H-MOSS® Occupancy and Vacancy Sensors







Adaptive Technology • Dual Technology Ultrasonic • Passive Infrared



Technology for Today's Needs



Dual Technology



Dual technology occupancy sensors use both passive infrared and ultrasonic technologies for maximum reliability. These sensors also minimize the risk of false triggering (lights coming on when the space is unoccupied). Both ultrasonic (US) and passive infrared (PIR) technologies must detect occupancy to turn lighting on, while continued detection by only one technology will keep lighting on. The dual technology sensors are the best performing sensor for most applications.

H-MOSS[®] Occupancy Sensors feature the latest in technological advances.

Adaptive Technology

Adaptive Technology is a Hubbell breakthrough that delivers benefits to the building owner and occupants. The building owner gets reduced energy costs, fewer adjustments and less maintenance. The building occupant experiences fewer false-offs, disturbances and lower energy costs.

Adaptive technology sensors use microprocessor-based technology which makes all the decisions for setting adjustments. Internal software constantly monitors the controlled area and automatically adjusts the sensitivity and timer based on environmental history. This means that instead of manually adjusting the sensor for seasonal changes, modified airflow, and furniture layout or occupancy pattern changes, the sensor will automatically adjust itself. These automatic adjustments will eliminate the need for multiple adjustments by maintenance, personnel or outside contractors.

Hubbell offers adaptive technology throughout its product offering (wall switches, ceiling and wall mount sensors) in conjunction with dual technology (ultrasonic and passive infrared), ultrasonic, and passive infrared products.

Ultrasonic (US)



Ultrasonic technology senses occupancy by bouncing ultrasonic sound waves (32kHz - 45kHz) off objects in a space and detecting a frequency shift between the emitted and reflected sound waves. Movement by a person or object within the space causes a shift in frequency, which is interpreted as occupancy. Ultrasonic occupancy sensors are good at detecting minor motion (e.g. typing, reading) and do not require an unobstructed line-of-sight, thus making them suitable for applications such as an office with cubicles or a restroom with stalls.

Passive Infrared (PIR)



Passive Infrared (PIR) technology senses occupancy by detecting the difference between heat emitted from the human body and the background space. PIR sensors require an unobstructed line-of-sight for detection. These sensors utilize a segmented lens, which divides the coverage area into zones. Movement between these zones is interpreted as occupancy. PIR sensors are good at detecting major motion (e.g. walking) and work best in small, enclosed spaces with high levels of occupant movement.

Energy Savings with Occupancy Sensors

GREENWISE

Typical Applications



Applications are generalized. Consult your Hubbell representative for the type of technology and products that fit your needs.

Occupancy Sensors = Energy Savings

For many years, occupancy sensors have been highlighted as a way to reduce energy consumption. The California Department of Energy has stated that lighting accounts for 35-45% of an office buildings energy use.

As seen in the chart, occupancy sensors can potentially reduce lighting use by 13-90%. In a large office building, for example, occupancy sensors can be an excellent way of reducing energy costs for both building operators and tenants.

Return on Investment (ROI)

Occupancy sensors can save a building operator or tenant money, but what is the return on investment (ROI) for a capital expenditure of this nature? Hubbell has developed a tool, the H-MOSS® ROI Worksheet, that can be accessed from the Hubbell website, www.hubbell-wiring.com, or from a Hubbell representative. This simple-to-use worksheet helps calculate present annual energy costs without sensors and estimated annual costs with sensors. The savings and short payback time can be surprising.

As energy costs continue to climb, standards and codes become

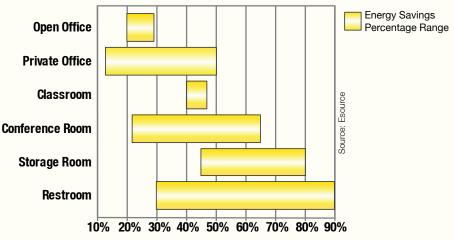
more stringent, and the "greening" of commercial and residential buildings increases across the country, you should look toward Hubbell Occupancy Sensors to help decrease your energy costs.

Layout Capabilities and Technical Support

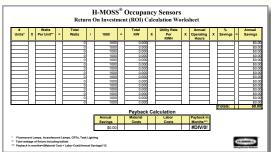
Hubbell representatives are available to meet and discuss any project, large or small. We can provide an occupancy sensors layout based on blueprints, either in electronic or paper form and a bill of material (BOM). All questions can be addressed by our technical service group that is always available.

| Location | Passive Infrared (PIR) | Ultrasonic | Dual Technology | Sensor Style |
|-------------------------|--|--|--------------------|--------------|
| Bedroom | ✓ | | | 00 |
| Cafeteria | Image: A set of the set of the | \checkmark | | 00 |
| Closet | Image: A set of the set of the | 1 | | 0 |
| Conference Room | | 1 | 1 | 000 |
| Classroom | | 1 | 1 | 0 |
| Lecture Hall | | | 1 | 0 |
| Library | | 1 | | 0 |
| Hallway | | Image: A second s | | 0 |
| Rest Room (multi-stall) | | 1 | 1 | 00 |
| Private Office | Image: A set of the set of the | 1 | 1 | 00 |
| Storage | Image: A second s | 1 | | 000 |
| Lobby | Image: A set of the set of the | | 1 | 000 |
| Warehouse | Image: A second s | | | 6 |

Potential Energy Savings Using Occupancy Sensors



H-MOSS[®] ROI Worksheet





Reduce Energy Consumption and Meet Federal and State Standards and Guidelines

Reduction of energy consumption at all levels: local, state and national is critical. Today's buildings, both commercial and residential new and renovated - must follow new state and federal standards and codes which call for energy efficiency throughout a facility.

LEED

LEED (Leadership in Energy and Environmental Design) which is sponsored by the U.S. Green Building Council (USBC) has created a rating system to define what constitutes a green building by establishing common standards of measurement, and promoting integrated and whole building design. This certification applies to both new and renovated commercial buildings. Points are awarded by category and there are four levels of certification- certified, silver, gold and platinum.





H-MOSS, **H**ubbell **M**otion **S**ensor **S**witches offer a large array of occupancy sensors, which can be utilized to help increase energy efficiency in the following categories:

LEED Credit Categories

Sustainable Sites- SS Light pollution reduction

Energy and Atmosphere- EA Optimize energy performance

Indoor Environment Quality- EQ Controllability of systems, lighting

Innovation & Design Process- ID Innovation in design



ASHRAE/IESNA 90.1 Standard

Among the requirements in this standard is that a building of 5,000 sq. ft. or more, except for lighting operated 24 hours per day, must incorporate automatic control devices to turn off all lighting.

IECC 2003 Lighting Control Provision

The International Energy Conservations Code (IECC) which has been adopted by some states, affects new construction, additions and alterations for all commercial buildings, including residential structures with four or more stories above grade. It requires an automatic shutoff of all lighting for buildings larger than 5,000 sq. ft. with occupancy sensors as one way to achieve this goal.

California Energy Commission (CEC) Title 24 Program

California's Title 24 Program sets up some of the most stringent standards and regulations in the country to reduce energy consumption in both commercial and residential structures.

Some of the key provisions are:

Multi-level lighting control

Any enclosed space 100 sq. ft. or larger which has a connected lighting load that exceeds 0.8 watts per sq. ft. and has more than one light source (luminaire) shall be controlled so that the load for lights may be reduced by a minimum of 50%.

Area controls

Each area enclosed by ceiling height partitions must have an independent switching or control device- occupancy sensor or manual switch.

Automatic shut-off controls

For every floor, all indoor lighting must have a separate automatic control, capable of automatically shutting off the lighting.

Residential buildings

In 2005, Title 24 simplified and expanded the standard to include use of high efficacy luminaires, manual-on occupancy sensors, fluorescent lights or dimmers in most rooms of the home such as bedrooms, bathroom, garage, living room, hallway, and utility room.

Hubbell offers many models of occupancy, vacancy and dimmers (all CEC Title 24 compliant) that will enable builders, contractors and homeowners to meet these new requirements.





H-MOSS[®] Wall Switches Featuring Adaptive Technology

All H-MOSS Wall Switches with Adaptive Technology featured below have the following standard features:

- Adaptive technology "Install and forget" operation
- All digital sensing technology
- Dual 120/277V AC operation
- Auto or manual "On" operating modes
- No minimum load requirements
- Hard lens (dual technology, passive infrared)

Adaptive Technology, Dual (Ultrasonic and Passive Infrared)

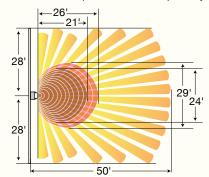
50/60Hz, 1000 sq. ft. coverage with photocell, 800W Incandescent,

1000W Fluorescent at 120V AC, 1800W Fluorescent at 277V AC

| Circuit | Button | Color | Catalog Numbers | |
|---------|-----------------------------------|----------------|------------------------|--|
| Single | 1 Button for manual/auto control | lvory White | AD1277l1 AD1277W1 | |
| Single | Auto control with no button | Ivory White | AD1277I1N AD1277W1N | |
| Dual | 2 Buttons for manual/auto control | Ivory White | AD1277I2 AD1277W2 | |
| Dual | Auto control with no button | lvory White | AD1277I2N AD1277W2N | |

Sensors are available in three special order colors. To order special order colors, replace "I or W" with the following: LA (Light Almond), GY (Gray) or BK (Black). Special order colors have minimum ordering requirements and minimum lead times. Please call Customer Service for further information. Wallplates are sold separately.

- Ultrasonic Major Motion
- Ultrasonic Minor Motion
- Passive Infrared



Adaptive Technology, Ultrasonic

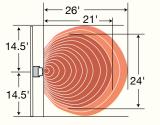
50/60Hz, 400 sq. ft. coverage with photocell,

800W Incandescent, 1000W Fluorescent at 120V AC, 1800W Fluorescent at 277V AC

| Circuit | Button | Color | Catalog Numbers |
|---------|-----------------------------------|----------------|------------------------|
| Single | 1 Button for manual/auto control | Ivory White | AU1277I1 AU1277W1 |
| Single | Auto control with no button | Ivory White | AU1277I1N AU1277W1N |
| Dual | 2 Buttons for manual/auto control | Ivory White | AU1277I2 AU1277W2 |
| Dual | Auto control with no button | Ivory White | AU1277I2N AU1277W2N |

Sensors are available in three special order colors. To order special order colors, replace "I or W" with the following: LA (Light Almond), GY (Gray) or BK (Black). Special order colors have minimum ordering requirements and minimum lead times. Please call Customer Service for further information. Wallplates are sold separately.

Ultrasonic Major MotionUltrasonic Minor Motion



- Zero arc point switching
- Built in photocell with manual super saver mode for daylight harvesting
- Two relays for two level switching or dual load control (AD, AP AU1277x2, 2N series)
- C-ULUS







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AD1277W1N AD1277W2N







AU1277W1



AU1277W1N AU1277W2N



AU1277W2

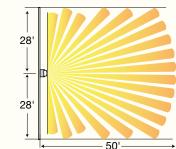
H-MOSS[®] Wall Switches and Wall Mount Sensors **Featuring Adaptive Technology**

Adaptive Technology, Passive Infrared

50/60Hz, 1000 sq. ft. coverage with photocell, 800W Incandescent, 1000W Fluorescent at 120V AC, 1800W Fluorescent at 277V AC

| Circuit | Button | Color | Catalog Numbers |
|---------|-----------------------------------|----------------|------------------------|
| Single | 1 Button for manual/auto control | Ivory White | AP1277l1 AP1277W1 |
| Single | Auto control with no button | lvory White | AP1277I1N AP1277W1N |
| Dual | 2 Buttons for manual/auto control | lvory White | AP1277I2 AP1277W2 |
| Dual | Auto control with no button | lvory White | AP1277I2N AP1277W2N |

Sensors are available in three special order colors. To order special order colors, replace "I or W" with the following: LA (Light Almond), GY (Gray) or BK (Black). Special order colors have minimum ordering requirements and minimum lead times. Please call Customer Service for further information. Wallplates are sold separately.



Adaptive Technology Wall Mount Sensors

- Adaptive Technology "Install and forget" operation
- Swivel mounting bracket included for wall or ceiling mounting
- All digital sensing technology
- Photocell for daylight harvesting and relay interface with auxiliary systems such as HVAC (WRP and HBRP models)
- 24V DC, 33MA
- Dual (Ultrasonic and Passive Infrared)

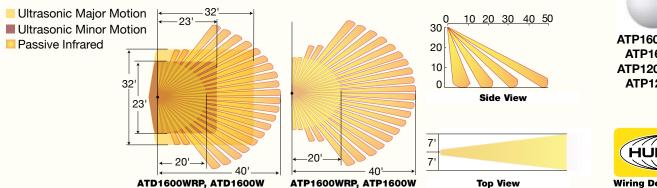
| Description | Coverage | Color | Catalog Numbers |
|--|--------------|-------|-----------------|
| 32kHz, with photocell and isolated relay | 1600 sq. ft. | White | ATD1600WRP |
| 32kHz | 1600 sq. ft. | White | ATD1600W |

Passive Infrared

Passive Infrared

| Description | Coverage | Color | Catalog Numbers |
|--|----------------|-------|-----------------|
| With photocell and isolated relay | 1600 sq. ft. | White | ATP1600WRP |
| | 1600 sq. ft. | White | ATP1600W |
| For aisle and high bay applications, with photocell and isolated relay | 120 linear ft. | White | ATP120HBRP |
| For aisle and high bay applications | 120 linear ft. | White | ATP120HB |

Note: All wall mount sensors must use a CU series control unit. See page 11 for details.





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AP1277W1N AP1277W2N



AP1277W2



ATD1600WRP ATD1600W



ATP1600WRP ATP1600W ATP120HBRP ATP120HB



Wiring Device-Kellems

H-MOSS[®] Wall Switches **Passive Infrared Sensors**

Adaptive Technology, Passive Infrared

1800W Incandescent

· Adaptive technology - "Install and forget" operation

120V AC

- Passive infrared technology
- Dual 120/277V AC operation
- Heavy duty relay (AT1277)

Description

One Button

- Audible alarm before sensor turns lights off (AT1277)
- 1200 sq. ft. coverage
- Built in photocell for daylight harvesting •

AT1277I

AT1277W

Catalog Numbers

Nylon wallplate included Color

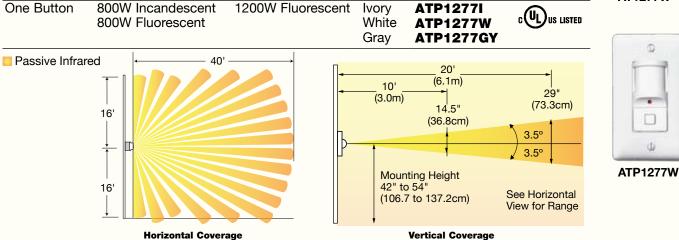
lvory

White



AT1277W

(UL



277V AC

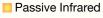
4155W Fluorescent

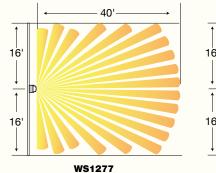
Horizontal Coverage

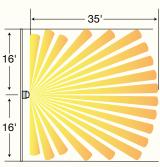
- **Passive Infrared Wall Switches**
- Passive infrared technology
- Manual adjustment time delay (WS1277 - 20 sec. to 30 min.) (WS120/WS277 - 30 sec. to 30 min.)
- Photocell (WS1277I, WS1277W)
- Dual level switching from one or two circuits • (WS1277W2)
- Nylon wallplate included (except WS1277W2)

| | | | , | | | , |
|---------------------------------------|-----------------|--|----------------------|----------------|--------------------|---------------|
| Description | Coverage | 120V AC | 277V AC | Color | Catalog Nur | nbers |
| One button 120/277V AC | 1200 sq. ft. | 800W | 1200W | lvory White | WS1277I WS1277W | CUL US LISTED |
| One button, 120V AC | 900 sq. ft. | 800W Incandescent 1000W Fluorescent | N/A | lvory White | WS120I WS120W | (J), (J) |
| One button, 277V AC | 900 sq. ft. | N/A | 1800W Fluorescent | lvory White | WS277I WS277W | له، ل |
| Double pole switch, 120/277V AC | 1000 sq. ft. | 600W Incandescent* 1000W Fluorescent* | 1800W Fluorescent | White | WS1277W2 | (U) :(U) |

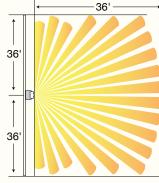
Two-gang adapter wallplate for WS1277W2 to mount to a two-gang box WSAP *per circuit







WS120, WS277



WS1277W2





WS1277W



WS120W



WS1277W2

H-MOSS[®] Wall Switches **Residential and Vacancy Sensors**

500W

500W

800W

1000W

Fluorescent

Incandescent

Incandescent

Residential Occupancy Sensors - Passive Infrared

- Passive infrared technology
- Photocell equipped for daylight harvesting
- Auto-on, auto-off

Single pole

switch with

150° view

Single pole

switch with

dimmina.

150° view

180° view

switch,

Heavy duty

button,

Delayed off adjustment from 30 seconds to 30 minutes

Description Coverage 120V AC

800 sq. ft.

800 sq. ft.

900 sq. ft.

· Patent pending "alert to off" feature dims lights prior to going off (RMS101&121)

Light Almond RMS101LA

Light Almond RMS121LA

Catalog Numbers

Standard

RMS101I

RMS121I

RMS141I

RMS141W

RMS141AL

RMS121W

RMS121AL

RMS101W

RMS101AL

c(U

Nightlight

RMS101ILI

RMS101ILW

RMS101ILAL

RMS101ILLA

RMS121ILI

RMS121ILW

RMS121ILAL

RMS121ILLA

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US LISTED

- Wallplate included
- C-ULUS

Color

Ivory

Ivory

White

lvory

White

Almond

Almond

White

Almond

277V AC

N/A

N/A

1800W



GREENWISE

RMS101W



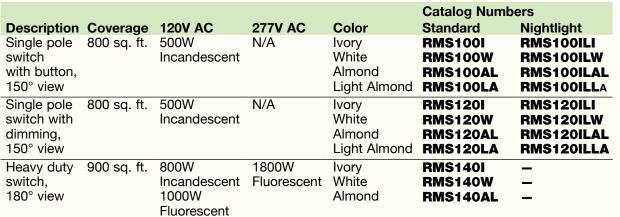
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RMS121ILW

Vacancy Sensors - Passive Infrared - CA Title 24 Compliant

Incandescent Fluorescent

- Passive infrared technology
- Manual-on, auto-off •
- Patent pending "alert to off" feature dims • lights prior to going off (RMS100 & 120)
- · Delayed off, adjustment from 30 seconds
- to 30 minutes
- Wallplate included C-UL US





RMS120ILW

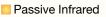


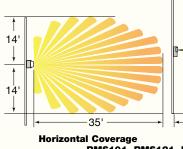
RMS140W

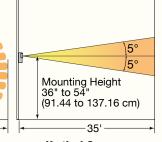


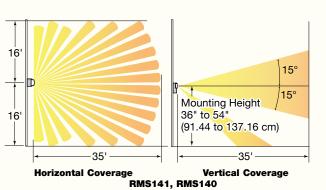
Wiring Device-Kellems

| lights phor | to going on | | • 0- | -02 03 | | |
|---|-------------|----------------------|---------|--|--|--|
| escription | Coverage | 120V AC | 277V AC | Color | Catalog Numb Standard | ers Nightlight |
| ingle pole witch ith button, 50° view | 800 sq. ft. | 500W Incandescent | N/A | Ivory White Almond Light Almond | RMS100I RMS100W RMS100AL RMS100LA | RMS100ILI RMS100ILW RMS100ILAI RMS100ILLA |
| ingle pole witch with imming, 50° view | 800 sq. ft. | 500W Incandescent | N/A | lvory White Almond Light Almond | | RMS120ILI RMS120ILW RMS120ILAI RMS120ILLA |
| A MARKA | 000 co ft | 800\// | 1 200\/ | lyony | DMC1/01 | |











RMS141W 0

0

RMS100W

All H-MOSS ceiling sensors with Adaptive Technology contain the following standard features:

- Adaptive Technology- "Install and forget"
- All digital sensing technology
- Photocell for daylight harvesting and relay to

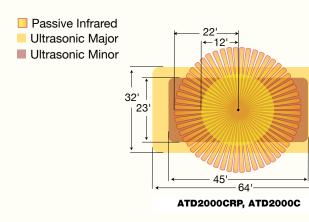
 interface with auxiliary systems such as HVAC
 (CRP models)
 •
- Non-volatile memory- learned and adjusted settings retained after power outage
 - 24V DC, 33mA
 - 32kHz (ATD/ATU500C & CRP 400kHz)
 - Mounting base included with sensor

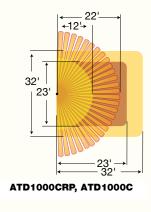
Adaptive Technology, Dual (Ultrasonic and Passive Infrared)

Combines the excellent minor motion detection of ultrasonic with the outstanding passive infrared (PIR) long-range major motion detection

| Coverage | Color | Catalog Numbers |
|--|-------|-----------------|
| 2000 sq. ft. with photocell and isolated relay | White | ATD2000CRP |
| 2000 sq. ft. | White | ATD2000C |
| 1000 sq. ft. with photocell and isolated relay | White | ATD1000CRP |
| 1000 sq. ft. | White | ATD1000C |
| 500 sq. ft. with photocell and isolated relay | White | ATD500CRP |
| 500 sq. ft. | White | ATD500C |

Note: All ATD ceiling sensors must use a CU series control unit. See page 11 for details.





ATU2000CRP ATU2000C

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ATU1000CRP

ATU1000C

ATU500CRP ATU500C

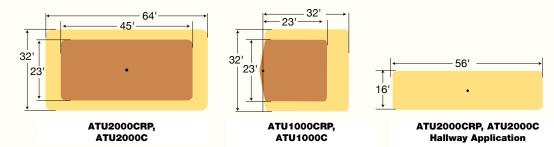
Adaptive Technology, Ultrasonic

Excellent minor motion detection

| Coverage | Color | Catalog Numbers |
|--|-------|-----------------|
| 2000 sq. ft. with photocell and isolated relay | White | ATU2000CRP |
| 2000 sq. ft. | White | ATU2000C |
| 1000 sq. ft. with photocell and isolated relay | White | ATU1000CRP |
| 1000 sq. ft. | White | ATU1000C |
| 500 sq. ft. with photocell and isolated relay | White | ATU500CRP |
| 500 sq. ft. | White | ATU500C |
| | | |

Note: All ATU ceiling sensors must use a CU series control unit. See page 11 for details.

- Ultrasonic Major
- Ultrasonic Minor



ATD2000CRP ATD2000C

111 111



ATD1000CRP ATD1000C ATD500CRP ATD500C

ATD500C

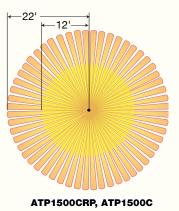
Adaptive Technology, Passive Infrared

Outstanding long range major motion detection

| Description | Coverage | Color | Catalog Numbers |
|-------------------|--|-------|-----------------|
| Wide view lens | 1500 sq. ft. with photocell and isolated relay | White | ATP1500CRP |
| Wide view lens | 1500 sq. ft. | White | ATP1500C |
| High density lens | 450 sq. ft. with photocell and isolated relay | White | ATP600CRP |
| High density lens | 450 sq. ft. | White | ATP600C |

Note: All ATP ceiling sensors must use a CU Series control unit. See below for details.

Passive Infrared



Control Units

Hubbell CU series control units provide a 24V DC power supply for 1 to 3 sensors or sensor/ Add-A-Relay combinations. The CU300A provides a 24V DC power supply for 1 to 4 sensors or sensor/Add-A-Relay combinations. The control units contain an internal relay for the control of an external lighting load. All control units are plenum rated.

| Description | Catalog Numbers |
|--|-----------------|
| 120/277V AC, 50/60 Hz for use with ATD, ATU and ATP series | CU300A |
| ceiling sensors and wall mount sensors | |
| 347V AC, 60 Hz, for use with ATD, ATU and ATP series ceiling and | CU347A |
| wall mount sensors | |



CU347A, CU300A



Add-A-Relay

Hubbell AAR Add-A-Relay contains an internal relay for control of an external lighting load. The AAR requires a 24V DC power supply from the Hubbell CU series control unit. The AAR is typically used when: 1. It is desired to switch more than one circuit when occupancy is sensed. 2. The lighting load exceeds the maximum rating of the control unit.

Description

switch feature

Catalog Number For use with CU series control units and Hubbell ATD, ATU and ATP AAR series ceiling and wall mount sensors

Digital Timer Wall Switch

| Description | 120V AC | 277V AC | Color | Catalog Number |
|---|---------|---------|-------|-------------------|
| Dip switch enabled preset intervals - 5,15 or 30 minutes - 1, 3, 6, 9 or 12 hours | 800W | 1200W | White | DT1277W |
| Includes an on/off momentary push button | | | | |



AAR





All Hubbell H-MOSS[®] Occupancy Sensors are covered by a 5 year limited warranty.



ATP1500CRP

ATP1500C

ATP600CRP ATP600C

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Adaptive Technology • Dual Technology Ultrasonic • Passive Infrared





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H5240



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