REDWALL®

Quality detection system for video surveillance

Unrivaled performance

INSTALLATION INSTRUCTIONS
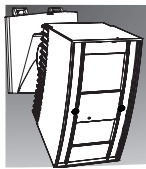
Synthesized Intelligent PIR

REDWALL-V series

CE

SECURITY

c **UL** us

LISTED

This model is UL Listed product. The comment with "*UL-Number" are UL's requirements and information for using this product.

FEATURES

* Low power consumption (3-9VDC, 40µA (standby) 5mA max.)
* Low battery signal
* Intelligent PIR Detection System
  - Three dual pyro-elements with patented Double Conductive Shielding
  - Detection of ambient temperature and illuminance for automatic sensitivity management
  - Advanced detection algorithm
* Anti-vandalism functions
  - Max.4 m (13 ft.) installation height
  - Anti-rotation function with accelerometer
  - Anti-masking function with photo-beam
* Independent sensitivity selector for near/far areas
* Detection logic selector
* Detection range selector
* Independent N.C. and N.O. ALARM output
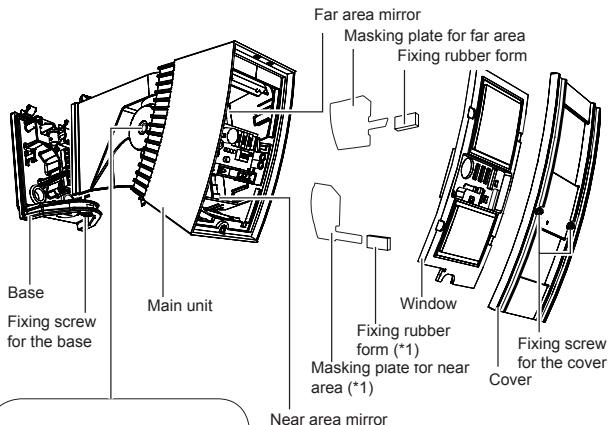* Adjustable alarm interval time
* Reinforced polycarbonate housing
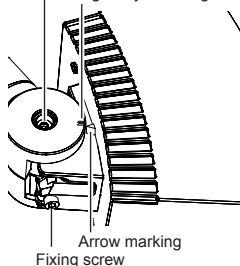
REDWALL-V

: Low current Synthesized Intelligent PIR

* SIP-3020WF
* SIP-4010WF
* SIP-404WF

1 PARTS IDENTIFICATION

Far area mirror
Masking plate for far area
Fixing rubber form

Base
Fixing screw for the base
Main unit
Window
Fixing rubber form (*1)
Masking plate for near area (*1)
Near area mirror
Cover
Fixing screw for the cover

Adjustment screws (two facing each other)
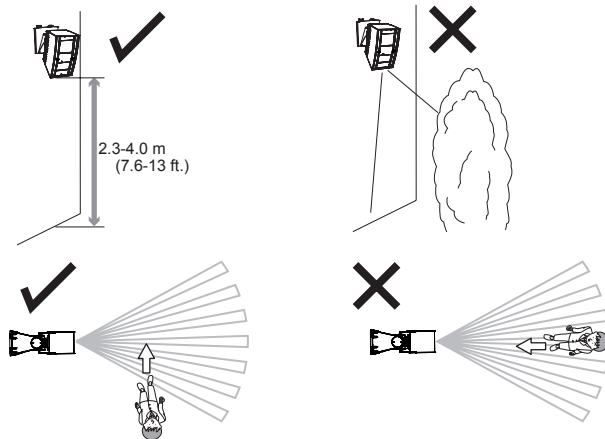Angle adjustment guide
Arrow marking
Fixing screw

*1: Not used for the SIP-4010WF and SIP-404WF.

2 INSTALLATION AND MAINTENANCE NOTES

⚠Warning	⚠Caution
Never repair or modify product	Hold the main unit securely when you install or service it. If you remove your hands from the main unit when cables are connected to it, the main unit may fall and the connector cables may break or the circuit board may be damaged.
Nylon wire loop When servicing, the sensor can be hooked onto the base using the nylon wire loop.	⚠Caution Verify that the power is off before connecting the wiring.

*UL-1: When assessing the installation and application, alarms triggered by conditions such as weather, blowing leaves and bush, or related environmental conditions, etc., need to be considered.
It is recommended that the intrusion detection unit is not to be connected to an alarm initiating circuit but may be connected to a trouble alarm circuit if nuisance trips are not tolerable.
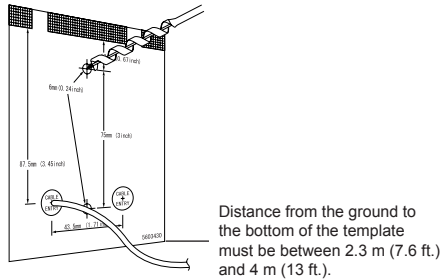
2-1 INSTALLATION HINTS

2.3-4.0 m
(7.6-13 ft.)

Mount the detector so that the majority of traffic flow is across the detection pattern.

ENGLISH
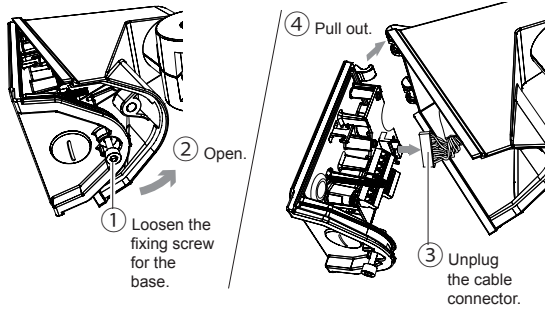
FRANÇAIS

DEUTSCH

ITALIANO

ESPAÑOL

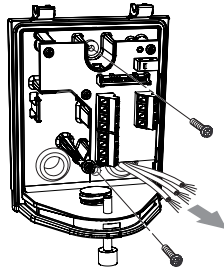# 3 INSTALLATION AND ANGLE ADJUSTMENT

3-1 Wall Mounting

(1) Attach the paper template (an accessory) onto the wall, and drill a 6-mm dia. mounting hole and a cabling hole. Insert the anchor bolt (an accessory) into the board mount hole.

Distance from the ground to the bottom of the template must be between 2.3 m (7.6 ft.) and 4 m (13 ft.).

(2) Using an allen key, remove the main unit from the base.

① Loosen the fixing screw for the base.
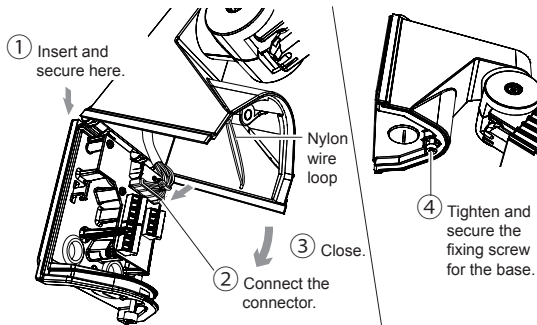② Open.
③ Unplug the cable connector.
④ Pull out.

(3) Drill through the bushing of the wiring hole, pass the cable through the hole, and secure the base to the wall.

(4) Connect the cable to the terminal block (see Step 3-3).

(5) Mount the main unit onto the base.

① Insert and secure here.
② Connect the connector.
③ Close.
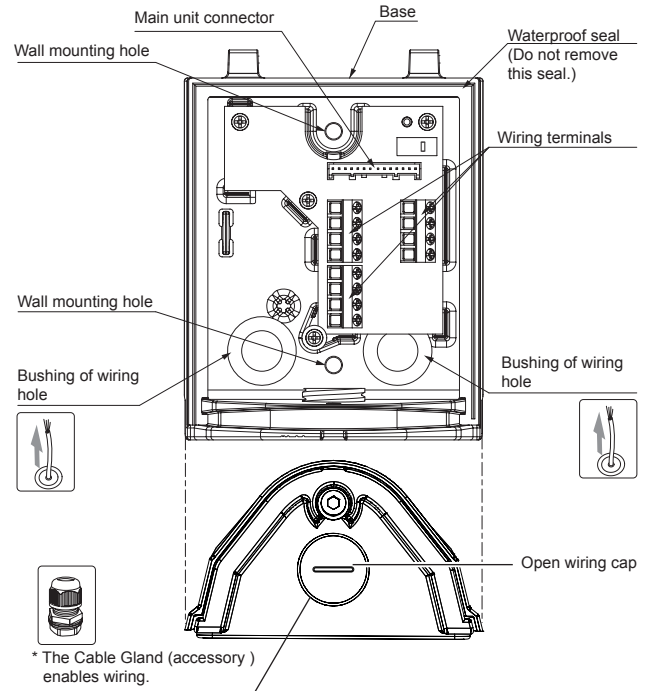④ Tighten and secure the fixing screw for the base.

Nylon wire loop

Cautions>>
When mounting the main unit, take care not to trap the nylon wire loop. Also, take care not to get your fingers caught.

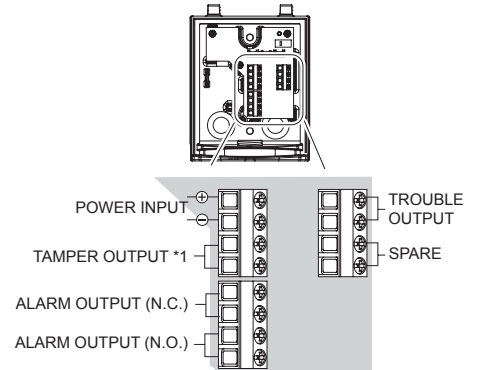(6) Check to see that the various settings and operations are correct.

Caution>>
When the red LED flashes after the power turns on, this signifies that the system is warming up. Wait for approximately 120 seconds.

3-2 Inside View of the Base

Main unit connector
Base
Wall mounting hole
Waterproof seal (Do not remove this seal.)
Wiring terminals
Wall mounting hole
Bushing of wiring hole
Bushing of wiring hole
Open wiring cap

* The Cable Gland (accessory) enables wiring.

3-3 WIRING

POWER INPUT
TAMPER OUTPUT *1
ALARM OUTPUT (N.C.)
ALARM OUTPUT (N.O.)
TROUBLE OUTPUT
SPARE

*1: TAMPER terminals to be connected to a 24 hour supervisory loop.

*UL-2: Minimum wire gauge is 22 AWG.
Wiring methods shall be accordance with the National Electrical Code NFPA 70 or CSA 22.2, Part 1 of the Electrical code for Canada.
*UL-3: UL/ULC required the unit to be connected to a UL/ULC Listed control panel or a power limited Listed Burglar alarm power supply capable of providing a minimum of 4 hours of battery standby power for UL/ULC Listed application.
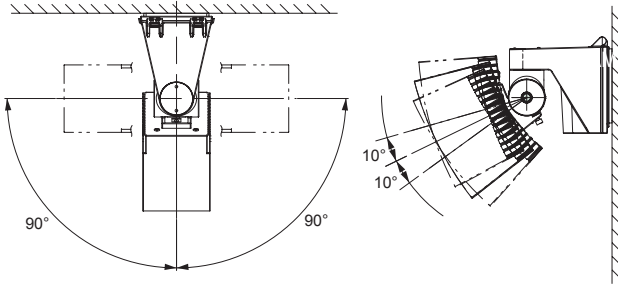
Cautions>>
Maximum wiring length is 3 m.

| Name	Function
TROUBLE OUTPUT	Trouble out is used for anti-masking signal and low battery signal. When an object is placed close to the lens surface, for a period of more than 120 seconds (approx.), the IR anti-masking circuit will activate and generate a trouble signal. When the battery power is less than 2.3V DC, and this condition continues more than 2.5 hours, the signal will be generated. (*UL-3)
TAMPER OUTPUT	It is detected when the cover is opened.
	It is detected when the main unit is removed from its base.
	Anti-Rotation: Damage sustained by the main unit is detected. If the main unit is impacted in a horizontal or vertical direction and if the position of the main unit has changed, damage sustained by the main unit will be detected.

4 | DETECTION AREA SETTING

You can adjust the detection area by 90 degrees in a horizontal direction and by 10 degrees in a vertical direction.
Correct the vertical detection angle according to the mounting height of the sensor unit.

| Applicable models | SIP-3020WF | SIP-4010WF | SIP-404WF |

Cautions>>

To rotate the main unit counterclockwise, loosen the RHside adjustment screw. To rotate the main unit clockwise, loosen the LH-side adjustment screw. Otherwise, you may find it difficult to tighten or you may find that you cannot tighten the adjustment screw when you are securing the main unit.
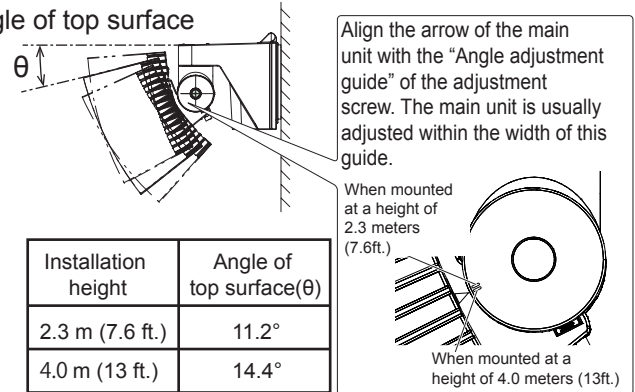
Adjustment screw
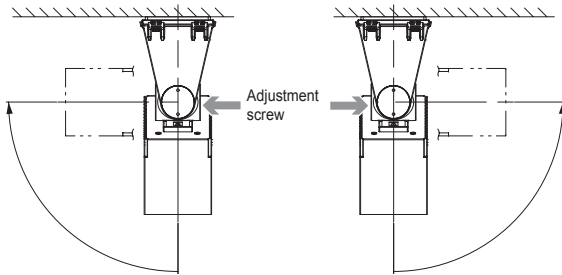
To rotate the unit counterclockwise   To rotate the unit clockwise

(1) Adjust the angle of the main unit in a horizontal direction so that you can cover the desired detection area.

③ Rotate the main unit.

① Loosen the fixing screw for the base.

② Loosen the adjustment screw.

④ Tighten the adjustment screw slightly.
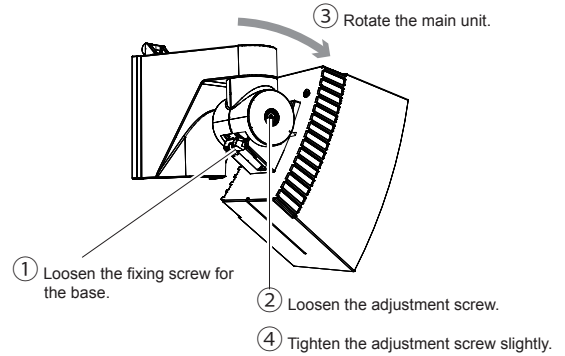
(2) Adjust the angle of the main unit in a vertical direction so that you can cover the desired detection area.

Angle of top surface

θ

Align the arrow of the main unit with the "Angle adjustment guide" of the adjustment screw. The main unit is usually adjusted within the width of this guide.

When mounted at a height of 2.3 meters (7.6ft.)

When mounted at a height of 4.0 meters (13ft.)

Installation height	Angle of top surface(θ)
2.3 m (7.6 ft.)	11.2°
4.0 m (13 ft.)	14.4°

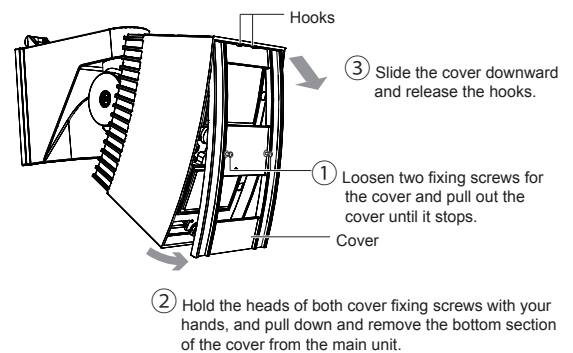*Cautions>>*

If the mounting wall is at an angle, the arrow of the main unit may exceed the top or bottom limit of "Angle adjustment guide". Always check this using the area viewfinder or the walk tester. If the detection area is too high or too low, an object outside the detection area may be detected or incorrect object detection may occur.
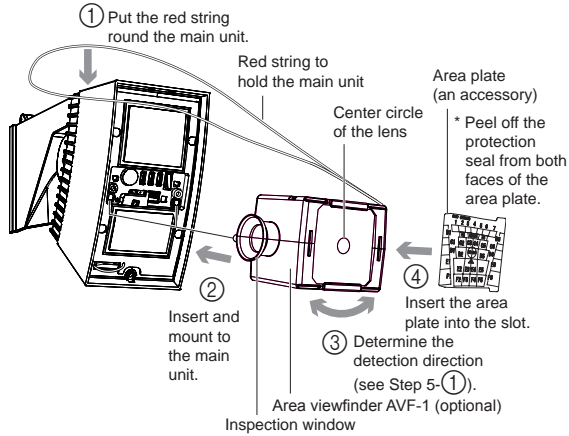
(3) Remove the cover.

Hooks

③ Slide the cover downward and release the hooks.

① Loosen two fixing screws for the cover and pull out the cover until it stops.

Cover

② Hold the heads of both cover fixing screws with your hands, and pull down and remove the bottom section of the cover from the main unit.

Cautions>>

The cover is linked to the main unit by nylon wire loop so that the cover does not fall. Do not pull the cover using excessive force.
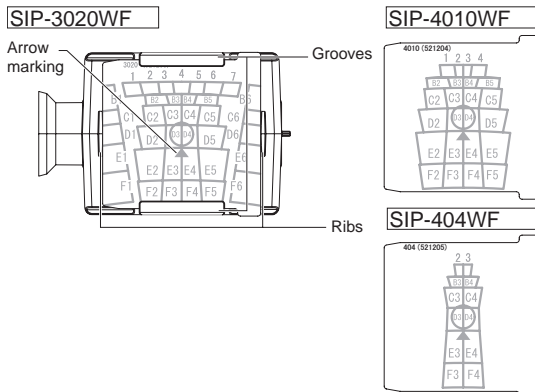
(4) Mount the area viewfinder.

① Put the red string round the main unit.

Red string to hold the main unit

Center circle of the lens

Area plate (an accessory)
* Peel off the protection seal from both faces of the area plate.

② Insert and mount to the main unit.

④ Insert the area plate into the slot.

③ Determine the detection direction (see Step 5-①).

Area viewfinder AVF-1 (optional)

Inspection window

Mounting tips>>
• Engage the convex section of the area viewfinder fixing arms with the notches of the main unit, and insert and mount the arms.

Fixing arms

Notch

Convex section
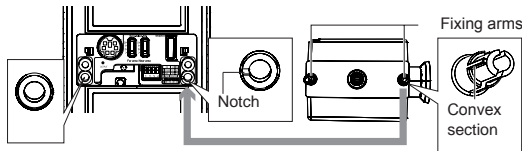
• Mount the area plate so that an arrow of the plate center section faces upward and the letter surface can be seen.
• Insert the area plate into the top and bottom grooves of the area viewfinder until the plate is stopped by the ribs.

SIP-3020WF
Arrow marking
Grooves
Ribs

SIP-4010WF
4010 (521204)

SIP-404WF
404 (521205)

(5) Fine adjust the main unit angle in vertical and horizontal direction by observing the target area through the area viewfinder.

① To change the direction of the inspection window, rotate the area viewfinder in a horizontal direction until it clicks and stops.

② Move your face close to the viewfinder so that your eye comes within 5 mm of the inspection window (lens surface).
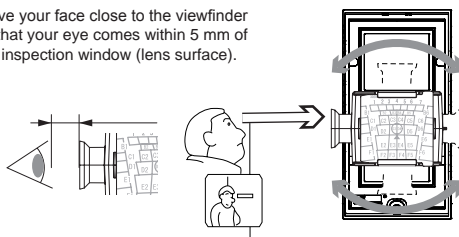
③ Locate the center circle of the area plate on the center circle of the lens of the area viewfinder, and check the detection area pattern on the area plate and the background image.
* Each letter on the area plate corresponds to each mirror number (see Step 8-2).
* You cannot observe mirror numbers B1 to F1 and B6 to F6 (shown at right) of the SIP-3020 area plate through the inspection window. Check them using the walk tester.
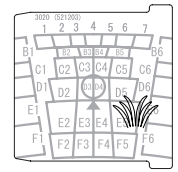
Center circle of the lens
Center circle of the area plate

Invisible area

The detection area is inside the frame border.
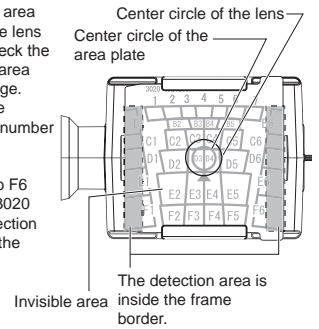
Adjusting tips>>
If you experience any of the following, see Step 10.

Limit line of detection area
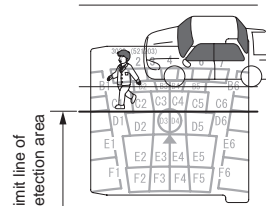
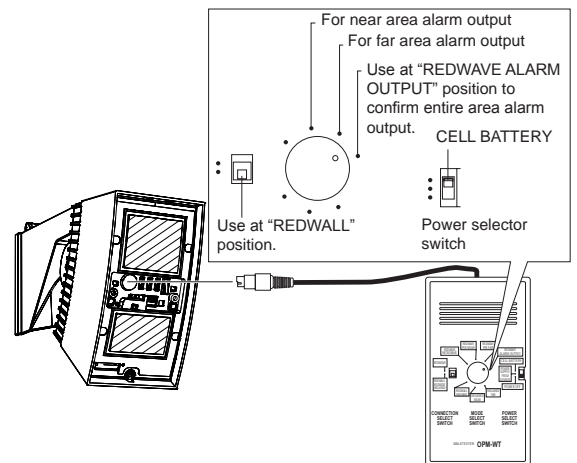The sensor area is extended over the street where a person walks or a car drives.

Branches of a tree and grass move when the wind blows.

Cautions>>
• The area viewfinder is a supporting tool for detection area adjustment.
• After you have adjusted the detection area using the area viewfinder, always check the area using the walk tester.
• Never look directly into the sun through the area view finder.
• After you have used the area viewfinder, store it away from direct sunlight.

(6) Securely tighten the adjustment screw that you have loosened.

(7) Connect the walk tester OPM-WT (optional) to the sensor unit, and check that the detection area is correct.

For near area alarm output
For far area alarm output

Use at "REDWAVE ALARM OUTPUT" position to confirm entire area alarm output.

CELL BATTERY

Use at "REDWALL" position.

Power selector switch

① When the power selector switch is turned to "CELL BATTERY" position after plugging the cable into the walk tester connector, a continuous beeping sound will be heard.

② When a pedestrian first enters the detection area, the strong and weak beeps will sound alternately.

③ When the entirety of a pedestrian's body is detected, the strong beep will sound continuously.

Cautions>>
• OPM-WT can not be operated at the "Power supply from sensor" position of the power select switch.
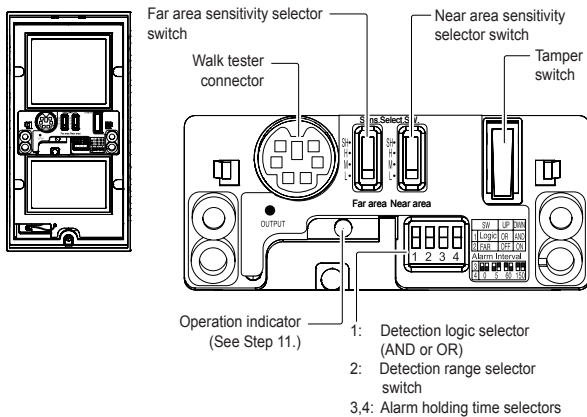
If it is difficult to detect an object>>

1. Set the detection logic switch to the "OR" position (see Step 5-2).
   If the sensor is OK when you have completed the walk test, return the logic switch to the "AND" position.
2. Adjust the sensor sensitivity switch (see Step 5-1).

To mask the detection area>>

Detection area	How to mask the area	Reference
Far area	Use the switch.	5-3
	Use the masking plate (mounted in the main unit).	Step 7
Near area	Use the masking plate (mounted in the main unit).	8-1
	Attach the masking seal (an accessory) to the area mirror surface.	8-2

5 FUNCTION SETTING

Applicable models   **SIP-3020WF**   **SIP-4010WF**   **SIP-404WF**

Far area sensitivity selector switch
Near area sensitivity selector switch
Walk tester connector
Tamper switch
Operation indicator (See Step 11.)

1: Detection logic selector (AND or OR)
2: Detection range selector switch
3,4: Alarm holding time selectors

5-1 Sensitivity Selector Switch for Near and Far Area

Applicable models   **SIP-3020WF**   **SIP-4010WF**   **SIP-404WF**

You can change the sensitivity for far area detection and near area detection independently.
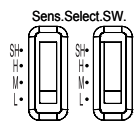
SELECTOR POSITION	FUNCTION
SH	Suitable for sites requiring a level of sensitivity higher than "H"
H	Suitable for sites requiring a level of sensitivity higher than "M"
M (Factory default)	Suitable for standard applications
L	Suitable for hostile and narrow area

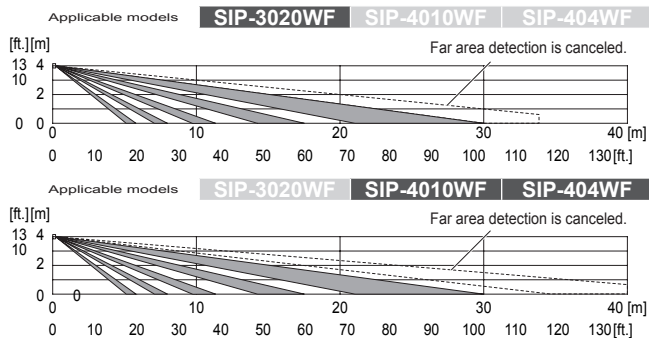## 5-2 Detection Logic Selector Switch   Dip switch **1**

Applicable models   **SIP-3020WF**   **SIP-4010WF**   **SIP-404WF**

The near area sensor has two dual-element devices, and it covers two types of plane areas alternately using the two devices.

SELECTOR POSITION	STATUS	FUNCTION
UP	OR (Factory default)	A sensor signal is output when an object is detected in either of the two detection areas. * Use this mode when you adjust the detection area. Switch to AND mode after you have finished the detection area adjustment.
DWN	AND	Use this mode to reduce instances of incorrect detection of objects. The sensor signal is output only when an object is detected within the two detection areas. If any objects are blocking multiple detection areas, use OR mode.

5-3 Detection Range Selector Switch   Dip switch **2**

SELECTOR POSITION	STATUS	FUNCTION
UP	OFF	Cancels the far area detection. The detection area is reduced as shown below.
DWN	ON (Factory default)	Enables the far area detection.

Applicable models   **SIP-3020WF**   SIP-4010WF   SIP-404WF

Far area detection is canceled.

Applicable models   SIP-3020WF   **SIP-4010WF**   **SIP-404WF**

Far area detection is canceled.

5-4 Alarm Interval Switch   Dip switch **3-4**

Applicable models   **SIP-3020WF**   **SIP-4010WF**   **SIP-404WF**

You can set an interval (4 different times) to suspend the alarm signal output.
For example, if you set this interval to 60 seconds, no more alarm signals will be output for 60 seconds after the output of the first alarm signal. It works to avoid frequent outputs to save battery life. If no pedestrians are detected for more than 60 seconds, the system returns to the standby mode.
Then, when a pedestrian is detected, the alarm signal will be output.

SELECTOR POSITION				
FUNCTION	0 sec (Factory default)	5 sec	60 sec	150 sec

6 DETECTION AREA

TOP VIEW (Installation height 4.0 m (13ft.))

SIDE VIEW (Installation height 4.0 m (13ft.)) ■ : Near area ■ : Far area

TOP VIEW (Installation height 2.3 m (7.6ft.))

SIDE VIEW (Installation height 2.3 m (7.6ft.)) ■ : Near area ■ : Far area

TOP VIEW (Installation height 4.0 m (13ft.))

SIDE VIEW (Installation height 4.0 m (13ft.)) ■ : Near area ■ : Far area

TOP VIEW (Installation height 2.3 m (7.6ft.))

SIDE VIEW (Installation height 2.3 m (7.6ft.)) ■ : Near area ■ : Far area

TOP VIEW (Installation height 4.0 m (13ft.))

SIDE VIEW (Installation height 4.0 m (13ft.)) ■ : Near area ■ : Far area

TOP VIEW (Installation height 2.3 m (7.6ft.))

SIDE VIEW (Installation height 2.3 m (7.6ft.)) ■ : Near area ■ : Far area

7 MASKING THE FAR AREA SENSOR

The far area mirror mounted in the main unit has 2 far masking plates; one at the right side of this mirror and the other at the left side of this mirror. You can mask the detection area by changing the position of these masking plates.

Cautions>>
- You can only mask the detection area from its outside to its inside using the masking plates. You cannot mask only the inside detection area.
- However, if you need to mask the inside detection area only, use the white space (margin) of the near area masking seal (an accessory) for the masking. Attach the seal and mask all mirrors that you need to shield.

Cautions>>
- The window is linked to the main unit by nylon wire loop so that the window does not fall. Do not pull the window using excessive force.
- After you have masked the detection areas, mount the window and place the excessive nylon wire loop inside the main unit.
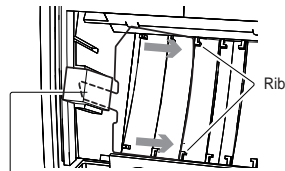
How to remove the window>>

Window

Press the left bottom hole with your finger, and pull the window up.

Applicable models   **SIP-3020WF**   SIP-4010WF   SIP-404WF

① Remove the masking plate from the storage, and check the detection area and the mirror you use by referring to the area chart.
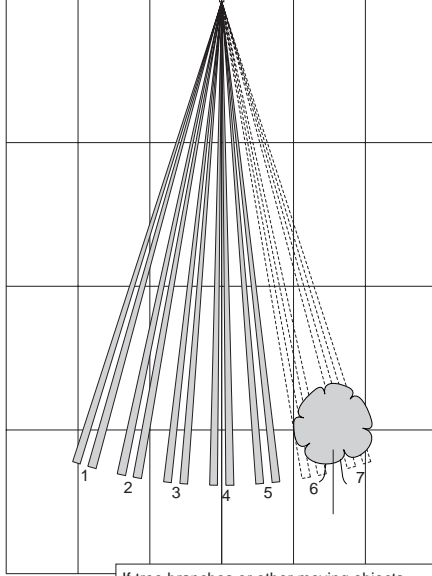
Far area mirror
Rib

② Attach the masking plate to the mirror, and secure it to the ribs.

Rib
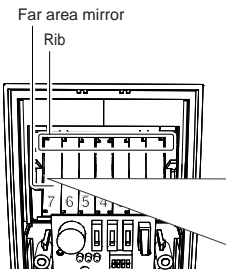
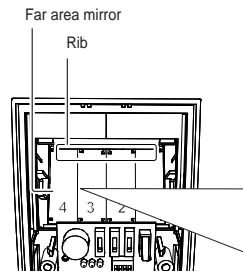③ Insert the fixing rubber form to secure the knob of the masking plate.

| 50 | 40 | 30 | 20 | 10 | 0 | 10 | 20 | 30 | 40 | 50 [ft.] |
| 15 | | 10 | | 5 | 0 | | 5 | | 10 | 15 [m] |

1 2 3 4 5 6 7

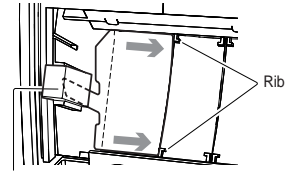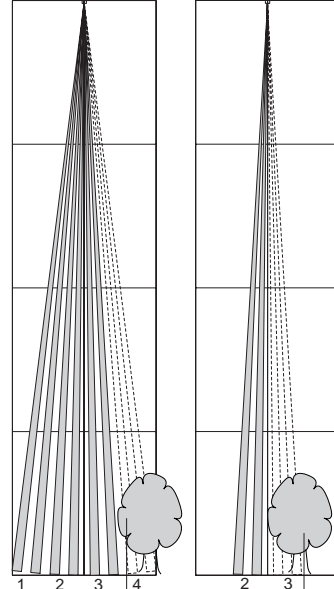If tree branches or other moving objects are in the path of the detection beam.

Applicable models   SIP-3020WF   **SIP-4010WF**   **SIP-404WF**

① Remove the masking plate from the storage, and check the detection area and the mirror you use by referring to the area chart.

Far area mirror
Rib

② Attach the masking plate to the mirror, and secure it to the ribs.

Rib

③ Insert the fixing rubber form to secure the knob of the masking plate.

SIP-4010WF

| 10 | 0 | 10 [ft.] |
| 5 | 0 | 5 [m] |

1 2 3 4

SIP-404WF

| 10 | 0 | 10 [ft.] |
| 5 | 0 | 5 [m] |

2 3

If tree branches or other moving objects are in the path of the detection beam.

8 MASKING THE NEAR AREA SENSOR

8-1 Masking the Detection Areas using Masking Plates

The near area mirror mounted in the main unit has 2 near masking plates; one at the right side of this mirror and another at the left side of this mirror. You can mask the detection area by changing the position of these masking plates.

Cautions>>
> You can mask the outside detection areas only; they are areas 1 and 6. Use the area masking seals (an accessory) to mask the other detection areas (see Step 8-2).
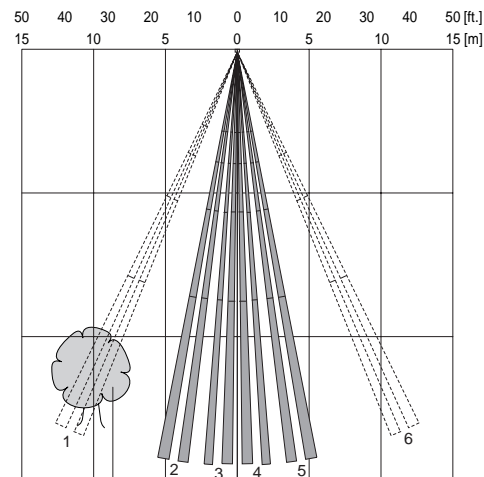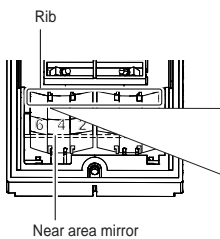
Applicable models **SIP-3020WF** SIP-4010WF SIP-404WF

① Remove the masking plate from the storage, and check the detection area and the mirror you use by referring to the area chart.

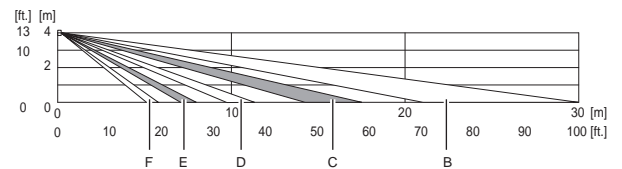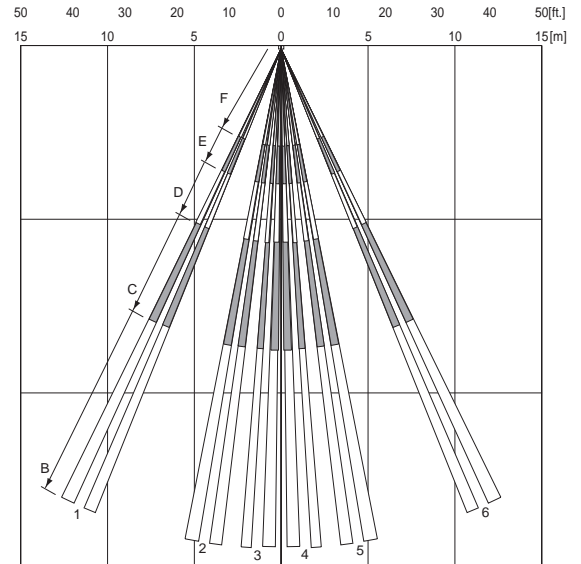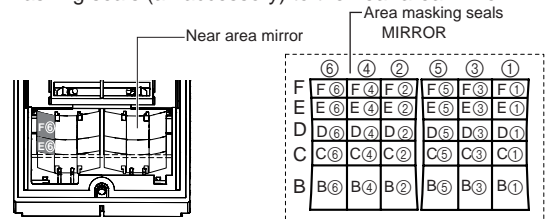② Attach the masking plate to the mirror, and secure it to the ribs.
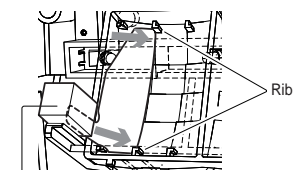
Rib

Rib

③ Insert the fixing rubber form to secure the knob of the masking plate.

Near area mirror

If tree branches or other moving objects are in the path of the detection beam.

8-2 Masking the Detection Areas using Masking Seals

Using the tweezers (an accessory), carefully attach the area masking seals (an accessory) to the near area mirror.

Near area mirror — Area masking seals MIRROR

	⑥	④	②	⑤	③	①
F	F⑥	F④	F②	F⑤	F③	F①
E	E⑥	E④	E②	E⑤	E③	E①
D	D⑥	D④	D②	D⑤	D③	D①
C	C⑥	C④	C②	C⑤	C③	C①
B	B⑥	B④	B②	B⑤	B③	B①

Points>>
> If you are using the SIP-3020WF, SIP-4010WF, or SIP-404WF sensor unit when you have completed Step 8, proceed to Step 9.

9 TERMINATION PROCEDURE

Applicable models   **SIP-3020WF** | **SIP-4010WF** | **SIP-404WF**

(1) After you have adjusted all sensor items, securely tighten all adjustment screws that you have loosened. Finally, securely tighten the bottom fixing screws.

① Adjustment screw
② Fixing screw
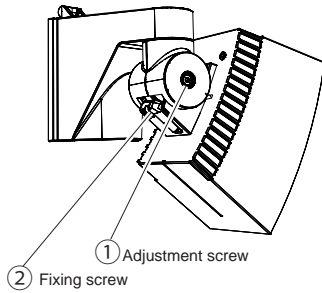
Cautions>>
- If you need to adjust the detection area again, be sure to loosen the fixing screw. If you try to move the main unit without loosening the fixing screw, the unit may be damaged.
- When you mount the cover, place the excessive nylon wire loop in the main unit. If the wire has been pinched by the window and the cover, rain drops may be able to enter into the main unit.

(2) Mount the cover.

10 OPERATION TEST

10-1 If There is a Public Street Where a People Walk or Cars Drive by the Detection Area

Points>>
Reduce the size of the detection area so that it does not include any public streets.

(1) Check to see that the arrow of the main unit is within the width of "Angle adjustment guide" on the adjustment screw.

(2) Using the area viewfinder, check to see that the detection area does not include any public streets.

(3) If the detection area does go beyond a public street, correct the vertical angle of the main unit.
However, exercise care so that the arrow does not move away significantly from the "Angle adjustment guide" position.

↓ *If the arrow does move away significantly from the "Angle adjustment guide" position:*

Mask the far area detection area using the masking plate or by using the far area masking switch. You may be required to also mask the near area detection area under specific sensor installation conditions (see Steps 5 and 8).
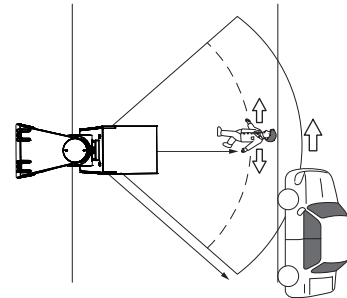
(4) When a person walks along the street or a car drives along it, check the detection area using the walk tester.

Points>>
You cannot mount and use both the area viewfinder and walk tester simultaneously.
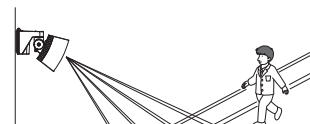
Cautions>>
The detection area may increase if there is a large difference in temperature between the moving object and the background.

Cautions>>
A heat source beyond the detection area may cause a false alarm due to the reflection of heat off the ground. Examples of types of surfaces that reflect include water (puddles), wet roads, smooth concrete surfaces and asphalt roads.
If the source of the heat is strong and/or the reflection rate is high, the detection distance will be longer than required and may detect unnecessary objects beyond the target area. Therefore, select the detection range position according to the ground conditions of the installation site.

Cautions>>
Conduct walk test at least once a year.

ENGLISH

FRANÇAIS

DEUTSCH

ITALIANO

ESPAÑOL

10-2 If Tree Branches or Grass are Detected When They Move Within the Detection Area

> **Points>>**
> Adjust the detection area so that it does not cover tree branches or grass that move when the wind blows.

(1) Check to see that the arrow of the main unit is within the width of "Angle adjustment guide" on the adjustment screw.

(2) Using the area viewfinder, check to see that the detection area does not cover tree branches or grass that may move when the wind blows.

(3) Use the walk tester to listen for sound level changes when there is no apparent activity in the detection area. Adjust the detection area so that it does not detect unwanted areas.

⬇

If the sound level changes, some part of the detection area must be active (i.e.: an object is moving).

(4) Use the walk tester and locate the part of the detection area that is active. Change the walk tester selector switch position and determine whether the active part of the detection area is far or near.

(5) Using the area viewfinder again, locate the active detection area.

(6) Mask the active detection area. To do this, mask the area using the masking plate or the masking seal. Otherwise mask the area using the far area masking switch (see Steps 5, 7, and 8).

(7) Using the walk tester again, check that the sound level changes. If the sound level does not change excessively, you can finish the adjustment.

> **Points>>**
> You cannot mount and use both the area viewfinder and the walk tester simultaneously.

11 LED FUNCTIONS
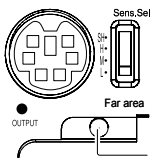
Operation indicator - Red LED

> **Cautions>>**
> If the red LED keeps blinking for approx. 120 seconds after turning the power on, turn the power off and then on again.

DETECTOR STATUS	If the cover is removed
During power ON	Blinks.
During standby	Turns OFF.
When detected (in far/near area)	Lights.

12 SPECIFICATIONS

12-1 Specifications of the Main Unit

Applicable models **SIP-3020WF SIP-4010WF SIP-404WF**

Model	SIP-3020WF	SIP-4010WF	SIP-404WF
Detection method	Passive infrared		
Coverage	30 x 20m (100 x 65ft.)	40 x 10m (130 x 33ft.)	40 x 4m (130 x 13ft.)
Number of detection zones	74 zones	48 zones	24 zones
Mounting height	2.3 to 4m (7.6 to 13ft.)		
Power input	3 - 9V DC (Alkaline or lithium battery) (*UL-5)		
Operating voltage	2.5 - 10V DC		
Current draw	40 µA (standby) 5mA max. (operating, LED ON)		
Operation indicator	RED ALARM		
Warm-up period	Approx. 120 sec.		
Detection range selector	Far area: ON / OFF		
Alarm interval period	0 / 5 / 60 / 150 sec.		
Detection logic selector	AND/OR		
Tamper output	N.C. 10V DC, 0.01A max. Resistive load only		
Trouble output	N.C. 10V DC, 0.01A max. Resistive load only		
Alarm output	N.C. 10V DC, 0.01A max. N.O. 10V DC, 0.01A max. Resistive load only		
Sensitivity selector	Far: SH/H/M/L Near: SH/H/M/L		
Operating temperature	-25 to +60°C (-13 to +140°F) (*UL-6)		
IP rating	Main unit: IP65 (*UL-7) Chassis: IP55		
Dimensions (H × W × D)	227 x 102 x 266mm (9 x 4 x 10.5 in.)		
Weight	1.2kg (42 oz.)		
Accessories	Screws, paper template, allen key, area masking seal, tweezers, instruction manual, area plate, fixing rubber form, cable glands		

*UL-5: UL/ULC required the unit to be connected to a UL/ULC Listed control panel or a power limited Listed Burglar alarm power supply capable of providing a minimum of 4 hours of battery standby power for UL/ULC Listed application.

*UL-6: UL/ULC tested this product at -40 and 66 °C.

*UL-7: IP rating is not a feature of UL Listed application.

DIMENSION

SIP-3020WF SIP-4010WF SIP-404WF

102
(4.0)

266
(10.5)

227
(9.0)

90
(3.6)

96
(3.78)

21
(0.83)

21
(0.83)

17.1
(0.67)

13
(0.51)

75
(3.0)

116
(4.57)

Unit:mm (inch)
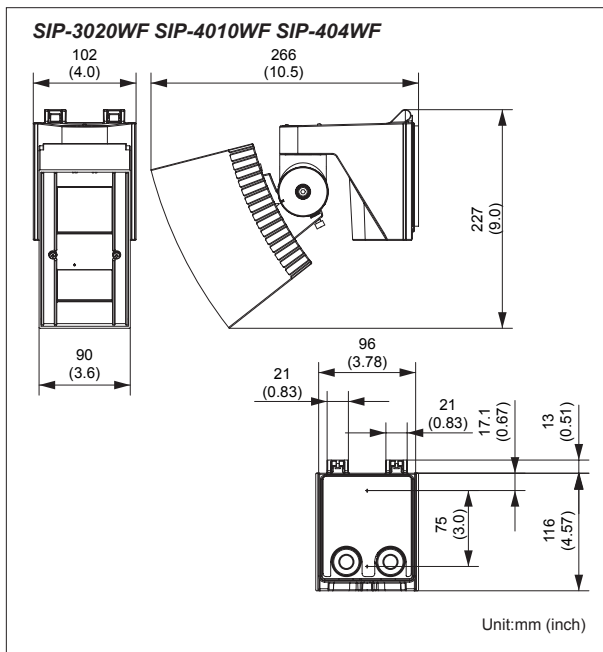
OPTION

- OPM-WT   -Audio Walk Tester
- AVF-1   -Area View Finder
- SIP-MINIHOOD   -Sun/Snow shield

*UL-8: The performance with these optional modules has not be verified by UL.

These units are designed to detect movement to activate CCTV system. Being only part of a complete surveillance system, we cannot accept responsibility for any damage or other consequences resulting form the activation of the unit.
This product confirms the EMC Directive 2004/108/EC.

Specifications and design are subject to change without prior notice.