

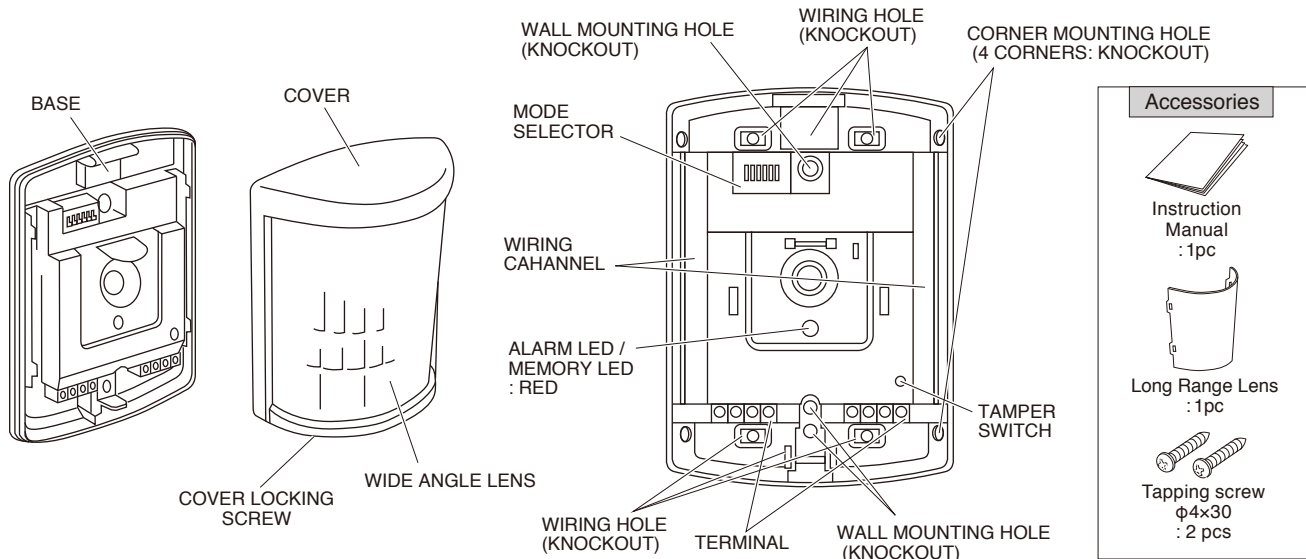
# TAKEX PASSIVE INFRARED SENSOR

PA-470L (For protection : Wide angle 16m/Long range 20m)

## Instruction Manual

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

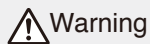
## 1 PRODUCT DESCRIPTION



## 2 PRECAUTIONS

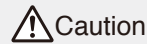
Be sure to observe

This manual describes precautions by classifying them based on degrees of danger and damage that would be generated if using the unit incorrectly.



### Warning

This indicates the possibility of severe injury, and even death, if ignored or a user handles the unit incorrectly.



### Caution

This indicates the possibility of minor injury and/or damage to properties, or of a notification delay in your system due to false operations and/or non-detection, if ignored or a user handles the unit incorrectly.

We categorize these precautions throughout the manual using the following symbols.



A prohibited action, you must not do.



An action you must do, and information you should keep in mind.

### Warning



Do not disassemble or modify this device. This may cause a fire, electrical shock, or malfunction of the device.



If the following events occur, turn off the power of the unit immediately, and ask the place of purchase for repair. Failure to follow this may result in fire, electric shock, and/or malfunction.

- Smoke, abnormal odor, and/or sound are found
- Liquid, such as water, and/or foreign material has entered the unit
- The unit has deformed and/or damaged parts



Do not install this device in a location that cannot support its weight. This may lead the device to fall and cause an injury or malfunction of the device.



Mount the unit on solid ceilings or wall surfaces where reinforcement materials are used. If you mount the unit on non-wood materials such as plaster board or concrete, securely mount it using anchors and mounting screws that match the wall materials. Unstable mounting may result in injury and/or property damage if the unit falls.



Do not use the unit with power voltage levels other than those specified. Failure to follow this may result in fire, electric shock, and/or malfunction.



Do not connect devices that exceed the indicated capacity to the output contact of the unit. Failure to follow this may result in electric shock, fire, and/or malfunction.



Do not touch terminals with wet hands. Failure to follow this may result in electric shock.

### Caution



Do not apply impact to the unit. Strong impact may result in performance deterioration and/or damage to the unit.



The unit may not operate properly near devices that generate a strong electric or magnetic field. Also, devices near the unit may not operate properly due to the magnetic field and/or magnetism generated from the unit. Make sure to confirm before operation.



Make sure to perform a sufficient operation check on the whole system before operation.



Refer to the detection area chart, and select the installation location. Then, check the actual operation, and adjust the appropriate area.



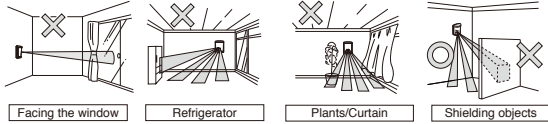
Make sure to check operation when you move tables and partitions to change the layout in protected rooms.



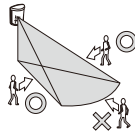
Do not install the unit in places subject to oil, smoke, steam, high humidity, and/or a lot of dust. Electricity that is conducted through these substances may result in fire, electric shock, and/or false operation.

## ⚠ Caution

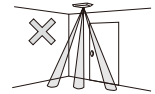
- ! Avoid installing the unit in the following places. Otherwise, non-detection and/or false detection may occur.
  - Places subject to strong direct or reflected light (sunlight, spotlight)
  - Places subject to rapid temperature fluctuations (air outlets of air-conditioning equipment, etc.)
  - Places where moving objects are included in the protection area (plants, laundry, etc.)
  - Places subject to strong vibration and/or electric noise
  - Places where pets, such as dogs and cats, and/or automatic cleaning robots may pass
  - Places where shielding objects (including glass and transparent resin, etc.) are placed in the protection area (shading parts will not be detected)
  - Places that people can easily touch.



- ! Passive infrared sensors are designed to detect changes of far-infrared ray energy. Energy changes largely when the human body moves across the detection area. However, energy does not change so much when the human body comes closer in a straight line, or stops. In addition, if the environment of detection area generates similar changes due to certain factors, the unit will issue an alarm without being able to judge properly.

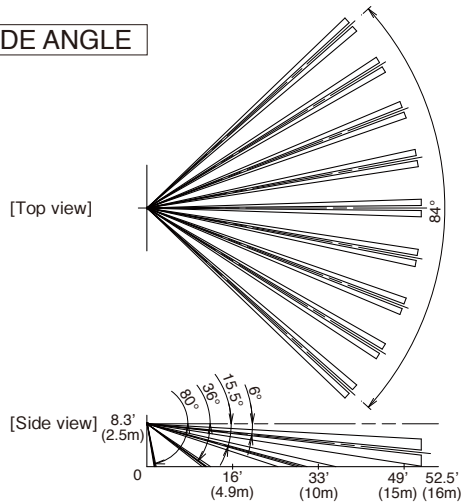


- ! Ask qualified personnel for any electrical work necessary for installation, if required. Failure to follow this may result in fire and/or electric shock.
- ! Securely conduct installation work according to the instruction manual. Also, make sure to use the supplied accessories and specified components. Failure to follow this may result in injury and/or property damage in the event of fire, electric shock or fall of the unit.
- ! This unit is for indoor use. Do not use the unit in places subject to water and/or high humidity. Failure to follow this may result in malfunction if water gets into the unit.
- ! This unit is not a waterproof (moisture proof/rainproof) or dust-proof structure. Do not use the unit in places subject to water and/or high humidity, such as bathrooms, and/or subject to large amounts of dust or sand. Failure to follow this could result in malfunction.
- ⊘ Do not perform aerial wiring of power and signal cables. Failure to follow this may result in electric shock, fire, and/or malfunction.
- ⊘ Do not install the sensor directly on the ceiling (When installed on ceiling, use optional attachment BCW-401)

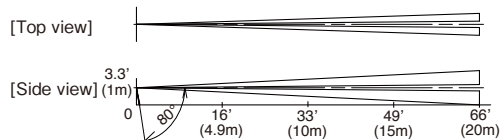


## 3 DETECTION AREA

### WIDE ANGLE



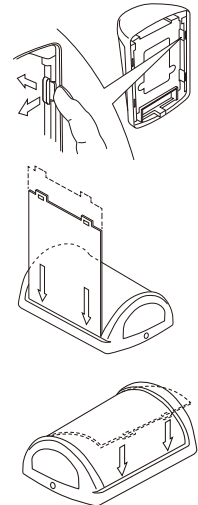
### LONG RANGE



\* Long range protection is possible with supplied long range lens.

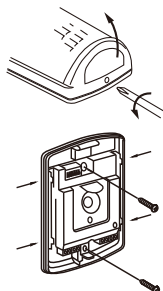
### ● Lens exchange

1. Pull four lens tabs on back side of the cover toward inside and push them out to remove the lens.
2. Put smooth face of the lens on the front side. Push one side of the lens into one side slot of the cover until it snaps.
3. Carefully bend the lens along edges of the cover. Push other side of the tabs into the other slot of the cover until it snaps.
4. Set dip switch "6" of the mode selector to the mode corresponding to protection pattern of the lens (refer to section "6. FUNCTION" )

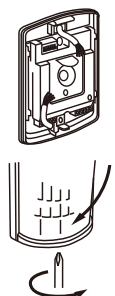


## 4 INSTALLATION

1. Loosen the cover locking screw and remove the cover. Do not remove the screw from the cover not to lose locking nut.
2. For wall mounting, use wall mounting hole located in the center of the base. For corner mounting, break 4 knockouts on both side to use corner mounting holes.

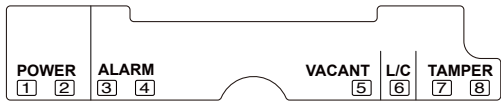


3. Break knockouts of wiring holes required to connect wires. In case wiring through upper wiring holes, pass the wires along wiring channels on either side of the base to connect them to the terminal.
4. Attach the cover and tighten the cover locking screw.



# 5 WIRING

## Terminal Arrangement



**1 2**

**POWER**  
(non-polarity)  
9.5V to 28V DC  
25mA Max.

**3 4**

**ALARM OUTPUT**  
Dry contact (semi-conductor)  
N.C./N.O. selectable  
Reset : approx. 2 sec.  
30V DC (24V AC) 0.25A Max.  
(Protective resistor 3.3Ω)

**5**

**VACANT**

**6**

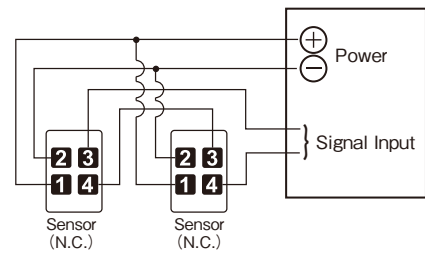
**LED Control**  
(Refer to section "6.FUNCTION")

**7 8**

**TAMPER OUTPUT**  
Dry contact N.C.  
Operation : Open when cover is detached.  
30V DC 0.1A Max.

## Basic connection

[When two units are used]



## WIRING DISTANCE BETWEEN SENSOR AND POWER SOURCE

Size of wire used	Distance at 12VDC	Distance at 24VDC
AWG 22 (Dia.0.65mm)	2500ft ( 750m)	14000ft ( 4400m)
AWG 18 (Dia.1.0mm)	4600ft (1400m)	28000ft ( 8500m)
AWG 16 (Dia.1.25mm)	8500ft (2600m)	50000ft (15200m)

Note : 1) Maximum wiring distance, when two or more sets are connected, is the value above divided by numbers of sets.

2) The signal line can be wired to a distance of 3,280 ft (1,000m) with AWG 22 (0.65mm dia.) wire.

\* Allow approx. one minute for warm-up after power is supplied. (Alarm LED is flashing) In the meantime, no alarm is initiated.

\* After the one minute has passed, the unit will be in the armed condition and will trigger an alarm when detecting a human body.

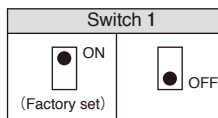
# 6 FUNCTION

## MODE SELECTOR

Sensor operation can be adjusted to fit the environments / applications with the built-in mode selector.

### ALARM LED

The alarm LED will light up, synchronized with the alarm contact, if you set the mode selector at ON.



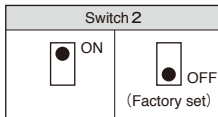
### ALARM MEMORY CHANGEOVER

Memory LED will inform you which sensor initiated an alarm during alert conditions when two or more sensors are connected on the same line.

When this setting is "ON", memory is always stored when sensor is armed.

When an alarm has been activated, the memory LED flashes for 3 min. and then remains lit for 47 min. It automatically reset and memory is also canceled.

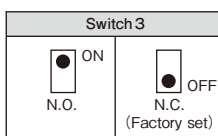
NOTE : Same LED is used to indicate alarm and alarm memory.



### ALARM CONTACT CHANGEOVER

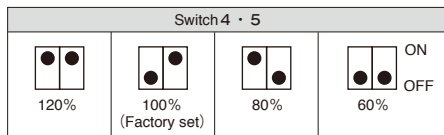
Change alarm contact to N.O. when sensor is used for an application other than security purpose, such as light control.

ON : N.O.  
OFF : N.C.



### SETTING OF SENSITIVITY

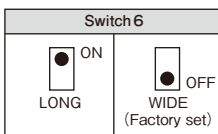
When operation check result excessive or insufficient high sensitivity of sensor, change setting of sensitivity with mode selector and re-check operation. Four settings are available.



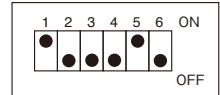
### PROTECTION PATTERN CHANGEOVER

Two protection patterns (Wide angle/Long range) are selectable by replacing lens. Reselect the dip switch when exchanging lens (refer to "3. DETECTION AREA"). Do not set the switch OFF for long range protection.

ON : LONG  
OFF : WIDE

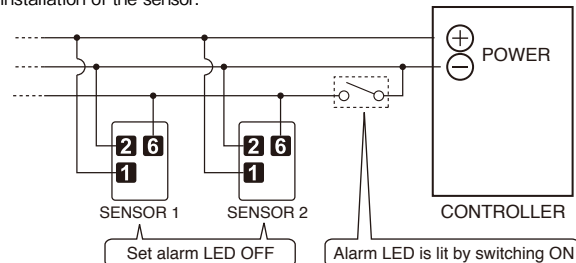


### FACTORY SET



### LED CONTROL

LED can be remotely controlled from the control panel. Even after setting alarm LED OFF, combined use of alarm LED control terminal (6 LED Control) and power terminal (negative) enables to reset the mode back to alarm LED ON, which makes it easy to operate a walk test even after installation of the sensor.



### TROUBLE ALARM

This function checks / monitors sensor unit itself in accordance with built-in program.

When trouble is found out as a result of the check / monitor, alarm LED lights and an alarm signal also continuously outputs.

#### 1 : Unit trouble

Trouble alarm outputs when inner circuit / wiring is damaged / broken. See "8. TROUBLESHOOTING" and remedy table.

NOTE : The monitor functions regardless of mode settings but an alarm is not indicated in case of setting alarm LED at OFF position. When power is reset during the alarm status, trouble alarm stops only for warming up time.

#### 2 : Low voltage

When power voltage of sensor drops down (approx. 8.5V DC or less), trouble alarm outputs before sensor operation becomes unstable due to low voltage. See "8. TROUBLESHOOTING".

NOTE : The monitor functions regardless of mode settings but an alarm is not indicated in case of setting alarm LED at OFF position. When power voltage recovers to normal level during the alarm status, trouble alarm stops.

# 7 OPERATION CHECK

When installation is completed, turn the power "ON" and check operation after about 1min. warming up time, as follows:

1. Make sure that alarm LED finished flickering.
2. Make a walk test in the protected area to check if an alarm is initiated. Check alarm LED and control panel for sensor operation.
3. After correct operation has been confirmed, use the mode selector switch to disable the alarm LED, if required.

# 8 TROUBLESHOOTING

Analyze possible problems according to the following table. If normal operations cannot be restored by these means, contact either the dealer from whom you bought the unit or TAKEX.

Trouble	Check	Corrective Action
Completely inactive	(1) Power supply is not connected(including broken wiring). (2) Power supply voltage is low. (3) 1 minute has not passed yet since turning the power ON. (4) The detection area is blocked by obstacles (which may include glass). (5) Improper detection (including detection distance). (6) Improper function mode setting.	(1) Check the power wiring. (2) Supply appropriate power voltage. (3) Wait approximately 1 minute. (4) Remove obstacles. (5) Readjust detection area. (6) Readjust mode setting.
Sometimes inactive	(1) Improper detection area settings (including detection distance). (2) Improper function mode setting. (3) Detection lens is covered with dust or water droplets. (4) Small difference between human and ambient temperature	(1) Readjust detection area. (2) Readjust mode setting. (3) Clean the lens with soft and dry cloth. (4) Increase sensitivity up to 120%
Activated when no person has passed	(1) Unstable power supply voltage. (2) Something is moving within the detection area, or there are sudden changes in temperature. (3) A source of electrical noise (broadcasting station, amateur radio station, etc.) is nearby. (4) Strong light (direct or reflected) such as sunlight or headlights from front side of the detection area. (5) Detecting someone passing outside the detection area. (6) Movement of pets is detected (7) Movement of robot cleaners is detected	(1) Supply appropriate power voltage. (2) Remove problem object.  (3) Change mounting location.  (4) Change mounting location or shield light with blinds, etc.  (5) Readjust detection area. (6) Prevent pets from entering detection area. (7) Prevent robot cleaners from entering detection area.
Alarm LED lights, but connected devices are inactive	(1) Wiring failure, broken wire, or short-circuit (2) Alarm signal is not output. (3) Setting of alarm output is inappropriate. (4) Connected devices don't function normally.	(1) Connect wiring correctly, or repair problem wire (2) Check terminal connection with a tester, etc (3) Readjust setting of alarm output. (4) Check connected devices
Alarm LED continues lighting or blinking and alarm output doesn't stop. (Abnormal detection)	(1) Reset power supply and wait for warm-up to be done.	(1) Contact the dealer or TAKEX (Devise or wire may be broken inside)

## MAINTENANCE

- To clean the device, use a soft, wet cloth and then wipe off any water drops. If the device is particularly dirty, dip the soft cloth in the water that contains a weak neutral detergent. Wipe the device gently with the cloth, then wipe off any detergent that remains. Do not use substances such as thinner or benzene. (The plastic parts may deform, discolor or change their properties.)
- Perform operation checks on a regular basis.

# 9 SPECIFICATIONS

Model	PA-470L	
Detection System	Passive infrared (QUAD · Fuzzy logic)	
Coverage	Wide angle protection	Long range protection
	52.5' (16m)	66' (20m)
Sensitive zone	88 (22pairs)	8 (2pairs)
Supply Voltage	9.5 to 28V DC (non-polarity)	
Current consumption	25mA Max. (N.C./N.O. selectable)	
Alarm output	Dry contact (Semi-Conductor) Reset : Apporox, 2 sec. (N.C./N.O. selectable) 24V DC (30V AC) 0.25A Max. (protective resistor 3.3Ω)	
Tamper output	Dry contact (type N.C.) Open when cover is detached 30V DC 0.1A MAX. (protective resistor 3.3Ω)	
LED(Red)	Alarm LED Flickering (every 0.5 sec.) : Warming-up Lighting (approx. 2 sec.) : Alarm Flickering (every 0.25 sec.) : Trouble indication Continuous lighting : Trouble alarm (LED disabled except trouble indication) Memory LED Flickering : Memory activated Lighting : Memory indication	
LED control	Controls alarm LED indication / with terminal L/C	
Trouble signal	Unit trouble : Monitoring inner circuit and wiring damage • Operation : Trouble alarm Low voltage trouble : Monitoring low voltage • Operation : Trouble alarm	
Ambient temperature range	+14°F to +122°F (without dewdrops) (-10°C ~ +50°C)	
Mounting position	Indoor (Wall/pillar) Ceiling mount is possible with optional attachment	
Wiring connections	Terminals	
Weight	5.82oz (165g)	
Appearance	resin (White)	

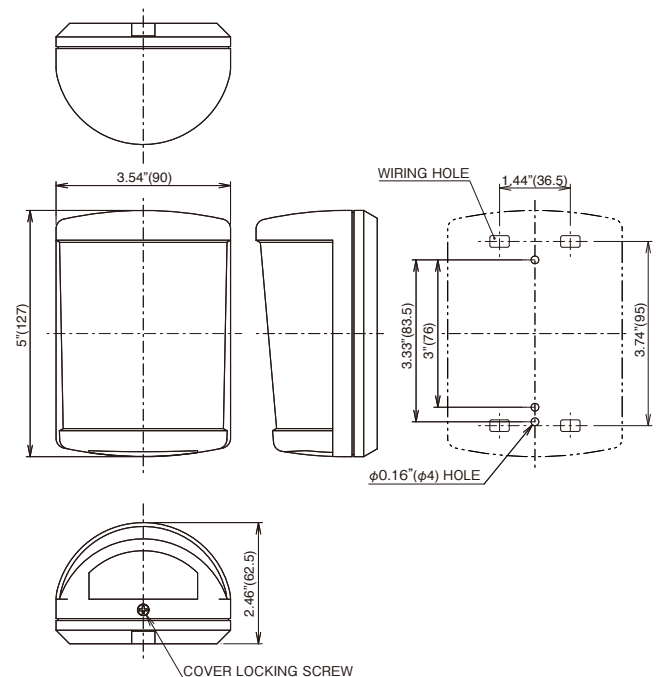
※Specifications and design are subject to change without prior notice.

## Limited Warranty :

TAKEX products are warranted to be free from defects in material and workmanship for 12 months from original date of shipment. Our warranty does not cover damage or failure caused by natural disasters, 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.

# 10 EXTERNAL DIMENSIONS

Unit: inch (mm)



■Option : Ceiling/Wall mounting attachment : BCW-401

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