



Date: Nov 13, 2013

Graybar Electric Company, Inc.
1919 6th Avenue South
Seattle WA 98134
Phone: (206) 292-4848
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Job Name
Sitka Trooper Academy

Bid Date
Nov 13, 2013

Submittal Date
Nov 13, 2013



Transmittal

Graybar Electric Company, Inc.
1919 6th Avenue South
Seattle WA 98134
Phone: (206) 292-4848
From: Shawn Mitchell

Project Sitka Trooper Academy
Location

Contact:

ATTACHED WE ARE SENDING YOU 0 COPIES OF THE FOLLOWING ITEMS:

- | | | |
|-----------------------------------|--|--------|
| <input type="checkbox"/> Drawings | <input type="checkbox"/> Specifications | Other: |
| <input type="checkbox"/> Prints | <input type="checkbox"/> Information | |
| <input type="checkbox"/> Plans | <input checked="" type="checkbox"/> Submittals | |

THESE ARE TRANSMITTED FOR:

- | | | |
|--|---|---------------------------------|
| <input type="checkbox"/> Prior Approval | <input type="checkbox"/> Resubmittal for Approval | <input type="checkbox"/> Record |
| <input checked="" type="checkbox"/> Approval | <input type="checkbox"/> Corrections | Bids due on: |
| <input type="checkbox"/> Approval as Submitted | <input type="checkbox"/> Your Use | Other: |
| <input type="checkbox"/> Approval as Noted | <input type="checkbox"/> Review and Comment | |

Type	MFG	Part
LED 1X4	COOPER	GR-LD1-32-A125-UNV-L840-CD1-U
LED WRAP	COOPER	WNLED-LD1-54-F-UNV-L840-CD1-U
FL 1X4	COOPER	GR8-232A125-UNV-L8841-A3/8-2/18G-ER81-U
FL WRAP	COOPER	WN-332A-UNV-ER81-U
Item Note: Provided with 800 series 4100K lamps		

COOPER LIGHTING - METALUX®



DESCRIPTION

GR LED is a lensed troffer series. This high quality luminaire is dedicated to the latest solid state lighting and electronic driver technology for optimal performance and energy efficiency. The GR LED is compatible with all of today's popular ceiling systems and is available with a number of options and accessories for application versatility.

The GR LED series features efficiency, quality and performance. The series is an excellent choice for commercial office spaces, schools, hospitals or retail merchandising areas.

SPECIFICATION FEATURES

Construction

Rigid housing is die formed of code gauge prime cold rolled steel and features full length die-formed stiffeners and unibody endplate for added strength. Side flanges are hemmed. Innovative design provides superior lens brightness uniformity and visual comfort. Unibody endplates are securely attached with interlocking tabs and screws. Four auxiliary fixture end suspension points provided. KOs for continuous row wiring. Endplates have integral Grid-lock feature for safety and convenience.

Controls

The GR LED is equipped standard with a 0-10V continuous dimming driver that works with any standard 0-10V control/dimmer. Combine with energy-saving products like occupancy sensors, daylighting controls, and lighting relay panels from Cooper Controls (www.coopercontrol.com) to maximize energy savings.

Electrical

Long-Life LED system coupled with electrical driver to deliver optimal performance. LED's available in 3500k or 4000k with a CRI ≥ 85. Projected life is 50,000 hours at 70% lumen output. cULus listed. Electronic drivers are available for 120-277V applications. A 0-10V dimming driver is standard.

Finish

Multistage, iron phosphate pretreatment ensures maximum bonding and rust inhibition. Housing and driver cover finished with new 90% reflective white enamel for superior performance. "PAF" Painted After Fabrication option also available.

Hinging/Latching

Positive spring loaded steel latches with baked white enamel finish. Safety-lock T-hinges allow hinging and latching either side.

Frame/Shielding

Die formed, heavy gauge, flat steel door with reinforced mitered corners and baked white enamel finish. Flat and regressed aluminum doors also available. Positive light seals. Light stabilized, acrylic prismatic lens. Standard #12 pattern.

Compliance

Modules are UL recognized components and indoor luminaires are cULus listed for 25°C ambient environments, RoHS compliant, and LED modules comply with IESNA LM-79 and LM-80 standards. DesignLights™ Consortium Qualified (high lumen version only). Refer to www.designlights.org Qualified Products List under Family Models for details.

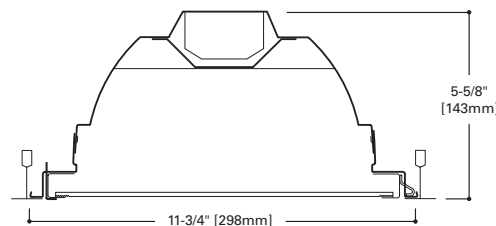


GR LED LED

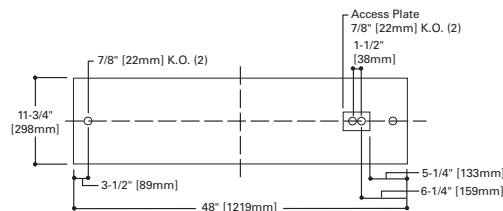
1' X 4' LED TROFFER

General Recessed LED Troffer

For Use in Insulated Ceilings



MOUNTING DATA



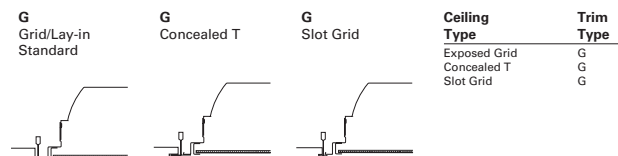
DOOR FRAMES



ENERGY DATA

Input Watts:
32=36W
43=49W

CEILING COMPATIBILITY



Job Name:
Sitka Trooper Academy

Catalog Number:
GR-LD1-32-A125-UNV-L840-CD1-U

Notes:

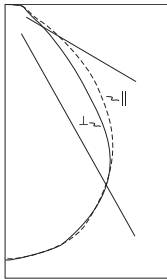
Type:

LED 1X4

GRASB13-928

GR LED

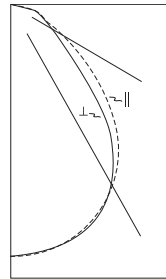
PHOTOMETRICS



GRLED-LD1-32-A-UNV-L835-CD1-U
Dimming Driver
Linear LED 3500K
Spacing criterion:
(H) 1.2 x mounting
height, (L) 1.2 x
mounting height
Efficiency: 100%
Lumens: 3179
Input Watts: 36.4W
Efficacy: 87.3 LPW
Test Report:
GRLED-LD1-32-A-
UNV-L835-CD1-U-IES

Candlepower

Angle	Along H	45°	Across L
0	1471	1471	1471
5	1472	1462	1468
10	1455	1442	1450
15	1419	1411	1414
20	1371	1360	1363
25	1303	1290	1291
30	1207	1196	1193
35	1097	1077	1041
40	957	917	856
45	810	761	627
50	644	576	466
55	490	403	357
60	367	282	280
65	259	188	226
70	194	136	193
75	152	117	164
80	116	104	125
85	62	60	64
90	0	0	0



GRLED-LD1-43-A-UNV-L835-CD1-U
Dimming Driver
Linear LED 3500K
Spacing criterion:
(H) 1.2 x mounting
height, (L) 1.2 x
mounting height
Efficiency: 100%
Lumens: 4324
Input Watts: 49.9W
Efficacy: 86.7 LPW
Test Report:
GRLED-LD1-43-A-
UNV-L835-CD1-U-IES

Candlepower

Angle	Along H	45°	Across L
0	2005	2005	2005
5	2009	1991	2001
10	1981	1964	1976
15	1935	1919	1928
20	1867	1852	1860
25	1766	1756	1756
30	1640	1630	1626
35	1491	1467	1416
40	1314	1247	1167
45	1099	1037	854
50	873	784	633
55	667	552	485
60	490	381	382
65	351	254	307
70	263	185	263
75	208	159	223
80	157	139	169
85	85	81	91
90	0	0	0

Coefficients of Utilization

rc	Effective floor cavity reflectance 20%				50%				10%				0%			
	80%	70%	50%	30%	10%	0%	80%	70%	50%	30%	10%	0%	80%	70%	50%	30%
rw	70	50	30	10	70	50	30	10	50	30	10	0	70	50	30	10
RCR																
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102
1	110	106	102	98	107	103	100	97	99	96	94	95	93	91	92	90
2	101	94	88	83	99	92	86	82	88	84	80	85	81	78	82	79
3	93	84	76	71	91	82	75	70	79	74	69	77	72	68	74	70
4	86	75	67	61	84	74	67	61	72	65	60	69	64	59	67	62
5	80	68	60	54	78	67	59	54	65	58	53	63	57	52	61	56
6	74	62	54	48	72	61	53	48	59	52	47	58	51	47	56	51
7	69	57	48	43	68	56	48	43	54	47	42	53	47	42	52	46
8	65	52	44	39	63	51	44	38	50	43	38	48	42	38	48	42
9	61	48	40	35	59	47	40	35	46	40	35	45	39	35	44	39
10	57	45	37	32	56	44	37	32	43	36	32	42	36	32	41	36

Coefficients of Utilization

rc	Effective floor cavity reflectance 20%				50%				10%				0%			
	80%	70%	50%	30%	10%	0%	80%	70%	50%	30%	10%	0%	80%	70%	50%	30%
rw	70	50	30	10	70	50	30	10	50	30	10	0	70	50	30	10
RCR																
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102
1	110	106	102	98	107	103	100	97	99	96	94	95	93	91	92	90
2	101	94	88	83	99	92	86	82	88	84	80	85	81	78	82	79
3	93	84	76	71	91	82	75	70	79	74	69	77	72	68	74	70
4	86	75	67	61	84	74	67	61	72	65	60	69	64	59	67	62
5	80	68	60	54	78	67	59	54	65	58	53	63	57	52	61	56
6	74	62	54	48	72	61	53	48	59	52	47	58	52	47	56	51
7	69	57	48	43	68	56	48	43	54	47	42	53	47	42	52	46
8	65	52	44	39	63	51	44	39	50	43	38	48	42	38	48	42
9	61	48	40	35	59	47	40	35	46	40	35	45	39	35	44	39
10	57	45	37	32	56	44	37	32	43	36	32	42	36	32	41	36

Zonal Lumen Summary

Zone	Lumens	%Fixture
0-30	1133	35.6
0-40	1800	56.6
0-60	2747	86.4
0-90	3179	100.0
0-180	3179	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	3858	3625	2987
55	2878	2367	2096
65	2064	1498	1801
75	1978	1523	2134
85	2396	2319	2473

Zonal Lumen Summary

Zone	Lumens	%Fixture
0-30	1543	35.7
0-40	2450	56.7
0-60	3738	86.4
0-90	4324	100.0
0-180	4324	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	5235	4940	4068
55	3917	3242	2848
65	2798	2024	2447
75	2707	2069	2902
85	3285	3130	3517

ORDERING INFORMATION

SAMPLE NUMBER: GR-LD1-32-A-UNV-L835-CD1-U

Rating Blank= Standard ATW-SW4= Chicago Rated Width Blank=1' Width Trim Type G=Grid/Lay-in (Standard) ⁽¹⁾ G=Concealed T G=Slot Grid Series R=General Purpose Troffer ⁽²⁾ Door Frame Standard=Flat White Steel Door (Leave Blank) FA=Flush White Extruded Aluminum c/w Spring Latch RA=Regressed White Extruded Aluminum FAN=Flush Natural Anodized Extruded Aluminum RAN=Regressed Natural Anodized Extruded Aluminum FAB=Flush Black Extruded Aluminum RAB=Regressed Black Extruded Aluminum	LED Type LD1=LED 1.0 LED Lumens Output⁽⁶⁾ 32=3200 43=4300 Shielding A=A12 .095 A125=A12 .125 A125MIN=A12 .125 MIN A19/156=A19 .156 F=A12 .095 Frost F125=A12 .125 Frost	Voltage⁽²⁾ UNV=Universal Voltage 120-277 ⁽²⁾ Options GL=Single Element Fuse GM=Double Element Fuse Flex=Flex Installed EL=Emergency Installed ^{(4),(5)} CCT L830=3000K L835=3500K L840=4000K L850=5000K	Driver Type CD=0-10V Dimming Driver SD=Step-Dim (BI Level) SLTD=Fifth Light (DALI) Driver Number of Drivers 1=1 Driver	Options PAF=Painted After Fabrication G1=Gasket, Door Frame and Housing G2=G1 plus Gasket between Lens and Door G3=G1 and G2 plus Gasketing on Mounting Surface of Fixture Trims ^{(8),(9)}	Packaging U=Unit Pack PALC=Palletized Fixtures in Carton
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ACCESSORIES

EQ-CLIP-U=T-BAR Safety Earthquake Clips⁽¹¹⁾

SHIPPING DATA

Catalog No.	Wt.	Pallet
GR-LD1-32	10 lbs.	33
GR-LD1-43	10 lbs.	33

NOTES: ⁽¹⁾ An EQ Grid Clip is recommended for all 9/16" ceiling systems. ⁽²⁾ Products also available in non-US voltages and frequencies for international markets. ⁽³⁾ Not available when specifying emergencies, voltage must be specific. ⁽⁴⁾ EL options are non-integral. ⁽⁵⁾ Call factory. ⁽⁶⁾ Nominal lumen output. ⁽⁷⁾ DesignLights Consortium Qualified (high lumen only). Refer to www.designlights.org Qualified Products List under Family Models for details. ⁽⁸⁾ Gasketing only available with aluminum door frame. ⁽⁹⁾ Gasketing minimum .125.

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

COOPER LIGHTING - METALUX®



DESCRIPTION

WNLED is a versatile LED wraparound series which can be used in a broad range of commercial and light industrial applications. This high quality luminaire utilizes the latest solid state lighting and electronic driver technology for optimal performance and energy efficiency.

The WNLED is an ideal choice for either general purpose lighting or higher-grade applications. This series can be the illumination solution in commercial, industrial, retail and residential applications.

SPECIFICATION FEATURES

Construction

Housing consists of die formed cold rolled steel. Ends formed with the housing for strength and provisions for continuous row aligners. Steel end plates with 7/8" KO and light-seal embossment. Driver cover can be removed by taking out four pan screws.

Controls

Equipped standard with a 0-10V continuous dimming driver that works with any standard 0-10V control/dimmer. Dimming range is 10% to 100%; varies by control device. Combine with energy saving products like occupancy sensors, day lighting controls, and lighting relay panels from Cooper Controls (www.coopercontrol.com) to maximize energy savings.

Electrical

Long-Life LED system coupled with electrical driver to deliver optimal performance. LED's available in 3500K or 4000K with a typical CRI 85. Projected life is 60,000 hours at 70% lumen output. CSA listed. Electronic drivers are available for 120-277V applications. A 0-10V dimming driver is standard.

Finish

Multistage iron phosphate pretreatment ensures maximum bonding and rust inhibitor. High reflective paint after fabrication, baked white enamel finish is standard.

Channel/Wireway Cover

Die formed heavy gauge steel. Tight fit for ease of maintenance.

Shielding

Acrylic lens is 100% frost (standard). Sides have inside linear prisms and bottom has pyramidal prisms for low brightness control.

Installation

Fixture may be surface, pendant, or stem mounted. See accessories below for ordering information.

Compliance

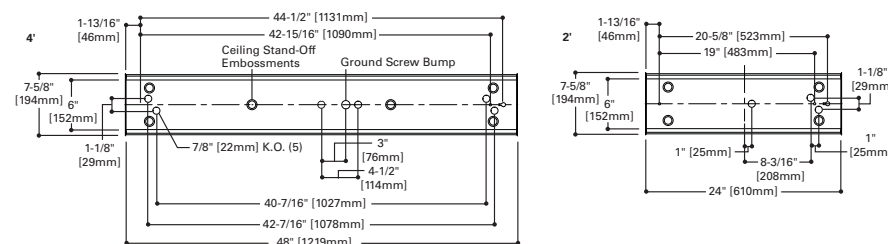
CSA Listed.



WNLED

Wraparound LED

MOUNTING DATA

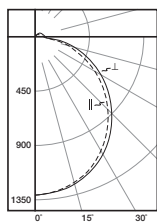


WATTAGE

Length	Lumens	Wattage
2 ft.	2700	32
4 ft.	4100	48
4 ft.	5400	65
4 ft.	7000	87

WNLED

PHOTOMETRICS



4WNLED-LD1-41-F-LW-UNV-L835-CD1-U
Electronic Driver
3500K LEDs
Spacing criterion:
(H) 1.2 x mounting
height, (L) 1.3 x
mounting height
Test Report:
4WNLED-LD1-41-F-
LW-UNV-L835-CD1-U

Candlepower

Angle	Along H	45°	Across L
0	1302	1302	1302
5	1301	1295	1301
10	1282	1280	1287
15	1251	1251	1260
20	1205	1210	1223
25	1148	1159	1174
30	1084	1099	1116
35	1010	1032	1047
40	933	956	971
45	845	875	892
50	755	788	804
55	661	699	715
60	567	604	621
65	468	507	528
70	368	409	429
75	270	313	333
80	173	219	237
85	81	130	148
90	2	48	71

Coefficients of Utilization

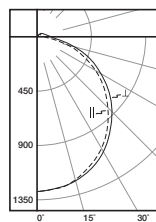
rc	Effective floor cavity reflectance						20%					
	80%		70%		50%		30%		10%		0%	
rw	70	50	30	10	70	50	30	10	50	30	10	0
RCR												
0	118	118	118	118	115	115	115	115	109	109	109	103
1	107	102	97	93	104	99	95	91	94	90	87	89
2	97	88	81	75	94	86	79	74	81	76	71	77
3	88	77	69	62	85	75	67	61	71	65	59	68
4	80	68	59	52	78	66	58	52	63	56	50	60
5	74	61	52	45	71	59	51	44	57	49	43	54
6	68	55	45	39	66	53	45	39	51	44	38	49
7	63	49	41	34	61	48	40	34	46	39	33	45
8	59	45	36	31	57	44	36	30	42	35	30	41
9	55	41	33	27	53	41	33	27	39	32	27	38
10	51	38	30	25	50	37	30	25	36	29	24	35

Zonal Lumen Summary

Zone	Lumens	%Fixture
0-30	1013	24.7
0-40	1659	40.4
0-60	2954	72.0
0-90	3912	95.4
0-180	4102	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	5143	5326	5429
55	4960	5245	5365
65	4766	5163	5377
75	4490	5205	5538
85	4000	6420	7309



4WNLED-LD1-54-F-UNV-L835-CD1-U
Electronic Driver
3500K LEDs
Spacing criterion:
(H) 1.2 x mounting
height, (L) 1.3 x
mounting height
Test Report:
4WNLED-LD1-54-F-
UNV-L835-CD1-U

Candlepower

Angle	Along H	45°	Across L
0	1705	1705	1705
5	1703	1694	1704
10	1679	1674	1685
15	1637	1638	1653
20	1576	1585	1600
25	1504	1516	1537
30	1418	1439	1461
35	1324	1349	1370
40	1216	1252	1270
45	1106	1145	1167
50	985	1032	1053
55	864	913	940
60	742	791	811
65	613	663	691
70	482	537	561
75	353	409	433
80	226	288	310
85	107	168	196
90	1	62	92

Coefficients of Utilization

rc	Effective floor cavity reflectance						20%					
	80%		70%		50%		30%		10%		0%	
rw	70	50	30	10	70	50	30	10	50	30	10	0
RCR												
0	118	118	118	118	115	115	115	115	109	109	109	103
1	107	102	97	93	104	99	95	91	94	90	87	89
2	97	88	81	75	94	86	79	74	81	76	71	77
3	88	77	69	62	85	75	67	61	71	65	59	68
4	80	68	59	52	78	66	58	52	63	56	50	60
5	74	61	52	45	71	59	51	44	57	49	43	54
6	68	55	45	39	66	53	45	39	51	44	38	49
7	63	49	41	34	61	48	40	34	46	39	33	45
8	59	45	36	31	57	44	36	30	42	35	30	41
9	55	41	33	27	53	41	33	27	39	32	27	38
10	51	38	30	25	50	37	30	25	36	29	24	35

Zonal Lumen Summary

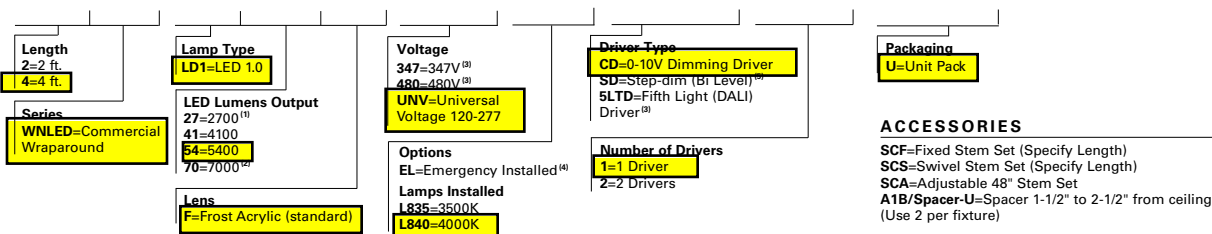
Zone	Lumens	%Fixture
0-30	1326	24.7
0-40	2171	40.5
0-60	3865	72.0
0-90	5120	95.4
0-180	5367	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	6732	6969	7103
55	6483	6851	7054
65	6243	6752	7037
75	5870	6801	7201
85	5284	8296	9679

ORDERING INFORMATION

SAMPLE NUMBER: 4WNLED-LD1-41-F-UNV-L840-CD1-U



NOTES: ⁽¹⁾ 2 ft. model. ⁽²⁾ 2 drivers required. ⁽³⁾ 4 ft. model only. ⁽⁴⁾ Specify 120 or 277V. EL option is only available for 120-277V applications. ⁽⁵⁾ Step-dim only available for 4100 lumen unit.

For complete product data, reference www.cooperlighting.com. Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

COOPER LIGHTING - METALUX®

DESCRIPTION

The GR8 is a T8-dedicated lensed troffer designed to offer premium performance in a low profile housing. T8 dedication and optimized lamp to lens spacing provides the best in energy efficiency and optical control. The GR8's shallow, low profile housing is compatible with even highly restrictive plenums. Luminaires are compatible with today's popular ceiling systems.

The GR8 offers great performance and great quality. The series is an excellent choice for commercial offices, schools, hospitals, retail merchandising and many other applications.

Catalog #	Type
Project	
Comments	Date
Prepared by	

SPECIFICATION FEATURES

Construction

Low profile recessed housing is die formed of code gauge prime cold rolled steel with full length stiffeners and mechanical endplate attachment for added strength. Ballast cover is easily removed without tools. Die formed captive lampholder bracket fully encloses lampholder wiring for easy lampholder replacement. Ample KO's are provided for continuous row wiring. Built-in grid-lock feature for safety and convenience.

Electrical**

Ballasts are CBM/ETL Class "P" and are positively secured. Pressure lock lampholders. UL/CUL listed. Suitable for damp locations.

Finish

Multistage, iron phosphate pretreatment ensures maximum bonding and rust inhibition. Lighting grade baked white enamel finish with premium reflectance for high efficiency.

Hinging/Latching

Positive cam action steel latches and integral safety hinges provide secure, high quality door fit and allow hinging and latching from either side.

Frame/Shielding

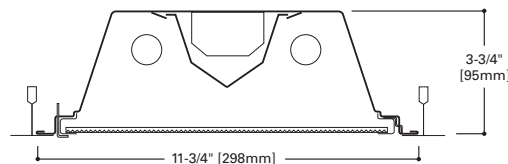
Heavy gauge flat steel door is die formed with reinforced mitered corners. Housing and door frame assemblies incorporate full length and width mechanical light traps. Light stabilized, acrylic prismatic lens.



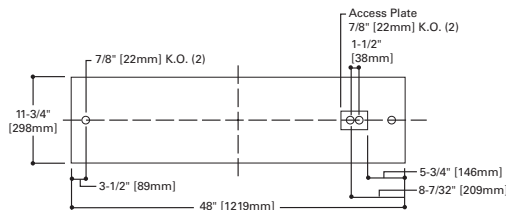
**GR8
232**

**1' X 4' TROFFER
2 LAMP**

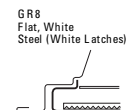
General Purpose
T8 Commercial Troffer



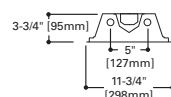
MOUNTING DATA



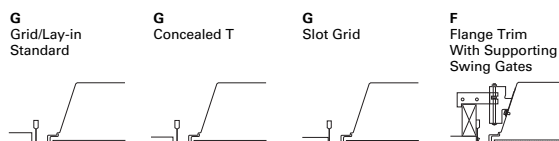
DOOR FRAMES



LAMP CONFIGURATIONS



CEILING COMPATIBILITY



COOPER LIGHTING

Ceiling Type	Trim Type
Exposed Grid	G
Concealed T	G
Slot Grid	G
Flange	G***

(Verify compatibility/ consult factory.)

ENERGY DATA

Input Watts:
EB Ballast & STD Lamps
232 (61)

ES Ballast & STD Lamps
232 (71)

Luminaire Efficacy Rating
LER = FL-58
Catalog Number: GR8-232A

Yearly Cost of 1000 lumens,
3000 hrs at .08 KWH = \$4.14

*Standard G (Grid) Type Fixtures can be field converted by adding trim kits. See Compatibility Section or Consult Factory.

**Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements.

***Order FCS-14W-U Flange Kit for installation in drywall ceiling. See options and accessories compatibility section.

LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

LINEAR DISCONNECT

Safe and convenient means of disconnecting power.



ADF031753

Job Name:
Sitka Trooper Academy

Catalog Number:

GR8-232A125-UNV-L8841-A3/8-2/
18G-ER81-U

Notes:

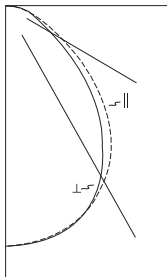
Type:

FL 1X4

GRASB13-928

GR 8

PHOTOMETRICS

**GR8-232A**

Electronic Ballast

F32T8/35K lamps

2800 lumens

Spacing criterion:

(II) 1.2 x mounting

height, (⊥) 1.2 x

mounting height

Efficiency 68.2%

Test Report:

GR8232A.IES

LER = FL-58

Yearly Cost of 1000

lumens, 3000 hrs at

.08 KWH = \$4.14

Coefficients of Utilization

Effective floor cavity reflectance												
20%												
rc	80%				70%				50%			
rw	70	50	30	10	70	50	30	10	50	30	10	0
RCR												
0	81	81	81	81	79	79	79	79	76	76	76	68
1	75	73	70	68	74	71	69	67	68	66	65	60
2	70	65	61	58	68	64	60	57	61	58	56	52
3	65	59	54	50	63	58	53	50	56	52	49	46
4	60	53	47	43	58	52	47	43	50	46	43	40
5	55	47	42	38	54	47	41	38	45	41	37	35
6	51	43	37	33	50	42	37	33	41	36	33	31
7	47	39	33	29	46	38	33	29	37	33	29	27
8	44	35	30	26	43	35	29	26	34	29	26	24
9	40	32	26	23	39	31	26	22	30	26	22	21
10	38	29	24	20	37	28	23	20	28	23	20	19

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	1322	23.6	34.6
0-40	2104	37.6	55.1
0-60	3301	58.9	86.4
0-90	3821	68.2	100.0
0-180	3821	68.2	100.0

Typical VCP Percentages

Room Size (Ft.)	Height Along		Height Across	
	8.5'	10.0'	8.5'	10.0'
20 x 20	61	64	62	67
30 x 30	54	58	54	59
30 x 60	45	48	44	47
60 x 30	56	60	57	61
60 x 60	46	49	45	48

Candlepower

Angle	Along II	45°	Across ⊥
0	1704	1704	1704
5	1695	1701	1699
10	1674	1683	1685
15	1637	1650	1652
20	1583	1597	1595
25	1511	1519	1496
30	1418	1405	1357
35	1300	1260	1199
40	1158	1089	1030
45	988	902	854
50	795	718	677
55	619	550	508
60	462	393	369
65	332	264	272
70	235	175	211
75	167	129	172
80	123	107	132
85	65	60	72
90	0	0	0

ORDERING INFORMATION

SAMPLE NUMBER: GR8-232A-120V-EB81-U

Width Blank= 1' Width	Number of Lamps 2=2 Lamps (Not included)	Options GL=Single Element Fuse GM=Double Element Fuse Lamps=Lamps Installed Flex=Flex Installed EL=Emergency Installed	Ballast Type EB8 = T8 Electronic Start. Total Harmonic Distortion < 10% No. of Ballast 1, 2 or 3 EB8 / PLUS = T8 Electronic Start. Total Harmonic Distortion < 10% High Ballast Factor > 1.15 No. of Ballast 1, 2 or 3 ER8 = T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10% No. of Ballast 1, 2 or 3	Options FR=Fire Label	Packaging U=Unit Pack
Trim Type G=Grid/Lay-in (Standard) F=Flange Trim	Wattage 32=32W T8 (48")			Accessories EQ=T-BAR Safety Earthquake Clips ⁽¹⁾ FCS-XXW-U=Field Insatled Flange Kit	
Series R8=General Purpose T8 Commercial Troffer ⁽¹⁾	Shielding A=#12 Acrylic Pattern A125=#12 Pattern Acrylic (.125" Thick)				
	Voltage⁽²⁾ 120V=120 Volt 277V=277 Volt 347V=347 Volt UNV=Universal Voltage 120-277 ⁽⁴⁾				

L8841 = 800-series 4100K lamp
A3/8-2/18G = 3 wire flex

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. ⁽⁴⁾Not available when specifying emergencies, voltage must be specific.

For complete product data, reference the Fluorescent Specification binder. Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

SHIPPING INFORMATION

Catalog No.	Wt.
GR8-232A	19 lbs.

DESCRIPTION

The WN Series is a specification wraparound luminaire featuring energy efficient performance. The luminaire's clean, low profile design is both appealing and functional. The WN Series utilizes a clear, low brightness, extruded acrylic refractor for high performance and aesthetics.

The efficient and stylish WN Series is the perfect wraparound for schools, offices and other commercial and retail spaces.

COOPER LIGHTING - METALUX®

Catalog #	Type
Project	
Comments	Date
Prepared by	

SPECIFICATION FEATURES

Construction

Housing consists of die formed cold rolled steel. Ends formed with the housing for strength and provisions for continuous row aligners. Steel end plates with 7/8" KO and light-seal embossment. Ballast cover easily removed without tools.

Electrical*

Ballasts are CBM/ETL Class "P" and are positively secured by mounting bolt. Rotor lock lampholders. UL/CUL listed. Suitable for damp locations.

Finish

Multistage, prepaint ensures maximum bonding and rust prevention.

Lens

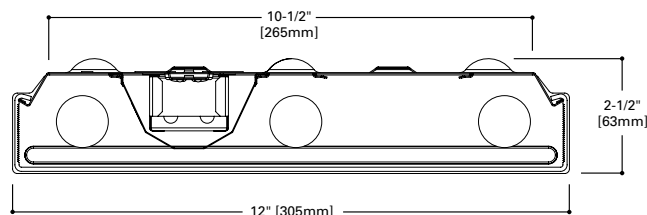
100% clear acrylic prismatic lens. Sides have inside linear prisms and bottom has pyramidal prisms for low brightness control.



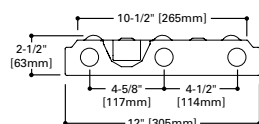
WN
328T8
332

4' SURFACE
3 T8 LAMPS

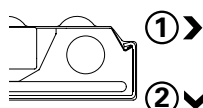
Commercial Wrap



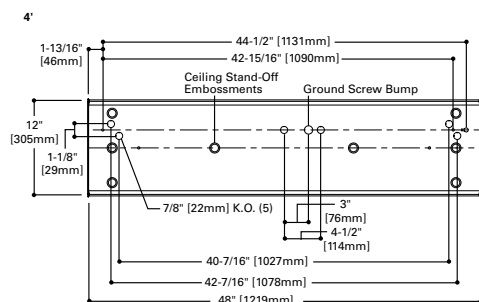
LAMP CONFIGURATIONS



LENS REMOVAL



MOUNTING DATA



ENERGY DATA

Input Watts:
EB Ballast & STD Lamps
328T8 (67)
332 (80)

Luminaire Efficacy Rating
LER = FW-84
Catalog Number: WN-332A
Yearly Cost of 1000 lumens,
3000 hrs at .08 KWH = \$2.86

*Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements.

LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

LINEAR DISCONNECT

Safe and convenient means of disconnecting power.

Job Name:
Sitka Trooper Academy

Catalog Number:
WN-332A-UNV-ER81-U

Notes: Provided with 800 series 4100K lamps

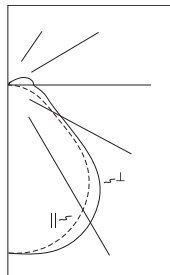
Type:

FL WRAP

GRASB13-928

WN T8

PHOTOMETRICS



WN-332-EB81-U
Energy Saving
Ballast

F32T8/35K Lamps
3100 Lumens

Spacing criterion:
(H) 1.3 x mounting
height, (L) 1.4 x
mounting height

Efficiency 83.5%

Test Report:
134P140

LER = FW-84

Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH = \$2.86

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	97	97	97	97		94	94	94	94		88	88	88		83	83	83		78	78	78		76
1	89	85	81	78		86	82	79	76		77	75	72		73	70	69		68	67	65		63
2	81	74	69	64		78	72	67	63		68	64	60		64	61	58		60	58	55		53
3	74	66	59	54		71	64	58	53		60	55	51		57	53	49		54	50	47		45
4	68	58	51	46		66	57	50	45		54	48	44		51	46	42		48	44	41		39
5	63	52	45	40		60	51	44	39		48	42	38		46	41	37		44	39	36		34
6	58	47	40	35		56	46	39	34		44	38	33		42	36	33		40	35	32		30
7	54	43	36	31		52	42	35	30		40	34	30		38	33	29		36	32	28		26
8	50	39	32	27		48	38	32	27		36	31	26		35	30	26		33	29	25		24
9	47	36	29	25		45	35	29	24		34	28	24		32	27	23		31	26	23		21
10	44	33	27	22		42	32	26	22		31	25	22		30	25	21		29	24	21		19

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	2026	21.8	26.1
0-40	3371	36.2	43.4
0-60	5704	61.3	73.5
0-90	7027	75.6	90.5
90-180	736	7.9	9.5
0-180	7762	83.5	100.0

Typical VCP Percentages

Room Size (Ft.)	Height Along		Height Across	
	8.5'	10.0'	8.5'	10.0'
20 x 20	51	56	44	51
30 x 30	43	48	33	40
30 x 60	36	40	19	24
60 x 30	42	47	37	44
60 x 60	34	38	20	25

Candela

Angle	Along H	45°	Across L
0	2455	2455	2455
5	2462	2473	2476
10	2449	2479	2502
15	2412	2470	2515
20	2347	2441	2495
25	2257	2383	2443
30	2143	2295	2356
35	2005	2177	2235
40	1831	2020	2076
45	1601	1801	1851
50	1267	1484	1491
55	914	1137	1104
60	702	864	855
65	557	654	706
70	440	496	619
75	319	379	554
80	202	303	483
85	98	242	413
90	8	172	361

ORDERING INFORMATION

SAMPLE NUMBER: WN-332A-UNV-EB81-U

Length Blank=4' Length	Voltage ⁽³⁾ 120V=120 Volt 277V=277 Volt 347V=347 Volt UNV=Universal Voltage 120-277 ⁽⁴⁾	Ballast Type ⁽⁵⁾ EB8 =T8 Electronic Instant Start. Total Harmonic Distortion < 10% No. of Ballast 1 or 2 EB8 /PLUS=T8 Electronic Instant Start. High Ballast Factor >1.13. Total Harmonic Distortion < 20% No. of Ballast 1 or 2 ER8 =T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10% No. of Ballast 1 or 2 ER8 /PLUS=T8 Electronic Program Start. High Ballast Factor >1.13. Total Harmonic Distortion < 10% No. of Ballast 1 or 2 HPT8 Ballast Ballast HB8_L =T8 Electronic Instant Start. Low Ballast Factor .77 HB8_N =T8 Electronic Instant Start. Normal Ballast Factor 1.0 HB8_H =T8 Electronic Instant Start. High Ballast Factor 1.15-1.2 HR8_DIM =T8 Electronic Program Start Step Dimming. Ballast Factor .88 HR8_L =T8 Electronic Program Start. Low Ballast Factor .77 HR8_N =T8 Electronic Program Start. Normal Ballast Factor 1.0 HR8_H =T8 Electronic Program Start. High Ballast Factor 1.15-1.2	Options DEC =Decorative End Cap CRA =Continuous Row Aligner Packaging U =Unit Pack
Series ⁽¹⁾ WN =Commercial Surface Wrap	Options GL =Single Element Fuse GM =Double Element Fuse EL =Emergency Installed ⁽⁶⁾		
Number of Lamps ⁽²⁾ 3 =3 Lamps (Not Included)			
Wattage 28T8 =28W T8 (48") ⁽⁶⁾ 32 =32W T8 (48")			
Lens A =Acrylic Refractor/Lens			

ACCESSORIES

WN-4LT-DEC-ENDS=Decorative End Caps - 3 or 4 Lamps (2 pieces)
WN-CRA=Continuous Row Aligner (1 only)

NOTES: ⁽¹⁾Steel endplates with 7/8" KO standard for continuous row mounting. ⁽²⁾Suspension mounting not recommended for 3 lamp models. ⁽³⁾Products also available in non-US voltage and frequencies for international markets. ⁽⁴⁾Not Available when specifying emergencies, voltage must be specified. ⁽⁵⁾A low profile battery pack is required for installation with standard ballast cover (consult Cooper Lighting). ⁽⁶⁾When utilizing 28W T8 lamps, HPT8 Ballast must be specified. Other ballast restrictions may apply. Consult your Cooper Lighting Representative for availability and ordering information.

For complete product data, reference the Fluorescent Specification binder. Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

SHIPPING DATA

Catalog No.	Wt.
WN-328T8A	12 lbs.
WN-332A	12 lbs.



Date: Nov 22, 2013

Graybar Electric Company, Inc.
1919 6th Avenue South
Seattle WA 98134
Phone: (206) 292-4848
Fax: (206) 701-2949

Job Name
Sitka Trooper Academy

Bid Date
Nov 13, 2013

Submittal Date
Nov 13, 2013



Transmittal

Graybar Electric Company, Inc.
1919 6th Avenue South
Seattle WA 98134
Phone: (206) 292-4848
From: Shawn Mitchell

Project **Sitka Trooper Academy**
Location

Contact:

ATTACHED WE ARE SENDING YOU 0 COPIES OF THE FOLLOWING ITEMS:

- | | | |
|-----------------------------------|--|--------|
| <input type="checkbox"/> Drawings | <input type="checkbox"/> Specifications | Other: |
| <input type="checkbox"/> Prints | <input type="checkbox"/> Information | |
| <input type="checkbox"/> Plans | <input checked="" type="checkbox"/> Submittals | |

THESE ARE TRANSMITTED FOR:

- | | | |
|--|---|---------------------------------|
| <input type="checkbox"/> Prior Approval | <input type="checkbox"/> Resubmittal for Approval | <input type="checkbox"/> Record |
| <input checked="" type="checkbox"/> Approval | <input type="checkbox"/> Corrections | Bids due on: |
| <input type="checkbox"/> Approval as Submitted | <input type="checkbox"/> Your Use | Other: |
| <input type="checkbox"/> Approval as Noted | <input type="checkbox"/> Review and Comment | |

Type	MFG	Part
LED 2X2	COOPER	2GR LD1 32 A125 UNV FLEX L835 CD 1 U
FL 2X2	COOPER	2GR8 2U6T8 A125 UNV FLEX LAMPS(835) EB81 U

COOPER LIGHTING - METALUX®



DESCRIPTION

GR LED is a lensed troffer series. This high quality luminaire is dedicated to the latest solid state lighting and electronic driver technology for optimal performance and energy efficiency. The GR LED is compatible with all of today's popular ceiling systems and is available with a number of options and accessories for application versatility.

The GR LED series features efficiency, quality and performance. The series is an excellent choice for commercial office spaces, schools, hospitals or retail merchandising areas.

Catalog #	Type
Project	
Comments	Date
Prepared by	

SPECIFICATION FEATURES

Construction

Rigid housing is die formed of code gauge prime cold rolled steel and features full length die-formed stiffeners and unibody endplate for added strength. Side flanges are hemmed. Innovative design provides superior lens brightness uniformity and visual comfort. Unibody endplates are securely attached with interlocking tabs and screws. Four auxiliary fixture end suspension points provided. Grid-lock feature for safety and convenience.

Controls

The GR LED is equipped standard with a 0-10V continuous dimming driver that works with any standard 0-10V control/dimmer. Combine with energy-saving products like occupancy sensors, daylighting controls, and lighting relay panels from Cooper Controls (www.coopercontrol.com) to maximize energy savings.

Electrical

Long-Life LED system coupled with electrical driver to deliver optimal performance. LED's available in 3500k or 4000k with typical CRI 85. Projected life is 50,000 hours at 70% lumen output. cULus listed. Electronic drivers are available for 120-277V applications. A 0-10V dimming driver is standard.

Finish

Multistage, iron phosphate pretreatment ensures maximum bonding and rust inhibition. Housing and driver cover finished with new 90% reflective white enamel for superior performance. "PAF" Painted After Fabrication option also available.

Hinging/Latching

Positive spring loaded steel latches with baked white enamel finish. Safety-lock T-hinges allow hinging and latching either side.

Frame/Shielding

Die formed, heavy gauge, flat steel door with reinforced mitered corners and baked white enamel finish. Flat and regressed aluminum doors also available. Positive light seals. Light stabilized, acrylic prismatic lens. Standard #12 pattern.

Compliance

Modules are UL recognized components and indoor luminaires are cULus listed for 25°C ambient environments, RoHS compliant, and LED modules comply with IESNA LM-79 and LM-80 standards. DesignLights™ Consortium Qualified.



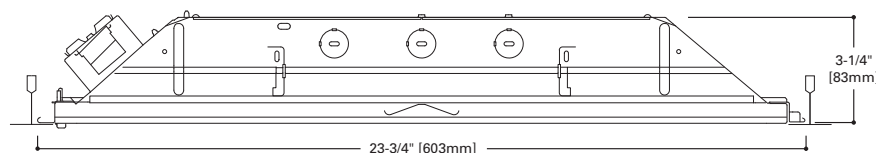
2GR LED

2' X 2' LED TROFFER

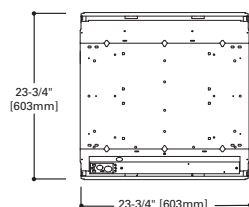
General Recessed LED Troffer

For Use in Insulated Ceilings

DESIGNLIGHTS
CONSORTIUM



MOUNTING DATA



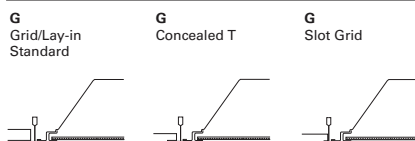
DOOR FRAMES



ENERGY DATA

Input Watts:
32=36W
43=49W

CEILING COMPATIBILITY



COOPER LIGHTING

Ceiling Type	Trim Type
Exposed Grid	G
Concealed T	G
Slot Grid	G

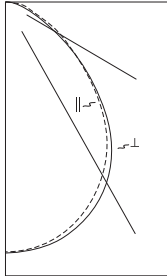
(Verify compatibility/ consult factory.)

LINEAR DISCONNECT

Safe and convenient means of disconnecting power.



ADF121759

2 GR LED**PHOTOMETRICS****2GR-LD1-32-A-UNV-L835-CD1-U**

Dimming Driver

Linear LED 3500K

Spacing criterion:

(H) 1.2 x mounting

height, (L) 1.2 x

mounting height

Efficiency: 100%

Lumens: 3221

Input Watts: 36.2W

Efficacy: 89 LPW

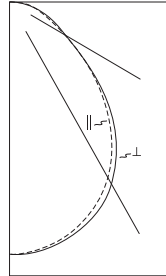
Test Report:

2GR-LD1-32-A-UNV-

L835-CD1-U.IES

Candlepower

Angle	Along H	45°	Across L
0	1470	1470	1470
5	1465	1461	1471
10	1438	1437	1451
15	1391	1396	1415
20	1328	1335	1361
25	1250	1258	1296
30	1150	1165	1204
35	1038	1050	1085
40	896	904	945
45	740	758	784
50	596	621	604
55	471	461	463
60	362	331	352
65	271	223	266
70	199	145	203
75	143	105	161
80	104	85	123
85	57	50	70
90	0	0	0

**2GR-LD1-43-A-UNV-L835-CD1-U**

Dimming Driver

Linear LED 3500K

Spacing criterion:

(H) 1.2 x mounting

height, (L) 1.2 x

mounting height

Efficiency: 100%

Lumens: 4351

Input Watts: 48.9W

Efficacy: 89 LPW

Test Report:

2GR-LD1-43-A-UNV-

L835-CD1-U.IES

Candlepower

Angle	Along H	45°	Across L
0	1987	1987	1987
5	1976	1971	1987
10	1939	1940	1959
15	1879	1883	1910
20	1796	1804	1840
25	1686	1698	1749
30	1557	1571	1626
35	1399	1415	1469
40	1210	1221	1268
45	1004	1023	1054
50	809	839	815
55	639	626	627
60	493	445	479
65	368	300	358
70	271	194	274
75	192	142	218
80	142	115	166
85	78	68	97
90	0	0	0

Coefficients of Utilization

rc	Effective floor cavity reflectance 20%				20%				30%				10%				0%			
	70%	50%	30%	10%	70%	50%	30%	10%	70%	50%	30%	10%	70%	50%	30%	10%	70%	50%	30%	10%
RCR	70	50	30	10	70	50	30	10	70	50	30	10	70	50	30	10	70	50	30	10
0	119	119	119	119	116	116	116	116	111	111	111	111	106	106	106	106	102	102	102	100
1	110	106	102	98	107	103	100	97	99	96	94	95	93	91	92	90	88	86	86	86
2	101	94	87	82	99	92	86	81	88	84	79	85	81	78	82	79	76	74	74	74
3	93	83	76	70	91	82	75	69	79	73	68	76	71	67	74	70	66	64	64	64
4	86	75	67	61	84	74	66	60	71	65	59	69	63	59	67	62	58	56	56	56
5	79	68	59	53	77	66	59	53	64	58	52	63	56	52	61	55	51	49	49	49
6	74	61	53	47	72	60	53	47	59	52	46	57	51	46	56	50	46	44	44	44
7	69	56	48	42	67	55	47	42	54	47	42	52	46	41	51	45	41	39	39	39
8	64	51	43	38	63	51	43	38	49	43	38	48	42	37	47	41	37	35	35	35
9	60	47	40	34	59	47	39	34	46	39	34	45	38	34	44	38	34	32	32	32
10	57	44	36	31	55	43	36	31	42	36	31	42	35	31	41	35	31	29	29	29

Zonal Lumen Summary

Zone	Lumens	%Fixture
0-30	1115	34.6
0-40	1170	55.0
0-60	2772	86.1
0-90	3221	100.0
0-180	3221	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	3350	3432	3549
55	2629	2573	2584
65	2053	1689	2015
75	1769	1299	1991
85	2094	1837	2571

Coefficients of Utilization

rc	Effective floor cavity reflectance 20%				20%				30%				10%				0%			
	70%	50%	30%	10%	70%	50%	30%	10%	70%	50%	30%	10%	70%	50%	30%	10%	70%	50%	30%	10%
RCR	70	50	30	10	70	50	30	10	70	50	30	10	70	50	30	10	70	50	30	10
0	119	119	119	119	116	116	116	116	111	111	111	111	106	106	106	106	102	102	102	100
1	110	106	102	98	107	103	100	97	99	96	94	95	93	91	92	90	88	86	86	86
2	101	94	87	82	99	92	86	81	88	83	79	85	81	78	82	79	76	74	74	74
3	93	83	76	70	91	82	75	69	79	73	68	76	71	67	74	70	66	64	64	64
4	86	75	67	61	84	74	66	60	71	65	59	69	63	59	67	62	58	56	56	56
5	79	68	59	53	77	66	59	53	64	58	52	63	56	52	61	55	51	49	49	49
6	74	61	53	47	72	60	53	47	59	52	46	57	51	46	56	50	46	44	44	44
7	69	56	48	42	67	55	47	42	54	47	42	52	46	41	51	45	41	39	39	39
8	64	51	43	38	63	51	43	38	49	43	38	48	42	37	47	41	37	35	35	35
9	60	47	40	34	59	47	39	34	46	39	34	45	38	34	44	38	34	32	32	32
10	57	44	36	31	55	43	36	31	42	36	31	42	35	31	41	35	31	29	29	29

Zonal Lumen Summary

Zone	Lumens	%Fixture
0-30	1505	34.6
0-40	2389	54.9
0-60	3744	86.1
0-90	4351	100.0
0-180	4351	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	4545	4631	4772
55	3566	3494	3500
65	2788	2272	2712
75	2375	1756	2696
85	2865	2498	3563

ORDERING INFORMATION

SAMPLE NUMBER: 2GR-LD1-32-A-UNV-L835-CD1-U

Rating Blank=Standard ATW-SW4=Chicago Rated	LED Type LD1=LED 1.0	Voltage ⁽²⁾ UNV=Universal Voltage 120-277 ⁽²⁾	CCT L835=3500K L840=4000K	Driver Type CD=0-10V Dimming Driver	Options PAF=Painted After Fabrication G1=Gasket, Door Frame and Housing G2=G1 plus Gasket between Lens and Door G3=G1 and G2 plus Gasketing on Mounting Surface of Fixture Trims	Packaging U=Unit Pack PALC=Palettized Fixtures In Carton
Width 2=2' Width	LED Lumens Output ⁽⁵⁾ 32=3200 43=4300	Options GL=Single Element Fuse GM=Double Element Fuse Flex=Flex Installed EL=Emergency Installed ⁽⁶⁾	Number of Drivers 1=1 Driver			
Trim Type ⁽⁶⁾ G=Grid/Lay-in (Standard) ⁽¹⁾ G=Concealed T G=Slot Grid	Shielding A=A12 .095 A125=A12 .125 A125MIN=A12 .125 MIN A19/156=A19 .156 F=A12 .095 Frost F125=A12 .125 Frost ND=No Door					
Series R=General Purpose Troffer						
Door Frame Standard=Flat White Steel Door (Leave Blank) FA=Flush White Extruded Aluminum Low Spring Latch RA=Regressed White Extruded Aluminum FAN=Flush Natural Anodized Extruded Aluminum RAN=Regressed Natural Anodized Extruded Aluminum FAB=Flush Black Extruded Aluminum RAB=Regressed Black Extruded Aluminum						

ACCESSORIESEQ-CLIP-U=T-BAR Safety Earthquake Clips⁽¹⁾
DF-22-W=2' x 2' Drywall Frame Kit

NOTES: ⁽¹⁾ An EQ Grid Clip is recommended for all 9/16" ceiling systems. ⁽²⁾ Products also available in non-US voltages and frequencies for international markets. ⁽³⁾ Not available when specifying emergencies, voltage must be specific. ⁽⁴⁾ Call factory. ⁽⁵⁾ Nominal lumen output. ⁽⁶⁾ DesignLights™ Consortium Qualified (high lumen only). Refer to www.designlights.org Qualified Products List under Family Models for details.

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

SHIPPING INFORMATION

Catalog No.	Wt.
2GR-LD1-32	10 lbs.
2GR-LD1-43	10 lbs.

COOPER LIGHTING - METALUX®

DESCRIPTION

The GR8 is a T8-dedicated lensed troffer designed to offer premium performance in a low profile housing. T8 dedication and optimized lamp to lens spacing provides the best in energy efficiency and optical control. The GR8's shallow, low profile housing is compatible with even highly restrictive plenums. Luminaires are compatible with today's popular ceiling systems. The GR8 offers great performance and great quality. The series is an excellent choice for commercial offices, schools, hospitals, retail merchandising and many other applications.

SPECIFICATION FEATURES

Construction

Unitized low profile recessed housing is die formed of code gauge prime cold rolled steel with full length stiffeners and unibody endplate for added strength. Ballast cover is easily removed without tools. Die formed captive lampholder bracket fully encloses lampholder wiring for easy lampholder replacement. Ample KOs are provided for continuous row wiring. Built-in grid-lock feature for safety and convenience.

Electrical**

Ballasts are CBM/ETL Class "P" and are positively secured by mounting bolts. Rotor-lock T8 lampholders. Biaxial models use 2G11 base lampholders with double-edge wiping action pressure-lock contacts and horizontally oriented lamp support clips. UL/CUL listed. Suitable for damp locations.

Finish

Multistage, iron phosphate pretreatment ensures maximum bonding and rust inhibition. Lighting grade baked white enamel finish with premium reflectance for high efficiency.

Hinging/Latching

Positive spring loaded steel latches and safety lock T-hinges provide secure, high quality door fit and allow hinging and latching from either side.

Frame/Shielding

Heavy gauge flat steel door is die formed with reinforced mitered corners. Housing and door frame assemblies incorporate full width mechanical light traps. Light stabilized, acrylic prismatic lens.

Controls

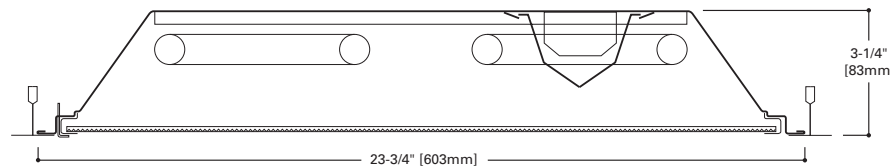
Fifth Light ballast options are offered for both 0-10V continuous dimming and DALI applications. Combine with energy-saving products like occupancy sensors, daylighting controls, and lighting relay panels from Cooper Controls (www.coopercontrol.com) to maximize energy savings.



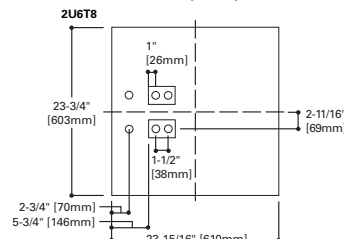
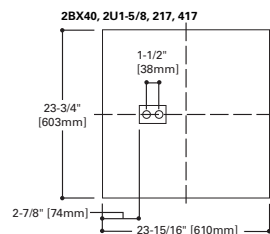
2GR8
2U6T8, 2BX40
2U1-5/8
217, 417

2' X 2' TROFFER
2 OR 4 LAMPS

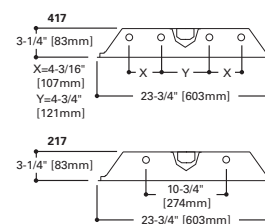
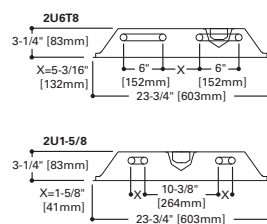
General Purpose
T8 Commercial Troffer



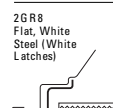
MOUNTING DATA



LAMP CONFIGURATIONS



DOOR FRAMES



CEILING COMPATIBILITY



COOPER LIGHTING

Ceiling Type	Trim Type
Exposed Grid	G
Concealed T	G
Slot Grid	G
Flange	G***

ENERGY DATA

Input Watts:

EB Ballast & STD Lamps

217 (36), 2U1-5/8 (61), 2U6T8 (61)
417 (63), 2BX40 (71)

ES Ballast & STD Lamps

217 (45), 2U1-5/8 (71), 2U6T8 (71)
417 (90), 2BX40 (77)

Luminaire Efficacy Rating

LER = FL-73

Catalog Number: 2GR8-2U6T8A

Yearly Cost of 1000 lumens, 3000
hrs at .08 KWH = \$3.29

*Standard G (Grid) Type Fixtures can be field converted by adding trim kits. See Compatibility Section or Consult Factory.

**Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements.

***When ordering Flange Kit for installation in drywall ceilings, see options and accessories compatibility section and ordering logic.

LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

LINEAR DISCONNECT

Safe and convenient means of disconnecting power.



ADF012705

Job Name:
Sitka Trooper Academy

Catalog Number:
2GR8 2U6T8 A125 UNV FLEX
LAMPS(835) EB81 U

Notes:

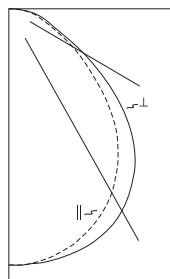
Type:

FL 2X2

GRASB13-928

2 GR 8

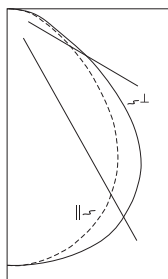
PHOTOMETRICS



2GR8-2U6T8A
Electronic Ballast
(2) 31W U6T8 lamps
2850 lumens
Spacing criterion:
(II) 1.2 x mounting
height, (L) 1.3 x
mounting height
Efficiency 77.1%
Test Report:
2GR82U6T8A.IES
LER = FL-73
Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH = \$3.29

Candela

Angle	Along II	45°	Across L
0	1775	1775	1775
5	1771	1769	1773
10	1742	1749	1768
15	1696	1717	1749
20	1629	1672	1719
25	1547	1607	1670
30	1443	1522	1591
35	1317	1406	1486
40	1171	1264	1363
45	996	1075	1195
50	805	877	993
55	638	688	780
60	491	495	574
65	361	330	406
70	271	224	307
75	210	175	245
80	153	146	179
85	82	86	90
90	0	0	0



2GR8-217A
Electronic Ballast
(2) F32T8 lamps
1350 lumens
Spacing criterion:
(II) 1.2 x mounting
height, (L) 1.4 x
mounting height
Efficiency 75.1%
Test Report:
2GR8-217A.IES
LER = FL-60
Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH = \$4.00

Candela

Angle	Along II	45°	Across L
0	795	795	795
5	794	792	796
10	782	785	794
15	763	774	790
20	734	756	781
25	699	731	765
30	652	697	734
35	597	648	695
40	528	586	646
45	449	503	574
50	363	413	478
55	287	325	371
60	220	235	273
65	165	155	189
70	123	104	143
75	96	81	112
80	70	68	82
85	38	39	40
90	0	0	0

Coefficients of Utilization

Effective floor cavity reflectance 20%												
rc	80%				70%				50%			
rw	70	50	30	10	70	50	30	10	50	30	10	0
RCR												
0	92	92	92	92	90	90	90	90	86	86	86	86
1	84	81	78	75	82	79	77	74	76	74	72	73
2	77	72	67	63	75	70	66	62	67	64	60	65
3	71	63	58	53	69	62	57	52	60	55	51	58
4	65	57	50	45	64	56	50	45	54	49	45	52
5	60	51	44	40	59	50	44	39	49	43	39	47
6	56	46	40	35	55	45	39	35	44	39	34	43
7	52	42	36	31	51	41	35	31	40	35	31	39
8	49	38	32	28	47	38	32	28	37	31	27	36
9	45	35	29	25	44	35	29	25	34	29	25	33
10	43	33	27	23	42	32	27	23	32	26	23	31

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	1394	24.5	31.7
0-40	2269	39.8	51.6
0-60	3729	65.4	84.8
0-90	4398	77.1	100.0
0-180	4398	77.1	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	3789	4090	4546
55	2992	3227	3658
65	2298	2100	2584
75	2183	1819	2546
85	2531	2654	2778

Coefficients of Utilization

Effective floor cavity reflectance 20%												
rc	80%				70%				50%			
rw	70	50	30	10	70	50	30	10	50	30	10	0
RCR												
0	89	89	89	89	87	87	87	87	83	83	83	80
1	82	79	76	73	80	77	74	72	74	72	70	71
2	75	70	65	61	73	68	64	60	66	62	59	63
3	69	62	56	51	67	61	55	51	58	54	50	56
4	64	55	49	44	62	54	48	44	52	47	43	51
5	59	49	43	38	57	49	43	38	47	42	38	46
6	54	45	38	34	53	44	38	34	43	37	33	41
7	50	41	34	30	49	40	34	30	39	34	30	38
8	47	37	31	27	46	37	31	27	36	30	27	35
9	44	34	28	24	43	34	28	24	33	28	24	32
10	41	32	26	22	40	31	26	22	30	25	22	29

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	631	23.4	31.1
0-40	1035	38.3	51.0
0-60	1718	63.6	84.7
0-90	2027	75.1	100.0
0-180	2027	75.1	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	2231	2499	2852
55	1758	1991	2273
65	1372	1289	1571
75	1303	1100	1520
85	1532	1572	1613



Job Name:
Sitka Trooper Academy

Catalog Number:
2GR8 2U6T8 A125 UNV FLEX
LAMPS(835) EB81 U

Notes:

Type:

FL 2X2

GRASB13-928

2 GR 8

ORDERING INFORMATION

SAMPLE NUMBER: 2GR8-2U6T8A-UNV-EB81-U

Rating ⁽⁴⁾ Blank=Standard ATW-SW4=Chicago Rated	Number of Lamps 2=2 Lamps 4=4 Lamps ⁽¹⁴⁾ (Not included)	Voltage ⁽²⁾ 347V=347 Volt UNV=Universal Voltage 120-277 ⁽³⁾
Width 2=2' Width	Wattage 17=17W T8 (24") U6T8=32W (24") ⁽²⁾ U1-5/8=31W T8 (24") ⁽⁸⁾ BX40=40W Bi axial (24")	Options GL=Single Element Fuse GM=Double Element Fuse Lamps=Lamps Installed Flex=Flex Installed EL=Emergency Installed
Trim Type G=Grid/Lay-in (Standard)	Shielding A=#12 Acrylic Pattern A125=#12 Pattern Acrylic (.125" Thick) A19/156=#19 Pattern Acrylic (.156" Thick) PB1S=Silver Parabolic Louver Flanged (1/2" x 1/2" x 1/2")	
Series R8=General Purpose T8 Commercial Troffer ⁽¹⁾		

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⁾Not available when specifying emergencies, voltage must be specific. ⁽⁴⁾For NYC rated product, see separate specification sheets. ⁽⁵⁾4-Lamp configuration only available in 17W. ⁽⁶⁾Not available in UNV voltages. Must specify voltage. ⁽⁷⁾Ballast Factor is 0.88 for 4 lamp 32W T8 fixtures. ⁽⁸⁾Fifthlight ballast option not available. ⁽⁹⁾For a complete listing of Fifthlight Technology products and other solutions from Cooper Controls, visit www.coopercontrol.com. ⁽¹⁰⁾0-10V ballast do not include DALI feature. Please select DALI ballast for use with Fifth Light system. ⁽¹¹⁾Specification grade 0-10V dimming ballast are NEMA premium and CEE listed. They are compatible with low mercury and energy saving lamps. ⁽¹²⁾Specification Grade 0-10V ballast not offered in 3 or 4-lamp versions. ⁽¹³⁾Standard 0-10V ballast not available for Bi axial lamps. ⁽¹⁴⁾Standard 0-10V ballast not offered in 3 or 4-lamp versions

For complete product data, reference the Fluorescent Specification binder. Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

Single Ballast

Ballast Type
EB8_=T8 Electronic Start. Total Harmonic Distortion < 10%
EB8_/PLUS= T8 Electronic Start. Total Harmonic Distortion < 10%.
ER8_= T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%
EB5_=T5 Biax Electronic Instant Start. Total Harmonic Distortion < 20%⁽⁶⁾
TEB5_=T5 Biax Electronic Instant Start. Total Harmonic Distortion < 10%⁽⁶⁾
ER5_=T5 Biax Electronic Program Rapid Start. Total Harmonic Distortion < 10%
High Performance T8 Ballasts
HB8_=T8 Electronic Instant Start. Total Harmonic Distortion < 10%. Standard Ballast Factor .86 – .88
HB8_L=T8 Electronic Instant Start. Total Harmonic Distortion < 10%. Low Ballast Factor .77 – .82
HB8_N=T8 Electronic Instant Start. Total Harmonic Distortion < 10%. Normal Ballast Factor 1.0
HB8_H=T8 Electronic Instant Start. Total Harmonic Distortion < 10%. High Ballast Factor 1.15 – 1.20
HR8_=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%. Standard Ballast Factor .86 – .88
HR8_DIM=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%. Step Dimming. Ballast Factor .88
HR8_L=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%. Low Ballast Factor .71 – .79
HR8_H=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%. High Ballast Factor 1.15 – 1.20
0-10V Dimming Ballasts⁽¹⁰⁾
SLTV8_=T8 0-10V Program Rapid Start. Total Harmonic Distortion < 10%. Ballast Factor 0.87^{(14), (15)}
SLTVS8_=T8 0-10V Spec Grade Program Rapid Start. Total Harmonic Distortion < 10%. Ballast Factor 0.87^{(11), (12), (13)}
Fifth Light DALI Ballasts⁽⁹⁾
5LT8_=T8 DALI Program Rapid Start. Total Harmonic Distortion < 10%. Ballast Factor 1.0
5LTSB_=T5 Biax DALI Program Rapid Start. Total Harmonic Distortion < 10%. Ballast Factor 1.0

Number of Ballasts
1=1 Ballast
2=2 Ballasts
3=3 Ballasts

Options
FR=Fire Label
Packaging
U=Unit Pack

ACCESSORIES

EQ-CLIP-U=T-BAR Safety Earthquake Clips⁽¹⁾
FCTKA-22W-U=Field Installed Flange Kit

FCTK Trim Kit Field Convertible Aluminum	A - 24 22=2' x 2' 24=2' x 4'	R W - U N=Natural W=White Blank=Single R=In Row E=End Row U=Unit Pack
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SHIPPING INFORMATION

Catalog No.	Wt.
2GR8-217A	12 lbs.
2GR8-417A	12 lbs.
2GR8-2U6T8A	12 lbs.
2GR8-2U1-5/8A	12 lbs.
2GR8-2BX40A	15 lbs.