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

Product Certification

Product Features

Connected Systems · powered by fifthlight · damp location · VividTune color tuning solutions

LINEAR DISCONNECT — Safe and convenient means of disconnecting power

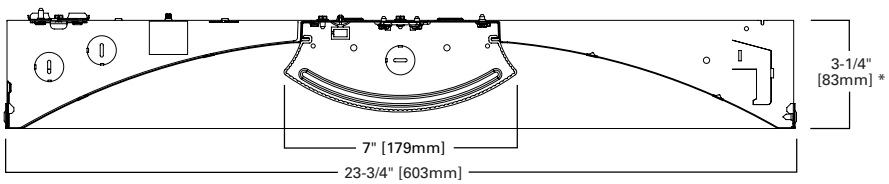
MWS MODULAR WIRING SYSTEM CLICK HERE

Rapid Response CLICK HERE

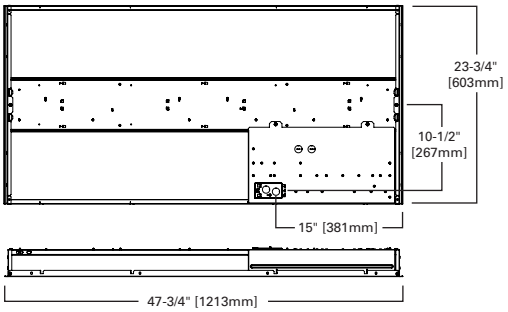
Top Product Features

- 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

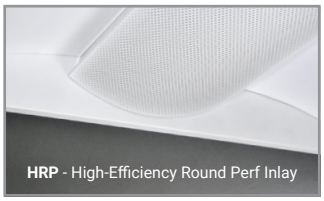
Dimensional and Mounting Details



*When combined with emergency total height is increased by 1 inch.



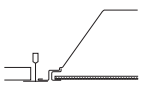
Shielding



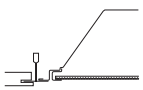
See ordering information for more shielding options.

Ceiling Compatibility

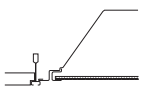
G Grid/Lay-in Standard



G Concealed T



G Slot Grid



Ceiling Type	Trim Type
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**

Rating

Rating	Series	Air	Lumen Output	Shielding	Voltage
[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), (18)	**[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 (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. (18) 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 DLVP system pages for additional details and compatibility.

Options / Emergency Options / CRI/CCT / Flex

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) **ELV7W**=7-watt DLVP-compatible low voltage emergency battery pack (C) **ELV14W**=14-watt DLVP-compatible low voltage 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) **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 (12) **L93050**=90CRI 3000K-5000K White Tuning (12) **L82765**=80CRI 2700K-6500K White Tuning (12) **L92765**=90CRI 2700K-6500K White Tuning (12)	**[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. (C) Consult DLVP system pages for additional details and compatibility.	**Notes** (12) 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

Driver Type	Number of Drivers	Integrated Sensing Systems	Packaging
CD=0-10V Dimming Driver (1%-100% Dimming) **SR**=Sensor-ready Dimming Driver for LWIPD1 option (1%-100% Dimming) (B) **5LTD**=Fifth Light DALI Driver (5%-100% Dimming) (E) **5LTHD**=Fifth Light Dimming Driver (1%-100% Dimming) (E) **LV**=DLVP Dimming 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) **L5**=Lutron 5 Series (LDE5-Series) 5%-100% EcoSystem Driver (F) **W2A**=White Tuning, 2 ch, Analog 0-10V Intensity and CCT Control (13) **WN**=WaveLinx Wireless Fixture, No Sensor. (A), (G), (H), (19)	**1**=1 Driver **2**=2 Drivers (14)	**[Blank]**=No Sensor **SWPD1**=WaveLinx Wireless Integrated Sensor (A) **SDWPD1**=WaveLinx Wireless Integrated Sensor Dual Band (A), (15) **LWIPD1**=Enlighted Wireless Integrated Sensor (B) **LDWIPD1**=Enlighted Wireless Integrated Sensor Dual Band (B), (15) **LWTPD1**=Enlighted Wireless Tile-mount Sensor (B) **SLVPD1**=DLVP Low-voltage Integrated Sensor (C) **SDLVPD1**=DLVP Low-voltage Integrated Sensor Dual Band (C), (15) **SVPD1**=0-10V Stand-alone Integrated Sensor (D) **SDVPD1**=0-10V Stand-alone Integrated Sensor Dual Band (D), (15)	**U**=Unit Pack **PAL**=Job Pack, out of carton **PALC**=Job Pack, in carton
Notes (13) 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. (19) Not available 30. 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) Consult Enlighted system pages for additional details and compatibility. (C) Consult DLVP system pages for additional details and compatibility. (E) Consult Fifth Light 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. (G) Not compatible with GTR, ETRD, or integrated sensor options. (H) Available with UNV voltage only.	**Notes** (14) 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** (15) Required for use with sensors and emergency options. Provides blank band on opposite side from sensor band to provide symmetric appearance. 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) Consult Enlighted system pages for additional details and compatibility. (C) Consult DLVP system pages for additional details and compatibility. (D) Consult SVPD series system pages for additional details and compatibility.	

Accessories

Accessories (order separately)
CZ2-EQCLIP-U-PK="CZ2" Earthquake Clip Kit (4 clips per bag kit) (16) **DF-24-W**=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 (16) An EQ Grid Clip is recommended for all 9/16" ceiling systems. Four required per fixture. 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) 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 fixture for sensor-less wireless control
- WaveLinx sensor compatible for IoT capability
- Enlighted sensor compatible for IoT capability
- SVPD sensor compatible for out of the box functionality
- DLVP sensor and driver compatible for low voltage 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
- TM21 life at 60,000 hours up to L94 and calculated L70 exceeds 290,000 hrs.
- Drivers available in 120-277V and 347V
- Color Tuning options available with Cooper Lighting Solutions' Vividtune

Emergency Options
- Optional UL924 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 UL924 emergency transfer relay options available

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

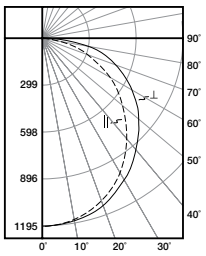
Shielding
- Ribbed acrylic frosted lens standard
- Optional smooth acrylic frosted lens (S)
- Optional metal perforated acrylic lens (RDP)
- Optional High-Efficiency Round Perf Inlay (HRP)

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

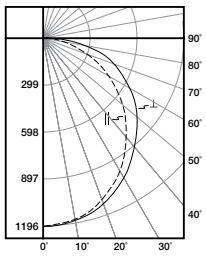
Warranty
- Five-year warranty standard. Optional ten year warranty available.

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	3032	24.2	125
24CZ2-35-UNV-L835-CD1-U	3638	30.1	121
24CZ2-40-UNV-L835-CD1-U	4196	36.2	116
24CZ2-45-UNV-L835-CD1-U	4618	42.9	108
24CZ2-50-UNV-L835-CD1-U	5015	48.6	103
24CZ2-55-UNV-L835-CD1-U	5571	50.5	110
24CZ2-60-UNV-L835-CD1-U	6042	55.6	109
24CZ2-65-UNV-L835-CD1-U	6572	62.8	105

High Efficacy Versions – Two Rows of LEDs

Catalog Number	Lumens	Watts	lm/W
24CZ2-30HE-UNV-L835-CD1-U	3014	22.4	135
24CZ2-35HE-UNV-L835-CD1-U	3583	26.9	133
24CZ2-40HE-UNV-L835-CD1-U	4029	30.6	132
24CZ2-45HE-UNV-L835-CD1-U	4582	35.3	130
24CZ2-50HE-UNV-L835-CD1-U	5021	38.6	130
24CZ2-55HE-UNV-L835-CD1-U	5564	43.5	128
24CZ2-60HE-UNV-L835-CD1-U	6011	44.1	136
24CZ2-65HE-UNV-L835-CD1-U	6590	48.9	135
24CZ2-70HE-UNV-L835-CD1-U	7018	51.0	138
24CZ2-75HE-UNV-L835-CD1-U	7572	55.4	137

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
3000K	0.994	0.830
3500K	1.00	0.845
4000K	1.00	0.854
5000K	1.065	0.852

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

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

Lumen Maintenance

Version	TM-21 Lumen Maintenance (60,000 hours) [1]	Theoretical L70 (Hours) [2]
Standard	> 87%	> 162,000
High Efficiency	> 94%	> 290,000
Very High Efficiency	> 94%	> 290,000

Notes: (1) Supported by IES TM-21 standards. (2) 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

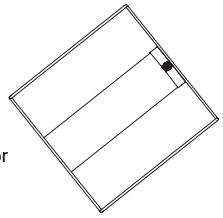
Negative Static Pressure (Inches H_2O)	Return Air Volume (CFM)
0.05	75
0.1	103
0.2	153
0.25	177
0.3	191
0.45	234

Control Systems

- WaveLinx
- DLVP
- Enlighted
- iLumin Plus
- VividTune

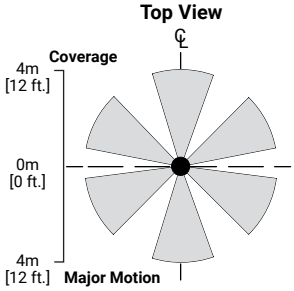
The Cruze ST with Integrated Sensor technology provides automatic energy savings without sacrificing performance. Traditionally, these types of energy savings required coordination between the luminaire and a lighting control system. The Cruze ST delivers superior lighting with integrated occupancy and daylighting controls.

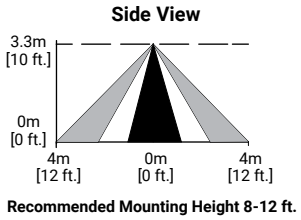
Capture the benefits of traditional lighting controls, without complicated coverage planning or special wiring. Ideal for new construction or retrofit, the Cruze ST delivers automatic ON to an energy saving light level, while ensuring lighting is turned OFF when the space is unoccupied.



The integral daylight sensor reduces the need for special daylight zone planning. Each luminaire will automatically adjust the light level based on reflected light beneath the sensor in a closed loop method.

The integral sensor can be offered in both standalone (SVPD1) and networked (SWPD1, LWIPD1, and SLVPD1) for application versatility.





Recommended Mounting Height 8-12 ft.

Installation of integrated sensors within 3-ft (1m) of HVAC air vents is not recommended.

Systems comparison chart

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

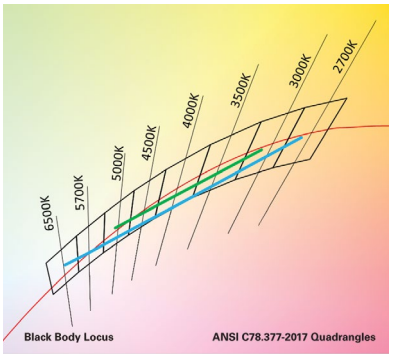
Connected Systems CLICK HERE

	Distributed Low-Voltage Power System	WaveLinx	Enlighted
Space type	**Interior**	**Interior/Outdoor**	**Any**
Stand-alone or Network	**Stand-alone**	**Both**	**Network**
Need-based feature progression			
Basic compliance only	●	●	●
Occupancy sensing	●	●	●
Daylight harvesting	●	●	●
Zone control	●	●	●
Scheduling	●	●	●
0-10V dimming	●	●	●
Individual fixture control	●	●	●
Retrofit+Building Integration	●	●	●
Total wireless connectivity		●	●
A/V integration		●	●
BMS integration		●	●
UI options (touchscreen, apps, etc.)		●	●
Enterprise level building integration		●	●
Facility management & tools		●	●
Floor plan & reporting tools			●
Value-added services			●
Asset tracking			●
API integration		●	●
Analytics/higher problem solving			●

VividTune™
color tuning solutions

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.



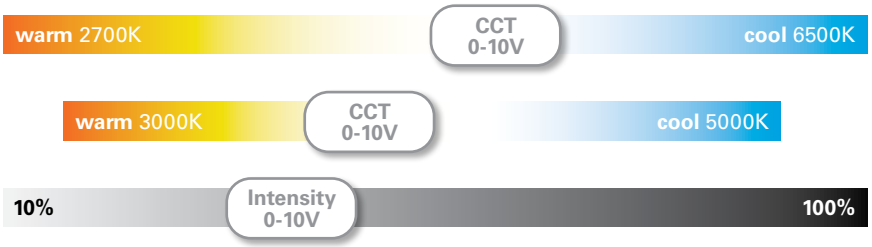
Performance Data*

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.*

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