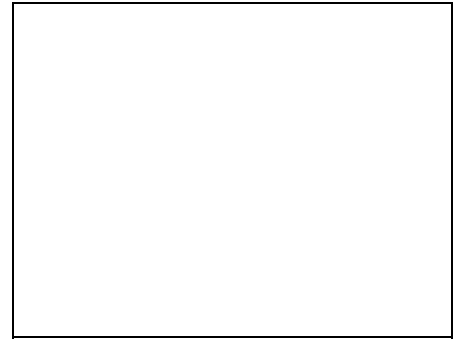


**SM**      **DIN 24x48 / 72x72 / 96x48**  
series      **Tachometer & Line speed meter**

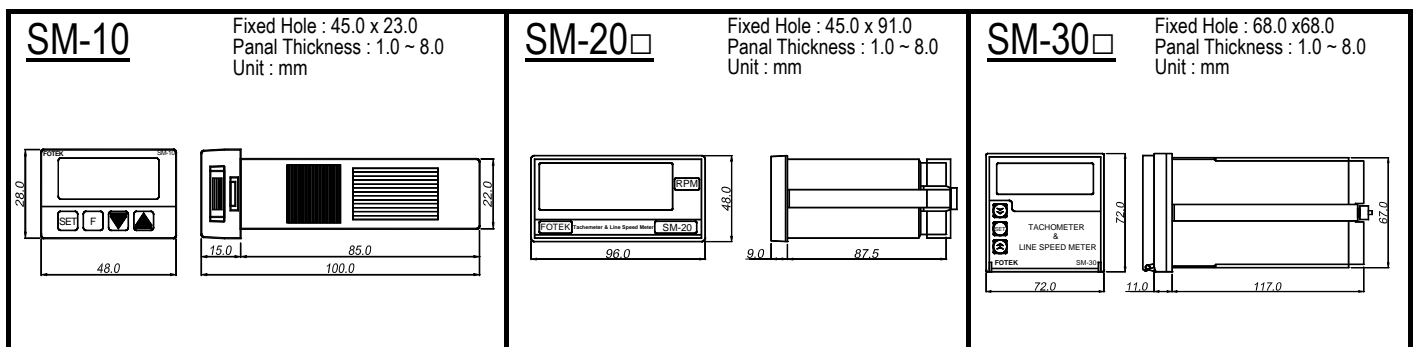
- \* **Multifunction meter**  
Tachometer、Line speed meter & Duty meter
- \* **Pulses per revolution settable**
- \* **Sampling time auto tuning**
- \* **Decimal point settable**
- \* **Limit of alarm settable**
- \* **Transmitter of multifunction meter is optional**
- \*



◆ **General data / 共同規格**

Outline	外型	24 x 48	96 x 48		72 x 72	
Model	型號	<b>SM-10</b>	<b>SM-20</b>	<b>SM-20S</b>	<b>SM-30</b>	<b>SM-30S</b>
Transmitter		Non	Non	4~20mA	Non	4~20mA
Alarm output	警報輸出	Relay	Relay	Non	Relay	Non
Output control	輸出控制	Hi / Lo	Hi / Lo	Non	Hi / Lo	Non
Digits	位數	4 digits				
Power supply	工作電壓	90 ~ 265 VAC 50/60 Hz				
Current consumption	耗電流	5VA max.				
DC output	直流輸出	12 V / 100 mA max.				
Input method	輸入方式	NPN				
Response time	應答時間	Ton = 0.1 ms ~ 99.9 ms settable				
Pulses per revolution ( PPR )		1~999 PPR settable				
Diameter		1 ~ 999mm settable ( Line speed meter available only )				
Memory method	記憶方式	EEPROM				
ESD strength	耐靜電	Over 8 KV				
Dielectric strength	電介強度	Over 2.5 KV / 1 min., Between power and each other terminal				
Isolation strength	絕緣強度	Over 100 MΩ / 500 VDC, Between power and each other terminal				
Operating Circums.	工作環境	- 20 °C ~ + 80°C ; 35% ~ 85% RH				

◆ **Outline dimension / 外形尺寸圖**



## ◆ Data setting / 參數設定

Status / 狀態	Symb./ 顯示符號	Description / 說明
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Running status 運轉狀態                 </div> <p>Press <b>SET</b> key ↓ 3 sec</p>	<b>100.0</b>	1 > Running status / 運轉狀態
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Setting of lock 鎖住設定                 </div> <p>Press <b>SET</b> key ↓</p>	<b>Lck.0</b>	1 > 「Lck = 0」: Unlock / 可設定 2 > 「Lck = 1」: All lock / 鎖定
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Setting of PPR 每轉信號數設定                 </div> <p>Press <b>SET</b> key ↓</p>	<b>P.001</b>	1 > 「PPR」: Pulses per revolution 2 > Range : 1 ~ 999
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Setting of diameter 輪軸直徑設定                 </div> <p>Press <b>SET</b> key ↓</p>	<b>d.100</b>	1 > 「d..100」: Diameter of roller=100 mm (Range=1~999mm) 2 > Disappeared at tachometer mode
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Setting of Limit 警報值設定                 </div> <p>Press <b>SET</b> key ↓</p>	<b>1000</b>	1 > Range : 0 ~ 9999 2 > Range : 0 ~ 9999
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Setting of alarm status 警報輸出狀態設定                 </div> <p>Press <b>SET</b> key ↓</p>	<b>C.0</b>	1 > 「C.0」: PV > 「Limit value」 → Relay ON 2 > 「C.1」: PV < 「Limit value」 → Relay ON
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Power on delay time 送電延遲時間                 </div> <p>Press <b>SET</b> key ↓</p>	<b>t.0</b>	1 > 「t」: 0 ~ 999s 2 > Power on alarm output delay time
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Setting of distance 通過行程設定                 </div> <p>Press <b>SET</b> key ↓</p>	<b>L.000</b>	1 > Distance of measuring : Unit = 1 Meter 2 > Passing time T (sec) = 「L」 / Line speed 3 > 「L」 appeared at 「nod.5」 only

## ◆ Function setting / 功能設定

Status / 狀態	Symb / 顯示符號	Description / 說明
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Running status 運轉狀態                 </div> <p>Press <b>DN</b> key ↓ 3 sec</p>	<b>100.0</b>	1 > Running status / 運轉狀態 2 > SM-10 / SM-30 :  key ; SM-20 :  key
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Selection of meter 轉速表或線速表選擇                 </div> <p>Press <b>SET</b> key ↓</p>	<b>nod.0</b>	1 > 「nod.0」 = RPM ; 2 > 「nod.1」 = RPS 3 > 「nod.2」 = RPH ; 4 > 「nod.3」 = M / min. 5 > 「nod.4」 = Yd/min ; 6 > 「nod.5」 = T sec
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Setting of response time 反應時間設定                 </div> <p>Press <b>SET</b> key ↓</p>	<b>r.00.1</b>	1 > Response time (r) : Response frequency = (500 / r) Hz 2 > Range : 0.1 ~ 99.9 ms
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">                     Setting of decimal point 小數點選擇                 </div> <p>Press <b>SET</b> key ↓</p>	<b>dP.A</b>	1 > 「dP.A」 = Decimal point auto shift 2 > 「dP.n」 = Without decimal point 3 > 「dP.1」 = One decimal point

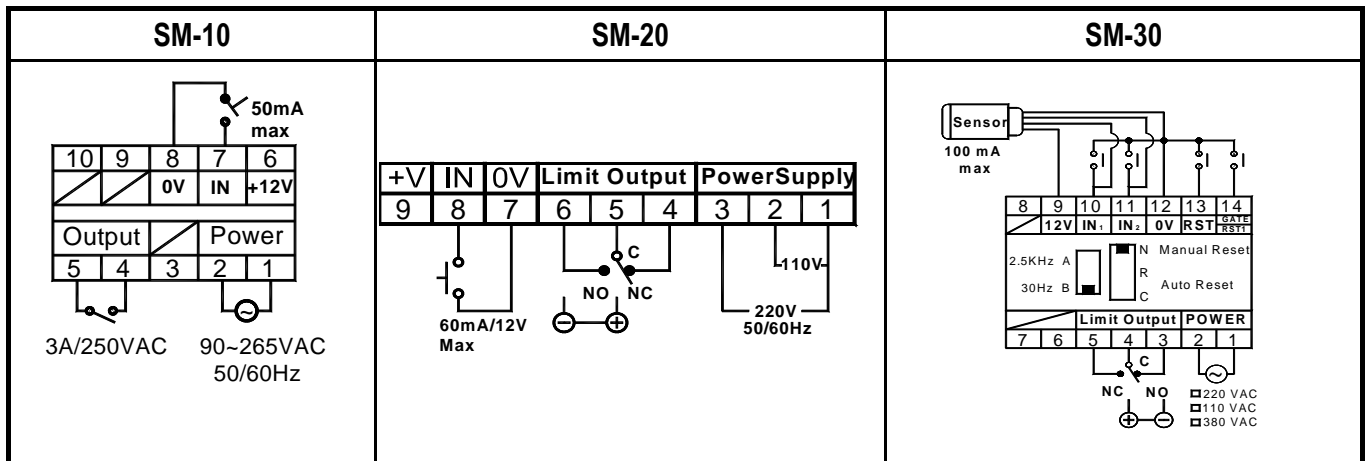
◆ Data setting / 參數設定

Status / 狀態	Symb./ 顯示符號	Description / 說明
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Running status 運轉狀態</div> <div style="margin-left: 20px;">Press <b>SET</b> key ↓ 3 sec</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Setting of lock 鎖住設定</div> <div style="margin-left: 20px;">Press <b>SET</b> key ↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Setting of PPR 每轉信號數設定</div> <div style="margin-left: 20px;">Press <b>SET</b> key ↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Setting of diameter 輪軸直徑設定</div> <div style="margin-left: 20px;">Press <b>SET</b> key ↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Limit of transmitter 傳送範圍設定</div> <div style="margin-left: 20px;">Press <b>SET</b> key ↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Setting of distance 通過時間行程設定</div> <div style="margin-left: 20px;">Press <b>SET</b> key   3SEC</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>100.0</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>Lck.0</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>P.001</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>d.100</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>1000</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>L.00.0</b></div>	<p>1 &gt; Running status / 運轉狀態</p> <p>1 &gt; 「Lck = 0」: Unlock / 可設定 2 &gt; 「Lck = 1」: All lock / 鎖定</p> <p>1 &gt; 「PPR」: Pulses per revolution 2 &gt; Range : 1 ~ 999</p> <p>1 &gt; Diameter of roller : 1 ~ 999 mm 2 &gt; Disappeared at tachometer mode</p> <p>3 &gt; Range of transmitter : 0 ~ 9999 「0 ~ 1000」 is transmitted to 「4 ~ 20 mA」 4 &gt; Range : 0 ~ 9999</p> <p>1 &gt; Distance of measuring : Unit = m 2 &gt; Passing time T (sec) = 「L」 / Line speed 3 &gt; 「L」 appeared at 「nod.5」 only</p>

◆ Function setting / 功能設定

Status / 狀態	Symb / 顯示符號	Description / 說明
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Running status 運轉狀態</div> <div style="margin-left: 20px;">Press <b>DN</b> key ↓ 3 sec</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Selection of meter 轉速表或線速表選擇</div> <div style="margin-left: 20px;">Press <b>SET</b> key ↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Setting of response time 反應時間設定</div> <div style="margin-left: 20px;">Press <b>SET</b> key ↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Setting of decimal point 小數點選擇</div> <div style="margin-left: 20px;">Press <b>SET</b> key ↓</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Offset of 4 mA 4 mA 偏差值設定</div> <div style="margin-left: 20px;">Press <b>SET</b> key   3 sec</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Offset of 20 mA 20 mA 偏差值設定</div> <div style="margin-left: 20px;">Press <b>SET</b> key</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>100.0</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>nod.0</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>r.00.1</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>dP.A</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>□.000</b></div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;"><b>□.000</b></div>	<p>1 &gt; Running status / 運轉狀態</p> <p>1 &gt; 「nod.0」 = RPM ; 2 &gt; 「nod.1」 = RPS 3 &gt; 「nod.2」 = RPH ; 4 &gt; 「nod.3」 = M / min. 5 &gt; 「nod.4」 = Yd/min ; 6 &gt; 「nod.5」 = T sec</p> <p>1 &gt; Response time (r) : Response frequency = (500 / r) Hz 2 &gt; Range : 0.1 ~ 99.9 ms</p> <p>1 &gt; 「dP.A」 = Decimal point auto shift 2 &gt; 「dP.n」 = Without decimal point 3 &gt; 「dP.1」 = One decimal point</p> <p>1 &gt; Range : -99 ~ 999 2 &gt; Offset of transmitter (4 mA)</p> <p>1 &gt; Range : -99 ~ 999 2 &gt; Offset of transmitter (20 mA)</p>

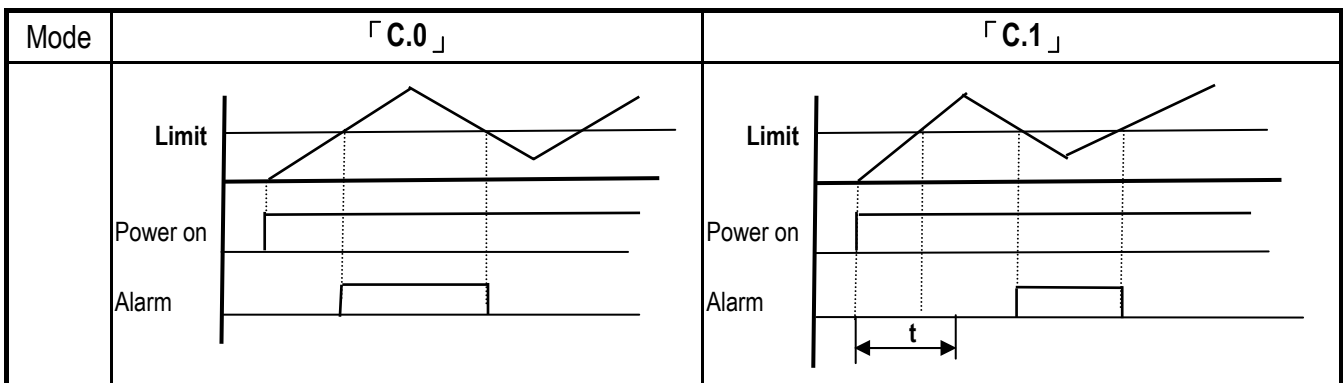
◆ Connection diagram / 接線圖



◆ Selection of meter / 轉速表或線速表選擇

nod	Type of meter	Method of measuring
「0」	Tachometer (RPM)	「RPM」: Revolutions per minute 每分鐘幾轉
「1」	Tachometer (RPS)	「RPS」: Revolutions per second 每秒幾轉
「2」	Tachometer (RPH)	「RPH」: Revolutions per hour 每小時幾轉
「3」	Line speed meter (M/min.)	「M/min.」: Meter per minute.
「4」	Line speed meter (Yd/min.)	「Yd/min.」: Meter per minute.
「5」	Duty meter (SEC)	「SEC」: Time of duty

◆ Alarm output



◆ Duty meter : To measure the passing time (T) from "A" to B"

Passing time : 「T」 (sec)  

$$\text{「T」 (sec)} = \text{「L」} / \text{Line speed}$$
 「d」 mm = Diameter of rolle  
 「L」 m = Distance from "A" to B"

