

Project		Catalog #		Type	
Prepared by		Notes		Date	



Metalux

Cruze ST 24CZ2

2' x 4' LED Specification Grade Troffer

Typical Applications

Office • Education • Healthcare • Hospitality • Retail

Interactive Menu

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- Connected Systems page 5
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- Product Warranty

Product Certification



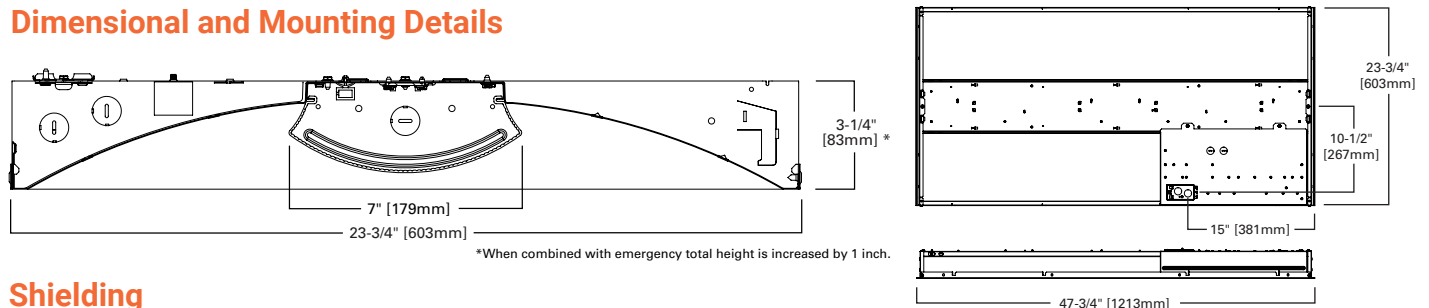
Product Features



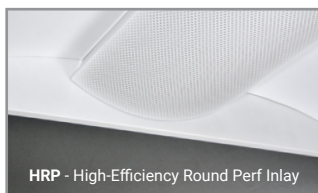
Top Product Features

- Latch-less design provides clean architectural look
- VividTune CCT tuning options from 3000K-5000K or 2700K-6500K
- Designers delight - ribbed, smooth and round perforated lens options
- High performance efficacy up to 167 lm/W
- Integrated sensor systems - occupancy, daylight and IoT connectivity
- Options to meet Buy American and other domestic preference requirements

Dimensional and Mounting Details



Shielding



See ordering information for more shielding options.

Ceiling Compatibility

G	G	G	Ceiling Type	Trim Type
Grid/Lay-in Standard	Concealed T	Slot Grid	Exposed Grid	Standard
			Concealed T	Standard
			Slot Grid	Standard
			Flange	*

*See Drywall Frame Kit Accessory in Ordering Information Section

Order Information

SAMPLE ORDER NUMBER: **24CZ2-45HE-UNV-L835-CD1-U**

Domestic Preferences	Rating	Series	Air	Lumen Output		Shielding	Voltage	
[Blank] =Standard BAA =Buy American Act TAA =Trade Agreements Act	[Blank] =Standard ATW-SW4 =Chicago Rated	24CZ2 =2x4 Cruze ST	[Blank] =Standard A =Air (Vented) ⁽¹⁾	30 =3000 Lumens 35 =3500 Lumens 40 =4000 Lumens 45 =4500 Lumens 50 =5000 Lumens 55 =5500 Lumens ⁽²⁾ 60 =6000 Lumens ⁽²⁾ 65 =6500 Lumens ^{(2), (3), (4)} 70 =7000 Lumens 75 =7500 Lumens ^{(3), (4)}	80 =8000 Lumens ⁽³⁾ 85 =8500 Lumens ⁽³⁾ 90 =9000 Lumens ⁽³⁾ 95 =9500 Lumens ⁽³⁾ 100 =10000 Lumens ⁽³⁾ 110 =11000 Lumens ⁽³⁾ 120 =12000 Lumens ⁽³⁾ 130 =13000 Lumens ⁽³⁾ 150 =15000 Lumens ⁽³⁾ 170 =17000 Lumens ⁽³⁾	[Blank] =Standard Efficacy ⁽⁵⁾ HE =High Efficacy ⁽⁶⁾ VHE =Very High Efficacy ^{(3), (7)}	[Blank] =Ribbed Frosted Acrylic Lens (standard) S =Smooth Frosted Acrylic Lens RDP =Smooth Lens with Round Pattern Insert HRP =High-Efficiency Round Perf Inlay SQR =Square Lens	UNV =Universal Voltage 120-277 347V =347 Volt ⁽⁹⁾ 48V =48 Volt Low-voltage (Class 2) ^(C)
Notes (23) Only product configurations with these designated prefixes are built to be compliant with the Buy American Act of 1933 (BAA) or Trade Agreements Act of 1979 (TAA), respectively. Please refer to DOMESTIC PREFERENCES website for more information. Components shipped separately may be separately analyzed under domestic preference requirements.			Notes (1) Air version is intended for air return through plenum. See air return data table for air flow volumes. Air option not available with ATW-SW4.	Notes (2) Not available with white tuning and Standard Efficacy. (3) Currently only available with CD driver option. (4) 6500 lumens standard efficacy and 7500 lumens and higher are not available with WN driver. (5) Available up to 6500 lumens. (6) Available up to 7500 lumens. (7) Requires 2 CD-1 drivers above 100VHE.			Notes (8) Products also available in non-US voltages and frequencies for international markets. (9) Some 347V versions require a transformer. Total wattage will increase by 2 watts if used. (C) Consult WaveLinx Low-Voltage or DLVP system pages for additional details and compatibility.	

Options	Emergency Options	CRI/CCT	Flex
GL =Single Element Fuse GM =Double Element Fuse	[Blank] =No emergency EL7W =7-watt 120V-277V emergency battery pack ⁽¹⁰⁾ EL14W =14-watt 120V-277V emergency battery pack ⁽¹⁰⁾ EL10WSD =Bodine 10W emergency battery pack with self diagnostic installed ^{(10), (12)} ELV7W =Low-voltage system, 7-watt emergency battery pack ^(C) ELV14W =Low-voltage system, 14-watt emergency battery pack ^(C) ETRD =Iota Emergency Transfer Relay with dimming control ⁽¹¹⁾ RRU =LVS Controls Emergency Transfer Relay with dimming control ⁽¹¹⁾ UEL7W =UL924 Listed luminaire, 7-watt, 120V-277V emergency battery pack ⁽¹⁰⁾ UEL14W =UL924 Listed luminaire, 14-watt 120V-277V emergency battery pack ⁽¹⁰⁾ UEL10WSD =Bodine 10W emergency battery pack with self diagnostic installed ^{(10), (13)} UETRD =UL924 Listed luminaire, Iota Emergency Transfer Relay with dimming control ⁽¹¹⁾ URRU =UL924 Listed luminaire, LVS Controls Emergency Transfer Relay with dimming control ⁽¹¹⁾	L830 =80CRI, 3000K L835 =80CRI, 3500K L840 =80CRI, 4000K L850 =80CRI, 5000K L930 =90CRI, 3000K L935 =90CRI, 3500K L940 =90CRI, 4000K L950 =90CRI, 5000K L83050 =80CRI 3000K-5000K White Tuning ⁽¹⁴⁾ L93050 =90CRI 3000K-5000K White Tuning ⁽¹⁴⁾ L82765 =80CRI 2700K-6500K White Tuning ⁽¹⁴⁾ L92765 =90CRI 2700K-6500K White Tuning ⁽¹⁴⁾	[Blank] =No Flex A3/8-4/18GDIM =3/8" Flex with 0-10V Dimming Leads A3/8-2/18G =3/8" Flex with line and common A3/8-5/18GDIM =Flex with 0-10V Dimming leads and Blue for alternate wiring. See below for details.
	Notes (10) Factory installed with integral test switch/indicator/laser test. For approximate delivered lumens multiply the lumens per watt of the desired fixture by the wattage of the emergency battery pack (100 lm/W x 7=700 lumens). IES-format photometry for luminaire under emergency operation available. Battery option increases total height by 1 inch. (11) Used to bypass local control during outage. Must be used in conjunction with UL 1008 device (provided by others). Devices are universal voltage (UNV), 347 not available. (12) EL10WSD not available with 347V. (13) UEL10WSD not available with 347V. (C) Consult WaveLinx Low-Voltage or DLVP system pages for additional details and compatibility.	Notes (14) White tuning provides correlated color temperatures (CCT) between 3000K (warm) to 5000K (cool) or 2700K (warm) to 6500K (cool). Must be used in conjunction with W2A driver only. Must be used with two (2) 10V dimming control channels, 1 color, 1 intensity. May be combined with WaveLinx sensor control systems only.	Flexible Metal Conduit Options Flex options available for 0-10V dimming control, DALI dimming control, emergency and night light functions. 72-inch factory-installed and pre-wired to driver, fitted to luminaire housing access plate with 90° enclosed FMC connector. Not all options may be combined and installation ratings vary by type. See online configurator for all flex options. A3/8-4/18GDIM series notes: Factory installed dimming option 3/8" flexible metal conduit with 2-#18 power and ground wires and 2-#18 UL-listed jacketed 0-10V +/- control wires. Meets UL 66, 83, 1479, 1569, 1581, 2556, NEC® 250.118, 300.22(C), 392, 396, 330, 501, 502, 503, 530, 504, 505, 518, 520, 530, 645, 72; Federal Specification A-A-59544 (formerly J-C-30B); all applicable OSHA and HUD Requirements. UL Classified 1-, 2-, and 3-hour through penetration with applicable fire stop product (not included). May be surface mounted, fished and/or embedded in plaster. Cable tray and approved raceway rated, install per NEC®; Environmental Air-Handling Space Installation per NEC® 300.22(C).

Driver Type	Number of Drivers	Integrated Sensing Systems	Packaging
CD =0-10V Driver (10%-100% Dimming) HCD =0-10V Driver (1%-100% Dimming) 5LTD =DALI Driver (5%-100% Dimming) 5LTHD =DALI Driver (1%-100% Dimming) LV =Low-voltage System Driver (0%-100% Dimming) ^(C) SD =Step Dimming Driver (50%-100% Dimming) LH =Lutron HiLume (LDE1 series) 1%-100% EcoSystem Driver with Soft-on Fade to Black dimming ^(F) W2A =White Tuning, 2 ch, Analog 0-10V Intensity and CCT Control ⁽¹⁵⁾ SR =Sensor-ready Driver (1%-100% Dimming)	1 =1 Driver 2 =2 Drivers ⁽¹⁷⁾	[Blank] =No Sensor WAA =WaveLinx Wireless Integrated Sensor ^{(19), (A)} WAB =WaveLinx Lite Wireless Integrated Sensor ^{(20), (B)} WLA =Low-voltage Integrated Sensor ^{(21), (C)} SVDP1 =0-10V Stand-alone Integrated Sensor ^{(20), (D)}	U =Unit Pack PAL =Job Pack, out of carton PALC =Job Pack, in carton
Notes (15) White tuning provides correlated color temperatures (CCT) between 3000K (warm) to 5000K (cool) or 2700K (warm) to 6500K (cool). Must be used in conjunction with W2A driver only. Must be used with two (2) 10V dimming control channels, 1 color, 1 intensity. May be combined with WaveLinx sensor control systems only. Integrated options must be used in conjunction with the associated system and may not be compatible with other options or accessories. Please refer to the following: (C) Consult WaveLinx Low-Voltage or DLVP system pages for additional details and compatibility. (F) Consult Marketplace Options - Lutron system pages for additional details and compatibility. Compatible only with driver series shown, and may require two or more drivers. Requires field commissioning to operate or dim. Contact Lutron at www.lutron.com .	Notes (17) See lumen limitation notes for applications requiring 2 drivers or use online configurator. When combined with emergency total height is increased by 1 inch.	Notes (18) Matching width lens band on other side of sensor band may be supplied for symmetrical appearance. Required for use with sensor and emergency combination. Add "D" to sensor ordering as shown - WAA, WAB, SVDP1. (19) WAA sensor to be used with CD or W2A driver. (20) WAB and SVDP1 sensor to be used with CD driver. (21) WLA sensor to be used with LV driver. Integrated options must be used in conjunction with the associated system and may not be compatible with other options or accessories. Please refer to the following: (A) Consult WaveLinx system pages for additional details and compatibility. (B) WaveLinx Lite devices are not currently compatible with the WaveLinx Wireless Area Controller. Consult WaveLinx Lite system pages for additional details and compatibility. (C) Consult WaveLinx Low-Voltage or DLVP system pages for additional details and compatibility. (D) Consult SVDP series system pages for additional details and compatibility.	

Accessories

Accessories (order separately) ⁽²⁴⁾

CZ2-EQCLIP-U-PK=“CZ2” Earthquake Clip Kit (4 clips per bag kit) ⁽²²⁾
DF-24W-U=2' x 4' Drywall Frame Kit
SK-24-WS=2' x 4' Shallow Surface Mount Kit
SK-24-WT=2' x 4' Tall Surface Mount Kit
ISHH-01=Programming Remote for Integrated Sensor ^(D)
ISHH-02=Personal Control Remote for Integrated Sensor ^(D)

Notes

(22) An EQ Grid Clip is recommended for all 9/16" ceiling systems. Four required per fixture.
 (24) Accessories sold separately will be separately analyzed under domestic preference requirements. Consult factory for further information. Integrated options must be used in conjunction with the associated system and may not be compatible with other options or accessories. Please refer to the following: (D) For use with SVPD sensor only. Consult SVPD series system pages for additional details and compatibility.

Product Specifications

Construction

- Die formed of code gauge prime cold rolled steel with full length die-formed stiffeners
- Unibody endplates attached with interlocking tabs and screws
- Hemmed side flanges
- Four auxiliary fixture end suspension points
- Integral Grid-lock feature for endplates for added safety
- Optional earthquake clips available

Integrated Controls

- 0-10V dimming to 1% standard
- WaveLinX wireless sensor compatible for standalone, controlled, connected, and IoT capability
- SVPD sensor compatible for standalone functionality
- Low-voltage sensor and driver compatible for WaveLinX Low-Voltage and DLVP applications
- DALI 2.0, Lutron, and step-dimming available

LED and Light Engine

- LED's available in 3000K, 3500K, 4000K, or 5000K at 80 CRI minimum and 90 CRI minimum
- Color accuracy ≤ 3 -Step MacAdam ellipse (SDCM)
- TM21 life at 60,000 hours up to L90 and calculated L70 exceeds 203,000 hrs.
- Drivers available in 120-277V and 347V
- Tunable white options available with Cooper Lighting Solutions' VividTune

Emergency Options

- Optional emergency battery available in 7W and 14W
- 90-minute backup period for code compliance
- Laser point test from floor for ease of use on 7W and 14W versions
- EZ Key feature prevents accidental discharge during construction on 7W and 14W versions
- Integral emergency transfer relay options available

Finish

- Multistage, iron phosphate pretreatment
- 90% reflective, matte white enamel finish
- Full fixture housing painted after fabrication

Shielding

- Ribbed acrylic frosted lens standard
- Optional smooth acrylic frosted lens (S)
- Optional metal perforated acrylic lens (RDP)
- Optional High-Efficiency Round Perf Inlay (HRP)

Compliance

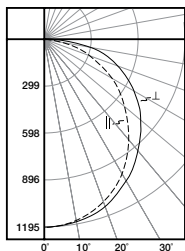
- IC rated for insulation contact
- cULus listed for damp locations
- UL924 luminaire listing available, see Emergency Options
- RoHS compliant
- Tested to IESNA LM-79 and LM-80
- Stated life tested to TM21 standards
- Can be used for State of California Title 24 high efficacy luminaire

Warranty

- Five-year warranty standard. Optional ten year warranty available.

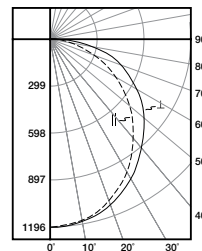
Photometric Data

[View IES files](#)



24CZ2-35-UNV-L830-CD1-U

Dimming Driver
 Linear LED 3000K
 Spacing criterion: (II) 1.22 x mounting height,
 (⊥) 1.28 x mounting height
 Lumens: 3618
 Input Watts: 30.1W
 Efficacy: 120.2 LPW
 Test Report: 24CZ2-35-UNV-L830-CD1-U.IES



24CZ2-35HE-UNV-L830-CD1-U

Dimming Driver
 Linear LED 3000K
 Spacing criterion: (II) 1.21 x mounting height,
 (⊥) 1.27 x mounting height
 Lumens: 3562
 Input Watts: 26.9W
 Efficacy: 132.4 LPW
 Test Report: 24CZ2-35HE-UNV-L830-CD1-U.IES

Energy and Performance Data

Standard Efficacy Versions – Single Row of LEDs

Catalog Number	Lumens	Watts	lm/W
24CZ2-30-UNV-L835-CD1-U	3028	22.4	135
24CZ2-35-UNV-L835-CD1-U	3633	27.3	133
24CZ2-40-UNV-L835-CD1-U	4178	30.4	137
24CZ2-45-UNV-L835-CD1-U	4602	35.0	132
24CZ2-50-UNV-L835-CD1-U	5049	39.6	128
24CZ2-55-UNV-L835-CD1-U	5571	41.1	135
24CZ2-60-UNV-L835-CD1-U	6056	46.3	131
24CZ2-65-UNV-L835-CD1-U	6601	50.1	132

High Efficacy Versions – Two Rows of LEDs

Catalog Number	Lumens	Watts	lm/W
24CZ2-30HE-UNV-L835-CD1-U	3100	22.3	139
24CZ2-35HE-UNV-L835-CD1-U	3685	27.0	137
24CZ2-40HE-UNV-L835-CD1-U	4144	30.7	135
24CZ2-45HE-UNV-L835-CD1-U	4712	35.3	134
24CZ2-50HE-UNV-L835-CD1-U	5164	38.6	134
24CZ2-55HE-UNV-L835-CD1-U	5722	43.5	132
24CZ2-60HE-UNV-L835-CD1-U	6182	44.1	140
24CZ2-65HE-UNV-L835-CD1-U	6777	48.9	139
24CZ2-70HE-UNV-L835-CD1-U	7218	49.3	146
24CZ2-75HE-UNV-L835-CD1-U	7787	55.4	141

Very High Efficacy Versions – Three Rows of LEDs

Catalog Number	Lumens	Watts	lm/W
24CZ2-30VHE-UNV-L835-CD1-U	3011	20.4	148
24CZ2-35VHE-UNV-L835-CD1-U	3526	22.8	155
24CZ2-40VHE-UNV-L835-CD1-U	4042	26.2	154
24CZ2-45VHE-UNV-L835-CD1-U	4559	29.6	154
24CZ2-50VHE-UNV-L835-CD1-U	5064	32.7	155
24CZ2-55VHE-UNV-L835-CD1-U	5570	36.1	154
24CZ2-60VHE-UNV-L835-CD1-U	6055	38.7	157
24CZ2-65VHE-UNV-L835-CD1-U	6565	42.2	156
24CZ2-70VHE-UNV-L835-CD1-U	7059	45.7	155
24CZ2-75VHE-UNV-L835-CD1-U	7662	49.9	154
24CZ2-80VHE-UNV-L835-CD1-U	8128	53.8	151
24CZ2-85VHE-UNV-L835-CD1-U	8600	57.9	149
24CZ2-90VHE-UNV-L835-CD1-U	9053	61.8	147
24CZ2-95VHE-UNV-L835-CD1-U	9521	65.6	145
24CZ2-100VHE-UNV-L835-CD1-U	10191	69.6	146
24CZ2-110VHE-UNV-L835-CD2-U	11098	77.4	143
24CZ2-120VHE-UNV-L835-CD2-U	12211	83.6	146
24CZ2-130VHE-UNV-L835-CD2-U	13271	90.7	146
24CZ2-150VHE-UNV-L835-CD2-U	15006	104.2	144
24CZ2-170VHE-UNV-L835-CD2-U	17021	123.4	138

Shielding

Lumen Adjustment Factors			
S	RDP	HRP	SQR
1.05	0.67	0.81	0.96

Lumen Calculator

CCT Multiplier	80 CRI	90 CRI ⁽¹⁾
3000K	0.965	0.827
3500K	1.000	0.847
4000K	1.019	0.856
5000K	1.019	0.909

Notes: (1) Input wattages for 90 CRI versions may vary. Refer to published IES-format photometry or LM-79 reports for more details.

Example of Lumen Adjustment Calculation

24CZ2-40-UNV-L835-CD1-U at 90CRI at 3500K

Lumen Adjustment Factor = 0.845

Total Light Output =

4,196 lm x 0.845 = 3,546 lm

Efficacy = $\frac{3,546 \text{ lm}}{36.2 \text{ W}}$ = 98 lm/W

Lumen Maintenance

Version	TM-21 Lumen Maintenance (60,000 hours) ⁽²⁾	Theoretical L70 (Hours) ⁽³⁾
Standard	> 87%	> 151,000
High Efficiency	> 90%	> 203,000
Very High Efficiency	> 90%	> 203,000

Notes: (2) Supported by IES TM-21 standards. (3) Theoretical values represent estimations commonly used; however, refer to the IES position on LED Product Lifetime Prediction, IES PS-10-18, that explains proper use of IES TM-21 and LM-80.

Load Data (Stock Product)

Thd	6%
Power Factor	0.99
Weight (lbs.)	16
Low Temp. Start	-20°C

Shipping Data

Catalog No.	Wt.	Pallet 49"L x 52"W x 46"H
2' x 4'	20.4 lbs.	28

Air Return Volume

Negative Static Pressure (Inches H ₂ O)	Return Air Volume (CFM)
0.05	75
0.1	103
0.2	153
0.25	177
0.3	191
0.45	234

Control Systems

- WaveLinx Wireless
- WaveLinx Wired
- WaveLinx Lite
- DLVP
- VividTune



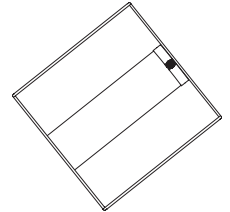
Connected Systems
[CLICK HERE](#)

The Cruze ST with Integrated Sensor technology provides automatic energy savings without sacrificing performance. The Cruze ST delivers superior lighting with integrated occupancy and daylighting controls.

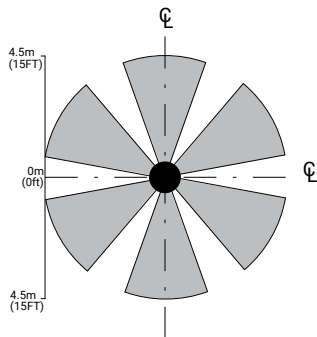
For standalone and controlled applications, the WaveLinx Lite integral sensor provides out-of-the-box functionality with no gateways required and factory startup is not needed.

When more connectivity is required, the WaveLinx Wireless sensor meets modern code and utility requirements, delivers energy and cost savings, while enabling buildings to become smart buildings.

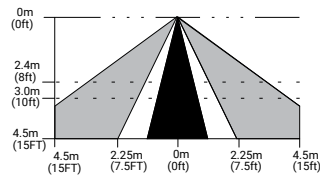
The WaveLinx Wireless Connected Lighting System combined with Trellix provides an open IoT platform and infrastructure that connects intelligent sensors leveraging the real-estate of the physical light fixture to solve higher complexity problems to deliver actionable insights through the aggregation of valuable data.



TOP VIEW:



SIDE VIEW:



Note: Installation of integrated sensors within 3-ft (1m) of HVAC air vents is not recommended. The pattern shown is intended solely as a general guide and is not to scale.

Systems comparison chart

Cooper Lighting Solutions provides many lighting system solutions designed to satisfy code requirements and meet the unique needs of any project.



Standalone



Controlled
WaveLinx Lite



Connected
WaveLinx Pro



Enterprise
Trellix

Occupancy	Yes	Yes	Yes	Yes
Daylighting	Yes	Yes	Yes	Yes
Wallstation	-	Yes	Yes	Yes
Gateways	-	-	1 WAC	300 WACs
Devices	-	50 per Area (1400 per site)	200 per WAC2	32,500 per Core Enterprise
Software	-	WaveLinx Lite Mobile App	WaveLinx Pro Mobile App	Trellix Core
Areas	-	28 per Site	50 per WAC2	up to 3,000
Zones	-	16 per Area	16 per Area	up to 9,000
Scheduling	-	-	Local	Global
VividTune™	-	-	Yes	Yes
Plug-Load Control	-	-	Yes	Yes
Low-Voltage Power	-	-	Yes	Yes
Integration	-	-	-	BACnet, API
Dashboards	-	-	-	Energy, Occupancy
Configuration	-	Installer	Technician	Technician / IT

SCALABILITY

devices

areas

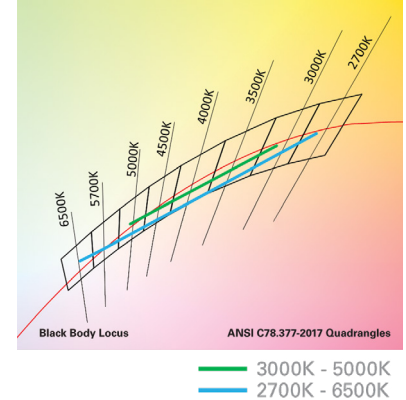
floors

buildings



24 Cruze ST LED with VividTune Tunable White

VividTune tunable white luminaires from Cooper Lighting Solutions deliver high-quality light in a broad range of continuously variable color temperatures and intensities. Create a dynamic environment by adjusting the ambient light warmer or cooler to influence mood, support the task at hand, or create a dramatic ambience. The ability to control correlated color temperature and intensity separately using simple controls is the next evolution of LED lighting for the commercial, educational, healthcare and hospitality space. The unparalleled flexibility and number of available lighting environments enable users to find the right light with tunable white.



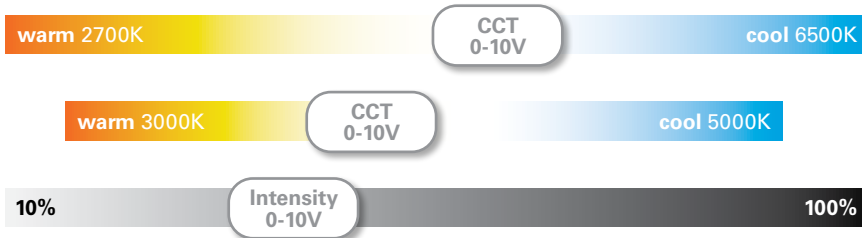
Performance Data*

Tunable White - Lumen Adjustment Factors				
CCT	3000K-5000K		2700K-6500K	
	80 CRI	90 CRI	80 CRI	90 CRI
2700K	-	-	0.878	0.750
3000K	0.904	0.744	0.903	0.779
3500K	0.956	0.813	0.934	0.819
4000K	1.004	0.878	0.954	0.844
4500K	1.014	0.893	0.972	0.866
5000K	1.014	0.893	0.985	0.884
6500K	-	-	0.999	0.908

2' x 4' Cruze ST LED - Example of Approximate Lumen Calculation			
	Standard Catalog #	VividTune 80 CRI Catalog #	VividTune 90 CRI Catalog #
CCT Setting	24CZ2-40HE-UNV-L835-CD1-U	24CZ2-40HE-UNV-L83050-W2A1-U	24CZ2-40HE-UNV-L93050-W2A1-U
3000K	-	3641	2998
3500K	4029	3853	3275
4000K	-	4046	3537
4500K	-	4084	3599
5000K	-	4084	3599

Controlling VividTune Tunable White

VividTune luminaires make tunable white more accessible by using simple and familiar controls. From wall dimmers to wireless controls, VividTune tunable white luminaires are compatible with industry standard 0-10V dimming controls. A single 0-10V dimming input is used to control intensity (brightness) while a second 0-10V dimming input is used to adjust CCT. For suggested control configurations, go to www.cooperlighting.com for tunable white application guides.



Example of Lumen Adjustment Calculation

24CZ2-40HE-UNV-L83050-W2A1-U at 80 CRI tuned to 3500K

Adjusted Lumen = published lm x adjusted lm factor

Adjusted Lumen = 4029 x 0.956

Adjusted Lumen = 3853 lm

** Lumen adjustment factors are for reference and may be different for each product selected. Refer to IES files for actual performance data on each.*