

# PS/PSN Series

## Rectangular type proximity sensor

### Features

- Shorten the time of maintenance with the body
- Improved the noise resistance by adopting dedicated IC (DC 3-wire type)
- Reverse power polarity (DC), surge (DC/AC), overcurrent protection (DC type—Except for PS12 Series.)
- Long life cycle and high reliability
- Red LED status indication
- IP67 rated waterproof structure (IEC standard)
- Replacer for micro switches and limit switches



**⚠ Please read "Caution for your safety" in operation manual before using.**



### Specifications

#### DC 3-wire type

※ The existing PS17 is upgraded its function and design and changed as PSN17.  
 ※ The case color of PNP output type is changed from orange to gray.

| Model                            | PS12-4DN<br>PS12-4DP<br>PS12-4DN2<br>PS12-4DNU<br>PS12-4DPU<br>PS12-4DN2U         | PSN17-5DN<br>PSN17-5DP<br>PSN17-5DN2<br>PSN17-5DP2<br>PSN17-5DNU<br>PSN17-5DPU<br>PSN17-5DN2U<br>PSN17-5DN-F | PSN17-8DN<br>PSN17-8DP<br>PSN17-8DN2<br>PSN17-8DNU<br>PSN17-8DPU | PSN17-8DN-F<br>PSN17-8DP-F<br>PSN17-8DN2-F<br>PSN17-8DNU-F<br>PSN17-8DPU-F<br>PSN17-8DN2U-F | PSN25-5DN<br>PSN25-5DP<br>PSN25-5DN2<br>PSN25-5DP2 | PSN30-10DN<br>PSN30-10DP<br>PSN30-10DN2<br>PSN30-10DP2 | PSN30-15DN<br>PSN30-15DP<br>PSN30-15DN2<br>PSN30-15DP2 | PSN40-20DN<br>PSN40-20DP<br>PSN40-20DN2<br>PSN40-20DP2 | PS50-30DN<br>PS50-30DP<br>PS50-30DN2<br>PS50-30DP2 |
|----------------------------------|---|--|--|---|--|--|--|--|--|
| Sensing distance                 | 4mm ±10%  | 5mm ±10%   | 8mm ±10%   |   | 5mm ±10%   | 10mm ±10%  | 15mm ±10%  | 20mm ±10%  | 30mm ±10%  |
| Hysteresis                       | Max. 10% of sensing distance  |  |  |   |  |  |  |  |  |
| Standard sensing target          | 12×12×1mm (Iron)  | 18×18×1mm (Iron)   | 25×25×1mm (Iron)   |   |  | 30×30×1mm (Iron)                                       | 45×45×1mm (Iron)                                       | 60×60×1mm (Iron)                                       | 90×90×1mm (Iron)                                   |
| Setting distance                 | 0~2.8mm   | 0~3.5mm  | 0~5.6mm  | 0~3.5mm   | 0~7mm  | 0~10.5mm   | 0~14mm   | 0~21mm   |  |
| Power supply (Operation voltage) | 12-24VDC (1-30VDC)  |  |  |   |  |  |  |  |  |
| Current consumption              | Max. 10mA   |  |  |   |  |  |  |  |  |
| Response frequency(*1)           | 500Hz   | 700Hz  | 200Hz  | 300Hz   | 250Hz  | 200Hz  | 100Hz  | 50Hz   |  |
| Residual voltage                 | Max. 1.5V   |  |  |   |  |  |  |  |  |
| Affection by Temp.               | ±10% Max. for sensing distance at +20℃ within temperature range of -25 ~ +70℃     |  |  |   |  |  |  |  |  |
| Control output                   | Max. 200mA  |  |  |   |  |  |  |  |  |
| Insulation resistance            | Min. 50MΩ (at 500VDC mega)  |  |  |   |  |  |  |  |  |
| Dielectric strength              | 1500VAC 50/60Hz for 1minute   |  |  |   |  |  |  |  |  |
| Vibration                        | 1mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours |  |  |   |  |  |  |  |  |
| Shock                            | 500m/s <sup>2</sup> (50G) in X, Y, Z direction for 3 times                        |  |  |   |  |  |  |  |  |
| Indicator                        | Operation indicator (Red LED)   |  |  |   |  |  |  |  |  |
| Ambient temperature              | -25 ~ +70℃ (at non-freezing status)   |  |  |   |  |  |  |  |  |
| Storage temperature              | -30 ~ +80℃ (at non-freezing status)   |  |  |   |  |  |  |  |  |
| Ambient humidity                 | 35 ~ 95%RH  |  |  |   |  |  |  |  |  |
| Protection circuit               | Surge, Reverse power polarity protection circuit                                  |  |  | Surge, Reverse power polarity, Overcurrent protection circuit                               |  |  |  |  |  |
| Protection                       | IP67 (IEC standard)   |  |  |   |  |  |  |  |  |
| Cable spec.                      | φ 4 × 2P, 2m  |  |  |   |  | φ 5 × 2P, 2m   |  |  |  |
| Approval                         | <b>CE</b>   |  |  |   |  |  |  |  |  |
| Unit weight                      | Approx. 62g   | Approx. 71g  | Approx. 70g  |   | Approx. 111g                                       | Approx. 158g   | Approx. 220g   |  |  |

※ (\*1) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

# Rectangular Type

## ■ Specifications

### ● DC 2-wire type

※The existing PS17 is upgraded its function and design and changed as PSN17.  
 ※The case color of Normal Close type is changed from orange to gray.

| Model                               | PSNT17-5DO<br>PSNT17-5DC  | PSNT17-5DOU<br>PSNT17-5DCU |
|-------------------------------------|---|----------------------------|
| Sensing distance                    | 5mm ±10%  |                            |
| Hysteresis                          | Max. 10% of sensing distance  |                            |
| Standard sensing target             | 18×18×1mm (Iron)  |                            |
| Setting distance                    | 0 ~ 3.5mm   |                            |
| Power supply<br>(Operating voltage) | 24VDC<br>(15~30VC)  |                            |
| Leakage current                     | Max. 0.6mA  |                            |
| Response frequency(*1)              | 700Hz   |                            |
| Residual voltage                    | Max. 3.5V   |                            |
| Affection by Temp.                  | ±10% Max. for sensing distance at +20°C within temperature range of -25 ~ +70°C   |                            |
| Control output                      | 2~100mA   |                            |
| Insulation resistance               | Min. 50MΩ (at 500VDC mega)  |                            |
| Dielectric strength                 | 1500VAC 50/60Hz for 1 minute  |                            |
| Vibration                           | 1mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours |                            |
| Shock                               | 500m/s <sup>2</sup> (50G) in X, Y, Z direction for 3 times                        |                            |
| Indicator                           | Operation indicator (Red LED)   |                            |
| Ambient temperature                 | -25 ~ +70°C (at non-freezing status)  |                            |
| Storage temperature                 | -30 ~ +80°C (at non-freezing status)  |                            |
| Ambient humidity                    | 35 ~ 95%RH  |                            |
| Protection circuit                  | Surge protection circuit  |                            |
| Protection                          | IP67 (IEC standard)   |                            |
| Cable                               | φ4×3P, 2m   |                            |
| Approval                            | CE  |                            |
| Unit weight                         | Approx. 69g   |                            |

※(\*1) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

### ● AC 2-wire type

※The case color of Normal Close type is changed from orange to gray.

| Model                               | PSN25-5AO<br>PSN25-5AC  | PSN30-10AO<br>PSN30-10AC | PSN30-15AO<br>PSN30-15AC | PSN40-20AO<br>PSN40-20AC |
|-------------------------------------|---|--------------------------|--------------------------|--------------------------|
| Sensing distance                    | 5mm ±10%  | 10mm ±10%                | 15mm ±10%                | 20mm ±10%                |
| Hysteresis                          | Max. 10% of sensing distance  |                          |                          |                          |
| Standard sensing target             | 25×25×1mm (Iron)  | 30×30×1mm (Iron)         | 45×45×1mm (Iron)         | 60×60×1mm (Iron)         |
| Setting distance                    | 0 ~ 3.5mm   | 0 ~ 7mm                  | 0 ~ 10.5mm               | 0 ~ 14mm                 |
| Power supply<br>(Operating voltage) | 100~240VDC<br>(85~264VC)  |                          |                          |                          |
| Leakage current                     | Max. 2.5mA  |                          |                          |                          |
| Response frequency(*1)              | 20Hz  |                          |                          |                          |
| Residual voltage                    | Max. 10V  |                          |                          |                          |
| Affection by Temp.                  | ±10% Max. for sensing distance at +20°C within temperature range of -25 ~ +70°C   |                          |                          |                          |
| Control output                      | 5 ~ 200mA   |                          |                          |                          |
| Insulation resistance               | Min. 50MΩ (at 500VDC mega)  |                          |                          |                          |
| Dielectric strength                 | 2500VAC 50/60Hz for 1 minute  |                          |                          |                          |
| Vibration                           | 1mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours |                          |                          |                          |
| Shock                               | 500m/s <sup>2</sup> (50G) in X, Y, Z direction for 3 times                        |                          |                          |                          |
| Indicator                           | Operation indicator (Red LED)   |                          |                          |                          |
| Ambient temperature                 | -25 ~ +70°C (at non-freezing status)  |                          |                          |                          |
| Storage temperature                 | -30 ~ +80°C (at non-freezing status)  |                          |                          |                          |
| Ambient humidity                    | 35 ~ 95%RH  |                          |                          |                          |
| Protection circuit                  | Surge protection circuit  |                          |                          |                          |
| Protection                          | IP67 (IEC standard)   |                          |                          |                          |
| Cable                               | φ4×2P, 2m   | φ5×2P, 2m                |                          |                          |
| Approval                            | CE  |                          |                          |                          |
| Unit weight                         | Approx. 65g   | Approx. 106g             | Approx. 152g             |                          |

※(\*1) The response frequency is the average value. The standard sensing target is used and the width is set as 2 times of the standard sensing target, 1/2 of the sensing distance for the distance.

(A)  
Counter

(B)  
Timer

(C)  
Temp.  
controller

(D)  
Power  
controller

(E)  
Panel  
meter

(F)  
Tacho/  
Speed/  
Pulse  
meter

(G)  
Display  
unit

(H)  
Sensor  
controller

(I)  
Switching  
power  
supply

(J)  
Proximity  
sensor

(K)  
Photo  
electric  
sensor

(L)  
Pressure  
sensor

(M)  
Rotary  
encoder

(N)  
Stepping  
motor &  
Driver &  
Controller

(O)  
Graphic  
panel

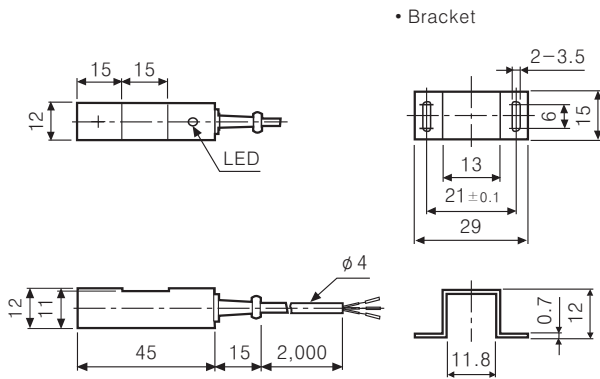
(P)  
Production  
stoppage  
models &  
replacement

# PS/PSN Series

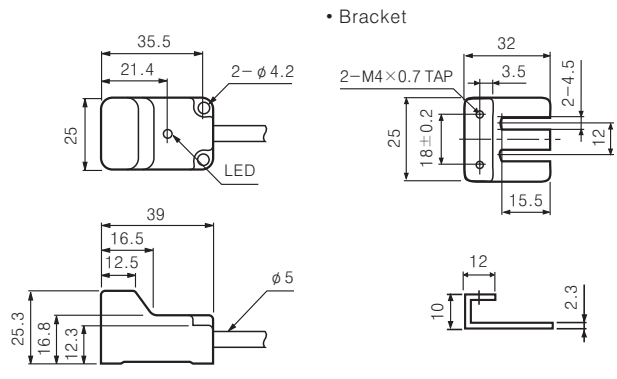
## ■ Dimensions

(Unit:mm)

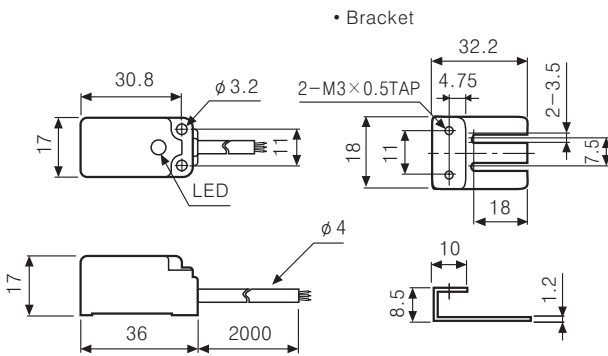
### ●PS12



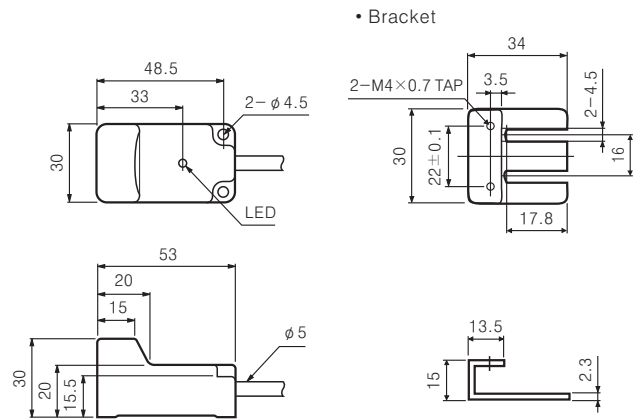
### ●PSN25



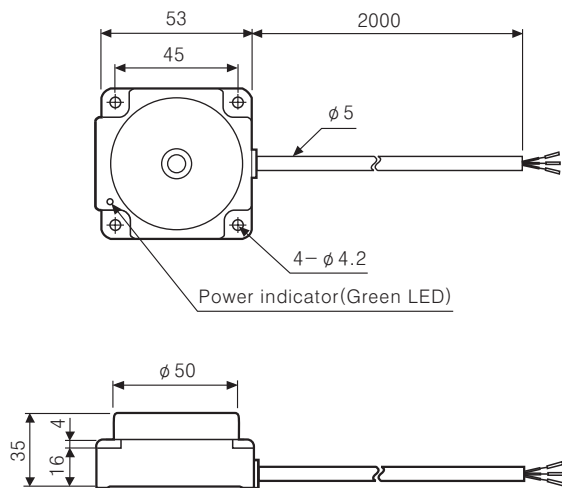
### ●PSN17 / PSNT17 (Former : PS17/ PST17)



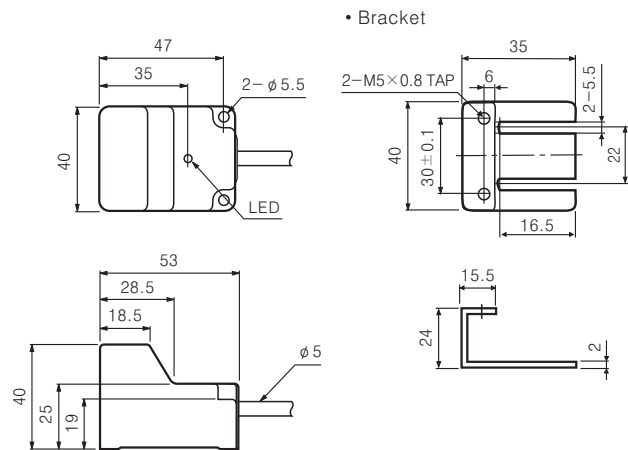
### ●PSN30



### ●PS50



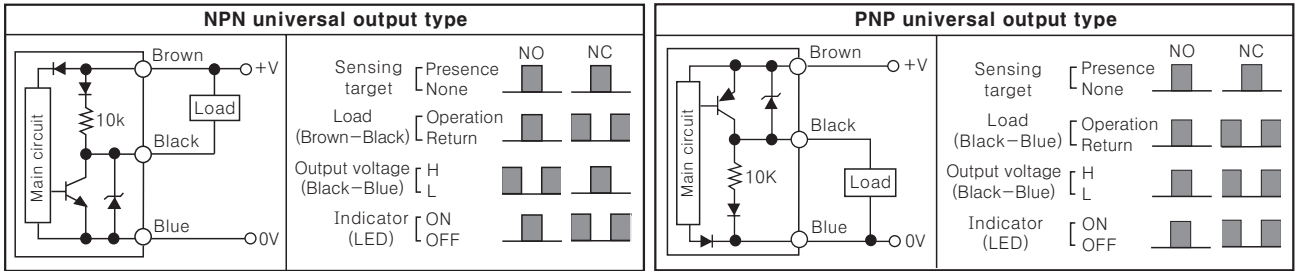
### ●PSN40



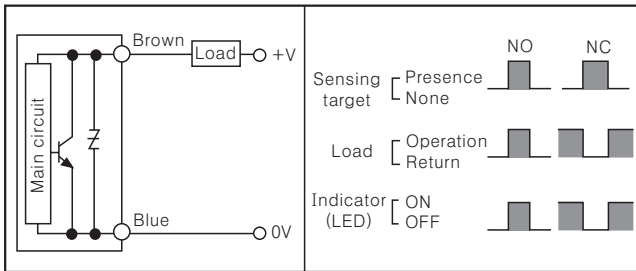
# Rectangular Type

## Control output diagram

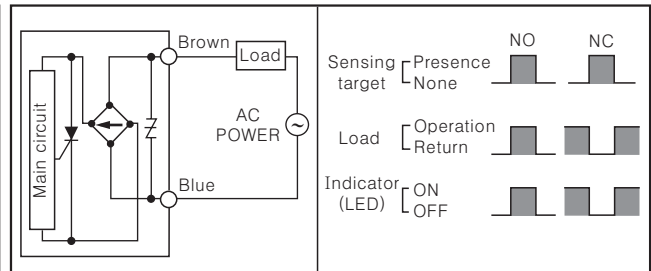
### DC 3-wire type



### DC 2-wire type

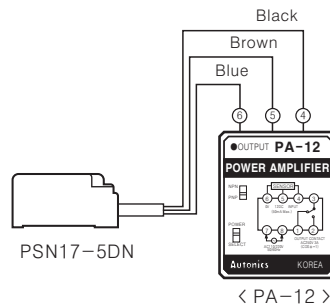
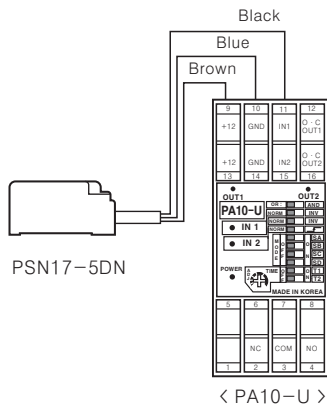


### AC 2-wire type



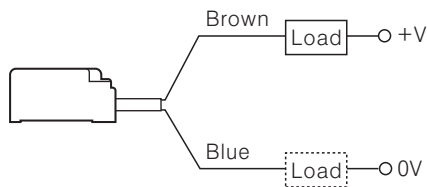
## Connections

### DC 3-wire type

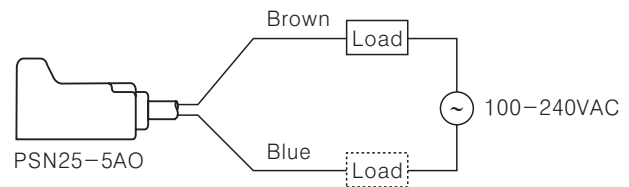


※ There is NPN/PNP selection switch in PA-12.

### DC 2-wire type



### AC 2-wire type



(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

(G) Display unit

(H) Sensor controller

(I) Switching power supply

(J) Proximity sensor

(K) Photo electric sensor

(L) Pressure sensor

(M) Rotary encoder

(N) Stepping motor & Driver & Controller

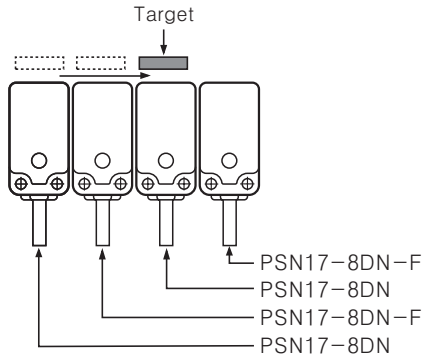
(O) Graphic panel

(P) Production stoppage models & replacement

# PS/PSN Series

## Proper usage

### ① Differential frequency

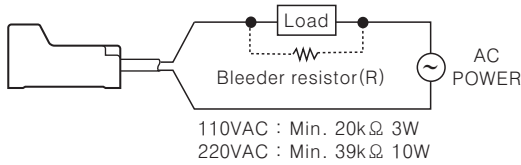


When installing several proximity sensor closely, it may cause malfunction due to mutual interference. Therefore, please use differential frequency for the application.

※Differential frequency type is only for 17 square.

### ② In case of the load current is small

#### ● AC 2-wire type

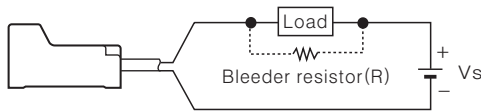


It may cause return failure of load by residual voltage. If the load current is under 5mA, please make sure the residual voltage is less than the return voltage of the load by connecting a bleeder resistor in parallel with the load as shown in the diagram.

$$R = \frac{V_s}{I} \quad (\Omega) \quad P = \frac{V_s^2}{R} \quad (W)$$

[ I : Action current of load, R : Bleeder resistance, P : Permissible power ]

#### ● DC 2-wire type



Please make the current on proximity sensor smaller than the return current of load by connecting a Bleeder resistor in parallel.

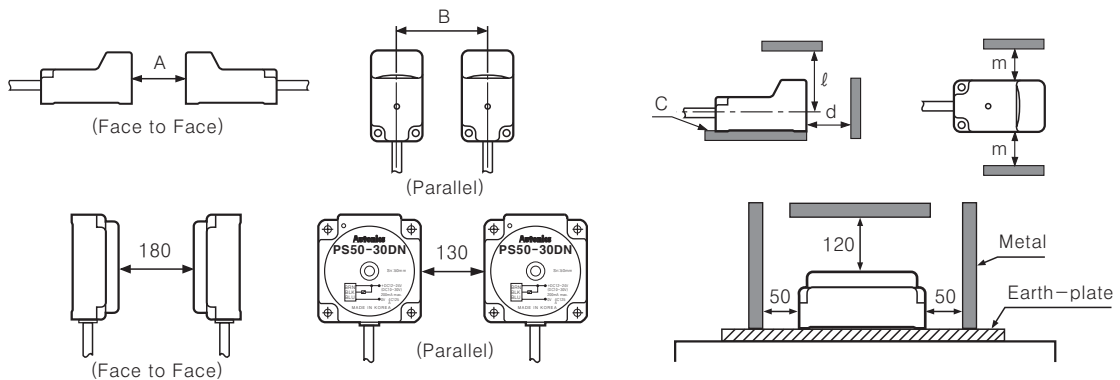
※W value of Bleeder resistor should be bigger for proper heat dissipation.

$$R = \frac{V_s}{I_o - I_{off}} \quad (\Omega) \quad P = \frac{V_s^2}{R} \quad (W)$$

[ Vs : Power supply, Io : Min. action current of proximity sensor  
Ioff : Return current of load, P : Number of Bleeder resistance watt ]

### ③ Mutual-interference & Influence by surrounding metals

When several proximity sensors are mounted closely, malfunction of sensor may be caused due to mutual interference. Therefore, be sure to provide a minimum distance between the two sensors, as below.



Unit:mm

| Item | Model | PSN17 |     |     | PSN25 | PSN30 |      | PSN40 |
|------|-------|-------|-----|-----|-------|-------|------|-------|
|      |       | 4mm   | 5mm | 8mm | 5mm   | 10mm  | 15mm | 20mm  |
| A    |       | 24    | 30  | 48  | 30    | 60    | 90   | 120   |
| B    |       | 24    | 36  | 40  | 40    | 50    | 85   | 70    |
| C    |       | 5     | 5   | 5   | 5     | 5     | 5    | 5     |
| d    |       | 12    | 15  | 24  | 15    | 30    | 45   | 60    |
| l    |       | 18    | 24  | 33  | 25    | 30    | 45   | 45    |
| m    |       | 12    | 18  | 20  | 20    | 25    | 35   | 35    |