

Project		Catalog #		Type	
Prepared by		Notes		Date	



Metalux

Cruze ST 22CZ2

2' x 2' LED Specification Grade Troffer

Typical Applications

Office • Education • Healthcare • Hospitality • Retail

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- Product Warranty

Product Certification



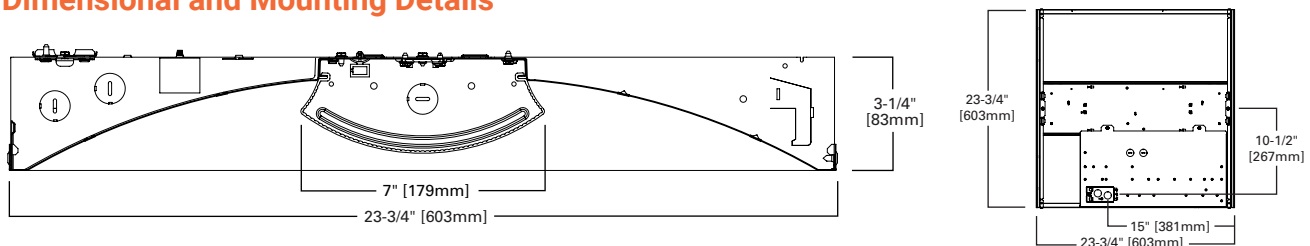
Product Features



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 151 lm/W
- Integrated sensor systems - occupancy, daylight and IoT connectivity

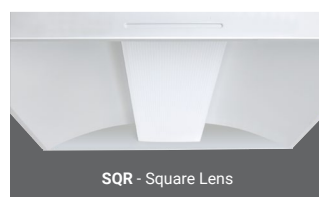
Dimensional and Mounting Details



Shielding



HRP - High-Efficiency Round Perf Inlay



SQR - Square Lens

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	Standard *

*See Drywall Frame Kit Accessory in Ordering Information Section

Order Information

22CZLD520UNVEL14WL835CD1U

Rating	Series	Air	Lumen Output		Shielding	Voltage	
Rating	Series	Air	Lumen Level	Efficacy	Shielding	Voltage ⁽⁴⁾	
[Blank]=Standard ATW-SW4= Chicago Rated	22CZ2=2x2 Cruze ST	[Blank]=Standard A=Air (Vented) ⁽¹⁾	20=2000 Lumens ⁽²⁾ 24=2400 Lumens ⁽²⁾ 29=2900 Lumens 32=3200 Lumens 34=3400 Lumens 39=3900 Lumens 44=4400 Lumens 50=5000 Lumens ⁽¹⁶⁾ 55=5500 Lumens ⁽¹⁶⁾ 60=6000 Lumens ⁽¹⁶⁾ 65=6500 Lumens ⁽¹⁶⁾	70=7000 Lumens ⁽¹⁶⁾ 75=7500 Lumens ⁽¹⁶⁾ 80=8000 Lumens ⁽¹⁶⁾ 85=8500 Lumens ⁽¹⁶⁾ 90=9000 Lumens ⁽¹⁶⁾ 95=9500 Lumens ⁽¹⁶⁾ 100=10000 Lumens ⁽¹⁶⁾ 110=11000 Lumens ⁽¹⁶⁾	[Blank]=Standard Efficacy ^{(3), (14)} HE=High Efficacy ⁽¹⁴⁾ VHE=Very High Efficacy ⁽¹⁶⁾	[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 48V=48 Volt Low-voltage (Class 2) ⁽⁹⁾
		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 WN driver. (3) White tuning not available with this model. (14) Available up to 4400 lumens. (16) Currently only available with CD driver option.		Notes (4) Products also available in non-US voltages and frequencies for international markets. (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 GTR2=Generator Transfer Relay ETRD=Emergency Transfer Relay with dimming control ⁽⁸⁾	[Blank]=No emergency EL7W=7-watt, 120V-277V emergency battery pack installed ⁽⁶⁾ EL14W=14-watt 120V-277V emergency battery pack installed ⁽⁶⁾ ELV7W=7-watt, DLVP-compatible low voltage emergency battery pack installed ^(C) ELV14W=14-watt DLVP-compatible low voltage emergency battery pack installed ^(C) GTR2=Generator Transfer Relay ⁽⁸⁾ ETRD=Emergency Transfer Relay with dimming control ⁽⁸⁾	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 ⁽⁹⁾ L93050=90CRI 3000K-5000K White Tuning ⁽⁹⁾ L82765=80CRI 2700K-6500K White Tuning ⁽⁹⁾ L92765=90CRI 2700K-6500K White Tuning ⁽⁹⁾	[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 (6) 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. (7) 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. Not compatible with other control or sensor options. Must be used in conjunction with W2A driver only. Must be used with two (2) 10V dimming control channels, 1 color, 1 intensity. Not compatible with other control or sensor options. (8) Used to bypass local control during outage. Must be used in conjunction with UL 1008 device (provided by others). GTR2 option includes 2 relays on fixtures with dimming drivers. ETRD option only requires one relay when used on a dimming fixture. Devices are universal voltage (UNV). 347 not available. (C) Consult DLVP system pages for additional details and compatibility.	Notes (9) 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	Accessories
Driver Type	Number of Drivers	Integrated Sensing Systems	Packaging	Accessories (order separately)
CD=0-10V Dimming Driver (1%-100% Dimming) SR=Sensor-ready Dimming Driver for LWIPD1 option (1%-100% Dimming) ⁽⁸⁾ SLTD=Fifth Light DALI Driver (5%-100% Dimming) ^(E) SLTHD=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 ⁽¹⁰⁾ WN=Wavelinx Wireless Fixture, No Sensor. ^{(A), (G), (H)}	1=1 Driver	[Blank]=No Sensor SWPD1=WaveLinX Wireless Integrated Sensor ^(A) SDWPD1=WaveLinX Wireless Integrated Sensor Dual Band ^{(A), (11)} LWIPD1=Enlighted Wireless Integrated Sensor ⁽⁸⁾ LDWIPD1=Enlighted Wireless Integrated Sensor Dual Band ^{(8), (11)} LWTPD1=Enlighted Wireless Tile-mount Sensor ⁽⁸⁾ SLVPD1=DLVP Low-voltage Integrated Sensor ^(C) SDLVPD1=DLVP Low-voltage Integrated Sensor Dual Band ^{(C), (11)} SVPD1=0-10V Stand-alone Integrated Sensor ^(D) SDVPD1=0-10V Stand-alone Integrated Sensor Dual Band ^{(D), (11)}	U=Unit Pack PAL=Job Pack, out of carton PALC=Job Pack, in carton	CZ2-EQCLIP-U-PK="CZ2" Earthquake Clip Kit (4 clips per bag kit) ⁽¹²⁾ DF-22-W=2' x 2' Drywall Frame Kit SK-22-WS=2' x 2' Shallow Surface Mount Kit SK-22-WT=2' x 2' Tall Surface Mount Kit ISHH-01=Programming Remote for Integrated Sensor ^(B) ISHH-02=Personal Control Remote for Integrated Sensor ^(B)
Notes (10) 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: (A) Consult Wavelinx system pages for additional details and compatibility. (B) Consult MarketPlace Options - Lutron 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. (E) Consult Fifth Light system pages for additional details and compatibility. (F) Consult MarketPlace Options - Lutron system pages for additional details and compatibility. (G) Not compatible with GTR, ETRD, or integrated sensor options. (H) Available with UNV voltage only.		Notes (11) 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.		Notes (12) 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 Eaton's VividTune

Emergency Battery Options

- Optional UL924 emergency battery available in 7W and 14W
- 90-minute backup period for code compliance
- Test switch with laser pointer and testing from floor feature for ease of use
- EZ Key feature prevents accidental discharge during construction
- Generator transfer 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

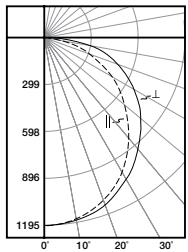
- IC rated for insulation contact
- cULus listed for damp locations
- RoHS compliant
- Tested to IESNA LM-79 and LM-80
- Stated life tested to TM21 standards
- Can be used for State of California Title 24 high efficacy luminaire

Warranty

- Five year warranty standard.

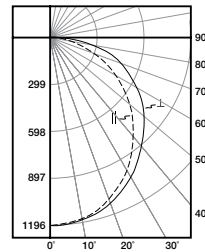
Photometric Data

[View IES files](#)



22CZ2-24-UNV-L830-CD1-U

Dimming Driver
 Linear LED 3000K
 Spacing criterion: (II) 1.2 x mounting height, (⊥)
 Lumens: 2437
 Input Watts: 21.9W
 Efficacy: 111.3 LPW
 Test Report: 22CZ2-24-UNVL830-CD1-U.IES



22CZ2-24HE-UNV-L830-CD1-U

Dimming Driver
 Linear LED 3000K
 Spacing criterion: (II) 1.19 x mounting height, (⊥)
 Lumens: 2402
 Input Watts: 19.2W
 Efficacy: 125.1 LPW
 Test Report: 14CZ2-29-UNV-L830-CD1-U.IES

Energy and Performance Data

Standard Efficacy Versions – Single Row of LEDs

Catalog Number	Lumens	Watts	lm/W
22CZ2-20-UNV-L835-CD1-U	2101	17.9	117
22CZ2-24-UNV-L835-CD1-U	2450	21.9	112
22CZ2-32-UNV-L835-CD1-U	3280	26.7	123
22CZ2-39-UNV-L835-CD1-U	3943	34.5	114
22CZ2-44-UNV-L835-CD1-U	4424	42.7	104

High Efficacy Versions – Two Rows of LEDs

Catalog Number	Lumens	Watts	lm/W
22CZ2-20HE-UNV-L835-CD1-U	2044	16.0	128
22CZ2-24HE-UNV-L835-CD1-U	2416	19.2	126
22CZ2-29HE-UNV-L835-CD1-U	2942	22.2	133
22CZ2-34HE-UNV-L835-CD1-U	3386	25.8	131
22CZ2-39HE-UNV-L835-CD1-U	3930	30.3	130
22CZ2-44HE-UNV-L835-CD1-U	4464	25.0	128

Very High Efficacy Versions – Three Rows of LEDs

Catalog Number	Lumens	Watts	lm/W
22CZ2-20VHE-UNV-L835-CD1-U	2008	14.2	141
22CZ2-24VHE-UNV-L835-CD1-U	2501	17.5	143
22CZ2-29VHE-UNV-L835-CD1-U	3114	21.7	144
22CZ2-34VHE-UNV-L835-CD1-U	3598	25.1	143
22CZ2-39VHE-UNV-L835-CD1-U	4078	28.6	143
22CZ2-44VHE-UNV-L835-CD1-U	4620	32.6	142
22CZ2-50VHE-UNV-L835-CD1-U	5095	36.2	141
22CZ2-55VHE-UNV-L835-CD1-U	5530	39.4	140
22CZ2-60VHE-UNV-L835-CD1-U	6110	44.1	139
22CZ2-65VHE-UNV-L835-CD1-U	6559	47.9	137
22CZ2-70VHE-UNV-L835-CD1-U	7017	50.3	140
22CZ2-75VHE-UNV-L835-CD1-U	7557	54.7	138
22CZ2-80VHE-UNV-L835-CD1-U	8092	59.1	137
22CZ2-85VHE-UNV-L835-CD1-U	8615	63.6	136
22CZ2-90VHE-UNV-L835-CD1-U	9125	68.2	134
22CZ2-95VHE-UNV-L835-CD1-U	9610	72.7	132
22CZ2-100VHE-UNV-L835-CD1-U	10108	77.7	130
22CZ2-110VHE-UNV-L835-CD1-U	11065	87.7	126

Shielding

Lumen Adjustment Factors			
S	RDP	HRP	SQR
1.05	0.67	0.80	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

22CZ2-32-UNV-L935-CD1-U at 90CRI at 3500K

Lumen Adjustment Factor = 0.845

Total Light Output =

$3,280 \text{ lm} \times 0.845 = 2,772 \text{ lm}$

Efficacy = $\frac{2,772 \text{ lm}}{26.7 \text{ W}} = 103.8 \text{ lm/W}$

Lumen Maintenance

Version	TM-21 Lumen Maintenance (60,000 hours)	Theoretical L70 (hours)
Standard	> 85%	> 131,000
High Efficiency	> 94%	> 290,000
Very High Efficiency	> 94%	> 290,000

Load Data (Stock Product)

Thd	6%
Power Factor	0.99
Weight (lbs.)	10.6
Low Temp. Start	-20°C

Shipping Data

Catalog No.	Wt.	Pallet 49"L x 52"W x 55"H
2' x 2'	12.5 lbs.	48

Air Return Volume

Negative Static Pressure (Inches H ₂ O)	Return Air Volume (CFM)
0.05	79
0.1	112
0.2	161
0.25	177
0.3	198
0.45	239

Control Systems

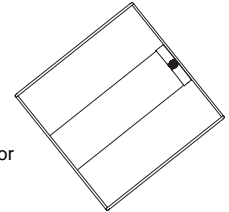
- WaveLinx
- DLVP
- Enlighted
- iLumin Plus
- VividTune

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.




We make connections work




EATON POWER
Unparalleled knowledge of electrical power management



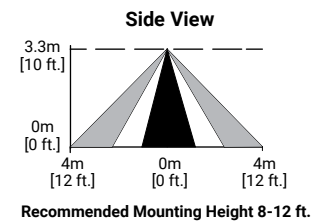
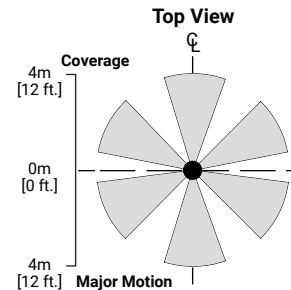
LIGHTING
Advanced LED fixtures



CONNECTIVITY
Communications & sensing technology
Physical devices & controllers



APPS
Software applications
Data accumulation & analysis



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

Systems comparison chart

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

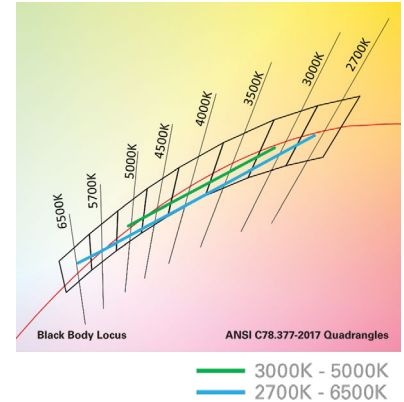


	Distributed Low-Voltage Power System	WaveLinx	Enlighted
Space type	Interior	Interior/Outdoor	Any
Stand-alone or Network	Stand-alone	Both	Network
Need-based feature progression			
Basic compliance only	●	●	●
Occupancy sensing	●	●	●
Daylight harvesting	●	●	●
Zone control	●	●	●
Scheduling	●	●	●
0-10V dimming	●	●	●
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			●



22 Cruze ST LED with VividTune Tunable White

VividTune tunable white luminaires from Eaton 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.



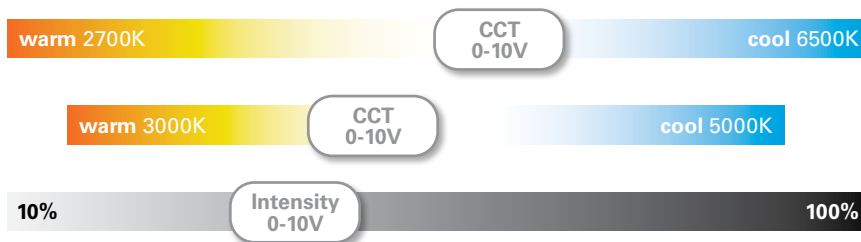
Performance Data*

Tunable White - Lumen Adjustment Factors				
CCT	3000K-5000K		2700K-6500K	
	80 CRI	90 CRI	80 CRI	90 CRI
2700K	-	-	0.868	0.741
3000K	0.894	0.736	0.893	0.771
3500K	0.946	0.804	0.924	0.809
4000K	0.993	0.868	0.944	0.835
4500K	1.002	0.883	0.961	0.857
5000K	1.002	0.883	0.974	0.874
6500K	-	-	0.988	0.897

2' x 2' Cruze ST LED - Example of Approximate Lumen Calculation			
	Standard Catalog #	VividTune 80 CRI Catalog #	VividTune 90 CRI Catalog #
CCT Setting	22CZ2-34HE-UNV-L835-CD1-U	22CZ2-34HE-UNV-L83050-W2A1-U	22CZ2-34HE-UNV-L93050-W2A1-U
3000K	-	3026	2491
3500K	3386	3202	2722
4000K	-	3362	2940
4500K	-	3394	2991
5000K	-	3394	2991

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.eaton.com/lighting for tunable white application guides.



Example of Lumen Adjustment Calculation

22CZ2-34HE-UNV-L83050-W2A1-U at 80 CRI tuned to 3500K

Adjusted Lumen = published lm x adjusted lm factor

Adjusted Lumen = 3386 x 0.946

Adjusted Lumen = 3202 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.