



796-2053

Ceiling microwave presence/absence detector

Overview



The 796-2053 microwave presence detector provides automatic control of lighting loads with optional manual control.

The 796-2053 detects movement using a highly sensitive microwave detector. This works by emitting low power microwave signals and measuring the reflections as the signals bounce off moving objects.

The output channel comprises a mains voltage relay capable of simple on/off switching.

Functioning as a presence detector, the unit can turn lights on when a room is occupied and off when the room is empty. Optional settings allow lights to be turned off in response to ambient daylight.

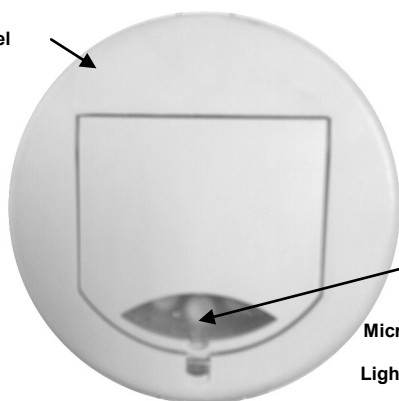
The 796-2053 has a unique adjustable sensor head that allows the area of detection to be optimised for the application.

All functionality is fully programmable using an IR handset.

Features

Front features

Mounting Bezel

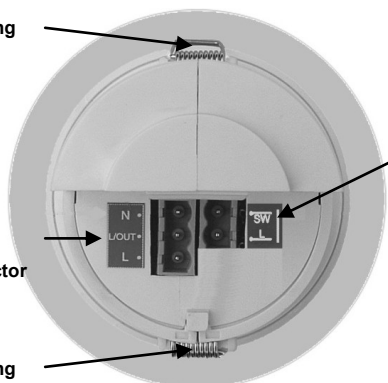


Sensor Lens
which covers...

Microwave Sensor
IR Receiver
Light Level Sensor
Status LEDs

Back features

Retaining Spring



Switch Input
Connector

Power Input
& Switched
Output Connector

Retaining Spring

Microwave Sensor

Detects movement within the unit's detection range, allowing load control in response to changes in occupancy.

IR Receiver



Receives control and programming commands from an IR (infrared) handset.

Light Level Sensor

Measures the overall light level in the detection area

Status LEDs

The LED flashes Red to indicate the following:

Walk Test LED active	 when movement is detected
Valid setting received	

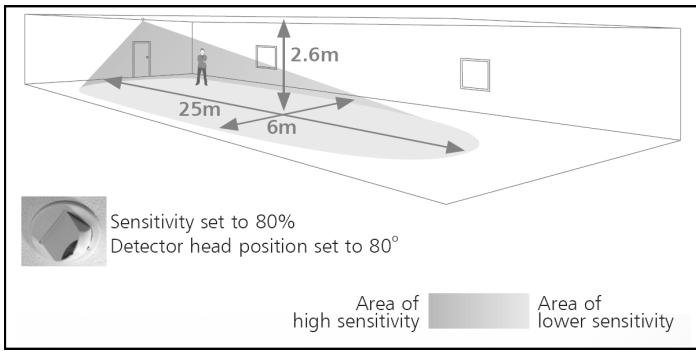
Power Input & Switched Output Connector

Used to connect mains power to the unit and to connect a switched load.

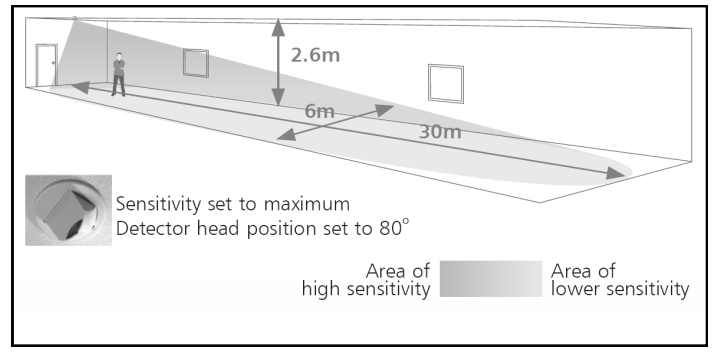
Switch Input Connector

Two input terminals can be used to manually override the lights on or off.

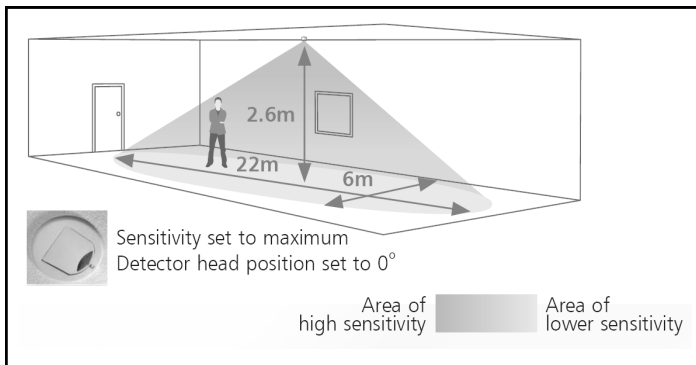
Detection diagrams



Ideal for large office or classroom



Ideal for corridor or aisle applications



Ideal for open plan areas and offices

Note. If the range is compromised by the ceiling construction / material. Add the supplied 20mm spacer ring. See page 4 for fitting details.

Sensor functionality

Detection Mode

The Detection Mode can be set to behave in Presence or Absence mode:

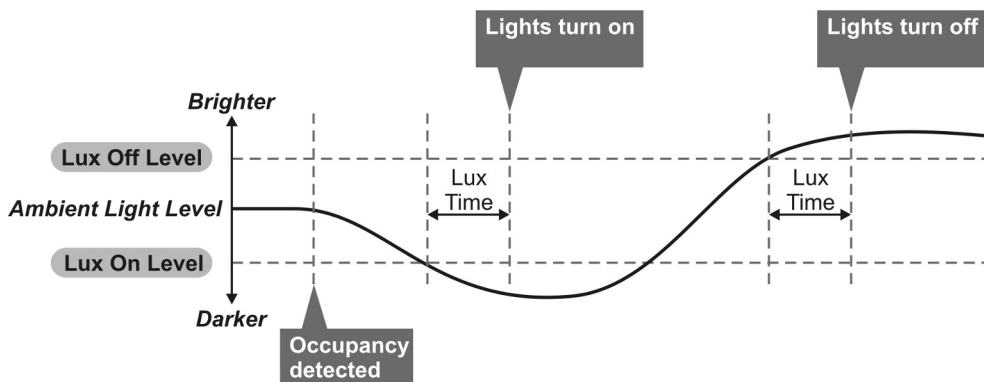
- **Presence** When movement is detected the load will automatically turn on. When the area is no longer occupied the load will automatically switch off after an adjustable time period.
- **Absence** The load is manually switched on. When the area is no longer occupied the load will automatically switch off after the adjustable time period has elapsed.

In either case, sensitivity to movement of the microwave sensor can be adjusted using the Sensitivity parameter.

HINT: To assist in setting the Sensitivity, turn on the Walk Test LED which will flash red when movement is detected.

Switch Level On/Off

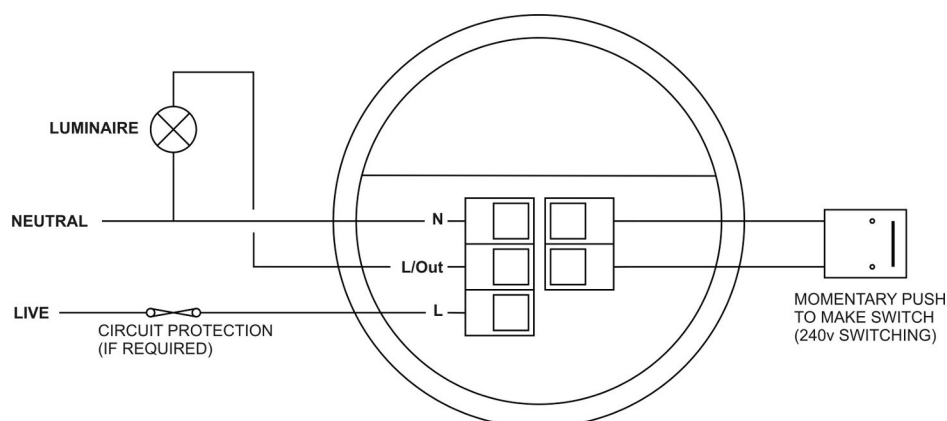
Occupancy detection can be made dependant on the ambient light level using the Lux On Level and Lux Off Level parameters.



Choosing a Suitable Location

The detector should be sited so that the occupants of the room fall inside the detection pattern shown opposite).

- Avoid positioning the unit where direct sunlight may enter the sensor element.
- Do not site the sensor within 1m of any lighting, forced air heating or ventilation.
- Do not fix the sensor to an unstable or vibrating surface.
- Avoid metallic objects directly in front of the sensor head.



Absence detection

- To use absence detection a retractive (momentary) switch must be connected between the 2 terminals on the diagram. Note that this will be switching mains voltage.
- The unit ships with presence detection as default. To change to absence detection, press and release the external switch 5 times within the first minute of power up. The LED will turn on solid for 30 seconds to indicate absence mode has been selected.
- To change back to presence detection, repeat the above procedure—the LED will flash for 30 seconds to indicate presence mode has been selected.

Note: the above adjustments can also be made using the UHS5 or UNLCDHS handsets. See Programming sections.

Power-up test procedure

When power is applied to the unit, the load will turn on immediately.

Set the timeout to 10 seconds, vacate the room or remain very still and wait for the load to switch off .

Check that the load switches on when movement is detected.

The unit is now ready for programming.

Installation

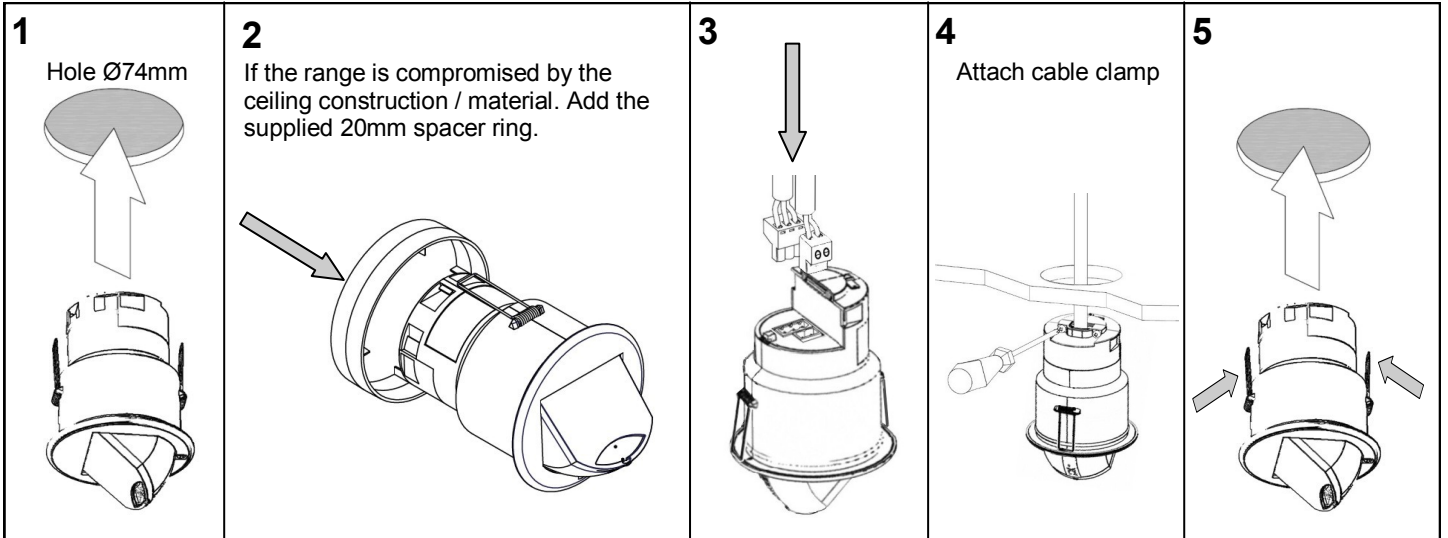
Designed to be mounted using either:

- Flush fixing, or
- Surface fixing, using the optional Surface Mounting Box (part no. 796-2081).

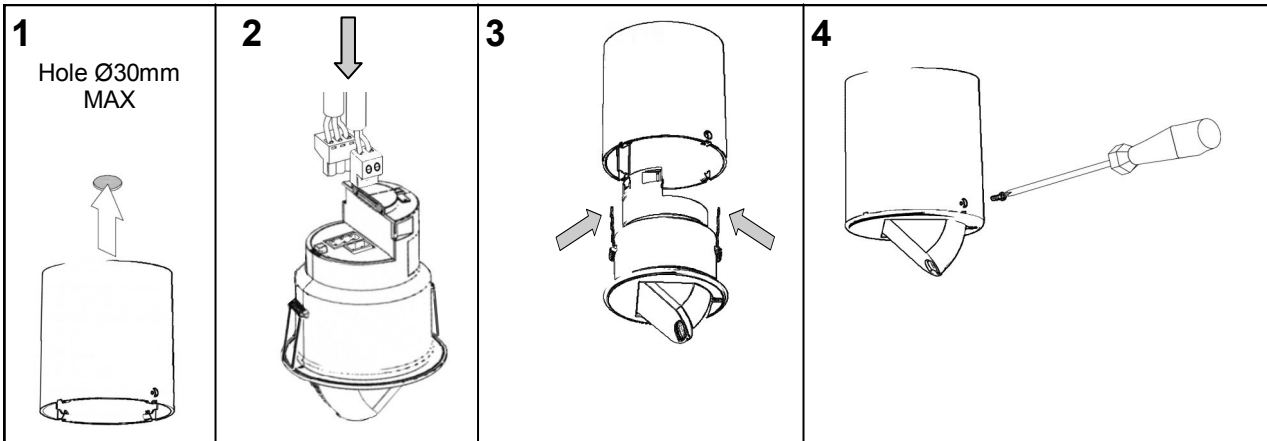
Both methods are illustrated below.

Warning - be careful bending springs when mounting unit.

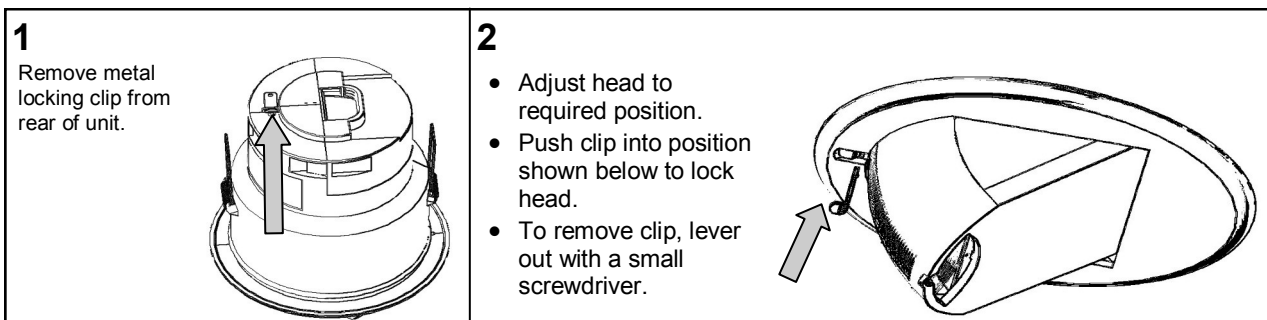
Flush fixing



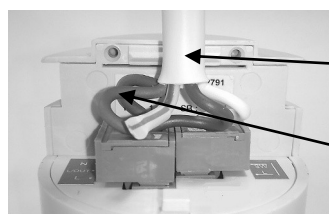
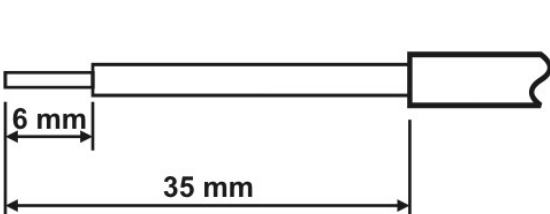
Surface fixing



Head locking



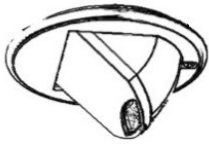
Wire stripping details



Important

Ensure that the cables are formed as shown before affixing the cable clamp. The clamp **MUST** clamp the outer sheath(s) only.

Bend cores as shown.



The functionality is controlled by a number of parameters which can be changed or programmed by any of the following devices:

- **796-2097** Infrared Handset. See below for programmable functions.

For most basic programming operations the 796-2097 handset can be used and the following procedures are based on using this device.

Point the handset at the Sensor and send the required programming commands to the unit as shown below.

Valid commands will be indicated by a red LED flash. See page 1 for details of other LED responses.

Note: other functions on the 796-2097 which are not shown below are not applicable to this product.



Parameter Name	Default Value	Number of Shift key presses				796-2097 Handset Graphics	Description
		0 SHIFT	1 SHIFT 1	2 SHIFT 2	3 SHIFT 1		
Button Activation							
On		On					Turn lights on.
Off		Off					Turn lights off.
Walk test	Off	On	Off				When set to On this causes a red LED to flash on the sensor when it detects movement. Use this feature to check for adequate sensitivity levels.
Time Out (Time adjustment)	20 mins	1, 10 & 20 minutes	5, 15 & 30 minutes	10 seconds			Once the detector is turned on, this value sets how long the lights will stay on once movement has ceased.
Lux on level (Switch level on)	9	2, 5 & 7	4, 6 & 9				Lux level setting to prevent the luminaires being switched on if the ambient light level is sufficient (adjustable between 1 and 9). The luminaires will always be switched on at level 9.
Lux off level (Switch level off)	9	2, 5 & 7	4, 6 & 9				Lux level setting to switch the luminaires off during occupancy if the ambient light level goes above the setting (adjustable between 1 and 9). Level 9 will always keep the lights on. This setting can be used for "window row switching". <i>Note: the Lux Off Level value must always be greater than the Lux On Level value.</i>
Sensitivity	9	1, 5 & 9	3, 6 & 8				Sensitivity level for detecting movement. 1 = low sensitivity 9 = high sensitivity
Defaults				D			Returns the unit to the default settings.
Presence / Absence	Presence	Presence	Absence				Presence mode allows the output to turn on when movement is detected and off when movement ceases. Absence mode allows the output to turn off when movement ceases, but must be manually turned on first.
Shift							Use this button to select the settings in red and blue signified by the 'Shift 1' and 'Shift 2' LEDs

Fault finding

What if the load does not turn ON?

- Check that the live supply to the circuit is good.
- Check that the load is functioning by bypassing the sensor (e.g. link terminals **L** and **L/ Out** on Channel1).
- If the detection range is smaller than expected, check the diagram on page 2. Adjusting the angle of the sensor head slightly may improve the detection range. If still reduced it may be compromised by the ceiling construction / material. Add the supplied 20mm spacer ring. See page 4 for fitting details.

HINT: *The Walk Test LED function can be used to check that the unit is detecting movement in the required area.*

What if the load does not turn OFF?

- Ensure that the area is left unoccupied for longer than the Time Out Period.
- Make sure that the sensor is not adjacent to vibrating surfaces or objects (e.g. ventilation equipment).
- The unit may pick up movement through glass, thin partitions or walls. Reduce the sensitivity.

Advanced programming

Parameter Name	Default Value	Range / Options	Description		
Detector Parameters					
Walk Test LED	Off	On or Off	When set to On this causes a red LED to flash on the sensor when it detects movement. Use this feature to check for adequate sensitivity levels.	✓	
Time Out (Time adjustment)	20 minutes	0-99 minutes	Once the detector is turned on, this value sets how long the lights will stay on once movement has ceased. Select 0 for 10 second delay – use for commissioning only.	✓	
Manual Time Out	10 minutes	0-99 minutes	When a manual operation occurs, either via the switch input or the infrared, it invokes the timeout period. Example 1: a detector in presence mode has a detector timeout of 15 minutes and a manual timeout of 3 minutes. When the user leaves the room they press the off button. The sensor will revert to automatic after 3 minutes, and then walking back in the room will turn the lights on. Example 2: using the settings above, the user turns the lights off (say for a presentation) but stays in the room. Every time a movement is detected, the manual timeout period is re-triggered, but when it doesn't pick up for the short timeout period, the sensor will timeout and revert to automatic. This means the lights may turn on inadvertently during the presentation, if the occupants are still for the manual timeout period, so adjust the timing carefully.	✗	
Sensitivity On	9	1 (min) to 9 (max)	Sensitivity level for detecting movement when the detector is already on. *UHS5 sets Sensitivity On and Off to the same value.	✓*	
Sensitivity Off	9	1 (min) to 9 (max)	Sensitivity level for detecting movement when the detector is off. *UHS5 sets Sensitivity On and Off to the same value.	✓*	
Lux time	0	0 (disabled) 1-99 minutes	If the detector measures the lux level and decides that the output needs switching on or off as a consequence, the lux time must elapse first. If at any time during the timed delay the lux change reverses then the process is cancelled. Lux Time enables absence detection to be implemented with a lux off level set. When the button is pressed, the lights will go on, regardless of ambient light level. However, if there is sufficient ambient light, they will turn off again after the Lux Time. <i>Note that whenever the an external switch is pressed, whether in absence or presence mode, if the lights were out because of the lux level, they will be immediately turned on again for at least the Lux Time.</i>	✗	
Power Up State	On	On or Off	Select No for a 30 second delay on start up. If Yes is selected, there will be no delay on start up and the detector will always power up detecting.	✗	
Disable Detector	N	Y or N	Disables detection, leaving the relay output permanently off with the dimming output operational. This mode is used when the unit is for maintained illuminance only.	✗	
Inhibit	4 seconds	1 to 99 seconds	When the detector turns off, a delay is instigated to prevent retriggering. In certain circumstances this delay may not be enough. This parameter allows the delay to be changed.	✗	
Factory default	-	-	Restores factory default settings	✓	

Switching functions					
Detection Mode	Presence	Presence or Absence	Presence mode allows the output to turn on when movement is detected and off when movement ceases. Absence mode allows the output to turn off when movement ceases, but must be manually turned on first.	✓	
Lux on level (Switch level on)	9	1 to 9 For a higher resolution a scale of 101-199 is available	Sets a minimum light level below which the microwave sensor is enabled, allowing lights to be turned on by movement. <i>Note: the Lux Level Off value must always be greater than the Lux Level On value.</i>	✓	
Lux off level (Switch level off)	9	1 to 9 For a higher resolution a scale of 101-199 is available	Sets a maximum light level above which the microwave sensor is disabled, preventing lights from being turned on by movement.	✓	

User Modes					
Override On	-	-	If the lights are off, sending the IR command will turn them on immediately and revert to automatic operation using the manual timeout period .	✓	
Override Off	-	-	If the lights are on, sending the IR command will turn them off immediately. After the manual timeout period (described above), the sensor will revert to automatic.	✓	
Cancel	-	-	Cancels the on or off override, returning the detector to normal operation.	✗	

Switch Input Modes					
1 position switch together	Default	-	Short press on, long press off.	✗	
2 position switch together	-	-	Short press on, short press off.	✗	

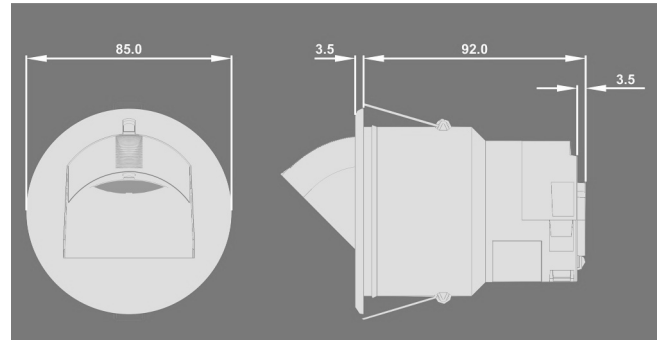
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Technical data

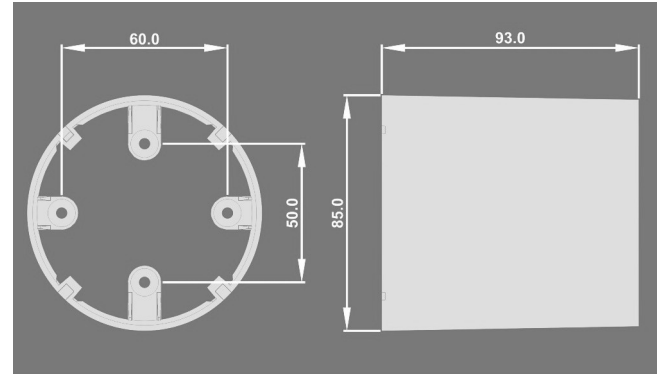
Dimensions	See diagrams opposite
Weight	0.15kg
Supply Voltage	230VAC +/- 10%
Frequency	50Hz
Maximum Load	10A of lighting and/or ventilation including incandescent, fluorescent, compact fluorescent, low voltage (by switching the primary of transformer).
Power consumption	On 1500mW, Off 910mW
Terminal Capacity	2.5mm ²
Temperature	-10°C to 50°C
Humidity	5 to 95% non-condensing
Material (casing)	Flame retardant ABS and PC/ABS
Classifications	Insulation Class II
	Purpose Sensing control
	Construction Independently mounted control for flush mounting.
	Type of action Type 1.B action (micro disconnection).
	Pollution Degree 2
	Software Class A
	Rated impulse voltage, 4000V
Safety	The microwave radiation emitted by these units is extremely low power and complies with ANSI standard "IEEEC95.1-1999 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields 3kHz 300GHz."
IP rating	IP40
Compliance	EMC-2004/108/EC LVD-2006/95/EC



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Microwave frequency compatibility

The allowable frequency of operation of this product is different depending on region. Please select the correct order code using the table below.

Suffix	Region	Frequency
blank	UK, China, India, Middle East, Malaysia, Hong Kong, Singapore	10.587GHz
-R2	Australia and all of Europe <u>except</u> : UK, France, Portugal, Germany, Switzerland, Austria, Slovak Republic, Republic of Ireland	10.525GHz
-R3	France, Portugal, Switzerland	9.900GHz
-R4	Germany, Austria, Slovak Republic	9.350GHz
-R5	Republic of Ireland	10.41GHz

Part numbers

	Part number	Description
Detector	796-2053	Ceiling microwave presence detector
Accessories	796-2081	Surface mounting box
	796-2097	Programming IR handset

IMPORTANT NOTICE!

This device should be installed by a qualified electrician in accordance with the latest edition of the IEE Wiring Regulations and any applicable Building Regulations.

