

DATE

PROJECT

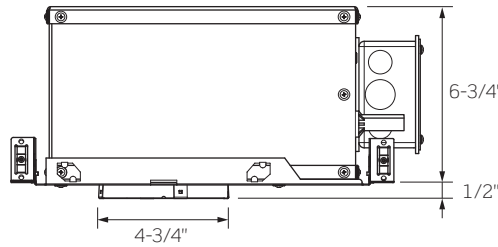
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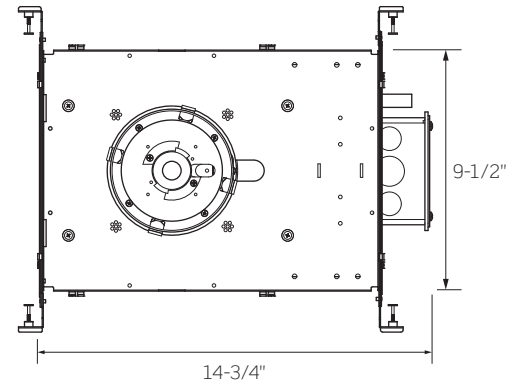
# 4 Inch Downlights with BIOS SkyBlue™ Technology: R4SA StopAire™ Housing



Side View



Bottom View



**Ceiling Opening:** 4-7/8 Inches  
**Ceiling Thickness:** 1/2 to 1-1/2 Inches

|                                         | R4SA1                                                                                                                                                                                                                                                 | R4SA2           | R4SA3           | R4SA4           | R4SA5           |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| WATTAGE                                 | 12W                                                                                                                                                                                                                                                   | 15W             | 21W             | 30W             | 39W             |
| LUMEN OUTPUT <sup>1</sup>               | 700Lm                                                                                                                                                                                                                                                 | 900Lm           | 1300Lm          | 1800Lm          | 2200Lm          |
| COLOR TEMPERATURE / CRI / R9            | 3000K / 81 CRI / 90 R9<br>3500K / 83 CRI / 95 R9<br>4000K / 83 CRI / 95 R9                                                                                                                                                                            |                 |                 |                 |                 |
| INPUT WATTAGE                           | 12W                                                                                                                                                                                                                                                   | 15W             | 21W             | 30W             | 39W             |
| INPUT CURRENT (A)<br>120V / 277V / 347V | .08 / .04 / .03                                                                                                                                                                                                                                       | .12 / .06 / .04 | .17 / .08 / .06 | .23 / .11 / .08 | .31 / .14 / .11 |
| INPUT VOLTAGE                           | 120V - 277V Standard Driver 90-305V AC, 50/60Hz<br>347V Standard Driver 347V AC, 50/60Hz<br>Lutron HiLume® Driver 120V AC, 50/60Hz<br>Lutron Eco-System® Driver 120V AC / 277V AC, 50/60Hz<br>eldoLED ECOdrive / SOLOdrive 120V AC / 277V AC, 50/60Hz |                 |                 |                 |                 |
| DRIVER POWER FACTOR                     | > 0.90                                                                                                                                                                                                                                                |                 |                 |                 |                 |
| TOTAL HARMONIC DISTORTION (THD)         | < 20%                                                                                                                                                                                                                                                 |                 |                 |                 |                 |
| LISTINGS                                | cCSAus Certified to UL Standards; Suitable for Damp Locations<br>Conforms to Washington State Energy Code (WSEC) for Low Air Infiltration; tested in accordance with ASTM E283 (2.0 CRM or less)<br>Chicago Plenum CCEA Listed                        |                 |                 |                 |                 |
| WARRANTY                                | Five (5) year replacement after date of purchase                                                                                                                                                                                                      |                 |                 |                 |                 |
| SYSTEM RATING                           | 50,000 Hours @ 70% Lumen Maintenance                                                                                                                                                                                                                  |                 |                 |                 |                 |

1. Approximate Lumen output based on 3000K performance; see photometric test results for additional information

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|------|---------|------|
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# 4 Inch Downlights with BIOS SkyBlue™ Technology: R4SA StopAire™ Housing

## ORDERING INFORMATION

Example Order: R4SA130KB12D<sup>2</sup>B

| Housing/LED Series        | Color Temp          | Electrical                   | Dimming                                                                         | BIOS Protocol                                                       |
|---------------------------|---------------------|------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------|
| <b>R4SA1</b> - 12W/700lm  | <b>30KB</b> - 3000K | <b>12</b> - 120V             | <b>D<sup>2</sup></b> - 120-277V Triac, ELV, 0-10V Dimming                       | <b>BT</b> - BIOS Tunable Dimming<br><b>BS</b> - BIOS Static Dimming |
| <b>R4SA2</b> - 15W/900lm  | <b>35KB</b> - 3500K | <b>27</b> - 277V             | <b>D2</b> - 347V 0-10V Dimming                                                  |                                                                     |
| <b>R4SA3</b> - 21W/1300lm | <b>40KB</b> - 4000K | <b>34<sup>1</sup></b> - 347V | <b>D3<sup>3</sup></b> - Lutron Hi-lume 1% 2-Wire (120V Forward Phase Only)      |                                                                     |
| <b>R4SA4</b> - 30W/1800lm |                     |                              | <b>D4<sup>3</sup></b> - Lutron Hi-lume 1% EcoSystem with Soft-on, Fade-to-Black |                                                                     |
| <b>R4SA5</b> - 39W/2200lm |                     |                              | <b>D6<sup>4</sup></b> - 120-277V eldoLED ECOdrive, 0-10V, 1% Dimming            |                                                                     |
|                           |                     |                              | <b>D7<sup>4</sup></b> - 120-277V eldoLED ECOdrive, DALI, 1% Dimming             |                                                                     |
|                           |                     |                              | <b>D8<sup>4</sup></b> - 120-277V eldoLED SOLOdrive, 0-10V, 0.1% Dimming         |                                                                     |
|                           |                     |                              | <b>D9<sup>4</sup></b> - 120-277V eldoLED SOLOdrive, DALI, 0.1% Dimming          |                                                                     |

1. Only available with 347V Dimming Option (D2)
2. Triac and ELV Dimming for 120V only
3. Lutron Hi-Lume 2-Wire Dimming available in 120V only, Eco-System available for both 120V and 277V. Lutron Dimming options are available for Series 1 through 4 only (12W through 30W); not available for use with LED Series 5 (39W).
4. eldoLED Drivers are programmed for Linear Curve Dimming as standard; for Logarithmic Curve Dimming, consult factory

### Accessories

*Standard Hanger Bars Supplied with Housing*

**HB-30** - T-Bar Hanger Set

See “Trims for 4-Inch BIOS LED Downlights” Specification Sheet for compatible Trim information and details

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# 4 Inch Downlights with BIOS SkyBlue™ Technology: R4SA StopAire™ Housing

## PRODUCT DETAILS

### Construction

- 4 Inch Specification Grade 16 Gauge Galvanized Steel StopAire™ Housing with Die-Cast Aluminum Heat Sink
- Quick Connect Light Engine
- LED Drivers are fully accessible from below the ceiling
- Dual Nailer Hanger Bars are adjustable for 16 and 24 inch center joists (14-1/4 to 24-1/2 inch). Nailer Bars may be extended to rest on T-Bar ceilings; optional clip-on T-Bar Hangers available.
- Pre-wired Junction Box with eight (8) 1/2 inch and four (4) 3/4 inch Knockouts
- Output over-voltage, over-current and short circuit protection
- Approved for Through Circuit Wiring: max. eight (8) 12 AWG (4in/4out), wiring rated to 90°C
- Requires minimum 3 inch clearance around housing from insulation material; thermally protected in case of improper insulation use

### Performance Summary

- All R4 Downlights are available for non-dimming and dimming applications; for compatible dimmers, refer to the Dimming Specification sheet
- Flanged or Trimless Specification Grade Trims; See “Trims for 4 Inch BIOS LED Recessed Downlights” Specification Sheet for compatible trim information and details
- Trimless Options require use of a Mud Frame (MF4, ordered separately) for securing housing and trim in 1/2 to 1 inch thick ceilings only
- Trimless options cannot be used with Remodel Housings (R4RM) or Slope Ceiling Adapters (RSA4L Series)
- UL8750 and Class 2 Compliant; RoHS Compliant, US only
- Assembled in the USA

## BIOS SKYBLUE LED TECHNOLOGY DETAILS

- BIOS SkyBlue™ Circadian Lighting Technology brings the benefits of blue skies inside by emulating the makeup of nature’s light spectrum.
- Light sends signals to the body that create biological responses, many associated with the body’s circadian system. These responses impact mood, hormone production, energy levels, alertness, fatigue and more.
- This biological response to light can be measured by the melanopic (non-visual) to photopic (visible) ratio called the M/P ratio. During the day, a high M/P ratio is optimal, while at night a low M/P ratio is best.
- BIOS LEDs provide high daytime stimulus by pin-pointing the peak sensitivity of the ‘sky blue’ visible light spectrum wavelengths, approx. 490nm, needed to effectively communicate and trigger circadian response.

|       |     |    | MELANOPIC RATIO (M/P) <sup>1</sup> |                    |
|-------|-----|----|------------------------------------|--------------------|
| CCT   | CRI | R9 | DAY                                | NIGHT <sup>2</sup> |
| 3000K | 81  | 90 | 0.74                               | 0.47               |
| 3500K | 83  | 95 | 0.83                               | 0.47               |
| 4000K | 83  | 95 | 0.92                               | 0.47               |

1. The Melanopic Ratios (M/P) provided have been calculated using the WELL v2 Methodology
2. 2700K CCT with SkyBlue (490nm) removed during Nighttime. Available only for Tunable BioDimming™, not available for Static BioDimming™

## BIOS BIO-DIMMING™

The BIOS Bio-Dimming Modules deliver a completely customizable and spectrally-modulated light source. Two Modules are available, Tunable or Static, depending on desired performance, and can be used with any standard dimming interface.

**Tunable Bio-Dimming™** is best suited for 24-hour facilities or evening applications, where full light output is desired as the day progresses, but also there is also the need to minimize circadian impact in the evening. When dimming, the sky blue wavelengths are removed first, resulting in a modest color temperature shift to 2700K. This occurs within the first 20% of the dimming profile, the remainder of the dimming profile reduces light output, providing a standard linear reduction of the sky blue depleted spectrum.

**Static Bio-Dimming™** supports proper daytime circadian stimulus, best suited for day-only applications.

A steady, invisible, sky blue signal boost to white light is delivered throughout the day for high daytime circadian stimulus. When dimming, these sky blue wavelengths remain as overall light intensity is dimmed down.

| TUNABLE BIO-DIMMING PROTOCOL |                                  |                                 |                |
|------------------------------|----------------------------------|---------------------------------|----------------|
| DIMMER LEVEL                 | CCT                              | SKYBLUE %                       | LIGHT OUTPUT   |
| 100%                         | Initial CCT<br>3000K/3500K/4000K | 100%                            | 100%           |
| 99% - 81%                    | Gradual Shift<br>down to 2700K   | 100% - 0%                       | 100%           |
| 80%                          | 2700K                            | 0%<br>No SkyBlue<br>Wavelengths | 100%           |
| 79% - 0%                     | 2700K                            | 0%<br>No SkyBlue<br>Wavelengths | Linear Dimming |

| STATIC BIO-DIMMING PROTOCOL |                                  |           |                |
|-----------------------------|----------------------------------|-----------|----------------|
| DIMMER LEVEL                | CCT                              | SKYBLUE % | LIGHT OUTPUT   |
| 100%                        | Initial CCT<br>3000K/3500K/4000K | 100%      | 100%           |
| 99% - 0%                    | Initial CCT<br>3000K/3500K/4000K | 100%      | Linear Dimming |

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# R4 SERIES | 4 Inch Downlights with BIOS SkyBlue™ Technology

## PHOTOMETRICS

### R4\*535KB12DBS / C4322M-CLR

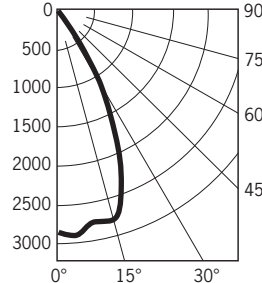
Fixture Delivered Lumens: 2240.8  
 Total Watts@120V: 38.5  
 Lumens Per Watt: 58.2  
 Center Beam Candle Power: 2841  
 Beam Distribution: 54.7°  
 Spacing Criterion: 0.84  
 Color Rendering Index (CRI)<sup>1</sup>: 84.8  
 Color Temperature (CCT)<sup>2</sup>: 3241K  
 Peak Sensitivity: 490nm  
 R9 Value: 93.2

Designed for 50,000 Hour Lamp Life<sup>3</sup>  
 LM-63 Test No. G21092801  
 LM-79 Test No. S21093002

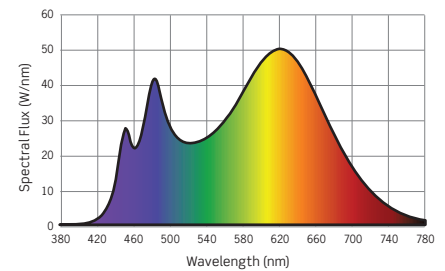
#### Intensity Distribution

| DISTANCE (FT.) | FOOTCANDLES (FC) | BEAM DIAMETER (FT.) |
|----------------|------------------|---------------------|
| 6 FT           | 78.9             | 6.2                 |
| 8 FT           | 44.4             | 8.3                 |
| 10 FT          | 28.4             | 10.3                |
| 12 FT          | 19.7             | 12.4                |
| 14 FT          | 14.5             | 14.5                |
| 16 FT          | 11.1             | 16.5                |

#### Candela Curve



#### Spectral Power Distribution Chart<sup>4</sup>



### R4\*535KB12DBS / C4322W-CLR

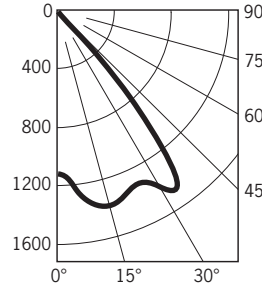
Fixture Delivered Lumens: 2259.6  
 Total Watts@120V: 38.5  
 Lumens Per Watt: 58.7  
 Center Beam Candle Power: 1118  
 Beam Distribution: 82.0°  
 Spacing Criterion: 1.25  
 Color Rendering Index (CRI)<sup>1</sup>: 84.8  
 Color Temperature (CCT)<sup>2</sup>: 3241K  
 Peak Sensitivity: 490nm  
 R9 Value: 93.2

Designed for 50,000 Hour Lamp Life<sup>3</sup>  
 LM-63 Test No. G21092802  
 LM-79 Test No. S21093002

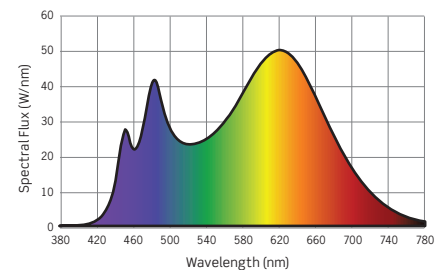
#### Intensity Distribution

| DISTANCE (FT.) | FOOTCANDLES (FC) | BEAM DIAMETER (FT.) |
|----------------|------------------|---------------------|
| 6 FT           | 31.1             | 10.4                |
| 8 FT           | 17.5             | 13.9                |
| 10 FT          | 11.2             | 17.4                |
| 12 FT          | 7.8              | 20.9                |
| 14 FT          | 5.7              | 24.3                |
| 16 FT          | 4.4              | 27.8                |

#### Candela Curve



#### Spectral Power Distribution Chart<sup>4</sup>



### R4\*535KB12DBS / C4322-PL

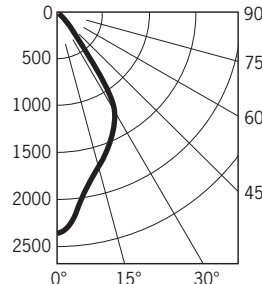
Fixture Delivered Lumens: 2006.3  
 Total Watts@120V: 38.5  
 Lumens Per Watt: 52.1  
 Center Beam Candle Power: 2371  
 Beam Distribution: 62.1°  
 Spacing Criterion: 0.92  
 Color Rendering Index (CRI)<sup>1</sup>: 84.8  
 Color Temperature (CCT)<sup>2</sup>: 3241K  
 Peak Sensitivity: 490nm  
 R9 Value: 93.2

Designed for 50,000 Hour Lamp Life<sup>3</sup>  
 LM-63 Test No. G21092803  
 LM-79 Test No. S21093002

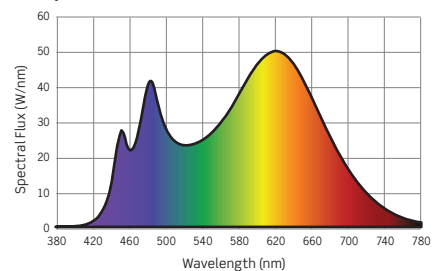
#### Intensity Distribution

| DISTANCE (FT.) | FOOTCANDLES (FC) | BEAM DIAMETER (FT.) |
|----------------|------------------|---------------------|
| 6 FT           | 65.8             | 7.2                 |
| 8 FT           | 37.0             | 9.6                 |
| 10 FT          | 23.7             | 12.0                |
| 12 FT          | 16.5             | 14.4                |
| 14 FT          | 12.1             | 16.8                |
| 16 FT          | 9.3              | 19.2                |

#### Candela Curve



#### Spectral Power Distribution Chart<sup>4</sup>



1. Accuracy of Rendering Colors 2. Color Appearance of Light Source 3. Dependent on Surrounding Temperatures 4. Colors Present within the Light Source

## PHOTOMETRIC MULTIPLICATION FACTORS

Lumen output values fluctuate based on Color Temperature, Luminaire Wattage/Output and Trim Selection. To estimate lumen output of these various options, multiply 3500K results by the following:

| CCT MULTIPLIERS |         | OUTPUT MULTIPLIERS |          |          |          | TRIM MULTIPLIERS |          |           |            |           |
|-----------------|---------|--------------------|----------|----------|----------|------------------|----------|-----------|------------|-----------|
| CCT             | STD CRI | SERIES 1           | SERIES 2 | SERIES 3 | SERIES 4 | C4322W-CLR       | C4322-PL | C4322-WHT | C4322DF-SL | C4323-CLR |
| 3000K           | 0.95    | 0.31               | 0.43     | 0.61     | 0.81     | 1.01             | 0.90     | 0.92      | 0.67       | 0.51      |
| 3500K           | N/A     |                    |          |          |          |                  |          |           |            |           |
| 4000K           | 1.05    |                    |          |          |          |                  |          |           |            |           |

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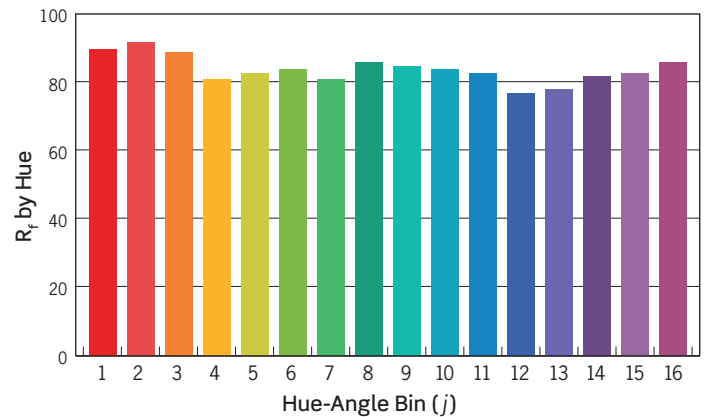
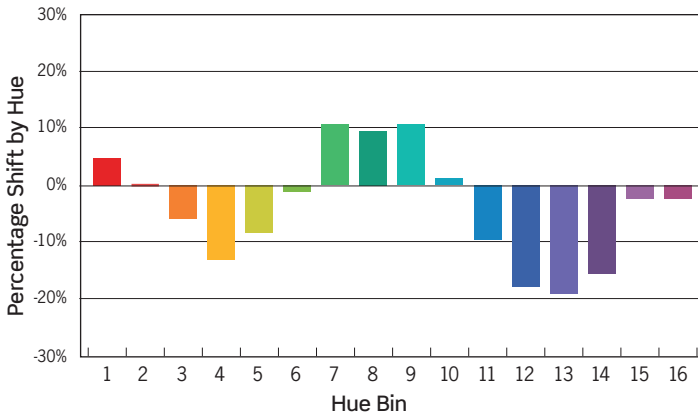
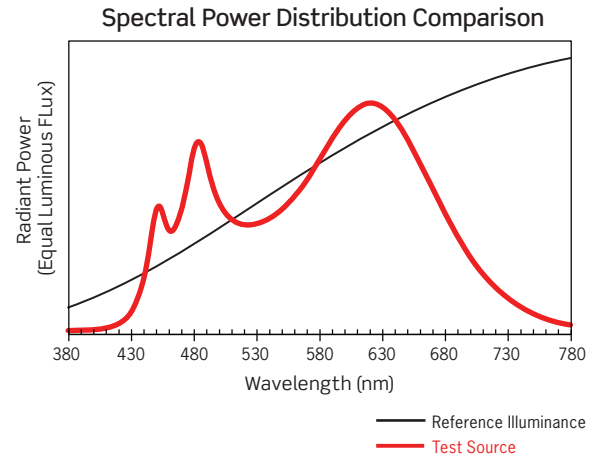
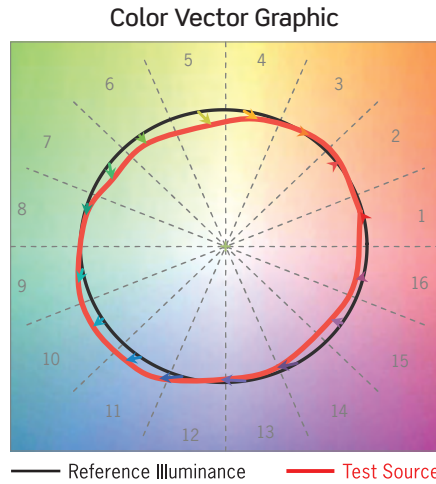
# R4 SERIES | 4 Inch Downlights with BIOS SkyBlue™ Technology

## TM-30 DATA

### R4\*535KB12DBS / C4322M-CLR

ANSI/IES TM-30-18 Color Rendition Report Test No. S21093002

|          |         |
|----------|---------|
| $R_f$    | 86      |
| $R_g$    | 96      |
| CCT(K)   | 3241K   |
| $D_{uv}$ | -0.0098 |
| $u'$     | 0.2468  |
| $v'$     | 0.5032  |



| HUE BIN     | 1  | 2  | 3   | 4    | 5   | 6   | 7  | 8  | 9  | 10 | 11  | 12   | 13   | 14   | 15  | 16  |
|-------------|----|----|-----|------|-----|-----|----|----|----|----|-----|------|------|------|-----|-----|
| HUE SHIFT   | 4% | 0% | -5% | -11% | -7% | -1% | 9% | 8% | 9% | 1% | -8% | -15% | -16% | -13% | -2% | -2% |
| $R_f$ VALUE | 91 | 93 | 90  | 82   | 84  | 85  | 82 | 87 | 86 | 85 | 84  | 78   | 79   | 83   | 84  | 87  |

Colors are for visual orientation purposes only

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# R4 SERIES | Trims for 4 Inch BIOS LED Downlights

## TRIMMED OPTIONS



**C4322-PL**  
Platinum Reflector



**C4322DF-SL**  
Satin Silver Painted Reflector



### C4322 Series

*Specification Grade Reflector*

4-3/8-Inch ID, 5-11/16-Inch OD, 3-1/8-Inch Height

Specification Grade Reflector. For Wet Location approved trim, add “-C” for Clear Lens or “-SL” for Sandblast Lens after finish code.



### C4322DF Series

*ISOWET Dead Front Reflector Trim*

4-3/8-Inch ID, 5-11/16-Inch OD, 3-1/8-Inch Height

Isolated, Wet Location approved Thermoplastic Reflector with clear Glass Lens deeply regressed inside top of Reflector.

- |                                                                  |                 |
|------------------------------------------------------------------|-----------------|
| <b>C4322M-CLR*</b> - 54° Medium Beam<br>Clear Specular Reflector | <b>Quantity</b> |
| <b>C4322W-CLR*</b> - 80° Wide Beam<br>Clear Specular Reflector   |                 |
| <b>C4322-PL*</b> - 57° Platinum Reflector                        |                 |
| <b>C4322-PLWHE</b> - 57° Platinum Wheat Reflector                |                 |
| <b>C4322-WHT</b> - 69° White Reflector                           |                 |

*\*Available with White Painted Flange, add “-WPF” to end of part number*

- |                                         |                 |
|-----------------------------------------|-----------------|
| <b>C4322DF-SL*</b> - Satin Silver Paint | <b>Quantity</b> |
| <b>C4322DF-WHT</b> - Matte White Paint  |                 |

*\*Available with White Painted Flange, add “-WPF” to end of part number*



**C4323-CLR**  
Clear Reflector

### C4323 Series

*Lensed Wall Wash Reflector Trim*

4-Inch ID; 5-11/16-Inch OD



**CTR4325L-WHT-P**  
Floating Glass Disc,  
White Reflector

### CTR4325L Series

*Floating Glass Disc*

4-3/8-Inch ID; 6-Inch OD

White Reflector with Floating Glass Disc; 1-1/4-inch drop from ceiling.

- |                                       |                 |
|---------------------------------------|-----------------|
| <b>C4323-CLR*</b> - Clear Reflector   | <b>Quantity</b> |
| <b>C4323-PL*</b> - Platinum Reflector |                 |
| <b>C4323-WHT</b> - White Reflector    |                 |

*\*Available with White Painted Flange, add “-WPF” to end of part number*

- |                                                                 |                 |
|-----------------------------------------------------------------|-----------------|
| <b>CTR4325L-WHT-P</b> - Floating Glass Disc/<br>White Reflector | <b>Quantity</b> |
|-----------------------------------------------------------------|-----------------|

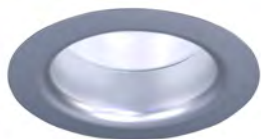
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# R4 SERIES | Trims for 4 Inch BIOS LED Downlights

## TRIMMED OPTIONS, CONTINUED



**C4321-WHT-PL**

White Reflector/Platinum Lower Cone



**C4321 Cone Series**

*Two Piece Reflector with Lower Cone and Flat Lens*  
3-7/8-Inch ID; 5-11/16-Inch OD

Two Piece Reflector: White Upper Reflector, Clear or Platinum Lower Cone. Includes one (1) LF20-CL Clear Glass Lens. Approved for Wet Locations when Glass Lens is installed.



**C4321-WHT-B**

White Reflector/Black Baffle



**C4321 Baffle Series**

*Two Piece Reflector with Lower Baffle and Flat Lens*  
3-7/8-Inch ID; 5-11/16-Inch OD

Two Piece Reflector: White Upper Reflector, Black or White Lower Baffle. Includes one (1) LF20-CL Clear Glass Lens. Approved for Wet Locations when Glass Lens is installed.

**C4321-WHT-CLR** - White Reflector/  
Clear Lower Cone

Quantity

**C4321-WHT-PL** - White Reflector/  
Platinum Lower Cone

**C4321-WHT-B** - White Reflector/  
Black Lower Baffle

Quantity

**C4321-WHT-P** - White Reflector/  
White Lower Baffle



**C4327-CLR-PL**

Clear Reflector/Platinum Lower Cone/  
Regressed Prismatic Convex Lens



**C4327 Cone Series**

*Two Piece Reflector:  
Lower Cone with Prismatic Convex Lens*  
3-7/8-Inch ID; 5-11/16-Inch OD

Two Piece Reflector with Lens: Clear or White Upper Reflector, Clear or Platinum Lower Cone, Prismatic Convex Lens with 1-1/2-inch regress. Wet Location Listed.



**C4327-CLR-P**

Clear Reflector/White Lower Baffle/  
Regressed Prismatic Convex Lens



**C4327 Baffle Series**

*Two Piece Reflector:  
Lower Baffle with Prismatic Convex Lens*  
3-7/8-Inch ID; 5-11/16-Inch OD

Two Piece Reflector with Lens: Clear or White Upper Reflector, Black or White Lower Baffle, Regressed Prismatic Convex Lens with 1-1/2-inch regress. Wet Location Listed.

**C4327-CLR-CLR** - Clear Reflector/  
Clear Lower Cone

Quantity

**C4327-CLR-PL** - Clear Reflector/  
Platinum Lower Cone

**C4327-WHT-CLR** - White Reflector/  
Clear Lower Cone

**C4327-WHT-PL** - White Reflector/  
Platinum Lower Cone

**C4327-CLR-B** - Clear Reflector/Black Lower Baffle

Quantity

**C4327-CLR-P** - Clear Reflector/White Lower Baffle

**C4327-WHT-B** - White Reflector/Black Lower Baffle

**C4327-WHT-P** - White Reflector/White Lower Baffle



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# R4 SERIES | Trims for 4 Inch BIOS LED Downlights

## TRIMLESS OPTIONS

**Trimless Options require use of Mud Frame accessory (MF4, ordered separately)**



**CN4322 \*- CLR**  
Specular Clear Reflector  
Multiple Beam Spreads



**CN4322-PL**  
Platinum Reflector



### CN4322 Series

*Specification Grade Trimless Reflector*  
4-3/8-Inch ID; 4-3/4-Inch OD

Specification Grade Specular Reflector. **Trim cannot be used on Remodel Housings (R4RM) or with Slope Ceiling Adapters (RSA4L). For use with 1/2- to 1-inch ceiling thicknesses only.** For Wet Location approved trim, add “-C” for Clear Lens or “-SL” for Sandblast Lens after finish code.

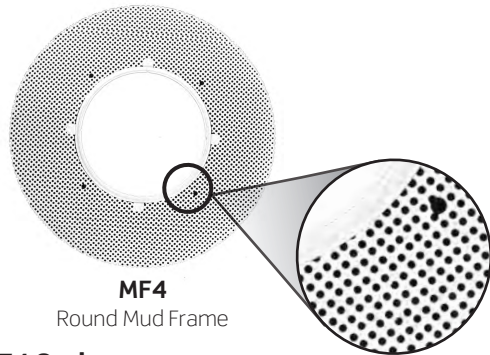
### CN4323 Series

*Trimless Lensed Wall Wash Reflector Trim*  
4-Inch ID; 4-3/4-Inch OD

**Trim cannot be used on Remodel Housings (R4RM) or with Slope Ceiling Adapters (RSA4L). For use with 1/2- to 1-inch ceiling thicknesses only.**

|                                                               | Quantity |
|---------------------------------------------------------------|----------|
| <b>CN4322M-CLR</b> - 54° Medium Beam Specular Clear Reflector |          |
| <b>CN4322W-CLR</b> - 80° Wide Beam Specular Clear Reflector   |          |
| <b>CN4322-PL</b> - 57° Platinum Reflector                     |          |
| <b>CN4322-WHT</b> - 69° White Reflector                       |          |

|                                       | Quantity |
|---------------------------------------|----------|
| <b>CN4323-CLR</b> - Clear Reflector   |          |
| <b>CN4323-PL</b> - Platinum Reflector |          |
| <b>CN4323-WHT</b> - White Reflector   |          |



**MF4**  
Round Mud Frame

### MF4 Series

*Round Mud Frame*  
10-Inch OD

**Required for use with trimless options.** Die-cast Ring with Steel Mesh Frame. Painted white.

|                               | Quantity |
|-------------------------------|----------|
| <b>MF4</b> - 4-Inch Mud Frame |          |



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# R4 and R6 LED Downlights with BIOS SkyBlue™ Circadian Lighting Technology

## PRODUCT DETAILS

### Dynamic 24-Hour Lighting Solutions to Regulate Circadian Systems and Create Healthier Spaces

BIOS SkyBlue™ Circadian Lighting Technology brings the benefits of blue skies inside by emulating the makeup of nature’s light spectrum.

Light sends signals to the body that create biological responses, many associated with the body’s internal 24-hour clock, or circadian system. These signals can impact mood, hormone production, energy levels, alertness, fatigue and more.

BIOS LEDs are expertly designed to generate psychological and biological responses, offering the most comprehensive approach to wellness lighting. BIOS LEDs provide high daytime stimulus by pin-pointing the peak sensitivity of the ‘sky blue’ visible light spectrum wavelengths, approx. 490nm, needed to effectively communicate and trigger circadian response.

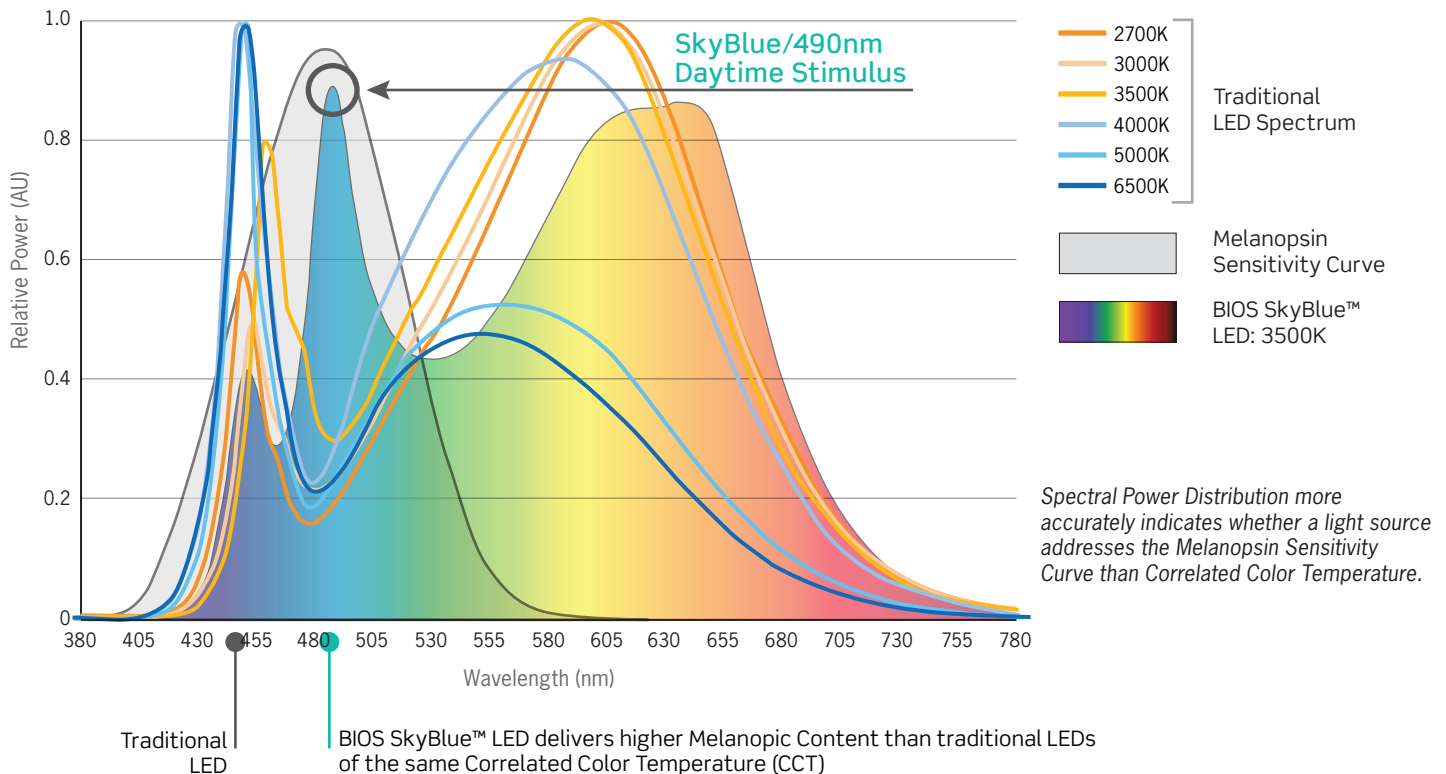
### BIOLOGICAL BENEFITS

- Strengthens Your Circadian Rhythm
- Increases Alertness
- Enhances Productivity
- Boosts Mood
- Promotes a Better Night Sleep

## PERFORMANCE COMPARISONS

### Spectral Power Composition and M/P Ratios: BIOS SkyBlue™ LED Compared to Traditional LEDs

The body’s biological response to light can be measured by the melanopic (non-visual) to photopic (visible light) ratio called the M/P ratio. During the day, a high M/P ratio is optimal, while at night a low M/P ratio is best.



For additional information, visit [www.bioslighting.com](http://www.bioslighting.com)

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# R4 and R6 LED Downlights with BIOS SkyBlue™ Circadian Lighting Technology

## CIRCADIAN LIGHTING SOLUTIONS: TUNABLE AND STATIC BIO-DIMMING™ MODULES



### Tunable Bio-Dimming™ Module

- Senior Living
- Hospitality
- Factories
- Residential
- Neonatal Intensive Care Unit/NICU

BIOS SkyBlue **Tunable** Bio-Dimming is best suited for 24-hour facilities or evening applications, where full light output is desired as the day progresses, but also a need to minimize circadian impact in the evening.

When dimming, the sky blue wavelengths are removed first, resulting in a modest color temperature shift to 2700K. This provides both psychological and biological benefits without a harsh change in CCT. This shift occurs within the first 20% of the dimming profile.

In the remaining 80% of the dimming profile, light output is reduced, enabling a standard linear reduction of the sky blue depleted spectrum.

Tunable Bio-Dimming adds the ability to fine-tune and dim-down the sky blue signal as desired, calibrate light levels and regulate spectral changes.

Compatible with all standard dimming and control protocols, making installation easy and inexpensive.

### Static Bio-Dimming™ Module

- Schools
- Sports Facilities
- Offices
- Retail
- Healthcare Facilities
- Outpatient Clinics
- Factories

BIOS SkyBlue **Static** Bio-Dimming supports proper daytime circadian stimulus, best suited for day-only applications.

- Color of light remains constant throughout the day:
  - 490nm 'Blue Boost' does not reduce during the day
  - Apparent CCT of 3000K, 3500K or 4000K remains constant
- High Melanopic to Photopic (m/p) ratio:
  - While m/p ratio will remain constant if light level is dimmed, EML (Equivalent Melanopic Lux) and CS (Circadian Stimulus) values will be affected due to reduced vertical illuminance

A steady, but invisible, sky blue signal boost to white light is delivered throughout the day for high daytime circadian stimulus. When dimming, these sky blue wavelengths remain as overall light intensity is dimmed down.

Compatible with all standard dimming and control protocols, making installation easy and inexpensive.

## BIO-DIMMING™ PROTOCOLS

| TUNABLE BIO-DIMMING PROTOCOL |                                  |                                 |                |
|------------------------------|----------------------------------|---------------------------------|----------------|
| DIMMER LEVEL                 | CCT                              | SKYBLUE %                       | LIGHT OUTPUT   |
| 100%                         | Initial CCT<br>3000K/3500K/4000K | 100%                            | 100%           |
| 99% - 81%                    | Gradual Shift<br>down to 2700K   | 100% - 0%                       | 100%           |
| 80%                          | 2700K                            | 0%<br>No SkyBlue<br>Wavelengths | 100%           |
| 79% - 0%                     | 2700K                            | 0%<br>No SkyBlue<br>Wavelengths | Linear Dimming |

| STATIC BIO-DIMMING PROTOCOL |                                  |           |                |
|-----------------------------|----------------------------------|-----------|----------------|
| DIMMER LEVEL                | CCT                              | SKYBLUE % | LIGHT OUTPUT   |
| 100%                        | Initial CCT<br>3000K/3500K/4000K | 100%      | 100%           |
| 99% - 0%                    | Initial CCT<br>3000K/3500K/4000K | 100%      | Linear Dimming |

For additional information, visit [www.bioslighting.com](http://www.bioslighting.com)

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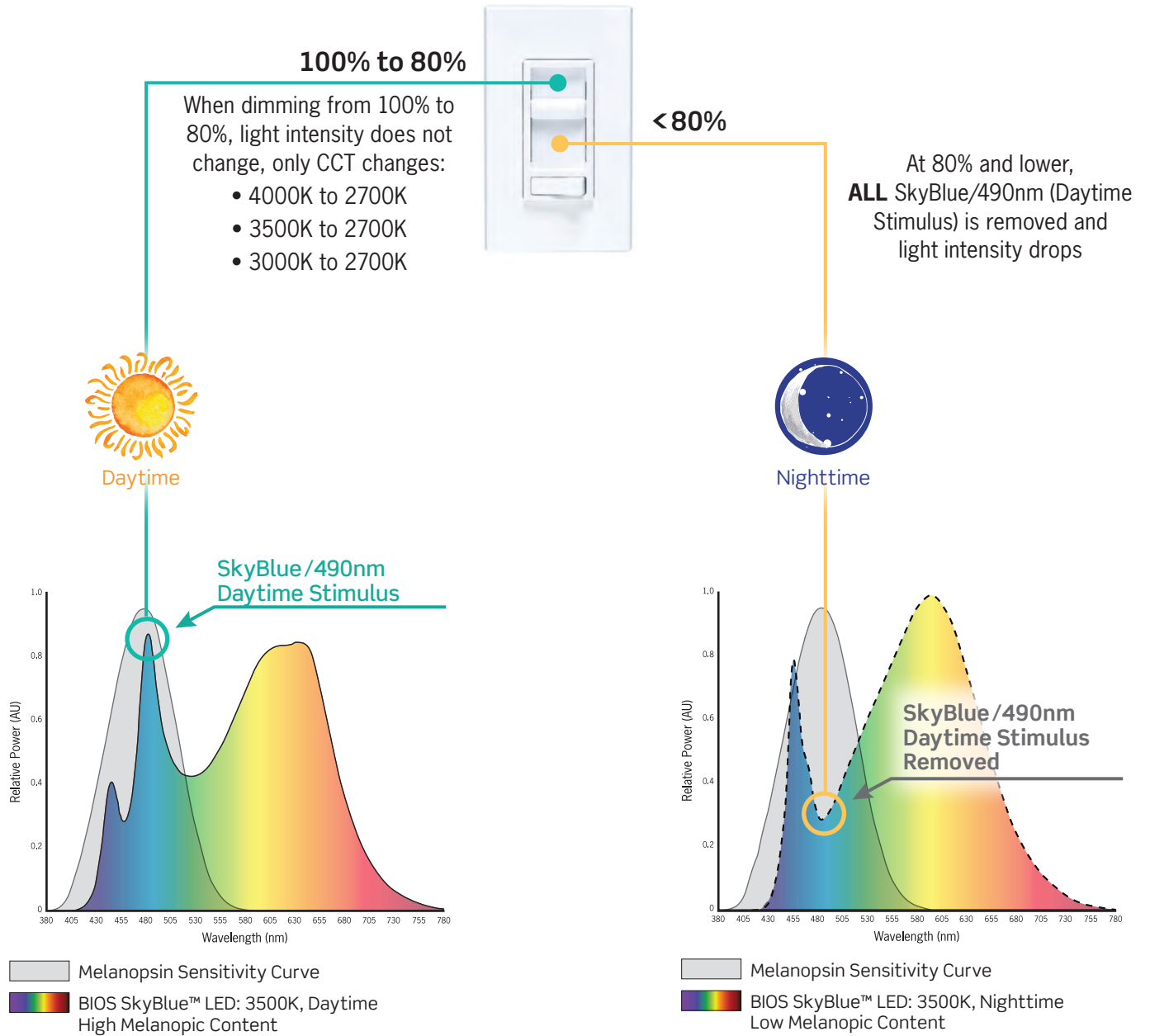
PROJECT

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# R4 and R6 LED Downlights with BIOS SkyBlue™ Circadian Lighting Technology

## TUNABLE BIO-DIMMING™



For additional information, visit [www.bioslighting.com](http://www.bioslighting.com)

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# R4 and R6 LED Downlights with BIOS SkyBlue™ Circadian Lighting Technology

## WELL BUILDING STANDARDS

BIOS SkyBlue™ LED contributes to satisfying Circadian Lighting Design Features and meets other features within the WELL Light Concept, including color quality and visual comfort metrics; helping buildings deliver more thoughtful and intentional spaces that enhance human health and well-being.

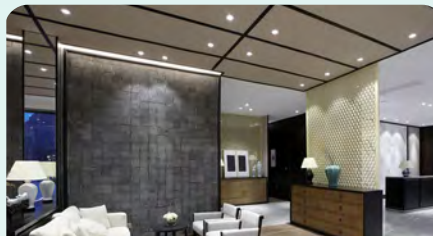
### Circadian Lighting Design

WELL v2™ Feature L03

Provide users with appropriate exposure to light for maintaining circadian health and aligning the circadian rhythm with the day-night cycle

\*EML (Equivalent Melanopic Lux) is a measurement of the effect of both natural and electric light on the human circadian rhythm.

#### BIOS SkyBlue™ LED



#### Maintains Lighting Design Intent

- Highest M/P Ratio for a given CCT
- Most effective technology to help meet EML\* vertical light requirements

#### Traditional White LED



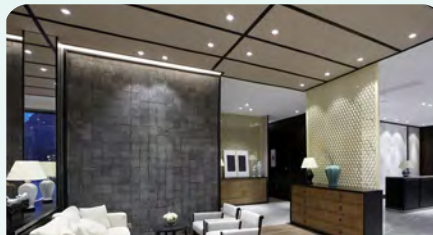
#### Increase Fixture Quantity

- More luminaires required to achieve higher light levels on vertical surfaces
- Increases energy use and lighting power density within the space

### Glare Control

WELL v2™ Feature L04

Manage glare by using strategies, such as calculation of glare and choosing the appropriate light fixtures for the space



#### Visually Comfortable / Energy Efficient

- Higher M/P Ratio means fewer luminaires needed to illuminate the space
- Naturally minimizes amount of glare



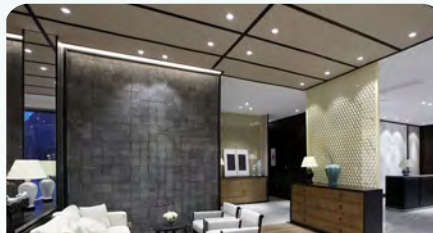
#### Increase Glare / Increase Energy

- Higher output luminaires are needed within the space to meet EML targets
- Increases energy use
- Probability of increased glare and visual discomfort in the space

### Electric Light Quality

WELL v2™ Feature L07

Develop and implement strategies to create a visually comfortable lighting environment



#### Desirable CCT / Great Color Quality

- 80+ CRI
- Ultra High R9 (>90)



#### Increase CCT / Decrease Color Quality

- Higher CCTs (5000K, 6500K) required to achieve the target EML values
- Does not meet R9 requirements

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## R4 SERIES | 4 Inch LED Downlights: Dimming Specifications

- Incandescent 120VAC Dimmers adjust the light with *Forward Phase Control*, where the Dimmer “chops” the forward part of the AC Wave to deliver less or more power to the light source. No Neutral Wire Connection required.
- Electronic Low Voltage 120VAC Dimmers adjust the light with *Reverse Phase Control*, where the Dimmer “chops” the back part of the AC Wave to deliver less or more power to the light source. Neutral Wire Connection required.
- 0–10V DC Low Voltage Dimmers operate using two (2) Low Voltage Dimming Wires that are separate from the 120VAC or 277VAC power. The Dimmer sends a Variable Output Voltage to the luminaire based upon the dimming level. 10V Corresponds to undimmed operation, 5V to 50% and so on. Switching On/Off is controlled with the line voltage power (120VAC or 277VAC) input to the Dimmer. Dimming operation is controlled with the 0–10V DC Low Voltage Wiring Connection between the Dimmer and the LED Driver. The Control Signal runs on two (2) low voltage control wires color coded Violet and Pink.
- Lutron HiLume and EcoSystem Drivers provide continuous dimming from 1%–100%. For a complete list of compatible Dimmers and Controls, visit [www.lutron.com](http://www.lutron.com)
- Use DALI approved Controls for dimming eLdoLED ECOdrive, 1% Dimming (Dimming Option D7 or MVD7) and eLdoLED SOLOdrive, 0.1% Dimming (Dimming Option D9 or MVD9).

| Manufacturer   | Product        | Model     | TRIAC, ELV, 0-10V DIMMING | eldoLED ECOdrive 0-10V      | eldoLED SOLOdrive 0-10V     |
|----------------|----------------|-----------|---------------------------|-----------------------------|-----------------------------|
|                |                |           | (12D, 27D or MVD Option*) | (12D6, 27D6 or MVD6 Option) | (12D8, 27D8 or MVD8 Option) |
|                |                |           | Light Output              | Light Output                | Light Output                |
| Leviton        | IllumaTech     | IPI06-1LZ | 1%-100%                   | NA                          | NA                          |
| Leviton        | SureSlide      | 6631-2    | 1%-100%                   | NA                          | NA                          |
| Leviton        | Vizia          | VPE06     | 9%-100%                   | NA                          | NA                          |
| Leviton        | Trimatron      | 6683-IW   | 6%-100%                   | NA                          | NA                          |
| Leviton        | Decora         | 6161      | 15%-100%                  | NA                          | NA                          |
| Leviton        | SureSlide      | 6633-P    | 1%-100%                   | NA                          | NA                          |
| Leviton        | IllumaTech     | IPE04     | 6%-100%                   | NA                          | NA                          |
| Leviton        | IllumaTech     | IP710-DLX | NA                        | 1%-100%                     | 0.1%-100%                   |
| Cooper         | Devine         | DLC03P    | 1%-100%                   | NA                          | NA                          |
| Cooper         | Skye           | SLC03P    | 0%-100%                   | NA                          | NA                          |
| Cooper         | Decorator      | DAL06P    | 0%-100%                   | NA                          | NA                          |
| Pass & Seymour | Titan          | CD4FB-W   | NA                        | 1%-100%                     | 0.1%-100%                   |
| Synergy        |                | ISD BC    | NA                        | 1%-100%                     | 0.1%-100%                   |
| Watt Stopper   | Miro Decorator | DCLV1     | NA                        | 1%-100%                     | 0.1%-100%                   |
| Lutron         | Ariadni        | TGCL-153P | 1%-100%                   | NA                          | NA                          |
| Lutron         | Ariadni        | TG-600P   | 13%-100%                  | NA                          | NA                          |
| Lutron         | Diva           | DVCL-153P | 1%-100%                   | NA                          | NA                          |
| Lutron         | Diva           | DV600P    | 6%-100%                   | NA                          | NA                          |
| Lutron         | Diva           | DVELV303P | 6%-100%                   | NA                          | NA                          |
| Lutron         | Diva           | DVTV      | NA                        | 1%-100%                     | 0.1%-100%                   |
| Lutron         | Faetra         | FAELV500  | 12%-100%                  | NA                          | NA                          |
| Lutron         | Lumea          | LG600P    | 8%-100%                   | NA                          | NA                          |
| Lutron         | Maestro        | MAELV600  | 16%-100%                  | NA                          | NA                          |
| Lutron         | Nova           | NFTV      | NA                        | 1%-100%                     | 0.1%-100%                   |
| Lutron         | Nova T         | NTFTV     | NA                        | 1%-100%                     | 0.1%-100%                   |
| Lutron         | Skylark        | S-603PG   | 5%-96%                    | NA                          | NA                          |
| Lutron         | Skylark        | S600P     | 5%-100%                   | NA                          | NA                          |
| Lutron         | Skylark        | SELV300P  | 10%-100%                  | NA                          | NA                          |
| Lutron         | Skylark        | CT103P    | 9%-100%                   | NA                          | NA                          |

**NOTES**

\*277V Triac Dimming is not available

1. Testing was performed with a single luminaire connected to Dimmer.
2. Testing has been performed on these Dimmers, but this does not imply any warranty of compatibility.
3. Dimming performance can be influenced by different Loads, as well as variations in Dimmer Switches within the same Model.
4. Dimmer Maximum Load Rating with LED may differ from published Traditional Source Dimmer Ratings. Consult manufacturer for maximum Dimmer information.
5. Consult factory for additional dimming information.