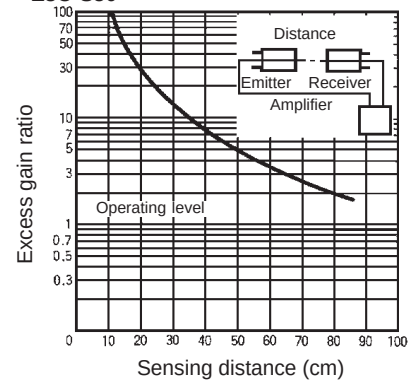
E3C-S20W (Typical)



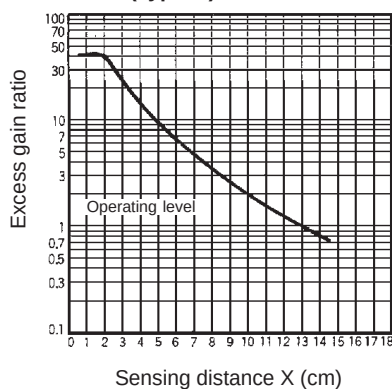
E3C-S30T/-S30W (Typical)



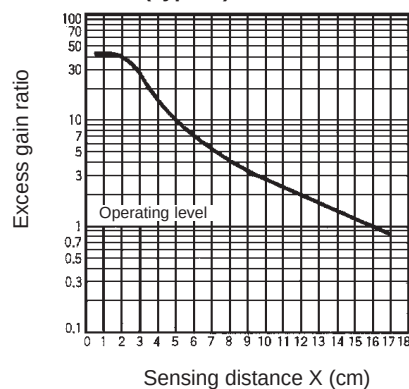
E3C-S50



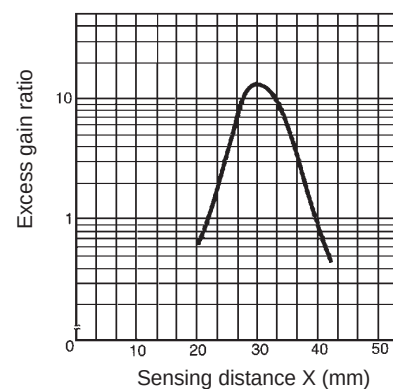
E3C-DS5W (Typical)



E3C-DS10T (Typical)

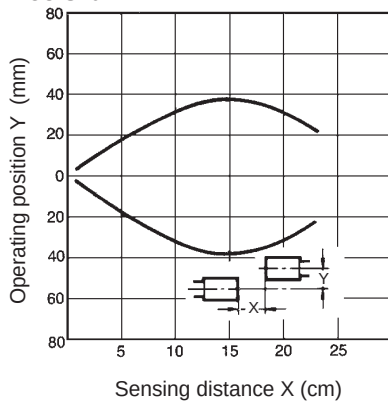


E3C-LS3R

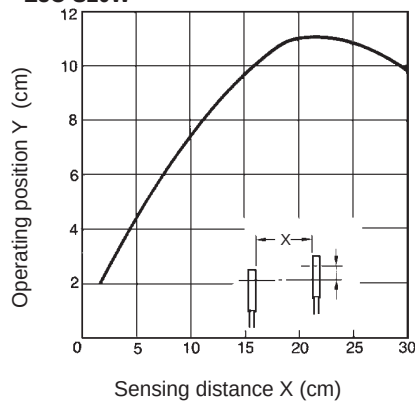


# Operating Range

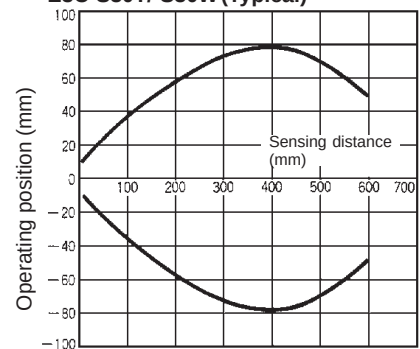
**E3C-S10**



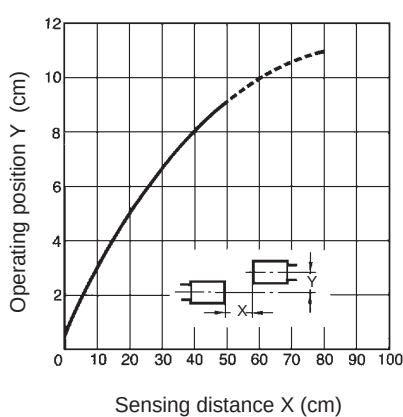
**E3C-S20W**



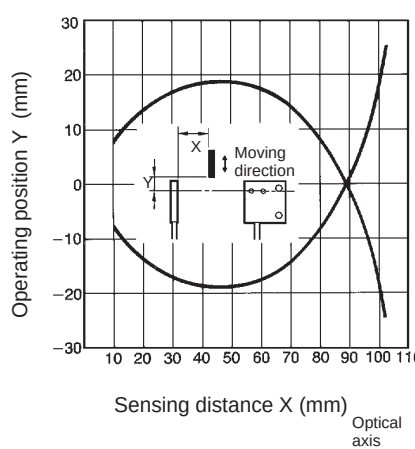
**E3C-S30T/-S30W (Typical)**



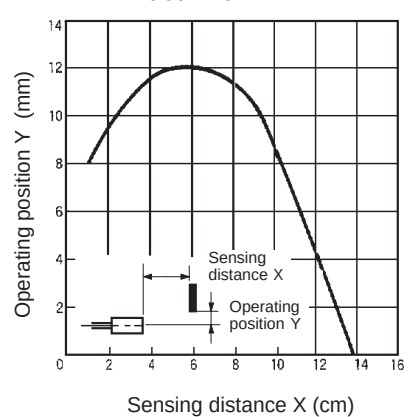
**E3C-S50**



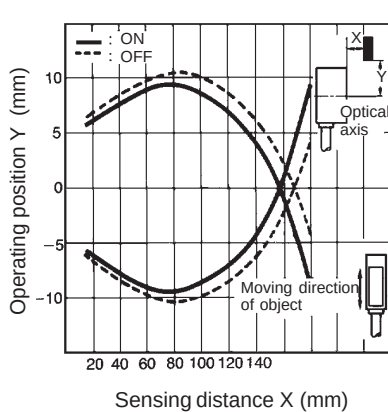
**E3C-DS5W**



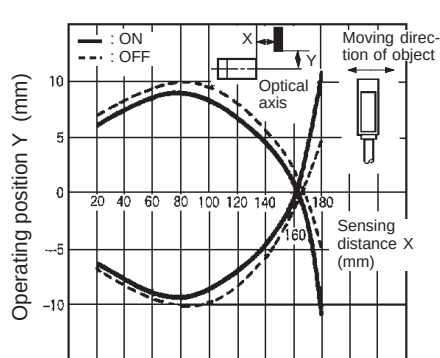
**E3C-DS10T (Typical)**



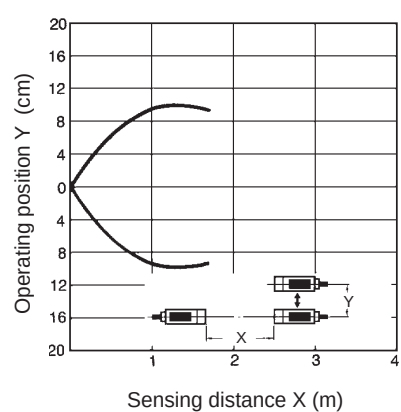
**E3C-DS10 (Typical 1)**



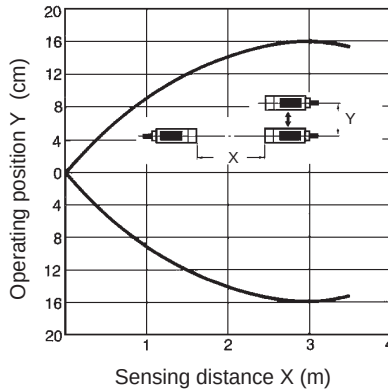
**E3C-DS10 (Typical 2)**



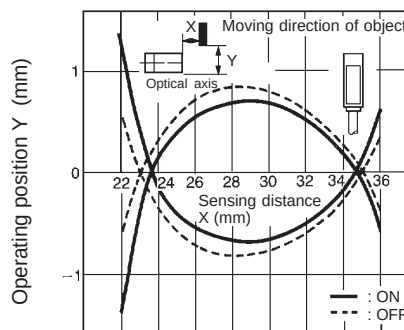
**E3C-1**



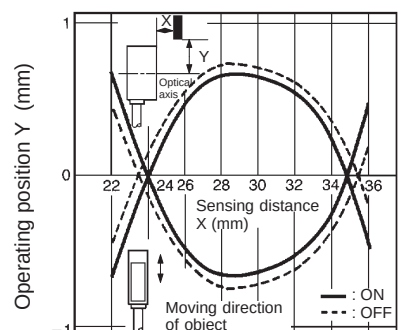
**E3C-2**



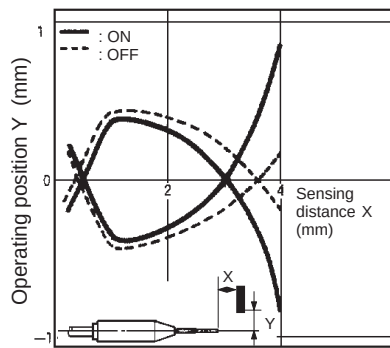
**E3C-LS3R (Typical 1)**



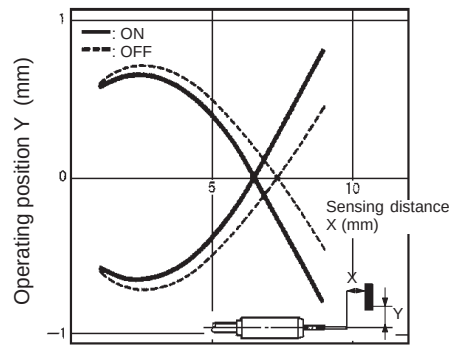
**E3C-LS3R (Typical 2)**



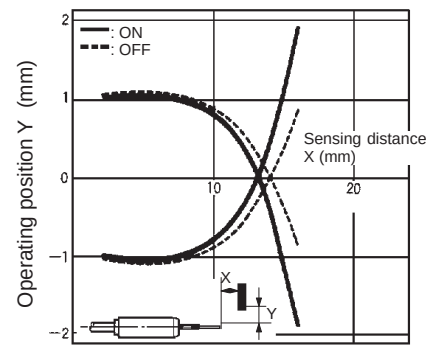
E3C-DM2R (Typical)



E3C-DM5/-DM5A (Typical)

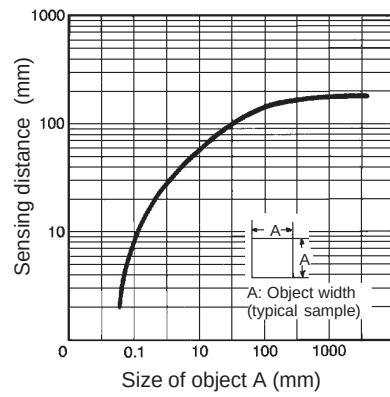


E3C-DS1/-DS1A (Typical)



## Sensitivity

### E3C-DS5W

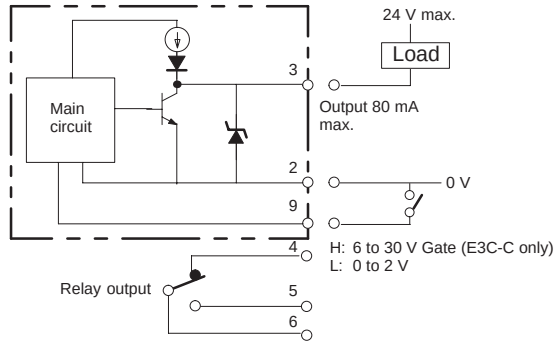




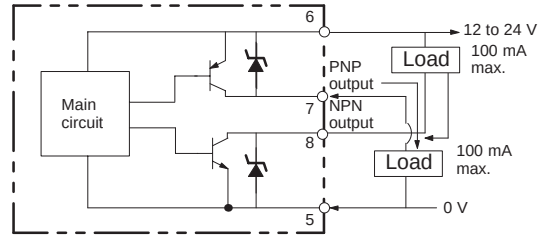
# Operation

## ■ Amplifier Units Output Circuits

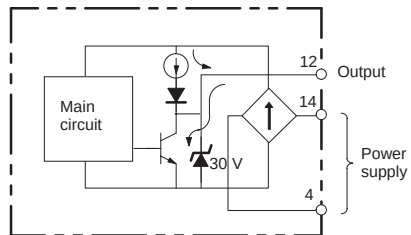
E3C-A/E3C-C



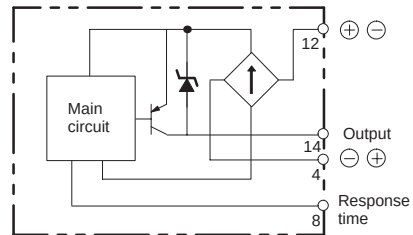
E3C-WH4F



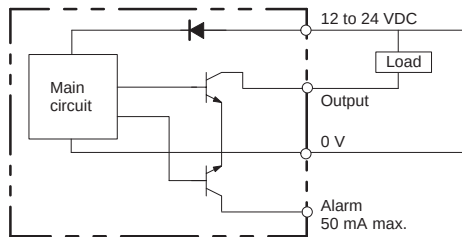
E3C-GE4 NPN Output Type



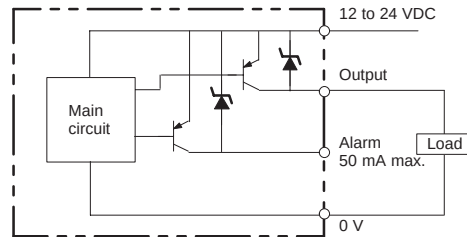
E3C-GF4 PNP Output Type



E3C-JC4P NPN Output Type

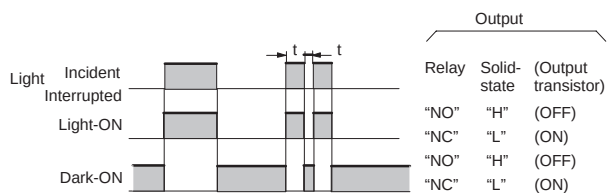


E3C-JB4P PNP Output Type



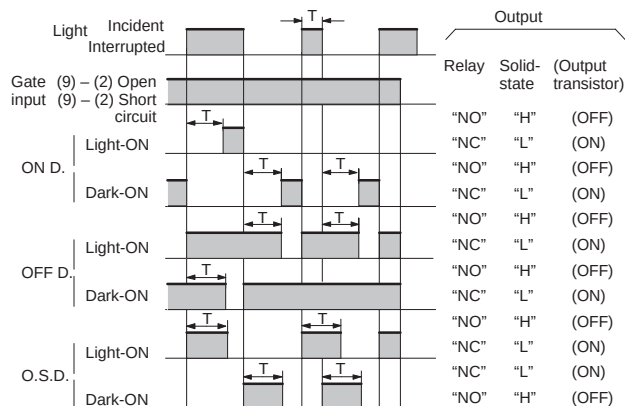
# Timing Charts

## E3C-A



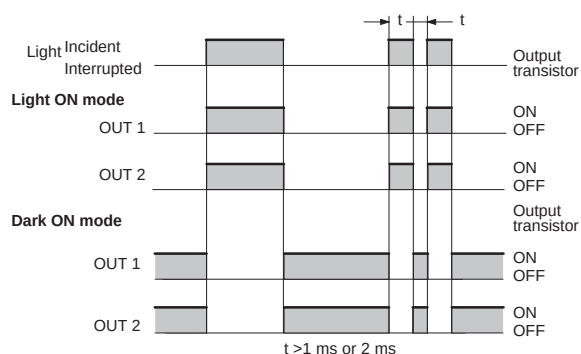
- Note:**
- Control output is produced only during the input time.
  - When  $t$  exceeds 1 ms or 2 ms, solid-state output is produced. To produce relay output,  $t$  must be longer than 20 ms.

## E3C-C

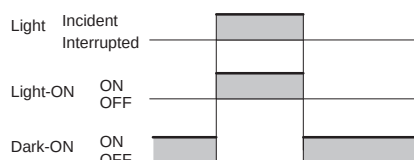


- Note:**
- $t$  must be longer than 1 ms or 2 ms.
  - $T$  denotes a delay time.

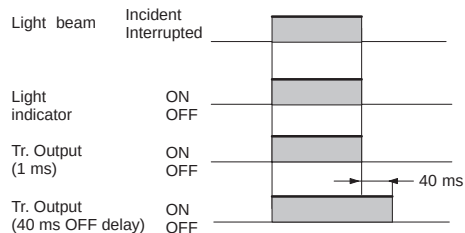
## E3C-WH4F



## E3C-GE4/E3C-GF4



## E3C-JC4P/E3C-JB4P



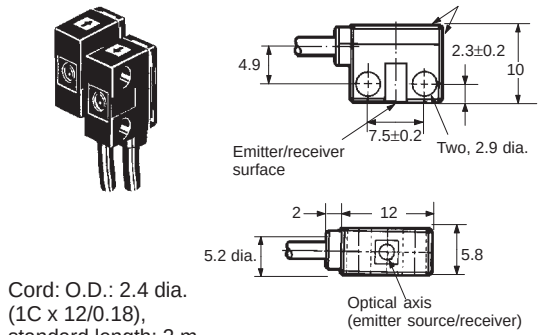
# Dimensions

**Note:** All units are in millimeters unless otherwise indicated.

## ■ Sensor Units

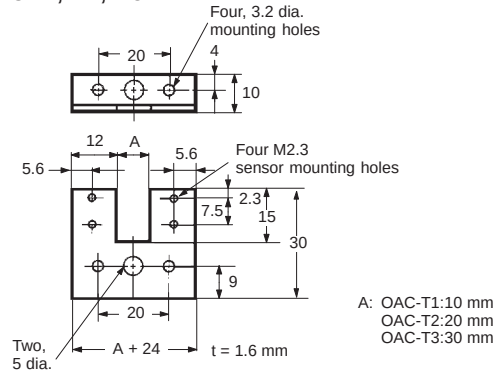
### E3C-S10

Weight: approx. 50 g



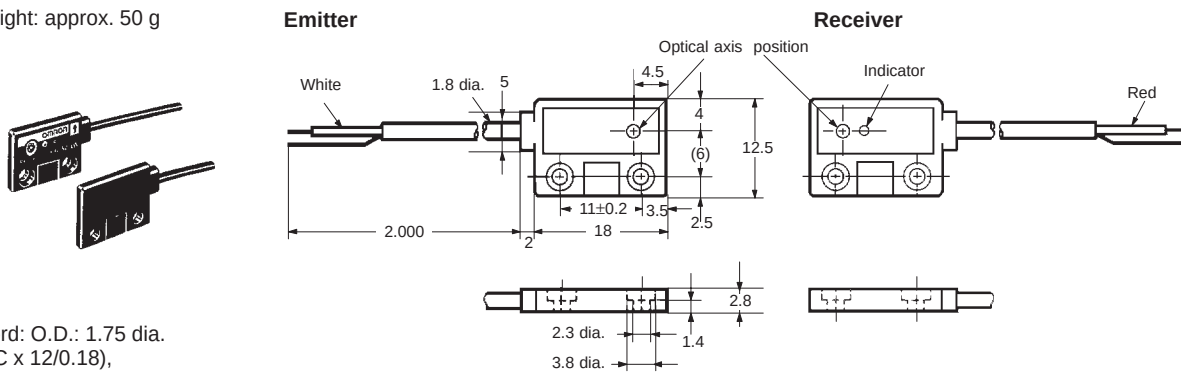
Cord: O.D.: 2.4 dia.  
(1C x 12/0.18),  
standard length: 2 m

### Mounting Bracket (Order Separately) OAC-T1, -T2, -T3



### E3C-S20W

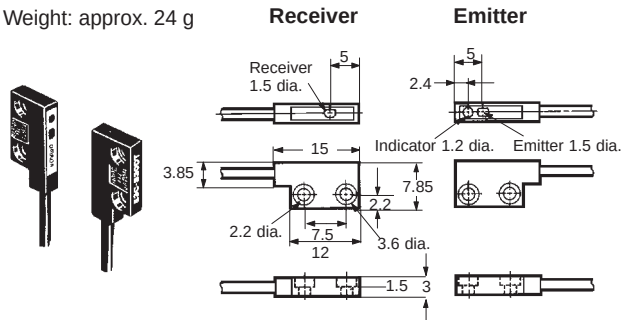
Weight: approx. 50 g



Cord: O.D.: 1.75 dia.  
(1C x 12/0.18),  
standard length: 2 m

### E3C-S30T

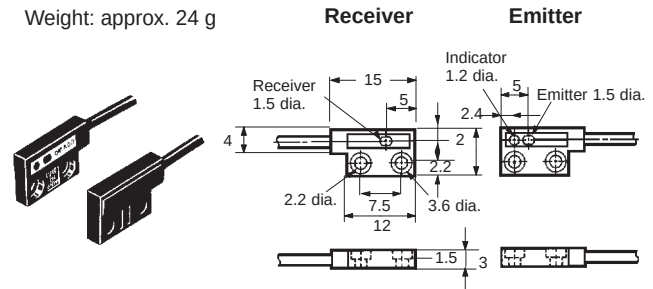
Weight: approx. 24 g



Cord: O.D.: 1.8 dia.  
(1C x 30/0.08),  
standard length: 2 m

### E3C-S30W

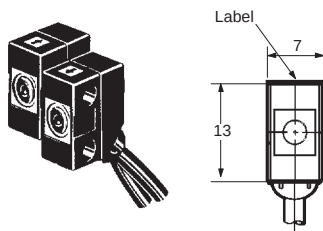
Weight: approx. 24 g



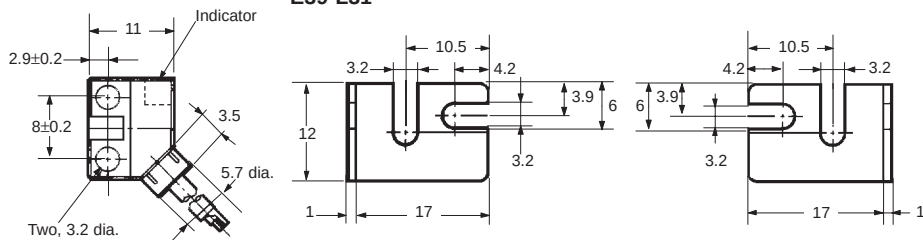
Cord: O.D.: 1.8 dia.  
(1C x 30/0.08),  
standard length: 2 m

### E3C-S50

Weight: approx. 50 g



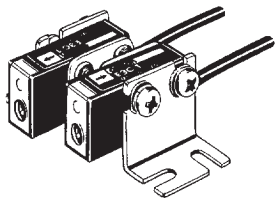
### Mounting Bracket (Order Separately) E39-L31



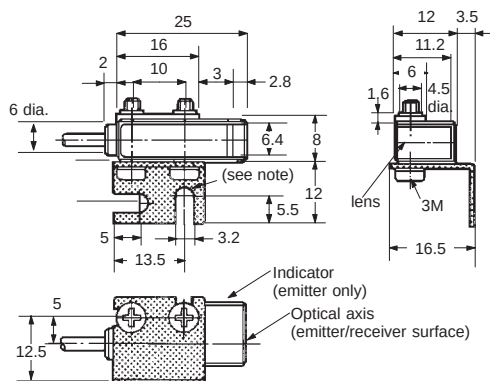
Cord: Polyethylene-insulated round cord, 8.4 dia.  
(12/0.18 dia.), one-core standard length: 2m

### E3C-1

Weight: approx. 60 g



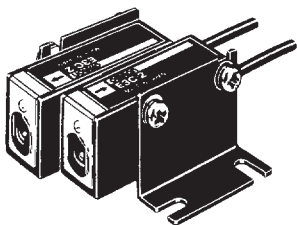
Cord: O.D.: 2.4 dia.  
(1C x 12/0.18),  
standard length: 2 m



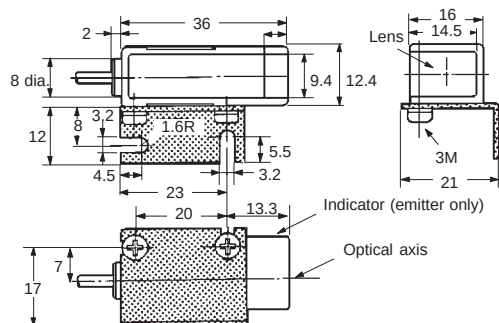
**Note:** The mounting bracket is supplied with E3C-1

### E3C-2

Weight: approx. 120 g

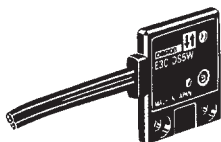


Cord: O.D.: 2.4 dia.  
(1C x 12/0.18),  
standard length: 2 m

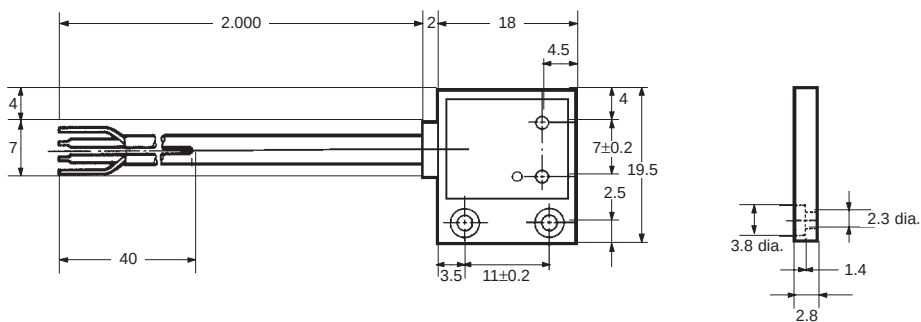


### E3C-DS5W

Weight: approx. 50 g

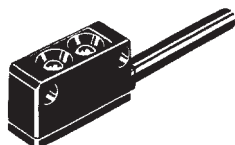


Cord: O.D.: 1.8 x 3.6  
(2C x 7/0.18),  
standard length: 2 m

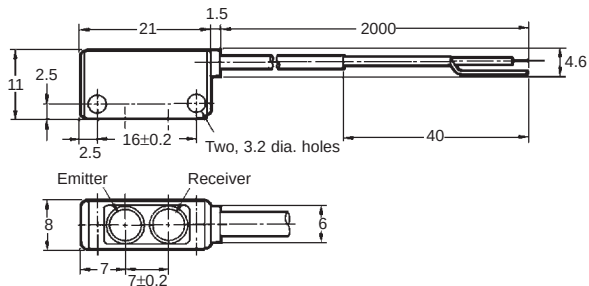




Weight: approx. 50 g

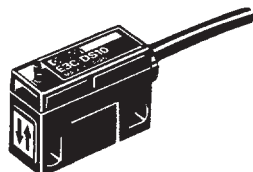


Cord: O.D.: 2.4 x 4.3  
(2C x 12/0.18),  
standard length: 2 m

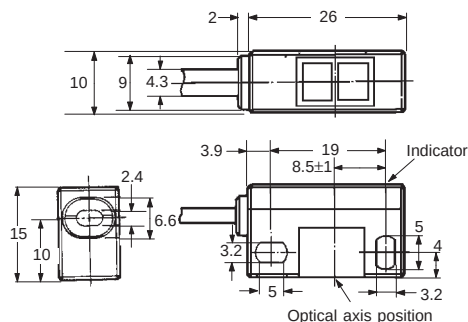


## E3C-DS10

Weight: approx. 50 g

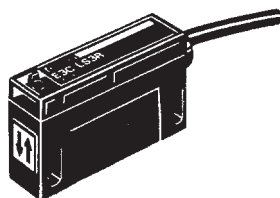


Cord: O.D.: 2.4 x 4.3  
(2C x 12/0.18),  
standard length: 2 m

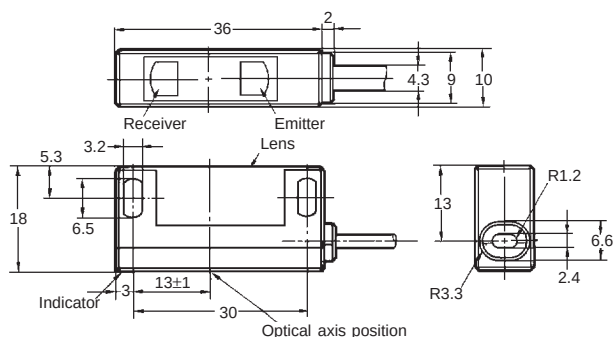


**E3C-LS3R**

Weight: approx. 55 g

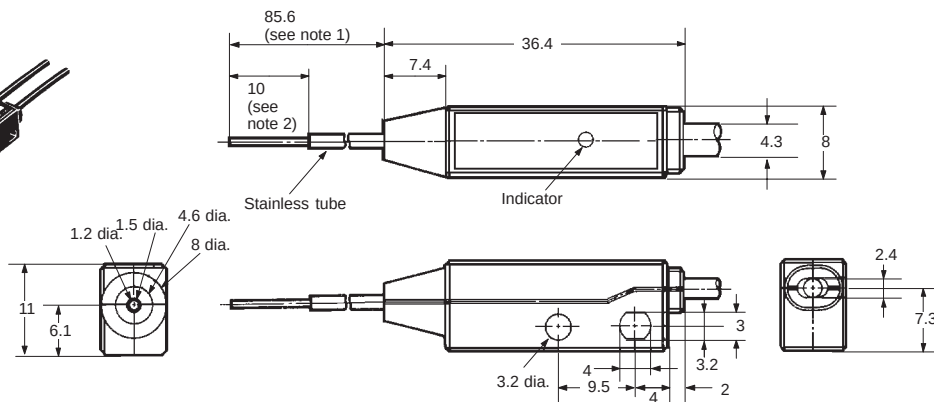
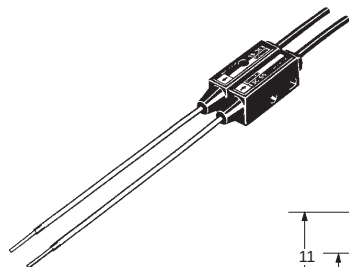


Cord: O.D.: 2.4 x 4.3  
(2C x 12/0.18),  
standard length: 2 m



**E3C-S5**

Weight: approx. 25 g

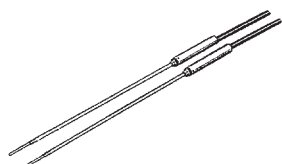


Cord: O.D.: 2.4 dia.  
(1C x 12/0.18),  
standard length: 2 m

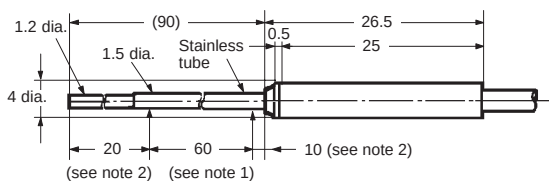
**Note:**

1. Bendable range (10 mm radius or more)
2. Do not bend this part.

Weight: approx. 25 g

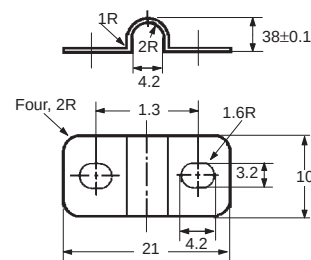


Cord: O.D.: 2.4 dia.  
(1C x 12/0.18),  
standard length: 2 m



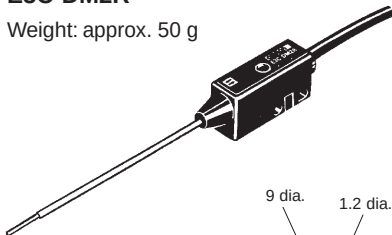
- Note:**
1. Bendable range (10 mm radius or more)
  2. Do not bend this part.

## Mounting Bracket

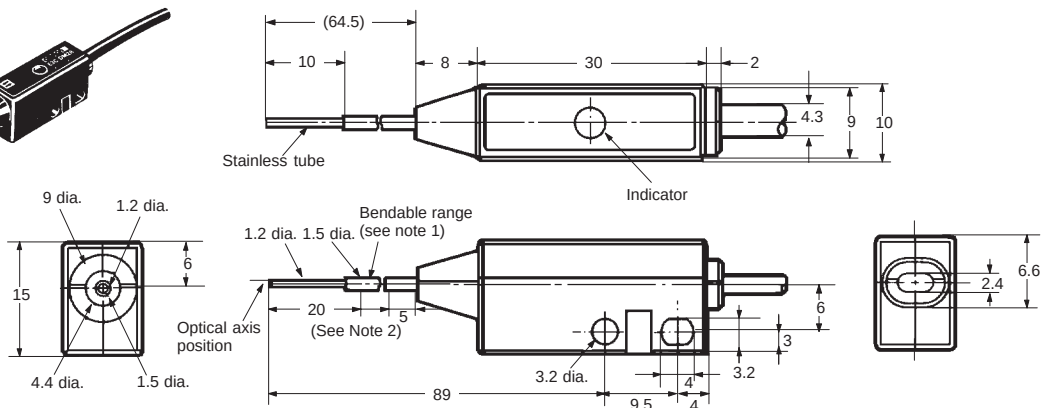


**E3C-DM2R**

Weight: approx. 50 g



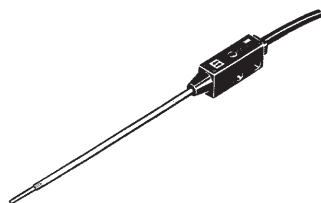
Cord: O.D.: 2.4 x 4.3  
(2C x 12/0.18),  
standard length: 2 m



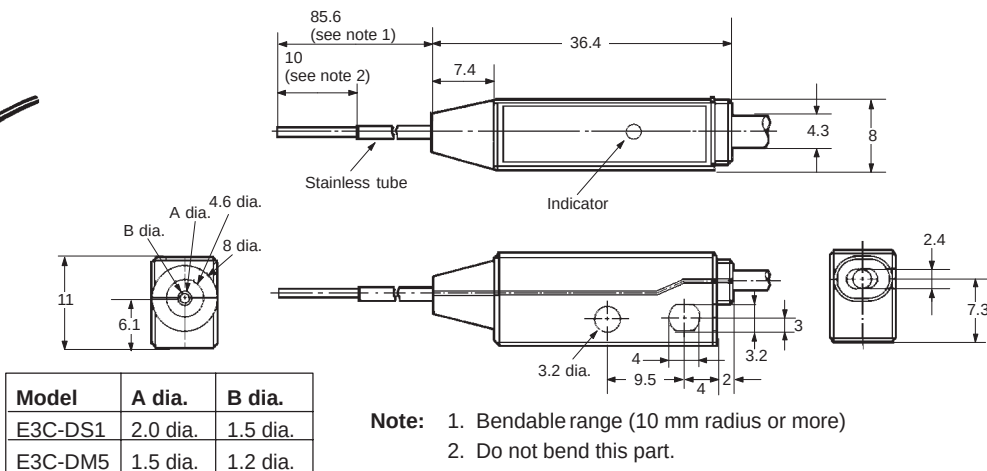
- Note:**
1. Bendable range (10 mm radius or more)
  2. Do not bend this part.

## E3C-DM5/-DS1

Weight: approx. 50 g



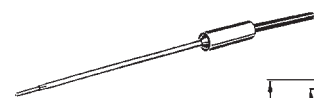
Cord: O.D.: 2.4 x 4.3  
(2C x 12/0.18),  
standard length: 2 m



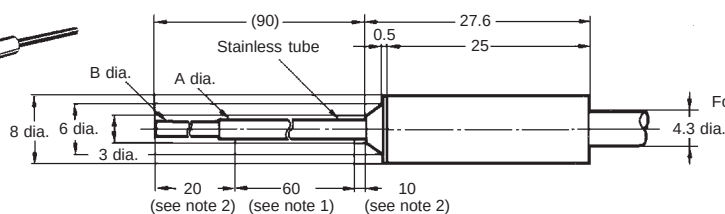
- Note:**
1. Bendable range (10 mm radius or more)
  2. Do not bend this part.

### E3C-DM5A/-DS1A

Weight: approx. 50 g

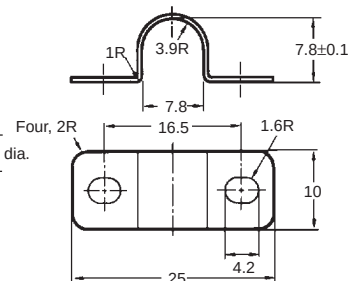


Cord: O.D.: 2.4 x 4.3  
(2C x 12/0.18),  
standard length: 2 m



| Model    | A dia.   | B dia.   |
|----------|----------|----------|
| E3C-DS1A | 2.0 dia. | 1.5 dia. |
| E3C-DM5A | 1.5 dia. | 1.2 dia. |

## Mounting Bracket

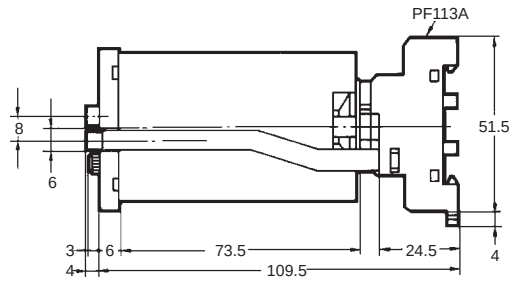
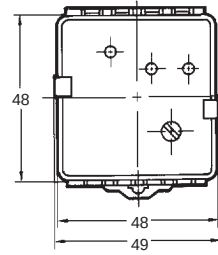
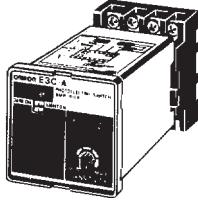


## ■ Amplifier Units

### E3C-A/-C

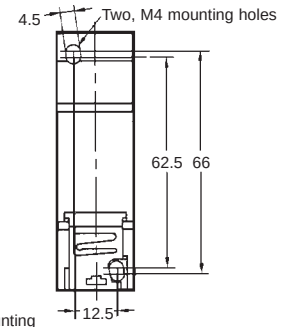
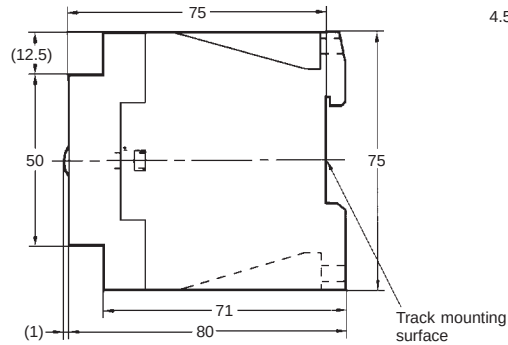
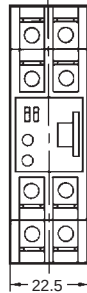
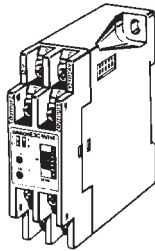
Weight: approx. 220 g

(The socket PF113A is supplied as an accessory.)



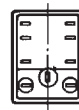
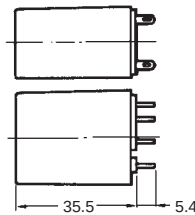
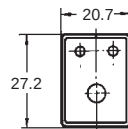
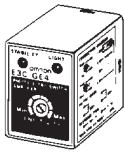
### E3C-WH4F

Weight: approx. 100 g



### E3C-GE4/-GF4

Weight: approx. 15 g

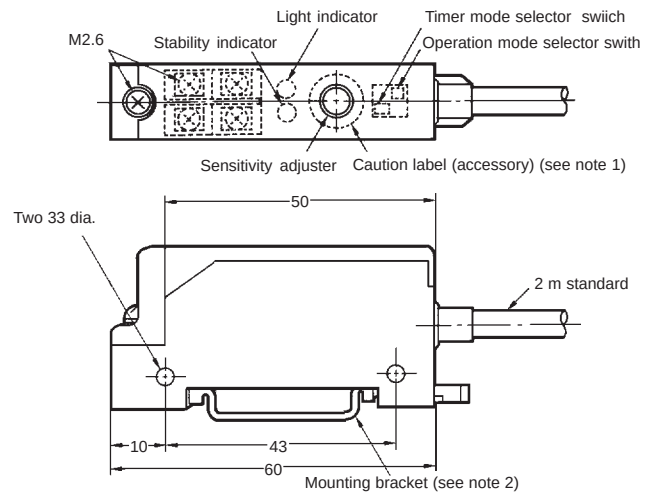
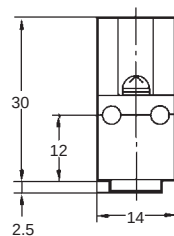
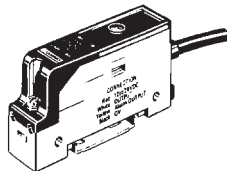


#### Connecting Socket

PYF08A Front-connecting Socket  
PY08 Back-connecting Socket

### E3C-JC4P/-JB4P

Weight: approx. 80 g

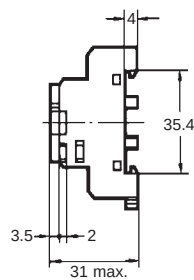
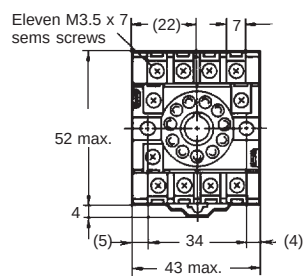
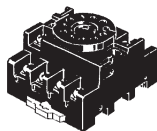


- Note:**
1. Attach the caution label after adjusting the sensitivity adjuster.
  2. This is not necessary when mounting the photoelectric sensor on a track.

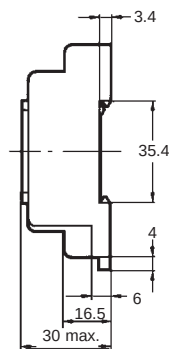
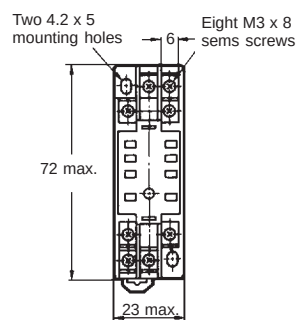
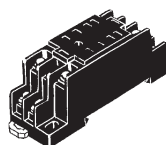
## ■ Accessories

### Socket

PF113A (for E3C-AI-C; included)



PYF08A (for E3C-GE4I-GF4; Order Separately)

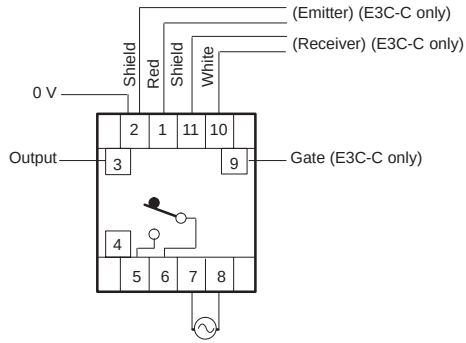


# Installation

## ■ Amplifier Units

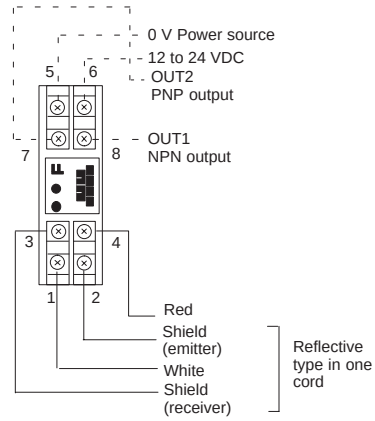
### Connections (to E3C Sensor Units)

#### E3C-A/E3C-C



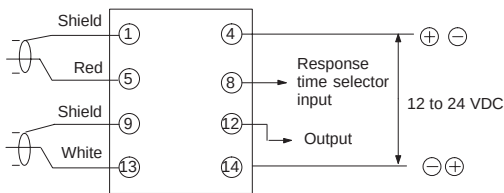
**Note:** Reflective type in one cord.

#### E3C-WH4F

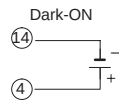
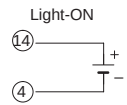


**Note:** Reflective type in one cord.

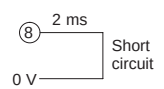
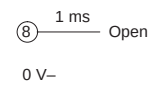
#### E3C-GE4/E3C-GF4



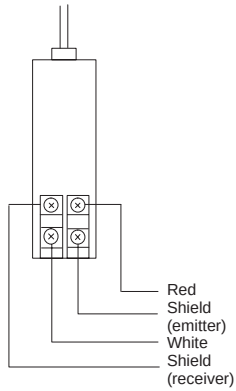
#### Operation Mode Selection



#### Response Time Selection



#### E3C-JC4P/E3C-JB4P





**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. E31-E1-7B    **In the interest of product improvement, specifications are subject to change without notice.**

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