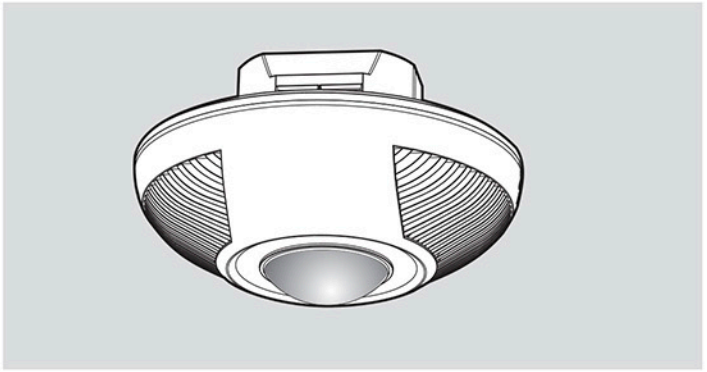


Dual Tech  
Presence Detector  
CPD-360DUALTECH



INSTRUCTION MANUAL

Installation and assembly of electrical equipment must be carried out by qualified electricians. Contact a qualified electrician in the event of fault or break down.

**CAUTION!**

- A circuit breaker (250VAC, 10A) type C according to EN60898-1 shall be installed in the fixed wiring for protection.
- Do not mount on conductive surface.
- Do not open the enclosure frequently.
- Turn off power when change the light sources.

TECHNICAL SPECIFICATIONS

Rated Voltage 220 - 240V~ 50/60Hz

Load  
CPD-360: For lighting (with jumper wire):  
DUALTECH

- Incandescent lamp : Max. 2000W
- AC Halogen lamp : Max. 1000W
- IV Halogen lamp : Max. 1000VA / 600W (traditional)  
Max. 1000VA / 900W (electronics)
- Fluorescent lamp : Max. 900VA / 100μF  
25 x (1 x 18W) ; 12 x (2 x 18W)  
15 x (1 x 36W) ; 7 x (2 x 36W)  
10 x (1 x 58W) ; 5 x (2 x 58W)  
Max. 1000VA / 600W  
(uncompensated)
- LED lamp : Max. 400W  
(include CFL and PL lamp)
- Energy Saving Lamp :Max.600VA/400W

TECHNICAL SPECIFICATIONS

CPD-360 : For HVAC (remove jumper wire):  
DUALTECH

- Max. 10A (cosφ=1) for ≤ 250VAC
- Max. 5A for ≤ 30VDC
- Max. 3A (cosφ=0.4) for ≤ 250VAC

Detection Angle	360°
Detection Range (H=2.5m)	PIR 360° circular, adjustable up to Φ8m US 360°, adjustable up to 10m x 16m, it's an oval shape
Auto Off Time Adjustment	Adjustable from approx. 5sec to 30min, Test & $\sqrt{L}$
Lux Adjustment	Adjustable from approx. 10Lux to 1000Lux
ACC ON / OFF	Select "ON" for activating or select "OFF" for deactivating air current compensation function
Triggering Method s	PIR + US, PIR only, US only, PIR or US
Ultrasonic Sensor Frequency	32KHz
Operating Temperature	0°C to +45°C
Environmental Protection	Class II, IP20

1 PACKAGE CONTENTS

Pattern				
Item	Detector	Lens shield	Screw Φ 3 x 14mm	Manual
Quantity	1	2	2	1

Pattern			
Item	Junction box	Non-dropping screw Φ 3 x 18mm	Wood screw Φ 4 x 25.4mm
Quantity	1	4	2

2 PRODUCT DESCRIPTION

2.1 Features

The Dual-Technology presence detector CPD-360DUALTECH integrates advanced PIR and Ultrasonic technologies in one unit. The combination of these technologies helps to eliminate false triggering problems even in difficult applications. It is suitable for indoor application which is ideal for using at home, open-plan office, multi-stall public restroom, conference room, underground parking lots, classroom, library, etc. With its knobs and IR remote controller, the time, ultrasonic sensor sensitivity, lux, ACC (air current compensation) function and PIR/US triggering method can be adjusted as user desired to match different application requirements and energy saving for switching light on and off.

Triggering mode application examples:

- PIR+US:  
If precise detection is needed, choose this triggering method which can reduce the false triggering problem. For example, in a classroom, an open-plan office, etc.
- US only or PIR/US:  
When there is high level of minor motion or obstacle (furniture or partitions) existing in the monitored space, or it is a multi-stall space. For example, multi-stall public restroom, an office with partitions, etc.
- PIR only:  
If the monitored space is free of obstacle or has high level of airflow or the detection area is needed to be well specified. For example, a small-scale office with air-conditioning, a small conference room, etc.

2.2 Additional functions

2.2.1 Function of terminal R

Connect terminal R with push button (N.O. type) to manually control the load's on / off. When the load is off, press (>1sec) the push button (N.O. type) to manually switch the load on. The load keeps on if the movement is detected constantly. The load can be automatically switched off if no movement is detected and the delay time has expired, or by pressing the push button again. When the load is off, the move-ment cannot trigger the load on, and the detector will return to the previous mode until detecting the last movement and the delay time has expired. Refer to FIG.6 for wiring connection.

2.3 Dimension:

- CPD-360DUALTECH: Φ111.5 x 67mm (See FIG.1-A)

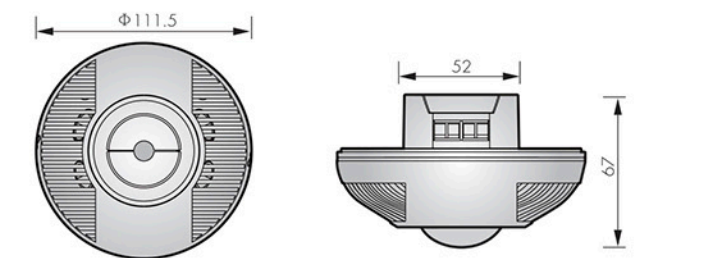


FIG. 1-A

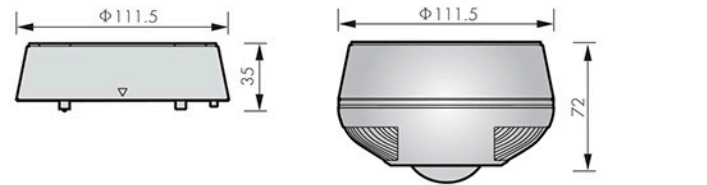


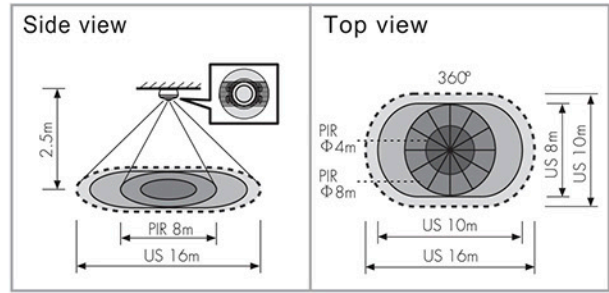
FIG. 1-B

3 INSTALLATION AND WIRING

Please disconnect power completely and read the entire instruction manual carefully before installation.

3.1 Select a proper location

- 3.1.1 The recommended installation height of this detector is 2-3m, and 2.5m is the optimal mounting height. The detection range of PIR sensor can reach up to Φ8m, and ultrasonic sensor is an oval shape of 8m x 10m with small movement (i.e. hand wave), and an oval shape of 10m x 16m with large movement (i.e. walk). The detection angle is 360° for both PIR and ultrasonic sensors [See FIG.2].



Ultrasonic Major Motion PIR Major Motion  
Ultrasonic Minor Motion PIR Minor Motion

FIG. 2

- 3.1.2 Location of dual-technology detector (See FIG.3-A & FIG.3-B).

- Dual-technology detector is capable of detecting occupant without directly seeing the moving person due to the high sensitivity of ultrasonic sensor.
- Ceiling mount will give an overall view of the entire room, and the detector should be mounted in the center of the room so that the detector can detect movement from anywhere of the monitored space.
- If you choose the PIR technology (PIR+US or PIR only) as triggering method, the detector should be located where the PIR sensor is able to see the occupant.
- In order to ensure good reliability of PIR sensor, an overlapping area is needed to be considered while installing several sensors in the same space.

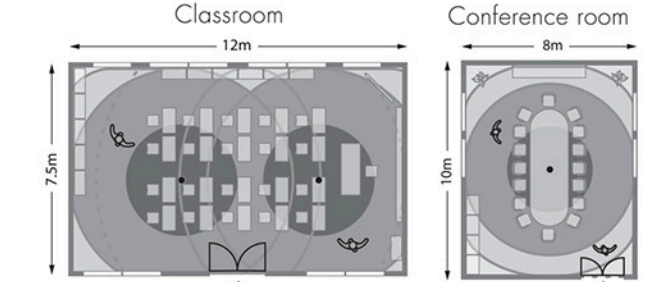


FIG. 3-A

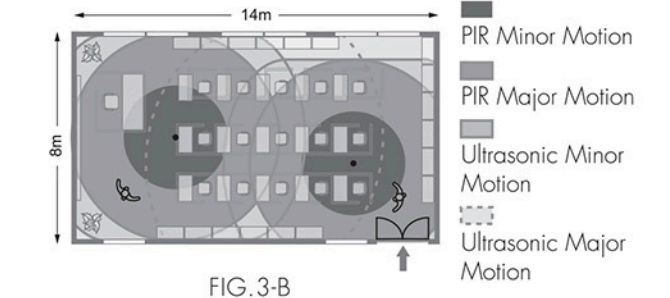


FIG. 3-B

3.1.3 Examples of application

- 3.1.3.1 Ultrasonic sensor is less affected by humidity which is more suitable for using in the humid environment (See FIG.4-A).



FIG. 4-A

- 3.1.3.2 Ultrasonic sensor detects occupant based on the Doppler Effect and it does not need to "see" the movement of occupant directly. In other words, it is able to detect the movement behind the obstacles [See FIG.4-B & FIG.4-C & FIG.4-D].

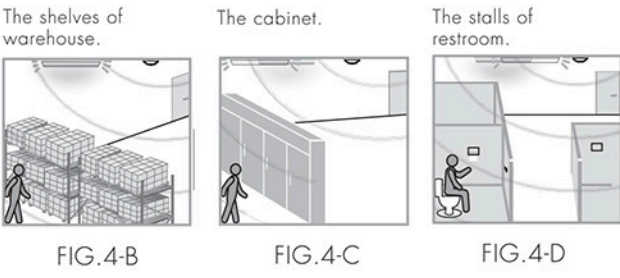


FIG. 4-B

FIG. 4-C

FIG. 4-D

- 3.1.3.3 Ultrasonic sensor is high sensitive in detecting small movement, such as a minor motion of typing, hand waving, door opening, etc. (See FIG.4-E & FIG.4-F & FIG.4-G):

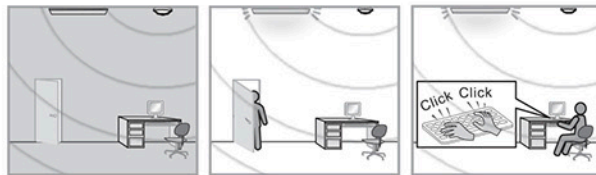


FIG. 4-E

FIG. 4-F

FIG. 4-G

- 3.1.3.4 Since ultrasonic sensor is high sensitive to small motion and does not require a direct view between the sensor and the moving object, therefore, it is optimum for using in the spaces where frequently has less or small motion taken place, such as a conference room, an open plan office with partitions, a library, etc. (See FIG.4-H & FIG.4-I & FIG.4-J).



FIG. 4-H

FIG. 4-I

FIG. 4-J

3.1.4 Helpful tips for installation

Since the detector is in response to temperature, airflow and wind change, please avoid the following conditions:

- Avoid aiming the detector toward the objects which maybe swayed in the wind, such as curtain, tall plants, miniature garden, etc. (See FIG.5-A).
- Avoid aiming the detector toward the objects whose surfaces are highly reflective, such as mirror, monitor, etc. (See FIG.5-A)
- It is better to locate the detector at least 2m away from the glass gate or window for avoiding nuisance triggering because the shaking of glass could trigger the ultrasonic sensor (See FIG.5-D).

- It is better to locate the detector at least 2m away from the source of airflow such as doorway, vents and air conditioning, etc. (See FIG.5-B & FIG.5-C & FIG.5-E).
  - After that, if the false triggering still exists, lower the ultrasonic sensitivity or select a more suitable location.
  - The distance between two detectors must be at least 2m to avoid interference (See FIG.5-F).
- The direction of the ultrasonic sensor should aim to the main detection area to obtain the best coverage [See FIG.3].



FIG. 5-A

FIG. 5-B

FIG. 5-C

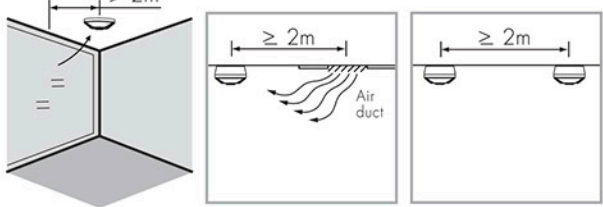


FIG. 5-D

FIG. 5-E

FIG. 5-F

3.2 Wiring

- 3.2.1 For lighting (has jumper wire between D1 & L terminals).
- 3.2.1.1 One detector controls one load (See FIG.6).

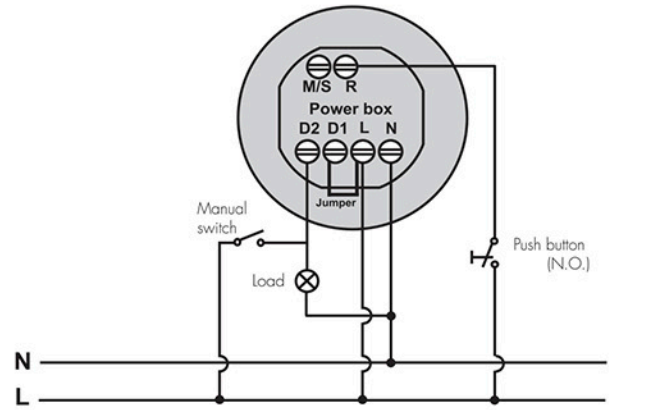


FIG. 6

- 3.2.1.2 One detector controls staircase timer (Set time knob to  $\sqrt{L}$ ) (See FIG.7).

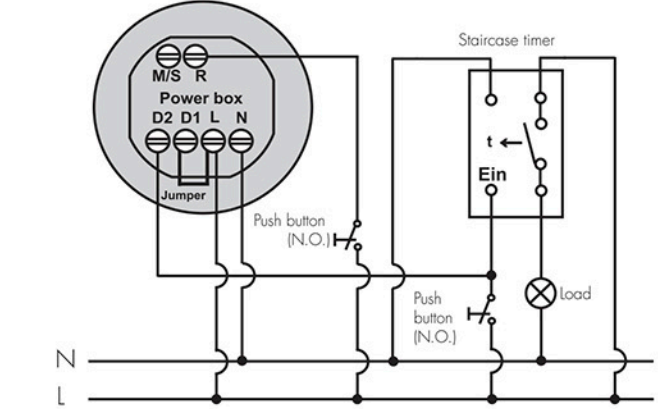


FIG. 7

- 3.2.2 For HVAC (Remove jumper wire between D1& L terminals) (See FIG.8).

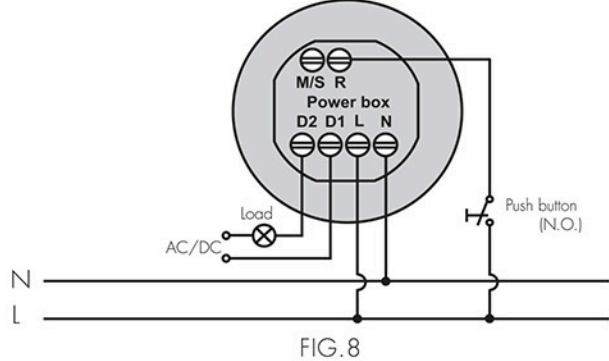


FIG. 8

3.3. Surface mount

- 3.3.1 There are 7 pairs of fixing holes with various distances from 41mm to 85mm on the bottom cover of the combined junction box which can be selected for different mounting applications (See FIG.9-A). Select two same figures on both ends for the corresponding fixing distance (See FIG.9-B).

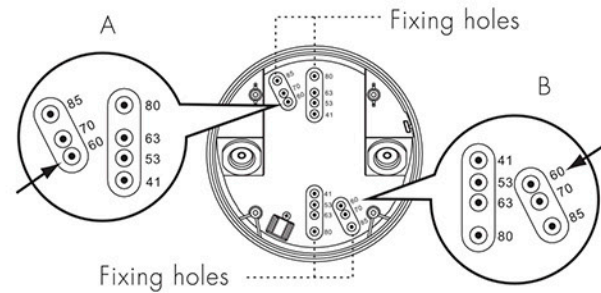


FIG. 9-A

NO.	A	B	The distance between A and B
1	41	41	41mm
2	53	53	53mm
3	60	60	60mm
4	63	63	63mm
5	70	70	70mm
6	80	80	80mm
7	85	85	85mm

FIG. 9-B

- 3.3.2 To feed power cables through the side of junction box, please use the cutting pliers to break the side cable entry knockouts, then insert cables into junction box and feed through it. Please strip off 6 - 8mm of cable sheathing for wiring (See FIG.10).

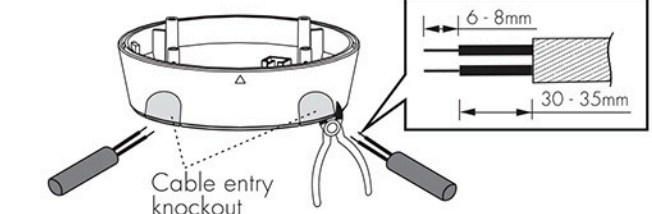


FIG. 10

- 3.3.3 Choose two proper knockouts to fix the junction box JB-46 on the surface of ceiling board with two wood screws (See FIG.11).

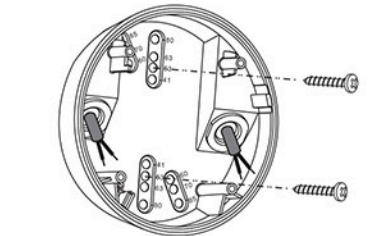


FIG. 11

- 3.3.4 Insert four non-dropping screws to the corresponding screw holes on detector's fixing plate. Afterwards, those four screws will not drop off to provide convenient subsequent installation (See FIG.12).

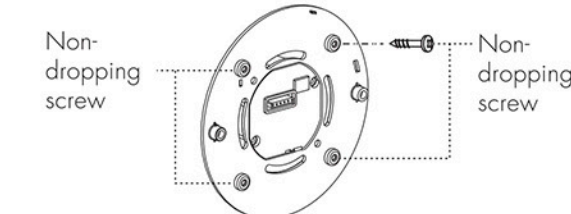


FIG. 12

- 3.3.5 Assemble the detector head with the power box, and then refer to the wiring diagrams (See FIG.6 - FIG.8) for correct cable connections.
- 3.3.6 Put on the decorative frame and restore power supply.



4 OPERATION AND FUNCTION

4.1 Setting of Lux, Time, Meter, ACC and PIR/US knobs

Knob (Ex-factory setting)	Function	Knob setting
	Set the light value for switching on load	Range: Approx. 10Lux to 1000Lux User can set the knob according to their requirement for application. The marked values are for reference only.
	Set delay off time for load	Range: Approx. 5sec to 30min Test: Test mode (Load and red and/or green LED will be 2sec on, 2sec off). Test mode is uncontrolled by lux setting. ⏏: Short impulse mode for staircase timer switch control (Load and red and / or green LED will be 1sec on, 9sec off).
	Set the detection coverage of ultrasonic sensor	"-" = Min. (Approx. an oval shape of 2m x 3m). "+" = Max. (Approx. an oval shape of 10m x 16m).
	Reduce the false trigger problem caused by airflow.	ON : Activate the ACC function. OFF: Deactivate the ACC function. Remark: Under ACC ON status, the detection coverage of ultrasonic sensor will be reduced.
	Select triggering method	PIR/US: Load will turn on when either PIR or ultrasonic sensor is triggered. PIR+US: Load will turn on when both PIR and ultrasonic sensors are triggered, and after the load is on, either PIR or ultrasonic sensor detects movement, the load keeps on. PIR only: Load will turn on only when PIR sensor is triggered. US only: Load will turn on only when ultrasonic sensor is triggered.

4.2 Usage of lens shield for PIR sensor

- 4.2.1 CPD-360DUALTECH has provided 2 lens shields for masking the undesired detection area of PIR sensor. One lens shield has 2 layers with 6 small units each, and 30° of detection angle can be covered by each unit. For example, to install the detector at the height of 2.5m, the detection range can reach to 2m diameter if the complete lens shield has been used; and up to 6m diameter if only the A layer of lens shield has been used (See FIG. 13-A & FIG. 13-B & FIG. 13-C).
- 4.2.2 After user choosing the desired detection area, the needless lens shield should be removed (See FIG. 13-D).

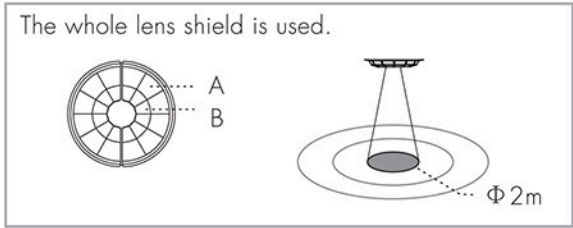


FIG. 13-A

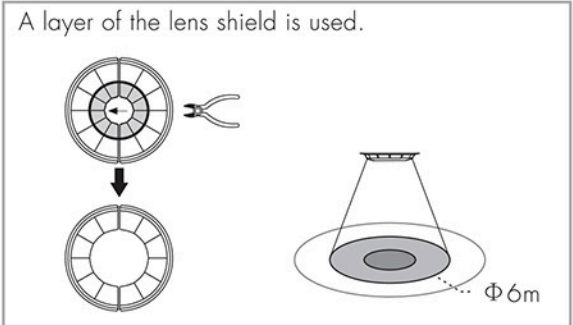


FIG. 13-B

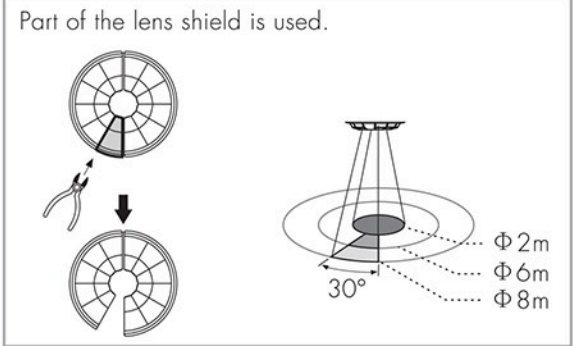


FIG. 13-C

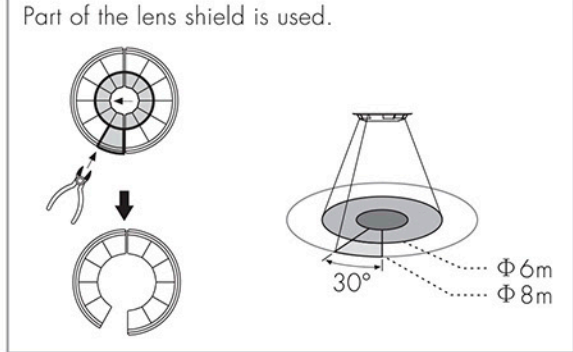


FIG. 13-D

- The shadow part of the lens shields in the FIG.13-A & FIG.13-B & FIG. 13-C & FIG.13-D are referring to the cut-off parts.
- The ultrasonic sensor is unaffected by the lens shield.

- 4.2.3 Fixing lens shield: There is a circular groove on the back of the decorative frame and the lens shield is designed with a circular hook. By coupling the hook into the groove, the lens shield is fixed (See FIG. 14-A & FIG. 14-B).

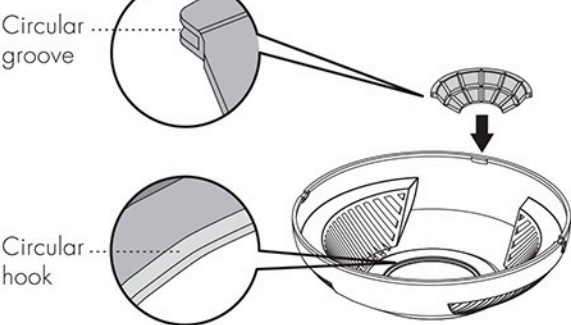


FIG. 14-A

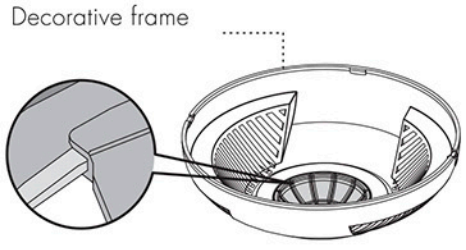


FIG. 14-B

4.3 Walk test (uncontrolled by Lux)

NOTE
● It takes approx. 30sec for detector to warm up with load on after power is initially supplied or resupplied after power failure, then the detector enters into normal operation to carry out a walk test. During which, red and green LEDs will permanent on for 30sec if no IR setting value is stored in detector. Reversely, the red and green LEDs will flash for 30sec if any setting value has been stored in the detector. ● Re-supplied after power failure, detector works according to the previous settings.

The purpose of conducting the walk test is to check whether the triggering method (PIR, ultrasonic) is set correctly or not and to adjust the detection coverage. Procedures of conducting the walk test (Lux controller is disabled):

- 4.3.1 Set the time knob to "Test" position.
- 4.3.2 Adjust the position of meter knob for matching the sensitivity of ultrasonic sensor as you desired. The detection coverage of PIR sensor can be adjusted by using the lens shield.

- 4.3.3 Set the ACC knob to OFF position.

- 4.3.4 Select the desired trigger method (i.e. PIR+US, PIR only, US only or PIR/US).

- Step 1: Switch on the power supply and it takes approx. 30sec for detector to warm up with load and LED on for 30sec, afterwards they will turn off.

- Step 2: To walk within the desired detection coverage of detector (Refer to FIG. 1 5-A & FIG.1 5-B).

- Step 3: When its PIR sensor is triggered by move-ment, the red LED turns on for 2sec, then turns off; when its ultrasonic sensor is triggered by movement, the green LED turns on for 2sec then turns off. When choosing PIR+US as triggering method, both red and green LEDs will turn on for 2sec then turn off if both sensors have been triggered by movement.

- 4.3.5 To repeat above mentioned procedures to adjust the settings of detector either by knobs or IR remote controller and conduct the walk test until the detector's detection coverage meets your demand.

Walking direction for PIR sensor testing

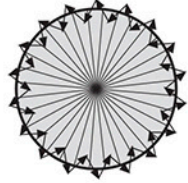


FIG. 1 5-A

Walking direction for ultrasonic sensor testing

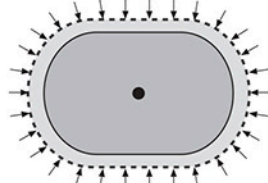


FIG. 1 5-B

5 TROUBLE SHOOTING

When CPD-360DUALTECH works abnormally, please check assumptivproblems and suggested solutions in following table that will hopefully solve your problems.

Problem	Possible cause	Suggested solution
lighting device does not turn on	1. Power does not switch on. 2. Incorrect wiring. 3. The ambient light level is too high. 4. Malfunctioned load.	1. Switch on the power. 2. Refer to wiring diagrams (See FIG. 6 - FIG. 8 ) and check if the load is malfunctioned. 3. Set Lux value above the ambient light level then trigger the detector and check if the load is switched on or not. 4. Replace the disabled load with a new one.
lighting device does not turn off	1. Auto off delay time is set too long. 2. Detector is nuisance triggered. 3. Incorrect wiring.	1. Set auto off delay time to a shorter time and check if the load is switched off or not according to the preset off delay time. 2. Keep the objects which may cause nuisance triggering away from detection coverage to avoid activating detector while doing the test. 3. Refer to wiring diagrams (See FIG. 6 - FIG. 8 ).
Red LED does not turn on	1. PIR sensor is not chose as the triggering method (PIR only; PIR/US; PIR+US). 2. Exceed the valid detection range.	1. Choose PIR sensor as the triggering method. 2. The movement should be within the valid detection range (Φ 8m).
Green LED does not turn on	1. Ultrasonic sensor is not chose as the triggering method (US only; PIR/US; PIR+US). 2. Exceed the valid detection range.	1. Choose ultrasonic sensor as the triggering method. 2. The movement should be within the valid detection range (10m x 16m).
Nuisance triggering	There are heat sources, airflow, highly reflective objects or any objects which may be swayed in the wind within the detection coverage.	Avoid aiming the detector toward any heat sources, such as air conditioning, electric fans, heaters or any highly reflective surfaces. Make sure there are no swaying objects within the detection coverage.

NOTE
■ Do not attempt to open or repair the unit without qualified electrician while it is malfunctioned.
■ Cleaning: Wipe with dry cloth only. Soap or rough cloth may damage the detector lens.
■ The Effects to ultrasonic sensitivity: The following conditions may cause lower sensitivity or false triggering of ultrasonic sensor: <ul style="list-style-type: none"><li>● Set ACC knob to ON: The airflow will cause false trigger to ultrasonic sensor. To reduce the possibility of false trigger, the dual technology sensor is designed with air current compensation (ACC) function which is able to reduce the sensitivity of ultrasonic sensor approx. 10% ~ 40% varied with the strength of airflow.</li><li>● Ultrasonic sensitivity will be affected by the materials such as carpet, sound absorbable cotton, curtain, etc. since they are sound wave absorber.</li><li>● Low ambient temperature might slightly decrease ultrasonic sensitivity and also reduce the detection range.</li><li>● Wire connections in reverse in between N and L will cause lower sensitivity of ultrasonic sensor.</li></ul>
■ The Effects to PIR sensitivity: The following conditions may cause lower sensitivity of PIR sensor: <ul style="list-style-type: none"><li>● On very foggy days, the sensitivity may be less due to moisture collecting on the lens.</li><li>● On very hot days, the sensitivity will be lower as high ambient temperature can be close to body temperature.</li><li>● On very cold days when wearing heavy clothing, and especially if the facial area is covered, maybe appear less sensitive.</li></ul>

6 OPTIONAL ACCESSORY

- 6.1 It is strongly recommended to purchase our high quality IR remote controller IR-11T for convenient and safe operation on CPD-360DUAL TECH

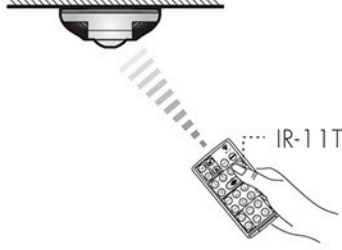


FIG. 16

6.2 IR-11T Remote Control functions:

Button	Function
	<b>Lock IR-11T</b> By pressing "⏏" button, IR-11T can be locked and no adjustments are workable (except "⏏" button).
	<b>Unlock IR-11T</b> By pressing "⏏" button, IR-11T is unlocked; thereafter it can be used to make settings. The IR-11T will lock automatically if there is no operation occurred in 2min counting from the last operation.
	<b>Reset</b> By pressing "⏏" button, detector is controlled by potentiometers, and it can delete all the MEMO data.

Button	Function
	<b>Load for lighting control (Relay)</b>
	<b>Lux value adjustments for lighting control</b> By pressing corresponding button, the selected light level threshold for switching on the connected load can be set.
	<b>Automatic read-in of actual light level function for lighting control</b> Actual light level can be read-in as threshold for switching the corresponding light if the provided lux values do not match user's requirement. The steps are as below: Push "👁️" button till detector's red and green LEDs flashing to enter into learning mode, learning time is 10sec. Then the ambient light level is read in confirmed by LEDs turn on to indicate IR learning successfully. Then it returns to Auto mode. If the ambient light level is out of the range of 5 ~ 1000Lux, detector will learn for 10sec, then LEDs flash quickly for 5sec to indicate IR learning unsuccessfully, but below lux value will be stored: 1000Lux if the actual light level is above 1000Lux, and 5Lux if the actual light level is below 5Lux.
	<b>Store and duplicate the values of Time/Time1, Time2 and Lux set by IR-11T</b> 1. By pressing "⏏" button, both loads and detector's LEDs have no reaction if no settings are stored in IR-11T. 2. When time of Time/Time1, Time2 and Lux are set by IR-11T already, press "⏏" button more than 3sec to store the settings successfully. By pressing "⏏" button less than 1sec, the stored settings can be duplicated to a new detector. 3. Remove the battery more than 5sec, all the settings will be deleted. It needs to be reset after replacing the battery.
	<b>Test mode</b> 1. By pressing "TEST" button to enter into test mode. Both load and LEDs are uncontrolled by lux value. 2. If the triggering method is "PIR+US": Both PIR and ultrasonic sensors are triggered, the load and LEDs will be on for 2sec, and then off. The next triggering should be 2sec interval. 3. If the triggering method is "PIR/US": Either PIR or ultrasonic sensor is triggered, the corresponding LED and load will be on for 2sec, and then off. The next triggering should be 2sec interval. 4. If the triggering method is "PIR only": Only when PIR sensor is triggered, the red LED and load will be on for 2sec, and then off. The next triggering should be 2sec interval. 5. If the triggering method is "US only": Only when ultrasonic sensor is triggered, the green LED and load will be on for 2sec, and then off. The next triggering should be 2sec interval. 6. Load II has no reaction in test mode.

Button	Function
	<b>Select load for time setting</b> By pressing "Time1" to set the delay off time value of load I, and "Time2" to set the delay off time value of load II. "Time1" is invalid if the detector has only one load. (Note:CPD-360DUALTECH has only one load)
	<b>Time setting for Time / Time1 or Time2</b> By pressing "Time1" + "Time2" to select the load desired to set the delay off time value. Either "Time1" or "Time2" is pressed, LED flashes 2sec, and then press the corresponding time value button to set it, which is confirmed byof detector's LED flashing for 2sec .
	<b>Short impulse mode</b> 1. Press "⏏" button to enter into short impulse mode, both LED and load are controlled by Lux under this mode. 2. If the triggering method is "PIR+US": Both PIR and ultrasonic sensors are triggered, the load and LEDs will be on for 1sec, and then off. The next triggering should be 9sec interval. 3. If the triggering method is "PIR/US": Either PIR or ultrasonic sensor is triggered, the corresponding LED and load will be on for 1sec, and then off. The next triggering should be 9sec interval. 4. If the triggering method is "PIR only": Only PIR sensor is triggered, the red LED and load will be on for 1sec, and then off. The next triggering should be 9sec interval. 5. If the triggering method is "US only": Only ultrasonic sensor is triggered, the green LED and load will be on for 1sec, and then off. The next triggering should be 9sec interval. 6. Load II has no reaction in short impulse mode.
	<b>Load on</b> 1. By pressing "ON" button, load will be switched on for 8hrs, it is confirmed by flashing of detector's LEDs. 2. Exit on mode and return to Auto mode either by pressing "ON" again or to resupply power to detector after it is off. 3. Load (for lighting control) can be lead to off mode by pressing "OFF" button under on mode.
	<b>Load off</b> 1. By pressing "OFF" button, load will be switched off for 8hrs, it is confirmed by flashing of detector's LEDs. 2. Exit off mode and return to Auto mode either by pressing "OFF" again or to resupply power to detector after it is off. 3. Load (for lighting control) can be lead to on mode by pressing "ON" button under off mode.

Button	Function
	<b>ACC on/off control function</b> 1. Pressing "ACC on" button to activate the air current compensation function which is confirmed by the green LED keeping on for 5sec. 2. Pressing "ACC off" button to deactivate the air current compensation function which is confirmed by the green LED flashing for 5sec.
	<b>PIR only function</b> By pressing "PIR only" button, the detector is set to activate its load on only when the PIR sensor of it detects the movement, and the red LED will flash to confirm the successful setting of this mode. To exit this mode by selecting other mode.
	<b>Ultrasonic only function</b> By pressing "US only" button, the detector is set to activate its load on only when the ultrasonic sensor of it detects the movement, and the green LED will flash to confirm the successful setting of this mode. To exit this mode by selecting other mode.
	<b>PIR or Ultrasonic mode</b> By Pressing "PIR US" button, the detector is set to activate its load on when either PIR sensor or ultrasonic sensor is triggered by movement. When PIR is triggered, the red LED will flash; when ultrasonic sensor is triggered, the green LED will flash. To exit this mode by selecting other mode.
	<b>PIR &amp; Ultrasonic mode</b> By pressing "PIR US" button, the detector is set to activate its load on when both PIR sensor and ultrasonic sensor detect the movement, and both red and green LEDs will flash. To exit this mode by selecting other mode.
	<b>Sensitivity adjustment of Ultrasonic sensor</b> 1. By pressing "⏏" + "US" buttons to set the sensitivity of ultrasonic sensor. Each time the user presses the button, the sensitivity of ultrasonic sensor would increase or decrease 10% with indication of green LED flashing. 2. By pressing "⏏" button to increase the sensitivity of ultrasonic sensor. 3. By pressing "⏏" button to decrease the sensitivity of ultrasonic sensor. 4. When the sensitivity of ultrasonic sensor is at its highest or lowest level which is confirmed by green LED keeping on for approx. 2sec.