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NREL Highlights RESEARCH & DEVELOPMENT

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IOWA UTILITIES BOARD

# NREL Documents Efficiency of Mini-Split Heat Pumps

A new report delivers MSHP performance data for use in whole-building simulation tools.

Mini-split heat pumps (MSHPs) are highly efficient refrigerant-based air conditioning and heating systems that permit room-by-room conditioning and control in homes. Because of their size, efficiency, and price, MSHPs are very popular overseas and are gaining market share in energy-efficient home upgrades in the United States. They are a good option for retrofitting older homes that lack ductwork. To evaluate MSHP cost effectiveness and performance in U.S. homes, National Renewable Energy Laboratory (NREL) researchers are studying these systems in the laboratory, simulated buildings, and field test settings. A new NREL report describes an innovative laboratory approach to testing MSHPs and includes experimental performance maps for use in whole-building simulation tools.

Most public information on MSHP performance is provided by equipment manufacturers, and is typically limited to performance at a single operating speed for heating and cooling. Mini-split heat pumps use variable speed components that spin up and down to continuously meet the heating or cooling need, significantly improving a system's operating efficiency. Measuring that efficiency in a laboratory is challenging and required new approaches to performance testing. NREL researchers worked with colleagues at Purdue University's Herrick Labs and Ecotope, Inc. to refine and apply this new approach to a suite of MSHP products.

Researchers measured the performance of two MSHPs across a variety of operating conditions, which allowed, for the first time, development of accurate building simulation MSHP models. In the laboratory tests, researchers found that both MSHPs achieved manufacturer-reported performance at rating conditions. However, at other temperature and humidity conditions, the heat pumps' capacity ranged from 40% above to 54% below the manufacturer-reported values. Knowing how performance varies is critical in order to reasonably estimate annual energy consumption of a MSHP, and to compare MSHPs to other heating and cooling options. Mini-split heat pump efficiency (COP) was seen to significantly exceed rated efficiency at low compressor speeds—a very important effect.

**Technical Contact:** Jon Winkler, *jon.winkler@nrel.gov*

**Reference:** Winkler, J. (2011). *Laboratory Test Report for Fujitsu 12RLS and Mitsubishi FE12NA Mini-Split Heat Pumps.* NREL Report No. TP-5500-52175; DOE/GO-102011-3380. *http://www.nrel.gov/docs/fy11osti/52175.pdf.*

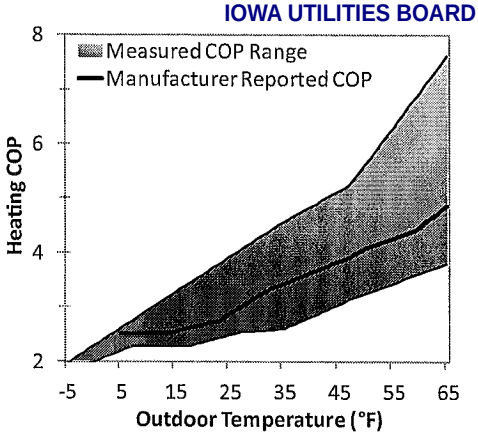


*Chart of MSHP heating efficiency (COP) at various outdoor temperatures. The wide colored band represents efficiency variation due to different heating loads. The manufacturer's reported efficiency is indicated by the thick blue line.*

## Key Research Results

### Achievement

Two MSHPs were tested in a laboratory so that performance across a range of temperature, humidity, and equipment speed could be evaluated.

### Key Result

Measured performance results are now available to enable simulation of MSHPs for any building and climate. Some conclusions comparing the tested units to high-SEER (Seasonal Energy Efficiency Ratio) staged systems are also provided.

### Potential Impact

Annual energy savings and better indoor comfort can be improved through accurate modeling of HVAC system effectiveness. Emerging technologies can be evaluated against the current "best practices" to maximize the impact of innovations.

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**NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.**

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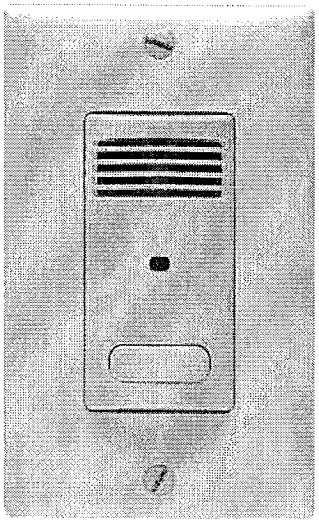
Building Automation, Inc.

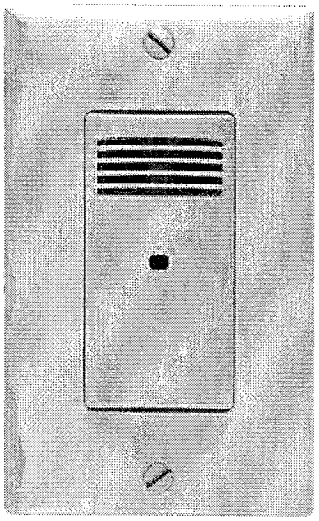
Office Bathroom Occupancy Sensors

# Wall Switch Occupancy Sensors

*LightHawk™ Ultrasonic*
*Wall Switch Sensor featuring IntelliDAPT®*



*LHUSS1*



*LHUSS0*

## KEY FEATURES

- All-digital ultrasonic (US) sensor
- IntelliDAPT self-adaptive technology—no manual adjustment required
- 2 relays for two-level switching or dual-circuit control
- Auto-on and manual-on operating modes (depending on model)
- 400 square-foot, 180° coverage area
- Built-in photocell with SuperSaver™ mode
- Dual 120/277 VAC operation
- No minimum load requirement
- Zero Arc Point Switching
- ETL, UL, and cUL listed
- Five-year warranty

## OVERVIEW

LHUSS sensors use ultrasonic (US) technology for unequaled occupancy detection and false trip immunity. These sensors feature Hubbell Building Automation's patented IntelliDAPT technology, which makes all the sensor adjustment decisions automatically. Throughout the product's lifespan, smart software analyzes the controlled area and makes digital adjustments to sensitivity and timer settings. Occupancy sensors with IntelliDAPT provide a maintenance-free install-and-forget operation. With selectable operating modes—automatic ON/OFF or manual ON/automatic OFF—and a built-in photosensor for automatic daylight harvesting, the LHUSS sensors are the most capable choice in today's market place.

## FEATURES and BENEFITS

| Features | Benefits |
|---|---|
| IntelliDAPT technology | • Sensor automatically determines optimum setting<br>• No manual sensitivity or timer adjustments required<br>• Provides a maintenance-free install-and-forget operation |
| All-digital ultrasonic (US) sensor | • Superior US minor-motion detection |
| Auto-on and manual-on operating modes (depending on model) | • Provides auto-on/auto-off and manual-on/auto-off operations |
| Tamper-proof automatic-only version available | • Automatically turns lighting on and off without requiring the user to push a button |
| Built-in photocell with optional SuperSaver mode | • Increases energy savings by preventing the lights from turning on when there is sufficient natural light<br>• Optional SuperSaver mode—turns lights off during periods of occupancy if there is enough natural light to illuminate the area |

**Hubbell Building Automation, Inc.** | 9601 Dessau Road | Building One | Austin, Texas 78754 | {512} 450-1100 | {512} 450-1215 fax
**hubbell-automation.com**
9.2011

## SPECIFICATIONS

| | |
|---|---|
| IntelliDAPT technology | • Self-adjusting timer<br>• Self-adjusting ultrasonic (US) sensitivity<br>• Automatic false-on/false-off corrections<br>• No manual adjustments required |
| Timer timeout | • Auto mode: 4–30 minutes; self-adjusts based on occupancy<br>• Fixed mode: 4, 8, 15, and 30 minutes<br>• Test mode: 5 seconds |
| Ultrasonic (US) output | • 40kHz output |
| Photocell | • Natural-light override range: 10–500 foot-candles |
| Coverage | • 400 square-foot, 180° coverage area |
| Power requirements | • 120/277VAC; 50/60Hz |
| Electrical ratings | • 120VAC: 800W Incandescent; 1,000W Fluorescent; 1/6 HP<br>• 277VAC: 1,800W Fluorescent; 1/6 HP |
| Load requirements | • No minimum load |
| Operating environment | • Indoor use only<br>• Operating temperature: 32°–104°F (0°–40°C)<br>• Relative humidity (non-condensing): 0–95% |
| Construction | • Casing—high-impact injection-molded plastic (UL-94-5V)<br>• Color-coded leads are 6" long |
| Size and weight | • Size: 4.2" x 1.8" x 2.1"; .37" extension<br>• Weight: 2.9 oz |
| Color | • White; Ivory; Light Almond; Gray; Black |
| Mounting | • Single-gang NEMA-style switch box (average switch box)<br>• (Decorator-style wall plate not included) |
| Certifications | • ETL, UL, and cUL listed |
| Warranty | • Five years |

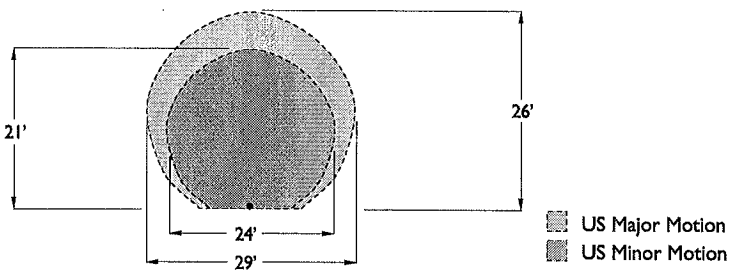
## ORDERING INFORMATION

| Catalog Number | Description |
|---|---|
| LHUSS1* | Ultrasonic Wall Switch Sensor with IntelliDAPT and Automatic/Manual Control, 120/277VAC |
| LHUSS0* | Ultrasonic Wall Switch Sensor with IntelliDAPT and Automatic Only Control, 120/277VAC |

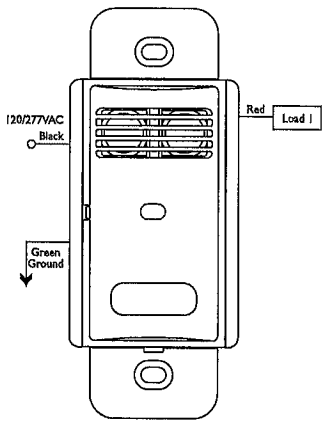
* = W – White, I – Ivory, A – Light Almond, G – Gray, B – Black

## RANGE DIAGRAM

*Refer to Application Guide.




## WIRING DIAGRAM




Single Circuit

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# OMNI™ Low Voltage Dual Technology Ultrasonic and PIR

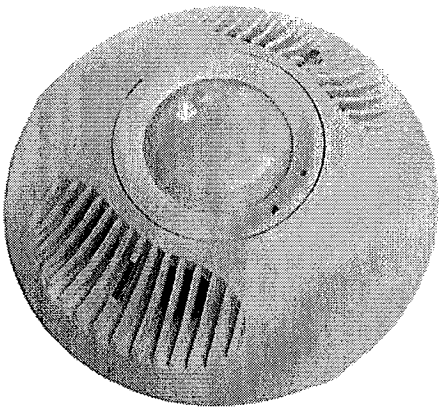
## CEILING MOUNT OCCUPANCY SENSORS

Community Room Occupancy Sensor

PROJECT INFORMATION

Project Name

Catalog No. Date



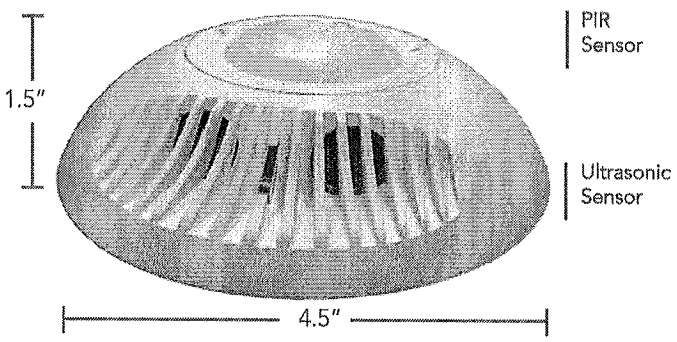
*OMNIDT2000*

The OMNIDT combines ultrasonic (US) and passive infrared (PIR) technologies to turn lighting on and off based on occupancy. This dual technology provides accurate turn-ons while virtually eliminating false-offs. This sensor features Hubbell Building Automation's patented IntelliDAPT technology, which makes all the sensor adjustments automatically.

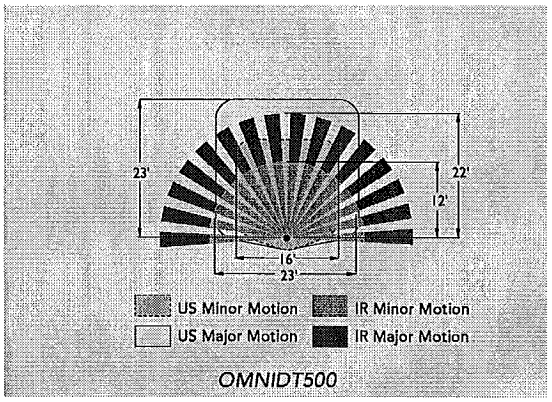
Throughout the product's lifespan, IntelliDAPT software analyzes the controlled area and makes digital adjustments to sensitivity and timer settings. Occupancy sensors with IntelliDAPT provide a maintenance-free install-and-forget operation.

## PRODUCT FEATURES

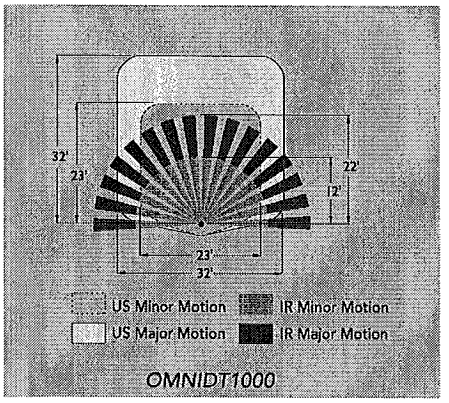
- IntelliDAPT self-adaptive technology - no manual adjustment required
- All-digital dual technology (ultrasonic [US] and passive infrared [PIR]) sensor
- Non-volatile memory for sensor settings
- 500–2,000 square-foot coverage area (depending on model)
- Optional relay and photocell control
- Optional Quick to Install (QTI) connector
- UL and cUL listed
- California Title 24 compliant
- Five-year limited warranty



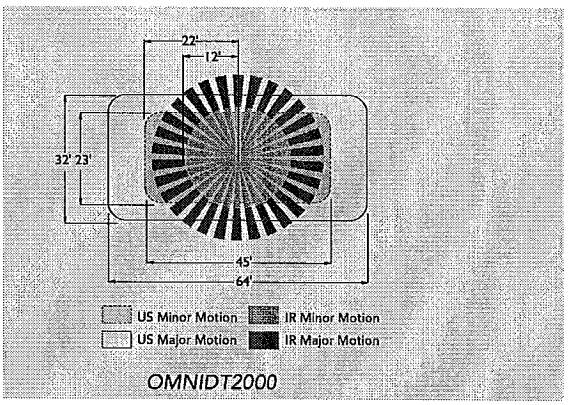

HUBBELL Building Automation



OMNIDT500



OMNIDT1000



OMNIDT2000

## General Specifications

| | |
|---|---|
| IntelliDAPT | Auto reset from test setting<br>Self-adjusting timer<br>Self-adjusting passive infrared thresholds<br>Automatic false-on/false-off corrections |
| LED lamp | Red - infrared motion<br>Green - ultrasonic detection |
| Timer timeout | Automatic mode: 8–30 min. (self-adjusts based on occupancy)<br>Test mode: 8 seconds (for an easy check at installation) |
| Ultrasonic (US) output | OMNIDT500: 40kHz output<br>OMNIDT1000 and OMNIDT2000: 32kHz |
| Passive infrared (PIR) | Dual-element pyrometer and 12-element cylindrical rugged lens |
| RP option | Relay and photocell included<br>Relay: N/O + N/C contacts; SPDT; 500 mA rated @ 24VDC; three-wire isolated relay<br>Photocell: adjustable natural-light override ranges from 0 to<br>100 foot-candles (0 to 1,000 lux) |
| Coverage | 500 - 2,000 square feet |
| Power requirements | 24VDC, 33mA (uses UVPP and MP- Series power pack- not included) |
| Output | 24VDC active high-logic control signal with short circuit protection and optional dry contact (see RP options) |
| Operating environment | Indoor use only<br>Operating temperature: 32° to 104°F (0° to 40°C)<br>Relative humidity (non-condensing): 0% to 95% |
| Construction | Casing- rugged, high-impact, injection-molded plastic KJB ABS<br>Cycolac (UL-945VA) flame class rating, UV inhibitors<br>Color-coded leads are 6" long |
| Dimensions | 4.5" diameter, 1.5" height (114 mm diameter, 38mm height) |
| Weight | 5.0 oz (142g) |
| Color | Off-white |
| Mounting | Mounting base provided<br>Recommended mounting height: 8ft with a max mounting height of 12ft. |
| Certifications | UL and cUL listed |
| Warranty | Five-year limited |

## Ordering Information

| OMNI | DT | | | |
|---|---|---|---|---|
| **MODEL** | **TECHNOLOGY** | **COVERAGE** | **RELAY / PHOTOCELL OPTION** | **QTI** |
| OMNI | **DT** Dual Technology | **500** 500 sq. ft. | **RP** Relay & Photocell | **QTI** Quick to Install |
| | | **1000** 1,000 sq. ft. | **Blank** No Option | **Blank** No QTI |
| | | **2000** 2,000 sq. ft. | | |

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# Passive Infrared Ceiling Sensor for Hallway Applications

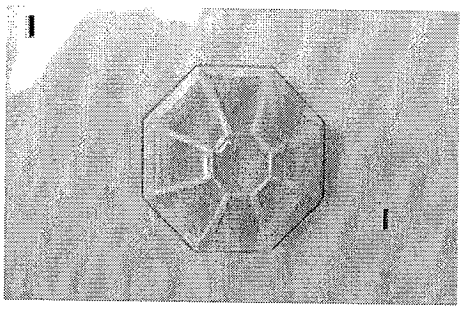
## CEILING AND WALL MOUNT OCCUPANCY SENSORS

PROJECT INFORMATION

Project Name

Catalog No. Date

Hallway occupancy sensor for step dimming.



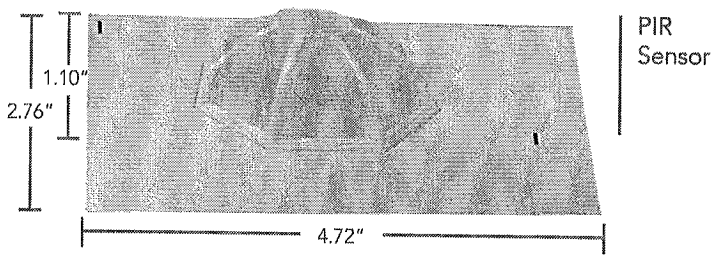
*PIR1000H*

The PIR1000H uses passive infrared (PIR) technology to turn lighting on and off based on occupancy. Designed specifically for hallway applications, the PIR1000H provides 16'x80' linear feet of coverage when mounted at 10'. The PIR1000H features a user-adjustable time delay of 30 seconds to 30 minutes and a bypass function for troubleshooting.

Motion detection is visibly confirmed from all angles via two red LED walk test indicators. Simple installation, low initial costs, and high energy saving potential expedite a fast and noticeable return on investment.

## PRODUCT FEATURES

- 16' x 80' linear feet of coverage
- LED walk test indicator
- 8 minute – 30 minute time delay
- UL and cUL listed
- California Title 24 compliant
- Five-year limited warranty

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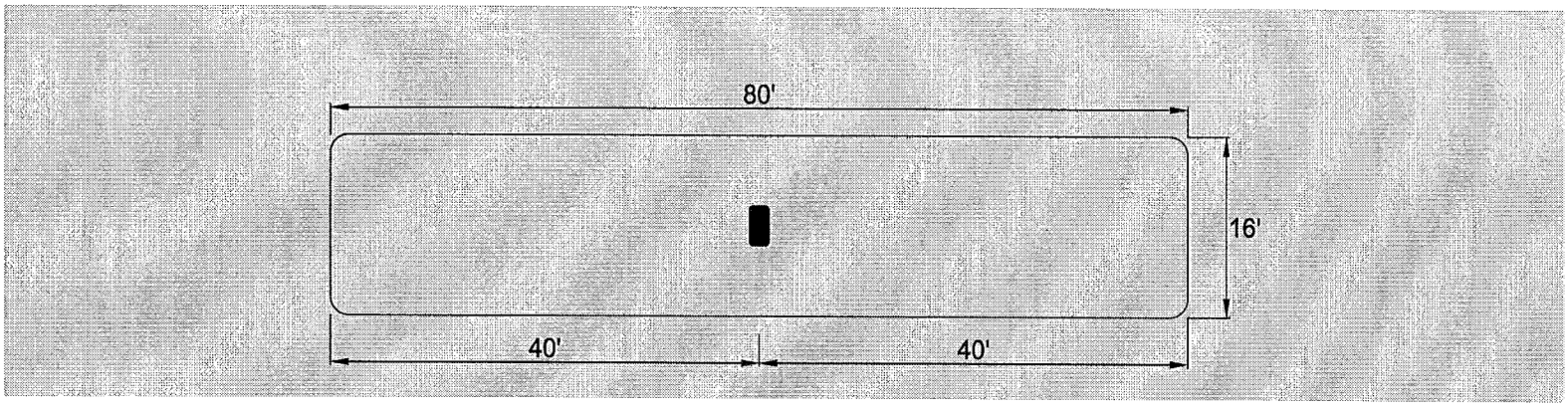


## General Specifications

| | |
|---|---|
| Sensitivity | Fully adjustable: 0% - 100% |
| Timer Timeout | Fully adjustable: 30 sec. to 30 min. |
| Passive Infrared | Multi-segmented, high-density Fresnel™ IR lens |
| LED Lamp | Walk test indicator<br>Red – Infrared motion |
| Coverage | 16' x 80' linear feet |
| Power Requirements | 24VDC (uses UVPP and MP-series power pack – not included) |
| Output | 24 VDC active high logic control signal |
| Operating environment | Indoor use only<br>Operating temperature: 0°F to 100°F (-18°C to 38°C) |
| Construction | Housing – Rugged, high impact, injection molded plastic<br>Color-coded leads |
| Dimensions | 4.72" L x 2.76" W x 1.10" D (119.8mm L x 70.0mm W x 27.9mm D) |
| Weight | 3.0 oz |
| Color | White |
| Mounting | Sensors may be mounted using a single gang mud ring attached to a 4-inch square electrical box<br>Recommended MAX mounting height: 10 Ft. |
| Certifications | UL and cUL Listed |
| Warranty | Five-year limited warranty |

## Ordering Information

**PIR1000H**

**MODEL**

**PIR1000H** Passive Infrared Ceiling Sensor for Hallway Applications, White 16' x 80' Linear ft.

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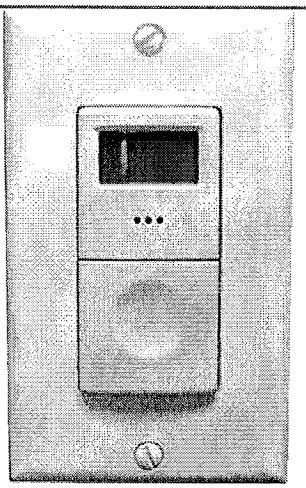
Building Automation, Inc.

Mechanical rooms & Storage rooms

# *Digital Programmable Timer*



*TD300*

## KEY FEATURES

- Supports multiple timer intervals
- Energy code presets for Title 24, IECC, and ASHRAE 90.1
- Visual and audible turnoff warning
- 3 Way and Multiple Way Switching
- No Neutral Required
- No Load Requirement
- Dip switch control of features
- Zero Arc Point Switching
- UL and cUL listed
- Five-year warranty

## OVERVIEW

With its aesthetically pleasing features, the TD300 combines style with functionality as it provides energy saving control of incandescent and fluorescent lighting, as well as certain motor loads such as fans, hot tub heaters and circulating pumps. The timer offers two presets for energy code compliance – two hour timing for Title 24 and IECC and 4 hour timing for ASHRAE 90.1. A timed override allows lights and HVAC (heating, ventilating and air conditioning) to remain on for a specified amount of time for after-hours cleaning crews. The TD300 is easy to install and can replace any wall switch.

## FEATURES and BENEFITS

| Features | Benefits |
|---|---|
| Energy Code Presets | • 2 hour timer for Title 24 and IECC<br>• 4 hour timer for ASHRAE 90.1 |
| Supports multiple timer intervals | • A turnoff timer can be set in the following intervals<br>- 5 minute steps between 5 minutes – 1 hour<br>- 10 minute steps between 1-4 hours<br>- 30 minute steps between 4-12 hours<br>-1 hour steps between 12-24 hours |
| Timed manual override option | • A button push keeps lights and HVAC on past the preset turnoff for a specified amount of time<br>• Adjustable to accommodate lighting for after-hours cleaning crews |
| Visual and audible warnings | • Provides one second flicker or beep warning:<br>- Flicker warning is at two minutes before the turnoff<br>- Beep warning starts two minutes before turnoff and continues every fifteen seconds |
| Zero Arc Point Switching | • Provides support for any lighting load, such as:<br>- Electronic ballasts<br>- Incandescent lighting<br>- Motor loads (the maximum electrical loads for a circuit) |

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**hubbell-automation.com**
5.2013

## SPECIFICATIONS

| | |
|---|---|
| Power requirements | • 120/230/277VAC; 50/60Hz |
| Electrical Ratings | • 120VAC<br>- 15A Resistive<br>- 10A Ballast<br>- 1200W LED Lamp Driver<br>- 8A Tungsten<br>- 1/4HP Motor<br>- 360VA Pilot Duty<br>• 277VAC<br>- 15A Resistive<br>- 15A Resistive<br>- 10A Ballast |
| Load Requirements | • None |
| Operating Environment | • Indoor use only<br>• Operating environment: 32° - 122°F (0°-50°C)<br>• Relative humidity (non-condensing): 0%-95% |
| Construction | • Casing – high impact injection-molded plastic<br>• Wall plate locks access to dipswitches for tamper resistance |
| Display | • Backlit LED |
| Size and Weight | • Size: 3.28" X 1.72" X 1.42"<br>• Weight: 2.9 oz |
| Color | • White |
| Mounting | • Single-gang NEMA-style switch box (average switch box)<br>• Decorator wall plate included |
| Certifications | • UL and cUL listed |
| Warranty | • Five years |

## ORDERING INFORMATION

| TD300 | W |
|---|---|
| **MODEL** | **COLOR** |
| **TD300**<br>Digital Programmable Timer | **W** White. |

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Building Automation, Inc.

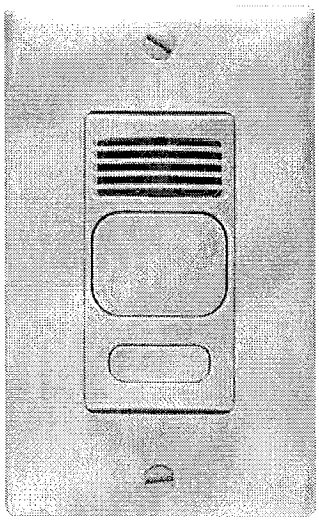
Office Occupancy Sensors

# Wall Switch Occupancy Sensors

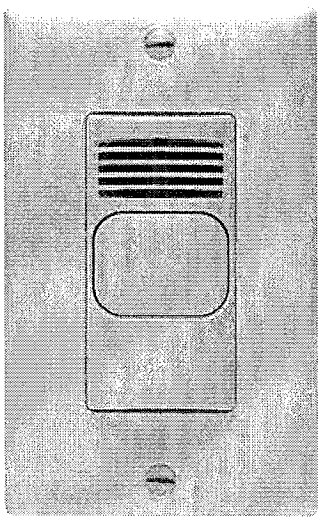
*LightHawk™ Multi-Technology*
*Wall Switch Sensor featuring IntelliDAPT®*

## KEY FEATURES

- All-digital dual technology (ultrasonic [US] and passive infrared [PIR]) sensor
- IntelliDAPT self-adaptive technology—no manual adjustment required
- Auto-on and manual-on operating modes (depending on model)
- 1,000 square-foot, 180° coverage area
- Built-in photocell with SuperSaver™ mode
- RhinoTuff™ lens
- Dual 120/277 VAC operation
- No minimum load requirement
- Zero Arc Point Switching
- ETL, UL, and cUL listed
- Five-year warranty



*LHMTS1*



*LHMTS0*

## OVERVIEW

LHMTS sensors combine ultrasonic (US) and passive infrared (PIR) technologies for unequaled occupancy detection and false trip immunity. These sensors feature Hubbell Building Automation's patented IntelliDAPT technology, which makes all the sensor adjustment decisions automatically. Throughout the product's lifespan, smart software analyzes the controlled area and makes digital adjustments to sensitivity and timer settings. Occupancy sensors with IntelliDAPT provide a maintenance-free install-and-forget operation. With selectable operating modes—automatic ON/OFF or manual ON/automatic OFF—and a built-in photosensor for automatic daylight harvesting, LHMTS sensors are the most capable choice in today's market place.

## FEATURES and BENEFITS

| Features | Benefits |
|---|---|
| IntelliDAPT technology | • Sensor automatically determines the ideal setting for an area<br>• No manual sensitivity or timer adjustments required<br>• Provides a maintenance-free install-and-forget operation |
| All-digital dual technology (ultrasonic [US] and passive infrared [PIR]) sensor) | • Superior US minor-motion detection with excellent PIR long-range major-motion detection |
| Auto-on and manual-on operating modes (depending on model) | • Provides auto-on/auto-off and manual-on/auto-off operations |
| Tamper-proof automatic-only version available | • Automatically turns lighting on and off without requiring the user to push a button |
| RhinoTuff lens | • Impact-resistant infrared (IR) lens |
| Built-in photocell with optional SuperSaver mode | • Increases energy savings by preventing lights from turning on when there is sufficient natural light<br>• Optional SuperSaver mode—turns lights off during periods of occupancy if there is enough natural light to illuminate the area |

## SPECIFICATIONS

| | |
|---|---|
| IntelliDAPT technology | • Self-adjusting timer<br>• Self-adjusting ultrasonic (US) and passive infrared (PIR) sensitivity<br>• Automatic false-on/false-off corrections<br>• No manual adjustments required |
| Timer timeout | • Auto mode: 4–30 minutes; self-adjusts based on occupancy<br>• Fixed mode: 4, 8, 15, and 30 minutes<br>• Test mode: 5 seconds |
| Ultrasonic (US) output | • 40kHz output |
| Passive infrared (PIR) | • Dual-element pyrometer and 12-element cylindrical RhinoTuff lens |
| Photocell | • Natural light override range: 10–500 foot-candles |
| Coverage | • 1,000 square-foot, 180° coverage area |
| Power requirements | • 120/277 VAC; 50/60Hz |
| Electrical ratings | • 120 VAC: 800W Incandescent; 1,000W Fluorescent; 1/6 HP<br>• 277 VAC: 1,800W Fluorescent; 1/6 HP |
| Load requirements | • None |
| Operating environment | • Indoor use only<br>• Operating temperature: 32°–104°F (0°–40°C)<br>• Relative humidity (non-condensing): 0–95% |
| Construction | • Casing—high-impact injection-molded plastic (UL-94-5V)<br>• Impact-resistant lens<br>• Color-coded leads are 6" long |
| Size and weight | • Size: 4.2" x 1.8" x 2.1"; .37" extension<br>• Weight: 2.9 oz |
| Color | • White; Ivory; Light Almond; Gray; Black |
| Mounting | • Single-gang NEMA-style switch box (average switch box)<br>• Decorator-style wall plate not included |
| Certifications | • ETL, UL, and cUL listed |
| Warranty | • Five years |

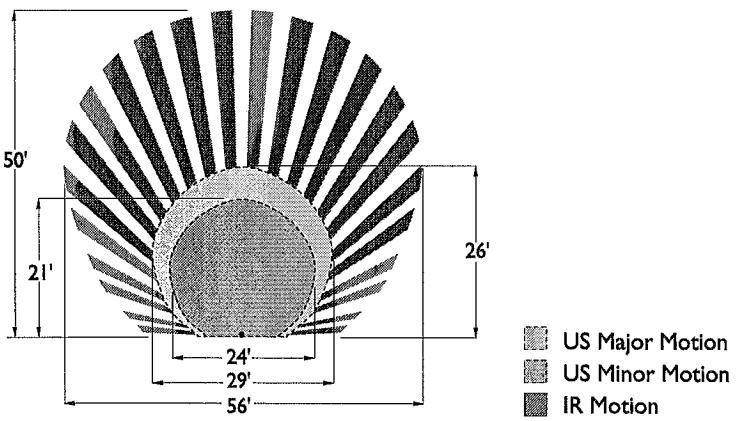
## ORDERING INFORMATION

| Catalog Number | Description |
|---|---|
| LHMTS1* | Ultrasonic and PIR Wall Switch Sensor with IntelliDAPT and Automatic/Manual Control, 120/277VAC |
| LHMTS0* | Ultrasonic and PIR Wall Switch Sensor with IntelliDAPT and Automatic Only Control, 120/277VAC |

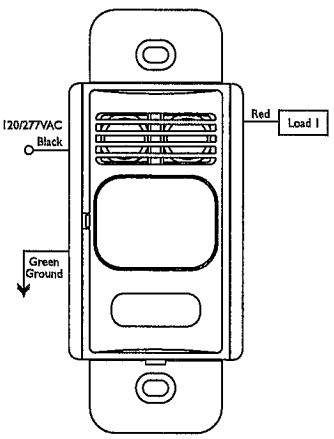
* = W – White, I – Ivory, A – Light Almond, G – Gray, B – Black

## RANGE DIAGRAM

*Refer to Application Guide.




## WIRING DIAGRAM




Single Circuit

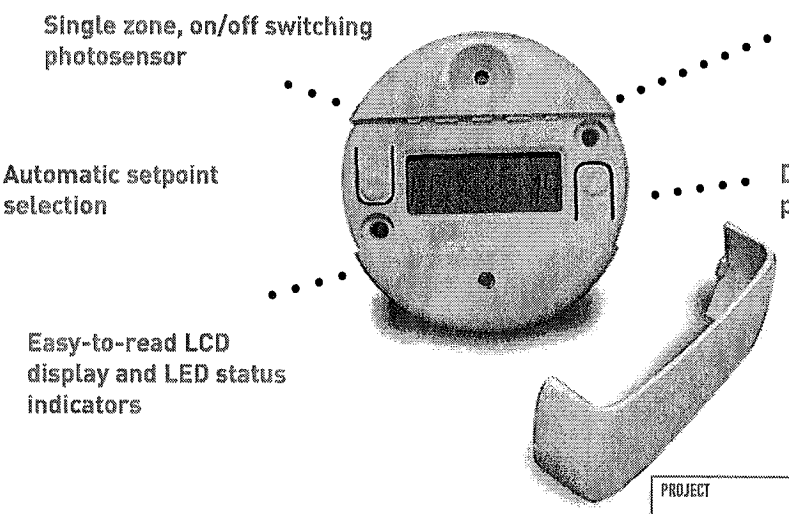
HUBBELL Building Automation, Inc.

**Hubbell Building Automation, Inc.**
9601 Dessau Road | Building One | Austin, Texas 78754
{512} 450-1100 | {512} 450-1215 fax
**hubbell-automation.com**

Stairway control at window landing.

DAYLIGHTING SENSORS & CONTROLS

# LightSaver® LS-102 Switching Photosensor




PROJECT

LOCATION/TYPE

## Product Overview

### Description

The LS-102 Daylighting Controller is a single zone, on/off switching device designed to be installed in a closed loop application. A self-contained 24 VDC device with an extended range of 1-1400 footcandles, the LS-102 requires a low voltage power pack to operate. The controller consists of an advanced digital multi-band photosensor, an on-board microcontroller, and an LCD display. This photosensor is positioned behind a 100° cone that cuts off unwanted light, preventing false triggers.

### Operation

Setpoints can be selected either automatically or manually. When ambient light levels exceed the off setpoint, the controller turns lighting off. It will turn lighting systems back on when the on setpoint is triggered. Because of its automatic calibration feature, many applications require little or no adjustment of the settings. The LS-102 can be paired with a low voltage wall switch to enable manual override, or with an occupancy sensor to enable its 'Hold On While Occupied' feature.

### Automatic Startup/Calibration

The LS-102 features automatic setpoint calculations. The device initiates a procedure to select an appropriate value for the on setpoint. As part of the process, the controlled load is first turned on for a brief interval to warm up the lamps, and then switched off. This process is repeated several times. At the completion of the calibration, a new value for the on setpoint will have been selected. Other adjustable settings include deadband and time delay settings. If desired, the deadband can be adjusted to a value of 25, 50, 75, or 100 percent above the setpoint. The time delay can be adjusted to 3, 10, 20 or 30 minutes.

### Applications

The LS-102 Daylighting Controller can be used to control any type of lighting: incandescent, fluorescent, compact fluorescent (CFL), HID, and LEDs. The devices work in peripheral offices, skylit areas, cafeterias, warehouses and any other indoor area with natural light contribution.

## Features

- Easy-to-read LCD display prompts installer through set-up
- Four user-adjustable parameters: on setpoint, off setpoint, off setpoint time delay, and 'Hold On While Occupied' Mode (if wired with an occupancy sensor)
- Test mode overrides programmed time delay, enabling installer to verify accuracy of settings
- Control load status verification allows testing and confirmation that wiring is correct
- Form factor designed to eliminate misalignment
- LED status indicator identifies when device is in override or test mode, or if device has switched lights on or off
- Mounting options for top- or side-lit applications
- One-hour manual override capability (when wired with low voltage, pushbutton wall switch)
- Programmable in most daylight conditions
- Qualifies for use on ARRA-funded public works projects

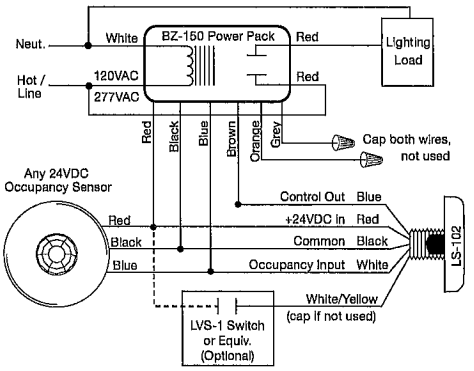
WattStopper®
www.wattstopper.com
800.879.8585

## Specifications

- Automatic setpoint calculation
- Digital Multi-Band Photosensor Range: 1-1400 footcandles
- ON Setpoint Range: 1-850 footcandles
- Status Indicator: Multi-function green LED
- Power Requirements: 12/24 VDC; 7 mA typical
- Output Signal: 24VDC; maximum 120 mA
- Location: Suitable for dry interior locations
- Environment: 32-120°F (0-49°C), less than 90% relative humidity
- Dimensions: 2.4" diameter x 0.7" deep (61mm x 17mm)
- Five year warranty
- UL listed

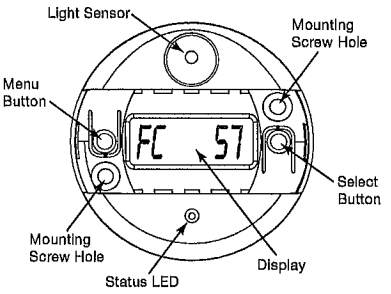
## Wiring, Installation & Location

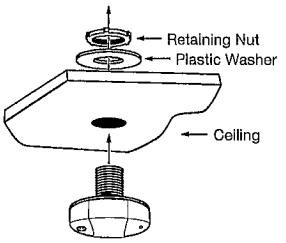
### Wiring Diagram



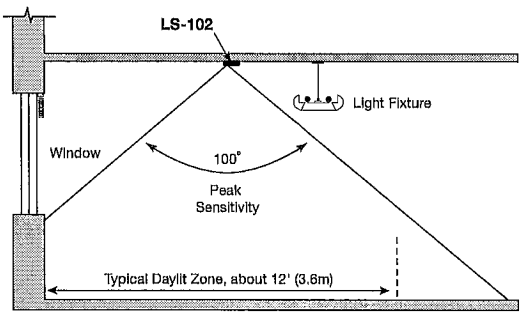

For other wiring diagrams, please visit the CAD Resource Center at www.wattstopper.com

### Mounting and LED Display

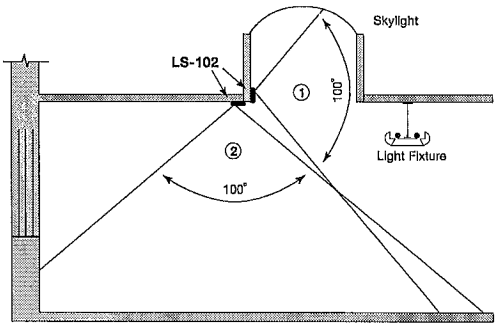


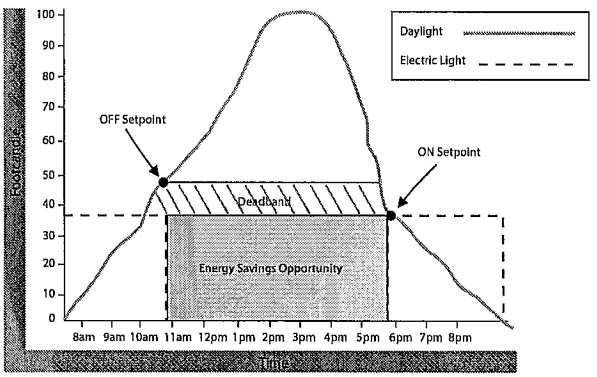

### Side Lighting Application




### Top Lighting Application




## Deadband Level Chart




If the LS-102's photosensor lighting level drops below the on setpoint, the lights will remain on. If the sensor's lighting level rises above the off setpoint, the LS-102 will automatically turn the lights off. If the sensor's lighting level remains in the predetermined deadband range (25%, 50%, 75% or 100%) the lighting will be passive until the sensor's level reaches the high or low setpoints.

## Ordering Information

| Catalog No. | Description | Footcandle Range | Deadband Adjustment Range |
|---|---|---|---|
| ☐ LS-102 | On/Off Switching Photosensor | 1-1400 fc | 25%, 50%, 75% & 100% above on setpoint |
| ☐ LS-102-U | On/Off Switching Photosensor, ARRA-compliant | 1-1400 fc | 25%, 50%, 75% & 100% above on setpoint |
| ☐ LS-102-FTA | On/Off Switching Photosensor, ARRA-compliant (FTA exception) | 1-1400 fc | 25%, 50%, 75% & 100% above on setpoint |

Pub. No. 29504 rev. 11/2010

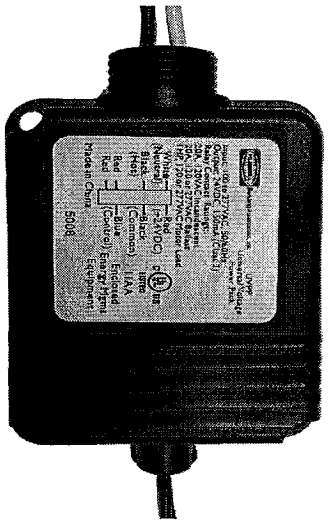
# Universal Voltage Power Packs

## Power Packs and Relays

PROJECT INFORMATION

Project Name

Catalog No. Date



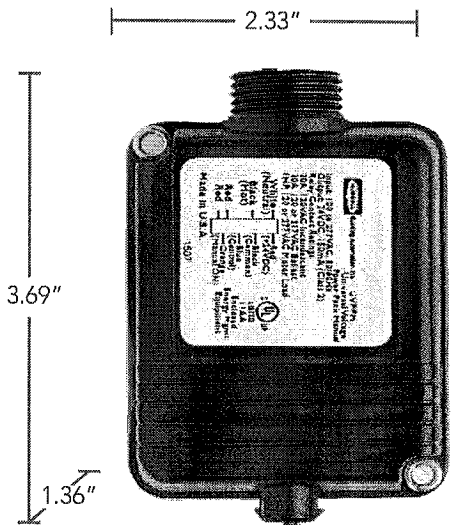
*UVPP*

The Universal Voltage Power Pack (UVPP) is a self-contained transformer and relay designed for low-voltage 24VDC occupancy sensors. The power pack supports and automatically detects the line-voltage input within the 100–277VAC range. This eliminates the need for voltage-specific power packs. The Universal Voltage Power Pack with Manual ON/OFF control (UVPPM) provides a unique solution for lighting applications where users require both manual ON/OFF control as well as automatic OFF control.

Both power packs are capable of switching 20A loads and feature Zero Arc Point Switching, minimizing relay-contact wear from high inrush loads. A single power pack can power either 4 sensors or 3 sensors and the MPSA auxiliary relay for multiple circuits. The power packs are plenum rated and easily mount inside or outside of a junction box or inside a fixture.

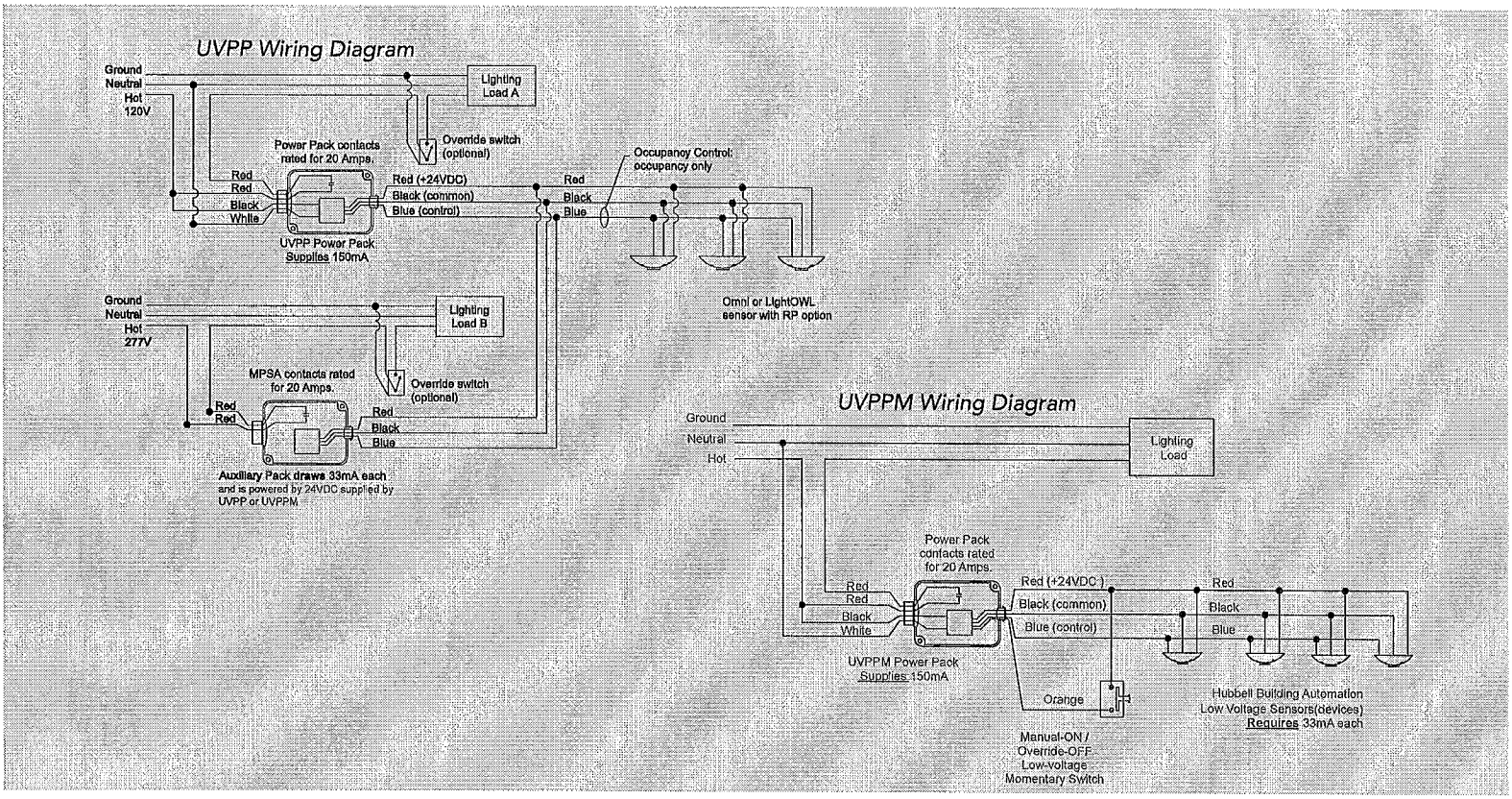
## PRODUCT FEATURES

- Universal voltage: 100–277VAC; 50/60Hz
- Automatic voltage detection
- Electrical load switching capability: maximum of 20 Amps
- Regulated 24VDC current; 150mA output
- Zero Arc Point Switching
- Plenum rated
- Mounts: inside or outside a junction box; inside a fixture
- Available with exclusive Quick-to-Install (QTI) connector
- Companion auxiliary relay device available (MPSA)
- UL and cUL listed
- Five-year limited warranty




*UVPPM*

HUBBELL Building Automation




## General Specification

| | |
|---|---|
| Power requirements | 100–277VAC; 50/60Hz |
| Output (UVPP/UPPM) | 24VDC; 150mA nominal, isolated, and regulated |
| Relay contact rating | 20A: 120VAC Incandescent<br>20A: 120 or 277VAC Ballast<br>1HP: 120 or 277VAC Motor Load |
| Plenum rated | Complies with requirements for use in a plenum area<br>Plenum rated for external junction box mounting |
| Operating environment | Indoor use only<br>Operating temperature: 32° to 104°F (0° to 40°C)<br>Relative humidity (non-condensing): 0% to 95% |
| Dimensions | 3.69" x 2.33" x 1.36" |
| Weight | 15 oz. |
| Color | Black |
| Certifications | UL and cUL listed |
| Warranty | Five-year limited |

## Ordering Information

| MODEL | |
|---|---|
| **UVPP** | Universal Voltage Power Pack |
| **UVPPQTI** | Universal Voltage Power Pack with QTI Connector |
| **MPSA** | Auxiliary Relay Device |
| **UVPPM** | Universal Voltage Power Pack with Manual ON/OFF Control |

HUBBELL Building Automation

9601 Dessau Road | Building One | Austin, Texas 78754 | 512-450-1100 | 512-450-1215 fax | www.hubbell-automation.com

2x2 Corridor Lighting
2x4 Office Lighting

JOB _____

TYPE _____

CATALOG # _____

LUMAX LIGHTING

# SUAFXLED SERIES

## APPLICATION

- OUTSTANDING FLEXIBILITY AND ECONOMY FOR LOBBIES, CORRIDORS, OR OFFICES TO COMPLEMENT THE INTERIOR DESIGN.
- WIDE SELECTION OF SHIELDING MEDIA, LAMP AND BALLAST TYPES.

## FINISH

- ALL EXPOSED METAL PARTS PRETREATED WITH A PHOSPHATE BONDING PROCESS AND POST-PAINTED WITH AN ELECTROSTATICALLY APPLIED HIGH TEMPERATURE BAKED WHITE ENAMEL FOR SUPERIOR QUALITY AND DURABILITY.

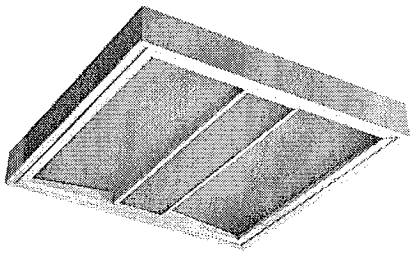
## CONSTRUCTION

- DIE-FORMED CODE GAUGE COLD ROLLED STEEL HOUSING AND ENDS. EMBOSSED FOR STRENGTH AND UNIFORMITY. HEAVY-DUTY ENDS ATTACH TO HOUSING WITH INTERLOCKING TABS. INTEGRATED EQ CLIPS. DRIVER COVER EASILY REMOVED WITHOUT TOOLS.
- QUICK ACCESS PLATE FOR CONVENIENT POWER CONNECTION.
- DOOR FRAMES AVAILABLE IN FLUSH STEEL. GASKETED TO PREVENT LIGHT LEAKAGE. STEEL HINGES AND ROTARY-ACTION CAM LATCHES. LATCHING/HINGING REVERSIBLE; DOOR FRAME EASILY REMOVED WITHOUT TOOLS.
- AIR MODELS WITH TOP SLOTS FOR HEAT REMOVAL.

## ELECTRICAL

ETL LISTED

- SUITABLE FOR DRY LOCATIONS.
- I.B.E.W. LABELED.
- LED BOARD AND DRIVER.
- 5 YEAR LIMITED WARRANTY ON LED BOARDS & DRIVERS.



## ARCHITECTURALLY PLEASING FIXTURE WITH FLEXIBLE LENS OPTIONS

## *ORDERING GUIDE* EXAMPLE: SUAFXLED35L4K22-9DFSFRS

| SERIES | LUMENS | KELVIN | FIXT. | | |
|---|---|---|---|---|---|
| *SUAFXLED* | 35L<br>70L | 3K,35K,<br>4K,5K | 14,22<br>24 | **HEAT REMAOVALSLOTS:**<br>T - TOP<br>**LUMENS:**<br>35L = 3,500 RATED INITIAL FIXTURE LUMENS<br>70L = 7,000 RATED INITIAL FIXTURE LUMENS<br>**NOTE:** CONTACT FACTORY FOR OTHER LUMEN/WATTAGE COMBINATIONS<br>**KELVIN:**<br>3K = 3,000 KELVIN<br>35K = 3,500 KELVIN<br>4K = 4,000 KELVIN<br>5K= 5,000 KELVIN<br>**VOLTAGE:**<br>9 - 120-277 UNIVERSAL VOLTAGE<br>**CENTER LENS:**<br>DF - DURA FROST TEXTURED BOTH SIDES (85%)<br>BL - BLADE LOUVER<br>CB - COBALT BLUE ACRYLIC<br>TO - TRANSLUCENT ORANGE ACRYLIC<br>GP100 - FLUFFY CLOUDS<br>OA - SMOOTH OPAL ACRYLIC (58%)<br>TS - TAN SCROLL OVER WHITE ACRYLIC OVERLAY<br>WC - WHITE GRID CLOTH PATTERN OVER WHITE ACRYLIC<br>RT - RAIN TREE PATTERN OVER WHITE ACRYLIC OVERLAY<br>SU - UNBRIA SLATE PATTERN OVER WHITE ACRYLIC OVERLAY<br>RU - RUSSELL FABRIC OVER WHITE ACRYLIC OVERLAY<br>PM - PERFORATED METAL WITH OVERLAY<br>SLT - SLOTTED METAL PERF WITH OVERLAY<br>TW - TRIPLE WAVE PATTERN ON CLEAR UV PET<br>SP - STRIPED PATTERN ON CLEAR UV PET<br>PY - TRIPLE PYRAMID, PATTERN ON CLEAR UV PET<br>PF-PERFORATED PATTERN ON CLEAR UV PET(90%+) | **2x2 ONLY:**<br>MN - MANGO LEAF PATTERNS WITH OFF WHITE BACKGROUND<br>BR - BANANA LEAF PATTERNS WITH RED BACKGROUND<br>BB - BANANA LEAF PATTERNS WITH BLUE BACKGROUND<br>WL - WHITE LINEN CLOTH STRETCHED THINLY OVER WHITE ACRYLIC OVERLAY<br>WW - WHIMSY WHITE, CIRCULAR PATTERN WHITE CLOTH OVER WHITE ACRYLIC<br>TS - TAN SCROLL OVER WHITE ACRYLIC OVERLAY<br>WC - WHITE GRID CLOTH PATTERN OVER WHITE ACRYLIC<br>RT - RAIN TREE PATTERN OVER WHITE ACRYLIC OVERLAY<br>SU - UNBRIA SLATE PATTERN OVER WHITE ACRYLIC OVERLAY<br>RU - RUSSELL FABRIC OVER WHITE ACRYLIC OVERLAY<br>**SIDE LENS:**<br>SF - FROSTED & TEXTURED ONE SIDE(88%)<br>DF - DOUBLE FROST TEXTURED(85%)<br>OA - SMOOTH OPAL AC (58%)<br>**DOOR FRAME:**<br>RS - FLUSH WHITE, STEEL<br>RH - REGRESSED WHITE, ALUMINUM<br><br>**ENERGY CONSUMED:**<br>40 WATTS: 1x4, 2x2<br>80 WATTS: 2x4<br>(CONTACT FACTORY FOR OTHER WATTAGE/LUMENS OPTIONS.)<br><br>**OPTIONS**<br><br>DD - DIMMING DRIVER (0-10V)<br>TPL - SPANNER HEAD SCREW THROUGH BOTH LATCHES ON DOOR FRAME LATCH RAIL, LATCH SECURED TO LATCH RAIL.<br>2G - 20 GUAGE HSG.<br>EMERGENCY DRIVER |

MADE IN THE USA ★ PARTS & LABOR ★

*LUMAX INDUSTRIES, INC.* Chestnut Avenue & Fourth Street
Altoona, PA 16603-0991 814-944-2537 Fax 814-944-6413
www.lumaxlighting.com

MADE IN THE USA ★ PARTS & LABOR ★

# SUAFXLED SERIES

## PHOTOMETRIC DATA

CATALOG NUMBER: **AFXLED**35L4K22-9DFSFRS
LED BOARD LUMENS: 4400
TOTAL LUMINAIRE EFFICIENCY: 80.6%

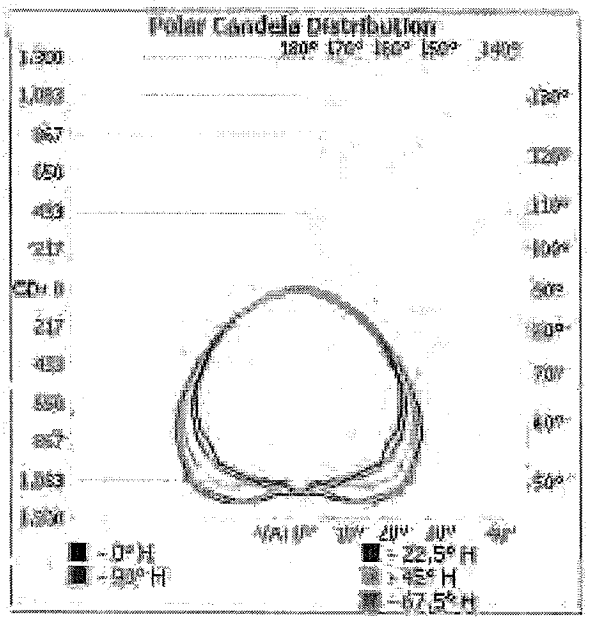
| Zone | Lumens | % Total |
|---|---|---|
| 0-10 | 187.3 | 3.8% |
| 10-20 | 551.7 | 11.4% |
| 20-30 | 745.5 | 15.3% |
| 30-40 | 874.8 | 18.0% |
| 40-50 | 891.2 | 18.3% |
| 50-60 | 779.8 | 16.0% |
| 60-70 | 568.8 | 11.6% |
| 70-80 | 265.6 | 5.2% |
| 80-90 | 40.8 | 1.0% |

| Zone | Lumens | % Lamp | % Luminaire |
|---|---|---|---|
| 0-30 | 1830 | 37.5% | 27.7% |
| 0-40 | 2,457.8 | 37.7% | 46.8% |
| 0-90 | 2,827.8 | 66.5% | 82.8% |
| 90-80 | 106.5 | 1.4% | 17.4% |
| 0-90 | 3,544.4 | 80.6% | 100% |

Coefficients Of Utilization - Zonal Cavity Method

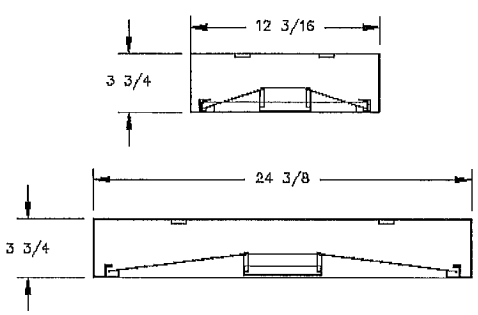
Effective Floor Cavity Reflectance 20%

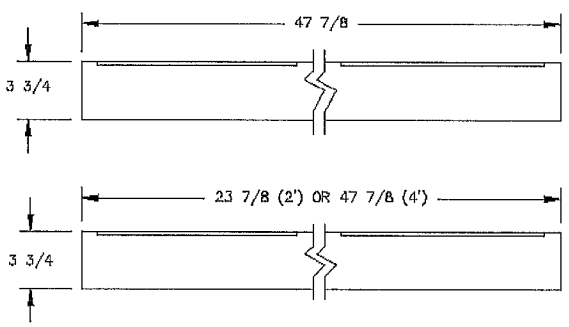
| RCC % | 80 | | 70 | | 50 | | 30 | | 10 | |
|---|---|---|---|---|---|---|---|---|---|---|
| RW % | 70 | 50 | 70 | 50 | 70 | 50 | 70 | 50 | 70 | 50 |
| RCR 0 | 84 | 84 | 84 | 84 | 80 | 80 | 76 | 76 | 74 | 74 |
| 1 | 81 | 81 | 80 | 80 | 77 | 77 | 74 | 74 | 72 | 72 |
| 2 | 78 | 74 | 77 | 73 | 74 | 71 | 72 | 69 | 70 | 68 |
| 3 | 75 | 69 | 74 | 69 | 71 | 68 | 69 | 66 | 67 | 65 |
| 4 | 72 | 65 | 71 | 65 | 68 | 64 | 66 | 63 | 64 | 62 |
| 5 | 69 | 62 | 68 | 62 | 65 | 61 | 63 | 60 | 62 | 59 |
| 6 | 67 | 59 | 65 | 59 | 63 | 58 | 61 | 57 | 59 | 57 |
| 7 | 64 | 57 | 63 | 56 | 61 | 55 | 59 | 55 | 57 | 54 |
| 8 | 62 | 54 | 61 | 54 | 59 | 53 | 57 | 52 | 55 | 52 |
| 9 | 60 | 52 | 59 | 52 | 57 | 51 | 55 | 50 | 54 | 50 |
| 10 | 58 | 50 | 57 | 50 | 55 | 49 | 53 | 48 | 52 | 48 |




## DIMENSIONS

SPECIFICATIONS AND DIMENSIONAL DATA SUBJECT TO CHANGE WITHOUT NOTICE.




(1 X 4)
CONSULT FACTORY
FOR MOUNTING DETAILS

(2 X 2)
(2 X 4)
CONSULT FACTORY
FOR MOUNTING DETAILS

PROGRESS LIGHTING

Stairway Lighting

Project:

Fixture Type:

Location:

Contact:

# P8022 Series LED New Construction and Remodel • Wet Location

PROGRESS LED

## Specifications:

**P8022-28/30K-AC1-L10**

### Description:

The P8022 delivers a solution for flush mount and recessed applications, for both residential and commercial markets. In addition, the P8022 is wet located and is a cost effective solution for fire rated application. The P8022 features a 120V alternating current source and eliminates the need for a traditional LED driver. This modular approach results in an encapsulated luminaire that unites performance, cost and saftey benefits.

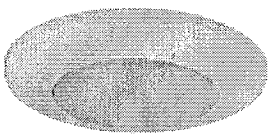
### Construction:

- Diffused polycarbonate lens controls direct glare from the LEDs
- Simple snap in installation for J-Box and Twist and Push for recessed housings
- Die-cast aluminum construction with a powder coat paint finish
- Can be installed in a 4" J-Box and 6", 5" and 4" recessed housing. (All hardware included)
- Lumen output and distribution comparable to a 100W incandescent lamp
- Suitable for use in IC or NON-IC Applications with 25°C (77°F) continuous room side ambient temperature.
- Provided with quick link for use with E26 Edison Base adapter
- Flicker-free dimming to 10% with most standard incandescent dimmers (See Dimming Notes)

### Performance:

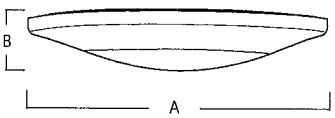
| | |
|---|---|
| Input Power | 17W |
| Input Voltage | 120V |
| Input Frequency | 60Hz |
| Lumens | 1077 (LM-79) |
| CCT | 3000K 4100K |
| CRI | 80+ |
| LPW | 63 |
| Life | 42,000 (L70/TM-21) |
| EMI/RFI | FCC Title 47, Part 15, Class B |
| Min. Start Temp | -30° C |
| Max. Operating Temp | 30° C |
| Warranty | 5 yrs. |
| Labels | cCSAus classified for wet locations |
| | ENERGY STAR® qualified |

### Images:



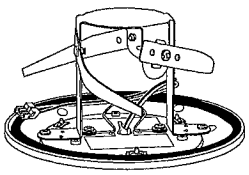
### Dimensions:

| A | B |
|---|---|
| 7.25" | 1.21" |

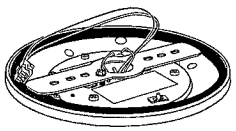



### Included Mounting Options:

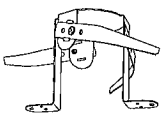
Recessed Mount with Quick-Link



J-Box Mount with Quick-Link



Recessed Adapter



E26 Edison Base Adapter

J-Box Adapter

### Catalog number:

| Base | Finish | Color Temp | Voltage | Lumen Package |
|---|---|---|---|---|
| P8022 | 28 - White | 30K - 3000K | AC1 - 120V | L10 - 1077 Lumens |

PROGRESS LIGHTING

# P8022 Series LED New Construction and Remodel · Wet Location

PROGRESS LED

## Photometrics: P8022-28/30K-AC1-L10

| ELECTRICAL DATA | P8022-28/30K-AC1-L10 |
|---|---|
| Input Voltage | 120V |
| Input Frequency | 60 Hz |
| Constant Current Output | 700mA |
| Power Factor | ≥0.90 |
| THD | <20% |
| EMI Filtering | FCC 47CFR Part 15, Class B |
| Operating Temperature | -30°C to 30°C |
| Dimming | Yes* |

Over-voltage, over-current, short-circuit protected
*See Dimming Notes for more information

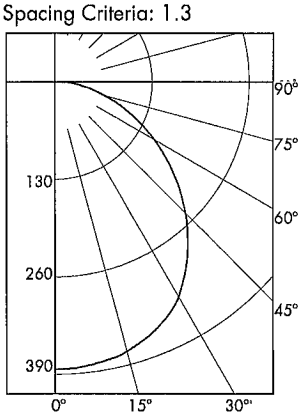
### PERFORMANCE DATACHART

| Single Unit, Initial Footcandles, 30" Work Plane | | | | | | | Ceiling to Floor Height (ft) | Multiple Units, Initial Footcandles, 30" Work Plane | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nadir | 10° | | 20° | | 30° | | | Spacing is Maximum Over Work Plane, SMH = 1.3 | | | |
| FC | FC | Dia (ft) | FC | Dia (ft) | FC | Dia (ft) | | Fixture Spacing (ft) | RCR 2 | RCR 5 | RCR 7 |
| 31 | 29 | 1 | 25 | 3 | 17 | 4 | ***6*** | 5.0 | 47 | 33 | 27 |
| 13 | 12 | 2 | 10 | 4 | 7 | 6 | ***8*** | 7.0 | 19 | 13 | 11 |
| 6 | 6 | 3 | 5 | 6 | 3 | 9 | ***10.5*** | 10.0 | 9 | 6 | 5 |
| 4 | 4 | 3 | 3 | 7 | 2 | 11 | ***12*** | 12.0 | 6 | 4 | 4 |

### ZONAL LUMEN SUMMARY

| ZONE | LUMENS | %LUMINAIRE |
|---|---|---|
| 0-30 | 302 | 28.0 |
| 0-40 | 493 | 45.7 |
| 0-60 | 848 | 78.6 |
| 0-90 | 1079 | 100.0 |

**P8022-28/30K-AC1-L10**
LED Light Engine: 3000K, 83 CRI
System Wattage: 16.7
Fixture delivered lumens: 1079
Fixture Efficacy: 64.4
Spacing Criteria: 1.3




### CANDELA DISTRIBUTION

| DEG | CANDELA |
|---|---|
| 0 | 383 |
| 5 | 382 |
| 15 | 372 |
| 25 | 349 |
| 35 | 305 |
| 45 | 247 |
| 45 | 185 |
| 55 | 124 |
| 65 | 69 |
| 75 | 29 |
| 90 | 16 |

Test No. 8660 2702498-01
Tested at 25° Ambient in accordance to IESNA LM-79-2008

### COEFFICIENTS OF UTILIZATION

Zonal Cavity Method

| Room Cavity Ratio | % Effective Ceiling Cavity Reflectance | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 80% | | | | 70% | | 50% | | 30% | |
| | 20% Effective Floor Cavity Reflectance | | | | | | | | | |
| | % Wall Reflectance | | | | | | | | | |
| | 70 | 50 | 30 | 10 | 70 | 10 | 50 | 30 | 50 | 30 |
| 1 | 108 | 103 | 99 | 95 | 106 | 93 | 97 | 94 | 93 | 90 |
| 3 | 90 | 79 | 71 | 65 | 87 | 64 | 75 | 68 | 72 | 66 |
| 5 | 76 | 63 | 54 | 47 | 74 | 47 | 60 | 52 | 58 | 51 |
| 7 | 65 | 52 | 43 | 37 | 63 | 36 | 49 | 42 | 48 | 41 |
| 9 | 57 | 43 | 35 | 29 | 55 | 29 | 41 | 34 | 40 | 34 |

P8022-28/30K-AC1-L10 Test No. 8660 2702498-01

PROGRESS LIGHTING

# P8022 Series LED New Construction and Remodel • Wet Location

PROGRESS LED

## Dimming Notes:

## P8022-28/30K-AC1-L10

P8022 is designed to be compatible with many 120VAC phase control dimmer controls including Incandescent (Forward Phase) and Electronic Low Voltage (ELV-Reverse Phase) controls. LED rated dimmer controls may offer favorable dimming performance.

The following is a partial list of known compatible dimmer controls:

### Line Voltage - Forward Phase Controls (Most incandescent line voltage dimmers have minimum load requirements of approx. 40W and may require multiple LED modules per control)

| | | |
|---|---|---|
| Lutron | Diva Series | (Part number DV-600P) |
| Lutron | Skylark Series | (Part Number S-600P) |
| Lutron | Ariadni Series | (Part Number AY-600P) |
| Lutron | Faedra Series | (Part Number FA-600P) |
| Lutron | Lumea | (Part Number LG-600PH) |
| Leviton | Renoir II | (Part Number AWRMG-MAW) |

### Electronic Low Voltage ELV Reverse Phase Controls

| | | |
|---|---|---|
| Lutron | Diva Series | (Part Number DVELV-300) |
| Lutron | Nova T Series | (Part Number NTELV-300) |
| Lutron | Vierti Series | (Part Number VTELV-600) |

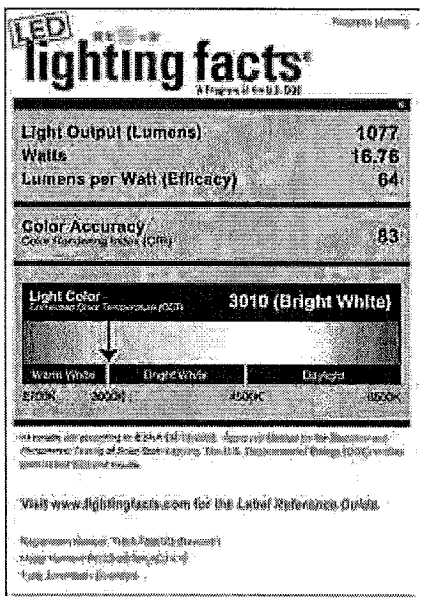
### LED Rated Controls

| | |
|---|---|
| Pass & Seymour | (Part Number DCL453PTCCCV6) |

Incandescent Digital type dimmers are not recommended.

Dimming capabilities will vary depending on the dimmer control, load, and circuit installation.
Always refer to dimmer manufacturer instructions or a controls specialist for specific requirements.

Dimmer control brand names where identified above are trade names or registered trademarks of each respective company.



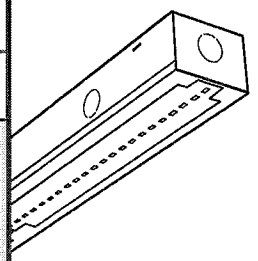
# LED STRIP 75

**SUBMITTAL:** Mechanical/Sprinkler room fixtures

**JOB:**

**TYPE:** **VOLTAGE:**

LED

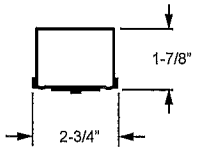


EXAMPLE: **75** - **4** - **LED*PH85/840** - **OPTIONS** - **EDD*PH** - **UNV**

| SERIES | NOMINAL LENGTH | LED PACKAGE | OPTIONS/ ACCESSORIES | DRIVER | VOLTAGE |
|---|---|---|---|---|---|

## FEATURES

- Small fixture profile allows inconspicuous placement in coves or confined spaces.
- Row applications produce continuous light with minimal interruption between fixtures.
- LED technology provides high efficacy and energy efficiency.
- Power and light levels can be custom set to meet energy and design needs in applications ranging from coves to high-ceiling common areas.
- 0-10V, DALI, and step-dimming available.
- Rated for 50,000 hours at 70% lumen maintenance (L70).
- 80 CRI minimum.
- Special reflectors are available to provide precise light distribution.
- This fixture is proudly made in the USA.




## SPECIFICATIONS

**Housing** – 22-gauge die-formed C.R.S.
**Finish** – 92% minimum average reflective white polyester powder coat bonded to phosphate-free, multi-stage pretreated metal. All parts painted after fabrication to facilitate installation, increase efficiency, and inhibit corrosion.
**LED Module** – Philips Fortimo LED light engine.
**Electrical** – Xitanium constant current, Class 2 driver.
**Mounting** – Surface or suspended.
**Labels** – cETLus conforms to UL STD 1598. Certified to CAN/CSA STD C22.2 No. 250.0. Suitable for damp locations.
**Warranty** – 5-year limited fixture warranty, see www.hewilliams.com.

## ORDERING INFORMATION

### SERIES

| | |
|---|---|
| **75** | LED Strip |

### NOMINAL LENGTH

| | |
|---|---|
| **2** | 2' |
| **4** | 4' |
| **8** | 8' |

### LED PACKAGE

| EXAMPLE: LED*PH85/840 | | |
|---|---|---|
| PREFIX | NOMINAL LUMENS | MINIMUM CRI & CCT |
| **2' LUMEN PACKAGES** | | |
| LED* | **PH15** = 1500[1]<br>**PH20** = 2000[1]<br>**PH30** = 3000<br>**PH40** = 4000 | **830** = 80 CRI, 3000K<br>**835** = 80 CRI, 3500K<br>**840** = 80 CRI, 4000K |
| **4' LUMEN PACKAGES** | | |
| LED* | **PH30** = 3000<br>**PH50** = 5000<br>**PH65** = 6500<br>**PH85** = 8500 | **830** = 80 CRI, 3000K<br>**835** = 80 CRI, 3500K<br>**840** = 80 CRI, 4000K |
| **8' LUMEN PACKAGES** | | |
| LED* | **PH60** = 6000<br>**PH100** = 10000<br>**PH130** = 13000<br>**PH170** = 17000 | **830** = 80 CRI, 3000K<br>**835** = 80 CRI, 3500K<br>**840** = 80 CRI, 4000K |

Additional LED packages ranging from 1500-4000 (2' units), 3000-8500 (4' units), and 6000-17000 (8' units) lumens available, consult factory.

### OPTIONS

| | |
|---|---|
| **EM/BSL310** | Emergency LED driver (nominal 1300 lumens module output in EM mode; 4' and 8' only) |

### ACCESSORIES (ordered separately)

See back for **special reflectors**, ordered separately.

| | |
|---|---|
| **WG-7511-LED** | 11-gauge white powder coat wireguard |
| **WG-7514-LED** | 14-gauge white powder coat wireguard |
| **315** | 1-1/2" ceiling spacer |
| **VBY** | (2) Y-hangers |
| **VBY-2** | (2) Y-hangers and (2) 2' chains |

### DRIVER

| | |
|---|---|
| **EDD*PH** | Philips Xitanium LED dimming driver prewired for 0-10V controls |
| **EDD*PH*DALI** | Philips Xitanium DALI dimming driver |
| **EDSD40*PH** | Philips Xitanium 40% step-dimming driver (must specify 120V or 277V) |
| **EDD*PH*MKX** | Philips Xitanium Mark X line voltage dimming driver (must specify 120V or 277V) |

### VOLTAGE

| | |
|---|---|
| **120** | 120V |
| **277** | 277V |
| **UNV** | 120-277V |

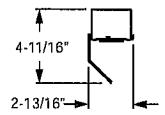
[1] Not available with EDSD40*PH and EDD*PH*MKX.

## SPECIAL REFLECTORS

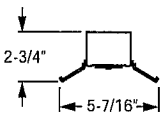
Reflectors are ordered separately.

**Example:**
**R1172-4-75LED REFL**

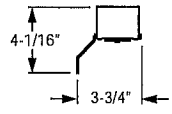
**R1015**



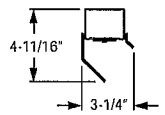

**R1172**




**R1324**




**R1684**

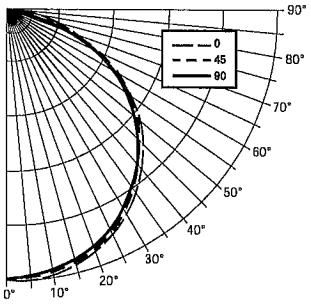



## PHOTOMETRY

Catalog #: **75-4-LED*PH85/840-EDD*PH**

### TEST REPORT INFORMATION

- Test Report #: 17875.0
- Date: 01/03/14
- Lamp Type: Philips Fortimo LED light engine
- **Rated Lumens: 8470**
- **Watts: 71.6**
- **Lumens Per Watt: 118.3**
- **CRI: 83.6**
- **CCT: 4053K**




### CANDLEPOWER DISTRIBUTION

| Vertical Angle | Horizontal Angle 0° | 45° | 90° | Zonal Lumens |
|---|---|---|---|---|
| 0° | 2874. | 2874. | 2874. | |
| 5° | 2895. | 2865. | 2854. | 273.8 |
| 15° | 2815. | 2778. | 2770. | 788.6 |
| 25° | 2643. | 2604. | 2590. | 1208.3 |
| 35° | 2397. | 2348. | 2320. | 1480.4 |
| 45° | 2050. | 1991. | 1975. | 1546.3 |
| 55° | 1622. | 1568. | 1548. | 1412.3 |
| 65° | 1115. | 1061. | 1040. | 1067.9 |
| 75° | 577. | 539. | 527. | 574.1 |
| 85° | 103. | 115. | 100. | 118.4 |
| 90° | 9. | 14. | 9. | |

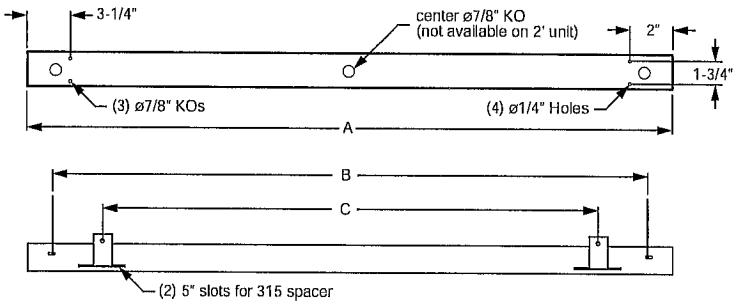
### LUMEN SUMMARY

| Zone | Lumens | % Fixture |
|---|---|---|
| 0 - 30 | 2271. | 26.8 |
| 0 - 40 | 3751. | 44.3 |
| 0 - 60 | 6710. | 79.2 |
| 0 - 90 | 8470. | 100.0 |
| **Total Luminaire:** | | |
| 0 - 180 | 8470. | 100.0 |

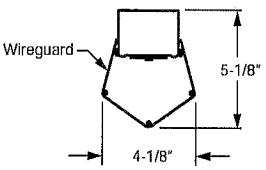
IES Spacing Criteria: End = 1.3
Across = 1.3

## FIXTURE DETAILS

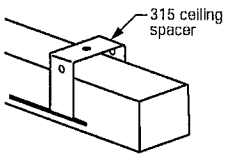
| | Nominal Fixture Length 2' | 4' | 8' |
|---|---|---|---|
| Actual Length (A) | 22-1/4" | 44-1/2" | 88-3/4" |
| VBY Hanger (B) | 19" | 41" | 85" |
| 315 Spacer (C) | 12" | 34" | 78" |



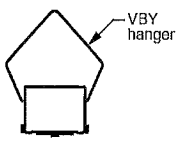

### ACCESSORIES DETAILS




**WG-7511-LED**
Wireguard
shown installed




**315**
Ceiling spacer
shown installed




**VBY**
Y-hanger
shown installed



Williams FLUORESCENT LIGHTING
H.E. Williams, Inc. ▪ Carthage, Missouri ▪ www.hewilliams.com ▪ 417-358-4065 ▪ Fax: 417-358-6015

Information contained herein is subject to change without notice.

# EVC Series

## *Architectural LED Combination Exit/Emergency Light*

| Catalog Number | |
|---|---|
| Comments | Type |

## FEATURES

### Application
The EVC Series is a compact architectural LED combination exit and emergency light designed for fast installation and reliable service. The EVC Series has a flame-rated, UV stable thermoplastic housing with a lightly textured white or black finish. Integral LED based lamp-heads are fully adjustable. Unit provides a full 90 minutes of exit and emergency lighting. Includes micro-controller based 3 stage constant current/constant voltage charger, and a long-life lithium iron phosphate(LiF$^{P}$) battery. The EVC accepts 120/277VAC input at 50 or 60Hz. and optional 220-240VAC input at 50 or 60 HZ with self-diagnostics option.

### Construction
The EVC Series housing and canopy are made from durable injection molded ABS thermoplastic. Lamp-head front halves are made of die-cast aluminum for thermal dissipation. Back half of lamp-head made of ABS thermo-plastic. LED lens are made of acrylic.

### Installation
EVC Series can be wall mounted by use of back-plate with molded-in template, or ceiling and end mounted with the use of supplied canopy to standard 3 ½" or 4" square or octagonal electrical boxes. Conduit entry through a molded-in entry point at the top center. Pre-stripped AC input leads provided.

### Illumination
The EVC Series provides bright and uniform illumination and increased coverage by using 2 high power LED's which are mounted in a specially designed heat dissipating lamp-head. Exit cavity illumination by red or green LED's with 10 year lifecycle. Each lamp-head is fully adjustable to the front or rear and side to side by use of a dual axis ratcheting design. Photometrics are available for download at www.dual-lite.com.

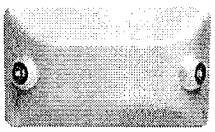
### Compliances
Listed to UL924 Standard, NFPA 101, NFPA 70
Damp Location Listed Optional

### Warranty
LED Lifetime Warranty
EVC Full 3 year warranty
EVC with Spectron® Full 5 year warranty

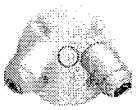
## ACCESSORIES

| | |
|---|---|
| **EV Unit** | 2 LED Indoor Emergency Light |
| **EVR2** | 2 LED Remote |
| **EVO** | 2 LED Outdoor Remote |
| **EVR2B** | 2 LED Remote with Black Finish |
| **VRS3** | Vandal Resistant Shield |

Reference "Remote Heads and Fixtures" specification sheet for information on matching LED remote heads



**EVR2 Indoor Remote**



**EVO Outdoor Remote**

## ORDERING GUIDE

**EVC** U

| Series | Faces | Letter Color | Finish | Application | Self-Diagnostics | Options |
|---|---|---|---|---|---|---|
| | **U** Universal Face | **R** Red<br>**G** Green | **W** White<br>**B** Black[7] | **Blank** Standard Model<br>**D4** 2 LED Remote Capacity<br>**D** Damp Listed[2] | **Blank** No Self-Diagnostics<br>**I** Spectron® Self-Diagnostics[6] | **-0** No Lamp-heads[3]<br>**-FAP** Fire Alarm Panel[1,5]<br>**-FM** Flasher Module[1,5]<br>**-AF** Audible Flasher[1,5]<br>**-24K** 220-240VAC 50,60Hz with Spectron®[4] |

[1] Can only be specified with Spectron® Self-Diagnostics and remote capacity
[2] Damp Location Listed not available with EVCURW and EVCUGW base models, standard with all other models
[3] No-head option only available on the EVC with remote capacity
[4] -24K option only available with Spectron® Self-Diagnostic and remote capacity
[5] FAP, FM or AF options may not be specified together
[6] Spectron® Self-Diagnostics only available with damp
[7] Black finish only available with damp option

**NOTE: Remote Capacity Option will only power the EVR2 and EVO remotes**

Hubbell Lighting, Inc.

# EVC Series

## *Architectural LED Combination Exit/Emergency Light*

## SPECIFICATIONS

### Electronics

Upon failure of normal utility power, a solid-state transfer switch automatically activates the emergency LED lamp-heads and exit LED's. Upon resumption of normal utility power, the battery is disconnected from the load and recharged through a micro-controller based 3 stage constant current/constant voltage charger. The battery is a maintenance-free Lithium Iron Phosphate (LiFePO) type which operates at 6.4 VDC. The EVC series accepts dual-voltage input of 120 or 277VAC at 50 or 60 Hz, or an optional 220-240VAC input at 50 or 60 Hz. A low voltage battery disconnect (LVD) feature protects the battery from severe damage during prolonged power failures. Manual testing is available at any time using the push-to-test button.

Number of Lamps- 2 High Power LEDs at 1 watt each configured so that if 1 lamp malfunctions, the remaining lamp will continue to provide illumination.

**Lamp Color:** Cool White

**Total Lamp Output:** 88 Lumens per LED

**System efficacy:** 80lm/W

**Rated LED lifecycle:** greater than 100,000 hrs or 10 years

### Standard Features Include:

- External push-to-test switch and AC-on indicator
- Battery re-charge within 24 hours
- AC Lock-out circuit
- Low voltage battery disconnect
- Conduit entry located at the top center
- Microprocessor controlled pulse charger

### Optional Spectron Feature:

- Self-diagnostics monitors LED status, LED load transfer circuit, battery capacity and charger function and displays any fault detection by means of a flashing code
- Self-Test feature automatically runs a 1 minute test once a month and an alternating 30 or 60 minute test once every 6 months. Multi-color LED indicator provides visible fault detection and charging status.
- User initiated 1 or 90-minute system test feature
- 15 minute re-transfer delay
- Automatic unit transfer in brown-out conditions (below 80% of nominal AC input voltage)

### Operating Temperature Range:

Standard: 68°F to 86°F (20° to 30°C)

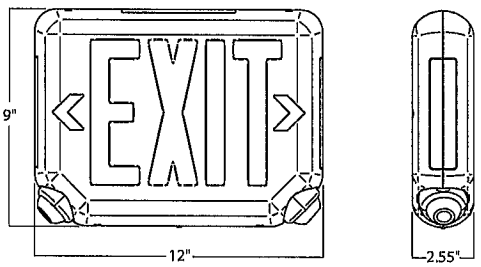
Damp Listed: 50°F to 104°F (10° to 40°C)

**Weight:** 2.0 lbs

## MAXIMUM POWER CONSUMPTION

| | AC Voltage | Hz. | Amps. | Watts | Power Factor |
|---|---|---|---|---|---|
| EVC | 120 | 60 | 0.021 | 1.65 | 0.65 |
| | 277 | 60 | 0.017 | 2.42 | 0.52 |

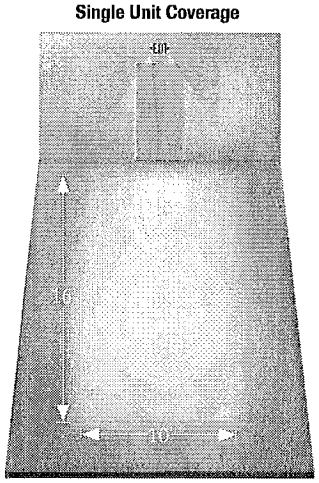
## DIMENSIONS




Overall height with Canopy is 9.8"

## APPLICATION INFORMATION

**Single Unit Coverage**




| 1 fc Average | |
|---|---|
| Depth (D) | Width (W) |
| 16' | 10' |
| **1 fc Minimum** | |
| Depth (D) | Width (W) |
| 6' | 10' |

Meets Life Safety Code minimum illuminance of 0.1 fc and average illuminance of 1.0 fc. Assumes open space with no obstructions, mounting height of 7.5', ceiling height of 9' and reflectances of 80/50/20. Photometry files available on the Dual-Lite web site (www.dual-lite.com).

Web: www.dual-lite.com • Tech Support: (866)-313-3909
701 Millennium Blvd. • Greenville, SC 29607 U.S.A.
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Hubbell Lighting, Inc.

0603543 A 11/12

# EV Series

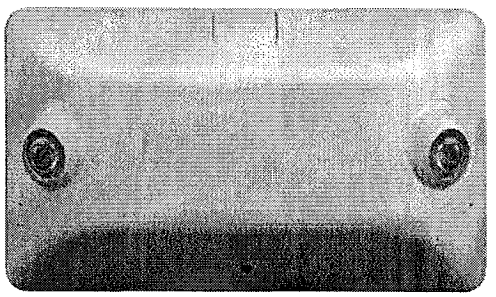
## *Architectural LED Emergency Light*

| Catalog Number | |
|---|---|
| Comments | Type |

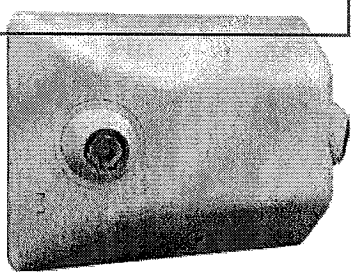
## FEATURES

### Application

The EV Series is a compact architectural emergency lighting unit designed for fast wall mount installation and reliable service. The EV Series has a flame-rated, UV stable thermoplastic housing and a lightly textured white finish. Integral LED based lamp-heads are fully adjustable. Unit provides a full 90 minutes of emergency lighting. Includes micro-controlled pulse charger and nickel metal hydride (NiMH) battery. The EV accepts 120/277VAC input at 60 Hz and optional 220-240VAC input at 50-60 Hz with self-diagnostics option.



**Patents Pending**



### Construction

The EV Series housing and back-plate are made from durable injection molded thermoplastic. Lamp-head front halves are made of die-cast aluminum for thermal dissipation. Back half of lamp-head made of ABS thermoplastic. LED lens are made of acrylic.

### Installation

Universal mounting template molded in the back plate aids in quick installation. Unit mounts to all single gang and standard 3 1/2" and 4" square or octagonal electrical boxes. Conduit entry through a molded-in knock-out at the top center. Pre-stripped AC input leads provided. Unit may be ceiling or wall mounted.

### Illumination

The EV Series provides bright and uniform illumination and increased spacing by using 2 high power LEDs which are mounted in a specially designed heat dissipation lamp-head. Each lamp-head is fully adjustable and positioning is maintained by a friction fit design. Photometrics are available for download at www.dual-lite.com.

### Compliances

Listed to UL924 Standard, NFPA 101, NFPA 70
Damp Location Listed Optional
RoHS

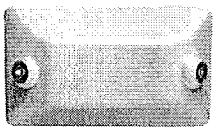
### Warranty

LED Lifetime Warranty
EV Full 3 year warranty
EV with Spectron® Full 5 year warranty

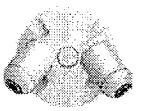
## ACCESSORIES

| | |
|---|---|
| **EVR2** | 2 LED Remote |
| **EVO** | 2 LED Outdoor Remote |
| **EVR2B** | 2 LED Remote with Black Finish |
| **WGLZ** | Wire Guard - 6 ¼"H x 14"L x 4"D |
| **VRS3** | Vandal Resistant Shield - 11 ½"H x 15 ½"L x 4 ½"D |

**Reference "Remote Heads and Fixtures" specification sheet for information on matching LED remote heads**



**EVR2 Indoor Remote**



**EVO Outdoor Remote**

## ORDERING GUIDE

**EV**

| Series | Capacity | Rating | Self-Diagnostics | Options |
|---|---|---|---|---|
| | **2** 1W LED heads<br>**4** 2W LED heads[4] OR 1W LED w/ remote cap.[1] | **Blank** Standard Model<br>**D** Damp Location Listed[2] | **Blank** No Self-Diagnostics<br>**I** Spectron® Self-Diagnostics | **B** Black Finish<br>**-24K** 220-240VAC 60Hz with Spectron®[3]<br>**-02L** 2 watt LED heads[5] |

[1] Capacity to run 2 head remote
[2] EV2 available with or with-out damp listing, all other models include damp
[3] -24K option only available with damp plus Spectron®
[4] Not capable of running remote heads
[5] Can only be run from EV4 model

**NOTE: Remote Capacity Option will only power the EVR2 and EVO remotes**

HUBBELL Lighting

# EV Series

## *Architectural LED Emergency Light*

## SPECIFICATIONS

### Electronics

Upon failure of normal utility power, a solid-state transfer switch automatically activates the emergency LED lamp-heads. Upon resumption of normal utility power, the battery is disconnected from the load and recharged through a microprocessor controlled pulse charger. The battery is a maintenance-free Nickel Metal Hydride(NiMH) type. The EV series accepts dual-voltage input of 120 or 277VAC at 60 Hz, or an optional 220-240VAC input at 50-60 Hz. A low voltage battery disconnect (LVD) feature protects the battery from severe damage during prolonged power failures. Manual testing is available at any time using the push-to-test button.

Number of Lamps- 2 High Power LEDs at 1 watt each configured so that if 1 lamp malfunctions, the remaining lamp will continue to provide illumination.

**Lamp Color:** Cool White

**Total Lamp Output:** 1W, 88 Lumens per LED
2W (optional), 145 Lumens per LED

**System efficacy:** 80lm/W

**Rated LED lifecycle:** greater than 100,000 hrs.

### Standard Features Include:

- Intelligent 2-wire input connection
- External push-to-test switch and AC-on indicator
- Battery re-charge within 24 hours
- AC Lock-out circuit
- Low voltage disconnect
- Conduit entry knock-out located at the top center
- Microprocessor controlled pulse charger

### Optional Spectron Feature:

- Self-diagnostics monitors LED status, LED load transfer circuit, battery capacity and charger function and displays any fault detection by means of a flashing code
- Self-Test feature automatically runs a 1 minute test once a month and an alternating 30 or 60 minute test once every 6 months. Multi-color LED indicator provides visible fault detection and charging status.
- User initiated 1 or 90-minute system test feature
- 15 minute re-transfer delay
- Automatic unit transfer in brown-out conditions (below 80% of nominal AC input voltage)

**Operating Temperature Range:**

Standard: 68° to 86°F (20° to 30°C)

Damp Listed: 50° to 104°F (10° to 40°C)

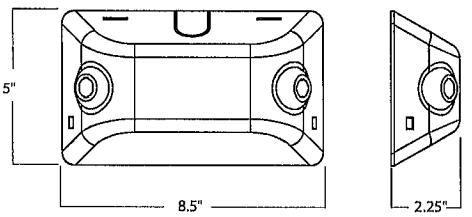
**Weight:** 2.0 lbs

## MAXIMUM POWER CONSUMPTION

| | AC Voltage | Hz. | Amps. | Watts | Power Factor |
|---|---|---|---|---|---|
| EV2 EV2D | 120 | 60 | 0.015 | 1.10 | 0.61 |
| | 240 | 60 | 0.009 | 1.43 | 0.62 |
| | 277 | 60 | 0.008 | 1.45 | 0.62 |
| EV4D | 120 | 60 | 0.022 | 2.00 | 0.73 |
| | 240 | 60 | 0.015 | 2.51 | 0.65 |
| | 277 | 60 | 0.014 | 2.75 | 0.63 |

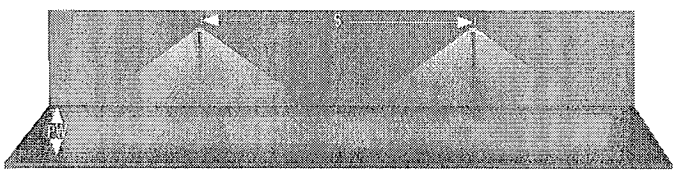
The EV Series meets proposed California Energy Commission(CEC) requirements for limits on power consumption in maintenance mode with less than 0.5 watts.

## DIMENSIONS



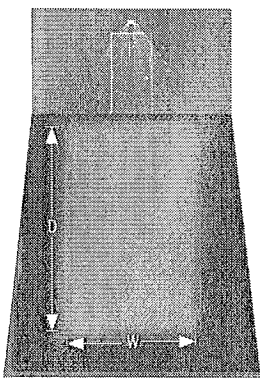

## APPLICATION INFORMATION

**Multi-Unit Spacing**




| 1 fc Average | | | 1 fc Minimum | | |
|---|---|---|---|---|---|
| | Using 1 Watt Heads | Using 2 Watt Heads | | Using 1 Watt Heads | Using 2 Watt Heads |
| Path Width (PW) | Spacing (S) | Spacing (S) | Path Width (PW) | Spacing (S) | Spacing (S) |
| 3' | 27' | 39' | 3' | 14' | 18' |
| 6' | 20' | 33' | 6' | 10' | 14' |

**Single Unit Coverage**




| 1 fc Average | |
|---|---|
| Using 1 Watt Heads | |
| Depth (D) | Width (W) |
| 16' | 10' |
| Using 2 Watt Heads | |
| Depth (D) | Width (W) |
| 26' | 10' |

| 1 fc Minimum | |
|---|---|
| Using 1 Watt Heads | |
| Depth (D) | Width (W) |
| 6' | 10' |
| Using 2 Watt Heads | |
| Depth (D) | Width (W) |
| 9' | 10' |

Meets Life Safety Code minimum illuminance of 0.1 fc and average illuminance of 1.0 fc. Assumes open space with no obstructions, mounting height of 7.5', ceiling height of 9' and reflectances of 80/50/20. Photometry files available on the Dual-Lite web site (www.dual-lite.com).

Web: *www.dual-lite.com* • Tech Support: *(866)-313-3909*
701 Millennium Blvd. • Greenville, SC 29607 U.S.A.
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HUBBELL Lighting

*0603491 B 9/13*

# LAREDO SERIES

LMC - 30LEDs

Cat.#

Job: Exterior at driveway 30' mounting height

Type: WL

**HUBBELL Outdoor Lighting**

Approvals

## SPECIFICATIONS

**Intended Use:**
Full cut-off IDA compliant perimeter or entry lighting for 12-18ft mounting heights that require high light output and maximum energy efficiency. Laredo LMC-30 LED wallpack provides low installation costs with little or no maintenance and 60%+ energy savings. Ideal for schools, factories, hospitals, warehouses and retail applications.

**Construction:**
Decorative die-cast aluminum housing and door. Rugged design protects internal components and provides excellent thermal management for over 70% lumen maintenance at 50,000 hours minimum LED life. Lektrocote® series powder paint finishes provide lasting appearance in outdoor environments. Five standard finishes include: Bronze, Black, Gray, White and Platinum.

**Optics/Electrical**
**LED:**
30 High power LEDs delivers up to 6070 lumens at 700mA and up to 3489 lumens at 350mA. Variety of distributions – Types II, III and IV (Forward throw). High CRI LEDs provide excellent color rendition with up to 100 lumens per watt efficiency.

- CCT- 5100K/ 67 CRI, 4200K/ 70 CRI, 3000K/ 80 CRI
- Electronic driver 71w system, 0.4 AMPS max, or 35w, 0.3 amps max, 120-277V, 50/60Hz. 0-10V dimming 120-277V only.
- 10 KVA surge protector

**Lenses:**
Full cut-off distribution - individual acrylic LED optics provide IES Type III and Type IV distributions.

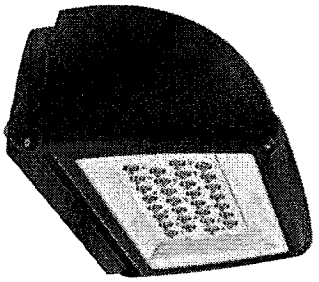
**Installation:**
Quick mount system provides rigid mounting over recessed junction boxes – fixture does not require opening for mounting. Foam gasket for sealing to smooth surfaces provided. Superior performance with 5 to 1 spacing to mounting height ratio. Minimum operating temperature is -40°C/ -40°F.

**Listings:**
- Listed to UL1598 for wet locations
- UL certified for thru-wiring
- 25° C ambient environments
- U.S. Patent No. D563,587
- DesignLights Consortium (DLC) qualified, Consult DLC website for more details: http://www.designlights.org/QPL

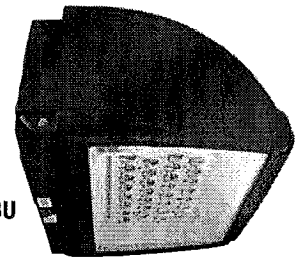
**LMC-30LU Egress Wallpack:**
Designed to meet strict 1fc minimum requirements. At 12ft mounting height 1fc covers 16x16ft area, well beyond the 10x10ft standard. 44w - 350mA drives 30LEDs at 3500 lumens at full power/ 2046 average lumens in battery mode. Outer clear impact resistant glass lens protects LED lenses. No uplight, external test button, quick mount, wet location listed. (Note: must use Type III)

**Warranty:**
Five year limited warranty (for more information visit: http://www.hubbelloutdoor.com/resources/warranty/

## PRODUCT IMAGE(S)

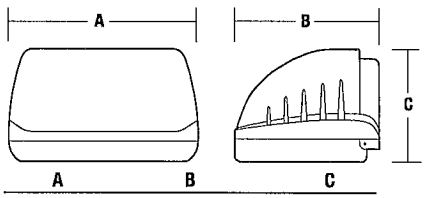


LMC-30LU



LMC-30LU BOC/BBU

## DIMENSIONS




| A | B | C |
|---|---|---|
| 16.0" (406 mm) | 12.125" (308 mm) | 9.0" (229 mm) |

## ORDERING INFORMATION

ORDERING EXAMPLE: LMC-30LU-5K-3-1-PC(4)

LMC - 30LU - 5K - [ ] - [ ] - [ ] - [ ]

| SERIES | NUMBER OF LEDS/SOURCE/VOLTAGE | CCT | IES DISTRIBUTION | DRIVE CURRENT | FINISH | OPTIONS |
|---|---|---|---|---|---|---|
| **LMC** Laredo Medium Cut-off | **30LU** 30 LEDs, 71w input, Universal voltage 120-277V<br>**30LF** 30 LEDs, 71w input, 347V | **3K** 3000K nominal<br>**4K** 4200K nominal<br>**5K** 5100K nominal | **2** Type II<br>**3** Type III<br>**4** Type IV (Forward throw) | **BLANK** STD 700MA<br>**035** 350MA | **1** Bronze<br>**2** Black<br>**3** Gray<br>**4** White<br>**5** Platinum | **PC(X)**[1] Button photocontrol, replace X with voltage, specify 1-120V, 2-208V, 3-240V, 4-277V<br>**WIH** In fixture wireless control module, (120V & 277V only) order separately, consult factory |

## ORDERING INFORMATION EGRESS LMC-30LU

ORDERING EXAMPLE: LMC-30LU-5K-3-035-1-BBU277

LMC - 4EP - [ ] - 3 - 035 - [ ] - [ ]

| SERIES | NUMBER OF LEDS/SOURCE/VOLTAGE | CCT | IES DISTRIBUTION | DRIVE CURRENT | FINISH | OPTIONS |
|---|---|---|---|---|---|---|
| **LMC** Laredo Medium Cut-off | **30LU** 30 LEDs, 43w input, Universal voltage 120-277V<br>**30LF** 30 LEDs, 43w input, 347V | **4K** 4200K nominal<br>**5K** 5100K nominal | **3**[2] Type III | **035** 350MA | **1** Bronze<br>**2** Black<br>**3** Gray<br>**4** White<br>**5** Platinum | **BBU277** Integral battery for 120-277V rated for -20° C ambient<br>**BOC277** Integral battery for 120-277V rated for 0° C ambient<br>**PC(X)** Button photocontrol, replace X with voltage, specify 1-120V, 2-208V, 3-240V, 4-277V |

1 PC(X) Replace X with 1-120V, 2-208V, 3-240V, 4-277V
2 Egress versions only Type III


HUBBELL Outdoor Lighting
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Due to our continued efforts to improve our products, product specifications are subject to change without notice.

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# LNC SERIES

Cat.#

Job: Building Lights

Type: WS

**HUBBELL Outdoor Lighting**

Approvals

## SPECIFICATIONS

**Intended Use:**
The compact LED LNC is designed for entry/perimeter illumination for safety, security and identity. Typical mounting height is up to 12 feet with 40ft fixture spacing (without acrylic diffuser) and 30ft spacing with acrylic diffuser installed. Photocontrol option is available to provide dusk-to-dawn control for additional energy savings.

**Construction:**
Decorative die-cast aluminum housing and door. Rugged design protects internal components and provides excellent thermal management for long life – 60,000 hours minimum LED life at L96 rating per IESNA TM-21-11. Powder paint finishes provide lasting appearance in outdoor environments.

**Optics/Electrical**
**LED:**
Drivers are 120-277V, 50/60Hz 5000K/70 CRI Type III and Type IV lenses provide wide lateral spread. 0-10V dimming 120-277V only.

- LNC5L – 5 LEDs, 12.6w, .11 amp max, 967 lumens, Type III only
- LNC7L – 7 LEDs, 16.4w, .14 amp max, 1389 lumens, Type III or IV
- LNC9L – 9 LEDs, 20.6w, .18 amp max, 1745 lumens, Type III or IV
- Minimum operating temperature is -40°C/-40°F

**Lenses:**
Full cut-off distribution; Ambient diffuser included, use for applications near enterances or locations where reduced brightness is desired.

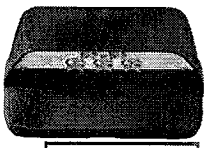
**Installation:**
Quick mount adapter provides quick installation, designed for both recessed box or surface conduit wiring. Fits 4" square junction box.

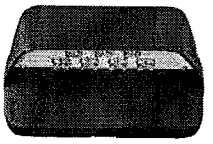
**Listings:**
Listed and labeled to UL 1598 for wet locations, 25° C ambient environments. Some models meet DesignLights Consortium (DLC) qualifications, consult DLC website for more details: http://www.designlights.org/QPL

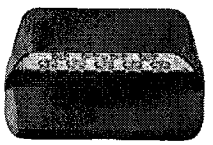
- IES Progress Award Winner - 2012

**Warranty:**
Five year limited warranty (for more information visit: http://www.hubbelloutdoor.com/resources/warranty/

## PRODUCT IMAGE(S)

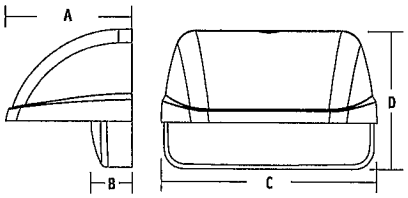

LNC-5L


LNC-7L


LNC-9L

With diffuser

## DIMENSIONS




| A | B | C | D |
|---|---|---|---|
| 4.81" (122 mm) | 1.55" (39 mm) | 8.22" (209 mm) | 5.25" (133 mm) |

## CERTIFICATIONS/LISTINGS

## SHIPPING INFORMATION

| Catalog Number | G.W(kg)/ CTN | Carton Dimensions | | | Carton Qty. per Master Pack |
|---|---|---|---|---|---|
| | | Length Inch (cm) | Width Inch (cm) | Height Inch (cm) | |
| LNC-5LU | 9.6 (4.36) | 14.5 (37) | 9.6 (24.5) | 6.8 (17.5) | 2 |
| LNC-7LU | 9.6 (4.36) | 14.5 (37) | 9.6 (24.5) | 6.8 (17.5) | 2 |
| LNC-9LU | 9.6 (4.36) | 14.5 (37) | 9.6 (24.5) | 6.8 (17.5) | 2 |

## ORDERING INFORMATION LNC-5L and LNC-7L/9L *(Order tree below)*

| CATALOG NUMBER | WATTAGE | NUMBER OF LEDS | VOLTAGE | LUMENS[1] | LIFE[2] | CCT | WEIGHT LBS. (KG) |
|---|---|---|---|---|---|---|---|
| LNC-5LU-5K | 12.6w | 5 | 120-277V | 967 | 60,000hrs | 5000k | 4.0 (1.8) |
| LNC-5LU-5K-PC | 12.6w | 5 | 120V | 967 | 60,000hrs | 5000k | 4.0 (1.8) |

1 Acrylic diffuser accessory lumen output is 650 with increased uniformity in the Type III distribution
2 Projected per IESNA TM-21-11

ORDERING EXAMPLE: LNC-9LU-5K-3-1-PC1

LNC - [ ] - [ ] - [ ] - [ ] - [ ]

**SERIES**
**LNC** Laredo Cut-off

**NUMBER OF LEDS/SOURCE/VOLTAGE**
**7LU** 7 LEDs, Universal voltage 120-277V
**9LU**[3] 9 LEDs, Universal voltage 120-277V

**CCT**
**3K** 3000K nominal, 70 CRI
**4K** 4200K nominal, 70 CRI
**5K**[3] 5000K nominal
**AM**[2] Amber (590 µm available for "Turtle Friendly"/ observatory applications, 350 mA (consult factory)

**IES DISTRIBUTION**
**3**[3] Type III
**4**[3] Type IV

**FINISH**
**1** Bronze
**2** Black
**3** Gray
**4** White
**5** Platinum

**OPTIONS**
**PC(X)**[1] Button photocontrol, replace X with voltage, specify 1-120V, 2-208V, 3-240V, 4-277V

1 When PC is ordered, input must match PC voltage
2 Amber LEDs only available on 7LU and 9LU configurations, 350 mA only
3 DesignLights Consortium (DLC) qualified 5/7/9 models 5K only



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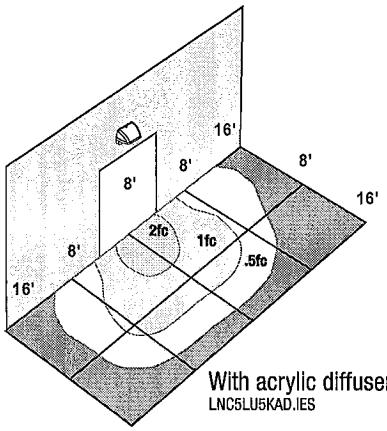
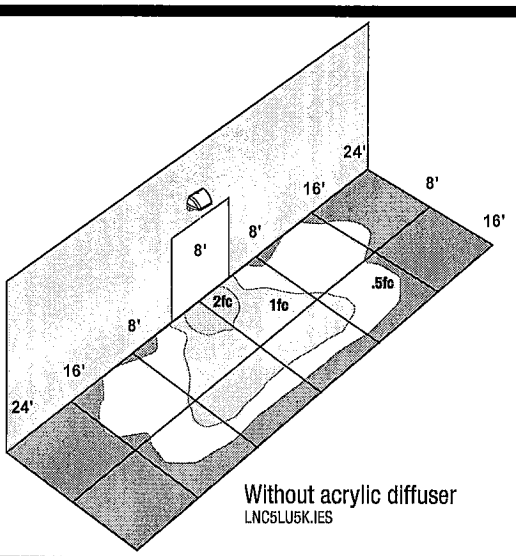
## REPLACEMENT PART

| CATALOG NUMBER | DESCRIPTION |
|---|---|
| 93039574 | Frosted comfort shield, improved uniformity with only 5% reduction |

## PHOTOMETRICS




With acrylic diffuser
LNC5LU5KAD.IES




Without acrylic diffuser
LNC5LU5K.IES

## PERFORMANCE DATA

| | | | | 5K (5100K nominal, 67 CRI) | | | | | 4K (4200K nominal, 70 CRI) | | | | | 3K (3000K nominal, 70 CRI) | | | | | AM (<580 nm wave-length) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # OF LEDS | DRIVE CURRENT | SYSTEM WATTS | DIST. TYPE | LUMENS | LPW[1] | B | U | G | LUMENS | LPW[1] | B | U | G | LUMENS | LPW[1] | B | U | G | LUMENS | LPW[1] | B | U | G |
| 5 | STD. (700mA) | 12.8W | 3 | 966 | 75 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| 7 | | 17.4W | 3 | 1389 | 80 | 0 | 0 | 1 | 1421 | 82 | 0 | 0 | 1 | 1046 | 60 | 0 | 0 | 1 | 268 | 16 | 0 | 0 | 0 |
| | | | 4 | 1441 | 83 | 0 | 0 | 1 | 1428 | 82 | 0 | 0 | 1 | 1071 | 62 | 0 | 0 | 1 | 309 | 19 | 0 | 0 | 0 |
| 9 | | 20.6W | 3 | 1745 | 85 | 0 | 0 | 1 | 1768 | 86 | 0 | 0 | 1 | 1310 | 64 | 0 | 0 | 1 | 347 | 17 | 0 | 0 | 0 |
| | | | 4 | 1806 | 88 | 0 | 0 | 1 | 1772 | 86 | 0 | 0 | 1 | 1317 | 64 | 0 | 0 | 1 | 382 | 19 | 0 | 0 | 0 |

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown. Actual performance may differ as a result of end-user environment and application.

## PROJECTED LUMEN MAINTENANCE

| | OPERATING HOURS | | | | | |
|---|---|---|---|---|---|---|
| Ambient Temp. | 0 | 25,000 | 50,000 | TM-21-11[1] L96 60,000 | 100,000 | L70 (hours) |
| 25°C / 77°F | 1.00 | 0.98 | 0.97 | 0.96 | 0.95 | >791,000 |
| 40°C / 104°F | 0.99 | 0.98 | 0.96 | 0.96 | 0.94 | >635,000 |

1. Projected per IESNA TM-21-11 * (Nichia 219B, 700mA, 85°C Ts, 10,000hrs)
Data references the extrapolated performance projections for the LNC-12LU-5K base model in a 40°C ambient, based on 10,000 hours of LED testing per IESNA LM-80-08.

## LUMINAIRE AMBIENT TEMPERATURE FACTOR (LATF)

| AMBIENT TEMPERATURE | | LUMEN MULTIPLIER |
|---|---|---|
| 0° C | 32° F | 1.02 |
| 10° C | 50° F | 1.01 |
| 20° C | 68° F | 1.00 |
| 25° C | 77° F | 1.00 |
| 30° C | 86° F | 1.00 |
| 40° C | 104° F | 0.99 |
| 50° C | 122° F | 0.98 |

Use these factors to determine relative lumen output for average ambient temperatures from 0-50°C (32-122°F).

## ELECTRICAL DATA

| # OF LEDS | DRIVE CURRENT (mA) | DRIVE CURRENT (mA) | INPUT VOLTAGE (V) | CURRENT (Amps) | SYSTEM POWER (w) |
|---|---|---|---|---|---|
| 5 | 1 | STD. (700mA) | 120 | 0.11 | 12.7 |
| | | | 277 | 0.05 | 12.7 |
| 7 | 1 | STD. (700mA) | 120 | 0.14 | 17.4 |
| | | | 277 | 0.07 | 17.4 |
| 9 | 1 | STD. (700mA) | 120 | 0.17 | 20.6 |
| | | | 277 | 0.09 | 20.6 |



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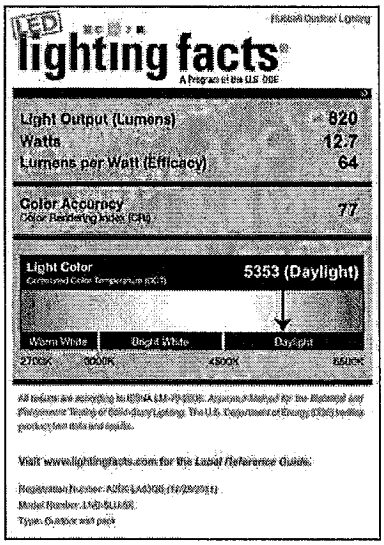
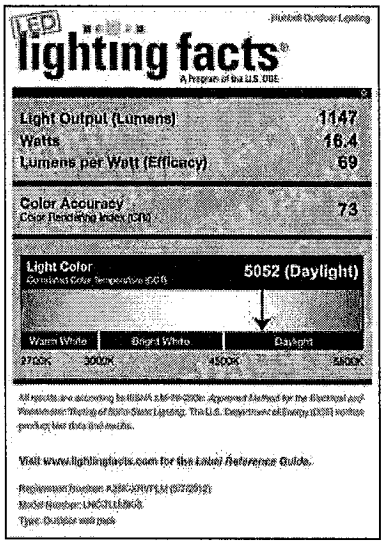
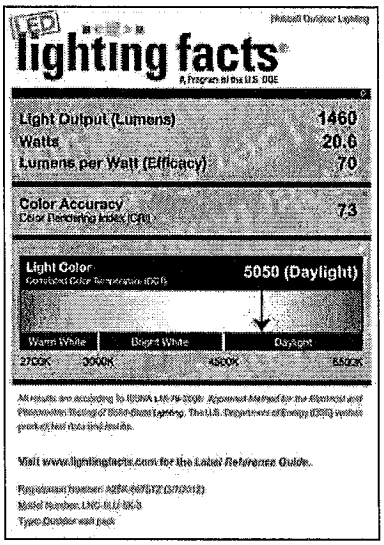
## LIGHTING FACTS





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# LNC2 SERIES

Cat.#

Job: Building Lights

Type: WS

**HUBBELL Outdoor Lighting**

Approvals

## SPECIFICATIONS

**Intended Use:**
The compact LED LNC2 is designed for perimeter illumination for safety, security and identity. This compact fixture has no uplight and is neighbor friendly with typical mounting height of 12-15ft. Units are supplied with an acrylic diffuser accessory that can be used for lower LED brightness near building entrances or other pedestrian areas. Units have protective polyester finish for long lasting appearance.

**Construction:**
Decorative die-cast aluminum housing protects components and provides an architectural appearance. Casting thermally conducts LED heat to provide optimum performance and long life. Powder paint finish provides durability in outdoor environments.

**Optics/Electrical:**
Class 2 electronic drivers (single in 12L units and dual in 18L units) feature 120-277V, 50/60 Hz input for universal usage with >90% power factor and <20% Total Harmonic Distortion (THD), 0-10V dimming 120-277V only.

**LED(s) CCT:**
3000K CCT nominal – 80 CRI, 4200K CCT nominal – 70 CRI, 5100K CCT nominal – 67 CRI

29 input watts, 12 LEDs deliver 2420 lumens with 85 LPW efficiency at 5100K CCT

45 input watts 18 LEDs deliver 3311 lumens at 78 LPW efficiency at 5100K CCT

Minimum operating temperature is -40°C/-40°F

**Optical:**
Cut-off Type III and IV distributions with individual PMMA acrylic lenses for wide lateral throw, maximum control and efficiency. Acrylic diffuser included where reduced LED brightness is desired.

**Lumen Maintenance:**
L96 at 60,000hrs (Projected per IESNA TM-21-11), see table on page 2 for all values.

**Installation:**
Quick-mount adapter provides easy installation to wall or to recessed junction boxes (4" square junction box). Gasket seal and secured by two Allen-head hidden fasteners for tamper resistance. Designed for direct j-box mount or conduit feed in single SKU.

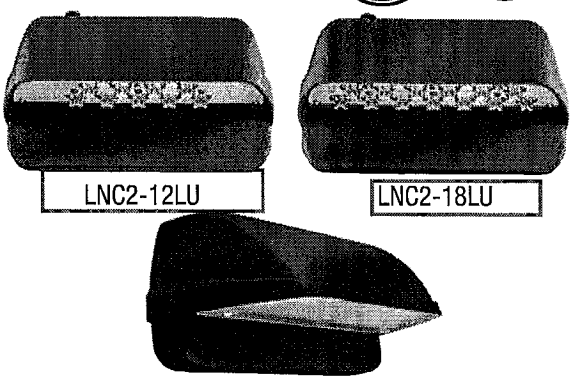
**Listings:**
- DLC Qualified, Consult DLC website for more details: http://www.designlights.org/QPL
- Listed to UL 1598 for use in wet locations, 40° C ambient environments. 25°C for 347V.

**Options:**
Button photocontrol for dusk to dawn energy savings

**Warranty:**
Five year limited warranty (for more information visit: http://www.hubbelloutdoor.com/resources/warranty/

- IES Progress Award Winner - 2013
- Building Operating Management 2014 Top Products Award - LNC2-18LU

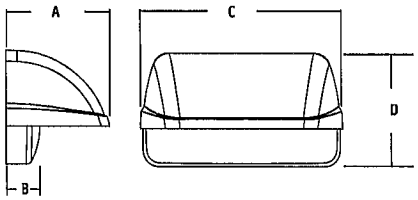
## PRODUCT IMAGE(S)






With diffuser

## DIMENSIONS




| A | B | C | D | Weight |
|---|---|---|---|---|
| 6.25" | 1.6" | 10.25" | 5.6" | 7.0 lbs. |
| 158.7 mm | 40.2 mm | 260.4 mm | 142.2 mm | 3.2 kg |

## SHIPPING INFORMATION

| Catalog Number | G.W(kg)/ CTN | Carton Dimensions | | | Carton Qty. per Master Pack |
|---|---|---|---|---|---|
| | | Length Inch (cm) | Width Inch (cm) | Height Inch (cm) | |
| LNC2-12LU | 14.3 (6.5) | 14.5 (37) | 11.4 (29) | 8.4 (21.5) | 2 |
| LNC2-18LU | 14.8 (6.7) | 14.9 (38) | 11.4 (29) | 8.4 (21.5) | 2 |

## CERTIFICATIONS/LISTINGS

C SP US · IDA Approved · LED · LED lighting facts LED Product Partner · Turtle Friendly · DLC QPL LISTED

## ORDERING INFORMATION

ORDERING EXAMPLE: LNC2-12LU-5K-3-1

W-1-LNC2-18LU-5K-4-1
W-2-LNC2-12LU-5K-4-1

LNC2 - [ ] - [ ] - [ ] - [ ] - [ ]

**SERIES**

**LNC2** Laredo LNC2

**NUMBER OF LEDS/SOURCE/VOLTAGE**

**12LU** 12 LEDs, 29w input, Universal voltage 120-277V

**18LU** 18 LEDs, 45w input, Universal voltage 120-277V

**CCT**

**3K** 3000K nominal 80 CRI

**4K** 4200K nominal 70 CRI

**5K** 5100K nominal 67 CRI

**AM**[1] Amber (590 µm available for "Turtle Friendly"/observatory applications, 350 mA (consult factory)

**IES DISTRIBUTION**

**3** Type III

**4** Type IV

**FINISH**

**1** Bronze
**2** Black
**4** White
**5** Platinum

**OPTIONS**

**PC(X)** Button photocontrol, replace X with voltage, specify 1-120V, 2-208V, 3-240V, 4-277V

1 Amber LEDs only available on 18LU configurations, 350 mA only. Universal Voltage 120V-277V

## REPLACEMENT PART

| CATALOG NUMBER | DESCRIPTION |
|---|---|
| 93044013 | Frosted comfort shield, improved uniformity with only 5% reduction |

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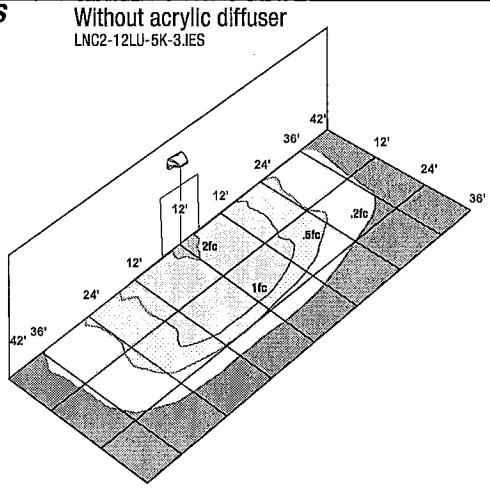
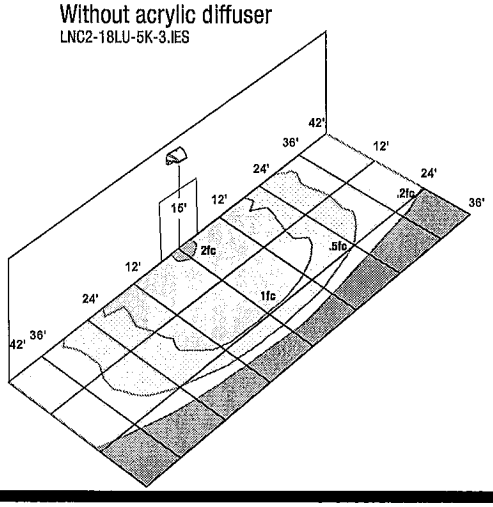
## PHOTOMETRICS

Without acrylic diffuser
LNC2-12LU-5K-3.IES




Without acrylic diffuser
LNC2-18LU-5K-3.IES




## PERFORMANCE DATA

| | | | | 5K (5100K nominal, 67 CRI) | | | | | 4K (4200K nominal, 70 CRI) | | | | | 3K (3000K nominal, 70 CRI) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # OF LEDS | DRIVE CURRENT | SYSTEM WATTS | DIST. TYPE | LUMENS | LPW[1] | B | U | G | LUMENS | LPW[1] | B | U | G | LUMENS | LPW[1] | B | U | G |
| 12 | STD. (700mA) | 28.6w | 3 | 2420 | 85 | 1 | 0 | 1 | 2246 | 79 | 0 | 0 | 1 | 1824 | 64 | 0 | 0 | 1 |
| | | | 4 | 2485 | 87 | 0 | 0 | 1 | 2291 | 80 | 0 | 0 | 1 | 1776 | 62 | 0 | 0 | 1 |
| 18 | | 44.5w | 3 | 3311 | 74 | 1 | 0 | 1 | 3069 | 69 | 1 | 0 | 1 | 2522 | 57 | 1 | 0 | 1 |
| | | | 4 | 3602 | 81 | 1 | 0 | 1 | 3225 | 72 | 1 | 0 | 1 | 2518 | 57 | 0 | 0 | 1 |

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown.
Actual performance may differ as a result of end-user environment and application.

## PROJECTED LUMEN MAINTENANCE

| | OPERATING HOURS | | | | | |
|---|---|---|---|---|---|---|
| Ambient Temp. | 0 | 25,000 | 50,000 | TM-21-11[1] L96 60,000 | 100,000 | L70 (hours) |
| 25°C / 77°F | 1.00 | 0.98 | 0.97 | 0.96 | 0.95 | >791,000 |
| 40°C / 104°F | 0.99 | 0.98 | 0.96 | 0.96 | 0.94 | >635,000 |

1. Projected per IESNA TM-21-11 * (Nichia 219B, 700mA, 85°C Ts, 10,000hrs)
Data references the extrapolated performance projections for the LNC-12LU-5K base model in a 40°C ambient, based on 10,000 hours of LED testing per IESNA LM-80-08.

## LUMINAIRE AMBIENT TEMPERATURE FACTOR (LATF)

| AMBIENT TEMPERATURE | | LUMEN MULTIPLIER |
|---|---|---|
| 0° C | 32° F | 1.02 |
| 10° C | 50° F | 1.01 |
| 20° C | 68° F | 1.00 |
| 25° C | 77° F | 1.00 |
| 30° C | 86° F | 1.00 |
| 40° C | 104° F | 0.99 |

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

## ELECTRICAL DATA

| # OF LEDS | DRIVE CURRENT (mA) | INPUT VOLTAGE (V) | CURRENT (Amps) | SYSTEM POWER (w) |
|---|---|---|---|---|
| 12 | STD. (700mA) | 120 | 0.25 | 28.6 |
| | | 277 | 0.11 | 28.6 |
| 18 | | 120 | 0.37 | 44.5 |
| | | 277 | 0.18 | 44.5 |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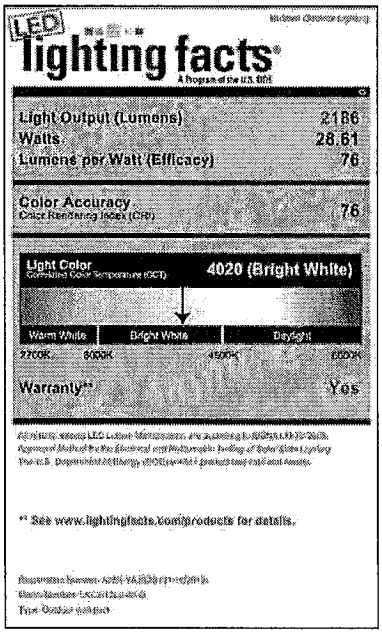
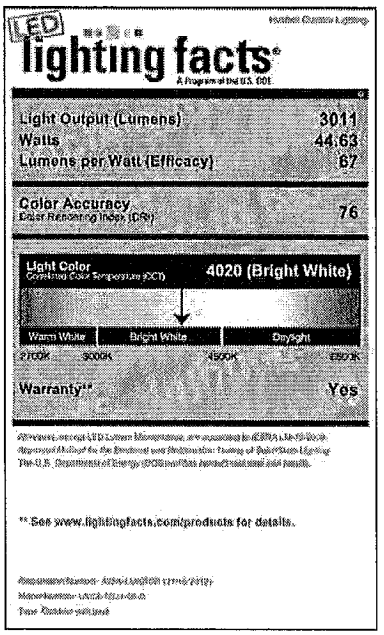
## *LIGHTING FACTS*

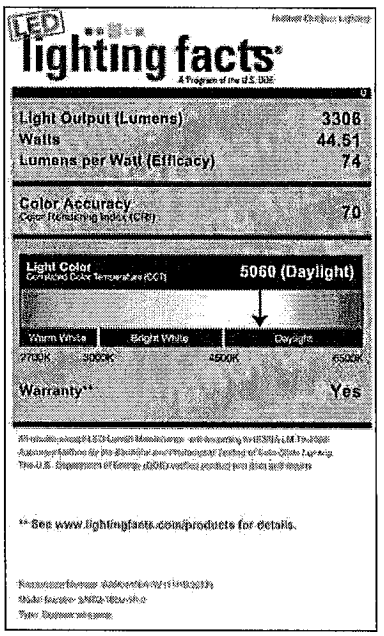
**LNC2-12LU-4K-3**




**LNC2-18LU-4K-3**




**LNC2-18LU-5K-3**





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# CIMARRON LED

| Cat.# | | Approvals | |
|---|---|---|---|
| Job: Parking Lot Light with sensor to reduce 50% | Type | | **SPAULDING LIGHTING** |

## SPECIFICATIONS

**Construction:**
- Stylish vertically finned die-cast solid top housing for maximum heat dissipation; Stops collection of unsightly debris from gathering on top of the housing
- Rugged lower die-cast aluminum heat sink accelerates thermal management and optimizes PCB and optical performance
- Separate optical and electrical compartment for optimum component operation
- One piece die cut silicone gasket ensures weather proof seal around each individual LED for IP65 rating
- Backlight Control (BC) option available for 85% spill light reduction, doesn't change fixture appearance or EPA, recommended for Type III and Type IV distributions
- Stamped bezel provides mechanical compression to seal the optical assembly
- Complements the Hubbell Southwest series of outdoor fixtures
- Weight - 45.0 pounds, EPA - 1.3 ft²
- Features exclusive wiHUBB technology -Wireless system for On/Off and 0-10VDC full range dimming control -Programmable autonomous operation
- Suitable for applications requiring 3G testing prescribed by ANSI C136.31

**Optics:**
- Choice of 72 high brightness LED configurations with individual acrylic lenses specially designed for IES Type II, III, IV and V distributions
- CCT: 3000K (80 CRI), 4200K (70 CRI), 5100K (67 CRI), and turtle friendly Amber LED options
- CRI: 70

**Electrical:**
- Universal input voltage 120-277 VAC, 50/60 Hz
- Integral step-down transformer for 347V & 480V
- Ambient operating temperature -40° C to 40° C
- Automatic thermal self-protection
- Drivers have greater than 90% power factor and less than 10% THD
- Optional continuous dimming to 10% or dual circuitry available
- LED drivers have output power over-voltage, over-current protection and short circuit protection with auto recovery
- 1050 mA driver available with 90L configuration for increased lumen output
- LED electrical assembly, including PR devices, consumes no power in the 'off' state
- Surge protection of 10KA 8/20 µSec wave; clamping voltage of 320V & surge rating of 273J

**Lumen maintenance:**
- L90 at 60,000 hours (Projected per IESNA TM-21-11)

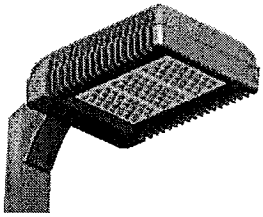
**Installation:**
- Two die-cast aluminum arm designs: The decorative arm offers a sleek upswept look while the straight arm follows the housing's contoured lines for continuity of style
- Fixture ships with arm installed for ease of installation and mounts to #2 drill pattern
- Wall bracket, mast arm fitter and pole accessories are also available allowing easy mounting for virtually any application

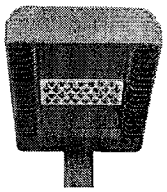
**Finish:**
- TGIC thermoset polyester powder paint finish applied at nominal 2.5 mil thickness

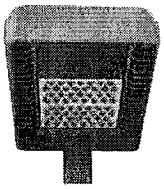
**Warranty:**
Five year limited warranty (for more information visit: http://www.hubbelloutdoor.com/resources/warranty/

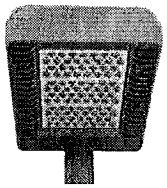
**Listings:**
- Listed to UL1598 and CSA C22.2#250.0-24 for wet locations
- Models meet DesignLights Consortium (DLC) qualifications, consult DLC website for more details: http://www.designlights.org/QPL
- IDA approved • IP65

## PRODUCT IMAGE(S)

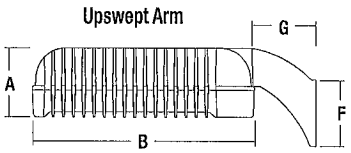

90 LED 3/4 VIEW

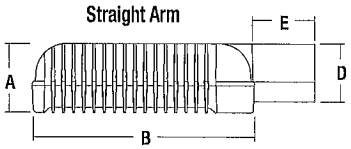

30 LED

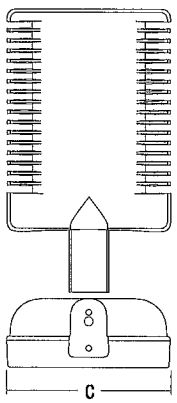

60 LED


90 LED

## DIMENSIONS




| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 6 3/4" 171mm | 21 3/4" 552mm | 16" 406mm | 6 5/8" 168mm | 6 5/16" 160mm | 5 5/8" 143mm | 6 1/8" 155mm |

## CERTIFICATIONS/LISTINGS

## ORDERING INFORMATION SEE NEXT PAGE

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## ORDERING INFORMATION ORDERING EXAMPLE: CL1-A-90LU-5K-3-DB-RPA3

| CL1 | - | WS | - | | | - | | - | 30LU | - | 5K | - | 4EP | - | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

### SERIES
- **CL1** Cimarron LED

### NO. OF LEDS
- **90L** 90 High brightness LEDs
- **60L** 60 High brightness LEDs
- **30L** 30 High brightness LEDs

### MOUNTING
- **A** Arm mount construction (6" straight rigid arm included & acceptable for 90° configurations)
- **AD** Decorative arm mount const. (6" decorative upswept arm incl. & acceptable for 90° configurations)
- **MAF** Mast arm fitter for mounting to standard 2 3/8" mast arm bracket, includes 6" straight rigid arm

### VOLTAGE
- **U**[3] Universal 120V-277V, 50/60 Hz
- **1**[7] 120V
- **2**[7] 208V
- **3**[7] 240V
- **4**[7] 277V
- **5** 480V, 60 Hz
- **F** 347V, 60 Hz
- **E**[4] 220V, 50 Hz

### CCT
- **3K** 3000K
- **4K** 4200K
- **5K** 5100K
- **AM**[8] Amber (590 nm available for "Turtle Friendly" applications (consult factory)

### DISTRIBUTION
- **2** Type II
- **3** Type III
- **4** Type IV
- **5M** Type V Medium
- **5S** Type V Short
- **5W** Type V Wide
- **2L** Type II Rotated 90° left
- **3L** Type III Rotated 90° left
- **4L** Type IV Rotated 90° left
- **2R** Type II Rotated 90° right
- **3R** Type III Rotated 90° right
- **4R** Type IV Rotated 90° right

### DRIVE CURRENT
- Leave blank for 700mA (standard)
- **035** 350mA Amber CCT only
- **105** 1050 mA (use with 90L only for higher lumen output)

### COLOR
- **DB** Dark Bronze
- **BL** Black
- **WH** White
- **GR** Gray
- **PS** Platinum Silver
- **RD** Red (premium color)
- **FG** Forest Green (premium color)
- **CC** Custom Color

### OPTIONS
- **BC**[6] Backlight control
- **BL**[1,2,5] Bi-level control
- **CD**[2] Continuous dimming
- **WB** Wall bracket
- **RPA3** 3" Round pole adapter
- **RPA4** 4" Round pole adapter
- **RPA5** 5" Round pole adapter
- **RPA6** 6" Round pole adapter
- **F(X)**[3,4] Fusing (replace X with voltage: 1-120V, 2-208V, 3-240V, 4-277V, 5-480V, 6-347V)
- **SSB** Stainless steel LED bezel
- **VG** Vandal guard

**CONTROL OPTIONS**

- **SCO** Motion sensor On/Off control, No light output when no motion detected
- **SCP** Programmable motion control, factory default is 50%
- **PR(X)**[5] NEMA Photo cell receptacle (replace X with voltage: U=120-277, 5=480, 6 =347)
- **WIH**[7] In-fixture wireless control module (120, 277, 347 & 480V)

Mounted on 25' SQ ST Steel Pole

Notes: 1- For BL option 90L and 60L; N/A 347V & 480V
2 - BL & CD cannot be combined
3 - Fuse option not available with universal voltage
4 - Select F3 fusing option for 220V
5 - Photocell receptacle not available with BL option
6 - Recommended for Type III and IV distributions only
7 - Select only when using voltage specific option (F or WIH)
8 - Available in 350mA drive current only Type IV, 5M

## ENERGY SAVING DATA

| ENERGY DATA | |
|---|---|
| Power Factor | >.9 |
| Total Harmonic Distortion | <10% |

| LIGHT ENGINE | INPUT WATTS | | LUMENS DELIVERED | | | | | | DRIVERS CURRENT |
|---|---|---|---|---|---|---|---|---|---|
| | 120V-277V | 347V-480V | TYPE 2 | TYPE 3 | TYPE 4 | TYPE 5M | TYPE 5S | TYPE 5W | |
| 30L-5K | 70 | 87 | 6384 | 6164 | 6641 | 7108 | 6999 | 6619 | 2@700mA |
| 60L-5K | 140 | 157 | 13300 | 12842 | 13125 | 13185 | 13675 | 12954 | 4@700mA |
| 90L-5K | 210 | 227 | 19684 | 19006 | 19202 | 20592 | 19610 | 18973 | 6@700mA |
| 90L-5K-105 | 336 | 363 | 26974 | 25351 | 26548 | 25793 | 27445 | 25195 | 6@1050mA |
| 30L-4K | 70 | 87 | 6089 | 6109 | 6104 | 6417 | 6439 | 6046 | 2@700mA |
| 60L-4K | 140 | 157 | 11583 | 11468 | 12036 | 12038 | 12581 | 11807 | 4@700mA |
| 90L-4K | 210 | 227 | 17143 | 16973 | 17648 | 18521 | 20220 | 17394 | 6@700mA |
| 90L-4K-105 | 336 | 363 | 23896 | 23912 | 24199 | 24583 | 25357 | 23128 | 6@1050mA |
| 30L-3K | 70 | 87 | 4606 | 4668 | 4686 | 4858 | 4902 | 4601 | 2@700mA |
| 60L-3K | 140 | 157 | 9013 | 9175 | 9216 | 9409 | 9461 | 8844 | 4@700mA |
| 90L-3K | 210 | 227 | 13360 | 13601 | 13575 | 13923 | 14004 | 13902 | 6@700mA |
| 90L-3K-105 | 336 | 363 | 17645 | 17612 | 17469 | 17950 | 18271 | 17330 | 6@1050mA |

***ACCESSORIES*** SEE NEXT PAGE

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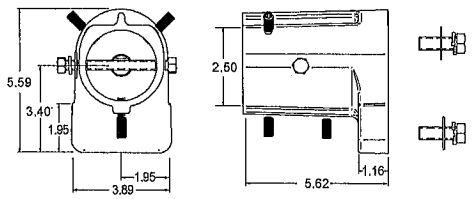
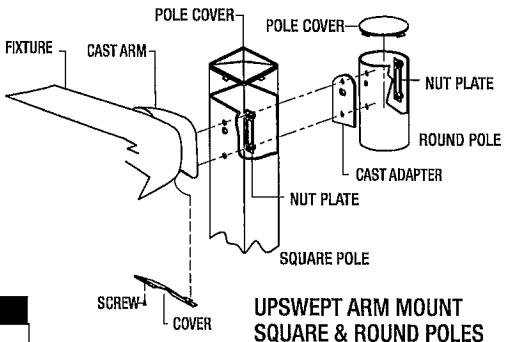
## ACCESSORIES

| Catalog Number | Description |
|---|---|
| CR-RPA3-XX[1] | Round pole adapter for straight arm (3¼ - 3¾") |
| CR-RPA4-XX[1] | Round pole adapter for straight arm (3⅞ - 4½") |
| CR-RPA5-XX[1] | Round pole adapter for straight arm (5") |
| CR-RPA6-XX[1] | Round pole adapter for straight arm (6") |
| CRD-RPA2-XX[1] | Round pole adapter for upswept arm (2¾ - 3⅛") |
| CRD-RPA3-XX[1] | Round pole adapter for upswept arm (3¼ - 3¾") |
| CRD-RPA4-XX[1] | Round pole adapter for upswept arm (3⅞ - 4½") |
| CRD-RPA5-XX[1] | Round pole adapter for upswept arm (5") |
| CRD-RPA6-XX[1] | Round pole adapter for upswept arm (6") |
| WB-CR-XX[1] | Wall bracket |
| TPLB-XX[1] | Twin parallel luminaire bracket |
| MAF-CL-XX[3] | Horizontal mast arm fitter for 2 3/8" OD arm. Mounts to standard 6" arm (ordered with fixture) |

1 Replace XX with color choice, eg.: DB for Dark Bronze
2 When ordering poles, specify Pole Drill Pattern #2
3 Fixture must include standard 6" arm




MAF – HORIZONTAL MAST ARM FITTER




UPSWEPT ARM MOUNT
SQUARE & ROUND POLES

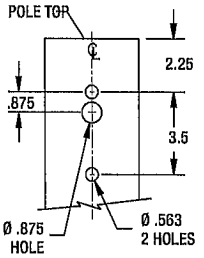
## MOUNTING ACCESSORIES

| Catalog Number | Description |
|---|---|
| ARM-CL-K-TA-XX[1] | Adjustable mounting arm for single fixture (2-3/8 tenon) – 5 lbs. 2.3 kgs. |
| ARM-CL-TK-TA-XX[1] | Adjustable mounting arm for two fixtures at 180° (2-3/8 tenon) – 7 lbs. 3.2 kgs. |
| ARM-CL-K-S-XX[1] | 10" adjustable arm – .5 lbs. .05 kgs. – 5.75 lbs. 2.6 kgs. |

1 Replace XX with color choice, eg.: DB for Dark Bronze
2 Fixture must include standard 6" straight arm

ARM-CL-K-TA-XX
ARM-CL-TK-TA-XX

ARM-CL-K-S-XX




#2 DRILL PATTERN FOR POLES

## TENON TOP POLE BRACKET ACCESSORIES

*(2 3/8" OD tenon) (RSS version requires 4" round pole adapter)*

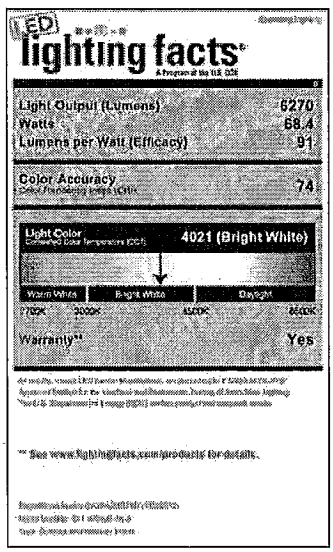
| Catalog Number | Description |
|---|---|
| SETA-XX[1] | Square pole tenon adapter (4 at 90 degrees) |
| RETA-XX[1] | Round pole tenon adapter (4 at 90 degrees) |
| TETA-XX[1] | Hexagonal pole tenon adapter (3 at 120 degrees) |

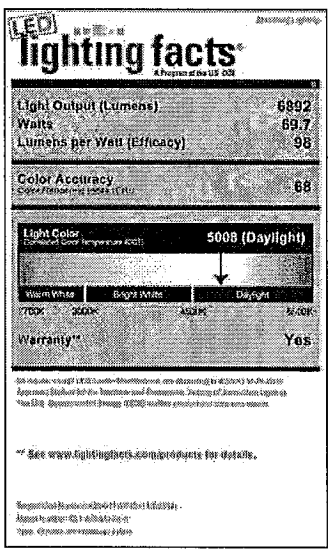
1 Replace XX with color choice, eg.: DB for Dark Bronze

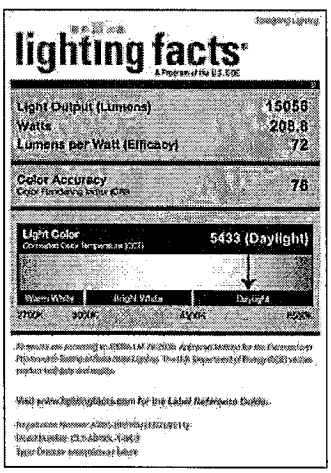
## PHOTOCONTROL EQUIPMENT

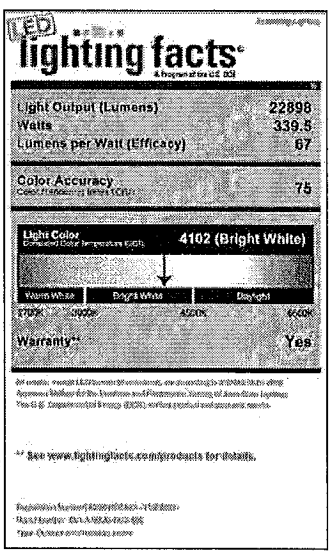
| Catalog Number | Description |
|---|---|
| PTL-1 | Photocontrol - twist-lock cell (120V) |
| PTL-8 | Photocontrol - twist-lock cell (120-277V) |
| PTL-5 | Photocontrol - twist-lock cell (480V) |
| PTL-6 | Photocontrol - twist-lock cell (347V) |
| PSC | Shorting cap - twist-lock |

## LIGHTING FACTS



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U.S. Government

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# ENERGYGUIDE

**Dishwasher**
**Capacity: Standard**

**General Electric**
**Models GDF5****D, GDT5****D

## Estimated Yearly Operating Cost
**(when used with an electric water heater)**

**$29**

**Cost Range of Similar Models**

| **275 kWh** | **$24** |
|---|---|
| **Estimated Yearly Electricity Use** | **Estimated Yearly Operating Cost** (when used with a natural gas water heater) |

Your cost will depend on your utility rates and use.

- Cost range based only on standard capacity models.
- Estimated operating cost based on four wash loads a week and a 2007 national average electricity cost of 10.65 cents per kWh and natural gas cost of $1.218 per therm.
- For more information, visit www.ftc.gov/appliances.

ENERGY STAR

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# ENERGYGUIDE

Refrigerator-Freezer
* Automatic Defrost
* Top-Mounted Freezer
* No Through-the-Door-Ice-Service

Electrolux
LFHT1817L*
Capacity: 18.2 Cubic Feet

## Estimated Yearly Operating Cost

**$41**

$42 — $52

The estimated yearly operating cost of this model was not available at the time the range was published.

Cost Range of Similar Models

**383 kWh**
Estimated Yearly Electricity Use

## Your cost will depend on your utility rates and use.

- Cost range based only on models of similar capacity with **automatic defrost**, **top-mounted freezer**, and **no through-the-door-ice-service**.
- Estimated operating cost based on a 2007 national average electricity cost of 10.64¢ cents per kWh.
- For more information, visit www.ftc.gov/appliances.

PART NO. 242028576

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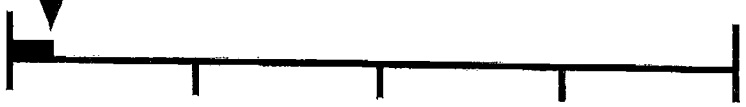
# ENERGYGUIDE

Refrigerator-Freezer
- Automatic Defrost
- With Side-Mounted Freezer
- With Through-The-Door-Ice Service

Whirlpool Corporation
Models:ED5VHE*V*0*
Capacity: 25.1 Cubic Feet

## Estimated Yearly Operating Cost

**$61**



**$60** — **$78**

Cost Range of Similar Models

**577** kWh

Estimated Yearly Electricity Use

**Your cost will depend on your utility rates and use.**

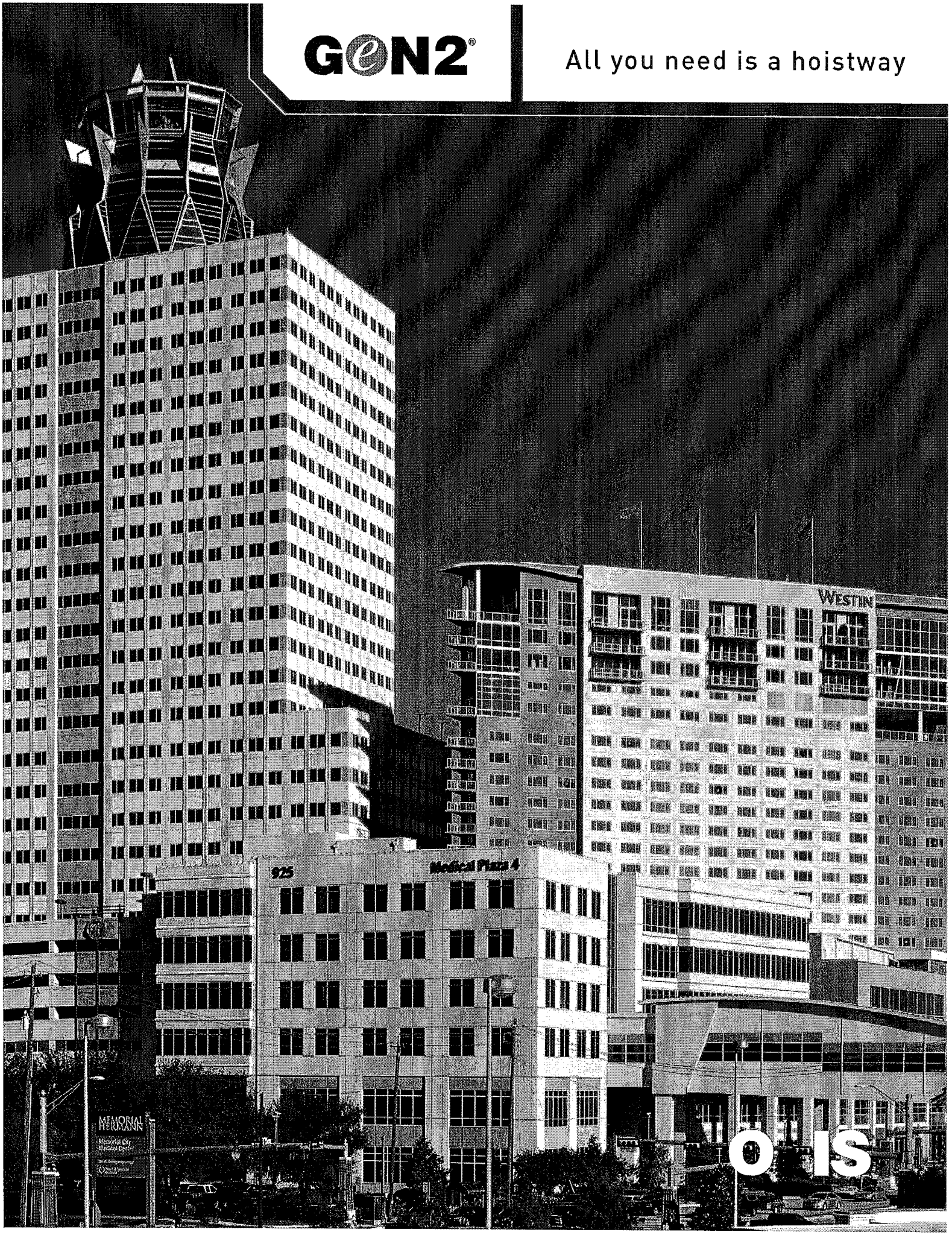
- Cost range based only on models of similar capacity With Automatic Defrost, With Side-Mounted Freezer and With Through-The-Door-Ice Service
- Estimated operating cost based on a 2007 national average electricity cost of 10.65 cents per kWh
- For more information, visit www.ftc.gov/appliances.

ENERGY STAR

W10312810

GeN2®

All you need is a hoistway

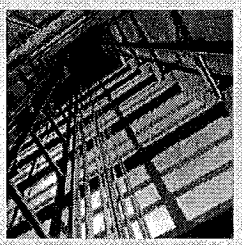



OTIS

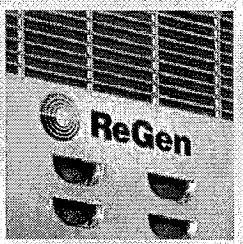
Open the door to complete design freedom.

# No control room. No machine room. All you need is a hoistway.

## Otis Gen2 Delivers:



Self-contained system




Green technology

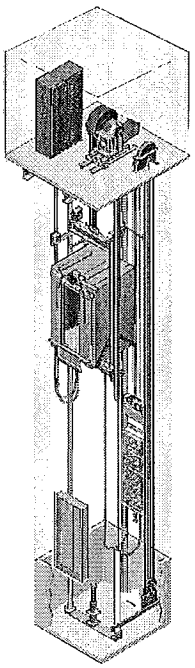
Smoothest ride

Minimal jobsite coordination

Proven reliability

Otis knows that it's not just any building—it's your building. With the Gen2® system, we re-examined every aspect of the elevator—from design and installation to operation and maintenance. The result is a system that moves elevator innovation to a new level, supporting your design vision in a way that only Otis can.

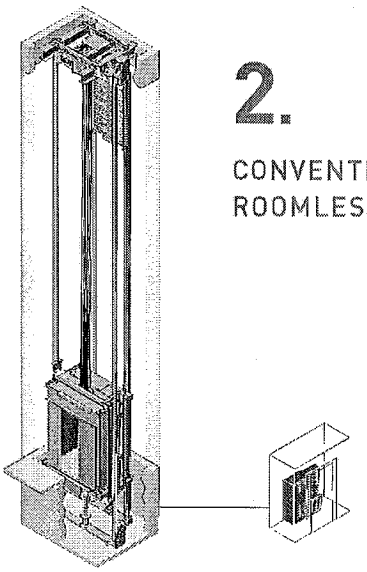
# Gen2 redefined the elevator with breakthrough belt technology.



## 1.

CONVENTIONAL GEARED ELEVATOR

Conventional geared elevator systems require a rooftop machine room to house the machine, governor and controller.



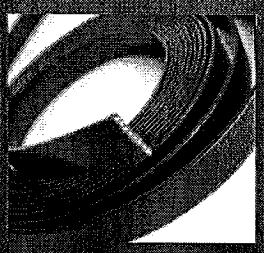
## 2.

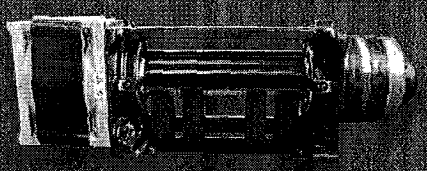
CONVENTIONAL MACHINE-ROOMLESS ELEVATOR

New advances in hoisting technology eliminate the need for a machine room. But these systems still require a separate room for the elevator control system.

## INTELLIGENT ENGINEERING

Otis applied the strength of its worldwide engineering resources to redefine the elevator system and set a new benchmark for design and performance.





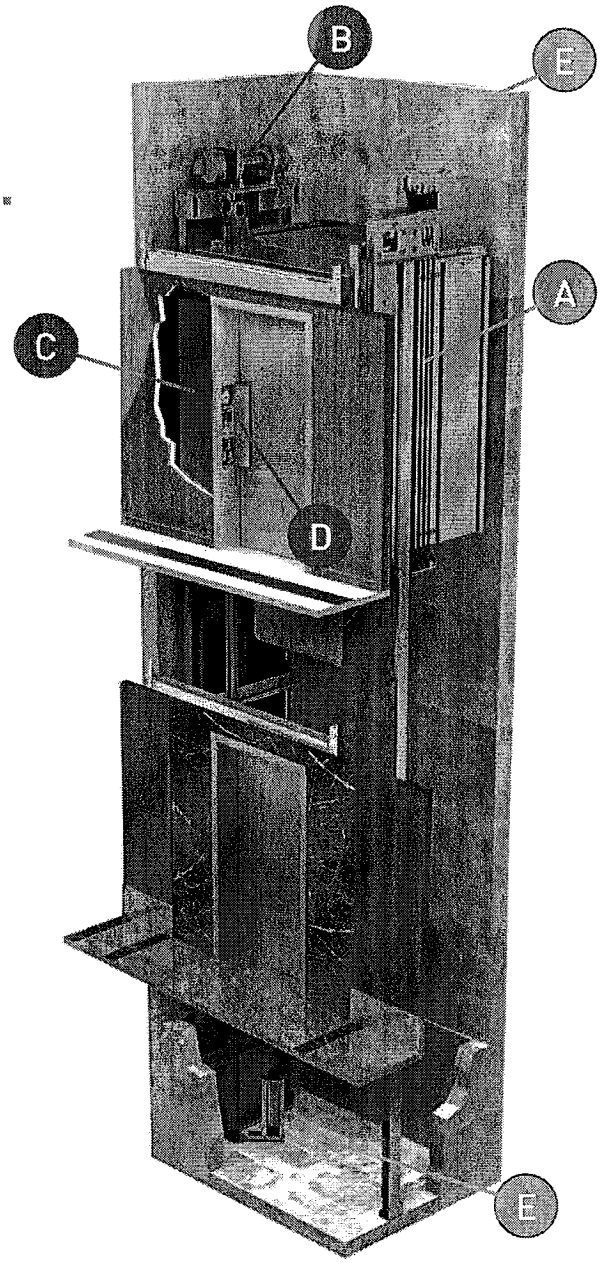
**A** COATED STEEL BELTS

Patented, coated-steel belts have a significantly smaller bending radius than wire rope. This enables a compact gearless machine.

**B** COMPACT GEARLESS MACHINE

Flexible belts allow a smaller sheave, creating a machine that is 70 percent smaller and up to 50 percent more efficient than conventional geared machines.

# The revolution continues.




## 3.

GEN2 ELEVATOR

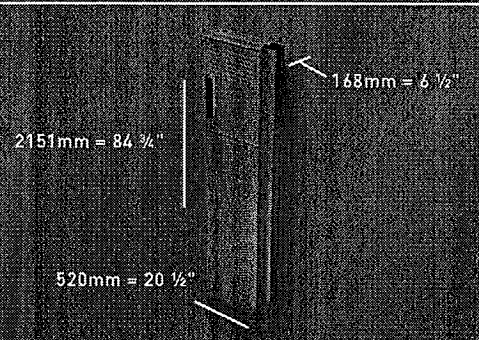
GeN2®

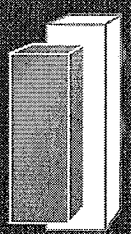
With Gen2, all you need is a hoistway. The controller is so compact it fits inside the wall of the top elevator landing for buildings up to 131 feet of rise.* You are no longer required to plan for extra room for elevator components.

**COMPACT DESIGN AND INTEGRATED COMPONENTS PROVIDE:**

- Greater architectural design freedom
- Space-saving configuration for more rentable space
- Less moving parts for greater durability and reliability
- Minimal jobsite coordination

* See pages 11-12 for detailed product information






**C** COMPACT CONTROLLER
The Gen2 system controller is compact enough to fit inside the wall of the top elevator landing.

**D** INSPECTION & TEST PANEL
Most necessary test and maintenance features are concealed behind a panel in the elevator entrance.

**E** SMALLEST HOISTWAY
Gen2 leads the industry with the shallowest pit and lowest overhead, fitting into most hydraulic hoistways.

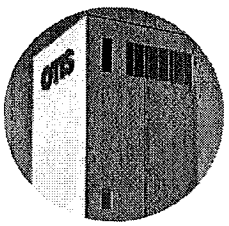
# Innovation meets sustainability.

OTIS THE WAY TO GREEN™

Otis is leading the industry with he Way to Green. It begins with green thinking on a global scale. We encourage and enable our more than 60,000 employees worldwide to address the future positively and proactively. It is all part of our end-to-end commitment to incorporating environmental awareness into everything we do. he Gen2 system with its state-of-the-art energy-efficiency is a result of this thinking.

## NO LUBRICATION

he Gen2 machine and coated steel belts require no additional lubrication, eliminating the need for storage, cleanup and disposal of hazardous waste.

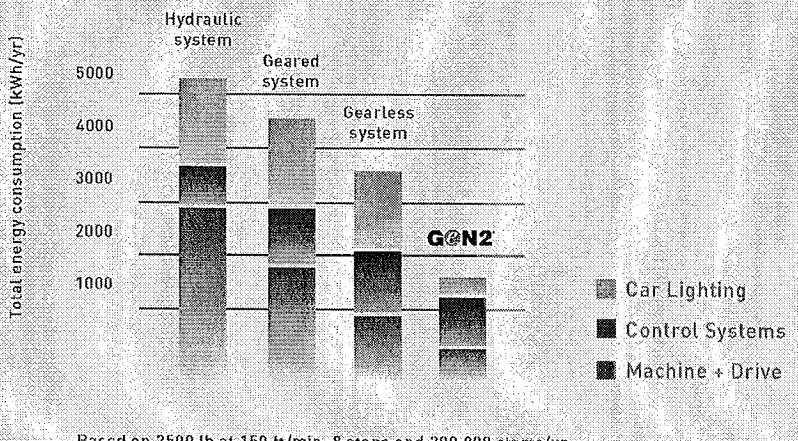



## MINIMIZING ENVIRONMENTAL IMPACT

Our new Florence, South Carolina facility reflects Otis' end-to-end environmental commitment. From high-efficiency HVAC and lighting systems to product designs that eliminate painting and welding processes, Otis incorporates green thinking throughout the product lifecycle.

## MAXIMIZED EFFICIENCY

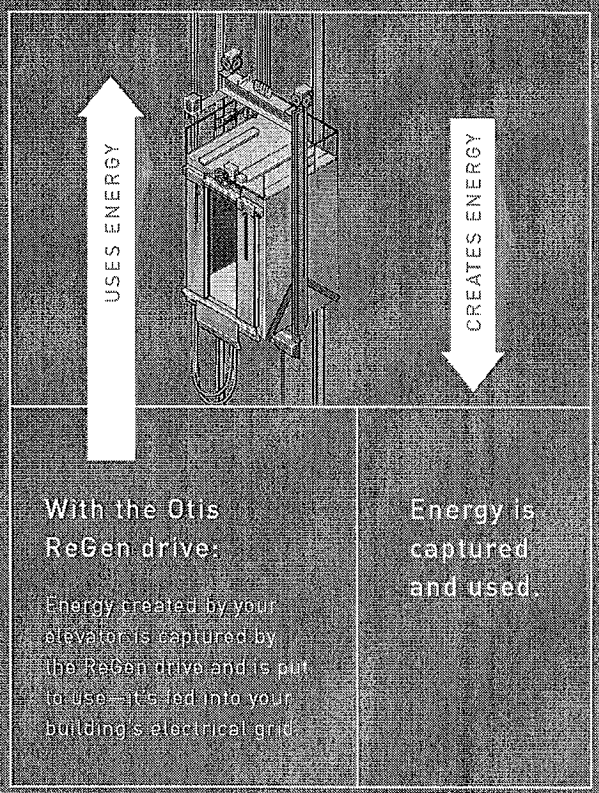
he Gen2 system—combined with our ReGen® drive, LED lighting and automatic sleep mode— maximizes energy efficiency.




Based on 2500 lb at 150 ft/min, 8 stops and 200,000 starts/yr

# Green Technology. Standard on the Gen2 system.

# Because being green is not optional.




**With the Otis ReGen drive:**

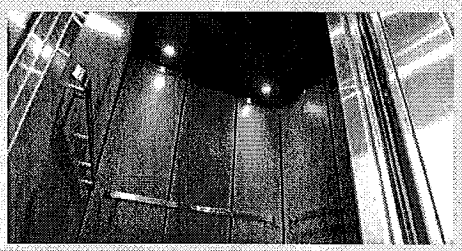
Energy created by your elevator is captured by the ReGen drive and is put to use—it's fed into your building's electrical grid.

**Energy is captured and used.**

ReGen®

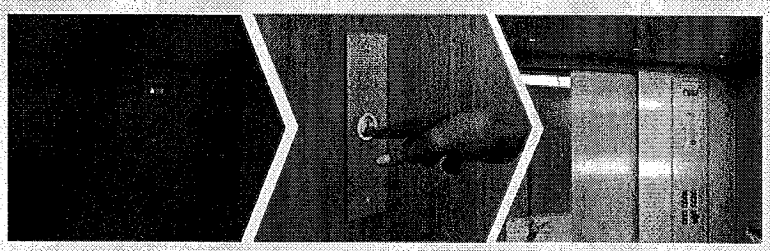
## Regenerative technology

Our ReGen drive, now standard on the Gen2 system, puts electricity back into your building's grid by capturing normally wasted energy. Thanks to low harmonic distortion, this recycled energy provides clean power minimizing impact to your building's electrical system. All this helps to make the Gen2 system up to 75% more efficient than conventional systems. And from an energy consumption standpoint, the Gen2 system uses up to 40% less energy than non-regenerative machine-roomless systems.



## EFFICIENT LED LIGHTING

LED illumination, standard on the Gen2 system, reduces energy consumption and lasts up to 10 times longer than conventional fluorescent lamps.



## SLEEP MODE

Lights and fan are shut down when there's no demand, making the LED lighting up to 80% more efficient than conventional lighting. The system seamlessly springs back to life with the press of a call button.

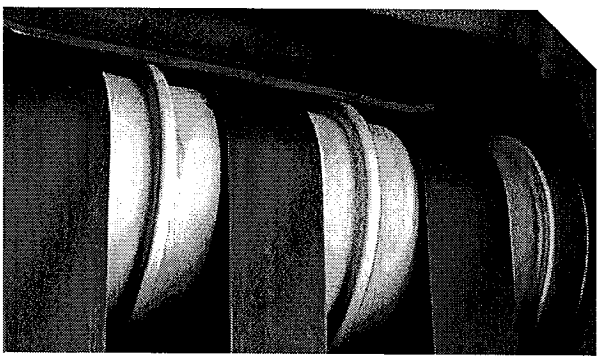
# A ride so smooth, you'll notice. Or maybe you won't.

By taking an in-depth look at all sources of noise and vibration, Otis engineers designed the Gen2 system with passenger and tenant comfort in mind.

The Gen2 system's ride quality is so smooth and quiet that passengers often don't notice it at all.

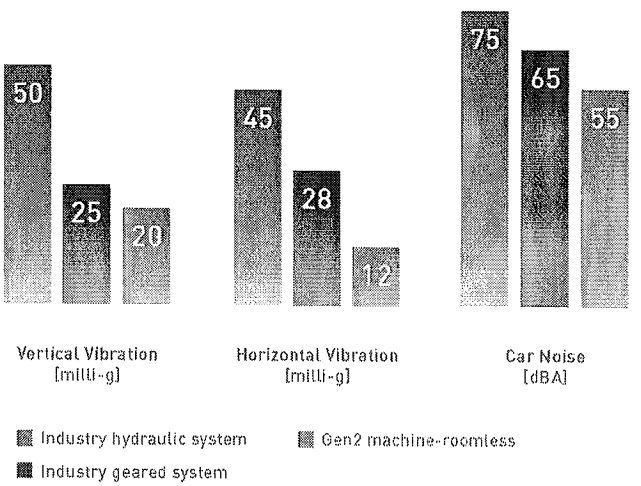
## SMOOTH OPERATION

The Gen2 system's method of hoisting - coated-steel belts - eliminates the metal-on-metal contact of steel ropes and sheaves used by traditional systems. The result is a ride experience with noticeably less vibration and noise.



## INDUSTRY COMPARISON

Careful component design and selection enabled Otis to engineer a remarkably smooth and quiet elevator. This means a more comfortable passenger experience as well as quiet operation that is critical to those tenants located near the elevator system.



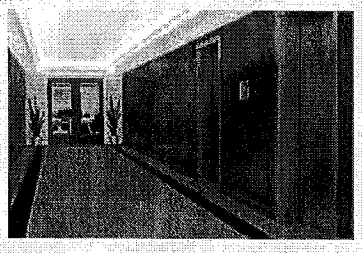
# Efficient. Seamless. Minimal impact on the jobsite.

With all major components located inside the hoistway, the Gen2 system allows for more flexibility and reduced cost.

## SPACE SAVINGS

Because the Gen2's compact controller fits in the wall, there's no need to create unsightly control closets.

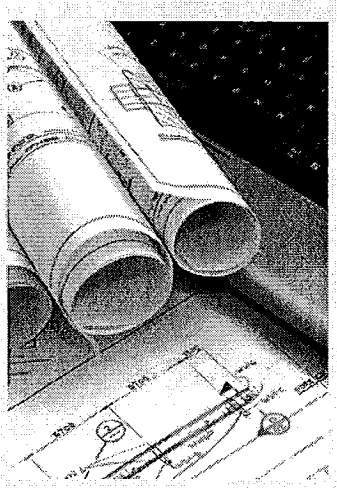
OTHER SYS EM —
Requires control closets.

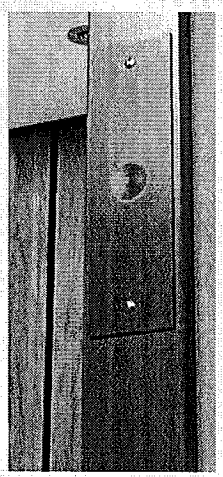


GEN2 SYS EM —
Creates cleaner building designs

## RAPID INSTALLATION

The Gen2 system is deliberately engineered to reduce cost and installation time using standard procedures. The result is an installation time that is up to 50% faster than conventional systems.





## SAVE CONSTRUCTION TIME AND COST

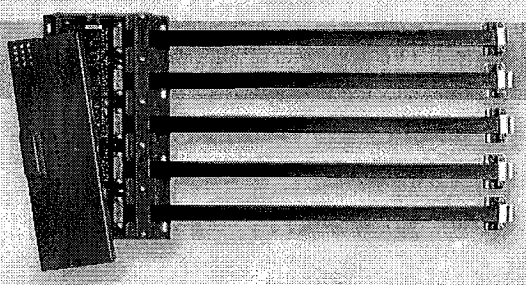
he Gen2 system doesn't require a control room to be built, saving time and material cost on the jobsite. And its hall buttons are mounted in the jamb, requiring less coordination time with other trades on the jobsite.

### Single-Phase Power Available

When your building is utilizing three-phase power for the elevator only, the Gen2 system operating on single-phase power will help reduce initial construction costs and monthly electric bills. Please contact an Otis representative to discuss if the single-phase power option can be used on your project.

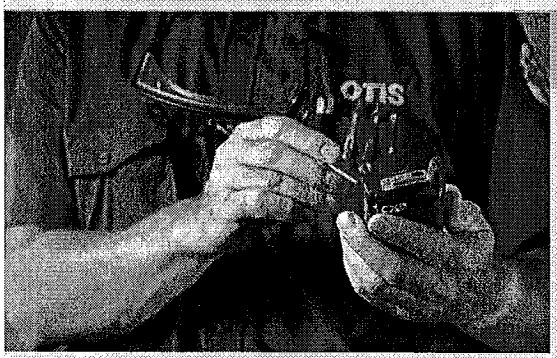
# Industry-leading service that only Otis can provide.

Otis is committed to ensuring optimal equipment performance throughout each product's lifecycle. Innovative technologies let Otis engineers precisely identify or anticipate possible issues. And when our mechanics arrive at customer sites, they are prepared to make repairs quickly and efficiently.



## PULSE®

The Pulse system provides safety and peace of mind with 24/7 monitoring of the Gen2's flat coated-steel belts. It provides advance notice of belt wear by detecting the slightest weakness.




## OMMS®

The Otis Maintenance Management System (OMMS) is a predictive and preventative system, ensuring fewer service calls and less downtime than any other plan in the industry. We'll focus on your elevator so you can focus on your building.

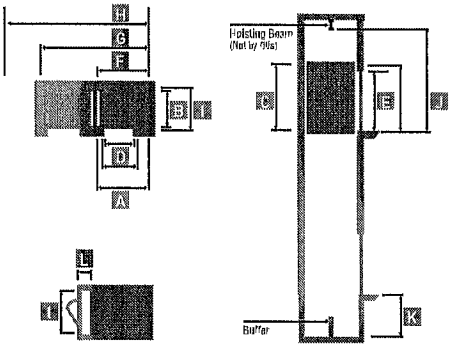
## OTIS ELITE℠

Otis Elite service takes elevator service to a new level. Elite experts dedicated to your elevator provide industry-leading response time because they are able to remotely interact with your elevator. They're able to make changes to your elevator and provided critical information with real-time status updates. Elite service provides guaranteed 15-minute response time, instant information and unprecedented control.

# At Otis, reliability is the hallmark of exceptional design.

Gen2 is the culmination of Otis' commitment to perfecting elevator technology. With flexible, coated-steel belts and lubrication-free, energy efficient components, Gen2 sets the benchmark for elevator design and performance. From our industry-leading safety record to our proven reliability, Gen2 is the traction elevator you can count on.

| Travel height maximum | 80'<br>24m | 100'<br>30m | 150'<br>45m |
|---|---|---|---|
| Maximum stops | 10 | 13 | 16 |
| Speed (ft/min) | 150<br>0.76m/s | 200<br>1.02m/s | 350<br>1.78m/s |




# Passenger

IMPORTANT:

To assist in your planning, we recommend that you call your Otis representative at the beginning of the project.

## Car[1]

| | Rated lbs.<br>Passenger Capacity | 2100 (953kg)<br>13 | 2500 (1134kg)<br>15 | 3000 (1361kg)<br>18 | 3500 (1588kg)<br>21 | 4000 (1814kg)[2]<br>25 |
|---|---|---|---|---|---|---|
| A | Interior width | 5'-8 5/16" (1735mm) | 6'-5 5/16" (1970mm) | | | 7'-5 5/16" (2275mm) |
| B | Interior depth | 4'-3 5/16" (1309mm) | | 5'-0 3/16" (1528mm) | 5'-5 5/16" (1665mm) | |
| | for front and rear openings | 4'-4 1/8" (1324mm) | | 5'-0 3/4" (1543mm) | 5'-6 1/8" (1680mm) | |
| C | Cab height[3] | 7'-9" Optional 9'-9" (2362mm Optional 2972mm) | | | | |
| D | Car door width | 3'-0" (914mm) | 3'-6" (1067mm) | | | 4'-0" (1219mm) |
| | Door type | SS | | CO/SS | | CO |
| E | Entrance height | 7'-0" Optional 8'-0" (2134mm Optional 2438mm) | | | | |

## Hoistway

| | Rated lbs.<br>Passenger Capacity | 2100 (953kg)<br>13 | 2500 (1134kg)<br>15 | 3000 (1361kg)<br>18 | 3500 (1588kg)<br>21 | 4000 (1814kg)[2]<br>25 |
|---|---|---|---|---|---|---|
| F | Single width | 7'-7" (2311mm) | 8'-4" (2540mm) | | | 9'-4" (2845mm) |
| | in seismic zones | 7'-9" (2362mm) | 8'-6" (2591mm) | | | 9'-6" (2896mm) |
| G | Double width | 15'-6" (4724mm) | 17'-0" (5182mm) | | | 19'-0" (5791mm) |
| | in seismic zones | 15'-10" (4826mm) | 17'-4" (5283mm) | | | 19'-4" (5893mm) |
| H | riple width | 23'-5" (7137mm) | 25'-8" (7620mm) | | | 28'-8" (8738mm) |
| | in seismic zones | 23'-11" (7290mm) | 26'-2" (7976mm) | | | 29'-2" (8890mm) |
| I | Depth | 5'-9" (1753mm) | | 6'-4" (1930mm) | 6'-11" (2108mm) | |
| | for front and rear openings | 6'-3 1/4" (1911mm) | | 6'-11 7/8" (2130mm) | 7'-5 1/4" (2267mm) | |

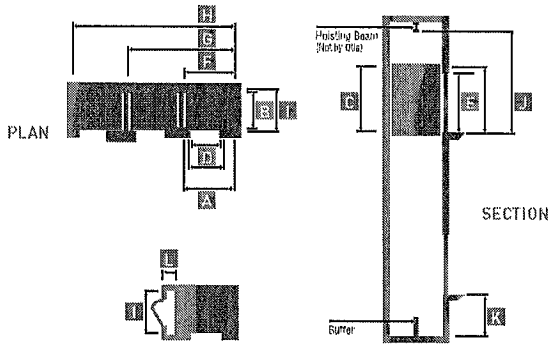
| J | Clear overhead to hoist beam[4,5] | 7'-9" Cab height | 9'-9" Cab height |
|---|---|---|---|
| | 150-200 FPM (0.76 m/s,1.02 m/s) | 12'-7" (3835mm) | 14'-7" (4445mm) |
| | 350 FPM (1.78 m/s) | 13'-2" (4013mm) | 15'-2" (4623mm) |
| K | Min pit depth[6] | 150-200 FPM (0.76 m/s, 1.02 m/s) | 350 FPM (1.78 m/s) |
| | | 4'-0"/5'-0" (1219mm/1524mm) | 4'-6"/5'-6" (1372mm/1676mm) |

## Control Closet/Room[7] (optional)

| L | Control closet | 1 x 3'-10" (Optional) (1 x 1168mm (Optional)) | 1 x 3'-10" (350 f/min) (1 x 1168mm (1.78 m/s)) |
|---|---|---|---|
| | Control room | 1 x 5'-9" (Optional) (1 x 1753mm (Optional)) | |
| | Control room-duplex | 1 x 7'-6" (Optional) (1 x 2286mm (Optional)) | |

1. Interior dimensions may vary depending on interior finishes
2. 4000P elevator @ 350fpm requires a control closet.
3. Clear cab height varies by ceiling type and floor recess
4. Allow a minimum of 4" [102mm] between top of safety beam and top of hoistway
5. In seismic areas, add 4" [102mm] to min and max overhead
6. Some locations require a 5' - 0" [1524mm] pit, contact your local Otis sales representative for details.
7. Please consult your local Otis representative regarding multi-car groups or smaller dimensions.
8. A pit ladder pocket may be required. Please contact your local Otis sales representative for details.
9. Hoistway widths for rises above 80' should be increased by 2" to allow for variance.

| | | |
|---|---|---|
| Travel height maximum | 80'<br>24m | 150'<br>45m |
| Maximum stops | 10 | 16 |
| Speed (ft/min) | 150<br>0.76m/s | 200<br>1.02m/s |




# Service

## Car[1]

| | Rated lbs.<br>Passenger Capacity | 4000 (1814kg)<br>25 | 4500 (2041kg)<br>28 | 5000 (2268kg)<br>31 | 5000AIA (2268kg)<br>31 |
|---|---|---|---|---|---|
| A | Interior width | 5'-5 1/16" (1665mm) | | 5'-11 5/16" (1811mm) | 5'-8" (1727mm) [2] |
| B | Interior depth | 7'-4 7/8" (2258mm) | 7'-10 15/16" (2411mm) | 8'-4 3/16" (2544mm) | 9'-0" (2743mm) [2] |
| | for front and rear openings | 7'-5 1/2" (2273mm) | 7'-11 1/2" (2426mm) | 8'-4 3/4" (2559mm) | 9'-0" (2743mm) |
| C | Cab height[3] | 7'-9" Optional 9'-9" (2362mm Optional 2972mm) | | | |
| D | Car door width | 4'-0" (1219mm) | | 4'-6" (1372mm) | 4'-0" (1219mm) |
| | Door type | 2S | | | |
| E | Entrance height | 7'-0" Optional 8'-0" (2134mm Optional 2438mm) | | | |

## Hoistway

| | Rated lbs.<br>Passenger Capacity | 4000 (1814kg)<br>25 | 4500 (2041kg)<br>28 | 5000 (2268kg)<br>31 | 5000AIA (2268kg)<br>31 |
|---|---|---|---|---|---|
| F | Single width | 7'-4" (2235mm) | | 7'-10" (2386mm) | 7'-6" (2286mm) |
| | in seismic zones | 7'-6" (2286mm) | | 8'-0" (2438mm) | 7'-8" (2337mm) |
| G | Double width | 15'-0" (4572mm) | | 16'-0" (4877mm) | 15'-4" (4674mm) |
| | in seismic zones | 15'-4" (4674mm) | | 16'-4" (4978mm) | 15'-8" (4775mm) |
| H | riple width | 22'-8" (6909mm) | | 24'-2" (7366mm) | 23'-2" (7061mm) |
| | in seismic zones | 23'-2" (7061mm) | | 24'-8" (7516mm) | 23'-8" (7214mm) |
| I | Depth | 9'-1" (2769mm) | 9'-7" (2921mm) | 10'-1" (3073mm) | 10'-8" (3251mm) |
| | for front and rear openings | 9'-10 1/2" (3009mm) | 10'-4 1/2" (3162mm) | 10'-9 3/4" (3295mm) | 11'-5" (3479mm) |

| | | | | |
|---|---|---|---|---|
| J | Clear overhead to hoist beam[4] | 7'-9" Cab height | | 9'-9" Cab height |
| | 150 FPM, 200 FPM (0.76 m/s, 1.02 m/s) | 12'-11" (3937mm) | | 14'-11" (4547mm) |
| K | Min pit depth[5] | 4000 (1814kg) | 4500 (2041kg) | 5000 (2268kg) / 5000AIA (2268kg) |
| | | 4'-0"/ 5'-0" (1219mm/1524mm) | | |

## Control Closet/Room[6] (optional)

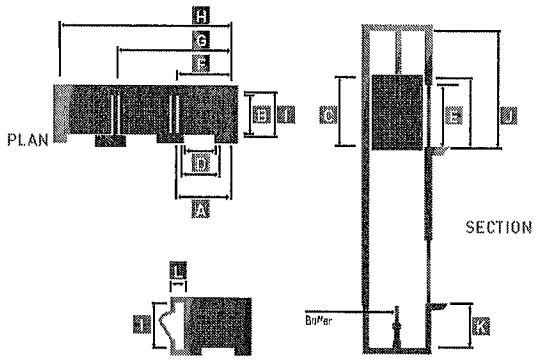
| | | |
|---|---|---|
| L | Control closet | 1 x 3'-10" (Optional) (1 x 1168mm (Optional)) |
| | Control room | 1 x 5'-9" (1 x 1753mm (Optional)) |
| | Control room-duplex | 1 x 7'-6" (1 x 2286mm (Optional)) |

1. Interior dimensions may vary depending on interior finishes
2. Clear inside dimensions based upon steel shell cab.
3. Clear cab height varies by ceiling type and floor recess
4. Allow a minimum of 4" [102mm] between top of safety beam and top of hoistway
5. Some locations require a 5' - 0" [1524mm] pit, contact your local Otis sales representative for details.
6. Please consult your local Otis representative regarding multi-car groups or smaller dimensions.

IMPORTANT:

To assist in your planning, we recommend that you call your Otis representative at the beginning of the project.

| | | | | |
|---|---|---|---|---|
| Travel height maximum | 300' 91m | | | |
| Max stops | 28 | | | |
| Speed (ft/min) | 350, 1.78m/s | 400, 2.03m/s | 450, 2.29m/s | 500 2.54m/s |




# Passenger

## Car[1]

| | Rated lbs. Passenger Capacity | 2500 (1134kg) 15 | 3000 (1361kg) 18 | 3500 (1588kg) 21 | 4000 (1814kg) 25 |
|---|---|---|---|---|---|
| A | Interior width | 6'-8 5/16" (2040mm) | | | 7'-8 5/16" (2345mm) |
| B | Interior depth | 4'-3 1/8" (1299mm) | 4'-9" (1448mm) | 5'-5" (1651mm) | |
| | for Front and rear openings | 4'-3 3/4" (1314mm) | 4'-9 5/8" (1463mm) | 5'-5 5/8" (1666mm) | |
| C | Cab height | 8'-0" Optional 9'-7" (2438mm Optional 2921mm) | | | |
| D | Car door width | 3'-6" (1067mm) | | | 4'-0" (1219mm) |
| | Door type | CO/SS | | | CO |
| E | Entrance height | 7'-0" Optional 8'-0" (2134mm Optional 2438mm) | | | |

## Hoistway

| | Rated lbs. Passenger Capacity | 2500 (1134kg) 15 | 3000 (1361kg) 18 | 3500 (1588kg) 21 | 4000 (1814kg) 25 |
|---|---|---|---|---|---|
| F | Single width[2,3] | 8'-4" (2540mm) | | | 9'-4" (2845mm) |
| | in seismic zones | 8'-6" (2591mm) | | | 9'-6" (2896mm) |
| G | Double width | 17'-0" (5182mm) | | | 19'-0" (5791mm) |
| | in seismic zones | 17'-4" (5283mm) | | | 19'-4" (5893mm) |
| H | riple width | 25'-8" (7823mm) | | | 28'-8" (8736mm) |
| | in seismic zones | 26'-2" (7976mm) | | | 29'-2" (8890mm) |
| I | Depth[2] | 6'-6" (1981mm) | 7'-0" (2134mm) | 7'-8½" (2350mm) | |
| | for front and rear openings | 6'-2 7/8" (1902mm) | 6'-8 3/4" (2051mm) | 7'-4 3/4" (2254mm) | |

| J | otal overhead[4] | 8'-0" Cab height | 9'-7" Cab height |
|---|---|---|---|
| | 350 ft/min (1.78 m/s) | 15'-5" (4699mm) | 17'-0" (5182mm) |
| | 400 ft/min (2.03m/s) | 15'-11" (4851mm) | 17'-7" (5359mm) |
| | 450 ft/min (2.29m/s) | 16'-4" (4976mm) | 17'-11" (5461mm) |
| | 500 ft/min (2.54m/s) | 16'-9" (5105mm) | 18'-4" (5586mm) |

| K | Min pit depth | 350 ft/min (1.78m/s) | 400 ft/min (2.03m/s) | 450 ft/min (2.29m/s) | 500 ft/min (2.54m/s) |
|---|---|---|---|---|---|
| | | 5'-6" (1675mm) | 5'-8" (1727mm) | 6'-2" (1880mm) | 6'-9" (2057mm) |

## Control Closet/Room[4]

| | | | |
|---|---|---|---|
| L | Control closet | 1 x 3'-10" (1 x 1168mm) | |
| | Control room | 1 x 5'-9" (1 x 1753mm) | |
| | Control room-duplex | 1 x 7'-6" (1 x 2286mm) | 1 x 9'-11" (1 x 3023mm) |

1. Interior dimensions may vary depending on interior finishes.
2. For elevators with occupied space below, this dimension may change. Consult your local Otis representative for dimensions.
3. Add 1' [305mm] of width for each hoistway with Front and Rear Openings
4. Please consult your local Otis representative regarding multi-car groups or smaller dimensions.

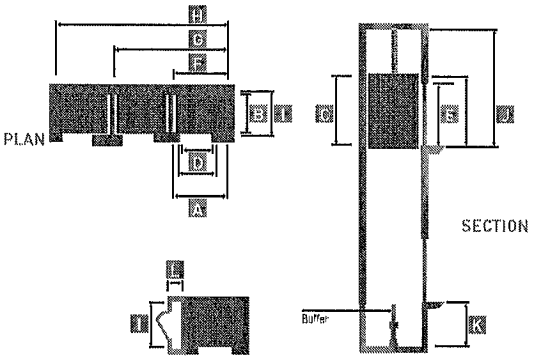
IMPORTANT:

To assist in your planning, we recommend that you call your Otis representative at the beginning of the project.

**Do you need a higher rise, flexible platform or C3 loading?**

For more complicated projects, contact your local Otis representative or email generalinquiry@otis.com

| | | | | |
|---|---|---|---|---|
| Travel height maximum | 300'<br>91m | | | |
| Max stops | 28 | | | |
| Speed (ft/min) | 350,<br>1.78m/s | 400,<br>2.03m/s | 450,<br>2.29m/s | 500<br>2.54m/s |




# Service

## Car[1]

| | Rated lbs.<br>Passenger Capacity | 4000 (1814kg)<br>25 | 4500 (2041kg)<br>28 | 5000 (2268kg)<br>31 | 5000AIA (2268kg)<br>31 |
|---|---|---|---|---|---|
| A | Interior width | 5'-8 5/16" (1735mm) | | 5'-11 5/16" (1811mm) | 5'-8 5/16" (1735mm) |
| B | Interior depth | 7'-5" (2261mm) | 7'-11" (2413mm) | 8'-6" (2591mm) | 9'-0" (2743mm) |
| | for front and rear openings | 7'-5 5/8" (2276mm) | 7'-11 5/8" (2428mm) | 8'-6 5/8" (2606mm) | 9'-0 5/16" (2758mm) |
| C | Cab height | 8'-0" Optional 9'-7" (2438mm Optional 2921mm) | | | |
| D | Car door width | 4'-0" (1219mm) | | 4'-6" (1371mm) | 4'-0" (1219mm) |
| | Door type | 2S | | | |
| E | Entrance height | 7'-0" Optional 8'-0" (2134mm Optional 2438mm) | | | |

## Hoistway

| | Rated lbs.<br>Passenger Capacity | 4000 (1814kg)<br>25 | 4500 (2041kg)<br>28 | 5000 (2268kg)<br>31 | 5000AIA (2268kg)<br>31 |
|---|---|---|---|---|---|
| F | Single width[4] | 8'-2" (2489mm) | | 8'-5" (2565mm) | 8'-2" (2489mm) |
| | in seismic zones | 8'-4" (2540mm) | | 8'-7" (2616mm) | 8'-4" (2540mm) |
| G | Double width | 16'-8" (5080mm) | | 17'-2" (5232mm) | 16'-8" (5080mm) |
| | in seismic zones | 17'-0" (5182mm) | | 17'-6" (5334mm) | 17'-0" (5182mm) |
| H | riple width | 25'-2" (7671mm) | | 25'-11" (7899mm) | 25'-2" (7671mm) |
| | in seismic zones | 25'-8" (7823mm) | | 26'-5" (8052mm) | 25'-8" (7823mm) |
| I | Depth | 9'-0" (2744mm) | 9'-6" (2894mm) | 10'-1" (3074mm) | 10'-7" (3227mm) |
| | for front and rear openings | 9'-10 5/8" (3013mm) | 10'-4 5/8" (3165mm) | 10'-11 5/8" (3349mm) | 11'-5 5/8" (3495mm) |

| J | Total overhead[2,3] | 8'-0" Cab height | 9'-7" Cab height |
|---|---|---|---|
| | 350 ft/min (1.78 m/s) | 15'-5" (4699mm) | 17'-0" (5182mm) |
| | 400 ft/min (2.03m/s) | 15'-11" (4851mm) | 17'-7" (5359mm) |
| | 450 ft/min (2.29m/s)[3] | 16'-4" (4978mm) | 17'-11" (5461mm) |
| | 500 ft/min (2.54m/s)[2,3] | 16'-9" (5105mm) | 18'-4" (5588mm) |

| K | Min pit depth | 350 ft/min (1.78 m/s) | 400 ft/min (2.03m/s) | 450 ft/min (2.29m/s) | 500 ft/min (2.54m/s) |
|---|---|---|---|---|---|
| | | 5'-5 1/2" (1657mm) | 5'-8" (1729mm) | 6'-2" (1880mm) | 6'-9" (2058mm) |

## Control Closet/Room[5]

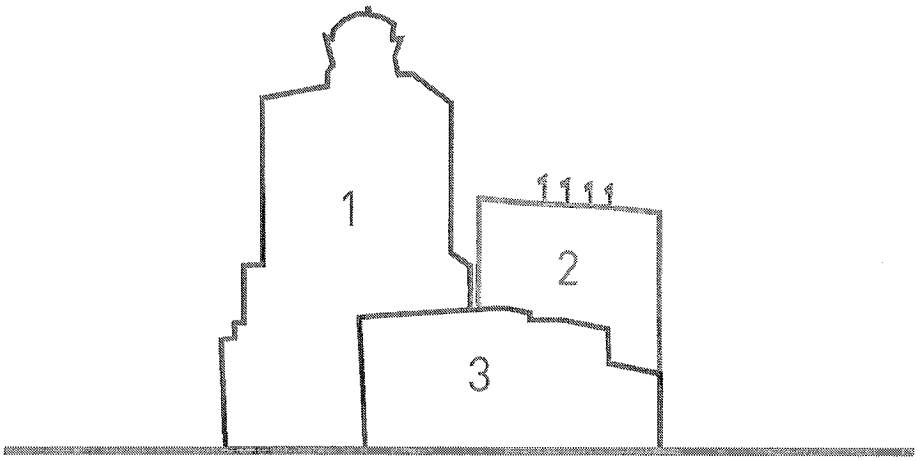
| | | |
|---|---|---|
| L | Control closet | 1 x 3'-10" (1 x 1168mm) |
| | Control room | 1 x 5'-9" (1 x 1753mm) |
| | Control room–duplex | 1 x 9'-11" (350 ft/min) (1 x 3023mm for 1.78m/s) |

IMPORTANT:

To assist in your planning, we recommend that you call your Otis representative at the beginning of the project.

1. Interior dimensions may vary depending on interior finishes
2. Available with all speeds except 500fpm [2.54m/s]
3. Available with all speeds except 450fpm [2.29m/s] or 500fpm [2.54m/s]
4. For elevators with occupied space below, this dimension may change. Consult your local Otis representative for dimensions.
5. Please consult your local Otis representative regarding multi-car groups or smaller dimensions.

## ON THE COVER




**1. Memorial Hermann Tower**

7 – Otis Gearless Elevators
8 – Otis Geared Elevators
6 – Gen2 Elevators
2 – NCE Escalators
3 – Otis Hydraulic Elevators

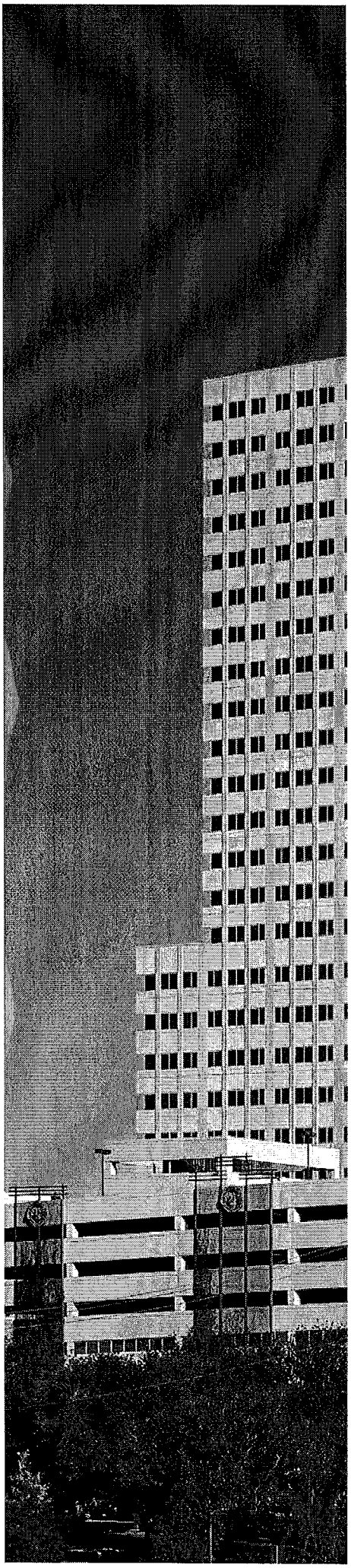
**2. The Westin Houston, Memorial City**

10 – Gen2 Elevators
3 – Otis Hydraulic Elevators

**3. Memorial City – Medical Plaza IV**

7 – Gen2 Elevators

Buildings developed by MetroNational in Houston, X.
Buildings constructed by Anslow Bryant Construction.



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publication GEN2-NSAA-001(0213) AKS

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# **ReGen** Drives
## The smart choice

Otis brings the advantages of regenerative-drive technology to low- and mid-rise residential and commercial buildings. The compact modular design makes ReGen™ drives ideal for application on Gen2™ systems.

**KEY BENEFITS**

### Environmentally friendly

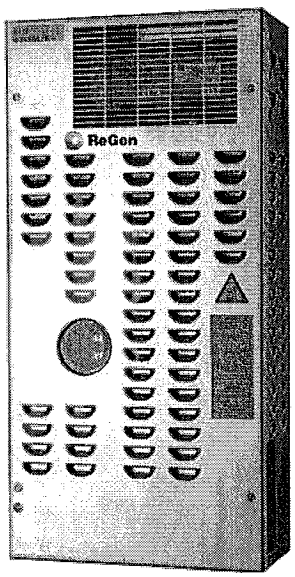
- Energy savings (up to 75 percent)
- Low harmonic distortion (typically below 5 percent)
- Reduced Radio Frequency Interference

### Significant cost savings

- Reduced peak power demand
- Decreased energy consumption

### Optimal system performance

- "Brown-out" tolerant, the drive can operate with voltage drops of up to 30 percent below the nominal value
- State-of-the-art digital design provides a smoother ride and improved floor-to-floor time




ReGen Drive

### A 'GREEN' SOLUTION

As the product of choice for "green" building initiatives, ReGen™ drives deliver substantial energy savings while helping to meet or exceed established worldwide standards.

#### Generating energy savings

In a typical non-regenerative drive, energy is dissipated as heat in a set of resistors when braking occurs, resulting in reduced efficiency and creating additional waste-heat loads in the building. ReGen drives feed this energy back into the building's internal electrical grid where it can be used by other loads or users connected to the same network.

ReGen drives reduce energy usage by up to 75 percent compared to non-regenerative drives. The drives are so efficient that their power factor is close to unity.

#### Minimizing harmonic distortion

ReGen drives produce "clean power" — resulting in less pollution of the building's electrical power system and helping to protect sensitive building equipment.

The drives minimize distortion of the incoming sinusoidal waveform line current, making Total Harmonic Distortion (THD) at nominal load typically equal to or below 5 percent, versus more than 80 percent in non-regenerative drives.

#### Reducing Radio Frequency Interference (RFI)

ReGen drives substantially minimize RFI, or Electromagnetic Interference (EMI) — virtually eliminating disruptions to other building electronic systems and ensuring compliance with strict regulations around the world.

### SIGNIFICANT ANNUAL SAVINGS

ReGen drives lower overall building operating costs, delivering significant annual savings to building owners and tenants year-after-year during the life of the elevator.

The drives help reduce the two key factors that influence energy costs, peak power demand and energy consumption. As a result, both the fixed costs based on peak power demand (kilovolt amperes or kVA) and variable costs based on energy consumption (kilowatt-hours or kWh) decrease.

Electrical power is generated when the elevator travels up with a light load, travels down with a heavy load and during the elevator system deceleration. In effect, a fully loaded, descending elevator can now provide a significant portion of the power for an adjacent ascending elevator.

The amount of energy savings due to regeneration depends on various system parameters and configurations such as car load, speed, length of run, traffic pattern and system efficiency.

Modeling and simulation results show that ReGen drives use substantially less energy than non-regenerative drives for equivalent elevator motion. (See energy savings example on back page.)

As a "green," cost effective option for the Gen2 system, ReGen drives are the smart choice for your next low- or mid-rise installation.

ReGen™ Drives

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OTIS

ReGen™ Drives

The combination of ReGen drive controls with Permanent Magnet Synchronous Motors (PMSM) optimizes motor and drive voltages, reducing currents during acceleration and normal run.

## OPTIMAL SYSTEM PERFORMANCE

### "Brown-out" tolerant

ReGen drives will continue to operate with acceptable levels of degradation (reduction of contract speed and acceleration rates) in the event of voltage drops as low as 30 percent below the nominal value, providing a significant advantage in areas where voltage fluctuations are common.

### Superior ride quality and performance

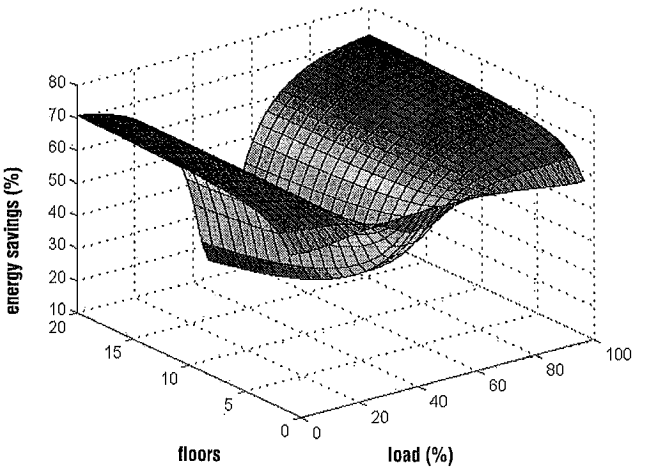
State-of-the-art, 32-bit high-speed digital signal processors and new control algorithms for profile generation and position accuracy result in a smoother ride and improved floor-to-floor time compared to a non-regenerative drive.

## SPECIFICATIONS

### Duty and speed

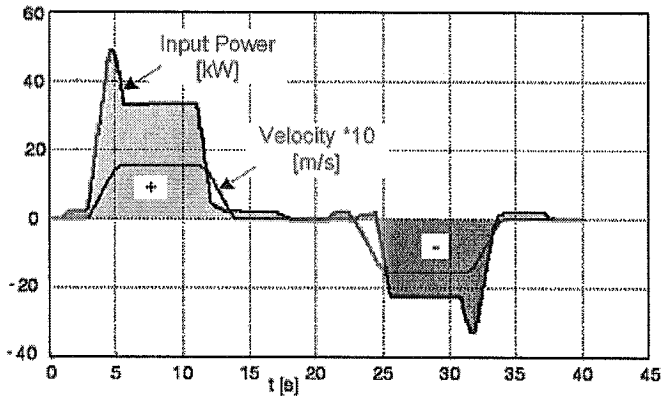
ReGen drives can be used with systems up to 4 meters per second. They are optimized for Gen2 systems with duties from 630 kg to 2,500 kg and speeds from 1 meter to 2.5 meters per second.

### Energy savings




Energy savings with a ReGen drive versus a non-regenerative drive during elevator motion as a function of car load and elevator run from 1 to 20 floors for a typical elevator cycle

### Energy efficiency




Energy consumed when a fully loaded car travels in up direction

Power benefit of ReGen drives: energy generated when a fully loaded car travels in down direction

### Energy and cost of energy consumed over a year

Profile: 20-floor building, 60-meter rise, 300,000 trips per year

| Duty/ Speed | Gen2 system ReGen drive Gearless PMSM | | Gen2 system Non-regenerative drive Gearless PMSM | | Geared system Non-regenerative drive Induction motor | |
|---|---|---|---|---|---|---|
| | Energy [kWh/Y] | Cost* [€/Y] | Energy [kWh/Y] | Cost* [€/Y] | Energy [kWh/Y] | Cost* [€/Y] |
| 1275 kg 1.6 m/s | 3640 | 364.0 | 6573 | 657.3 | 9930 | 993.0 |
| 1600 kg 1.6 m/s | 4431 | 443.1 | 8161 | 816.1 | 12258 | 1225.8 |

(*) Cost of energy assumes € 0.1/kWh

OTIS

# Bringing North American Clothes Dryers into the 21st Century: A Case Study in Moving Markets

*Chris Badger and Rebecca Foster, Vermont Energy Investment Corporation*
*Chris Granda, Grasteu Associates*
*Christopher Wold, Collaborative Labeling & Appliance Standards Program*

## ABSTRACT

Most major household appliances, including refrigerators, dishwashers and clothes washers have become 50-80% more energy efficient over the last two decades as a result of ENERGY STAR, stricter federal efficiency standards, and energy efficiency programs. This success only serves to highlight the lack of change in clothes dryer efficiency during this same period. Clothes dryers are now in over 80% of US and Canadian homes, and represent the single largest remaining household appliance efficiency opportunity.

Historically, clothes dryers were considered to be simple machines with little potential for energy savings, but new technologies, including heat pump clothes dryers in Europe, have opened the door for 30-40% efficiency gains in the North American market. Manufacturers will need to make significant capital investments to bring new products to market and building the necessary confidence in a market for advanced dryers requires cooperation between federal agencies, industry and energy efficiency programs to ignite and sustain customer demand.

In 2010 New Jersey's Clean Energy Program launched the Super Efficient Dryer Initiative (SEDI) to support the successful market introduction of advanced clothes dryers through key stakeholder engagement and coordination. SEDI's progress was recently highlighted by the announcement of a scoping process for an ENERGY STAR clothes dryer label and the selection of advanced clothes dryers for the 2012 ENERGY STAR Emerging Technology award.

This paper will provide an overview of SEDI's work to date to bring highly efficient clothes dryers to the North American market and provide an example of an active market transformation initiative.

## Introduction

SEDI was designed to explore the potential for commercializing and propagating recent efficiency improvements in residential electric clothes dryer technology throughout the U.S. and Canada[1]. The project topic had been inspired by several years of work by the Swiss Agency for Efficient Energy Use (SAFE) which, since 2005, has documented the entry of advanced clothes dryers using heat pump technology into the European market, and the energy savings associated with these new products. Although initiated under the New Jersey Clean Energy Program, SEDI partnered with the Collaborative Labeling and Appliance Standards Program (CLASP) in 2011 to fortify both the initiative's technical and policy efforts.

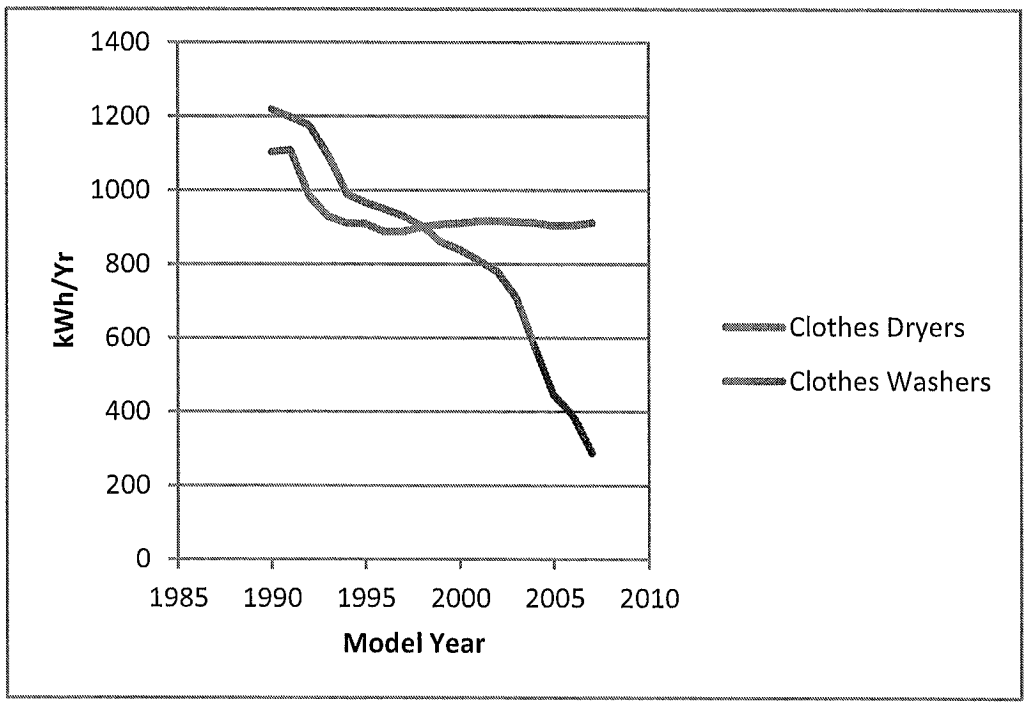
Despite the rapid advancement in the energy efficiency of clothes washers over the last 20 years, clothes dryers have lagged significantly behind. Due to the absence of significant technology improvements by the industry, the lack of an ENERGY STAR product labeling

[1] Opportunities for increases in gas dryer energy efficiency were outside of SEDI's initial scope.

program for clothes dryers, no incentives for efficient clothes dryers from energy efficiency program sponsors, and long-overdue updates to the federal energy conservation standard for clothes dryers there has been surprisingly little change in energy efficiency of clothes dryers for many years.

Figure 1 highlights the dramatic decrease in the average shipment-weighted annual energy consumption of clothes washers with respect to clothes dryers over the last 20 years.

**Figure 1. Average Shipment-weighted Annual Energy Consumption of Clothes Washers and Electric Clothes Dryers in Canada**




Source: NRCan 2007

To remedy this situation, SEDI developed a phased plan designed to address recognized market barriers, as well as the needs of efficiency programs and the laundry manufacturers with regards to introducing a new technology to the market. SEDI was strongly influenced by the framework for the Consortium for Energy Efficiency's Super Efficient Home Appliances Initiative (SEHA), building on the previous successes of collaborative efforts to improve the efficiency of household appliances. During 2010-2011, SEDI focused on addressing three underlying questions:

- Does the technical and market energy savings potential of the technology support the development of a North American residential advanced clothes dryer initiative?
- Is there a group of stakeholders willing to support the development of a North American market for advanced clothes dryers by participating in the design of a multi-country initiative?
- Will stakeholders and new sponsors provide sufficient resources to support an initiative that builds consensus support for the market introduction of advanced clothes dryers?

The process of answering these questions have set the stage for the current efforts by SEDI to deploy the first highly efficient advanced clothes dryers in the US and Canada during 2013.

## Defining the Energy Saving Potential for Advanced Dryers

The first task of SEDI was to understand the existing market for clothes dryers in North America, the short term technology options and market barriers for energy savings, and ultimately an estimate of the savings potential for the introduction of new, high efficiency clothes dryer technology.

### North American Clothes Dryer Market

The penetration of clothes dryers into homes in North America has trailed the penetration of clothes washers, though the difference between the two has narrowed over time. **Table 1** presents clothes dryer stock data from the 2009 Residential Energy Consumption Survey conducted by the U.S. Energy Information Agency, and 2007 data from the Canadian NRCan "2007 Survey of Household Energy Use".

**Table 1. North American Clothes Dryer Stock (2009)**

| Market Penetration | US | Canada | Both |
|---|---|---|---|
| Total households | 113.6 mil | 12.9 mil | 126.5 mil |
| % electric | 63.2% | 81% | 65.2% |
| Total with electric | 71.8 mil | 10.7 mil | 82.5 mil |
| % natural gas or propane | 16.3% | 3.9% | 15.0% |
| Total natural gas or propane | 18.5 mil | 486,692 | 19.0 mil |
| % without dryers | 20.6% | 12.0% | 19.7% |
| Homes without dryers | 23.4 mil | 1.5 mil | 24.9 mil |

There are more than 80 million residential electric clothes dryers in use in North America today. DOE's technical assessment document for residential clothes dryers estimates US shipments at approximately 7 million for 2008, 80% of which were electric. (US DOE, 2010)

### Current Test Procedures and Standards

The simplicity of the tumble clothes drying process is one reason why little attention has been paid to dryer energy efficiency over the years. It was widely believed that there was little that could be done to reduce residential clothes dryer energy use. Both the U.S. and Canada have minimum efficiency standards and energy efficiency test procedures in place for residential clothes dryers. Starting in 1994, the effective U.S. efficiency standard for residential electric clothes dryers was set at 3.01 lbs of water removed per kWh through the National Appliance Energy Conservation Act (NAECA). The baseline unit electricity consumption (UEC) was set at 967 kWh per annum, based on a 7 lb standard laundry load and 416 cycles/year as defined in the 1981 DOE test procedure for dryers. Prior to 2011 no additional changes had been made either to the minimum efficiency requirements or to the energy consumption test methodology.

In addition to the lack of technical innovation, shortcomings in the 1994 DOE clothes dryer test procedure presented barriers to progress in energy efficiency. In a recently released

study sponsored by the Natural Resources Defense Council (NRDC, 2011), Ecova identified deficiencies in the existing DOE test procedure and recommended changes including:

- Specific testing of dryer moisture sensing capability and determination of end-of-cycle
- Testing of a greater diversity of laundry load size and clothing types and materials
- Lowering the remaining moisture content levels based on current clothes washer technology
- HVAC impacts from the reduction or elimination of externally vented dryer exhaust
- Change efficiency metric to reflect capacity for removal of water content and source energy

The NRDC report highlights that by incorporating these changes to the testing procedure the result would be a broader differentiation of efficiency levels across clothes dryers currently available in the North American market and new highly efficient advanced dryers that may be introduced in the future. The inclusion of HVAC savings would also specifically support the future promotion of ventless (condensing and heat pump) clothes dryers in the North American market. Another important change requested by multiple stakeholders (manufacturers and efficiency programs) is the expansion of the existing product categories to include standard size (>4.4 cu. ft) ventless dryers in addition to compact versions.

In its final rule for a new test procedure in 2011 and its standard for energy conservation of residential clothes dryers, DOE addressed updates to appropriate levels of moisture content and load size, but did not appropriately address end-of-cycle moisture sensing or HVAC impacts when comparing vented and ventless dryers. (US DOE, 2011)

**Sample Cost-Effectiveness Analysis for North America**

The European experience with heat pump clothes dryers shows us that at least one technology option for a significantly more energy efficient residential electric clothes dryer can be commercially viable and provides an indicator of the potential savings for the U.S. and Canada. Advanced clothes dryers, utilizing heat pump technology, have gained significant market share in Europe. For example, in Switzerland there are more than 50 models of heat pump clothes dryers are available for residential consumers and 3 for semi-professional use.

SEDI developed a model to estimate the energy saving potential of a hypothetical North American heat pump clothes dryer compared to both existing standard and efficient electric clothes dryers currently in the market. Existing efficient electric clothes dryers, although technologically similar to a standard version, often utilize advanced temperature and moisture sensing to automatically terminate a cycle early. Results from this modeling are presented in Tables 2 and 3 below.

**Table 2. Clothes Dryer Energy Consumption and Costs**

| Electric Clothes Dryer | | Standard Dryer | Efficient Dryer | Heat Pump Dryer |
|---|---|---|---|---|
| Annual Consumption (kWh/yr) | Direct | 775 | 646 | 370 |
| | HVAC | 57 | 57 | 0 |
| | Total | 832 | 703 | 370 |

| | | | |
|---|---|---|---|
| Installed Cost | $564 | $716 | $969 |
| Annual Cost of Operation ($/yr) | $136 | $115 | $61 |

**Table 3. Heat Pump Clothes Dryer Cost-Effectiveness**[2]

| Electric Clothes Dryer | Relative to a Standard Dryer | Relative to a an Efficient Dryer |
|---|---|---|
| Annual Savings (kWh/yr) | 462 | 332 |
| Annual Savings ($/yr) | $76 | $54 |
| Lifetime Savings (kWh)* | 5,541 | 3,987 |
| Lifetime Savings ($) | $909 | $654 |
| Price Premium ($) | $405 | $253 |
| Payback on Price Premium (yr) | 5.3 | 4.6 |
| Present Value of Net Benefits ($) | $297 | $235 |
| Benefit-to-Cost Ratio | 1.86 | 2.09 |

This analysis uses New Jersey's 2009 average residential electric rate of US $0.16/kWh, which is higher than the US $0.149/kWh rate for a large state that DOE used in its pre-analysis. In order to account for avoided generation and transmission costs, efficiency program managers will need to custom tailor these avoided costs and calculate their own per-unit savings. The size and relative importance of HVAC savings from a ventless dryer design are very dependent upon climate. As part of the analysis, SEDI developed a spreadsheet tool to calculate HVAC savings taking into account variables including heating and cooling degree days and the prices of heating fuels and electricity.

The total energy efficiency savings generated by the successful commercialization of residential advanced clothes dryers in North America will be a function of the efficiency of the new technology, and its popularity with U.S. and Canadian consumers.

**Overview of cost effectiveness analysis.** These two scenarios were developed by SEDI based on estimates of total cycle energy consumption derived through recent laboratory testing performed for the Natural Resource Defense Council by Ecova (NRDC, 2011). The Ecova testing included both a sample of clothes dryers currently available on the North American market and a single model of European heat pump clothes dryer. Since that report was released, the DOE has established a draft of recommended changes to the existing clothes dryer test procedure. (US DOE, 2011) In order to evaluate the impacts of the DOE final rule for clothes dryer on the existing test results, the following factors were incorporated in SEDI's analysis:

- *Reduction in initial moisture content of laundry coming from washer from 70% to 47%*
- *Increase in laundry test load weight from 7lbs to 8.45 lbs*
- *Reduction in the average number of household annual laundry cycles from 416 to 283*

[2] High efficiency clothes dryers were not included in this part of the analysis.

SEDI also estimated home space heating and cooling (HVAC) impacts from the elimination of externally vented dryer exhaust. In North America, most clothes dryers draw conditioned air from inside homes, heat it, use it to dry clothes and then exhaust it outside through a vent; which can have an impact on home HVAC energy consumption. On the other hand, most European clothes dryers are unvented; instead they draw air from inside homes, heat it, use it to dry clothes, and then condense the moisture out of the air and expel it as liquid water. There are other clothes dryer designs that are partially vented (TIAX/Whirlpool, 2005), though these were not included in our analysis. Estimates for the savings from eliminating venting vary significantly based on the seasonal heating and cooling requirements of different homes in different climates. The NRDC study does not explicitly estimate the HVAC impacts from eliminating venting, but does incorporate savings from the direct ducting into the dryer cabinet of makeup air from outside the house.

The calculation used in this report is based on extrapolating the dryer ventilation impacts from the heating degree days (HDD) and cooling degree days (CDD) for a region and the heat capacity of the volume of air that is moved. This provided a simple method for the various stakeholders to estimate HVAC impacts. Based on an ASHRAE rule of thumb, only half of the added ventilation from the clothes dryer (based on the cfm rating of the blower fan) is added to the existing natural infiltration for most existing homes.

**Impact of demand reduction on avoided utility costs.** SEDI developed its own estimate of demand reduction and avoided costs, because DOE used a different methodology than efficiency programs when it estimated life cycle costs of more efficient dryers for a recent rulemaking. Specifically, DOE utilized the Annual Energy Outlook 2008 residential energy price projection for electricity price trends. Because this electricity price is for energy only, and has no demand component, it significantly understates the value of energy efficiency measures in reducing the growth of electricity demand. On the other hand, the utility total resource net benefits test included in this analysis quantifies both the energy and capacity saved in avoiding any generation or transmission upgrades.

**Incremental costs, lifetimes and residential rates.** The projected cost of a "standard," "high efficiency", or hypothetical North American heat pump clothes dryer used in this analysis are similar to both DOE's incremental cost estimates and the proportional price premium for heat pump dryers in the European market.

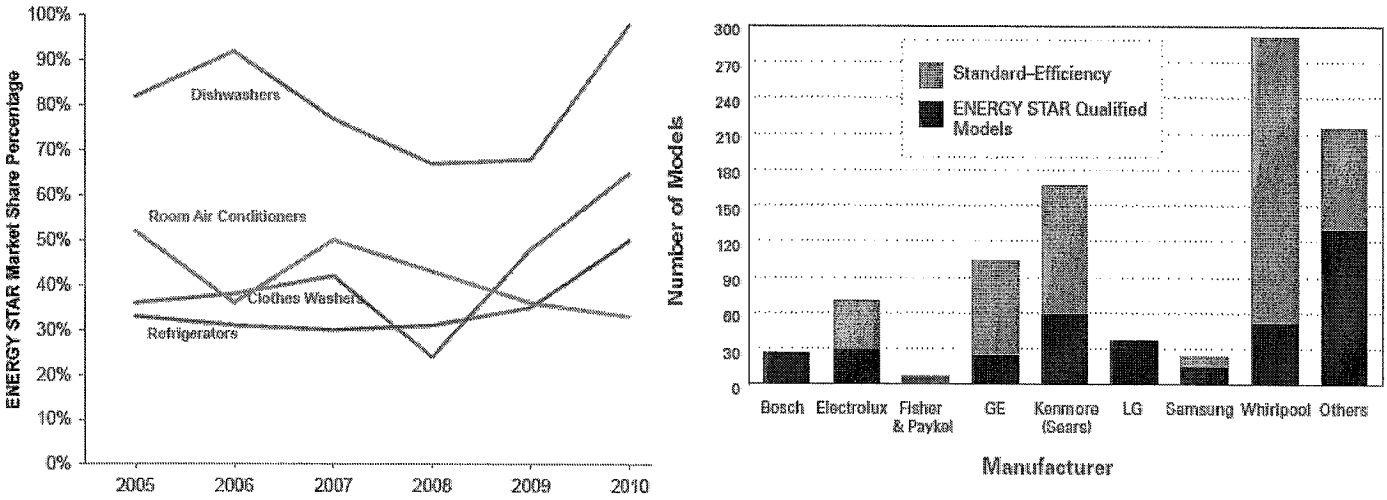
## Building a Collaborative Initiative for High Efficiency Dryers

After analyzing the market and savings opportunity, SEDI began work to build a collaborative program model for supporting the introduction of advanced dryers into the North American market. SEDI looked to the residential clothes washer initiative (RECI) sponsored by the Consortium for Energy Efficiency (CEE) as a model. RECI created a close partnership between efficiency programs and manufacturers and helped to introduce European-style front-loading washing machines to the US market. Between 1996 and 1999, the initiative supported a 5% gain in market share for high efficiency clothes washers with over 200 participating utilities and efficiency programs, 14 manufacturers and 35 qualifying models. Subsequent, significant upgrades in the energy efficiency specifications for qualified ENERGY STAR clothes washers

(1997, 2001, 2004, 2007 and 2011), has increased the market share of ENERYG STAR qualifying products to 64% by 2010 (US EPA, 2010).

As experienced with clothes washers in RECI, the synergistic effects of ENERGY STAR specifications and technology advancements with a coordinated energy efficiency program effort to drive demand can create a positive feedback loop leading to greater demand for more efficient products supported by increased ENERGY STAR specifications.

**Figures 2 & 3. ENERGY STAR Clothes Washer 2010 Market Share and 2008 Product Snapshot**




## Engaging U.S. EPA

The ENERGY STAR program will play an important role in the introduction of advanced clothes dryers into the North American market. As manager of the influential ENERGY STAR program, EPA was a primary target of SEDI activity in 2011. In 2011, EPA took two very important steps towards clothes dryer efficiency; EPA announced the ENERGY STAR Emerging Technology Award for Advanced Clothes Dryers and assessed the opportunity for an ENERGY STAR label.

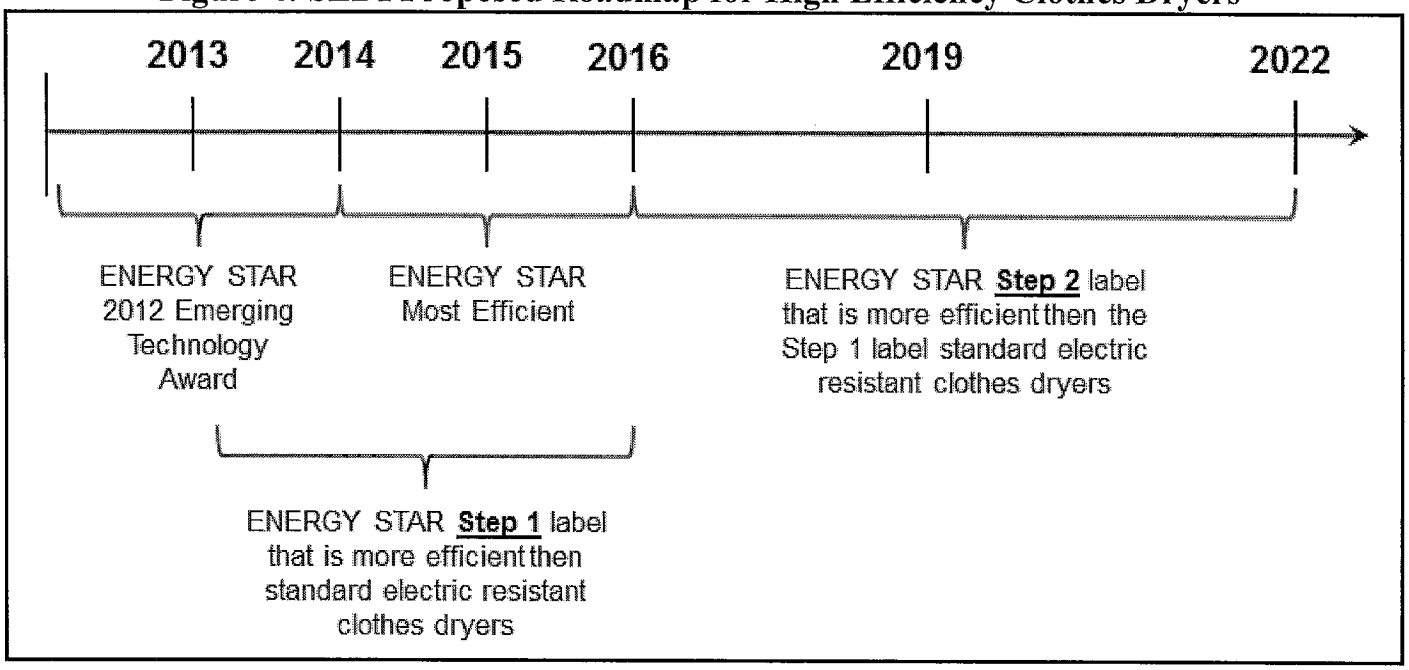
**Emerging technology award.** Early in 2011, SEDI responded to an EPA solicitation for nominations for the 2012 ENERGY STAR Emerging Technology (ET) Award and proposed the nomination of advanced clothes dryers for the 2012 product category. The ENERGY STAR Emerging Technology Award "raises the profile of innovative technologies that may not yet meet key principles associated with the ENERGY STAR program (e.g. widely available, cost-effective), but have the potential to significantly reduce greenhouse gas emission once they are more widely adopted." (US EPA, 2011) In September 2011, after discussions with both SEDI and domestic and international clothes dryer manufacturers, EPA announced that Advanced Clothes Dryers were selected for the 2012 Emerging Technology Award. The award would be given to any manufacturer that brings a residential electric clothes dryer to the US market in 2012 or 2013 that meets a performance level approximately 30% higher than the current federal standard.

**ENERGY STAR label for clothes dryers.** In the same timeframe, SEDI, manufacturers, and several other key stakeholders were actively engaging EPA to initiate a scoping process for the development of an ENERGY STAR clothes dryer specification. SEDI proposed a two-step approach to EPA, suggesting that they first label the clothes dryers currently on the market that are more efficient than the standard clothes dryer and raise the specification level to recognize the higher performance of advanced clothes dryers once they are brought to market. SEDI argued that these steps were both necessary towards achieving market transformation for clothes dryers in North America. EPA began the ENERGY STAR scoping process and recently shared its results, which align with SEDI's recommendations. EPA sees both a short term opportunity for modest energy savings by labeling more efficient clothes dryers that are currently in the market and a longer term opportunity for more dramatic energy savings from advanced clothes dryers anticipated to enter the market in 2013.

### SEDI Proposed Roadmap

EPA's announcement of an Emerging Technology Award and a specification-development process for ENERGY STAR clothes dryers has established the framework and longer term roadmap for the introduction of advanced clothes dryers in the North American market. Figure 4 presents a proposed roadmap for advanced clothes dryers, as the evolution of the market and the ENERGY STAR specification progresses. SEDI supports the identification of tiered efficiency specifications with defined end points, as these are important for the continued improvements of clothes dryer efficiency.

**Figure 4: SEDI Proposed Roadmap for High Efficiency Clothes Dryers**




## Investing in the Future of High Efficiency Dryers

In Switzerland, heat pump clothes dryers went from zero to 16% market share in about five years, or about 3% annual market share growth. Starting in 2012, the market share of heat pump dryers is estimated at 100% with the adoption of an aggressive new Swiss minimum

energy performance standard for tumble dryers. (TopTen, 2012) SEDI anticipates a more moderate increase in North American market share through a combination of utility incentives and the ENERGY STAR voluntary labeling program. If we assume that in the US and Canada it would be possible to achieve a 2% increase in market share per year starting in 2013, by 2018 SEDI will have helped save over 35,000 cumulative lifetime GWh of electricity.

During 2011, SEDI focused on engaging manufacturers and efficiency programs in introducing advanced clothes dryers to the North American market. SEDI also launched important research that will support the energy saving potential of advanced clothes dryers.

## Manufacturer Interviews

In the third quarter of 2011, SEDI conducted interviews with major manufacturers of clothes dryers to assess their interest in introducing more energy efficiency products to the North American market. Twelve manufacturers were contacted and resulted in interviews with Arcelik AS, Bosch & Siemens, Electrolux, General Electric, LG, Miele, Samsung, and Whirlpool. All but GE, LG, and Samsung currently offer heat pump clothes dryers either directly or through sub-brands on the European market. An additional interview was held with the engineering design and development firm, Porticos.

All manufacturers reported that they were, in some way, responding to perceived changes in the market by introducing more energy efficient clothes dryers. Several are already marketing "Eco" models on the North American market. None are currently selling clothes dryers using heat pump technology in the US or Canada. Results of manufacturer surveys and retailer engagement in 2011 have demonstrated a clear indication that there is an opportunity for partnership with efficiency programs in supporting the market introduction of advanced clothes dryers.

In November 2011, SEDI presented at the ENERGY STAR Partner Meeting in Charlotte, NC to further engage manufacturers, retailers and efficiency programs. The SEDI presentation was part of a two hour session entitled, "Focus on Laundry: Residential Clothes Dryer Opportunities" which was attended by both major US and international manufacturers, energy efficiency program managers and the EPA to discuss activity around promoting advanced clothes dryers.

## Laboratory Testing

That same month, SEDI undertook laboratory testing of European heat pump and North American electric resistance dryers. Testing data will validate the energy saving potential of heat pump technology and help U.S. utilities and ENERGY STAR better understand the energy saving potential this technology may have in North America. This project was directly funded by CLASP and with testing conducted by Ecova at its Durango, CO facility. Test results and a final report will be available in mid-2012.

## Mobilizing the Support of Efficiency Programs

In 2011, SEDI engaged efficiency programs. Appropriate incentives to offset the higher incremental cost of the ENERGY STAR clothes dryers and consumer outreach are critically needed for new technologies to be successful. Several regional efficiency programs that are core

stakeholders in SEDI (including National Grid, Efficiency Vermont, NYSERDA, New Jersey Clean Energy Program, and LIPA) have indicated strong support for developing incentive programs in 2012-2013 to support any new products brought to market.

With over one million households with electric clothes dryers, New Jersey has already taken the next step in leading other programs towards direct market support of advanced clothes dryers, highlighted in the 2012 program filing for New Jersey's Clean Energy Program (NJCEP):

> "During 2010 and 2011, the Program was successful in advancing a consortium of efficiency programs, manufacturers, and the EPA on behalf of ENERGY STAR in the introduction of super-efficient clothes dryers to the North American market, under the banner of the Super-Efficient Dryer Initiative (SEDI). As a result of SEDI, heat pump clothes dryers have been selected for the 2012 ENERGY STAR Emerging Technology Award, which will support manufacturers bringing this technology to the North American market. Although no new R&D initiatives will be introduced for energy efficient products in 2012, the Program will look to continue its leadership role in SEDI by supporting these manufacturers and providing upstream incentives for field testing heat pump clothes dryers in New Jersey."

Per the language in the filing, it is anticipated that New Jersey's engagement of trade allies in 2012 and beyond will inform both the state's longer term planning and ENERGY STAR's development of a clothes dryer specification for 2013. With several appliance manufacturers headquartered in New Jersey, including Miele, LG and Samsung, the state has a strong presence in a potentially growing industry for advanced clothes dryers.

## Next Steps

During the latter part of 2011, SEDI began identifying stakeholders willing to support SEDI's aims. While the ENERGY STAR Emerging Technology Award is a powerful incentive for manufacturers and retailers, deciding to bring a new product to market is no small undertaking. Based on its efforts to date, SEDI has developed a scope of work intended to continue the momentum that has been built since the beginning of the initiative in 2010. This scope of work includes industry support (manufacturer and retailer communications), efficiency program support (development of inputs for cost effectiveness screening and help with program design models for supporting new products), and continued technical research to better understand baseline clothes dryer efficiency use in North America and the savings that heat pump dryers can deliver. SEDI is seeking commitments from efficiency programs to support advanced clothes dryers in anticipation of the 2012-2013 market introductions of the Emerging Technology Award winners.

## Conclusion

Since 2010 with the founding of SEDI, New Jersey's Clean Energy Program, CLASP and other key stakeholders have played prominent and critical roles in coalescing support of efficiency programs and providing guidance to EPA and the industry to ensure a rapid introduction of advanced clothes dryers in to the North American market. The process taken was to first understand and quantify the savings potential and market opportunities/barriers, then to begin building a collaborative initiative to mitigate risk to all stakeholders, and lastly to work to

overcome specific barriers and put into place "carrots" like incentive programs to keep the momentum going. While the work to bring a new generation of advanced clothes dryers to the North American market is not yet complete, much has been accomplished and a path has been laid out to achieve that goal in 2013.

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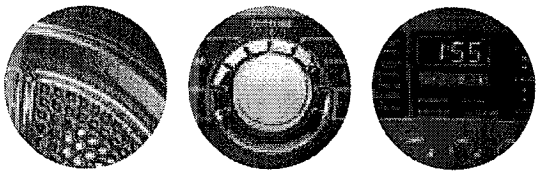
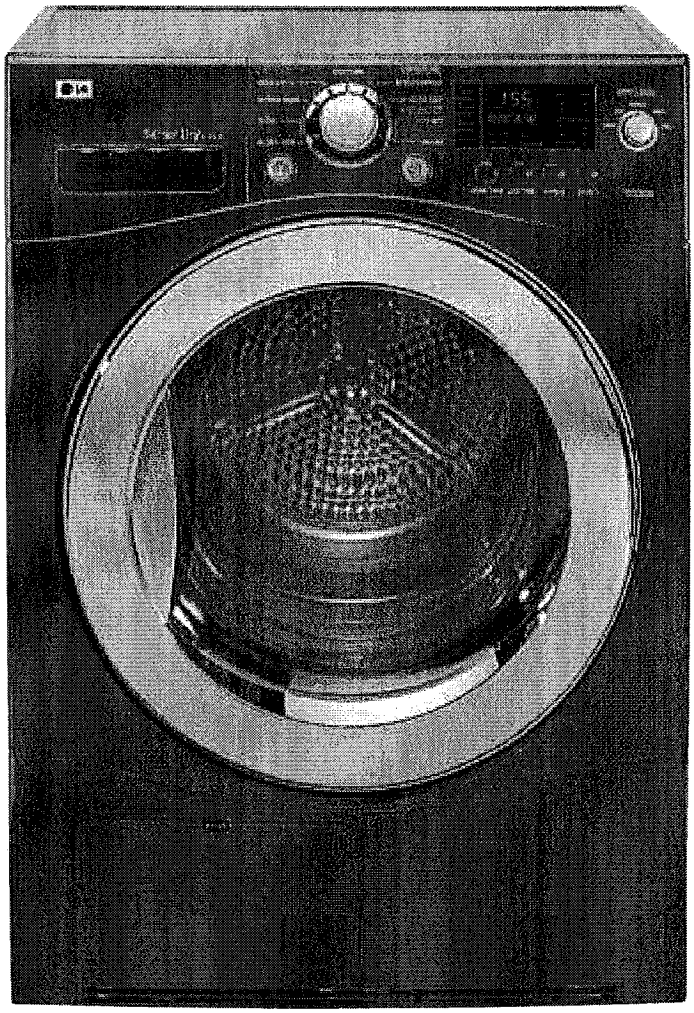
Life's Good



LAUNDRY

# DLEC855W/R
## 24" Compact Electric Condensing Dryer

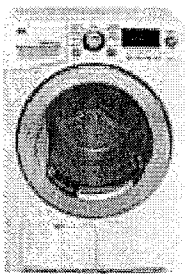


### SMART TECHNOLOGY

- 4.2 cu.ft. Large Capacity with NeveRust™ Stainless Steel Drum
- Sensor Dry System
- LoDecibel™ Quiet Operation
- 9 Drying Programs
- 10 Options
- Precise Temperature Control with Variable Heat Source
- Wrinkle Care Option
- Delicates Cycle

### STYLISH DESIGN

- Intelligent Electronic Control Panel with LED Display and Dial-A-Cycle™
- Stackable with Matching Washer (WM1335HW/WM1355HR)
- Chrome Door with Clear Glass



As a leader in smart technology and stylish design, LG introduces a new 24" compact condensing ventless dryer. The ventless condensing system dries clothes without the need for external venting. Perfect for apartments, condos or small spaces.

Available colors:

● Wild Cherry Red (R) ○ White (W)

LAUNDRY

# DLEC855W/R
## 24" Compact Electric Condensing Dryer

LG Life's Good

### Ventless Condensing System
Ventless condensing dryers dry clothes without the need for external venting.

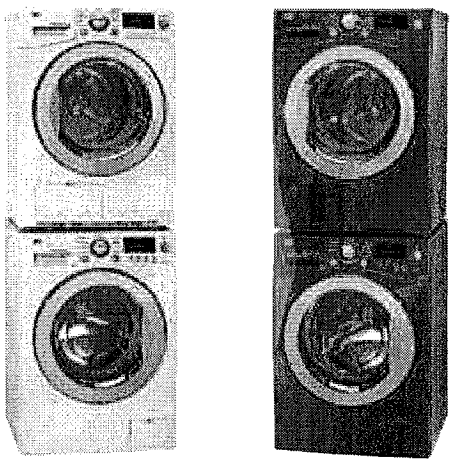
### LoDecibel™ Quiet System
LG washers are some of the quietest in the industry. The direct drive motor reduces unnecessary noise and vibration.

### Sensor Dry System
Measures moisture during the cycle, and automatically adjusts the drying time and temperature for optimal fabric care.

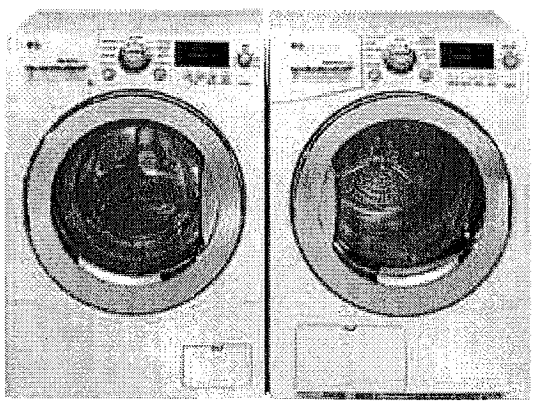
### Intelligent Electronic Controls with LED Display and Dial-A-Cycle™
Intuitive controls allow you to "set it and go".

### Wrinkle Care
Dry clothes are periodically tumbled without heat to reduce wrinkles.

### Stacked Configuration



### Side by Side



| | |
|---|---|
| CAPACITY | |
| Capacity* | 4.2 cu.ft. |
| APPEARANCE | |
| Design Look | Front Control |
| Intelligent Electronic Controls with LED Display | • |
| Dial-A-Cycle™ | • |
| DRYING PROGRAMS | |
| 9 Programs | Cotton, Mixed Fabrics, Quick Dry, Bulky Item, Wool, Delicates, Sportswear, Cool Air, Warm |
| 10 Options | Gentle, Damp Dry Beep, Crease Care, Time Delay, Custom Program, Drum light, Child Lock, More Time, Less Time, Wrinkle Care |
| 5 Drying Levels | Very Dry, More Dry, Normal Dry, Less Dry, Damp Dry |
| Dry Times | More Time, Less Time |
| FABRIC CARE FEATURES | |
| Sensor Dry | • |
| Variable Heater | • |
| CONVENIENCE FEATURES | |
| LoDecibel™ Quiet Operation | • |
| End of Cycle Beeper | Adjustable |
| Child Lock | • |
| Venting Option | No |
| Accessible Filter | • |
| Drum Light | • |
| Remaining Time Display/Status Indicator(s) | • |
| Leveling Legs | 4 Adjustable Legs |
| MATERIALS AND FINISHES | |
| NeveRust™ Stainless Steel Drum | • |
| Top Plate | LPM Board |
| Cabinet | Painted Steel |
| Control Panel | Plastic |
| Available Colors | White (W), Wild Cherry Red (R), |
| POWER SOURCE | |
| Ratings | UL Listed |
| Requirements | 240V, 30 Amps |
| Type | Electric |
| DIMENSIONS | |
| Product (WxHxD) | 24" x 33 1/2" x 25 1/4" |
| Carton (WxHxD) | 26" x 35 3/4" x 27 3/4" |
| Weight: Product / Shipping | 105 lbs. / 115 lbs. |
| WARRANTY | |
| | 1 Year Parts and Labor |
| UPC CODES | |
| DLEC855W | 048231 010399 |
| DLEC855R | 048231 010405 |

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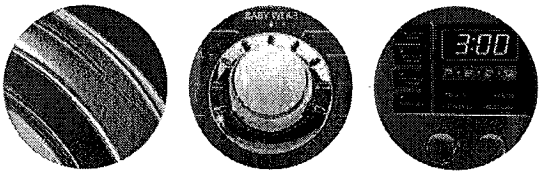
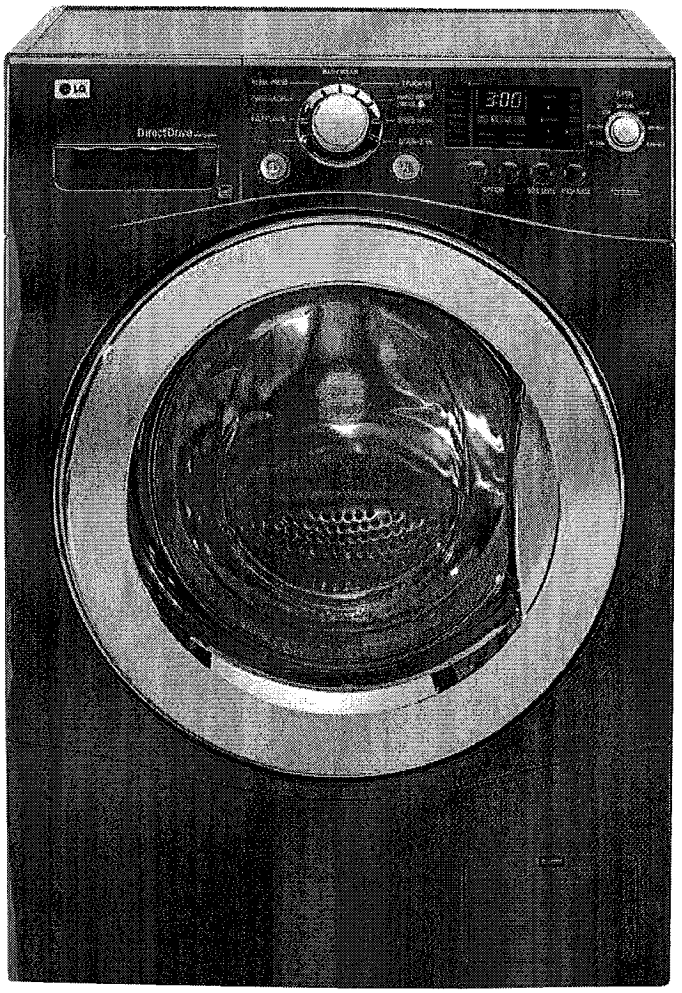


LAUNDRY

# WM1355HW/HR
## 24" Compact Washing Machine

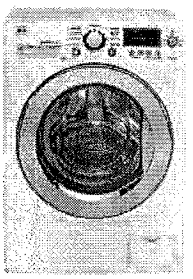


### SMART TECHNOLOGY

- 2.3 cu.ft. (DOE) Ultra Capacity with NeveRust™ Stainless Steel Drum (IEC)
- Direct Drive Motor (10 Year Warranty)
- 1300 RPM
- LoDecibel™ Quiet Operation
- Highly Energy and Water Efficient
- SenseClean™
- 9 Washing Programs
- 5 Temperature Levels
- Sanitary Cycle
- Delay Wash (up to 19 hours)

### STYLISH DESIGN

- Intelligent Electronic Control Panel with LED Display and Dial-A-Cycle™
- Stackable with Matching Dryer (DLEC855W, DLEC855R)
- Chrome Door with Clear Glass



As a leader in smart technology and stylish design, LG introduces a new 24" compact washer. Perfect for apartments, condos or small spaces.

Available colors:

● Wild Cherry Red (R) ○ White (W)

ENERGY STAR

LG front load washers exceed Energy Star® classifications by a minimum of 39%.

LGusa.com

LAUNDRY

# WM1355HW/HR
## 24" Compact Washing Machine

LG Life's Good

### LoDecibel™ Quiet System
LG washers are some of the quietest in the industry. The direct drive motor reduces unnessary noise and vibration.

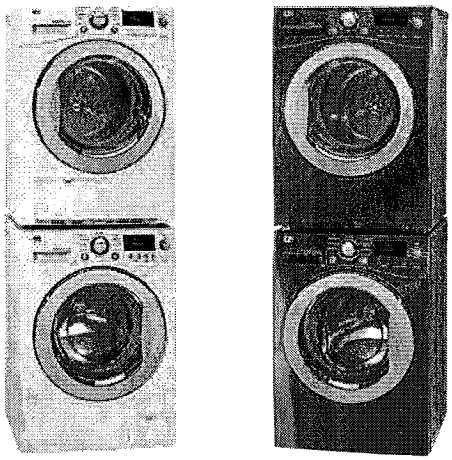
### Direct Drive Motor
Power is delivered right to the drum from the motor without belts, resulting in a highly durable, powerful and quiet washing machine.

### SenseClean™ System
The water level and wash time are set automatically based on the weight and size of each load for optimal washing care.

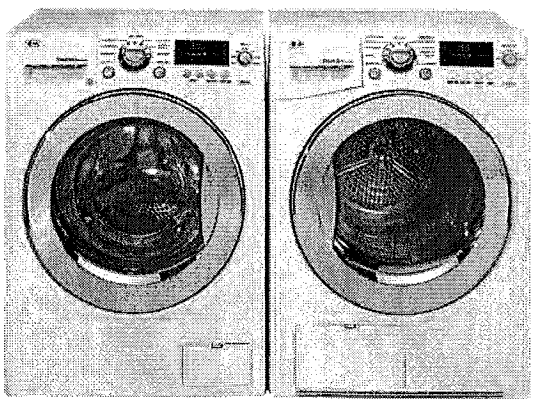
### Intelligent Electronic Control Panel with Dial-A-Cycle™
Intuitive controls allow you to 'press and go'.

### Sanitary Cycle
Get tough stains and bacteria out of dirty clothes with this special cycle that boosts water temperature to 158°F.

### Stacked Configuration



### Side by Side



| | |
|---|---|
| CAPACITY | |
| Capacity | 2.3 cu.ft. (DOE) |
| APPEARANCE | |
| Design Look | Front Control |
| Intelligent Electronic Controls with LCD Display | • |
| ENERGY | |
| Energy Star Compliant | • |
| WASH PROGRAMS | |
| 9 Programs | Sanitary, Bulky/Large, Cotton/Normal, Perm Press, Baby Wear, Delicates, Hand Wash/Wool, Speed Wash, Drain & Spin |
| 5 Wash/Rinse Temps | Extra Hot/Cold, Hot/Cold, Warm/Warm, Warm/Cold, Cold/Cold |
| Spin Speeds | Extra High (1300 max), Very High (1200), High (1000), Medium (800), Low (600), Very Low (400), No Spin |
| No. of Water Levels | Automatically adjusts to size of load |
| No. of Soil Level | 5 |
| 10 Options | Prewash, Rinse + Spin, Extra Rinse, Stain Cycle, Water Plus, Tub Clean Delay Wash (up to 19 hours), Child Lock, Favorite, Beeper |
| CONVENIENCE FEATURES | |
| 3 Tray Dispenser | Prewash, Main Wash, Softener |
| LoDecibel™ Quiet Operation | • |
| End of Cycle Beeper | • |
| Child Lock | • |
| Self -Diagnosis | • |
| Auto Balancing | • |
| Auto Suds Removal | • |
| Forced Drain System | • |
| Status Indicator(s) | • |
| Internal Water Heater (1000W) | • |
| Leveling Legs | • |
| MOTOR AND AGITATOR | |
| Motor Type | Direct Drive Motor |
| Motor Speed | Variable |
| Axis | Horizontal |
| MATERIALS AND FINISHES | |
| NeveRust™ Stainless Steel Drum | • |
| Cabinet | Painted Steel |
| Control Panel | Plastic |
| Top Plate | LPM Board |
| Transparent Door Glass | • |
| Door Rim | Chrome |
| Available Colors | White (W), Wild Cherry Red (R) |
| POWER SOURCE | |
| Ratings | UL Listed |
| Electrical Requirements / Type | 120V, 10 Amps / Electric |
| DIMENSIONS | |
| Product (WxHxD) | 24" x 33 1/2" x 25 1/4" |
| Carton (WxHxD) | 26" x 35 3/4" x 27 3/4" |
| Weight: Product / Shipping | 150 lbs. / 159 lbs. |
| WARRANTY | |
| | 1 Year Parts and Labor, 10 Years Motor, Lifetime on Drum |
| UPC CODES | |
| WM1355HW | 048231 010375 |
| WM1355HR | 048231 010382 |

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LG Electronics U.S.A., Inc.
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Customer Service and Technical Support: (800) 243-0000

LGusa.com

# QUANTUM™ SYSTEM COMMERCIAL WASHER &

| | Washers | Single Load Dryers | | |
|---|---|---|---|---|
| | SFNLCFS, SFNLCFJ, SFNLYFS, SFNLYFJ | Electric: SDELCFG, SDELYFG<br>Gas: SDGLCFG, SDGLYFG | | Electric:<br>Gas: |
| Basket/Cylinder Volume - cu.ft. (liters) | 2.84 (80) | 7.0 (198) | | 7.0 (198) |
| Width - in (mm) | 26 7/8" (683) | 26 7/8" (683) | | 26 7/8" (6 |
| Depth - in (mm) | 28" (711) | 28" (711) | | 28" (711) |
| Height* - in (mm) | 43" (1092) | 43" (1092) | | 76 5/8" (1 |
| Weight - lb (kg) | 250 (113) | Electric:<br>Gas: | 150 (68)<br>155 (70) | Electric:<br>Gas: |
| Shipping Weight - lb (kg) | 270 (123) | Electric:<br>Gas:: | 160 (73)<br>165 (75) | Electric:<br>Gas: |
| Cycle Time - minutes (default) | 27 | 45 | | 45 |
| Motor HP (Capacitor Start and Thermal Protected) | 1 HP, 750W | 1/3 HP, 5.5 amps | | 1/3 HP, 5 |
| Water Consumption - gal (Liter) | 11.0 (41.7) | N/A | | N/A |
| Water Factor - gal/ft³ (Liters/Liter/cycle) | 4.0 (0.53) | N/A | | N/A |
| Modified Energy Factor - ft³/kWh/cycle (Liters/kWh/cycle) | 2.40 (67.97) | N/A | | N/A |
| Average Hot Water Usage - gal (Liter) | 0.9 (3.3) | N/A | | N/A |
| Water Pressure - psi (bar) | Pressure fill 20 to 120 (1.4/8.3) | N/A | | N/A |
| Spin Speed - RPM | 500, 650, 1000 | N/A | | N/A |
| Cycle/Temperature | Hot Normal<br>Warm Perm Press<br>Cold Delicate | High<br>Medium<br>Low<br>Delicate<br>No Heat | 160 °<br>155 °<br>145 °<br>115 ° | High<br>Medium<br>Low<br>Delicate<br>No Heat |

ACEEE
American Council for an Energy-Efficient Economy

# Cooking

*This is a consumer page on cooking. For more resources related to cooking, visit t*

While fuel choice and cooktop design are important considerations, the key to efficient cooking is understanding your cooking habits. If you don't cook much, more efficient cooking appliances won't save much energy. On the other hand, these appliances tend to have long lives, so it is worth using efficiency as one guide when you purchase new kitchenware.

**Part 1: Which is More Efficient?** Things to Consider When Purchasing New Appliances
**Part 2: Energy Saving Tips**

## *Which is More Efficient?*

When looking for new cooking appliances, you have several choices to make:

**1. Range, or Cooktop + Oven?**
It makes no difference in terms of energy use whether you prefer to have your cooktop separate from your oven or combined in one range.

**2. Gas or Electric?**
As explained in the **water heating chapter**, gas is usually preferable to electricity as a heating fuel. But because cooking doesn't make a huge overall impact on your energy bill, this choice has more to do with your own preference. Many people find that gas offers better cooking control; however, it also introduces combustion products into the house that must be vented to the outside. Be sure to purchase an **energy-efficient range hood** that vents cooking products **up from the cooktop** and directly outside (avoid down-draft vents).

**3. Which Gas Element?**
There are two types of gas burners available: conventional burners with electric ignition (the most common), and sealed burners, where the burner is fused to the cooktop. When comparing sealed to unsealed burners, there is no measurable difference in cooking efficiency, although sealed burners are simpler and easier to clean.

**4. Which Electric Element?**
With electric cooktops, a number of different burner types are available, in order of increasing efficiency (and cost): ***solid disk***, ***exposed coil*** (the most common type), ***radiant***, ***halogen***, or ***induction*** elements. Unless you do a lot of cooking, it is probably hard to justify the fancier cooktop technologies on energy savings alone. It would probably be most cost-effective to stick with an electric coil or radiant element and put your money into better **cookware**.

**5. Conventional or Convection Oven?**
Convection ovens are usually more energy efficient than conventional ovens because the heated air is continuously circulated around the food being cooked, reducing required temperature and cooking times. On average, you'll cut energy use by about 20%.

**6. Self-Cleaning or Standard Oven?**
With conventional gas or electric ovens, self-cleaning models are more energy-efficient because they have more insulation. But if you use the self-cleaning feature more than about once a month, you'll end up using more energy with the feature than you save from the extra insulation.

**7. What Kind of Microwave?**
Microwaves use a lot of energy when operating, but because cooking times are so drastically reduced, using a microwave to prepare a meal will reduce energy use by about two-thirds compared to a conventional oven. Because less heat is generated in the kitchen, you may also save on air conditioning costs during the summer. Some microwave ovens include sophisticated features to further boost energy efficiency and cooking performance, such as temperature probes, controls to

## Consumer Resources

- Building Envelope
- Heating
- Air Conditioning
- Ventilation
- Water Heating
- Lighting
- Refrigeration
- Home Electronics
- Laundry
- Dishwashing
- Cooking
- Driving

turn off the microwave when food is cooked, and variable power settings. New "rapid-cook" ovens combining microwaves with other cooking technologies— notably halogen lights or convection—are designed to cut cooking time and improve the quality of foods compared to standard microwave preparation.

↑ *Top of Page*

### *Energy-Saving Tips for Cooking*

- **Match the Cooking Method to the Meal**

Methods of cooking that minimize the area the must be heated (a toaster oven versus an oven, for example) save energy. On the other hand, sometimes the most efficient cooking methods (like the microwave) will sacrifice food quality. The trick is to find the right balance, or an appliance explicitly designed for a particular type of meal (crockpot, rice-cooker, etc)

- **Match the Pan Size to the Element Size**

For example, when using an electric cooktop, a 6" pan on an 8" burner will waste over 40% of the heat produced by the burner.

- **Buy Sturdy, Flat-Bottomed Cookware**

The ideal pan has a slightly concave bottom — when it heats up, the metal expands and the bottom flattens out. An electric element is significantly less efficient if the pan does not have good contact with the element. For example, boiling water for pasta could use 50% more energy on a cheap, warped-bottom pan compared to a flat-bottom pan.

- **Use High-Conductivity Materials**

Certain materials also work better than others and usually result in more evenly cooked food. For instance, copper-bottom pans heat up faster than regular pans. In the oven, glass or ceramic pans are typically better than metal—you can turn down the temperature about 25°F and cook foods just as quickly.

- **Keep Your Stovetop Clean and Shiny**

Believe it or not, when burner pans become blackened from heavy use, they can absorb a lot of heat, reducing burner efficiency. You want them to remain shiny so they reflect heat up to the cookware.

- **Reduce your Cooking Time...**

***...before you start,*** by defrosting frozen foods in the refrigerator before cooking. With conventional ovens, keep preheat time to a minimum.

***...while you cook,*** by keeping oven racks clear. Don't lay foil on the racks and, if possible, stagger multiple pans to improve air flow. Avoid peeking into the oven as you cook. On an electric burner or in the oven, turn off the heat just before the cooking is finished to prevent overcooking.

***...next time,*** by cooking double portions so all you have to do is reheat prepared food. Also, use the self-cleaning option in your oven infrequently and only after you've cooked a meal so it can use the residual heat.

↑ *Top of Page*

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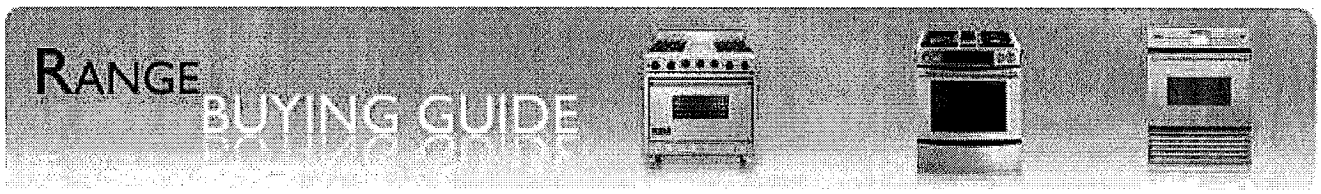
*Page last updated December 2012*




Looking for the best kitchen stove or range? CNET editors help you choose between gas stoves, electric stoves, and other kitchen ranges to meet your specific needs.

What types of stoves are available?
What size do I need?
What basic range features can I expect?
What basic oven options can I expect?
What high-tech or advanced features will I find?
How much energy does the average range/oven use?

## HOW MUCH ENERGY DOES THE AVERAGE RANGE/OVEN USE?

In general, cooking with natural gas is cheaper over the long run than cooking with electricity, especially if the range uses spark ignition over a pilot light, which runs continuously. Choosing an oven with a window is an energy-saver because you won't keep letting heat out to check the progress of your dish. Not using the self-cleaning mode more than once a month is another cost-saving tip. With electric ranges, it also pays to make sure you match the pot size with the burner.

According to the Consumer Guide to Home Energy Savings, here is an energy cost comparison of ovens based on cooking an average casserole. It assumes the cost of gas is 60 cents a therm, and electricity is 8 cents a kWh:

CLOSE

| Appliance | Temperature | Time | Energy | Cost |
|---|---|---|---|---|
| Electric Oven | 350 | 1 hour | 2.0 kWh | $.16 |
| Electric Convection Oven | 325 | 45 minutes | 1.39 kWh | $.11 |
| Gas Oven | 350 | 1 hour | .112 therm | $.07 |
| Electric Frying Pan | 420 | 1 hour | .9 kWh | $.07 |
| Toaster Oven | 425 | 50 minutes | .95 kWh | $.08 |
| Electric Crockpot | 200 | 7 hour | .7 kWh | $.06 |
| Microwave Oven | "High" | 15 minutes | .36 kWh | $.03 |

Previous page:
What high-tech or advanced features will I find?

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from cnet

# Types of ovens

Ovens typically last for two decades, so when you buy one you'll have to live with your energy efficiency decision for a long time. In addition to the choice of electricity or gas, consider these oven variations:

- Self-cleaning ovens have more insulation than a standard oven, so it will keep the heat in better and use less energy. During the cleaning process, the oven door locks to prevent it from being opened as the oven heats up to 900 degrees Fahrenheit. This extreme temperature burns off food spilled inside the oven, leaving ash that can easily be wiped out. Self-cleaning ovens often cost more than standard ovens, but over time the energy and cost savings are well worth it.
- Convection ovens continually use a fan to circulate heated air around the food being cooked. By distributing heat more evenly than ordinary ovens, convection ovens allow you to reduce cooking time and cooking temperatures and to cut energy use by about a third. Convection cooking can eliminate hot and cool spots for more even cooking. A turkey roasted in a convection oven, for example, will brown all over, rather than just on top. Convection ovens allow you to choose between conventional baking and roasting or convection baking and roasting.

There is no ENERGY STAR label for residential ovens, ranges, or microwave ovens at this time. However, there are ENERGY STAR labeled commercial ovens.

Over 60 product categories have an ENERGY STAR label.

Review the list of ENERGY STAR specifications in development.

U.S. Government

Federal law prohibits removal of this label before consumer purchase.

# ENERGYGUIDE

Refrigerator-Freezer
* Automatic Defrost
* Top-Mounted Freezer
* No Through-the-Door-Ice-Service

Electrolux
LFHT1817L*
Capacity: 18.2 Cubic Feet

## Estimated Yearly Operating Cost

**$41**

$42 — $52

The estimated yearly operating cost of this model was not available at the time the range was published.

**Cost Range of Similar Models**

**383 kWh**

**Estimated Yearly Electricity Use**

## Your cost will depend on your utility rates and use.

- Cost range based only on models of similar capacity with automatic defrost , top-mounted freezer , and no through-the-door-ice-service
- Estimated operating cost based on a 2007 national average electricity cost of 10.64 cents per kWh.
- For more information, visit www.ftc.gov/appliances.

PART NO. 242028576

ENERGY STAR

Canada

# ENERGUIDE

## Energy consumption / Consommation énergétique

# 383 kWh
per year / par année

This Model ▼

285 kWh — 484 kWh

**Uses least energy / Consomme le moins d'énergie**

**Uses most energy / Consomme le plus d'énergie**

## Type 3

16.5 TO 18.4 CU. FT.
volume in $ft^3$ / volume en $pi^3$

Similar models compared

Modèles similaires comparés

Model number

**LFHT1817L***

Numéro du modèle

Removal of this label before first retail purchase is an offense (S.C. 1992, c. 36).
Enlever cette étiquette avant le premier achat au détail constitue une infraction (L.C. 1992, ch. 36).

ENERGY STAR
HIGH EFFICIENCY
HAUTE EFFICACITÉ

The **ENERGY STAR®** mark on this EnerGuide label signifies that this is an energy-efficient appliance. Its energy performance meets or exceeds the Government of Canada's high efficiency levels. Use the EnerGuide rating to determine how this appliance compares to other similar models.

La marque **ENERGY STAR®** sur cette étiquette ÉnerGuide signifie que l'appareil est éconergétique et que son rendement énergétique satisfait ou dépasse les niveaux de haute efficacité du gouvernement du Canada. Utilisez la cote ÉnerGuide afin de comparer le rendement de l'appareil avec celui d'autres modèles similaires.

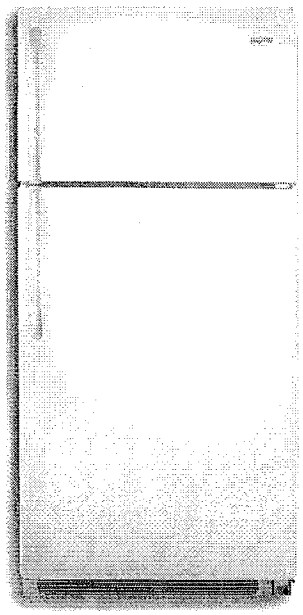
| Brand | Model Number | Additional Model Information | Configuration | Defrost Type | Compact | Through the Door Ice Service | Total Volume (ft3) | Adjusted Volume (ft3) | Annual Energy Use (kWh/year) | Federal Standard (kWh/year) | % Better than Federal Standard | Date Available On Market | Date Qualified | Markets | ENERGY STAR Model Identifier |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frigidaire | FPRH19D7L** | | Refrigerator Only - Single Door | Automatic | No | No | 18.5 | 18.5 | 365 | 457 | 20% | 6/10/2010 | 6/10/2010 | United States | |
| Frigidaire | FPUI1888L* | | Top Freezer | Automatic | No | No | 18.2 | 20.7 | 335 | 479 | 30% | 2/17/2010 | 2/17/2010 | United States | |
| Frigidaire | FPUI1888P* | | Top Freezer | Automatic | No | No | 18.3 | 20.8 | 336 | 480 | 30% | 10/1/2012 | 9/20/2012 | United States, Canada | 12050808_9999999 |
| Frigidaire | FPUI2188L* | | Top Freezer | Automatic | No | No | 20.6 | 23.9 | 356 | 510 | 30% | 3/12/2010 | 3/12/2010 | United States | |
| Frigidaire | FPUI2188P* | | Top Freezer | Automatic | No | No | 20.7 | 23.9 | 357 | 510 | 30% | 10/1/2012 | 9/20/2012 | United States, Canada | 12050808_9999999 |
| Frigidaire | FPUS2686L* | | Side-by-Side | Automatic | No | Yes | 26.0 | 32.0 | 509 | 730 | 30% | 2/17/2010 | 2/17/2010 | United States | |
| Frigidaire | FPUS2698L* | | Side-by-Side | Automatic | No | Yes | 25.9 | 31.9 | 509 | 728 | 30% | 2/17/2010 | 2/17/2010 | United States | |
| Frigidaire | *FRH47M4M* | | Refrigerator Only - Single Door | Automatic | Yes | No | 4.6 | 4.6 | 331 | 413 | 20% | 6/1/2011 | 5/4/2011 | United States, Canada | 2012033123_9999999 |
| Frigidaire | FRS3HF55K* | | Side-by-Side | Automatic | No | Yes | 22.6 | 27.9 | 549 | 688 | 20% | 5/20/2009 | 5/20/2009 | United States | |
| Frigidaire | FRS3HR35K* | | Side-by-Side | Automatic | No | Yes | 22.6 | 27.9 | 549 | 688 | 20% | 7/8/2009 | 7/8/2009 | United States | |
| Frigidaire | FRS3R5EMB | | Side-by-Side | Automatic | No | Yes | 22.6 | 27.9 | 549 | 688 | 20% | 4/13/2011 | 4/14/2011 | United States, Canada | 2012033123_9999999 |
| Frigidaire | FRS6HF55K* | | Side-by-Side | Automatic | No | Yes | 26.0 | 32.0 | 582 | 730 | 20% | 2/13/2009 | 2/13/2009 | United States | |
| Frigidaire | FRS6HR35K* | | Side-by-Side | Automatic | No | Yes | 26.0 | 32.0 | 582 | 729 | 20% | 1/30/2009 | 1/30/2009 | United States | |
| Frigidaire | FRS6HR45K* | | Side-by-Side | Automatic | No | Yes | 26.0 | 32.0 | 582 | 729 | 20% | 5/20/2009 | 5/20/2009 | United States | |
| Frigidaire | FRS6LF7J* | | Side-by-Side | Automatic | No | Yes | 26.0 | 31.9 | 582 | 729 | 20% | 1/18/2008 | 1/18/2008 | United States | |
| Frigidaire | FRT15HB3J* | | Top Freezer | Automatic | No | No | 14.8 | 17.1 | 354 | 444 | 20% | 1/18/2008 | 1/18/2008 | United States | |
| Frigidaire | FRT17HB3J* | | Top Freezer | Automatic | No | No | 16.5 | 18.9 | 368 | 461 | 20% | 5/15/2008 | 5/15/2008 | United States | |
| Frigidaire | FRT17HB3JW* | | Top Freezer | Automatic | No | No | 16.5 | 18.9 | 368 | 461 | 20% | 3/12/2010 | 3/12/2010 | United States | |
| Frigidaire | FRT17HB3JZ* | | Top Freezer | Automatic | No | No | 16.5 | 18.9 | 368 | 461 | 20% | 3/12/2010 | 3/12/2010 | United States | |
| Frigidaire | FRT18GB5J* | | Top Freezer | Automatic | No | No | 18.2 | 20.8 | 383 | 479 | 20% | 3/12/2010 | 3/12/2010 | United States | |
| Frigidaire | FRT18HB5J* | | Top Freezer | Automatic | No | No | 18.2 | 20.8 | 383 | 479 | 20% | 1/18/2008 | 1/18/2008 | United States | |
| Frigidaire | FRT18HP7J* | | Top Freezer | Automatic | No | No | 18.3 | 20.9 | 383 | 481 | 20% | 1/18/2008 | 1/18/2008 | United States | |
| Frigidaire | FRT18HS6J* | | Top Freezer | Automatic | No | No | 18.2 | 20.8 | 383 | 479 | 20% | 1/18/2008 | 1/18/2008 | United States | |
| Frigidaire | FRT18HS7JS | | Top Freezer | Automatic | No | No | 18.2 | 20.7 | 376 | 479 | 22% | 2/13/2009 | 2/13/2009 | United States | |
| Frigidaire | FRT18HS8K* | | Top Freezer | Automatic | No | No | 18.2 | 20.7 | 383 | 479 | 20% | 5/20/2009 | 5/20/2009 | United States | |
| Frigidaire | FRT18IL6J* | | Top Freezer | Automatic | No | No | 18.2 | 20.7 | 376 | 479 | 22% | 1/18/2008 | 1/18/2008 | United States | |
| Frigidaire | FRT18S8K* | | Top Freezer | Automatic | No | No | 18.2 | 20.8 | 376 | 479 | 22% | 8/19/2009 | 8/19/2009 | United States | |
| Frigidaire | FRT21HS6J* | | Top Freezer | Automatic | No | No | 20.6 | 23.9 | 407 | 510 | 20% | 1/21/2008 | 1/21/2008 | United States | |
| Frigidaire | FRT21HS8KS | | Top Freezer | Automatic | No | No | 20.5 | 23.8 | 407 | 509 | 20% | 5/20/2009 | 5/20/2009 | United States | |
| Frigidaire | FRT21HS8PS | | Top Freezer | Automatic | No | No | 20.6 | 23.8 | 408 | 509 | 20% | 10/15/2012 | 10/2/2012 | United States, Canada | 82012050808_9999999 |
| Frigidaire | FRT21IL6J* | | Top Freezer | Automatic | No | No | 20.6 | 23.9 | 407 | 511 | 20% | 1/18/2008 | 1/18/2008 | United States | |
| Frigidaire | FRT21IL6JW* | | Top Freezer | Automatic | No | No | 20.6 | 23.9 | 407 | 511 | 20% | 1/18/2008 | 1/18/2008 | United States | |
| Frigidaire | FRT21IS6J* | | Top Freezer | Automatic | No | No | 20.5 | 23.8 | 407 | 510 | 20% | 2/17/2010 | 2/17/2010 | United States | |
| Frigidaire | FTHD18P4K* | | Top Freezer | Automatic | No | No | 18.2 | 20.8 | 383 | 479 | 20% | 8/19/2009 | 8/19/2009 | United States | |
| Frigidaire | HRT17HG3K* | | Top Freezer | Automatic | No | No | 16.5 | 18.9 | 368 | 461 | 20% | 5/20/2009 | 5/20/2009 | United States | |
| Frigidaire | LFHB2741P* | | Bottom Freezer | Automatic | No | Yes | 26.7 | 31.5 | 556 | 697 | 20% | 2/1/2013 | 12/6/2012 | United States, Canada | 0120410016_2582681 |
| Frigidaire | LFHI1826L* | | Top Freezer | Automatic | No | No | 18.2 | 20.7 | 383 | 479 | 20% | 1/26/2010 | 1/26/2010 | United States | |
| Frigidaire | LFHN2741P* | | Bottom Freezer | Automatic | No | No | 26.6 | 31.4 | 482 | 603 | 20% | 2/1/2013 | 12/21/2012 | United States, Canada | 0121000582589425 |
| Frigidaire | LFHS2611N* | | Side-by-Side | Automatic | No | Yes | 26.0 | 32.0 | 580 | 729 | 20% | 2/3/2012 | 3/26/2012 | United States, Canada | 012050808_9999999 |
| Frigidaire | LFHS2612N* | | Side-by-Side | Automatic | No | Yes | 26.0 | 32.0 | 580 | 729 | 20% | 2/3/2012 | 3/26/2012 | United States, Canada | 012050808_9999999 |
| Frigidaire | LFHT1513L* | | Top Freezer | Automatic | No | No | 14.8 | 17.1 | 355 | 444 | 20% | 7/1/2010 | 7/1/2010 | United States | |
| Frigidaire | LFHT1513N* | | Top Freezer | Automatic | No | No | 14.7 | 17.1 | 354 | 444 | 20% | 6/12/2012 | 9/10/2012 | United States, Canada | 012050808_9999999 |
| Frigidaire | LFHT1713L* | | Top Freezer | Automatic | No | No | 16.5 | 18.9 | 365 | 461 | 21% | 3/12/2010 | 3/12/2010 | United States | |
| Frigidaire | LFHT1817L* | | Top Freezer | Automatic | No | No | 18.2 | 20.8 | 383 | 479 | 20% | 1/26/2010 | 1/26/2010 | United States | |
| Frigidaire | LFHT1817L* | | Top Freezer | Automatic | No | No | 18.2 | 20.8 | 383 | 479 | 20% | 6/28/2010 | 6/28/2010 | United States | |
| Frigidaire | LFHT1837L* | | Top Freezer | Automatic | No | No | 18.3 | 20.9 | 383 | 481 | 20% | 1/26/2010 | 1/26/2010 | United States | |
| Frigidaire | LFHT1847L* | | Top Freezer | Automatic | No | No | 18.3 | 20.9 | 383 | 481 | 20% | 1/26/2010 | 1/26/2010 | United States | |
| Frigidaire | LFHT2117L* | | Top Freezer | Automatic | No | No | 20.5 | 23.8 | 407 | 510 | 20% | 1/26/2010 | 1/26/2010 | United States | |
| Frigidaire | LFHT2117NF | | Top Freezer | Automatic | No | No | 20.6 | 23.8 | 407 | 509 | 20% | 6/12/2012 | 9/10/2012 | United States, Canada | 2012050808_9999999 |
| Frigidaire | LFHT2137NF | | Top Freezer | Automatic | No | No | 20.7 | 23.9 | 407 | 510 | 20% | 6/12/2012 | 9/10/2012 | United States, Canada | 2012050808_9999999 |
| Frigidaire | LFPH16M4LB | | Refrigerator/Freezer - Single Door | Manual | Yes | No | 1.8 | 1.8 | 252 | 318 | 21% | 3/22/2010 | 3/22/2010 | United States | |
| Frigidaire | LFPH25M4LB | | Refrigerator/Freezer - Single Door | Manual | Yes | No | 2.4 | 2.4 | 253 | 325 | 22% | 3/22/2010 | 3/22/2010 | United States | |
| Frigidaire | LFPH25M4LW | | Refrigerator/Freezer - Single Door | Manual | Yes | No | 2.4 | 2.4 | 253 | 325 | 22% | 3/22/2010 | 3/22/2010 | United States | |
| Frigidaire | LFPH31M6LB | | Top Freezer | Partial | Yes | No | 3.1 | 3.7 | 337 | 424 | 21% | 3/22/2010 | 3/22/2010 | United States | |
| Frigidaire | LFPH31M6LM | | Top Freezer | Partial | Yes | No | 3.1 | 3.7 | 337 | 424 | 21% | 3/22/2010 | 3/22/2010 | United States | |
| Frigidaire | LFPH33M4LM | | Refrigerator Only - Single Door | Manual | Yes | No | 3.3 | 3.3 | 267 | 334 | 20% | 3/22/2010 | 3/22/2010 | United States | |
| Frigidaire | LFPH40M4NB | | Refrigerator Only - Single Door | Manual | Yes | No | 4.0 | 4.0 | 262 | 342 | 23% | 5/25/2012 | 12/21/2012 | United States, Canada | 12012145455_63592 |

FRIGIDAIRE

# Top Mount Refrigerator

## LFHT1817L F/R/W/B (327306/356190/327337/327338) 18 Cu. Ft. Top Mount

ONLY AT LOWE'S!
¡SOLAMENTE EN LOWE'S!



### Product Dimensions

| | |
|---|---|
| Height (Including Hinges) | 66-5/8" |
| Width | 30" |
| Depth (Including Door) | 30-1/8" |

### More Easy-To-Use Features

**Full-Width Door Racks**
Gives you more usable door space for accessibility and better organization.

**Full-Width Freezer Shelf**
For more usable space and better organization.

**Store-More™ Gallon Door Shelf**
Door storage gives you room for larger items like a gallon of milk.

**Bright Lighting**
Our bright lighting makes it easy to see what's inside.

**Cool Zone™ Drawer**
Conveniently located in the fresh food section, the Cool Zone™ Drawer is ideal for deli meats, cheeses and sandwich fixings or any food items that are frequently used.

**Reversible Door**
Door can be installed to open left or right based on your needs (W/B only).

**Built With American Pride**

ENERGY STAR®

**Available in:**

EasyCare™ Stainless (F) | Stainless (R) | White (W) | Black (B)

**Compare to Model:**
**FFHT1817LS**
**with these additional features**
- EasyCare™ Stainless Steel
- Easy Ice

## Signature Features

### SpaceWise® Adjustable Wire Shelves

Easily clean and adjust glass shelves up and down to create more space for taller items.

### Store-More™ Clear Humidity-Controlled Crisper Drawers

Keep your fruits and vegetables fresh in our humidity-controlled crisper drawers.

### ONLY AT LOWE'S! EasyCare™ Stainless Steel

A clear protective coating reduces fingerprints and smudges.

### ONLY AT LOWE'S! Easy Ice Ready

Install your optional ice maker in less than 5 minutes with Lowe's exclusive quick-connect technology. Easy Ice allows you to add ice-making capabilities to Lowe's exclusive Frigidaire Top Mount refrigerators.

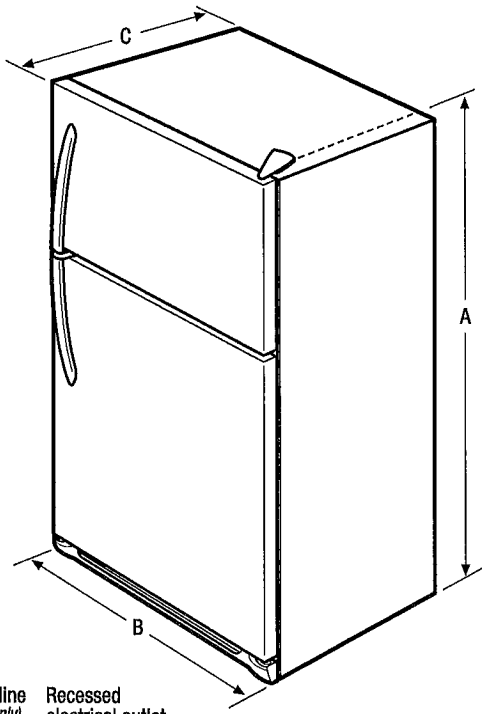
FRIGIDAIRE

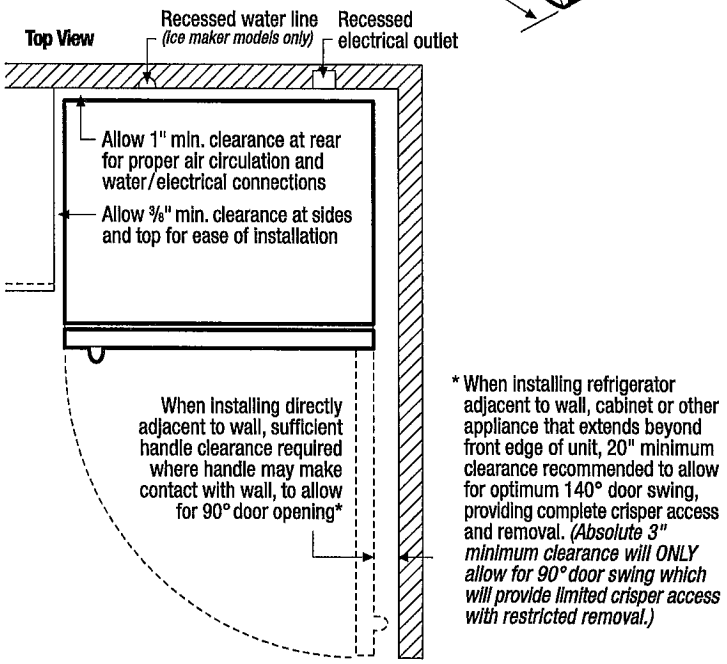
# Top Mount Refrigerator

LFHT1817L F/R/W/B **18 Cu. Ft.**

| Features | |
|---|---|
| Door Design | UltraSoft™/Short Door |
| Door Handle Design | Color-Coordinated |
| Cabinet Finish (Textured) | Color-Coordinated |
| Door Stops | Yes |
| Door Hinge Covers | Color-Coordinated |
| Door Reverse Option | Yes |
| Left-Swing Door | (R) Stainless |
| Rollers - Front/Rear | Fixed/Yes |
| Toe Grille | Color-Coordinated |
| **Refrigerator Features** | |
| Interior Lighting | Bright |
| Refrigerator Shelves | 2 Sliding SpaceWise® Adjustable Glass |
| Cool Zone™ Drawer | Clear |
| Store-More™ Crisper Drawers | 2 Clear |
| Humidity Controls | 2 |
| Dairy Compartment | Clear Dairy Door |
| Door Bins | 3 Full-Width White |
| Gallon Door Storage | 1 |
| **Freezer Features** | |
| Door Racks | 2 Full-Width White |
| Freezer Shelves | 1 Full-Width Wire |
| Ice Maker | Optional (IM115) |
| **Certifications** | |
| ENERGY STAR® | Yes |
| **Specifications** | |
| Total Capacity (Cu. Ft.) | 18.3 |
| Refrigerator Capacity (Cu. Ft.) | 14.2 |
| Freezer Capacity (Cu. Ft.) | 4.1 |
| Power Supply Connection Location | Right Bottom Rear |
| Water Inlet Connection Location | Bottom Right |
| Voltage Rating | 120V/60Hz/15 or 20A |
| Connected Load (kW Rating) @ 120 Volts[1] | .72 |
| Amps @ 120 Volts | 4.5 Amps |
| Minimum Circuit Required (Amps) | 15 |
| Shipping Weight (Approx.) | 205 lbs. |

[1] *For use on adequately wired 120V, dedicated circuit having 2-wire service with a separate ground wire. Appliance must be grounded for safe operation.*




* When installing refrigerator adjacent to wall, cabinet or other appliance that extends beyond front edge of unit, 20" minimum clearance recommended to allow for optimum 140° door swing, providing complete crisper access and removal. *(Absolute 3" minimum clearance will ONLY allow for 90° door swing which will provide limited crisper access with restricted removal.)*

## Electrical Specifications

- An electrical supply with grounded three-prong receptacle is required. The power supply circuit must be installed in accordance with current edition of National Electrical Code (NFPA 70) and local codes & ordinances.
- Voltage Rating - 120V / 60 Hz / 15 or 20 Amps
- Connected Load (kW Rating) @ 120 Volts = .72 kW
- Amps @ 120 Volts = 4.5 Amps

## Optional Accessories

- Optional Ice Maker Kit (PN # IM115) available for installation in ice maker-ready models only.

*NOTE: For planning purposes only. Always consult local and national electric and plumbing codes. Refer to Product Installation Guide for detailed installation instructions on the web at frigidaire.com.*

| Product Dimensions | |
|---|---|
| A - Height (Incl. Hinges and Covers) | 66-5/8" |
| B - Width | 30" |
| C - Depth (Including Door) | 30-1/8" |
| Depth with Door Open 90° | 58-1/2" |

*Accessories information available on the web at frigidaire.com*


FRIGIDAIRE

**USA** • 10200 David Taylor Drive • Charlotte, NC 28262 • 1-800-FRIGIDAIRE • **frigidaire.com**
**CANADA** • 5855 Terry Fox Way • Mississauga, ON L5V 3E4 • 1-800-265-8352 • **frigidaire.ca**



LFHT1817 01/13



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*Specifications subject to change.*

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# ENERGYGUIDE

Refrigerator-Freezer
- Automatic Defrost
- With Side-Mounted Freezer
- With Through-The-Door-Ice Service

Whirlpool Corporation
Models:ED5VHE*V*0*
Capacity: 25.1 Cubic Feet

## Estimated Yearly Operating Cost

**$61**

**$60** — **$78**

Cost Range of Similar Models

**577** kWh

Estimated Yearly Electricity Use

**Your cost will depend on your utility rates and use.**

- Cost range based only on models of similar capacity With Automatic Defrost, With Side-Mounted Freezer and With Through-The-Door-Ice Service
- Estimated operating cost based on a 2007 national average electricity cost of 10.65 cents per kWh
- For more information, visit www.ftc.gov/appliances.

ENERGY STAR

W10312810

| Brand | Model Number | Additional Model Information | Configuration | Defrost Type | Compact | Through the Door Ice Service | Total Volume (ft3) | Adjusted Volume (ft3) | Annual Energy Use (kWh/year) | Federal Standard (kWh/ year) | % Better than Federal Standard | Date Available On Market | Date Qualified | Markets | ENERGY STAR Model Identifier |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Whirlpool | ED5KHE*W*0 | | Side-by-Side | Automatic | No | Yes | 25.1 | 31.3 | 577 | 722 | 20% | 10/1/2009 | 10/1/2009 | United States | |
| Whirlpool | ED5KVE*V*0* | | Side-by-Side | Automatic | No | Yes | 25.1 | 31.3 | 577 | 722 | 20% | 1/26/2009 | 1/26/2009 | United States | |
| Whirlpool | ED5LDE*W*0* | | Side-by-Side | Automatic | No | Yes | 25.1 | 31.3 | 577 | 722 | 20% | 1/26/2009 | 1/26/2009 | United States | |
| Whirlpool | ED5LHA*W*0* | | Side-by-Side | Automatic | No | Yes | 25.1 | 31.3 | 577 | 722 | 20% | 1/26/2009 | 1/26/2009 | United States | |
| Whirlpool | ED5LTA*V*0* | | Side-by-Side | Automatic | No | Yes | 25.4 | 31.7 | 580 | 726 | 20% | 8/2/2007 | 8/2/2007 | United States | |
| Whirlpool | ED5LVA*W*0* | | Side-by-Side | Automatic | No | Yes | 25.1 | 31.3 | 577 | 722 | 20% | 11/17/2010 | 11/17/2010 | United States | |
| Whirlpool | ED5NHG*V*0* | | Side-by-Side | Automatic | No | Yes | 25.1 | 31.3 | 577 | 722 | 20% | 3/21/2008 | 3/21/2008 | United States | |
| Whirlpool | ED5PBA*V*0* | | Side-by-Side | Automatic | No | Yes | 25.4 | 31.7 | 580 | 727 | 20% | 3/21/2008 | 3/21/2008 | United States | |
| Whirlpool | ED5PVE*W*0* | | Side-by-Side | Automatic | No | Yes | 25.2 | 31.5 | 577 | 724 | 20% | 5/27/2009 | 5/27/2009 | United States | |
| Whirlpool | ED5PVE*W*1* | | Side-by-Side | Automatic | No | Yes | 25.2 | 31.5 | 577 | 724 | 20% | 5/10/2012 | 5/2/2012 | United States, Canada | 82012050808_9 999999 |
| Whirlpool | ED5SHE*X*O* | | Side-by-Side | Automatic | No | Yes | 25.2 | 31.5 | 577 | 724 | 20% | 8/15/2010 | 8/15/2010 | United States | |
| Whirlpool | ED5VHE*V*0* | | Side-by-Side | Automatic | No | Yes | 25.1 | 31.3 | 577 | 722 | 20% | 8/11/2008 | 8/11/2008 | United States | |
| Whirlpool | EL4GSNWXQ | | Refrigrator/Freezer - Single Door | Automatic | Yes | No | 4.4 | 4.4 | 329 | 411 | 20% | 9/14/2009 | 9/14/2009 | United States | |
| Whirlpool | EL4GSNXWQ | | Refrigerator Only - Single Door | Automatic | Yes | No | 4.4 | 4.4 | 329 | 411 | 20% | 9/10/2010 | 9/10/2010 | United States | |
| Whirlpool | EL4WSNXWB | | Refrigrator/Freezer - Single Door | Automatic | Yes | No | 4.4 | 4.4 | 329 | 411 | 20% | 9/14/2009 | 9/14/2009 | United States | |
| Whirlpool | EL4WSNXWS | | Refrigrator/Freezer - Single Door | Automatic | Yes | No | 4.4 | 4.4 | 329 | 411 | 20% | 9/15/2009 | 9/15/2009 | United States | |
| Whirlpool | EL87TR* | | Refrigrator/Freezer - Single Door | Automatic | No | No | 17.7 | 17.7 | 358 | 449 | 20% | 2/19/2010 | 2/19/2010 | United States | |
| Whirlpool | EL88TRRW* | | Refrigerator Only - Single Door | Automatic | No | No | 17.7 | 17.7 | 358 | 449 | 20% | 2/24/2010 | 2/24/2010 | United States | |
| Whirlpool | EL8ATR* | | Refrigrator/Freezer - Single Door | Automatic | No | No | 17.7 | 17.7 | 358 | 449 | 20% | 2/19/2010 | 2/19/2010 | United States | |
| Whirlpool | ER9FHK*V*0* | | Top Freezer | Automatic | No | No | 18.9 | 22.0 | 393 | 492 | 20% | 2/21/2008 | 2/21/2008 | United States | |
| Whirlpool | ES5DVA*W*0* | | Side-by-Side | Automatic | No | Yes | 25.6 | 32.0 | 509 | 729 | 30% | 3/3/2009 | 3/3/2009 | United States | |
| Whirlpool | ET1CHE*V*0* | | Top Freezer | Automatic | No | No | 21.0 | 25.0 | 416 | 521 | 20% | 3/20/2008 | 3/20/2008 | United States | |
| Whirlpool | ET1FTE*V*0* | | Top Freezer | Automatic | No | No | 21.0 | 25.0 | 416 | 521 | 20% | 3/20/2008 | 3/20/2008 | United States | |
| Whirlpool | ET5WSE*V*0* | | Top Freezer | Automatic | No | No | 14.6 | 17.1 | 354 | 443 | 20% | 5/14/2008 | 5/14/2008 | United States | |
| Whirlpool | ET8CHE*V*0* | | Top Freezer | Automatic | No | No | 18.2 | 21.4 | 388 | 486 | 20% | 3/20/2008 | 3/20/2008 | United States | |
| Whirlpool | ET8FTE*V*0* | | Top Freezer | Automatic | No | No | 18.2 | 21.4 | 388 | 486 | 20% | 3/20/2008 | 3/20/2008 | United States | |
| Whirlpool | ET8WTE*V*0* | | Top Freezer | Automatic | No | No | 18.3 | 21.4 | 388 | 486 | 20% | 3/20/2008 | 3/20/2008 | United States | |
| Whirlpool | G2IXEFMW*0* | | Top Freezer | Automatic | No | No | 21.7 | 25.8 | 422 | 528 | 20% | 10/15/2008 | 10/15/2008 | United States | |
| Whirlpool | G9IXEFMW*0* | | Top Freezer | Automatic | No | No | 18.9 | 22.0 | 393 | 492 | 20% | 10/15/2008 | 10/15/2008 | United States | |
| Whirlpool | GB2FHDXW** | | Bottom Freezer | Automatic | No | No | 21.9 | 25.8 | 403 | 578 | 30% | 8/14/2009 | 8/14/2009 | United States | |
| Whirlpool | GB2SHDXT** | | Bottom Freezer | Automatic | No | No | 21.9 | 25.8 | 459 | 578 | 21% | 11/8/2006 | 11/8/2006 | United States | |
| Whirlpool | GB2SHTXT** | | Bottom Freezer | Automatic | No | No | 21.9 | 25.8 | 459 | 578 | 21% | 11/8/2006 | 11/8/2006 | United States | |
| Whirlpool | GB9FHDXV* | | Bottom Freezer | Automatic | No | No | 18.5 | 22.0 | 392 | 560 | 30% | 8/14/2009 | 8/14/2009 | United States | |
| Whirlpool | GB9FHDXW* | | Bottom Freezer | Automatic | No | No | 18.5 | 22.0 | 392 | 560 | 30% | 10/1/2009 | 10/1/2009 | United States | |
| Whirlpool | GB9SHDXV* | | Bottom Freezer | Automatic | No | No | 18.5 | 22.0 | 448 | 560 | 20% | 2/2/2009 | 2/2/2009 | United States | |
| Whirlpool | GC3NHA*V*0* | | Side-by-Side | Automatic | No | Yes | 23.1 | 28.8 | 557 | 697 | 20% | 1/24/2008 | 1/24/2008 | United States | |
| Whirlpool | GC3SHA*V*0* | | Side-by-Side | Automatic | No | Yes | 23.1 | 28.8 | 557 | 697 | 20% | 5/14/2008 | 5/14/2008 | United States | |
| Whirlpool | GC5NHA*V*0* | | Side-by-Side | Automatic | No | Yes | 24.5 | 30.6 | 571 | 715 | 20% | 1/24/2008 | 1/24/2008 | United States | |
| Whirlpool | GC5SHA*V*0* | | Side-by-Side | Automatic | No | Yes | 24.5 | 30.6 | 571 | 715 | 20% | 5/14/2008 | 5/14/2008 | United States | |
| Whirlpool | GD5DHA*V*0* | | Side-by-Side | Automatic | No | Yes | 25.6 | 31.9 | 580 | 728 | 20% | 1/24/2008 | 1/24/2008 | United States | |
| Whirlpool | GD5NVA*W*0* | | Side-by-Side | Automatic | No | Yes | 25.4 | 31.7 | 580 | 726 | 20% | 2/2/2009 | 2/2/2009 | United States | |
| Whirlpool | GD5RVA*V*0* | | Side-by-Side | Automatic | No | Yes | 25.6 | 31.9 | 580 | 728 | 20% | 1/24/2008 | 1/24/2008 | United States | |
| Whirlpool | GI0FSAXV* | | Bottom Freezer | Automatic | No | Yes | 19.8 | 23.0 | 523 | 654 | 20% | 10/15/2008 | 10/15/2008 | United States | |
| Whirlpool | GI5FSAXV* | | Bottom Freezer | Automatic | No | Yes | 24.9 | 29.0 | 547 | 684 | 20% | 5/14/2008 | 5/14/2008 | United States | |
| Whirlpool | GI5FVAXV* | | Bottom Freezer | Automatic | No | Yes | 24.9 | 29.0 | 547 | 684 | 20% | 5/14/2008 | 5/14/2008 | United States | |
| Whirlpool | GI5FVAXY** | | Bottom Freezer | Automatic | No | Yes | 24.9 | 29.1 | 547 | 685 | 20% | 4/15/2011 | 3/25/2011 | United States, Canada | 012022334_999 9999 |
| Whirlpool | GI5SVAXV* | | Bottom Freezer | Automatic | No | Yes | 24.9 | 29.0 | 547 | 684 | 20% | 5/14/2008 | 5/14/2008 | United States | |
| Whirlpool | GI6FARXX** | | Bottom Freezer | Automatic | No | Yes | 25.6 | 29.8 | 515 | 688 | 25% | 11/17/2010 | 11/17/2010 | United States | |
| Whirlpool | GI6FDRXX** | | Bottom Freezer | Automatic | No | Yes | 25.7 | 29.9 | 481 | 688 | 30% | 8/15/2010 | 8/15/2010 | United States | |
| Whirlpool | GI6SARXX** | | Bottom Freezer | Automatic | No | Yes | 25.6 | 29.8 | 515 | 688 | 25% | 5/10/2011 | 5/6/2011 | United States, Canada | 012033123_999 9999 |
| Whirlpool | GI6SDRXX** | | Bottom Freezer | Automatic | No | Yes | 25.7 | 29.9 | 481 | 688 | 30% | 8/15/2010 | 8/15/2010 | United States | |
| Whirlpool | GI7FVCXW*0* | | Bottom Freezer | Automatic | No | Yes | 26.6 | 31.0 | 555 | 694 | 20% | 7/20/2009 | 7/20/2009 | United States | |
| Whirlpool | GI7FVCXX** | | Bottom Freezer | Automatic | No | Yes | 26.6 | 31.0 | 555 | 694 | 20% | 11/17/2010 | 11/17/2010 | United States | |
| Whirlpool | GR2FHM*V*0* | | Top Freezer | Automatic | No | No | 21.7 | 25.8 | 422 | 529 | 20% | 3/20/2008 | 3/20/2008 | United States | |
| Whirlpool | GR2FHT*V*0* | | Top Freezer | Automatic | No | No | 21.7 | 25.8 | 422 | 528 | 20% | 3/20/2008 | 3/20/2008 | United States | |
| Whirlpool | GR2SHW*V*0* | | Top Freezer | Automatic | No | No | 21.7 | 25.8 | 422 | 529 | 20% | 3/20/2008 | 3/20/2008 | United States | |
| Whirlpool | GR9FHK*V*0* | | Top Freezer | Automatic | No | No | 18.9 | 22.0 | 393 | 492 | 20% | 2/19/2008 | 2/19/2008 | United States | |
| Whirlpool | GR9FHM*V*0* | | Top Freezer | Automatic | No | No | 18.9 | 22.0 | 393 | 492 | 20% | 2/6/2008 | 2/6/2008 | United States | |
| Whirlpool | GR9FHT*V*0* | | Top Freezer | Automatic | No | No | 18.9 | 22.0 | 393 | 492 | 20% | 3/20/2008 | 3/20/2008 | United States | |
| Whirlpool | GS2KVA*V*0* | | Side-by-Side | Automatic | No | Yes | 21.8 | 26.4 | 537 | 673 | 20% | 5/14/2008 | 5/14/2008 | United States | |
| Whirlpool | GS5VHA*W*0* | | Side-by-Side | Automatic | No | Yes | 25.7 | 32.0 | 509 | 729 | 30% | 1/26/2009 | 1/26/2009 | United States | |
| Whirlpool | GS6NHA*V*0* | | Side-by-Side | Automatic | No | Yes | 25.6 | 31.9 | 580 | 728 | 20% | 1/24/2008 | 1/24/2008 | United States | |
| Whirlpool | GSC25C4EY*0* | | Side-by-Side | Automatic | No | Yes | 24.5 | 30.8 | 573 | 717 | 20% | 3/1/2011 | 3/2/2011 | United States, Canada | 112012014439_ 9999999 |