

Date: Aug 28, 2013

Quote: OLS13-37367-0

# Quote

Page 1/1

Michigan Lighting Systems East  
1389 Wheaton Avenue, Suite 500  
Troy MI 48083  
Phone: (248) 542-2200  
Fax: 248-519-2700  
From: Al Specht  
Quoter Ph: [419-705-6114]  
email: aspecth@mls-east.com

Project Napoleon City Bld  
Location  
Quote OLS13-37367-0

To: City of Napoleon

For  
Bid Date Aug 27, 2013  
Expires Sep 26, 2013

QTY	Type	MFG	Part	Price	UQ	ExtPrice
Note			LED OPTION *			
123	A	CREE	SL40-40L-35K LED CEILING MOUNT FIXTURE	\$125.00		\$15,375.00
101	B	CREE	CR24-40L-35K-S-HD LED LAYIN	\$198.00		\$19,998.00
9	F	COLM	CSR8-232-ST-4EU-FO835 INDUSTRIAL, 8 foot, 2-32 Watt T8, 120-277V 4-L T8 Elec Ballast	\$92.00		\$828.00
<b>SUBTOTAL</b>						<b>* \$36,201.00</b>
Note			FLUORESCENT OPTION **			
101	C	COLM	JT824-232G-FSA12-11EU-FO835 FLUORESCENT LAYIN	\$93.00		\$9,393.00
123	D	COLM	WC4-232-11EU-FO835	\$88.00		\$10,824.00
9	F	COLM	CSR8-232-ST-4EU-FO835 INDUSTRIAL, 8 foot, 2-32 Watt T8, 120-277V 4-L T8 Elec Ballast	\$92.00	E	\$828.00
<b>SUBTOTAL</b>						<b>** \$21,045.00</b>

<b>Mfg Terms:</b>		Freight Allowance	Minimum Order
CREE	Cree	Freight Allowed	
		Freight Allowed: \$3000.00.	
		Pre-shipment of anchor bolts incurs freight charges.	
HUBB	Hubbell Lighting	Freight Allowed	\$50.00
		Freight Allowed: \$1,000.00. Minimum Order \$50.00	Parts order \$50.00
		Pre-shipment of anchor bolts incurs freight charges.	

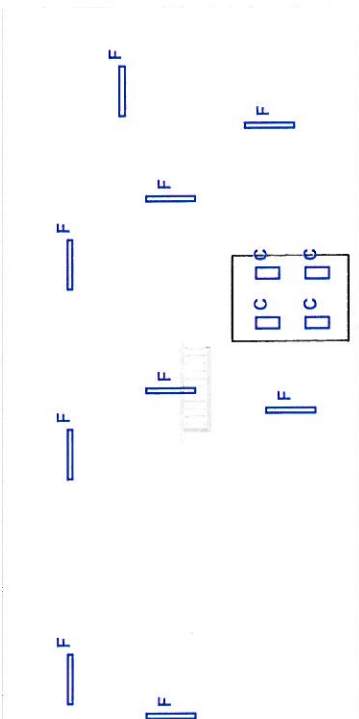


# LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	C	101	-E-PAF	JT824-232G-F-SA12-JT8 Lensed Troffer 2'X4' 2-LAMP WITH A-12 PATTERN ACRYLIC PRISMATIC LENS BAL. B2321120RH-A; LAMPS: F32T8; BAL. FAC. .88; WATTS: 60		13121.IES	2900	0.72	60
	D	123	WCA-232-E-PAF	WC/MCW Wraps 10" X 48" WHITE PAINTED INTERIOR WITH WRAP AROUND PRISMED LENS BAL. B2321120RH; LAMP: F032/31K; BAL. FAC. .88; WATTS: 59.2		L11152.IES	2900	0.72	59.2
	F	9	CSR8-232-E-PAF	CSR Industrial 1 X 8 4-LAMP WITH BAKED WHITE ENAMEL REFLECTOR BAL. B4321120; LAMPS: F032; B.F.: .88; WATTS: 120		12460.IES	2900	0.72	120

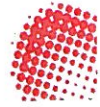
## STATISTICS

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Accounts Rec	+	55 fc	63 fc	31 fc	2.0:1	1.8:1
Conference Rm	+	64 fc	77 fc	52 fc	1.5:1	1.2:1
Engineering Records	+	47 fc	54 fc	42 fc	1.3:1	1.1:1
Engineering Staff	+	59 fc	71 fc	48 fc	1.5:1	1.2:1
Finance Director	+	59 fc	71 fc	44 fc	1.6:1	1.3:1
Open Office	+	71 fc	90 fc	32 fc	2.8:1	2.2:1
Senior Engineering Tech	+	58 fc	71 fc	47 fc	1.5:1	1.2:1
Staff Engineer	+	72 fc	80 fc	67 fc	1.2:1	1.1:1



Plan View  
Scale 1" = 20'

Indicated values include direct and interreflected components.





# SL40™

40" LED Surface Linear

## Product Description

The SL40™ LED Surface Linear luminaire delivers 4000 lumens of high-quality, low brightness light which instantly improves the space by lighting the walls and lighting the volume of space with more natural light. The versatile, compact design of the SL Series uses indirect-view LEDs combined with the Cree proprietary MicroMixing™ technology to deliver exceptional illumination performance and cost-effective lighting. Cree's SL Series soft-edged luminaires are constructed of durable, lightweight robust polymer and install in minutes.

## Performance Summary

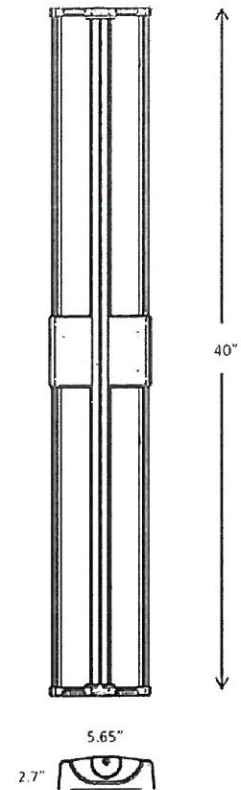
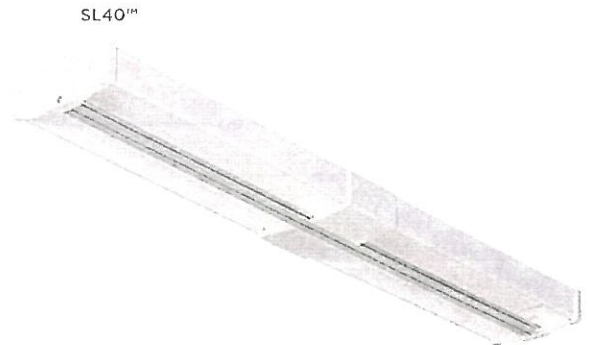
- Room-side heat sink
- MicroMixing™ Technology
- Delivered Light Output: 4000 lumens
- Input Power: 55 watts
- CRI: >80
- CCT: 3500K
- Input Voltage: 120 VAC
- Lifetime: Designed to last 55,000 hours
- Warranty: 10 years†
- Mounting: Surface or suspended
- Dimensions: L 40" x W 5.65" x H 2.25"
- Weight: 3.4 lbs.

## Ordering Information

Example: SL40-40L-35K

SL40	40L	35K		
Product	Lumen Output	Color Temperature	Voltage	Options
SL40	40L 55W 4000 lumens - 73 LPW	35K 3500 Kelvin	Blank 120 Volt	SV Silver Endcaps

† See [www.cree.com/lighting](http://www.cree.com/lighting) for warranty terms.



Rev. Date 06/17/2013



**Product Specifications**

**ROOM-SIDE HEAT SINK**

An innovative thermal management system designed to maximize cooling effectiveness by utilizing a unique room-side heat sink. This breakthrough design creates a pleasing architectural aesthetic while conducting heat away from LEDs in a temperature-controlled environment. This enables the LEDs to consistently run cooler, providing significant boosts to lifetime, efficacy and color consistency.

**CONSTRUCTION & MATERIALS**

- High strength, lightweight polymer forms the reflector and driver housing.
- Innovative mounting clips allow the luminaire to easily mount to a junction box.

**OPTICAL SYSTEM**

- High-efficiency reflector with MicroMixing™ Optics which integrates the intense direct LED light and distributes optimally mixed indirect white light resulting in a comfortable appearance while maintaining high-efficiency optics.
- Indirect LED strip eliminates direct view of highly efficient, lighting quality LEDs.
- Full Definition Color (80 CRI).

**ELECTRICAL SYSTEM**

- Integral, high-efficiency driver and power supply.
- **Power Factor** = 0.9 nominal.
- **Input Power:** Stays constant over life.
- **Input Voltage:** 120V, 60Hz.
- **Temperature Rating:** Designed to operate in temperatures -20°C to 25°C and below room side and plenum side.
- **Total Harmonic Distortion:** < 20%.

**CONTROLS**

- Non-dimming.

**REGULATORY & VOLUNTARY QUALIFICATIONS**

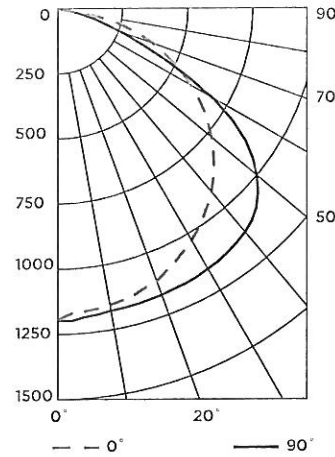
- cULus listed.
- Suitable for damp locations.

**Photometry**

**SL40™**

SL40-40L-35K / Based on DTC Report Test #: 13160-G

Fixture photometry has been conducted by a NVL AP accredited testing laboratory in accordance with IESNA LM 79-08. IESNA LM 79-08 specifies the entire luminaire as the source resulting in a fixture efficiency of 100%.



**Coefficients Of Utilization**

RCC %:	80			
	70	50	30	0
RW %:				
RCR: 0	1.19	1.19	1.19	1.19
1	1.09	1.04	1	.96
2	.99	.90	.83	.78
3	.9	.79	.70	.64
4	.82	.69	.60	.54
5	.75	.62	.52	.46
6	.69	.55	.46	.39
7	.64	.50	.41	.35
8	.59	.45	.37	.31
9	.55	.41	.33	.27
10	.52	.38	.30	.25

Effective Floor Cavity Reflectance 20%

**Zonal Lumen Summary**

Zone	Lumens	Luminaire
0-30	952	24.4%
0-40	1,610	41.3%
0-60	3,076	78.9%
0-90	3,896	99.9%
0-180	3,898	100%

**Average Luminance Table (cd/m2)**

Vertical Angle	Horizontal Angle		
	0°	45°	90°
0°	10,969	10,969	10,969
45°	11,014	12,694	13,992
55°	10,990	13,684	14,155
65°	10,794	12,981	9,812
75°	10,177	7,210	5,430
85°	6,046	2,933	3,050

Reference [www.cree.com/lighting](http://www.cree.com/lighting) for detailed photometric data.



# CR24™

2'x4' Architectural LED Troffer

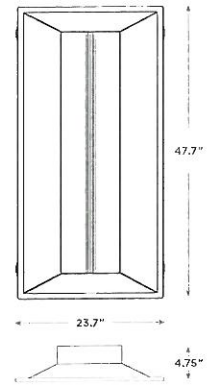
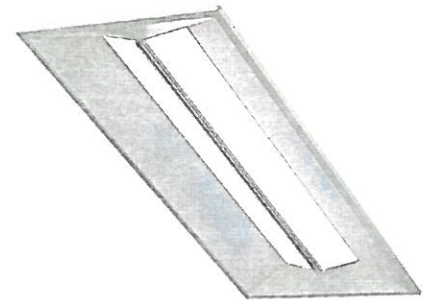
## Product Description

The CR24 Architectural LED High Efficiency (HE) troffer delivers up to 130 lumens per watt of exceptional 90 CRI light at 4000 lumens. This breakthrough performance is achieved by combining the high efficacy and high-quality light of Cree TrueWhite™ Technology with a unique thermal management design. The CR24 High Definition (HD) option delivers enhanced spectrum 80+ CRI color quality. The CR24 product family is available in warm, neutral, cool, or daylight color temperatures and has step, 0-10V, or Lutron EcoSystem™ Enabled dimming options. Its compact, lightweight design makes the CR24 perfect for use in commercial new construction or renovated spaces.

## Performance Summary

- Utilizes Cree TrueWhite™ Technology
- Active Color Management
- Room-Side Heat Sink
- Assembled in the US & Mexico
- Efficacy: 90-130 LPW
- Delivered Light Output: 2200, 3100, 4000, 5000 lumens
- Input Power: 22-50 watts
- CRI: 80-90
- CCT: 3000K, 3500K, 4000K, 5000K
- Input Voltage: 120-277 VAC
- Warranty: 10 years
- Lifetime: Designed to last from 50,000 hours up to 100,000 hours with HE Option
- Controls: Step Level to 50%, 0-10V Dimming or Lutron EcoSystem Enabled to 5%
- Mounting: Recessed

CR24



NOTE: Use of Expanded Junction Box will expand the depth to 6.67" and Emergency Backup will expand the depth to 6.30".

## Housings & Accessories

### Accessories

<b>CPLCR</b> Chicago Plenum Field Kit	<b>CR-347V</b> 347 Volt	<b>PW-18/4-06-9T/SS-CR</b> Power Whip	<b>ACS-72-PD8-JB</b> Adjustable Cable
<b>CPLCR-EM</b> Chicago Plenum Field Kit-Emergency	<b>CR-347V-SD</b> Step Dimming to 50%	<b>AC5-18/4-72-PD8-JB</b> Adjustable Cable	<b>EJBCR-5PK</b> Expanded size junction box for through wiring (5 pack)
	<b>SMK-24</b> Surface Mount Kit		

## Ordering Information

Example: CR24-40L-35K-S

CR24	Lumen Output		Color Temp	Voltage	Control	Options
<b>CR24</b>	<b>22L</b> 22W	2200 lumens - 100 LPW	<b>30K</b> 3000 Kelvin	<b>Blank</b> 120-277 Volt (Standard)	<b>S</b> Step Dimming to 50% <b>10V</b> 0-10V Dimming to 5% <b>LES</b> Lutron EcoSystem™ Enabled to 5%	<b>HD<sup>6</sup></b> High Definition Color - CRI 80+ (44W 4000 lumens - 90 LPW)
	<b>31L</b> 34W	3100 lumens - 90 LPW	<b>35K</b> 3500 Kelvin			<b>EB14<sup>2,4</sup></b> Emergency Backup - 1400 lumens
	<b>40L</b> 40W	4000 lumens - 100 LPW	<b>40K</b> 4000 Kelvin			<b>EB14 SMK<sup>2,5</sup></b> Emergency Backup with surface mount kit - 1400 lumens
	<b>40L HE</b> 30.5W	4000 lumens - 130 LPW (30K)	<b>50K</b> 5000 Kelvin			
	<b>32W</b>	4000 lumens - 125 LPW (35K)				
	<b>33W</b>	4000 lumens - 120 LPW (40K)				
	<b>34.5W</b>	4000 lumens - 115 LPW (50K)				
	<b>50L</b> 50W	5000 lumens - 100 LPW				

1. Reference [www.cree.com/lighting](http://www.cree.com/lighting) for recommended dimming control options. 2. Not available with 50L or LES option. 3. Not available with EB14 option. Use EB14 SMK. 4. EB14 not for use with SMK Kits. 5. Includes surface mount kit accessory (SMK-CR24). 6. HD only available in 40L. Suggested MSRP for the adder over the standard CR Series fixture for the Lutron EcoSystem™ Enabled feature is \$49. †See [www.cree.com/lighting](http://www.cree.com/lighting) for warranty terms.



**Product Specifications**

**CREE TRUEWHITE TECHNOLOGY**

A revolutionary way to generate high quality white light, Cree TrueWhite™ Technology mixes the light from the highest performing red and unsaturated yellow LEDs. This patented approach delivers an exclusive combination of 90+ CRI, beautiful light characteristics, and lifelong color consistency, all while maintaining high luminous efficacy—a true no compromise solution.

**ROOM-SIDE HEAT SINK**

An innovative thermal management system designed to maximize cooling effectiveness by integrating a unique room-side heat sink into the diffusing lens. This breakthrough design creates a pleasing architectural aesthetic while conducting heat away from LEDs in a temperature-controlled environment. This enables the LEDs to consistently run cooler, providing significant boosts to lifetime, efficacy, and color consistency.

**LUMEN MAINTENANCE FACTORS**

- Reference [www.cree.com/lighting](http://www.cree.com/lighting) for detailed lumen maintenance factors.

**CONSTRUCTION & MATERIALS**

- Durable 20-gauge steel housing with standard troffer access plate for electrical installation.
- Field replaceable light engine integrates LEDs, driver, power supply, thermal management, and optical mixing components.
- One-piece lower reflector finished with a textured high reflectance white polyester powder coating creates a comfortable visual transition from the lens to the ceiling plane.
- Provided t-bar clips and holes for mounting support wires enable recessed or suspended installation.
- Individual fixtures may be mounted end to end for a continuous row of illumination.

NOTE: Reference [www.cree.com/lighting](http://www.cree.com/lighting) for detailed instructions on field replacement of the light engine.

**OPTICAL SYSTEM**

- Unique combination of reflective and refractive optical components achieves a uniform, comfortable appearance while eliminating pixelation and color fringing.
- Components work together to optimize distribution, balancing the delivery of high illuminance levels on horizontal surfaces with an ideal amount of light on walls and vertical surfaces. This increases the perception of spaciousness.
- Diffusing lens integrated with upward-facing LED strip eliminates direct view of LEDs while lower reflector balances brightness of lens with the ceiling to create a low-glare high angle appearance.

**ELECTRICAL SYSTEM**

- Integral, high-efficiency driver and power supply.
- **Power Factor** = 0.9 nominal
- **Input Power:** Stays constant over life.
- **Input Voltage:** 120V-277V, 50/60Hz
- **Battery Backup:** Consult factory.
- **Temperature Rating:** Designed to operate in temperatures 0-35 C and below room side and plenum side.
- **Total Harmonic Distortion:** < 20%

**CONTROLS**

- Step dimming to 50% comes standard.\*
- Optional continuous dimming to 5% with 0-10V DC control protocol.\*
- Optional Lutron EcoSystem™ Enabled option allows seamless integration with Lutron EcoSystem controls.\*

**REGULATORY & VOLUNTARY QUALIFICATIONS**

- UL924 (EB14 option).
- cULus Listed.
- DLC qualified.\*\*
- Suitable for damp locations.
- Designed for Indoor use.

\*Reference [www.cree.com/lighting](http://www.cree.com/lighting) for recommended dimming controls and wiring diagrams.

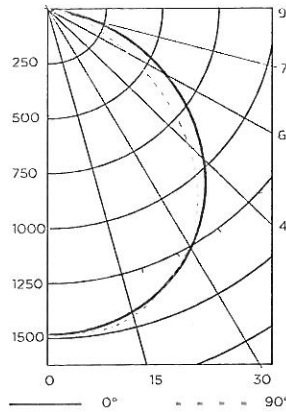
\*\*Does not apply to -LES models

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**Photometry**

**CR24-4000L BASED ON LTL REPORT TEST #: 22421**

Fixture photometry has been conducted by a NVLAP accredited testing laboratory in accordance with IESNA LM-79-08. IESNA LM-79-08 specifies the entire luminaire as the source resulting in a fixture efficiency of 100%.



**Coefficients Of Utilization**

RCC %:	80			
RW %:	70	50	30	0
RCR: 0	119	119	119	119
1	109	105	101	97
2	100	92	85	79
3	91	80	72	66
4	83	71	63	56
5	76	64	55	48
6	71	57	48	42
7	65	52	43	37
8	61	47	39	33
9	57	43	35	30
10	53	40	32	27

Effective Floor Cavity Reflectance: 20%

Average Luminance Table (cd/m2)

Vertical Angle	Horizontal Angle		
	0°	45°	90°
0°	2174	2174	2174
45°	1976	2116	2152
55°	1807	2018	2074
65°	1553	1889	1879
75°	1149	1501	1119
85°	424	62	62

**Zonal Lumen Summary**

Zone	Lumens	% Lamp	Luminaire
0-30	1,115	27.9%	27.9%
0-40	1,835	45.9%	45.9%
0-60	3,245	81.1%	81.1%
0-90	4,000	100%	100%

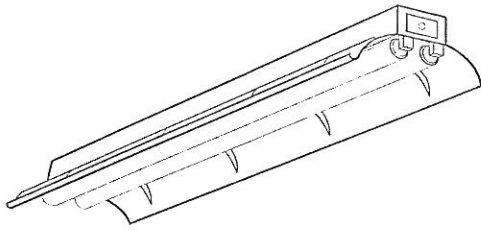
Reference [www.cree.com/lighting](http://www.cree.com/lighting) for detailed photometric data.

**Application Reference**

Open Space					
Spacing	Lumens	Wattage	LPW	w/ft²	Average fc
8 x 8	2200L	22W	100	0.35	30
	4000L	40W	100	0.69	54
	4000L	30.5W	130	0.56	54
	5000L	50W	100	0.78	68
8 x 10	2200L	22W	100	0.28	25
	4000L	40W	100	0.55	45
	4000L	30.5W	130	0.45	45
	5000L	50W	100	0.62	57
10 x 10	2200L	22W	100	0.22	21
	4000L	40W	100	0.44	38
	4000L	30.5W	130	0.36	38
	5000L	50W	100	0.50	48
10 x 12	2200L	22W	100	0.19	17
	4000L	40W	100	0.37	30
	4000L	30.5W	130	0.30	30
	5000L	50W	100	0.42	38

9' ceiling, 80/50/20 reflectances; 2.5' workplane, open room. LLF 1.0 Initial. Open Space: 50' x 40' x 10'





**FEATURES**

- Available in 4' and 8' lengths
- Choice of 4' reflectors in solid top or 5% uplight distribution
- Rotary lock tombstone lampholders
- 2½" lamp spacing
- For individual or continuous row mounting
- Channel ends double as joiners
- Two 4' reflectors with reflector aligners supplied on 8' fixtures

**PROJECT INFORMATION**

Project Name \_\_\_\_\_

Type \_\_\_\_\_

Catalog No. \_\_\_\_\_

Date \_\_\_\_\_

**HOUSING**

Die formed steel with knockouts for stems or chain hangers.

**REFLECTOR**

Die embossed with transverse ribs for maximum rigidity. Available with apertures for uplight.

**BALLASTS**

Energy efficient, thermally protected, automatic resetting, Class P, high power factor, sound rated A, unless otherwise specified. CEE NEMA Premium compliant.

**ELECTRICAL**

Standard class "P" thermally protected, autoresetting HPF ballast, sound rated A. CEE NEMA Premium compliant. All ballast leads extend a minimum of 6" through access location. NEC/CEC-compliant ballast disconnect is standard.

**FINISH**

White painted parts are treated with a five stage phosphate bonding process and finished after fabrication with a minimum 90% reflective gloss baked enamel. LSR and M4R reflectors specular room side, Mill finish aluminum top surface.

**CERTIFICATION**

All luminaires are built to UL 1598 standards and bear appropriate UL and cUL or CSA labels. Damp location labeling is standard. Emergency-equipped fixtures labeled UL 924.

**ORDERING INFORMATION**

EXAMPLE CSR4-232-U-EU-EL

CSR									
MODEL	SIZE	NO. OF LAMPS IN CROSS SECTION	LAMP TYPE	REFLECTOR TYPE	BALLAST	VOLTAGE	OPTIONS		
CSR Industrial	4 4' 8 8'	1 One 2 Two 3 Three	14 2', T5: 14 Watt 24 2', T5: 24 Watt 28 4', T5: 28 Watt 32 4', T8: 32, 30, 28 or 25 Watt 54 4', T5: 54 Watt	ST Solid Reflector, No Uplight U Apertured Reflector for 5% Uplight LSRU Apertured Alum Reflector with Specular Silver Finish LSRST Solid Top Alum Reflector with Specular Silver Finish M4RU Apertured Alum Reflector with 95% Reflective Specular Silver Finish M4R Solid Top Alum Reflector with 95% Reflection Specular Silver Finish	E Electronic T8, Instant Start 4E 4-Lamp Electronic T8, Instant Start 3E 3-Lamp Electronic T8, Instant Start 4EP 4-Lamp Electronic T8 or T5HO For a specific ballast vendor, show as option.	U 120V-277V 347 347V	GLR Fast Blow Fuse <sup>1</sup> GMF Slow Blow Fuse <sup>1</sup> EL Emergency Battery Pack <sup>1</sup> BC Branch Circuit Plug-on Wiring System (See options section for details.) PAF Paint After Fabrication NYC NYC Compliant NYCU NYC Compliant, Union Label		
<b>ACCESSORIES (ORDER SEPARATELY)</b>									
CSZTF	Zip Tee Hanger - flush mounting on T-Bar ceiling								
CSZT	Zip Tee Hanger - 1½" spacer on tee bar ceiling								
CSTH	Slide Clamp Tong Hanger								
S18	18" Stem, canopy and 8° aligner								
SS18	18", 45° Swivel Stem & Canopy								
ITB4	Close Mounting on T-Bar ceiling								
CSHC	14" Chain Hanging Assembly								
CSRWG4	4' Wire Guard (two required for 8' fixture)								
OS1K	Occupancy Sensor Kit, 120/277/347V, One Relay <sup>2</sup>								

<sup>1</sup> Option requires fixture voltage in catalog numbers.

<sup>2</sup> Use programmed start ballast. Not recommended for use with an instant start. For more occupancy/daylight harvesting sensor accessories see Technical section.



Test 10331 Test Date 1/8/03

## PHOTOMETRIC DATA

### LUMINAIRE DATA

Luminaire	CSR4-232 CSR Industrial 1 X 4 2-Lamp with Baked White Enamel Reflector
Ballast	B2321120
Ballast Factor	0.88
Lamp	FO32
Lumens per Lamp	2900
Watts	60
Shielding Angle	N/A
Spacing Criterion	0° = 1.27 90° = 1.46
Luminous Opening in Feet	Length: 4.00 Width: 0.88 Height: 0.00

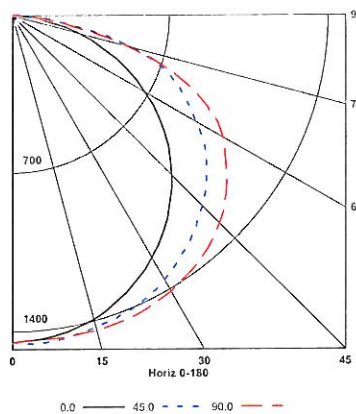
### ZONAL LUMEN SUMMARY

Zone	Lumens	Lamp	Fixt.
0-30	1173	20.2	22.5
0-40	1980	34.1	38.0
0-60	3790	65.3	72.7
0-90	5211	89.8	100.0
0-180	5211	89.8	100.0

### ENERGY DATA

Total Luminaire Efficiency	89.8%
Luminaire Efficacy Rating (LER)	76
IESNA RP-1 1993 Compliance	Non-Compliant
Comparative Yearly Lighting Energy Cost per 1000 Lumens	\$3.16 based on 3000 hrs. and \$0.08 per KWH

### INDOOR CANDELA PLOT



### AVG. LUMINANCE (Candela/Sq. M.)

	0.0	22.5	45.0	67.5	90.0
0	4419	4419	4419	4419	4419
30	4361	4513	4756	4908	4965
40	4331	4603	4986	5269	5369
45	4307	4662	5142	5501	5613
50	4277	4729	5338	5752	5875
55	4228	4820	5555	6003	6158
60	4153	4948	5161	6385	6587
65	4045	5123	6056	6751	6910
70	3862	5275	6455	6849	6858
75	3568	5364	6463	6120	6037
80	3047	5882	5371	4631	4508
85	2210	4947	2982	1754	1649

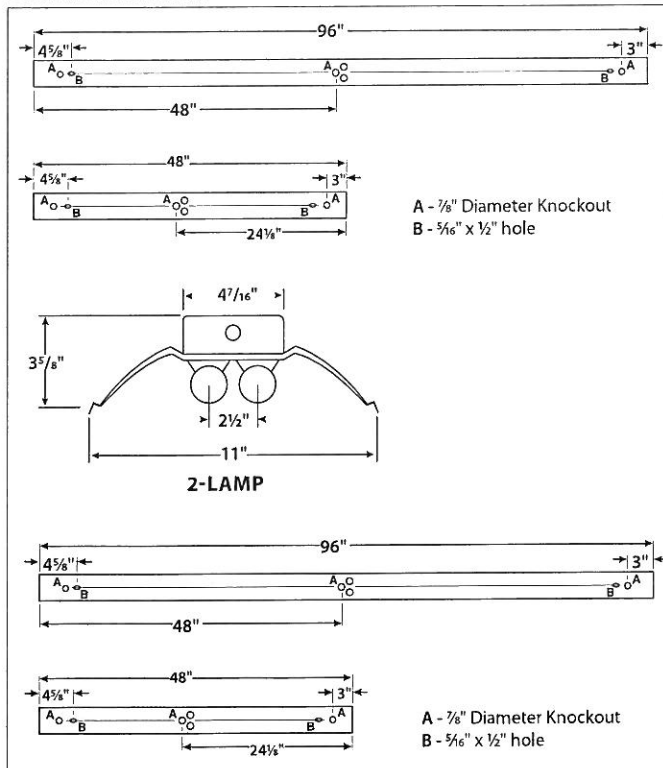
### COEFFICIENTS OF UTILIZATION (%)

RCR	RC 80				RC 70				RC 50				RC 0			
	RW 70	50	30	10	70	50	30	10	50	30	10	0	70	50	30	10
1	97	92	88	84	94	90	86	83	86	83	80	73				
2	87	79	72	67	85	77	71	66	74	69	64	59				
3	79	68	61	54	76	67	60	54	64	58	53	49				
4	72	60	52	45	69	59	51	45	57	50	44	41				
5	66	53	45	38	64	52	44	38	50	42	38	35				
6	60	48	39	33	59	47	39	33	45	38	33	30				
7	56	43	35	29	54	42	34	29	41	34	29	26				
8	52	39	31	26	50	38	31	25	37	30	25	23				
9	48	36	28	23	47	35	28	23	34	27	23	21				
10	45	33	25	21	44	32	25	20	31	25	20	19				

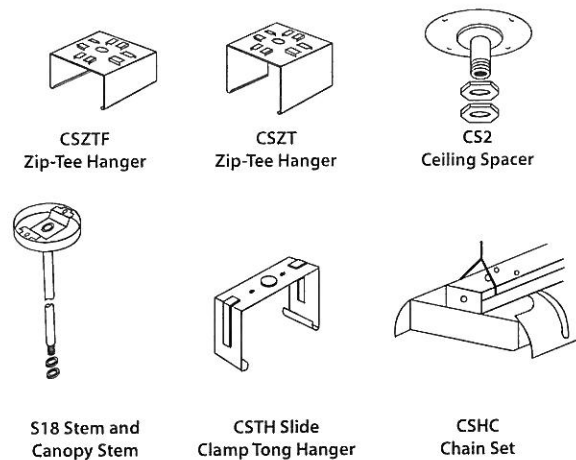
RCR = Room Cavity Ratio

RC = Effective Ceiling Cavity Reflectance RW = Wall Reflectance

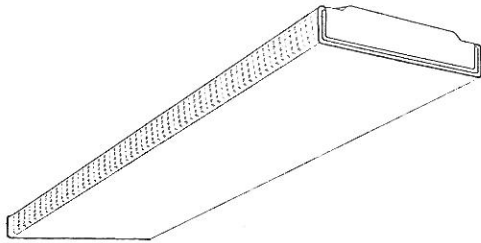
### DIMENSIONAL DATA



### MOUNTING ACCESSORIES



**NOTE:** All Non-Shielded (strip) fixtures - Deduct 1/16" from overall dimension for continuous row mounting. All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.



**FEATURES**

- Clear acrylic prismatic diffuser. Hinges from either side. Flat bottom and vertical sides
- Linear side prisms control visual brightness and direct light onto adjacent ceiling area
- Injection molded decorative glow ends on diffuser baskets.
- Heavy gauge steel housing, die embossed for maximum rigidity
- Heat sink embossments and levelling projections allow direct mounting of HPF fixtures on combustible low density cellulose fiberboard ceilings
- Also available with 3 lamps, see WCW3

**PROJECT INFORMATION**

Project Name \_\_\_\_\_

Type \_\_\_\_\_

Catalog No. \_\_\_\_\_

Date \_\_\_\_\_

**FINISH**

All parts pre-painted with high gloss baked white enamel, minimum reflectance 86%, applied over iron phosphate pre-treatment for maximum adhesion and rust resistance.

**SHIELDING**

100% clear prismatic acrylic. 50% DR acrylic lens available as an option.

**BALLASTS**

Energy efficient, thermally protected, automatic resetting, Class P, high power factor, sound rated A, unless otherwise specified. CEE NEMA Premium compliant.

**CERTIFICATION**

All luminaires are built to UL 1598 standards and bear appropriate UL and cUL or CSA labels. Damp location labeling is standard. Emergency-equipped fixtures labeled UL 924.

**ELECTRICAL**

Standard class "P", thermally protected, auto-resetting HPF ballast, sound rated A. CEE NEMA Premium compliant. All ballast leads extend a minimum of 6" through access location. NEC/CEC-compliant ballast disconnect is standard.

**ORDERING INFORMATION**

EXAMPLE WCW4-432-4EU

WCW									
MODEL	SIZE	LAMP TYPE		BALLAST		VOLTAGE		OPTIONS	
WCW 15 3/8" Wide Specification Grade Wraparound	2 2' 4 4' 8 8'	14 2', T5: 14 Watt	17 2', T8: 17 Watt	E Electronic T8, Instant Start	U 120V-277V 347 347V	GLR Fast Blow Fuse	EL Emergency Battery Pack	PAF Paint After Fabrication	NYC NYC Compliant
		24 2', T5HO: 24 Watt	28 4', T5: 28 Watt	4E 4-Lamp Electronic T8, Instant Start		NYCU NYC Compliant, Union Label			
		32 4', T8: 32, 30, 28 or 25 Watt	54 4', T5HO: 54 or 51 Watt	EP Electronic T5, T5HO, or T8, Programmed Start					
				4EP 4-Lamp Electronic T5 or T8, Programmed Start					
	<b>NO. OF LAMPS</b>	<b>LENS</b>				<b>ACCESSORIES (ORDER SEPARATELY)</b>			
	2 Two 4 Four	Blank Clear Prismatic Acrylic DR 50% DR content, Clear Prismatic Acrylic				ITB4 T-Bar Hanger S18 18" Stem, Canopy SS18 18" Swivel Stem - 45° Swivel			

### PHOTOMETRIC DATA

#### LUMINAIRE DATA

Luminaire	WCW4-432
	15" x 48" White Painted Interior with Wraparound Acrylic Prisms Lens
Ballast	B4321120RH
Ballast Factor	0.88
Lamp	F032/41K BAL. FAC.: .88
Lumens per Lamp	2900
Watts	105
Shielding Angle	N/A
Spacing Criterion	0° = 1.26 90° = 1.34
Luminous Opening in Feet	Length: 4.00 Width: 1.27 Height: 0.08

#### ZONAL LUMEN SUMMARY

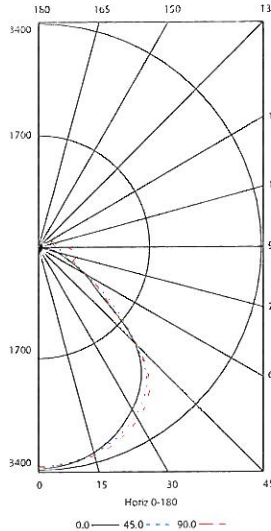
Zone	Lumens	% Lamp	% Fixt.
0-30	2661	22.9	28.9
0-40	4401	37.9	47.8
0-60	7047	60.8	76.6
0-90	8488	73.2	92.2
90-120	491	4.2	5.3
90-130	575	5.0	6.2
90-150	682	5.9	7.4
90-160	717	6.2	7.8
0-180	9206	79.4	100.0

Test L11151 Test Date 1/8/03

#### ENERGY DATA

Total Luminaire Efficiency	79.4%
Luminaire Efficacy Rating (LER)	77
IESNA RP-1-1993 Compliance	Non-Compliant
Comparative Yearly Lighting Energy Cost per 1000 Lumens	\$3.12 based on 3000 hrs. and \$0.08 per KWH

#### INDOOR CANDELA PLOT



#### AVG. LUMINANCE (Candela/Sq. Ft.)

	0.0	22.5	45.0	67.5	90.0
0	7102	7102	7102	7102	7102
30	6910	6913	7007	7107	7170
40	6624	6636	6754	6807	6902
45	6128	6093	5947	5789	6013
50	4730	5151	5037	4502	4507
55	3689	4259	4042	3822	3782
60	3318	3410	3193	3405	3175
65	2663	2844	2774	3176	2734
70	2237	2451	2566	3305	3037
75	2171	2352	2633	3680	4004
80	2159	2664	3278	4726	5259
85	1919	2469	4278	6436	7110

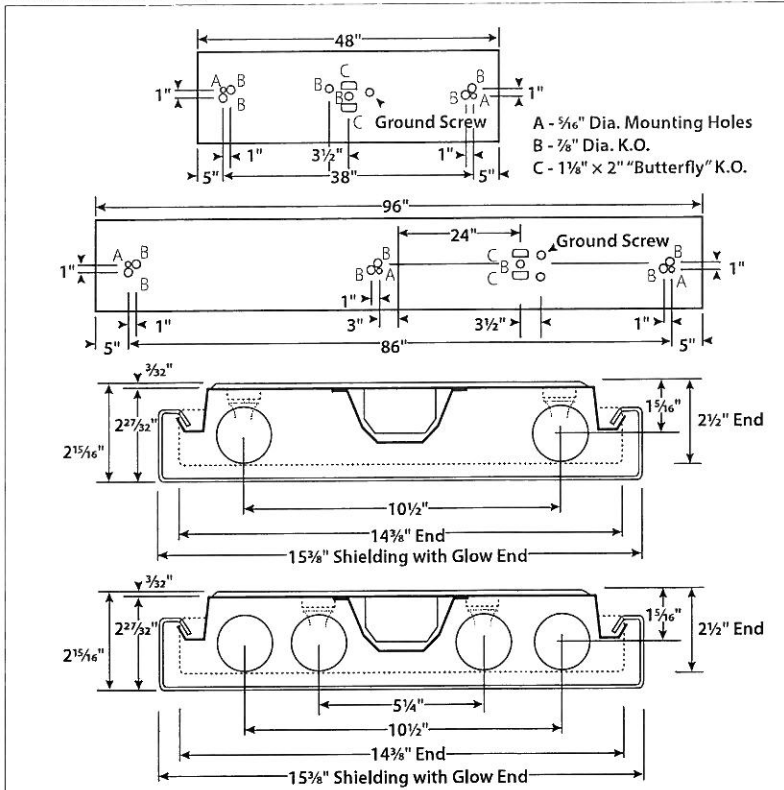
#### COEFFICIENTS OF UTILIZATION (%)

RCR	RW	80				70				50				0				
		70	50	30	10	70	50	30	10	50	30	10	0	50	30	10	0	
1	85	81	78	75	82	79	76	73	74	72	70	61						
2	78	72	66	62	75	70	65	61	66	62	59	52						
3	71	64	57	53	69	62	56	52	59	54	50	45						
4	66	57	50	45	64	55	49	45	53	47	43	39						
5	61	51	44	39	59	50	44	39	48	42	38	34						
6	56	46	40	35	54	45	39	34	43	38	34	30						
7	52	42	35	31	51	41	35	31	39	34	30	27						
8	49	39	32	28	47	38	32	27	36	31	27	24						
9	46	35	29	25	44	35	29	25	33	28	24	22						
10	43	33	27	23	42	32	26	22	31	26	22	20						

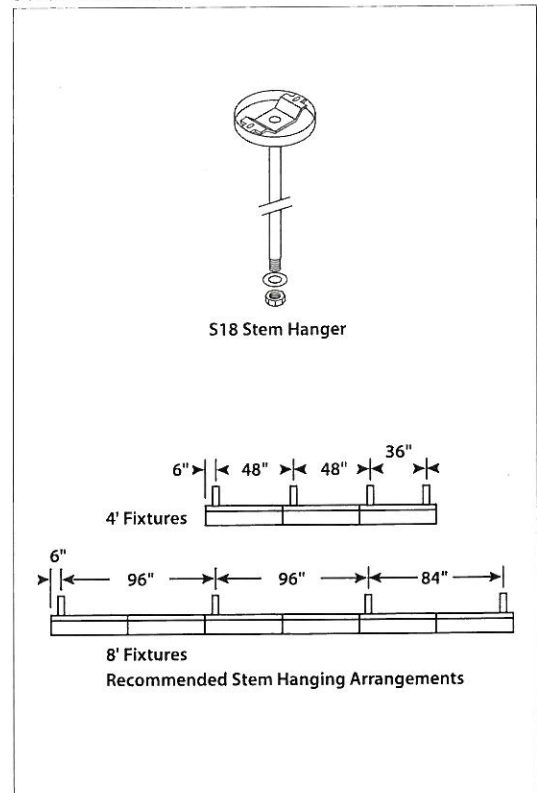
RCR = Room Cavity Ratio

RC = Effective Ceiling Cavity Reflectance RW = Wall Reflectance

#### DIMENSIONAL DATA

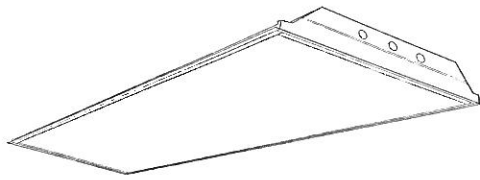


#### STEM MOUNTING



**NOTE:** All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.





## FEATURES

- T8 optimized fluorescent lensed troffer
- Shallow design frees up plenum space
- Hemmed fixture edges reduce risk of injury during fixture handling and installation
- Integral T-bar clips quickly secure fixture to the grid
- Corner hinging for easy insertion and removal of shielding frame
- Housing embossments provide extra strength and rigidity
- Housing ends secured by unique corner interlock and screws
- Snap-in ballast cover requires no tools for wireway access
- Flush steel shielding frame, screw assembled for easy diffuser replacement
- Rotary action cam latches. Smooth operating for secure shielding retention
- Metal to metal light leak protection on all four sides of shielding frame
- Rotary lock lampholders for positive lamp contact
- Heat sink embossments behind ballasts for cooler operation, longer life
- Recessed, surface or cable mount
- UL listed 1598

## PROJECT INFORMATION

Project Name \_\_\_\_\_

Type \_\_\_\_\_

Catalog No. \_\_\_\_\_

Date \_\_\_\_\_

## CONSTRUCTION

Housing is constructed of heavy gauge steel, die formed for extra rigidity. Four T-bar clips integral to housing. Housing features hemmed edges. Door frame hinges and latches from either side. Wireway accessible from below for upgrades or maintenance.

## BALLASTS

Energy efficient, thermally protected, automatic resetting, Class "P", high power factor, sound rated A, unless otherwise specified. For a specific vendor and/or ballast, specify as option. CEE NEMA Premium compliant.

## ELECTRICAL

Standard class "P" thermally protected, autoresetting HPF ballast, sound rated A. CEE NEMA Premium compliant. All ballast leads extend a minimum of 6" through access location. NEC/CEC compliant ballast disconnect is standard.

## FINISH

All metal parts processed with a phosphate bonding treatment. Grid units are pre-painted with high gloss baked white enamel, 86% reflective. Polyester powder coat paint after fabrication (PAF) option available, reflectance 90%.

## SHIELDING

100% virgin acrylic prismatic 12, extruded and roll-embossed, diagonally oriented female prisms standard. Other shielding may be specified. If desired shielding media is not shown in ordering guide, contact your local Hubbell Lighting representative.

## CEILING COMPATIBILITY

Designed for recessed installation in standard inverted tee grid ceilings (G), recessed installation in hard ceilings (G with FK accessory), Surface mount at ceiling plane (SM) or cable mount suspension below ceiling plane (CM). For compatibility with specific ceilings contact your Hubbell Lighting representative.

## CERTIFICATION

All luminaires are built to UL 1598 standards and bear appropriate UL and cUL or CSA labels. Damp location labeling is standard. Emergency-equipped fixtures labeled UL 924.

## ORDERING INFORMATION

EXAMPLE JT824-232G-FSA12-EU-F0735-C388-GLR

JT8	24	32				
<b>MODEL</b>	<b>NO. OF LAMPS</b>	<b>CEILING TYPE</b>	<b>SHIELDING</b>	<b>VOLTAGE</b>	<b>OPTIONS</b>	
JT8 Dedicated T8 Lensed Troffer	2 Two 3 Three	G Inverted T-Bar <sup>1</sup> SM Surface Mount CM Cable Mount <sup>2</sup>	A12 Pattern 12 Acrylic 0.100" Nominal (Std.)  A12.125 Pattern 12 Acrylic 0.125" Nominal  A19 Pattern 19 Acrylic 0.156" Male Prism  PC1 Silver Parabolic Louver 1/2" x 1/2" x 1/2"	U 120V-277V  347 347V	F0730 T8, 70CRI, 3000K Lamps, Furn/Inst. F0735 T8, 70CRI, 3500K Lamps, Furn/Inst. F0741 T8, 70CRI, 4100K Lamps, Furn/Inst.  GLR Fast Blow Fuse EL Emergency Battery Pack Installed PAF Paint After Fabrication MS9 Master/Satellite w/9' Harness C388 3/8" Flex with 3 No. 18 Wires C384 3/8" Flex with 3 No. 14 Wires C488 3/8" Flex with 4 No. 18 Wires C424 1/2" Flex with 4 No. 14 Wires M4R Specular Reflector G1 Single Gasket (Door to Housing) G2 Double Gasketing (G1 and Lens to Door) G3 Triple Gasketing (G2 and Housing to Ceiling) WIH w/HUBB Enabled <sup>3,4</sup> EOR End of Row (SM/CM only) <sup>5,6</sup> INT Intermediate (SM/CM only) <sup>5,6</sup>	
	<b>SIZE</b>	<b>DOOR STYLE</b>		<b>BALLAST</b>		
	24 2' x 4'	FS Flush Steel FA Flush Aluminum		E Electronic T8, Instant Start 3E 3-Lamp Electronic T8, Instant Start 24E (1) 2-Lamp & (1) 4-Lamp Electronic T8, Instant Start (For use with MS9) EP Electronic T8, Programmed Start 3EP 3-Lamp Electronic T8, Programmed Start ELW 2-Lamp Electronic T8, 0.77 Ballast Factor, Low Wattage, Instant Start 3ELW 3-Lamp Electronic T8, 0.77 Ballast Factor, Low Wattage, Instant Start		
	<b>LAMP TYPE</b>					
	32 4', T8: 32, 30, 28 or 25 Watt	For additional door styles contact your local Columbia Lighting representative.	For more shielding, see Options and Accessories.			
		<b>ACCESSORIES (ORDER SEPARATELY)</b>				
		FK24 2' x 4' Flange Kit FKCR Flange Kit Continuous Row Connector CM48Y2SC3F-KIT 48" Cable Mount Kit for 2' wide CM ceiling type, 3 Wire Feed Cord				

<sup>1</sup> For drywall order flange kit accessories separately

<sup>2</sup> Order hanger accessories separately

<sup>3</sup> In-Fixture Module Antenna adds 2" to overall fixture height at power feed location

<sup>4</sup> Not available with Surface Mount ceiling types.

<sup>5</sup> Provides ends with wiring access for continuous row mounting.

<sup>6</sup> Contact Hubbell representative for continuous row, 3-lamp fixtures.

For a specific ballast vendor, show as option.

For a complete set of options, see Options and Accessories.

## PHOTOMETRIC DATA

### LUMINAIRE DATA

Luminaire	JT824-332G-FSA12
	J Lensed Troffer 2' x 4' 3-Lamp with A-12 Pattern Acrylic Prismatic Lens
Ballast	B332I120RH-A
Ballast Factor	0.88
Lamp	F32T8
Lumens per Lamp	2900
Watts	84
Shielding Angle	N/A
Spacing Criterion	0° = 1.23 90° = 1.36

### AVG. LUMINANCE (Candela/Sq.M.)

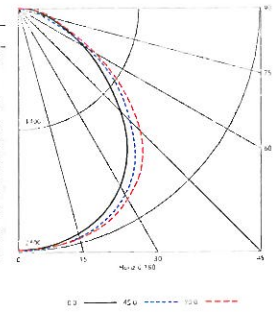
	0.0	22.5	45.0	67.5	90.0
Average Luminance Angle	0	4289	4289	4289	4289
	30	4106	4177	4409	4495
	40	3635	4032	4230	4421
	45	3655	3764	3921	4218
	50	3299	3469	3761	3940
	55	2993	3133	3443	3569
	60	2706	2694	2903	3078
	65	2420	2238	2231	2547
	70	2178	1908	1643	2223
	75	2101	1792	1501	2130
	80	2255	1822	1831	2229
	85	2344	2009	2079	2555

### COEFFICIENTS OF UTILIZATION (%)

RCR	80				70				50				0				
	RW	70	50	30	10	70	50	30	10	50	30	10	0	70	50	30	10
1	93	89	85	82	90	87	84	81	83	81	79	72					
2	85	78	73	68	83	77	72	67	74	70	66	61					
3	78	69	63	58	76	68	62	57	65	60	56	52					
4	71	62	55	49	70	61	54	49	59	53	48	45					
5	66	55	48	43	64	54	48	42	53	47	42	39					
6	61	50	43	38	59	49	42	37	48	42	37	35					
7	57	45	38	33	55	45	38	33	44	37	33	31					
8	53	42	35	30	51	41	34	30	40	34	29	28					
9	49	38	31	27	48	38	31	27	37	31	27	25					
10	46	35	29	24	45	35	29	24	34	28	24	23					

Test 13120 Test Date 11/07/2003

### INDOOR CANDEL PLOT



### ZONAL LUMENS SUMMARY

Zone	Lumens	Lamp	Fixt.
0-30	2232	25.7	30.3
0-40	3678	42.3	49.9
0-60	6216	71.4	84.4
0-90	7364	84.6	100.0
0-180	7364	84.6	100.0

### ENERGY DATA

Total Luminaire Efficiency	84.6%
Luminaire Efficacy Rating (LER)	77
IESNA RP-1-2004 Compliance	Non-Compliant
Comparative Yearly Lighting Energy Cost per 1000 Lumens	\$3.12 based on 3000 hrs. and \$0.08 per KWH

### LUMINAIRE DATA

Luminaire	JT824-232G-FSA12
	J Lensed Troffer 2' x 4' 2-Lamp with A-12 Pattern Acrylic Prismatic Lens
Ballast	B232I120RH-A
Ballast Factor	0.88
Lamp	F32T8
Lumens per Lamp	2900
Watts	60
Shielding Angle	N/A
Spacing Criterion	0° = 1.23 90° = 1.36

### AVG. LUMINANCE (Candela/Sq.M.)

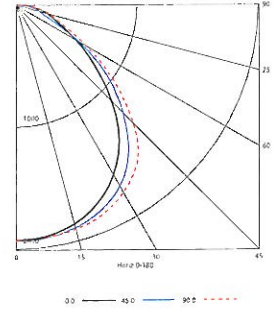
	0.0	22.5	45.0	67.5	90.0
Average Luminance Angle	0	2967	2967	2967	2967
	30	2850	2921	3045	3133
	40	2638	2733	2893	3073
	45	2430	2537	2719	2912
	50	2198	2308	2513	2669
	55	1973	2046	2220	2327
	60	1757	1754	1806	1923
	65	1577	1461	1377	1563
	70	1509	1302	1100	1361
	75	1596	1329	1169	1377
	80	1716	1450	1389	1512
	85	1780	1656	1568	1709

### COEFFICIENTS OF UTILIZATION (%)

RCR	80				70				50				0				
	RW	70	50	30	10	70	50	30	10	50	30	10	0	70	50	30	10
1	94	91	87	84	92	89	85	83	85	82	80	74					
2	87	80	74	70	84	78	73	69	75	71	67	62					
3	79	71	64	59	77	69	63	58	67	62	57	54					
4	73	63	56	50	71	62	55	50	60	54	49	46					
5	67	57	49	44	66	56	49	44	54	48	43	40					
6	62	51	44	39	61	50	43	38	49	43	38	36					
7	58	47	39	34	56	46	39	34	45	38	34	32					
8	54	43	36	31	53	42	35	31	41	35	30	28					
9	50	39	32	28	49	39	32	28	38	32	27	26					
10	47	36	30	25	46	36	29	25	35	29	25	23					

Test 13121 Test Date 1/8/03

### INDOOR CANDEL PLOT



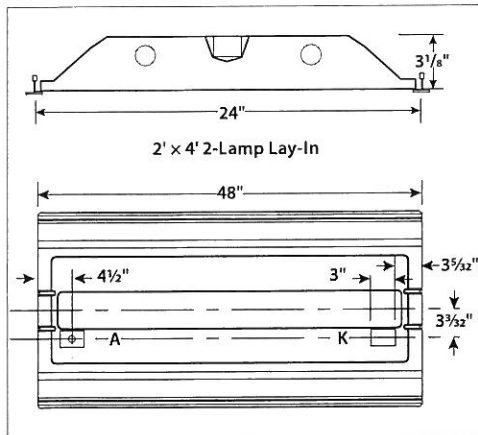
### ZONAL LUMENS SUMMARY

Zone	Lumens	Lamp	Fixt.
0-30	1542	26.6	30.8
0-40	2538	43.8	50.7
0-60	4234	73.0	84.6
0-90	5004	86.3	100.0
0-180	5004	86.3	100.0

### ENERGY DATA

Total Luminaire Efficiency	86.3%
Luminaire Efficacy Rating (LER)	73
IESNA RP-1-2004 Compliance	Non-Compliant
Comparative Yearly Lighting Energy Cost per 1000 Lumens	\$3.29 based on 3000 hrs. and \$0.08 per KWH

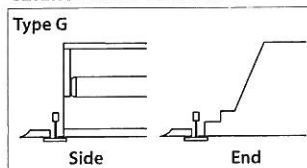
### DIMENSIONAL DATA



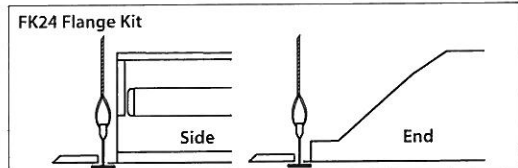
A: 3/8" Diameter knockout  
K: 2" x 3" through hole for access plate.

**NOTE:** All dimensions are in inches; dimensions and specifications are subject to change without notice. Please consult factory or check sample for verification.

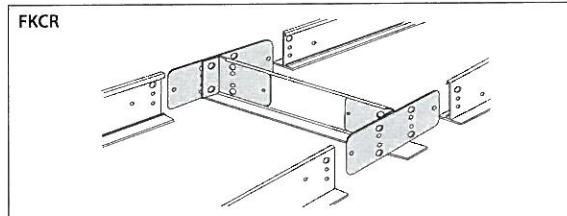
### CEILING COMPATIBILITY



For lay-in installation in exposed grid ceilings. Maximum tee widths of 1" and maximum tee heights of 2" allowed.



For hard ceiling applications order FK24 flange kit. Flange kit wires directly into concealed ceiling opening for a clean, finished appearance.

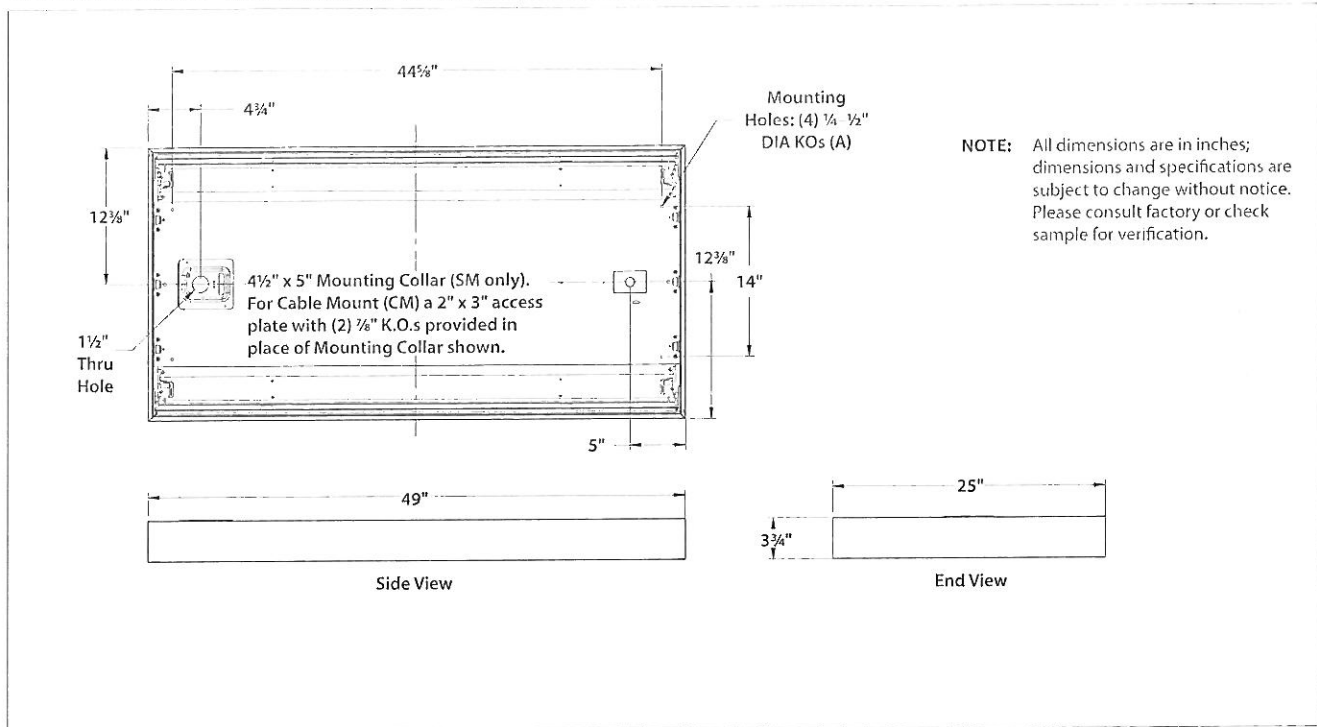


Row cut out dimensions using FK24 & FKCR adapters:  
Width 24 3/8", Length [(# in row) x 48"] + 3/8". Example: (48" x 2) + 3/8" = 96 3/8"  
Flange kit rough in dimensions for single unit only: 24 3/8" x 48 3/8"

For flanged fixtures in row configurations, the FKCR adapter bracket kit is required in addition to the FK24 kit. Order one less FKCR than the total number of fixtures in row. (Example: Row of two, order (2) FK24 & (1) FKCR)



DIMENSIONAL DATA - SURFACE MOUNT (SM) AND CABLE MOUNT (CM)



**SURFACE MOUNT**

Order SM ceiling type. Mounting collar required for surface mounting. (4) Mounting knock-outs, 1/4" to 1/2" provided as shown, marked "A".

**CABLE MOUNT**

Order CM ceiling type. Access plate supplied for cable mounting or suspension. Use CM48Y2C3F-KIT 48" cable mount kit. Includes 3 wire feed cord. For other wiring needs, contact Hubbell Lighting representative. Mounting knock-outs, 1/4" to 1/2" provided as shown, marked "A".