

# TAKEX TOILET OCCUPANCY SENSOR

## TS-7 (Round) / TS-7U (Flush mount) / TS-7R (Square)

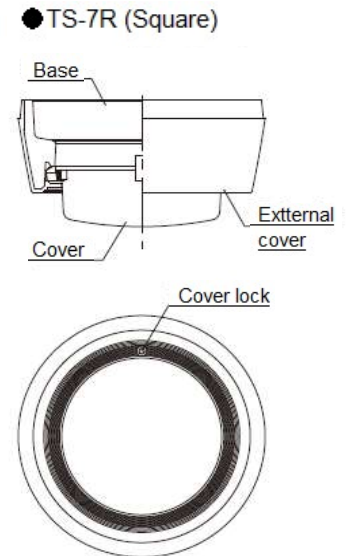
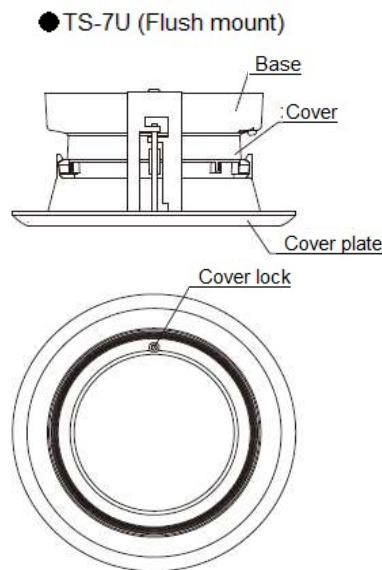
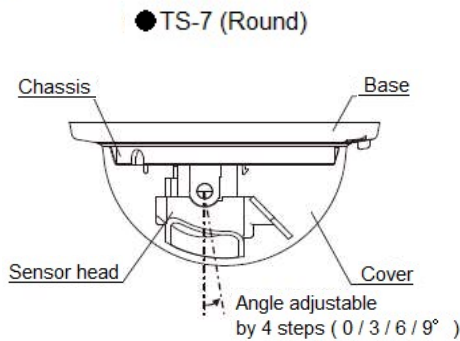
### Instruction Manual

Thank you for purchasing this product. Before using the product, please read this instruction manual carefully to ensure correct operation.

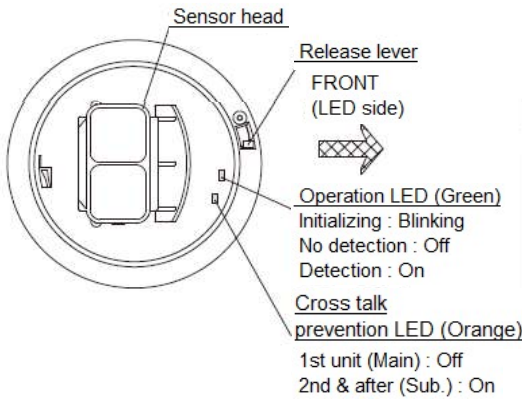
## 1 PRODUCT DESCRIPTION

- This sensor detects the occupancy state of the toilet (regardless of whether the user is stationary or moving).
- The height of the user from the floor surface is measured with near infrared rays to judge the occupancy, thus avoiding being affected by conditions of the floor surface (watered or cleaned).
- The seven optical axes independently recognize the distance to the floor and the toilet bowl to automatically perform initial setting.
- In case there is a lighting/ventilation opening (directly above on the ceiling), handrails or hand-washing space, installation can be done properly by adjusting the sensor head angle or switching 9 types of detection areas.

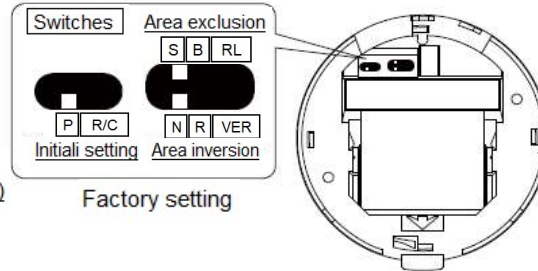
## 2 PARTS DESCRIPTION



### COMMON PART



### SETTING PART

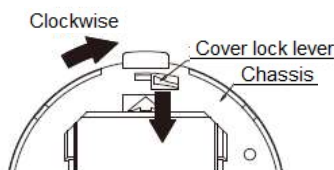


### Accessories

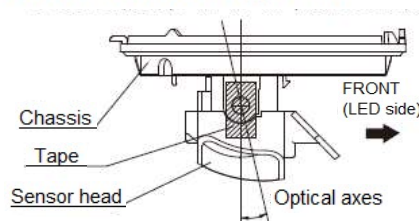
- TS-7
  - Lock tapping screw M3 x 6 1pc
  - Mounting tapping screw M4 x 20 2pcs
- TS-7U
  - Cover lock screw M3 x 12 1pc
- TS-7R
  - Cover lock screw M3 x 12 1pc
  - Mounting tapping screw M4 x 20 2pcs

### Sensor head angle adjustment

- 1. Separate the chassis and cover**  
Turn the cover clockwise while gently pushing down the cover lock lever from the inside in the direction of the arrow.

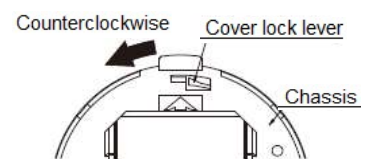


- 2. Adjust the sensor head angle**  
Remove the tape that secures the sensor head for the adjustment.



\*Angle is adjustable by 4 steps (0/3/6/9°)

- 3. Attach the cover to the chassis**  
Place the cover in close contact with the chassis and turn the cover counterclockwise until the cover lock lever snaps.



### 3 PRECAUTIONS



#### Warning

● Strictly observe the specified voltage. (12 to 24 VDC)



● Strictly observe the specified contact output capacity. (30 VDC, 0.5A)



● Do not disassemble or modify the unit.



\* Failure to follow above warnings may result in fire or electric shock.

- ① This sensor may have an error in the initial setting area, detection output area and detection output height, depending on the color/material of the floor and user's clothing,
- ② At the time of detection, the detection output area goes down to approx. 0.2 m above the floor surface. So, there is no detection if the height is less than 0.2 m, e.g. with only human feet. In addition, detection may not be performed depending on the lying posture of the human on the floor.
- ③ The response time will be max. 10 seconds, depending on the speed of entry and the color of the clothes.
- ④ Contact output is performed during the initial setting. Also, even after the initial setting is completed, there will not be any detection during response time of max. 10 seconds
- ⑤ In the remote control initial setting mode, when the power is turned on, the contact output is performed after response time of max.10 seconds.
- ⑥ If the operating condition is different from the initial setting state(e.g. toilet seat or lid left open, position of the handrail changed, etc), detection occurs and contact output will be performed. So, return the condition to the initial setting state.
- ⑦ If there is steam condensation or water droplets on the cover near the bathroom, be sure to ventilate the location to avoid malfunction.
- ⑧ Clean the device on regular basis to remove dirt and dust. Do not use thinner, benzene or alcohol. After that, return the toilet seat and lid

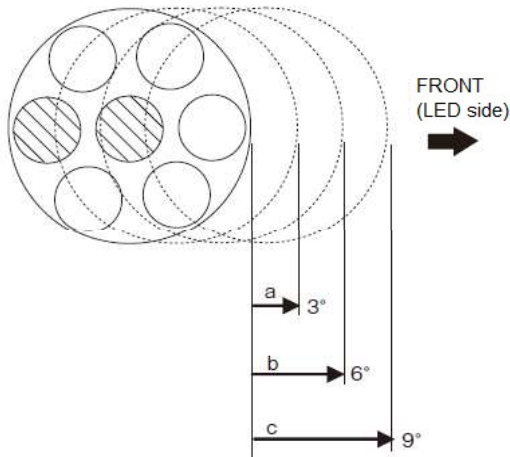
### 4 AREA SETTING

Consider the size of the toilet room, the direction of the entrance, the position of the door/handrails/ceiling spotlight/ventilation fan, and the frequency of placing implements on the floor.

#### 1. Sensor head angle adjustment

The sensor head angle can be adjusted in the FRONT direction (on operation LED side) by 4 steps ( 0 / 3 / 6 / 9° ) to move the detection area in the same direction as shown in the figure below.

See the table below for the moving distance of the detection area on the floor, and refer to "2 Parts description / Sensor head angle adjustment" for angle adjustment.



Mounting height	Moving distance of detection area		
	a	b	c
3.0	0.15	0.31	0.47
2.8	0.14	0.29	0.44
2.5 (standard)	0.13	0.26	0.39
2.3	0.12	0.24	0.36

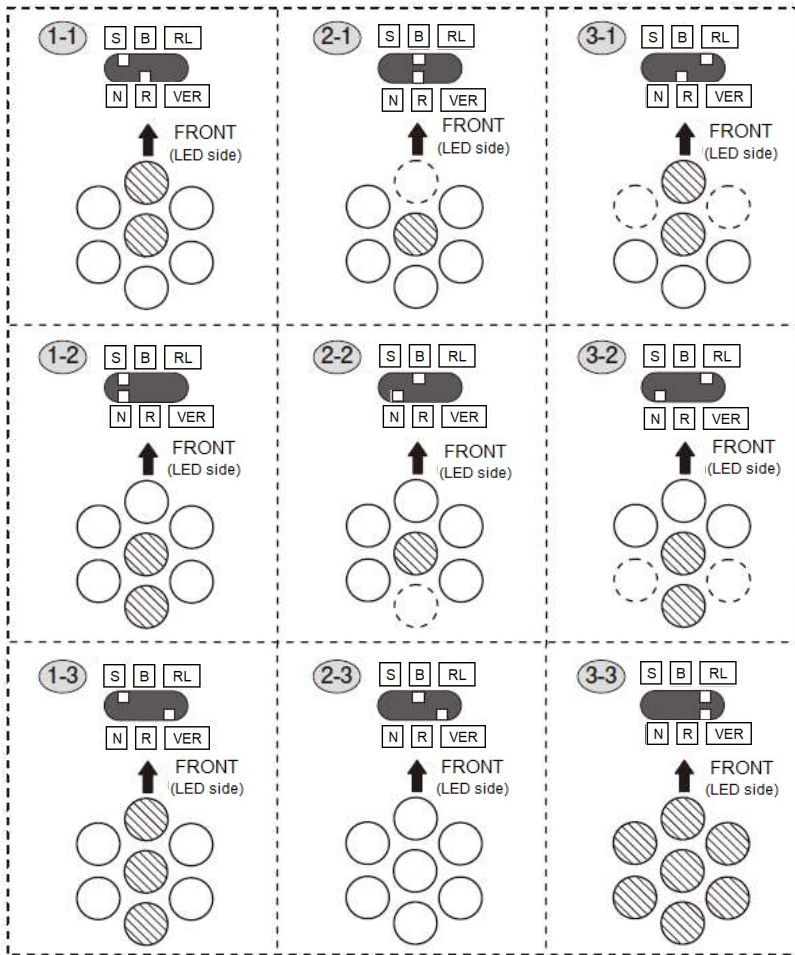
#### 2. Detection area pattern switching

The seven areas can be classified into three types as below. 9 area patterns are switchable by combining these classified areas.

- Ordinary 0.4m (approx.) ⇒ When detected 0.2m(approx.) Area where the optical axes hit the floor  
\* Height to detect a person lying down
- ▨ Ordinary 0.55m (approx.) ⇒ When detected 0.45m(approx.) Area where the optical axes hit the toilet seat/implements  
\* In case the detection height may change thereby
- ⋯ Excluded area For movable handrails, washstand, wall, etc. or for small toilet

The seven areas are independent one by one with same sensitivity level.  
If the required detection height is different within one area, set it to the higher object.

### 3.9 Pattern diagram

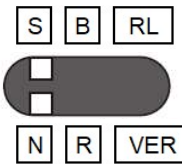


#### Beam classification

- Detection output height : 0.4m or more
- Detection output height : 0.55m or more
- Excluded area

#### Area exclusion switch

- S : Standard
- B : Back
- RL : Right and left



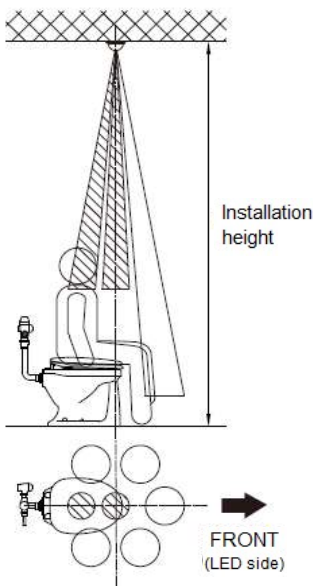
#### Area inversion switch

- N : Standard
- R : Reverse
- VER : Versatile

## 5 MOUNTING POSITION

### 1. Standard position

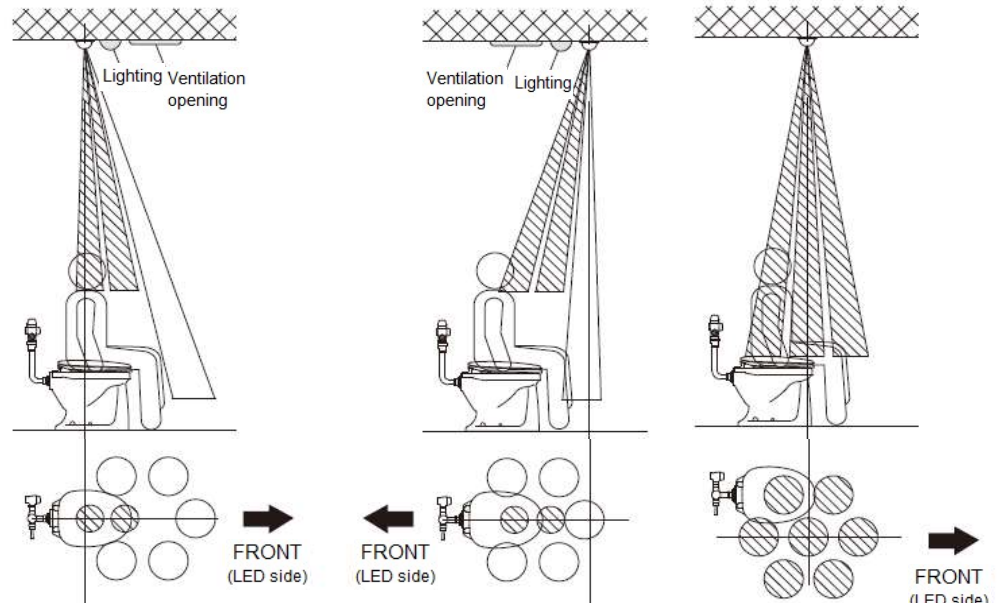
(Installed directly above)



- Detection output height : 0.4m or more
- Detection output height : 0.55m or more

### 2. To avoid lighting or ventilation opening directly above

(Switching detection area patterns required)



For installation to the rear of the toilet bowl, adjust the angle of the sensor head as shown in the above figure.

For installation in front of the toilet bowl, set the area inversion switch to "reverse", adjust the angle of the sensor head, as shown in the above figure.

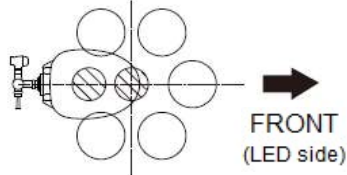
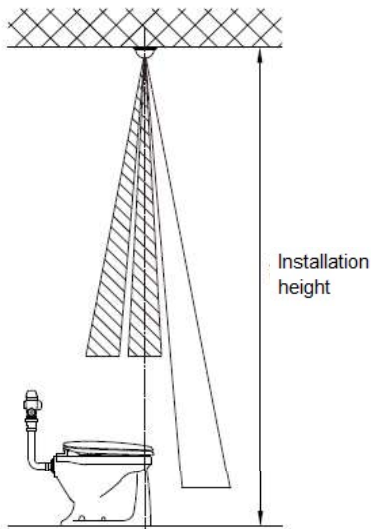
For installation on the right or left side of the toilet bowl, set the area inversion switch to "Versatile", and the area exclusion switch to "Right and left" and install the sensor as shown in the figure above.

# 6 INSTALLATION

## 1. Precautions for installation

- ① This sensor is for indoor use. Never use it outdoors.
- ② This sensor is not waterproof. Do not install it in a bathroom/toilet. There is a risk of malfunction or failure due to water intrusion.
- ③ Make sure that strong light such as sunlight does not directly hit the unit, the floor surface to be detected, or the upper side of the toilet bowl.
- ④ The maximum installation height is 3 m. However, if the floor is black, etc. with low reflectance, use it at 2.5 m or less.
- ⑤ Install the sensor so that one of the optical axes with a detection output height of 0.55 m or more hits on the seating position (or at the center of the toilet bowl) as shown in the left figure. Make sure that no optical axes will hit the open toilet lid/ seat, door, curtain, etc.
- ⑥ The sensor head angle can be adjusted only in the FRONT direction (operation LED side). So follow the correct direction when installing.
- ⑦ If installation is not possible directly above due to lighting or ventilation opening, select an appropriate detection area pattern.
- ⑧ Install the unit horizontally with respect to the floor. Note that the angle of the sensor head can be adjusted up to  $9^\circ$ , but it will be damaged when tilted further.
- ⑨ Install multiple units in the large toilet such as a toilet for the physically challenged people). Using cross talk prevention, up to 8 units can be installed even if the areas overlap.
- ⑩ When installing two or more sensors, connect to a power supply having the necessary current capacity.

## 2. Standard position



- Detection output height : 0.4m or more
- ▨ Detection output height : 0.55m or more

※ Image of visualized optical axes by the area checker(not for sale)



## 3. Operation check

- Perform initial settings to set the distance from the ceiling to the floor, toilet seat, toilet lid, handrail, and equipment. When the current condition is different from the initial setting state (toilet seat and toilet lid left open, position of the handrail changed, equipment removed, etc.), malfunction may occur by detecting from that point up to certain height. Carefully verify in advance the condition of the installation location (toilet seat/lid, handrail, equipment). Also, adjust the sensor head angle (by 4 steps:  $0 / 3 / 6 / 9^\circ$ ) according to the mounting position, and make sure that there is no malfunction before operation.

## 4. Installation location

- ① Ventilation fan :  
Installing it near the sensor is possible, but make sure that the area setting will not change due to vibration.
- ② Lighting :  
Installing it near the sensor is possible unless it does not generate high temperature to deform the appearance. Make sure that the light does not directly enter the detection area on the floor.
- ③ Do not place toilet equipments, disposable diapers, decorations, etc. within the detection area to avoid malfunction.
- ④ Do not install the sensor in a bathroom/toilet.



No installation in a bathroom/toilet.

Do not put anything extra

# 7 SELECT INITIAL SETTING SWITCH

■ Initial setting by power ON or by remote controller(R/C)



With the initial setting switch set to **PW**, turn the power on or operate the remote controller TS-A (sold separately). The operation LED (green) starts blinking and the initial setting is performed..

- ① This sensor requires initial setting.
- ② With the initial setting switch set to **PW**, the initial setting is performed each time the power is turned on.
- ③ Clean the cover of this sensor regularly. After that, return the toilet seat and lid to their original state, and perform the initial setting again.
- ④ If a malfunction occurs, return the toilet seat and toilet lid to their original state, and perform the initial setting again.

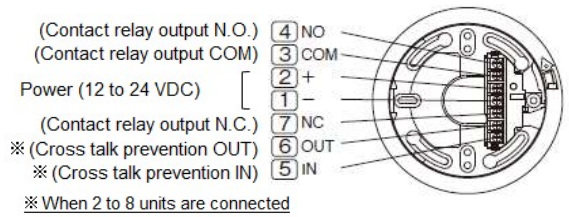
■ Initial setting only with remote controller(R/C)



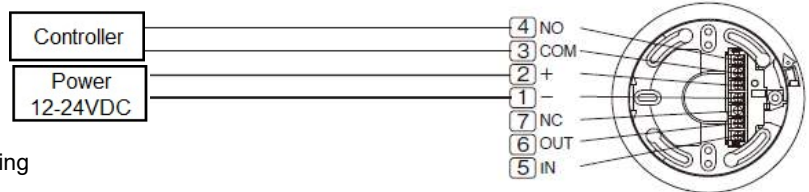
With the initial setting switch set to **R/C**, operate the remote controller TS-A (sold separately). The operation LED (green) lights approx. 3 sec, then the initial setting is performed while LED blinks.  
 ※ No initial setting is done even if the power is turned on.

# 8 WIRING

Wire the terminals as shown on the right. For extension of wiring, use a wire of diameter  $\phi 0.9$  mm or more. (Possible extension : 40m max.)



## 1. Wiring example

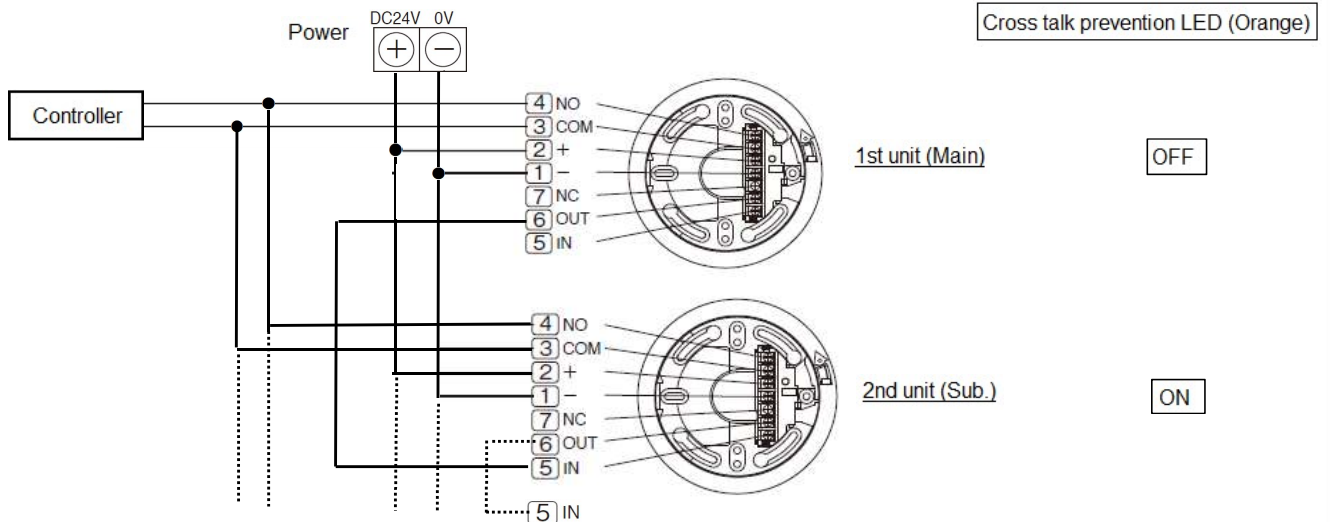


(Note 1) If you want to perform the initial setting again, set the initial setting switch to **PW**.

(Note 2) Do not wire **5 IN** & **6 OUT**

## 2. Wiring multiple units (using "Cross talk prevention")

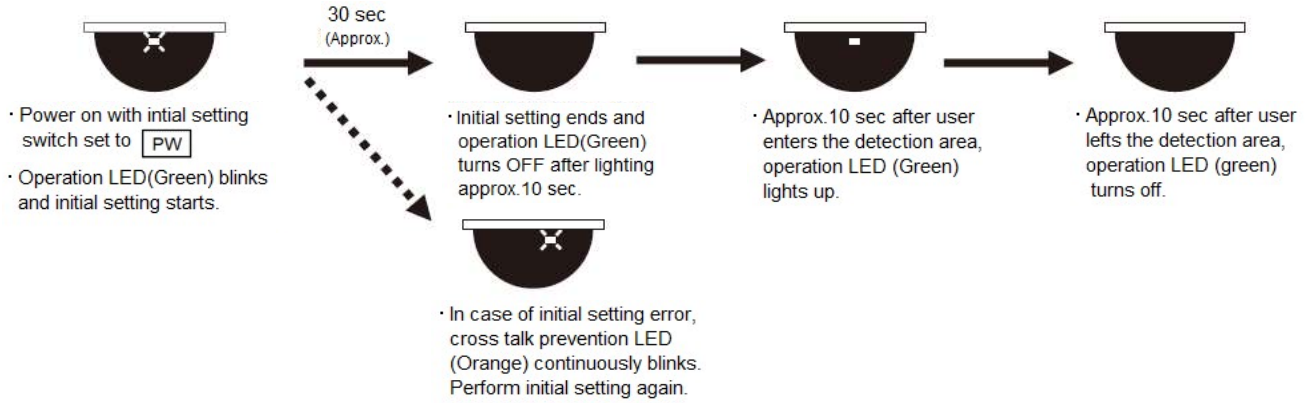
\* Max. 8 units connectable



※ If the multiple units have different power sources, connect all the units each other with " **1 -** ".

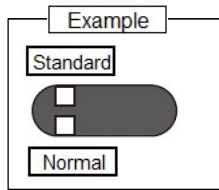
# 9 INITIAL SETTING

## Operation LED for initial setting and detection operation

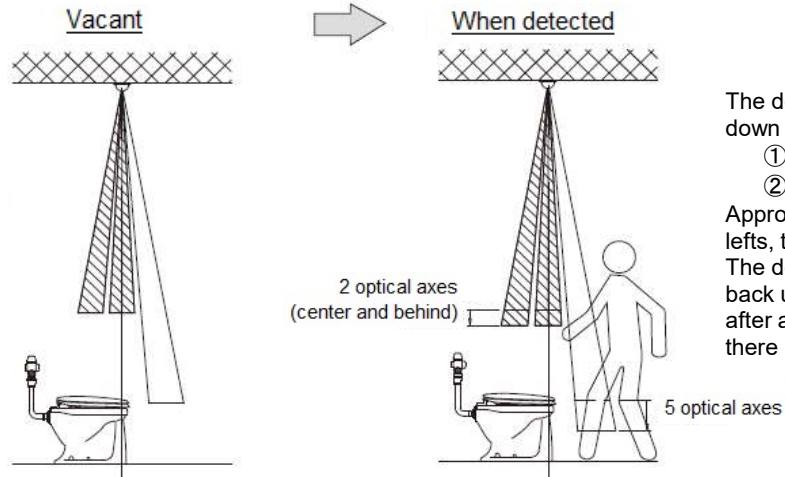


- If the initial setting switch is set to **R/C**, the initial setting will not be performed when the power is turned on.
- Make sure that the toilet seat, toilet lid and handrails are in their original position.
- In case of initial setting error, check the operating environment including the following points:
  - Someone enters the detection area during initial setting
  - Installation height is too high (max. 3m)
  - Normal voltage (12V to 24VDC) is not supplied.

# 10 OPERATION



Approx. 10 sec after the user enters the detection area, the areas of 0.4 m and 0.55 m in the 9 pattern areas issue contact outputs.



The detection output areas go down as below:

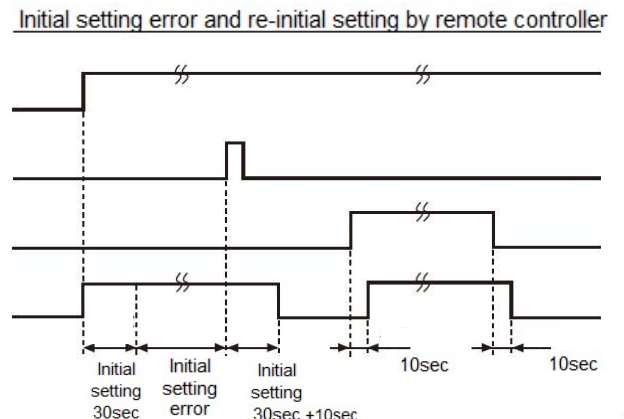
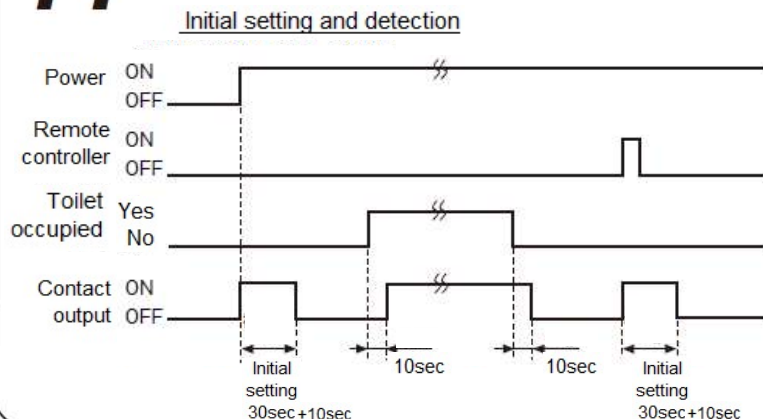
- ① 0.4m → 0.2m
- ② 0.55m → 0.45m.

Approx. 10sec after the user leaves, the contact outputs stop. The detection output areas go back up to their original height after approx. 30 sec, when there is no user.

### In case of malfunction...

If the positions of the toilet seat, toilet lid, movable handrail, equipment (toilet cleaning supplies, consumables, etc.), doors, curtains, etc. are different from the initial setting state, the change of distance may cause malfunction.

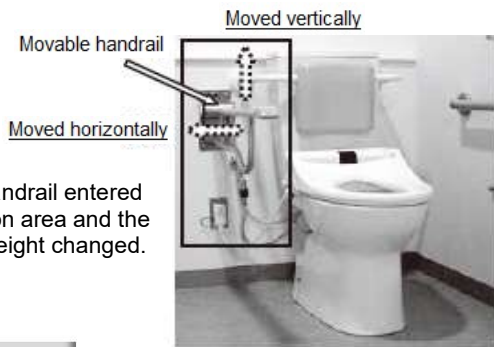
# 11 OPERATION TIME CHART



# 12 COUNTERMEASURES FOR MALFUNCTION

In case of malfunctions, change 1) 9 patterns, 2) area angle(4 steps), or 3) mounting angle (base angle: slightly).

Caused by "Movable handrail (horizontal/vertical type)"



Movable handrail entered the detection area and the detection height changed.

### Countermeasures

Return the movable handrail to the position of the initial setting, or exclude the detection area covering movable handrail and perform the initial setting again. Note that the person lying down will not be detected in the excluded area.

Caused by "Equipment"

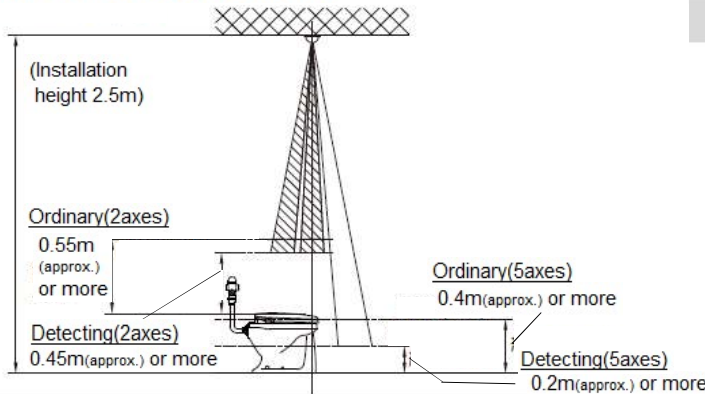


Toilet cleaning supplies, equipment, consumables, etc. were placed or moved in the detection area, and the detection height changed.

### Countermeasures

Return to the initial setting state, or perform the initial setting again. Do not place any equipment that can be moved within the detection area.

# 13 DETECTION AREA

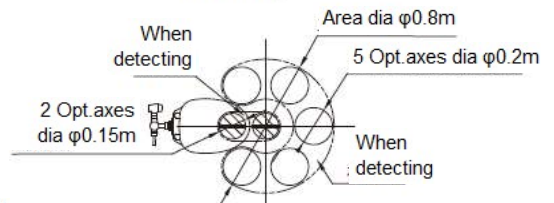


Setting

Standard



Normal



# 14 TROUBLESHOOTING

State	Cause	Countermeasure
Operation LED(Green) does not light up when entering detection area	①No power supply. ②Wiring failure, broken wire, or short-circuit. ③Improper detection area setting.	①Turn the power ON. ②Check wiring. ③Adjust the angle, change detection area pattern, and perform initial settings again.
Operation LED(Green) does not turn off (continuous detection)	①Toilet seat/lid not closed. ②Movable handrail not in initial setting position. ③Objects moved from initial setting position ④Foliage plant or luggage newly placed. ⑤Entering detection area during initial setting. ⑥Not in initial setting state when re-energized after power failure. ⑦Insufficient power capacity.	①Close toilet seat/lid. ②Return it to initial setting position. ③Perform initial setting again. ④Perform initial setting again. ⑤Perform initial setting again. ⑥Perform initial setting again.
Frequent contact output generated intermittently	①Wiring failure. ②Unstable power supply voltage(12-24VDC). ③Moving Object in detection area. ④Power wiring near wiring to the sensor. ⑤Direct light(e.g.sunlight) in detection area. ⑥Improper detection area setting.	①Check wiring. ②Ensure appropriate power supply voltage. ③Stabilize or remove it. ④Change wiring route. ⑤Remove the light source. ⑥Adjust the angle, change detection area pattern, and perform initial settings again.
Cross talk prevention LED blinks	①Initial setting error.	①Perform initial setting again.
Initial setting does not start after turning power ON	①Initial setting switch set to <b>R/C</b> .	①Set initial setting switch to <b>PW</b> .

