OPTEX

High Mount Outdoor Detector

HX-80N/80NAM

HX-80N	2 PIRs standard model
HX-80NAM	HX-80N with anti-masking

• Long distance detection area (24.0 m)

• Flexible detection area setting with plates and flaps

• Unique pyro element

• Intelligent AND logic

• Dual signal processing logic

• Vegetation sway analysis logic

• Digital anti-masking (AM model)

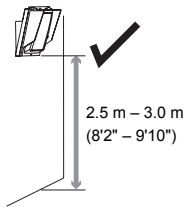## CONTENTS

1 INSTALLATION PRECAUTIONS

1-1 BEFORE INSTALLATION

⚠Warning	Failure to follow the instructions provided with this indication and improper handling may cause death or serious injury.
⚠Caution	Failure to follow the instructions provided with this indication and improper handling may cause injury and/or property damage.

The check ✓ mark indicates recommendation.
The nix 🚫 sign indicates prohibition.

⚠Warning	⚠Warning	⚠Caution
Do not repair or modify product	Keep product away from water	Mount the unit securely

Mounting height	Keep the detector parallel to the ground.
2.5 m – 3.0 m (8'2" – 9'10")	Parallel / Tilt
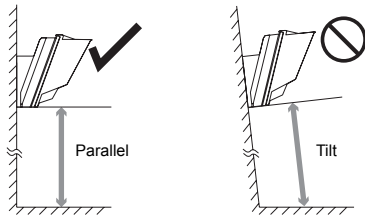
Consider the direction a person is approaching from, as well as the detection area.

Install the detector in a place where it is free from false alarm factors. For example:
- Sunlight and reflection
- Heat source
- Objects moving in the wind

PARTS IDENTIFICATION

Bracket base

Base

Terminals

Main unit

Cover

PIR1
(Do not touch)

Anti-masking infrared LED
(HX-80NAM only)
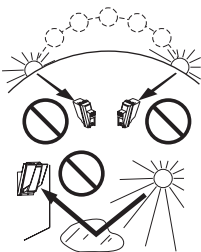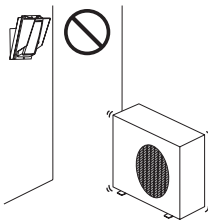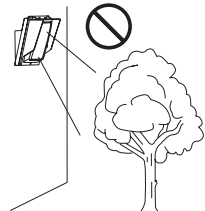
PIR2
(Do not touch)

Bracket

Shaft cover

Lock Screw* (M4 × 35 mm)

Screw (4 × 20 mm)

LED indicator

Lens

Lock screw

Screw kit

For joint	For wall mounting
Screw (4 × 20 mm)	Screw (4 × 20 mm)

*Lock screw attached on bracket base
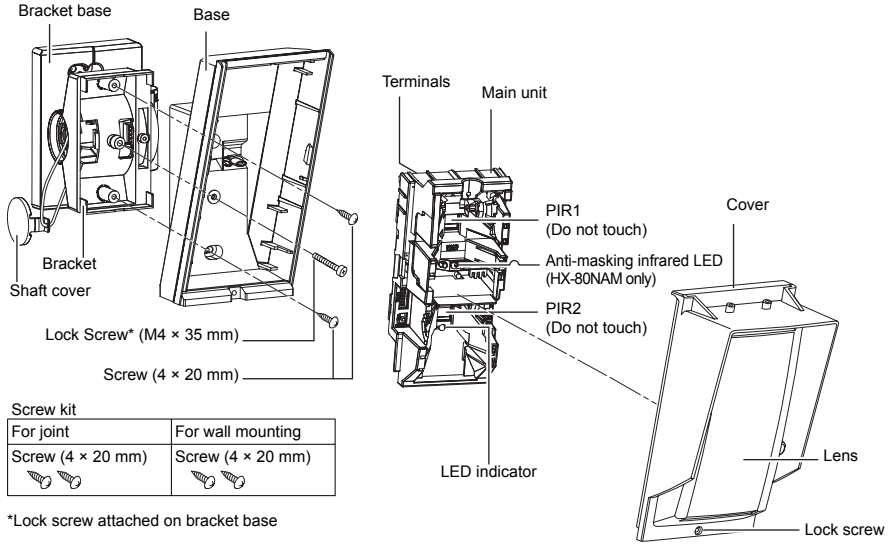
KNOCKOUTS

Main unit

Bracket

Wiring Hole

Wiring
knockout

(Off-the-shelf) Universal
magnet switch install position

Wiring sponge pad

Wiring Hole

For bracket
Up-Down lock screw

For wall fastening/bracket fastening
(installation pitch 83.5 mm (3.29"))

Do not touch

For wall
fastening

For switch
box fastening

Up-Down
lock screw

Adjustment screw

For main unit fastening

- 3 -
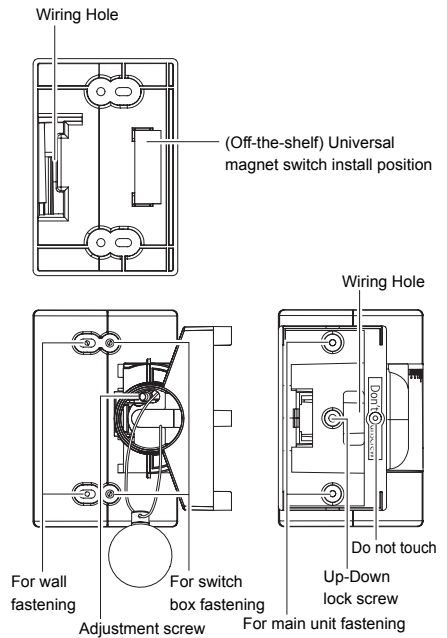
2 DETECTION AREA

2-1 OUTLINE OF DETECTION AREA

Plate 1

Upper flap

Plate 2

Lower flap

Flap fix position
indicator

Plate fix position
indicator
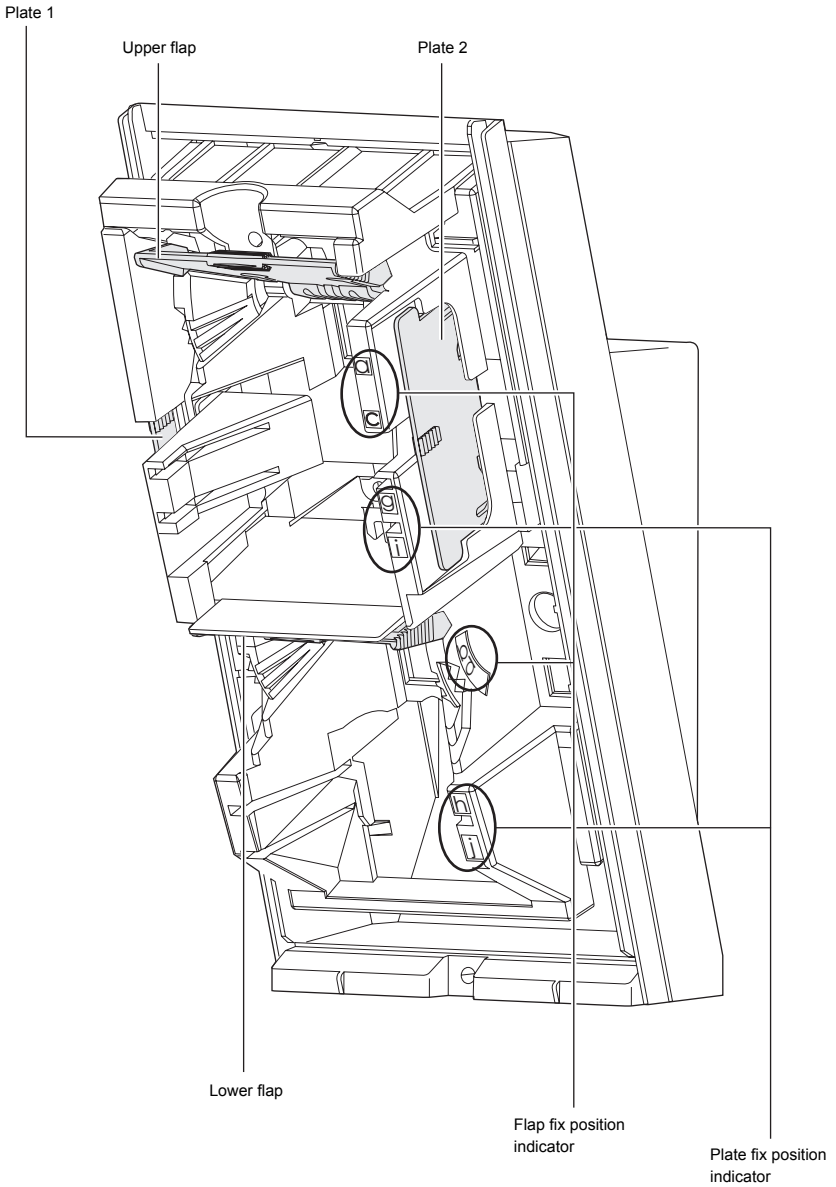
DETECTION AREA (factory default)

Side View

3.0 m (9'10")

a b c d e f g h i j

(m) 3.0 2.0 1.0

(ft.) 10 8 6 4 2

80 (ft.) 24 (m) 70 20 60 16 50 40 12 30 8 20 4 10
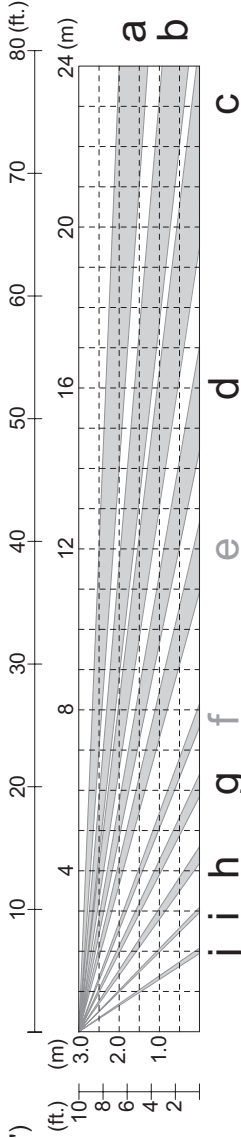
Caution>>
• Adjust 1 click (1.25° upward) for 3.0 m (9'10") height installation. (Refer to 3-2)

2.5 m (8'2")

a b c d e f g h i j

(m) 2.5 1.5 0.5

(ft.) 8 6 4 2

80 (ft.) 24 (m) 70 20 60 16 50 40 12 30 8 20 4 10
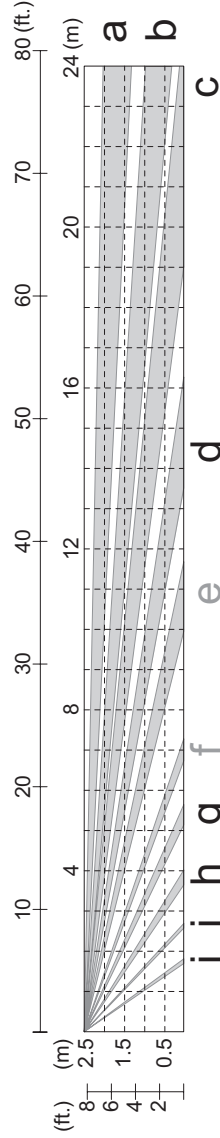
Caution>>
• Adjust 2 clicks (2.5° upward) for 2.5 m (8'2") height installation. (Refer to 3-2)

Top View

(m) 1.0 0 1.0

(ft.) 3 0 3

80 (ft.) 24 (m) 70 20 60 16 50 40 12 30 8 20 4 10
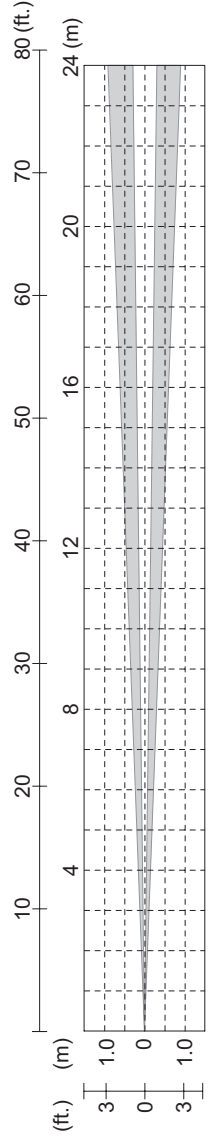
HOW TO REDUCE THE LONG RANGE DETECTION AREA

To adjust the LONG range of detection, set the upper and lower flaps as follows:

Upper flap

Flap fix position indicator
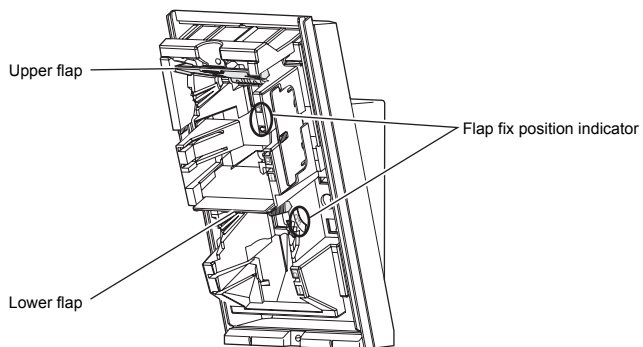
Lower flap

1 Pull out the flap.
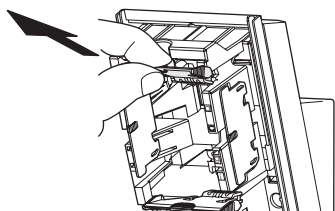
Note>>
If the lower flap is located at the factory default position, slide it out with your thumb.
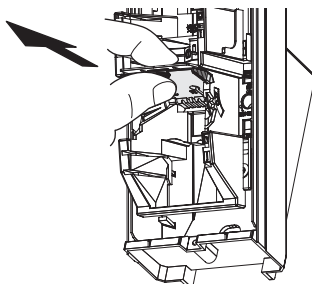
2 Move the flap to the position that corresponds with the desired detection distance.
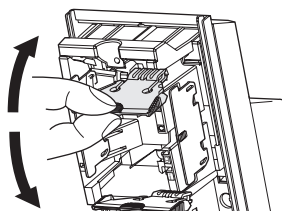
3 Push the flap until it clicks into position.
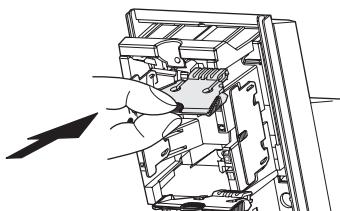
PIR long range detection area reduction

The detection distance in the following table can be limited by combining the positions of the flap.
Use the following table to determine the positions of the upper and lower flaps that set the required max. detection distance.
NOTES:
1. The distance may vary due to environmental conditions.
2. Always walk test the detector to confirm the detection distance.

Upper \ Lower	Factory default	b	d
Factory default	24.0 m (80')	N.A.	N.A.
a	① 18.0 m (60')	② 13.0 m (42'8")	N.A.
c	N.A.	③ 10.0 m (32'10")	④ 6.5 m (22')

NOTE: Use only the following combinations for the flap settings.

①
18m(60')
5m   10m   15m
MASK
3.0m(9'10")
Upper position: **a**, Lower position: Factory default

②
13m(42'8")
5m   10m
MASK
3.0m(9'10")
Upper position: **a**, Lower position: **b**

③
10m(32'10")
5m
MASK
3.0m(9'10")
Upper position: **c**, Lower position: **b**

④
6.5m(22')
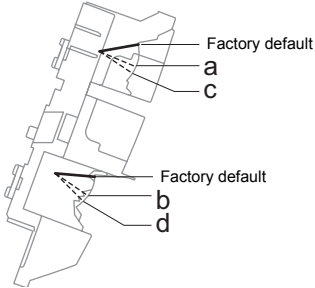5m
MASK
3.0m(9'10")
Upper position: **c**, Lower position: **d**
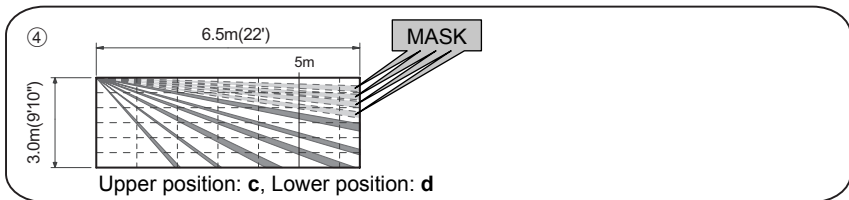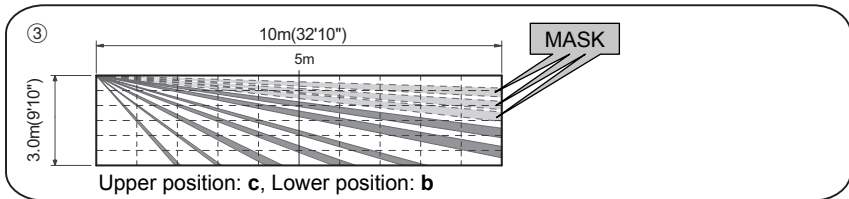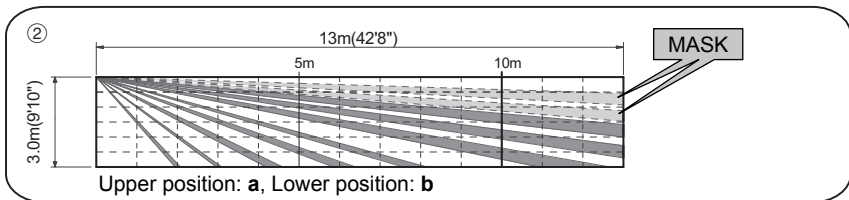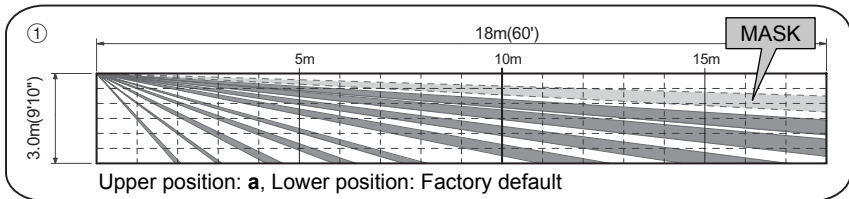
HOW TO DEACTIVATE THE SHORT RANGE DETECTION AREA

To adjust the SHORT range of detection, set the upper and lower plates as follows:

Plate 2

Plate 1

Plate fix position indicator

* Plate 1 and 2 are identical.
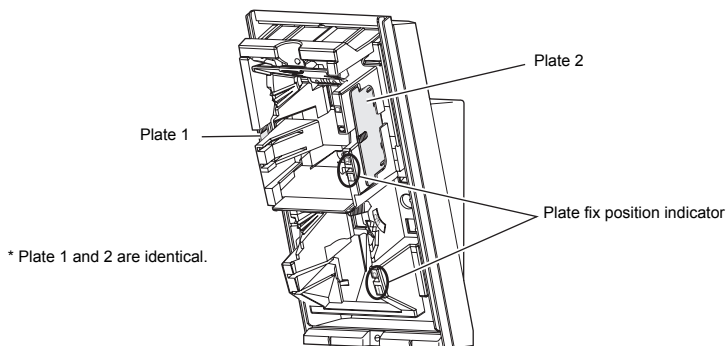
1 Remove the plate.
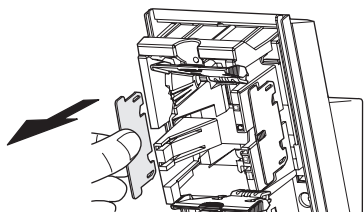
2 Insert the plate into the position determined by the required masking distance until it clicks.
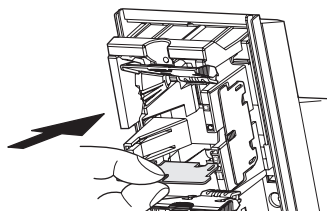
3 If any plate is not used, place it in the storage position.
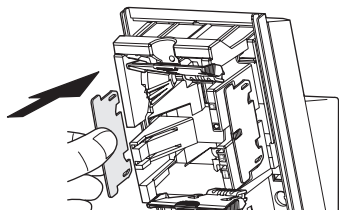
Note>>
Be careful not to lose the plates.

PIR short range detection area deactivation

Use the following table to determine the positions of the plates that set the required masked area.
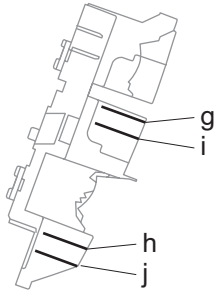
Upper \ Lower	Not used	j	h
Not used	Factory default	①	N.A.
i	N.A.	②	③
g	N.A.	N.A.	④

NOTE: Use only the following combinations for the plate settings.

①
24m(80')
3.0m(9'10")
5m 10m 20m
MASK Upper position: Factory default, Lower position: **j**

②
24m(80')
3.0m(9'10")
5m 10m 20m
MASK Upper position: **i**, Lower position: **j**

③
24m(80')
3.0m(9'10")
5m 10m 20m
MASK Upper position: **i**, Lower position: **h**

④
24m(80')
3.0m(9'10")
5m 10m 20m
MASK Upper position: **g**, Lower position: **h**
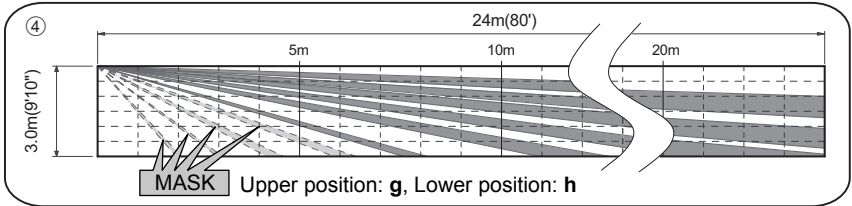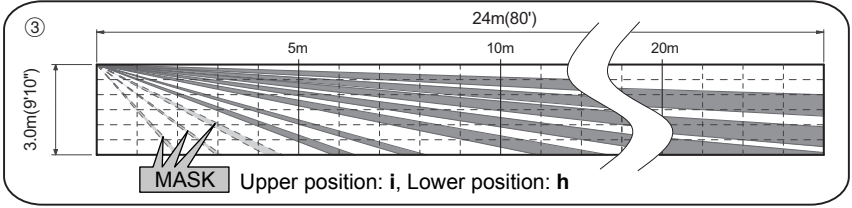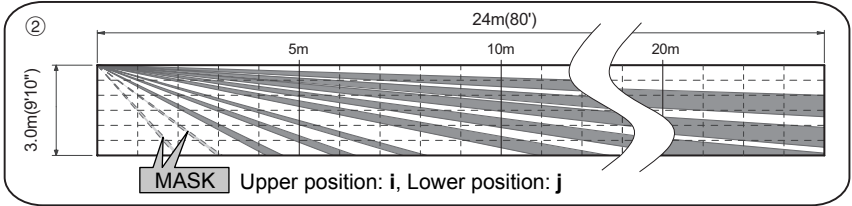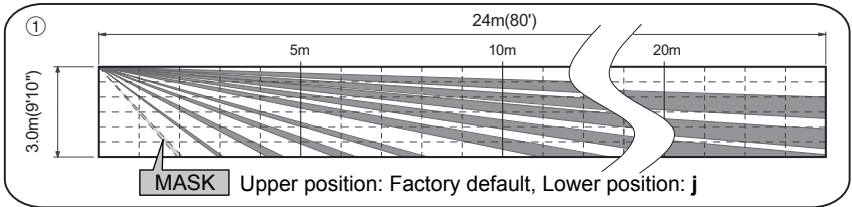
3 | INSTALLATION

Use the bracket for normal installation. The unit may be installed directly on the wall, without the bracket, only if the following three conditions are met;
• The mounting height is less than 3m (9'10").
• Horizontal adjustment is not necessary.
• The ground must be level.

3-1 | INSTALLING WITH BRACKET

Using the bracket makes it possible to adjust the unit horizontally by ±90°.
In cases where the ground is uneven and/or not parallel with the base of the unit, it is possible to adjust the unit vertically by ±20°.

90°   90°

Caution>>
Do not change the detection length with bracket.
Use the flaps and plates to adjust the detection length.

20°
20°

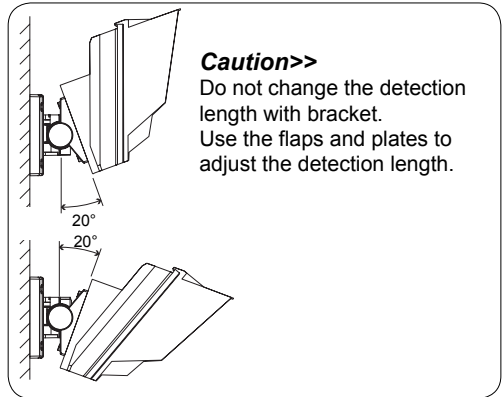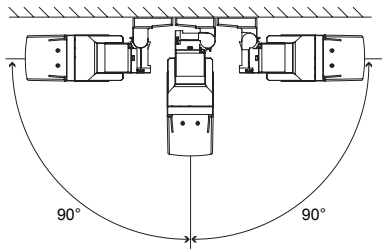1 | Remove the Up-Down lock screw.
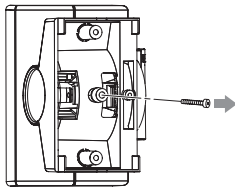
2 | Push the shaft cover clip straightly to remove the shaft cover.

Shaft cover clip

Shaft cover

Push with suitable tool.
e.g. small screwdriver
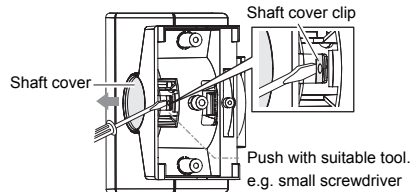
3 | Loosen the adjustment screw two turns.

Adjustment screw
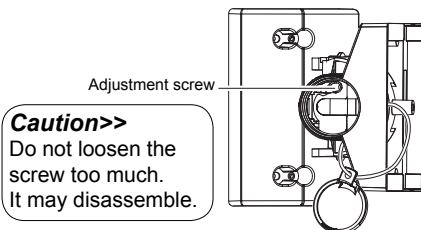
Caution>>
Do not loosen the screw too much.
It may disassemble.

4 | Tilt the bracket about 45° and pass through the wire.

In

Out
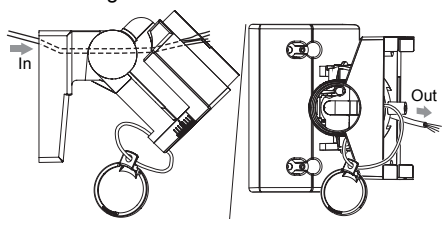
5 Determine the horizontal direction (left or right) of the detector before installing the bracket on the wall.

| To the right | | To the left |
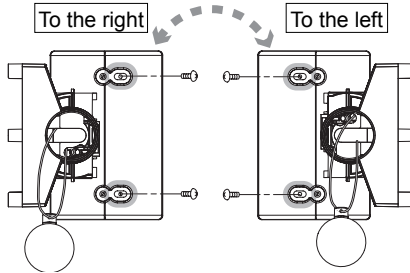
6 Open the wiring knockout.

Wiring knockout
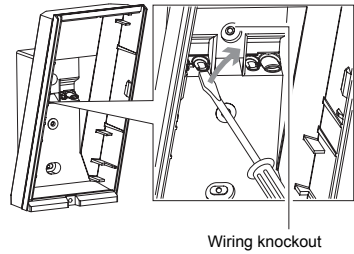
7 Open the Up-Down lock screw knockout for connecting the bracket.
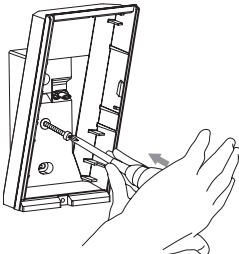
Knockout with 4×20
tapping screw (screwkit)

8 Tighten screws ① and ②, adjust the bracket angle (refer to 3-2), then tighten screw ③.
Perform an area check. If re-adjustment is required, loosen screw ③ and change the bracket angle.
After the adjustment is complete, tighten screw ③ again.

Wiring hole
Wiring sponge pad
Out
①4×20 screw
③4×35 Up-Down lock screw
②4×20 screw
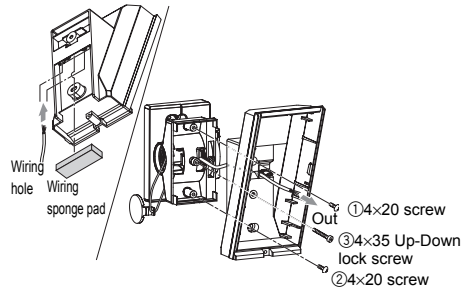
9 Tighten the adjustment screw clockwise.

Adjustment screw
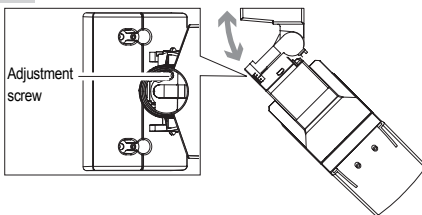
10 Wire to the terminal and install the main unit and lens on the base.
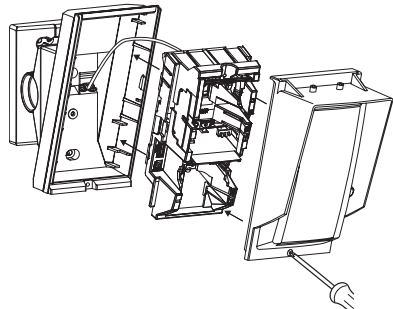
11 Install shaft cover into place.

3-2 ADJUSTING THE VERTICAL ANGLE

For best performance, install detector parallel to the ground.
Decide the detection length. To change the detection length, adjust the flap and plate positions. Refer to the 2-2, 2-3 for the details.

Perform walk test to ensure detector is parallel to the ground.

24.0 m (80')

3.0 m (9'10")
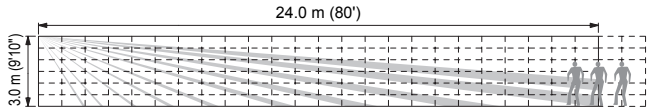
* This description assumes the detection length to be 0 m (0') to 24.0 m (80').

If the detection length is shorter than that which was setup (refer to page 7), change the detector angle upwards.
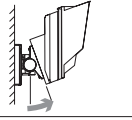
If the detection length is longer than that which was setup (refer to page 7), change the detector angle downwards.
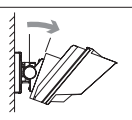
If the detection length is equal to that which was setup (refer to page 7), the adjustment is complete.

Caution>>

• If the base of the unit is already parallel to the ground, do not change the detection length by tilting the main unit up or down. Refer to 3-1 for the details.

Example (the ground is level)
0° is the origine.

Adjust 2 clicks (2.5° upward) for 2.5 m (8'2") height installation.

Adjust 1 click (1.25° upward) for 3.0 m (9'10") height installation.
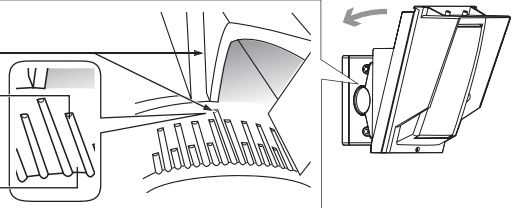
3-3 INSTALLING WITHOUT BRACKET

1 Open the wiring knockout with suitable tool e.g. screwdriver.
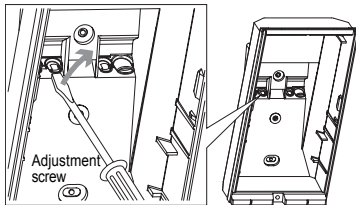
2 Pull the wire through the base knockout.

Adjustment screw

In

Wiring sponge pad

Out
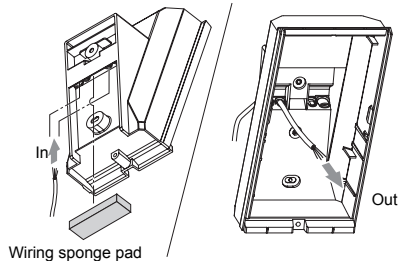
3 Fasten the base to the wall.
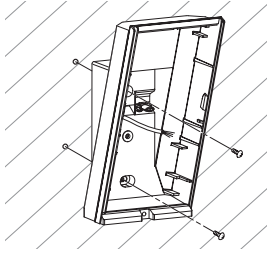
4 Install main unit after wiring to the terminal.
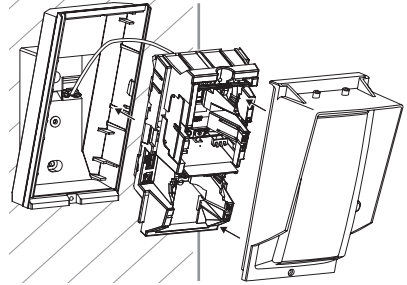
3-4 WIRING

Power wires should not exceed the following lengths.

WIRE GAUGE	HX-80N		HX-80NAM	
	12 V	14 V	12 V	14 V
AWG22 (0.33 mm^2)	160 m (520')	360 m (1,180')	140 m (460')	310 m (1,020')
AWG20 (0.52 mm^2)	260 m (850')	560 m (1,840')	230 m (750')	490 m (1,610')
AWG18 (0.83 mm^2)	410 m (1,350')	900 m (2,950')	360 m (1,180')	780 m (2,560')
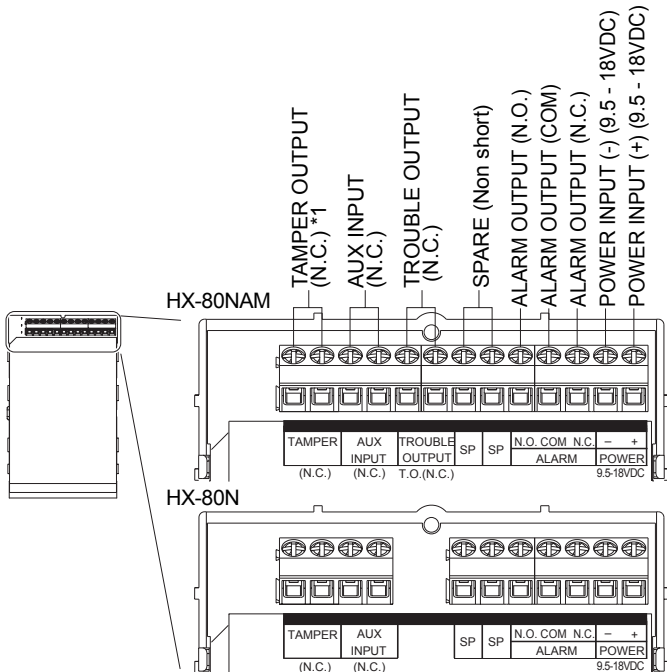
*1: TAMPER terminals to be connected to a 24 hour supervisory loop.

WALL TAMPER (OPTION)

Universal magnet switch may be mounted as a wall tamper.

Installation space for magnet switch is provided on the back of the main unit and the bracket.
Maximum size of an applicable magnet switch: D 9 mm (0.35") × W 40 mm (1.57") × H 9 mm (0.35")
Magnet switch is not included.

Main unit

Bracket

Wiring Hole

Wiring sponge pad

Magnet switch (Wall side) installation position

Magnet switch (Base side) installation position

Magnet switch (Bracket side) installation position

Magnet switch (Wall side) installation position
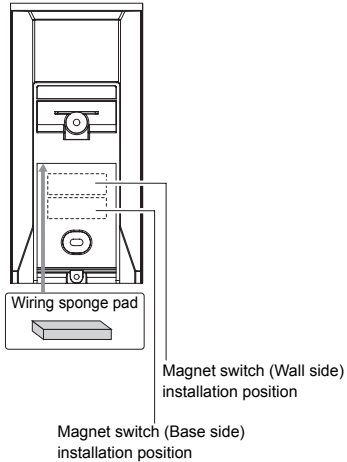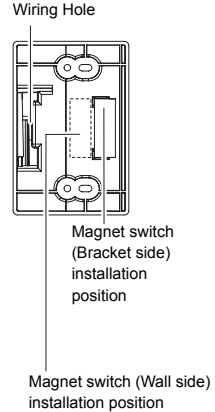
-Installation

1 Install the magnet switch (wall side) to the wall. To determine the installation position, use the "Installation position template" provided on the inside cover of the product package.
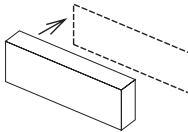
2 Open the wiring knockout with suitable tool e.g. screwdriver.
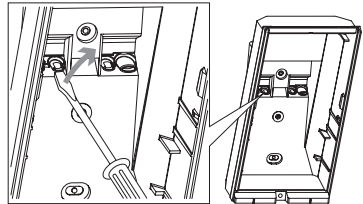
3 Install the other portion of the magnet switch to the back of the main unit or the bracket.
Pull the wiring through the knockouts.

When not using the bracket	When using the bracket

① Fix
② In
④ Wiring sponge pad
Out ③

① Fix
In
②

Tilt the bracket about 45° and
pass through the wire.

In
③
Out

Magnet
switch

In
④

⑥
Wiring
sponge pad

⑤
Out
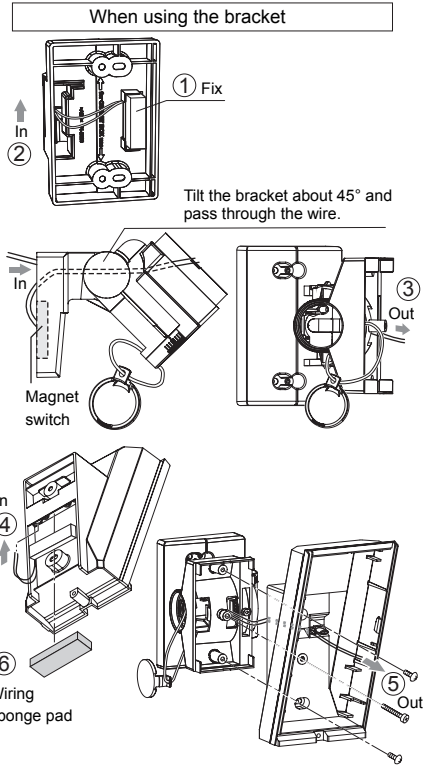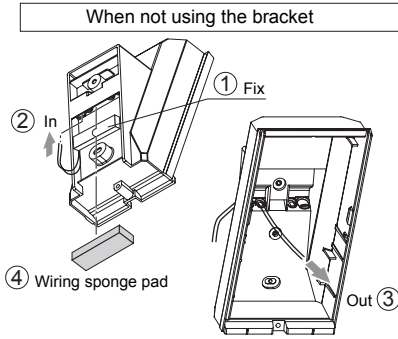
4 Install bracket and the main unit to the
walls surface.

5 Connect the magnet switch wiring to the
tamper terminal of the main unit.

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4 WALK TEST

1 Set the DIP switch 1 (LED ON/OFF) to "ON".
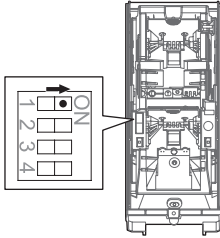
Note>>
The switch is set "ON" by factory default.

2 Check that the detector detects an object in the intended detection area. The installation has been successful if the LED lights for two seconds after a person walks into the detection area.

Detected   Not detected
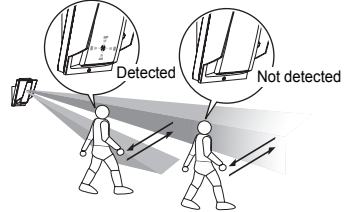
Note>>
For the walk test, move more than 1.0 m (3'3") away from the detector.

3 If the LED indication is not required at all times, set the DIP switch 1 (LED ON/OFF) to "OFF".

5 SETTING

PIR 1
(Do not touch)

DIP switch
1. LED ON/OFF
2. IMMUNITY
3. AUX INPUT
4. PIR AND/OR

DIP SW.

SHORT

LONG

MW SENS.

PIR sensitivity selector

PIR SENSE.

AM SENS.

STD
OFF

Anti masking sensitibity selector

PIR 2
(Do not touch)

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-LED ON/OFF

HX-80N
HX-80NAM

OFF ⟷ ON
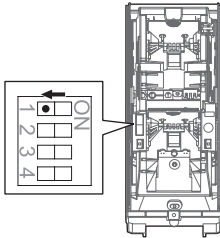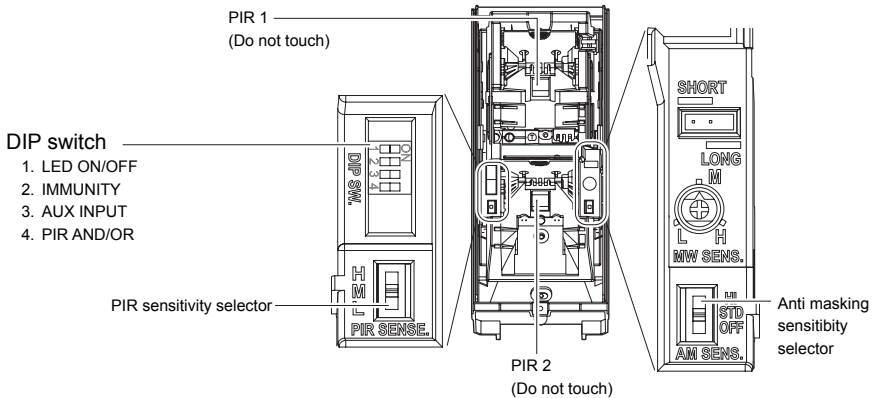
POSITION	FUNCTION
ON (Factory default)	The LED lights when someone is detected.
OFF	The LED does not light even if someone is detected.

-IMMUNITY

HX-80N
HX-80NAM

STD ⟷ IMMUNITY

POSITION	FUNCTION
STD (Factory default)	IMMUNITY logic is not activated.
IMMUNITY	IMMUNITY logic is activated. Use this under harsh environment (e.g. vegetation sway).

-AUX INPUT

HX-80N
HX-80NAM

By connecting a secondary unit (another warning sensor), you can extend the detection area and correct false alarms. The secondary unit must have a voltage free N.C. output such as another PIR detector or AIR detector.
<Infrared (AIR) sensors, thermal line (PIR) sensors, magnet switches, etc.>

AND ⟷ OR

Notes>>
• The alarm is only activates if both the main unit and the secondary unit are activated within 60 sec.
• In OR mode, a secondary detector must be fitted. If not fitted, the unit will generate an alarm continuously.

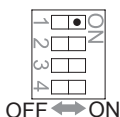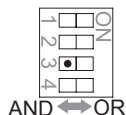| POSITION	FUNCTION
AND (Factory default)	When both the main unit and the secondary detect someone, the alarm is activated. Choose this setting when a secondary unit is not connected.
OR	When either the main unit or the secondary detects someone, the alarm is activated.

-PIR AND/OR

HX-80N
HX-80NAM

AND ⟷ OR
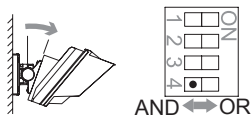
Note>>
"OR" mode is appropriate for the sites that require more detectability rather than false alarm tolerance such as lighting control and camera activation.

POSITION	FUNCTION
AND (Factory default)	An alarm is output when both PIR1 and PIR2 detect an object.
OR	An alarm is output when either PIR1 or PIR2 detects an object. Selecting "OR" mode makes detection range longer than "AND" mode. Walk test to readjust the detection range is required when "OR" is selected. Actual adjustment should be conducted by adjusting the bracket angle. OR mode only

-PIR SENSITIVITY

PIR
SENSITIVITY SELECTOR
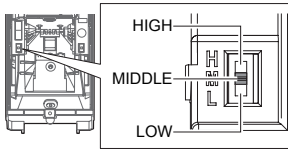
| HX-80N |
| HX-80NAM |

POSITION	FUNCTION
HIGH	High sensitivity
MIDDLE (Factory default)	Middle sensitivity
LOW	Low sensitivity

-ANTI-MASKING SENSITIVITY

ANTI-MASKING
SENSITIVITY SELECTOR

| HX-80N |
| HX-80NAM |
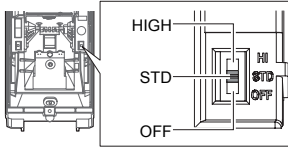
POSITION	FUNCTION
HIGH	High sensitivity
STD (Factory default)	Normal sensitivity
OFF	Disabled

Caution>>
After closing the cover, do not leave any objects closer than 1 meter from the unit.

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6 | LED INDICATION

Red LED

☀	●	○
Blink	Light	OFF

DETECTOR CONDITION		LED INDICATOR (RED ONLY)
Warm-up		☀ ⟶ ○ Blinks for approx. 60 sec.
Alarm		● ⟶ ○ Lights for 2 sec.
Trouble output (HX-80NAM only)	Anti-Masking booting (Anti-Masking start up)	☀ ⟶ ☀ ⟶ ○ Blinks 2 times and goes off for 5 sec. and then repeats for 180 sec.
	Masking detection	☀ ⟶ ☀ ⟶ ☀ ⟶ ○ Blinks 3 times and goes off for 3 sec. and then repeats.

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7 SPECIFICATIONS

7-1 SPECIFICATIONS

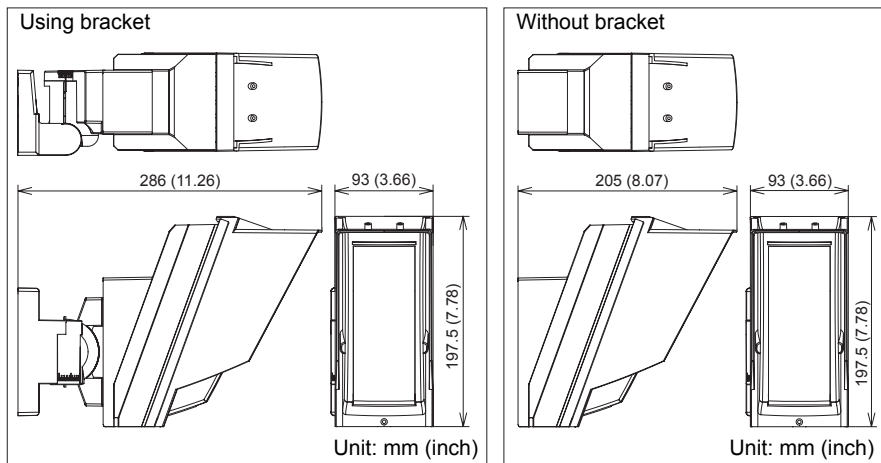| Model	HX-80N	HX-80NAM
Detection method	Passive infrared	
PIR Coverage	24.0 m × 2.0 m (80' × 6'7") narrow / 20 zones	
PIR distance limit	6.5 m, 10.0 m, 13.0 m, 18.0 m (22', 33', 42', 59')	
Detectable speed	0.3 m/s – 1.5 m/s (1'/s – 4'11"/s)	
Sensitivity	2.0°C (3.6°F) at 0.6 m/s	
Power input	9.5 – 18 V DC	
Current draw	35 mA (max.) at 12 V DC	40 mA (max.) at 12 V DC
Alarm period	2.0 ±1 sec.	
Warm-up period	Approx. 60 sec. (LED blinks)	
Alarm output	Form C 28 V DC 0.2 A (max.)	
Tamper output	N.C. 28 V DC, 0.1 A (max.) N.C. open when cover removed.	
Trouble output	–	N.C. 28 V DC, 0.1 A (max.)
Aux input	N.C. 28 V DC, 0.1 A (max.)	
LED indicator	Red: Warm-up, Alarm	Red: Warm-up, Alarm, Trouble
RF interference	No alarm 10 V/m	
Operating temperature	-20 – +60°C (-4 – +140°F)	
Environment humidity	95% max.	
Weatherproof	IP55	
Mounting	Wall	
Mounting height	2.5 – 3.0 m (8'2" – 9'10")	
Bracket adjust angle	Vertical: ±20° Horizontal: ±95°	
Weight	720 g (25.4 oz.)	
Accessories	Bracket, Screw (4 × 20 mm) × 4	

*Specifications and designs are subject to change without prior notice.

DIMENSIONS

Using bracket	Without bracket
286 (11.26)　　93 (3.66)　　197.5 (7.78)　　Unit: mm (inch)	205 (8.07)　　93 (3.66)　　197.5 (7.78)　　Unit: mm (inch)

The HX-80N series is only a part of a complete system, therefore we cannot accept complete responsibility for any damages or other consequences resulting from an intrusion.

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