Metalux

DESCRIPTION

The Cruze™ ST LED series combines latch-less design, matte white paint after fabrication and frosted acrylic lens to deliver architectural appeal at unmatched price. This high performance LED troffer is constructed with Eaton's the latest solid-state technology platform and delivers unprecedented energy savings, visual comfort and aesthetics at an incredible value. Cruze ST offers premium finishes and clean lines making it an ideal choice for commercial office spaces, schools, hospitals, and retail merchandising areas.

Catalog #	990822RFPK LENSE	**Type**
Project		
Comments		**Date**
Prepared by		

SPECIFICATION FEATURES

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 sensor compatible for IoT capability
- LumaWatt Pro 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

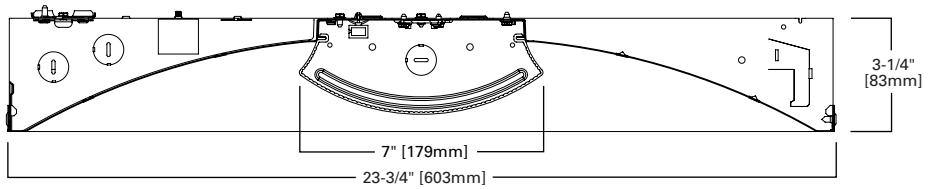
Emergency Battery Options
- Optional 120-277V emergency battery available in 7W or 14W
- 90-minute backup period for code compliance
- Test switch with laser pointer and testing from floor feature for ease of use
- EZ Key feature prevents accidental discharge during construction
- Generator transfer 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.



Cruze **ST 22CZ2** LED

2' X 2' LED TROFFER

Specification Grade Troffer

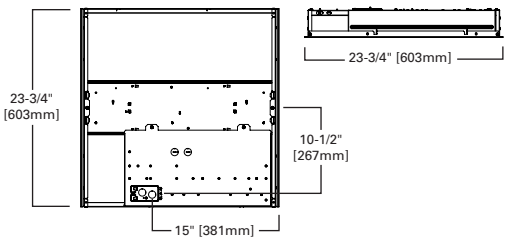
Connected Systems CLICK HERE

VividTune

DLC PREMIUM

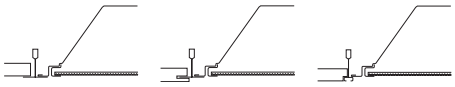
Efficiency Standards T24 California Title 24 Non-Residential Compliant

MOUNTING DATA



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

LOAD DATA (STOCK PRODUCT)

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

LINEAR DISCONNECT
Safe and convenient means of disconnecting power

ISO SYSTEMS CERTIFIED

EATON
Powering Business Worldwide

ORDERING INFORMATION

SAMPLE NUMBER: 22CZ2-34HE-UNV-L835-CD1-U

Rating
Blank=Standard
ATW-SW4=Chicago Rated

Cruze ST Series
22CZ2=2x2 Cruze ST

High Efficacy
Lumen Output
20HE=2000 Lumens
24HE=2400 Lumens
29HE=2900 Lumens
34HE=3400 Lumens
39HE=3900 Lumens
44HE=4400 Lumens

Standard Efficacy
Lumen Output
20=2000 Lumens [8]
24=2400 Lumens [8]
32=3200 Lumens [8]
39=3900 Lumens [8]
44=4400 Lumens [8]

Shielding
[Blank]=Ribbed Frosted Acrylic Lens (standard)
S=Smooth Frosted Acrylic Lens
RDP=Smooth Lens with Round Pattern Insert
HRP=High-Efficiency Round Perf Inlay

Voltage [2]
UNV=Universal Voltage 120-277
347V=347 Volt [5]
48V=48 Volt Low-voltage (Class 2) [C]

Options
GL=Single Element Fuse
GM=Double Element Fuse

Emergency
[Blank]=No emergency
EL7W=7-watt, 120V-277V emergency battery pack installed [3]
EL14W=14-watt 120V-277V emergency battery pack installed [3]
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 [7]
ETRD=Emergency Transfer Relay with dimming control [6]

CRI/CCT
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 [7]
L93050=90CRI 3000K-5000K White Tuning [7]
L82765=80CRI 2700K-6500K White Tuning [7]
L92765=90CRI 2700K-6500K White Tuning [7]

Flex
[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.

Driver Type
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]
LV1=DLVP Dimming Driver (0%-100% Dimming) [C]
SD=Step Dimming Driver (50% or 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 [7]

Number of Drivers
1=1 Driver

LENSE ONLY

Integrated Sensing Systems
[Blank]=No Sensor
SWPD1=WaveLinx Wireless Integrated Sensor [A]
SDWPD1=WaveLinx Wireless Integrated Sensor Dual Band [A], [4]
LWIPD1=LumaWatt Pro Wireless Integrated Sensor [B]
LDWIPD1=LumaWatt Pro Wireless Integrated Sensor Dual Band [B], [4]
LWTPD1=LumaWatt Pro Wireless Tile-mount Sensor [B]
SLVPD1=DLVP Low-voltage Integrated Sensor [C]
SDLVPD1=DLVP Low-voltage Integrated Sensor Dual Band [C], [4]
SVPD1=0-10V Stand-alone Integrated Sensor [D]
SDVPD1=0-10V Stand-alone Integrated Sensor Dual Band [D], [4]

Connected Systems CLICK HERE

Packaging
U=Unit Pack
PAL=Job Pack, out of carton
PALC=Job Pack, in carton

ACCESSORIES

CZ2-EQCLIP-U-PK=Cruze ST "CZ2" Earthquake Clip Kit (4 clips per bag kit) [1]
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 [D]
ISHH-02=Personal Control Remote for Integrated Sensor [D]

NOTES: [1]An EQ Grid Clip is recommended for all 9/16" ceiling systems. Four required per fixture. [2]Products also available in non-US voltages and frequencies for international markets. [3] 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. [4]Required for use with sensors and emergency options. Provides blank band on opposite side from sensor band to provide symmetric appearance. [5]347 versions 6000 lumens and below are available with emergency options, 347 versions with emergency 5LTHD, step dim, or sensors are not available. [6]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. Must specify voltage as 120V or 277V when ordering these devices. 347 not available. [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] White tuning not available with this model.

Integrated Sensing and Control System Options
NOTES: 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 LumaWatt Pro 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. 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.

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.
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).

Specifications & dimensions subject to change without notice. Consult your Eaton Representative for availability and ordering information.

SHIPPING DATA

Size	Wt.	Pallet 49"L x 52"W x 55"H
2' x 2'	12.5 lbs.	48

Eaton
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.eaton.com/lighting

Powering Business Worldwide

Specifications and dimensions subject to change without notice.

ENERGY AND PERFORMANCE DATA BY CATALOG NUMBER

Standard Efficacy Versions

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

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	35.0	128

Stock Versions

Catalog Number	UPC	CCT	Delivered Nominal Lumens	Watts	Efficacy
24CZ24035		3500k	4196	36.2	116
24CZ24040		4000k	4196	36.2	116
24CZ25035		3500k	5015	48.6	103
24CZ25040		4000k	5015	48.6	103

SHIELDING

Lumen Adjustment Factors		
S	RDP	HRP
1.0548	0.6693	0.8052

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

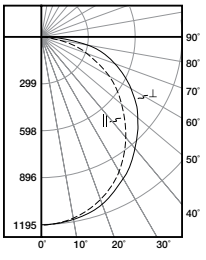
Total Light Output =
3,280 lm x 0.845 = 2,772 lm

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

LUMEN MAINTENANCE

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

PHOTOMETRICS



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

Dimming Driver

Linear LED 3000K

Spacing criterion: (II) 1.2 x mounting height, (⊥) 1.28 x mounting height

Lumens: 2437

Input Watts: 21.9W

Efficacy: 111.3 LPW

Test Report: 22CZ2-24-UNV-L830-CD1-U.IES

Candlepower

Angle	Along II	45°	Across ⊥
0	818	818	818
5	810	816	817
10	795	804	808
15	771	783	791
20	740	756	768
25	701	723	739
30	657	681	706
35	608	637	668
40	553	588	628
45	503	538	584
50	439	485	540
55	388	432	491
60	318	376	440
65	261	321	387
70	203	264	334
75	136	206	273
80	80	144	186
85	32	67	83
90	0	0	0

Coefficients of Utilization

Effective floor cavity reflectance 20%

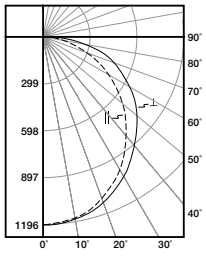
rc	80%				70%				50%			30%			10%			0%
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	108	103	98	94	105	100	96	92	96	93	90	92	89	87	89	86	84	82
2	98	89	82	76	95	87	80	75	83	78	73	80	75	71	77	73	70	67
3	89	78	69	62	86	76	68	62	73	66	61	70	64	60	68	63	59	56
4	81	69	60	53	79	67	59	52	65	57	51	62	56	51	60	55	50	48
5	74	61	52	45	72	60	51	45	58	50	44	56	49	44	54	48	43	41
6	69	55	46	39	67	54	45	39	52	44	39	51	44	38	49	43	38	36
7	64	50	41	35	62	49	40	34	47	40	34	46	39	34	45	38	34	32
8	59	45	37	31	58	45	36	31	43	36	30	42	35	30	41	35	30	28
9	55	42	33	28	54	41	33	28	40	33	27	39	32	27	38	32	27	25
10	52	38	30	25	51	38	30	25	37	30	25	36	29	25	35	29	25	23

Zonal Lumen Summary

Zone	Lumens	% Fixture
0-30	630	25.9
0-40	1029	42.2
0-60	1834	75.3
0-90	2437	100.0
0-180	2437	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	1914	2047	2222
55	1820	2027	2304
65	1662	2044	2464
75	1414	2142	2838
85	988	2069	2563



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

Dimming Driver

Linear LED 3000K

Spacing criterion: (II) 1.19 x mounting height, (⊥) 1.27 x mounting height

Lumens: 2402

Input Watts: 19.2W

Efficacy: 125.1 LPW

Test Report: 22CZ2-24HE-UNV-L830-CD1-U.IES

Candlepower

Angle	Along II	45°	Across ⊥
0	817	817	817
5	808	814	816
10	794	802	806
15	770	781	788
20	739	752	763
25	699	721	733
30	653	676	696
35	604	630	656
40	550	581	615
45	495	530	571
50	435	477	527
55	378	424	477
60	320	369	428
65	253	316	378
70	193	261	325
75	134	205	264
80	79	143	173
85	32	63	71
90	0	0	0

Coefficients of Utilization

Effective floor cavity reflectance 20%

rc	80%				70%				50%			30%			10%			0%
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	108	103	98	94	105	101	96	93	96	93	90	92	90	87	89	86	84	82
2	98	89	82	76	95	87	81	75	84	78	73	80	76	71	77	73	70	68
3	89	78	69	63	86	76	68	62	73	66	61	70	65	60	68	63	59	56
4	81	69	60	53	79	67	59	52	65	57	52	63	56	51	60	55	50	48
5	75	61	52	45	72	60	52	45	58	50	44	56	49	44	54	48	43	41
6	69	55	46	39	67	54	46	39	52	45	39	51	44	39	49	43	38	36
7	64	50	41	35	62	49	41	35	48	40	34	46	39	34	45	39	34	32
8	59	46	37	31	58	45	37	31	44	36	31	42	35	30	41	35	30	28
9	56	42	34	28	54	41	33	28	40	33	28	39	32	27	38	32	27	25
10	52	39	31	25	51	38	30	25	37	30	25	36	30	25	35	29	25	23

Zonal Lumen Summary

Zone	Lumens	% Fixture
0-30	627	26.1
0-40	1022	42.5
0-60	1813	75.5
0-90	2402	100.0
0-180	2402	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	1884	2017	2173
55	1773	1989	2238
65	1611	2012	2407
75	1393	2131	2745
85	988	1945	2192

Powering Business Worldwide

Eaton
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.eaton.com/lighting

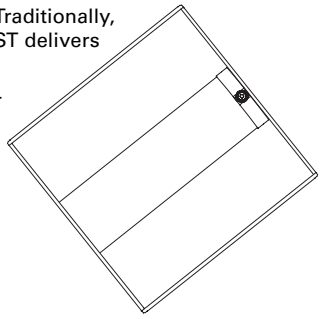
INTEGRATED SENSOR

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.

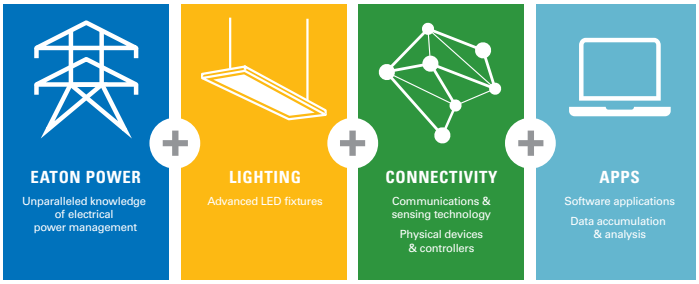
Capture the benefits of traditional lighting controls, without complicated coverage planning or special wiring. Ideal for new construction or retrofit, the Cruze ST delivers automatic ON to an energy saving light level, while ensuring lighting is turned OFF when the space is unoccupied.

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.

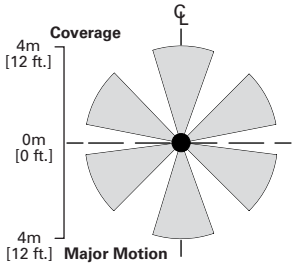
The integral sensor can be offered in both standalone (SVPD1) and networked (SWPD1, LWIPD1, and SLVPD1) for application versatility.



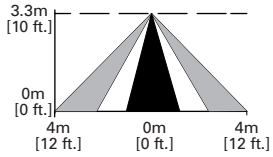
We make connections work



Top View



Side View



Reccomended Mounting Height 8–12 ft.

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

Systems comparison chart

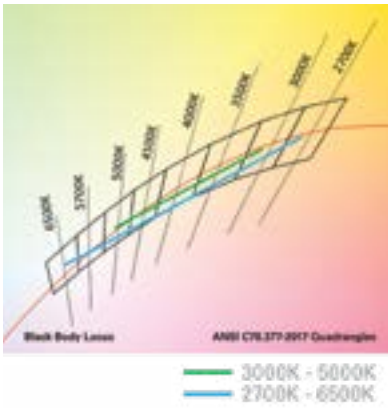
Eaton provides many lighting system solutions designed to satisfy code requirements and meet the unique needs of any project.

	Distributed Low-Voltage Power System	WaveLinx	LumaWatt Pro
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

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.



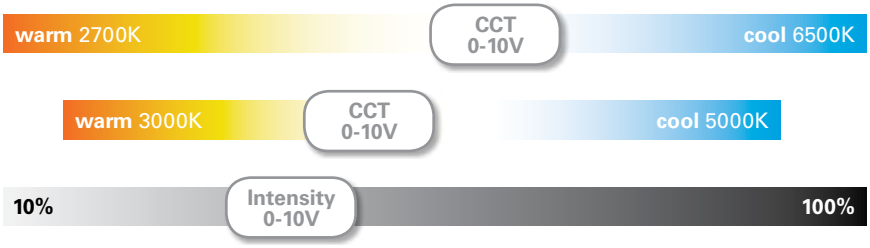
Performance Data*

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.*

Eaton
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.eaton.com/lighting