

TAKEX FLAME SENSOR WITH SPEAKER

FS-6000C / FS-6000E

Instruction Manual

We appreciate your purchase of a TAKEX flame sensor. This sensor will provide long and dependable service when properly installed. Please read this Instruction Manual carefully for correct and effective use.

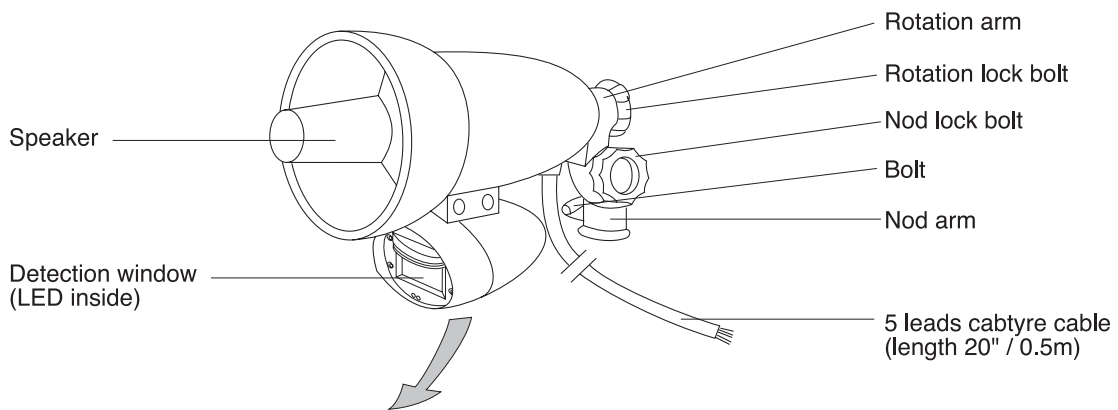
Please Note : This sensor is designed to detect flames and to initiate an alarm; it is not a fire-preventing device.

TAKEX is not responsible for damage, injury or losses caused by accident, theft, Acts of God (including inductive surge by lightning), abuse, misuse, abnormal usage, faulty installation or improper maintenance.

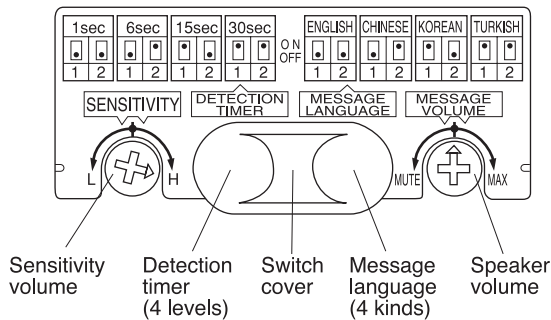
PRODUCT DESCRIPTION

FS-6000C/FS-6000E are flame sensors that output warning messages. It immediately detects ultraviolet rays contained in flames and outputs a warning message and activates the external output. It can be installed either indoors or outdoors.

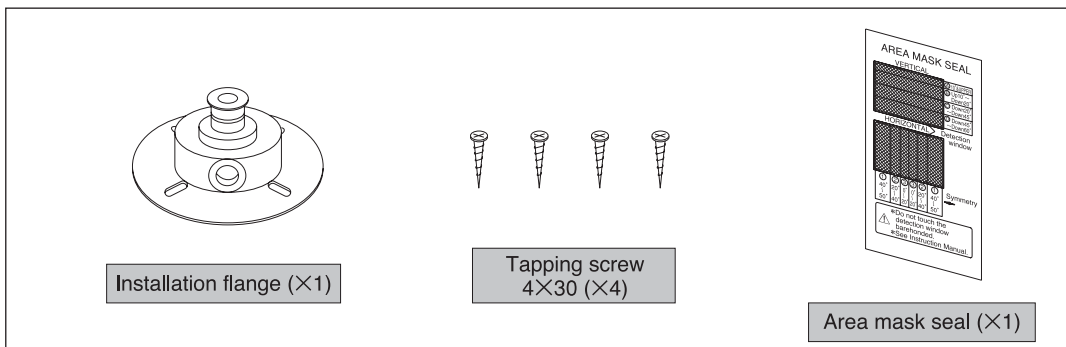
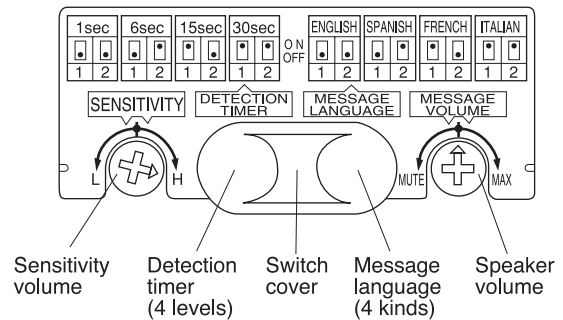
1 PARTS DESCRIPTION



FS-6000C



FS-6000E



2 ATTENTION

PRODUCT CLASSIFICATION

This sensor is designed to detect ultraviolet rays contained in flames, and to issue a signal. This unit is not a fire-preventing device. And this will not detect smoke, heat. PULNiX is not responsible for damage, injury or losses by fire, accident, calamity, Acts of God (including inductive surge by lightning), abuse, misuse, abnormal usage, faulty installation or improper maintenance.

OBJECTS TO BE DETECTED

This sensor detects ultraviolet rays in a very sensitive level. So it will possibly detect other objects than flames. Besides, this sensor does not detect the burning object which is not flaming.

Possible cause of false alarm. Do not install the sensor nearby the followings.	Flames which can not be detected.
<ul style="list-style-type: none"> * Halogen lamp * Electric discharging lamp such like mercury lamp * Electric sterilizer lamp * Spark of welding * Electric spark (caused by motor, pantograph) * Sunlight * Electric discharge of thunderbolt * High electric field * All objects that give out ultraviolet rays 	<ul style="list-style-type: none"> * Flames through the glass or transparent resin * Lighting portion of cigarette * Burning charcol or briquet * Electric stove * Burning object without flames

(Ultraviolet rays contained in discharge lights such as sparks at welding construction sites or from pantographs of trains, are very strong. Even though the sensor does not detect directly, it may detect the reflection.)

OTHERS

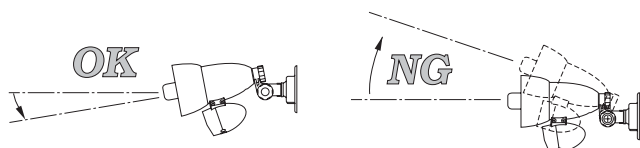
- * The warning message is one phrase-one shot operation. The message will not be repeated when the sensor detects while outputting. (It will repeat when it detects after outputting one phrase.)
- * The detection output for this unit is Off-Delay operation. The operation time is detection time+approx. 2secs. It operates during the sensor is detecting (Detection Time).
- * In cases that the detection window is covered with frost or ice etc., the sensitivity will become very low and may not operate properly.
- * The sensitivity will decrease in cases of rain or snow in the detection area.
- * Do not touch the detection window barehanded. The oil of hands may cause low sensitivity. Wipe with soft cloth with alcohol in case it gets soiled. Also after installation, keep wiping when necessary.
- * Do not pour water directly on the sensor. (It is rain resistant structured but not water resistant.)
- * The detection window is special glass. It is a fragile article.
- * The sensor may get damaged before detecting flames where there is an explosion.
- * Make sure that the speaker volume is not too loud (especially night time) and is not annoying the neighbor.
- * Ultraviolet rays are invisible, It could be released from unexpected objects. Set up the sensitivity to "L" and detection timer to the next longer time when the sensor does not operate properly, such as raising an alarm while there is no flame, and there is non of the facts of the above-mentioned "possible cause of false alarm" nearby.



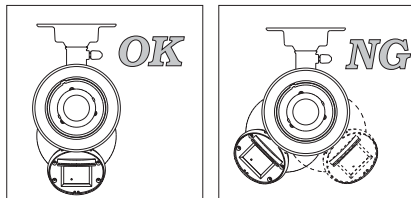
When a strong impact is given to the sensor, it may cause damage, malfunction or less performance. Do not handle in a rough manner.

3 DO'S AND DON'T'S

- * Keep the sensor angle downward than horizontal when installed outdoors.



- * Keep the detection window straight and the adjusting part at the bottom.



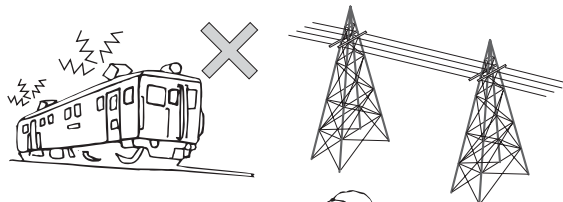
- * There are many other ultraviolet ray factors outdoors that may cause unexpected detection. Therefore, the detection timer is recommended to be set up longer than 6 secs. and sensitivity set up to "L" when installed outdoors.

INSTALLED OUTDOORS DETECTION TIMER	1 sec. : not recommended 6 secs. or more : OK
INSTALLED OUTDOORS SENSITIVITY	H : not recommended L : OK

(The ex-factory's set up for detection timer is 1 sec. and sensitivity is "H" in order to check the area and operation.)

- * Refer the detection area drawing when installing. Check the area adjustment while operating the sensor.
- * Do not install in following locations.

- Near railways. The sparks from the pantograph may cause false detection.
- Near high voltage power lines. The sparks from the pylon may cause false detection.



- Near weld construction sites. The sparks may cause false detection.



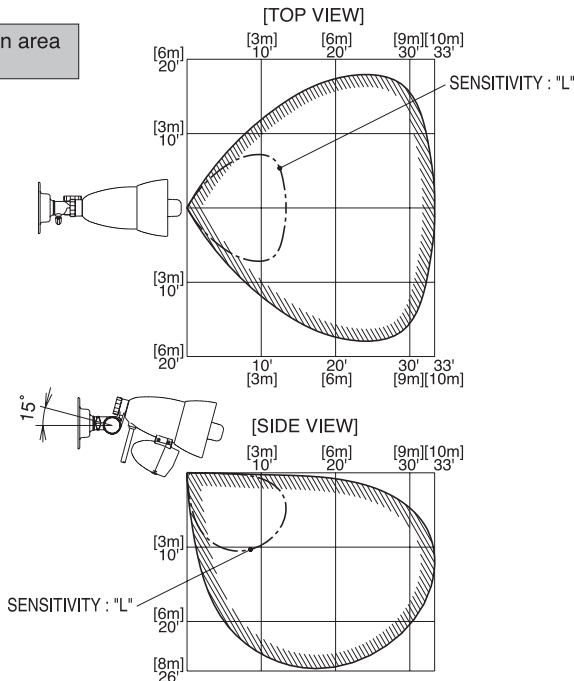
- Where spark or flame is usually used. (kitchen, incinerator etc.)
- Where "possible cause of false alarm" (2. OBJECTS TO BE DETECTED) is nearby.
- Where severe shock or electric noise is caused.
- Where shield object (glass, transparent resin etc.) is in front.
- Where steam stagnates heavily. (bathroom etc.)
- Where temperature is under -20°C (-4°F) or over +50°C (+122°F).
- High location installation is recommended to prevent mischief. (over 2.5m/approx. 8.3ft.)
- This product is for wall, ceiling, under eaves installation. Use the optional attachment for installation at unplane places.

4 DETECTION AREA

1. Detection Area

- *The upper detection area is limited to avoid sun ray influence and other remote unexpected detectable objects.
- *The detection distance depends on the size and time of flaming. The bigger and longer continued flame is prior to be detected. The smaller and shorter the flame continues, the detection area gets narrower.

Detection area picture

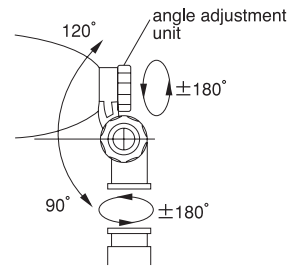


CONDITIONS OF DETECTION AREA

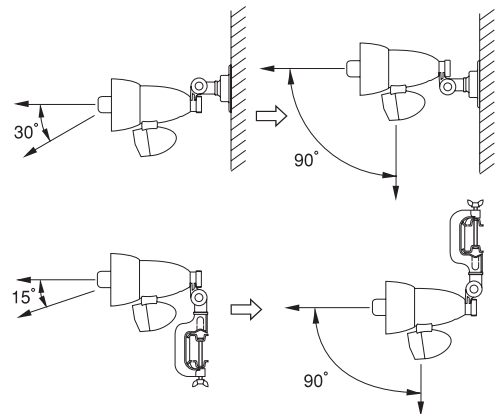
- * DETECTION OBJECT : GAS FLAME OF LIGHTER 2.75" (7cm)
- * SENSITIVITY : "H"
- * DETECTION TIMER : 1sec.
- * ANGLE ADJUSTMENT : DOWNWARD 15°

2. Area adjustment

- The area adjustment in wide angle allows the sensor to be installed in various locations.



- The angle adjustment unit on the rear part of the product has 3 rotary and movable structures. It can be adjusted to almost any kind of angle. In case of installing as the left drawings below, the adjustable angle is small. Therefore, installation as the right drawings are recommended.



[optional VISE F3 used]

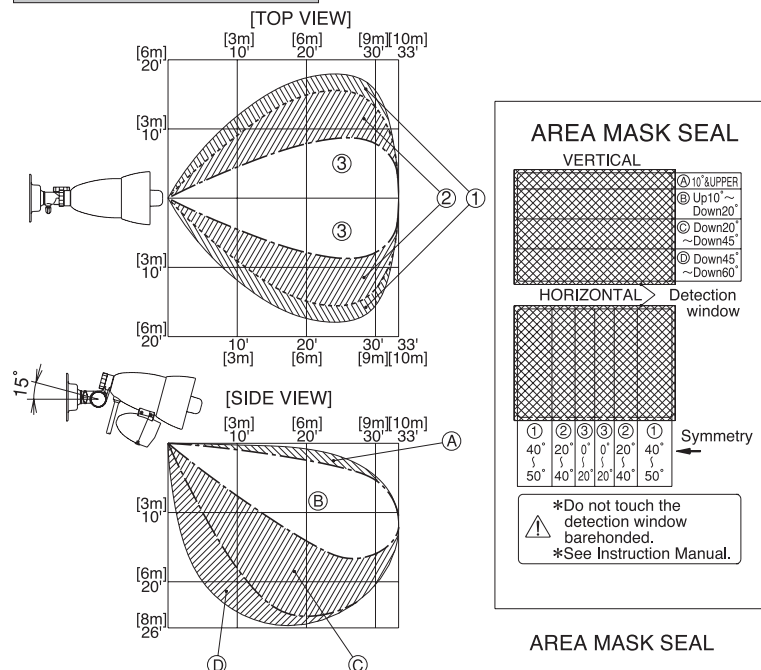
- Keep the detection area downwards to avoid sun ray influence and other remote unexpected detectable objects when installing outdoors.

3. Area masking

There are many ultraviolet ray factors outdoors that may cause unexpected detection. In case there are objects that cause unexpected detection in the area and is not avoidable by adjustment, use the accessorized "area mask" to cover the area.

- *There are 6 horizontal masks and 4 vertical masks. The 2 types can also be used combined.
- *Stick it on from the edge of the detection window holding the ear. Tear the ear after sticking on.
- *After sticking on, check the operation of the sensor.
- *Wear gloves and do not touch the detection window barehanded. When accidentally touched, wipe with soft cloth with alcohol.

Masked detection area



CONDITIONS OF DETECTION AREA

- * DETECTION OBJECT : GAS FLAME OF LIGHTER 2.75" (7cm)
- * SENSITIVITY : "H"
- * DETECTION TIMER : 1sec.
- * ANGLE ADJUSTMENT : DOWNWARD 15°

5 OPERATION AND FUNCTION

(1) Operation

FS-6000 outputs the followings when the sensor detects flame (ultraviolet ray) of the size set up by "sensitivity" for the time set up by "detection timer."

* Warning message (speaker) :

FS-6000C		FS-6000E	
● English	"Inflammable materials in this area. No naked flames."	* English	"Inflammable materials in this area. No naked flames."
● Chinese	"此處嚴禁煙火、請馬上熄滅火源"	* Spanish	"Materiales inflamables en este area. Sin llamas."
● Korean	"여기는 화기엄금입니다 즉시 불을 꺼주십시오."	* French	"Produits inflammables pas de flammes nues."
● Turkish	"Yanici yer. ateşle yaklaşmayın."	* Italian	"Attenzione zona a rischio incendi, non fumare e non usare fiamme libere."

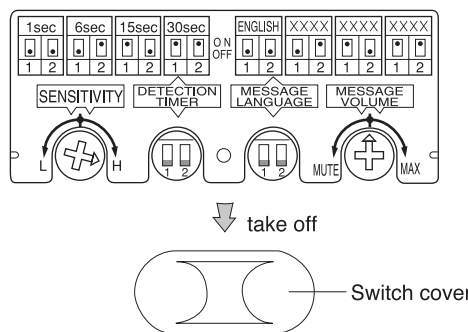
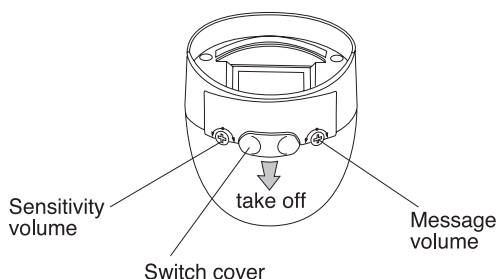
* LED : Blink during warning message output.

* Detection output : Successive output-off delay operation (approx. 2secs.)

- In case the flame does not go out after the warning message output and LED output finishes, it will repeat the output again.
- The detection output will continue until the flame goes out. (It will stop after 2secs.)

(2) Mode Setting

The following settings and functions are selectable for detection and output. Use the dip switch in the switch cover and adjusting volume which is on the bottom of the sensor.



① Detection Function

This product detects ultraviolet ray included in flames and outputs an alarm. Outdoor installation would cause much more false detection than indoor installation, for there are many other ultraviolet ray factors and few shielding objects. The selectable sensitivity levels combined by 4 detection timer set ups and sensitivity set up that controls ultraviolet ray strength are made to prevent false detection at such uncertain conditions outdoors. Select the set up that most suits the environment and purpose. When the sensor does not operate properly, set up the sensitivity to "L" and detection timer to the next longer time.

* The environment for the ultraviolet ray is not always the same. Note that the strength and time changes according to the location.

Detection timer (Dip switch in the switch cover)

This function set ups the min. flaming time to detect. It outputs when it continues to flame for more than the set up time. It will not output when the flame goes out before the set up time.

The following 4 levels are selectable.

ADJUSTING BOX	DETECTION TIME	PURPOSE/EXAMPLE
detection timer	(outputs when flames for more than the below time)	
OFF ● OFF 1 2	1 sec.	Flame of lighter/match detection at non-smoking areas.
OFF ● ON 1 2	6 secs.	Fire detection
ON ● OFF 1 2	15 secs.	In case of uncertain operation on the above two.
ON ● ON 1 2	30 secs.	Fire detection at uncertain environment.

- * The alarm may delay when the strength of ultraviolet ray is weak.
- * Intermittent ultraviolet ray will not be detected.
- * Timer set up 6 secs. or more is recommended for outdoor installation.

Sensitivity (Volume)

This function set ups the size of flame (the strength of ultraviolet ray) to detect.

SENSITIVITY	ADJUSTABLE RANGE
	40%~100% (L) (H)

- * The detective distance for "L" is 40% of that for "H", when detecting same flame.
- * When there is uncertain operation at "H", change the sensitivity to "L".
- * For outdoor use, less than middle to "L" is recommended.

② Message output

Warning message

(Select by dip switch in the switch cover.)

The warning message can be selected from 4 different languages.

FS-6000C		
DIP SWITCH	LANGUAGE	MESSAGE
	English	"Inflammable materials in this area. No naked flames."
	Chinese	"此処嚴禁煙火、請馬上熄滅火源"
	Korean	"여기는 화기엄금입니다. 즉시 불을 꺼주십시오."
	Turkish	"Yanici yer. ateşle yaklaşmayın."

FS-6000E		
DIP SWITCH	LANGUAGE	MESSAGE
	English	"Inflammable materials in this area. No naked flames."
	Spanish	"Materiales inflamables en este area. Sin llamas."
	French	"Produits inflammables pas de flammes nues."
	Italian	"Attenzione zona a rischio incendi, non fumare e non usare fiamme libere."

Volume

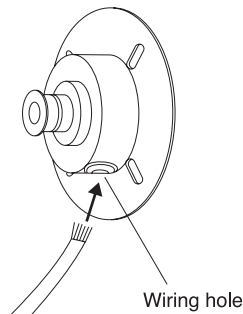
The message volume can be adjusted.

VOLUME	ADJUSTABLE RANGE
	MUTE-MAX (100dB : at 1m)

6 WIRING

(1) Attention

- * Turn off power when installing. Hot line work will cause electric shock and damage.
- * The wiring is lead wiring. Follow the prepare procedure.
- * In case of wiring inside the installation flange, attach the flange so the wiring hole comes to the bottom. Calk or take any other kind of measures to rain resist the surrounding of the flange, tapping screw, wiring hole.

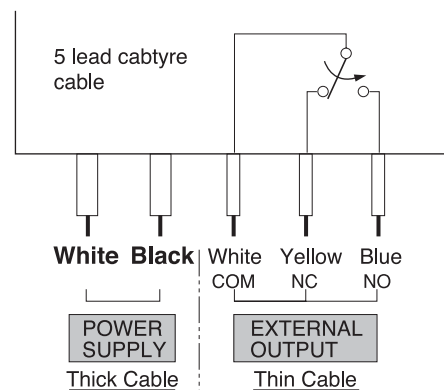


(2) Wiring distance between sensor and power supply

WIRE SIZE	WHEN SUPPLYING DC12V
0.65mm ² (Dia ϕ 0.9mm)	up to 65m (210ft.)
1.15mm ² (Dia ϕ 1.2mm)	up to 120m (400ft.)
2.0mm ² (Dia ϕ 1.6mm)	up to 215m (700ft.)

* Max. wiring distance when two or more sets are connected is the above value divided by the number of sets.

(3) Wiring Connection



12VDC \pm 2V
(non-polarity)
Stand-by : 35mA or less
Operate : 500mA or less

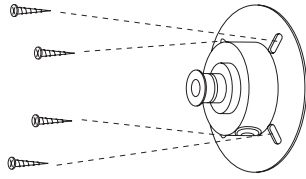
Dry contact relay output Form C
Action : Off delay
(detection time + 2 sec.)
Contact : 30V (AC/DC) · 0.5A or less
capacity (resistance load)

7 INSTALLATION

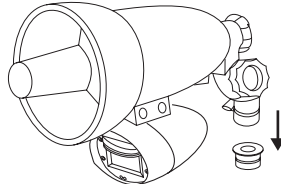
[1] Select the most suitable installation place and way according to the purpose.
(Refer to "2. ATTENTION", "3. DO'S AND DON'TS", "4. DETECTION AREA".)

[2] Wire the sensor.
(Refer to "6. WIRNG")

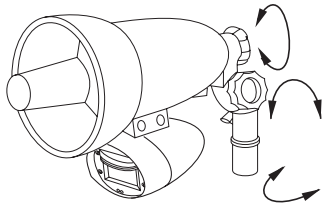
[3] Install the "Installation Flange" by the 4 "Tapping Screws".



[4] Loosen the "Bolt" on the "Nod Arm" and temporarily set up the "Installation Flange" and "Vise" (optional).



[5] Loosen the "Rotation Lock Bolt", "Nod Lock Bolt", "Bolt" slightly and decide the direction and angle of the detection area. After that, tighten it and settle the unit.



[6] Set up temporary and confirm the area and operation.
* Use optional products for other installations.

8 OPERATION CHECK

Check operation after wiring and installation.

(1) Check the surrounding ultraviolet ray environment.

- Set up angle according to "4. Detection Area".

(2) Set up the detection condition.

- Set up the and according to (1).

<Refer to "5. OPERATION AND FUNCTION">

(3) Detection area and operation.

- Set up the and according to the installed environment.
- Check the operation of message output, operation LED, and whole system functions by turning on a lighter in the detection area for more longer than the set up.

* In case it includes unnecessary areas, adjust by changing angle or masking the area.

* When installed outdoors:

- : Less than middle to "L" is recommended.
- : More than 6 secs. is recommended.



Do not use lighters etc. at locations that flammable materials are prohibited!
In this case, check the operation of the sensor at a different locaton.

9 TROUBLE SHOOTING

TROUBLE	CHECK	CORRECTIVE ACTION
Completely inactive	<ul style="list-style-type: none"> • No power supply (Broken or improper wiring) • Low voltage • Interrupting object in front of detection area (Including glass) • Improper detection area set up (Including detection distance) • Improper detection timer set up 	<ul style="list-style-type: none"> → • Correct supply or replace broken wiring → • Correct supply or replace broken wiring → • Remove the interrupting object → • Re-adjust the detection area set up (Refer to "4. DETECTION AREA") → • Re-adjust the detection timer set up
Sometimes inactive	<ul style="list-style-type: none"> • Improper detection area set up (Including detection distance) • Detection window soiled • Improper detection timer, sensitivity set up 	<ul style="list-style-type: none"> → • Re-adjust the detection area set up (Refer to "4. DETECTION AREA") → • Wipe with soft dry cloth → • Re-adjust the detection timer, sensitivity set up
Activate without flame	<ul style="list-style-type: none"> • Unstable power supply • Large electrical noise source such as radio station or wireless station nearby • Unexpected ultraviolet ray nearby (Refer to "2. ATTENTION", 3. DO'S AND DON'T'S") • Sparking object such as welding construction site, railway pantograph nearby 	<ul style="list-style-type: none"> → • Correct supply → • Relocate the sensor → • Remove the object / Relocate the sensor / Adjust the angle / Mask the area by seal / Set up sensitivity to "L" / Set up detection timer to the next longer time. (Refer to "4. DETECTION AREA, 5. OPERATION AND FUNCTION") → • Relocate the sensor / Adjust the angle / Mask the area by seal / Set up sensitivity to "L" / Set up detection timer to the next longer time. (Refer to "4. DETECTION AREA, 5. OPERATION AND FUNCTION")
The LED lights and speaker activates but the connected device inactivates	<ul style="list-style-type: none"> • Poor contact output connection or broken wire • Improper output connection • Improper connected units 	<ul style="list-style-type: none"> → • Check the wiring or connection → • Check the output terminal by tester etc. → • Check the connected units
The LED lights and connected device activates but the speaker inactivates	<ul style="list-style-type: none"> • Volume set up at "mute" 	<ul style="list-style-type: none"> → • Adjust the volume

USUAL CHECK

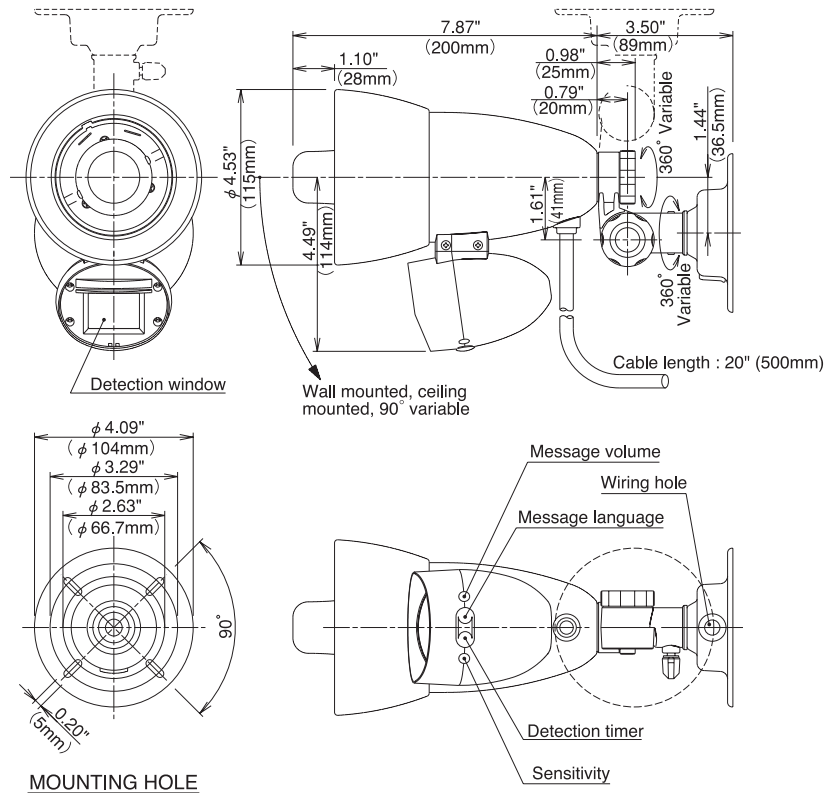
- Follow the following for maintenance.
 - Detection window → Wipe with soft cloth with alcohol
 - Other parts → Wipe with soft cloth with synthetic cleanser
- * Do not use alkaline cleanser.

- Check operation once a week. Also check operation when the surrounding is changed.

10 SPECIFICATIONS

PRODUCT NAME	FLAME SENSOR WITH SPEAKER	
MODEL NO.	FS-6000C	FS-6000E
DETECTION SYSTEM	Ultraviolet rays detection (Detected wave length <185 to 260nm>)	
DETECTION AREA	Distance	33ft. (10m) [2.75" (7cm) flame]
	Angle	Vertical : approx. 75° (upward :15° ; downward : 60°) Horizontal : approx. 100°
	Adjustment range	Vertical : downward 90° (horizontal-vertical) Horizontal : 180°
SENSITIVITY ADJUSTMENT	Sensitivity	L (40%) - H (100%) [selectable by volume]
	Detection timer	1sec., 6sec., 15sec., 30sec. [selectable by switch]
POWER SUPPLY	DC12V ±2V (non-polarity)	
POWER CONSUMPTION	Stand by	35mA or less
	Operate	500mA or less
WARNING MESSAGE OUTPUT	Operation	Output warning message when detecting flames. (One-shot operation)
	Message selection	4 options [selectable by dip switch]
	• English	"Inflammable materials in this area. No naked flames."
	• Chinese	"此処嚴禁煙火、請馬上熄滅火源"
	• Korean	"여기는 화기엄금입니다. 즉시 불을 꺼주십시오"
• Turkish	"Yanici yer. ateşle yaklaşmayın."	
	* English	"Inflammable materials in this area. No naked flames."
	* Spanish	"Materiales inflamables en este area. Sin llamas."
	* French	"Produits inflammables pas de flammes nues."
	* Italian	"Attenzione zona a rischio incendi, non fumare e non usare fiamme libere."
	Volume : Mute-max. approx. 100db (3.3ft. <1m> from the front of speaker.)	
EXTERNAL OUTPUT	Dry contact relay Form C (alarm : open/close) Contact capacity : 30V (AC/DC) 0.5A or less (resistance load) Output operation : Off delay approx. 2 secs.	
LED	Red LED Operation : Blink during warning message output.	
WIRING	Lead wiring (cable length 20" <0.5m>) power supply (thick) : 2 / dry contact (thin) : 3	
INSTALLATION METHOD	Screw on flange	
AMBIENT TEMP. RANGE	-4° F to +122° F (-20°C to +50°C)	
INSTALLATION	Indoor, Outdoor	
WEIGHT	approx. 35 oz (1,000g)	
APPEARANCE	Sensor part : PC resin (black) Adjustment part : PPO resin (black)	
ACCESSORIES	* Installation flange : 1 * Tapping screw : 1 type φ 4 × 30 (SUS) 4 * Area mask seal : 1	
OPTIONAL	* Black vise F3	

11 EXTERNAL DIMENSIONS



CAUTION

- * Follow the voltage of the indicated power supply. Incorrect voltage may cause fire, electric shock etc.
- * Do not connect equipment that exceed the indicated output capacity. It may cause fire.
- * Do not install in locations that do not endure the weight of this product. It may drop and cause accident.
- * Do not decompose, modify this product. It may cause fire, electric shock etc.



Limited Warranty

TAKEX products are warranted to be free from defects in material and workmanship for 12 months from original date of shipment. This sensor is a product that raises an output when it detects ultraviolet rays and is not an accident prevention product. Our warranty does not cover damage or failure caused by Acts of God, abuse, misuse, abnormal usage, faulty installation, improper maintenance or any repairs other than those provided by TAKEX. All implied warranties with respect to TAKEX, including implied warranties for merchantability and implied warranties for fitness, are limited in duration to 12 months from original date of shipment. During the Warranty Period, TAKEX will repair or replace, at its sole option, free of charge, any defective parts returned prepaid. Please provide the model number of the products, original date of shipment and nature of difficulty being experienced. There will be charges rendered for product repairs made after our Warranty Period has expired.

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