

# MRG OIL AND GAS

## CE PAD

EE-SAR-000-001-1

### Lighting Mitigation Plan

Prepared by: David Nowicki, PE



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[www.camposepc.com](http://www.camposepc.com)

No.	Description	Approval	Date
0	Issued As Attachment To The Permit	DN	08/03/2022
1	Issued As Attachment To The Permit – Sound Walls Added	DN	9/26/2022
2	Issued As Attachment To The Permit – Production Pad Light Type Changed, Plan Added	DN	5/3/2023



## EE-SAR- 000-001-1 Lighting Mitigation Plan

Client:	MRG Oil and Gas	Rev	Date	Description
Project:	CE Pad	2	05/03/23	Issued As Attachment To The Permit

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	 <b>CAMPOS   EPC</b>		
<b>REPORT</b>			
<b>Client:</b>	MRG Oil and Gas	<b>Rev</b>	<b>Date</b>
<b>Project:</b>	CE Well Pad	2	5/03/22

## A. Summary

Campos EPC, LLC (CEPC) was retained by Ardor Environmental to develop a lighting mitigation plan for MRG Oil and Gas CE pad that included preproduction and production phases of the site development. This report demonstrates compliance with the Colorado Oil and Gas Conservation Commission (COGCC) Rule 424, City of Loveland Division 18.09.02 Lighting Ordinances, Larimer County Code of Ordinances 4.10 Exterior Lighting, and Larimer County Code of Ordinances 11.3.13 Lighting and Visual Impacts.

Lighting impacts are summarized below.

Category - Lumens Per Square Foot	Calculated Value	Limit
Preproduction Drilling Phase (lm/ft <sup>2</sup> )	11.9 lm/ft <sup>2</sup>	≤ 12 lm/ft <sup>2</sup>
Preproduction Completions Phase (lm/ft <sup>2</sup> )	9.9 lm/ft <sup>2</sup>	≤ 12 lm/ft <sup>2</sup>
Production (lm/ft <sup>2</sup> )	0.1 lm/ft <sup>2</sup>	≤ 5 lm/ft <sup>2</sup>

Category - Impacts on RBU within 1 mile	Calculated Value	Limit
Preproduction Drilling Maximum (lux)	0.1 lux	≤ 4.0 lux
Preproduction Completions Maximum (lux)	0.1 lux	≤ 4.0 lux
Production (lux)	≤ 0.1 lux	≤ 4.0 lux

All calculated values are within the prescribed limits.



				
<b>REPORT</b>				
<b>Client:</b>	MRG Oil and Gas	<b>Rev</b>	<b>Date</b>	<b>Description</b>
<b>Project:</b>	CE Well Pad	2	5/03/22	Issued As Attachment To The Permit

## B. Codes, Standards, Practices, and Software

The following was relied upon for this report.

Colorado Oil and Gas Conservation Commission (COGCC) Rule 424 Lighting

Lamier County, Land Use Code Article 4.10 Exterior Lighting

Lamier County, Land Use Code Article 11.0 Oil and Gas Facilities, 11.3.13 Lighting and Visual Impacts

City of Loveland Ordinances, Division 18.09.02

DIALux evo Version 10.1

AGI 32 Photometric Toolbox Version 2.9

## C. Methodology

For lighting impacts on Residential Building Units (RBU) within 1 mile, a three-dimensional lighting model was developed which encompasses the surrounding area of the site topology for 1 mile. RBU locations were identified within the 1-mile radius of the site and a vertical wall simulated. The lighting model simulated impacts on the residential building units up to 1 mile for the preproduction and production phases. The calculated values were summarized and compared to regulatory limits.

For compliance for lumens per hardscape, exterior fixtures light output information was gathered that indicates light fixture output in lumens. Exterior lights light output was summarized based on type, lumen output, and number of lights for the site based on the phase. The total site lumen output was ratioed to the site hardscape and compared to the regulatory limits.

The models developed for the preproduction phases are based on current lighting systems for drilling and completions. Due to the nature of rental equipment and availability, portable light towers are subject to change and the models are based on current available units.

The following assumptions were relied upon for this report.

- The height of the drill rig is 155 feet.
- Zero degrees (0°) represents a luminaire facing directly downward.
- Intermittent sources of lights for alarms lights are not included in this analysis.
- The quantity, placement and calculated values shown represent an estimated upper limit based on the model and lighting analysis.



	 <b>CAMPOS   EPC</b>		
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## D. Best Management Practices

The following best management practices are used during the preproduction phases.

- Lights are angled away from surrounding off site buildings
- Lighting for preproduction has been reduced to provide a minimum acceptable level for safe operation.
- Lights are switched off when not required.
- Lights are directed to task areas only.
- Light masts are automatically switched on and off based on a lighting sensor.

The following best management practices are used for the production phase.

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- Lighting levels do not exceed 10-foot candles.
- Type H lights are full cutoff and mounted outside of any hazardous areas.
- Type H lights fixtures are mounted at a height of 12 feet above grade.
- Lights are to be provided with a photocell sensor which automatically turns on when at dusk and turns off during daylight hours.

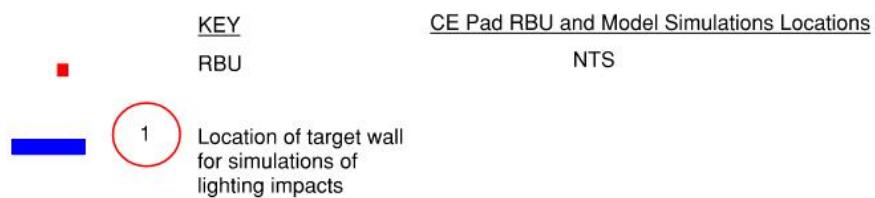
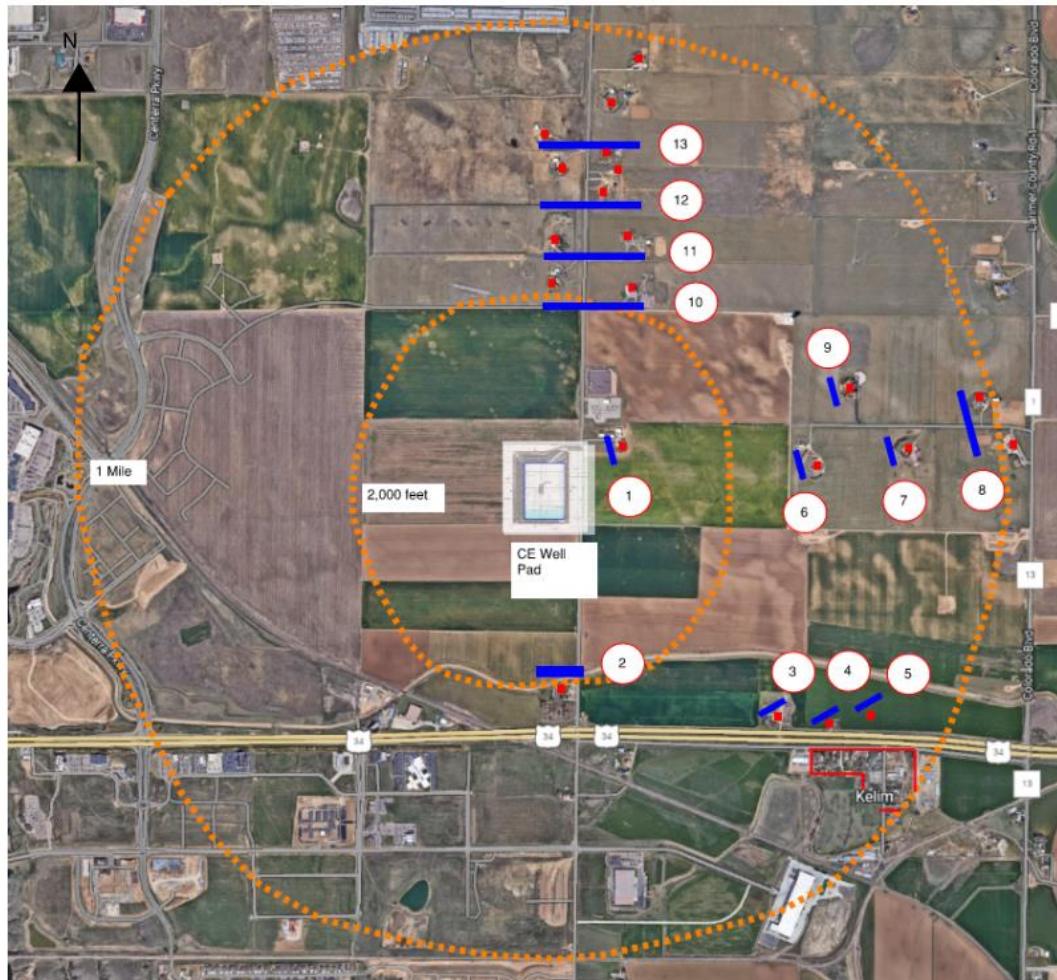


**REPORT**

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## E. Lighting Impacts up to 1 mile

The following locations were used to determine lighting impacts on RBU within 1 mile.



**REPORT**

Client:	MRG Oil and Gas	Rev	Date	Description
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The following are the results of the simulations.

Preproduction Drilling

Target Wall Number	Resulting Impact
1	0.1 lux
2	< 0.1 lux
3	< 0.1 lux
4	< 0.1 lux
5	< 0.1 lux
6	< 0.1 lux
7	< 0.1 lux
8	< 0.1 lux
9	< 0.1 lux
10	< 0.1 lux
11	< 0.1 lux
12	< 0.1 lux
13	< 0.1 lux

Preproduction Completions

Target Wall Number	Resulting Impact
1	< 0.1 lux
2	< 0.1 lux
3	< 0.1 lux
4	< 0.1 lux
5	< 0.1 lux
6	< 0.1 lux
7	< 0.1 lux
8	< 0.1 lux
9	< 0.1 lux
10	0.1 lux
11	0.1 lux
12	0.1 lux
13	0.1 lux

**REPORT**

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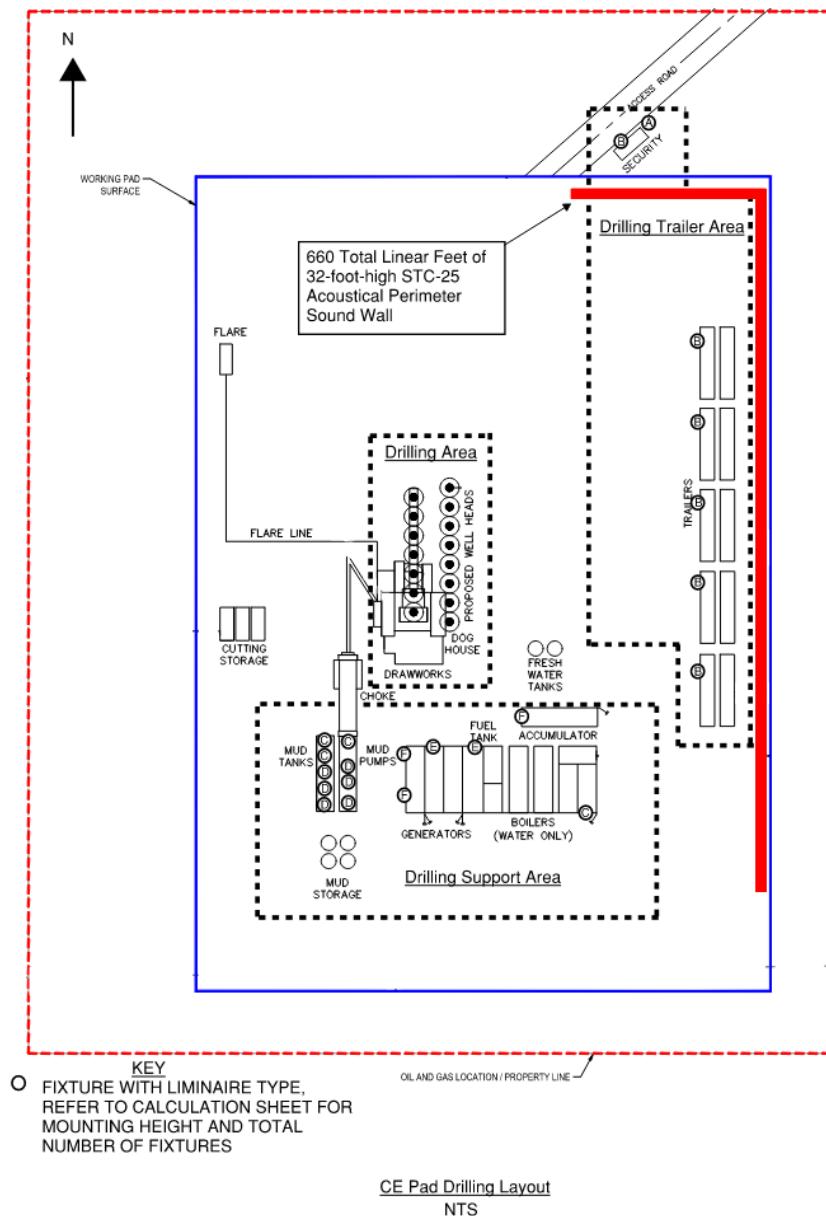
Production

Target Wall Number	Resulting Impact
1	< 0.1 lux
2	< 0.1 lux
3	< 0.1 lux
4	< 0.1 lux
5	< 0.1 lux
6	< 0.1 lux
7	< 0.1 lux
8	< 0.1 lux
9	< 0.1 lux
10	< 0.1 lux
11	< 0.1 lux
12	< 0.1 lux
13	< 0.1 lux

**REPORT**

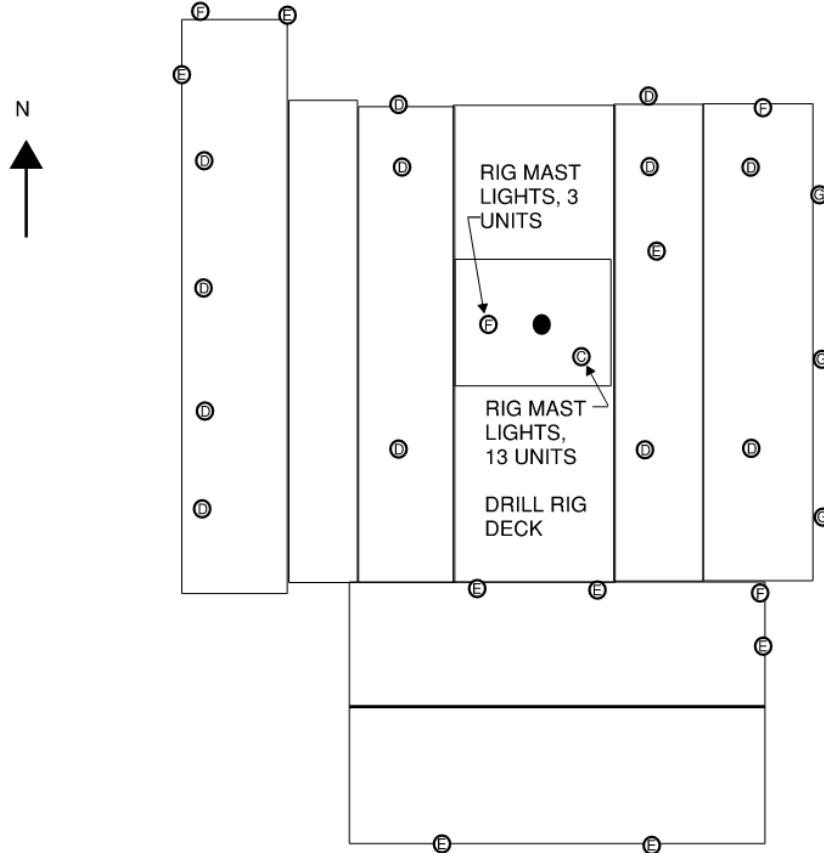
Client:	MRG Oil and Gas	Rev	Date	Description
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The following lighting layouts were used for the calculation of lumens per square foot.

Preproduction Drilling


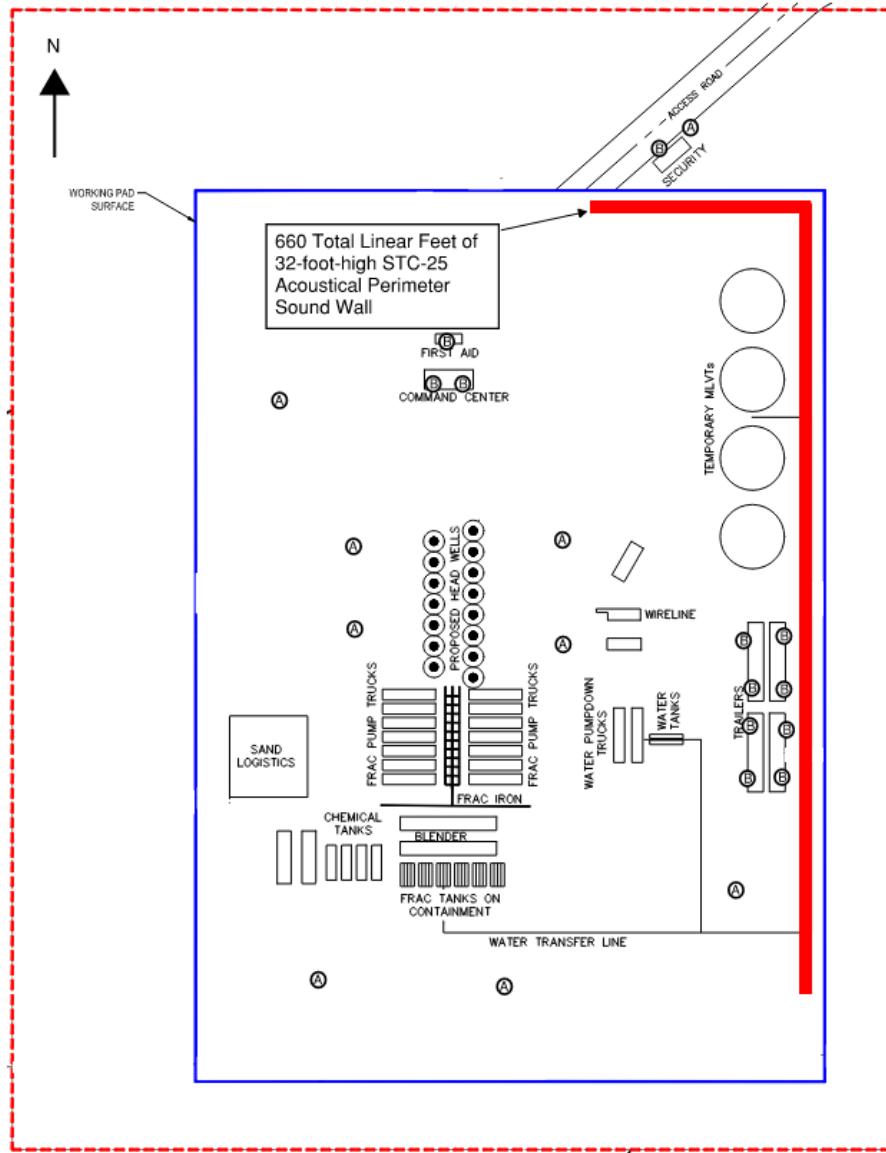
**REPORT**

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Preproduction Drilling Rig


**REPORT**

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Preproduction Completions


**KEY**

- FIXTURE WITH LIMINAIRE TYPE,  
REFER TO CALCULATION SHEET FOR  
MOUNTING HEIGHT AND TOTAL  
NUMBER OF FIXTURES

CE Pad Completions Layout  
NTS

<b>REPORT</b>				
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#### Production Pad

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For Production Pad Calculations Refer to Attachment 3

For the luminaire description and photometric plan refer to MRG OIL AND GAS CE PRODUCTION PAD, SHEET 001 LUMINAIRE DESCRIPTION AND SCHEDULE AND SHEET 002 PHOTOMETRIC PLAN

#### F. Attachments

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Attachment 1 Preproduction Drilling Calculations Rev 0

Attachment 2 Preproduction Completions Calculations Rev 0

Attachment 3 Production Calculations Rev 1

Attachment 4 Luminaire Information Rev 0

#### G. Reference

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MRG OIL AND GAS CE PRODUCTION PAD, SHEET 001 REV 0 AND SHEET 002, REV 0



# Attachment 1

# Preproduction Drilling

# Calculations

Client: MRG Oil and Gas

Project: CE Well Pad

Date: 8/3/22

Revision: 0 Issued As Attachment To The Permit

Preproduction Drilling Summation	
Lumens Per Square Foot	
Site Hardscape (Footage):	87,120 ft <sup>2</sup>
Site Acres:	2.00 ACRES
Site Total Lumens:	1,038,871 lm
Base Allowance:	12 lm/(ft <sup>2</sup> )
Site Allowance Initial Lumens Total:	1,045,440 lm
Calculated Site (Lumens / ft <sup>2</sup> ):	11.9 lm/(ft <sup>2</sup> )

Drilling Lumen Subtotal Calculations	
Preproduction - Drill Rig Area Lights	714,181 lm
Preproduction - Drilling Support Area	201,890 lm
PreProduction - Drilling Trailer Area	122,800 lm
	<b>Total Area Lumens:</b> 1,038,871 lm

Luminaire Schedule				
Luminaire Type	Model Number	Manufacturer	Lumens	Description
A	M4	HP WINNER	88,000 lm	LIGHT MAST
B	WPS	STANPRO	5,800 lm	WALL MOUNT EXTERIOR
C	DLL4/UNV1 S903	EATON - COOPER CROUSE HINDS	7,619 lm	LED - 4FT LINEAR POLYCARBONATE LENS
D	HEU4MC2ANNWNGN	DIALIGHT	11,500 lm	LED - HIGH BAY
E	DFLMMY400	EATON - COOPER CROUSE HINDS	40,000 lm	HID - HAZ. Area CLEAR GLASS
F	DLL2/UNV1 S903	EATON - COOPER CROUSE HINDS	3,938 lm	LED - 2FT LINEAR POLYCARBONATE LENS

#### Preproduction - Drill Rig Area Lights

Luminaire Position and Tilt				
Luminaire Number:	Mounting Height (Feet)	Tilt	Luminaire Type	Lumens
1	45'	90°	C	7,619 lm
2	53'	90°	C	7,619 lm
3	60'	90°	C	7,619 lm
4	68'	90°	C	7,619 lm
5	76'	90°	C	7,619 lm
6	83'	90°	C	7,619 lm
7	91'	90°	C	7,619 lm
8	99'	90°	C	7,619 lm
9	106'	90°	C	7,619 lm
10	114'	90°	C	7,619 lm
11	122'	90°	C	7,619 lm
12	129'	90°	C	7,619 lm
13	137'	90°	C	7,619 lm
14	24'	0°	D	11,500 lm
15	24'	0°	D	11,500 lm
16	24'	0°	D	11,500 lm
17	24'	0°	D	11,500 lm
18	24'	0°	D	11,500 lm
19	24'	0°	D	11,500 lm
20	24'	0°	D	11,500 lm
21	24'	0°	D	11,500 lm
22	24'	0°	D	11,500 lm
23	20'	0°	D	11,500 lm
24	20'	0°	D	11,500 lm
25	20'	0°	D	11,500 lm
26	21'	75°	E	40,000 lm
27	21'	75°	E	40,000 lm
28	21'	75°	E	40,000 lm
29	21'	75°	E	40,000 lm
30	21'	75°	E	40,000 lm
31	21'	75°	E	40,000 lm
32	21'	75°	E	40,000 lm
33	44'	75°	E	40,000 lm
34	38'	75°	F	3,638 lm
35	38'	75°	F	3,638 lm
36	9'	75°	F	3,638 lm
37	45'	0°	F	3,638 lm
38	45'	0°	F	3,638 lm
39	45'	0°	F	3,638 lm
40	38'	75°	G	45,102 lm
41	38'	75°	G	45,102 lm
42	38'	75°	G	45,102 lm
Total Lumens CALCULATION				
Total Area Lumens:				714,181 lm

Preproduction - Drilling Support Area

Luminaire Position and Tilt				
Luminaire Number:	Mounting Height (Feet)	Tilt	Luminaire Type	Lumens
42	9'	75°	C	7,619 lm
43	9'	75°	C	7,619 lm
44	9'	75°	C	7,619 lm
45	15'	0°	C	7,619 lm
46	15'	0°	D	11,500 lm
47	15'	0°	D	11,500 lm
48	15'	0°	D	11,500 lm
49	15'	0°	D	11,500 lm
50	15'	0°	D	11,500 lm
51	15'	0°	D	11,500 lm
52	15'	0°	D	11,500 lm
53	15'	75°	E	40,000 lm
54	15'	75°	E	40,000 lm
55	9'	75°	F	3,638 lm
56	9'	75°	F	3,638 lm
57	9'	75°	F	3,638 lm
Total Lumens Calculation				
Total Area Lumens:				<b>201,890 lm</b>

PreProduction - Drilling Trailer Area

Luminaire Position and Tilt				
Luminaire Number	Mounting Height (Feet)	Tilt	Luminaire Type	Lumens
57	16'	75°	A	88,000 lm
58	11'	0°	B	5,800 lm
59	11'	0°	B	5,800 lm
60	11'	0°	B	5,800 lm
61	11'	0°	B	5,800 lm
62	11'	0°	B	5,800 lm
63	11'	0°	B	5,800 lm
Total Lumens Calculation				
Total Area Lumens:				<b>122,800 lm</b>

# Attachment 2

## Preproduction

## Completions

## Calculations

Preproduction Completions Summation	
Lumens Per Square Foot	
Site Hardscape (Footage):	87,120 ft <sup>2</sup>
Site Acres:	2.00 ACRES
Site Total Lumens:	861,600 lm
Base Allowance:	12 lm/ft <sup>2</sup>
Site Allowance Initial Lumens Total:	1,045,440 lm
Calculated Site (Lumens / ft <sup>2</sup> ):	9.9 lm/(ft <sup>2</sup> )

Completions Lumen Subtotal Calculations	
Pre-Production Completions	861,600 lm
Total Area Lumens:	<b>861,600 lm</b>

Luminaire Schedule				
Luminaire Type	Model Number	Manufacturer	Lumens	Description
A	M4	HP WINNER	88,000 lm	LIGHT MAST
B	WPS	STANPRO	5,800 lm	WALL MOUNT EXTERIOR

**Pre-Production Completions**

Luminaire Position and Tilt				
Luminaire Number:	Mounting Height (Feet)	Tilt	Luminaire Type	Lumens (Ø)
76	16'	75°	A	88,000 lm
77	16'	75°	A	88,000 lm
78	16'	75°	A	88,000 lm
79	16'	75°	A	88,000 lm
80	16'	75°	A	88,000 lm
80	16'	75°	A	88,000 lm
80	16'	75°	A	88,000 lm
80	16'	75°	A	88,000 lm
85	11'	0°	B	5,800 lm
86	11'	0°	B	5,800 lm
87	11'	0°	B	5,800 lm
88	11'	0°	B	5,800 lm
85	11'	0°	B	5,800 lm
86	11'	0°	B	5,800 lm
87	11'	0°	B	5,800 lm
88	11'	0°	B	5,800 lm
88	11'	0°	B	5,800 lm
88	11'	0°	B	5,800 lm
88	11'	0°	B	5,800 lm
Total Lumens Calculation				
Total Area Lumens:				<b>861,600 lm</b>

# Attachment 3

## Production

## Calculations

Production Summation	
Lumens Per Square Foot	
Site Hardscape (Footage):	87,120 ft <sup>2</sup>
Site Acres:	2.00 ACRES
Site Total Lumens:	10,842 lm
Base Allowance:	5 lm/(ft <sup>2</sup> )
Site Allowance Initial Lumens Total:	435,600 lm
Calculated Site (Lumens / ft <sup>2</sup> ):	0.1 lm/(ft <sup>2</sup> )

Production Lumen Subtotal Calculations	
Production Site Total	
	Total Area Lumens: <b>10,842 lm</b>

Luminaire Schedule				
Luminaire Type	Model Number	Manufacturer	Lumens	Description
H1	SMIL17FAFC40	RAB	5,421 lm	FULL CUT OFF WALL PACK
H2	SMIL17FAFC40	RAB	5,421 lm	FULL CUT OFF WALL PACK MOUNTED ON POLE

#### Production

Luminaire Position and Tilt				
Luminaire Number:	Mounting Height (Feet)	Tilt	Luminaire Type	Lumens (Φ)
89	12'	0°	H	5421 lm
90	12'	0°	H	5421 lm
Total Lumens Calculation				
Total Area Lumens: <b>10842 lm</b>				

# Attachment 4

# Luminaire Information

Client: MRG Oil and Gas

Project: CE Well Pad

Date: 8/3/22

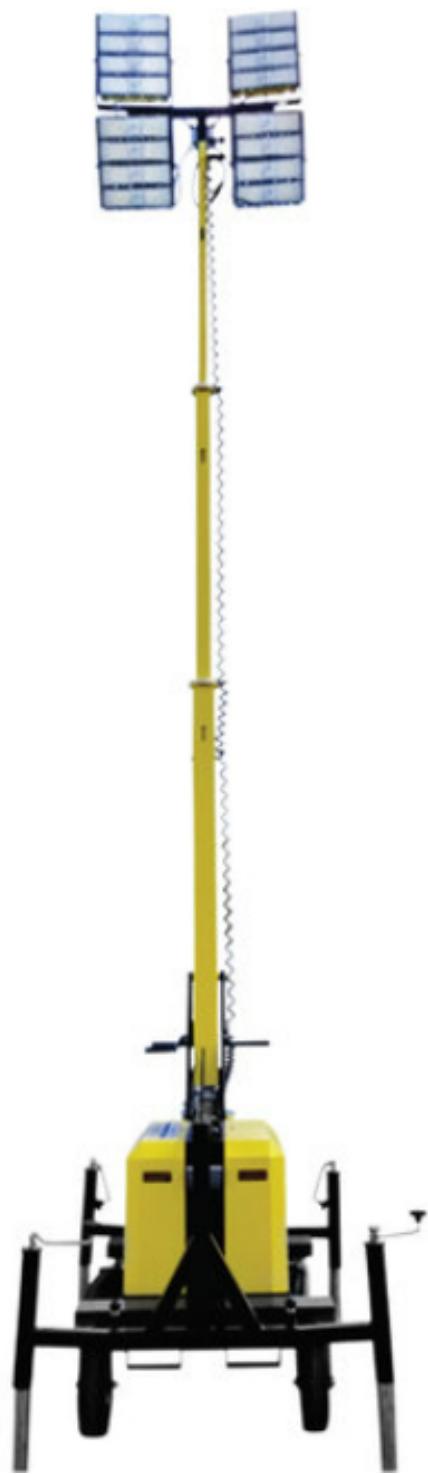
Revision: 0 Issued As Attachment To The Permit

# TYPE A

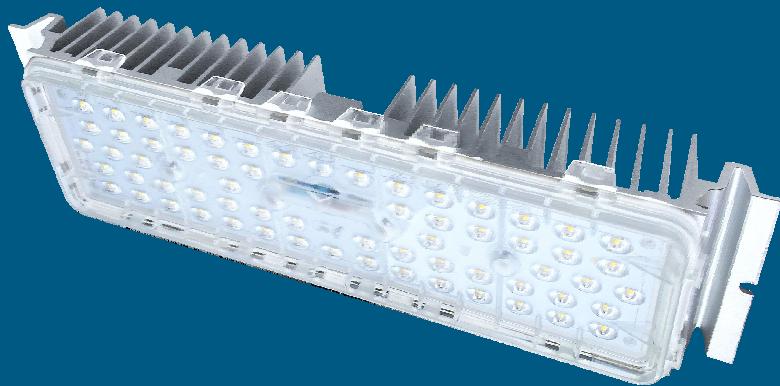
Notes:

1. Type A fixture are portable light masts. These unit vary based on supplier and rental agency, and inventory. A representative model is used based on typical vendor information.
2. The light poles are pointed at work area and downward.
3. The unit is comprised of 16 modules total and estimated at a total output of 88,000 lumens per mast.

# TYPE A Model Example Used



# LED Module M8B Series



## Specification

**Working Environment:** -40°C~+50°C

**Storage Temperature:** -40°C~+50°C

**Relative humidity:** 10%~90%RH

**Typical value of pad temperature<sup>[1]</sup>:** 70°C

**IP Rating of LED Light Engine:** IP68

**Impact Protection Level:** IK09

**Color Temperature (CCT)<sup>[2]</sup>:** 3000K, 4000K, 5000K, 5700K

**Main Material:** Aluminum 6063

**Module N.W.:** 0.67±0.04 kg

**Note :**

[1] Typical values of pad temperature is obtained based on 60W with a ambient temperature of 25°C.

[2] Efficacy of 3000K is 5% lower than other CCTs.

## Features

- Lumileds Luxeon 3030;
- Super long lifetime(Lumen maintenance);
- Multiple lighting distributions available;
- Wide applicability for complex situations;
- High versatility apply for all sorts of lamps retrofit.

## Application

- Street lighting retrofit and application;
- Factory lighting retrofit and application;
- Tunnel lighting retrofit and application;
- Sports lighting retrofit and application.

## Ordering Information

For example: M8B-VCA-63 -1321-7040-LU

Module Model	Interface	Dimension of LEDS	Wire Material	LED Qty	Lens Model		Ra & CCT	LED Brand
M8B	V: V-shape Groove	C: 3030	A: CCC+VDE C: PSE H: UL X: Others	49 49PCS 63 63PCS	1324 Type II Short 2322 Type II Short (V) 5321 Type II Short 2321 Type II Short 1321 Type III Medium	1325 25 DEG 2360 60 DEG 5340 40 DEG 5390 90 DEG 1310 Lambert Type 1390 Tunnel Lighting	7030: Ra≥70, 3000K 8040: Ra≥80, 4000K ... ...	LU: Lumileds SN: Sanan XX: Others

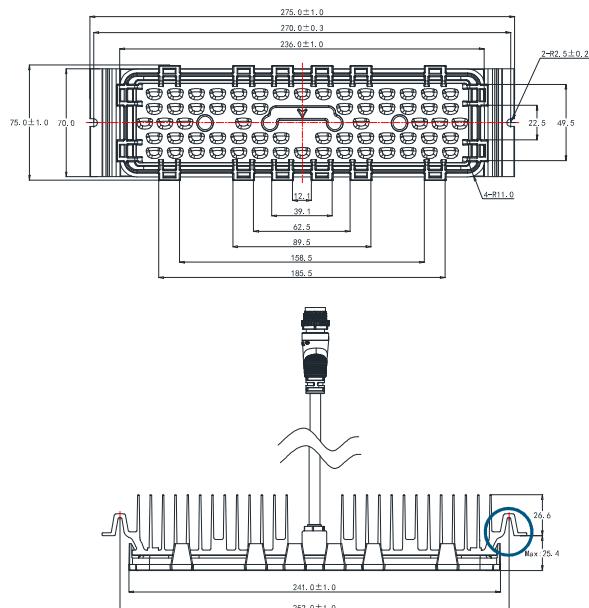
## Performance

Model	Power (W)	Driving current (mA)	Input voltage (Vdc)	Efficacy (lm/W)	Lumens (lm)
M8B-VCA-63	40	700	48~61	140	5600
M8B-VCA-49	50	1050	38~48	127	6350
M8B-VCA-63	50	860	48~61	135	6750
M8B-VCA-63	60	1050	48~61	127	7620

Note : Values shown are subject to ±5%~±8% tolerance; Cable default A type;

Efficacy above is based on calculated @92% power efficiency ; Light efficacy of 3000K is 5% lower than other CCTs.

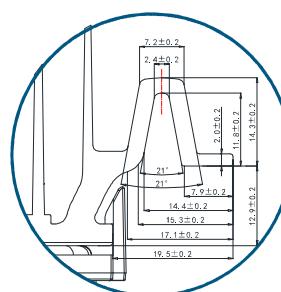
## Dimensions



L (mm)	W (mm)	H (mm)
275	75	Max52

The height of the module is the maximum value.

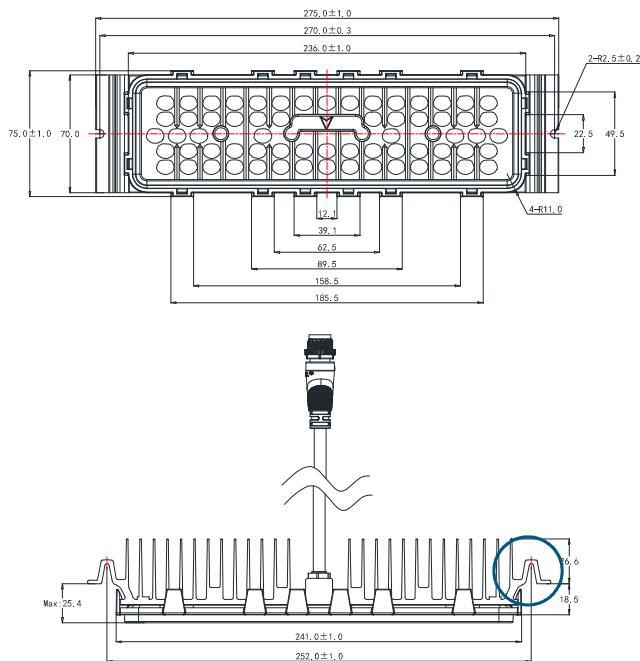
Tolerance: ±0.5mm



## Available Lens Model

1321	1324	1390
1232	2322	5321

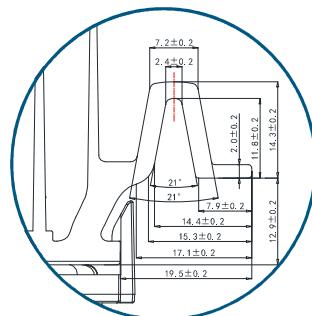
## Dimensions



L (mm)	W (mm)	H (mm)
275	75	Max52

The height of the module is the maximum value.

Tolerance: ±0.5mm



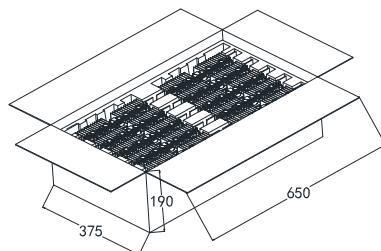
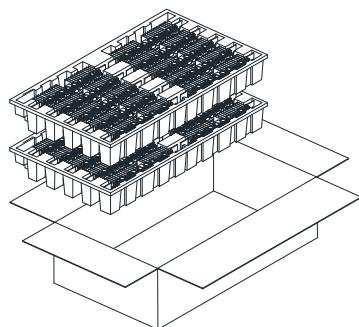
## Available Lens Model

1310	1325	5340	2360
5390			

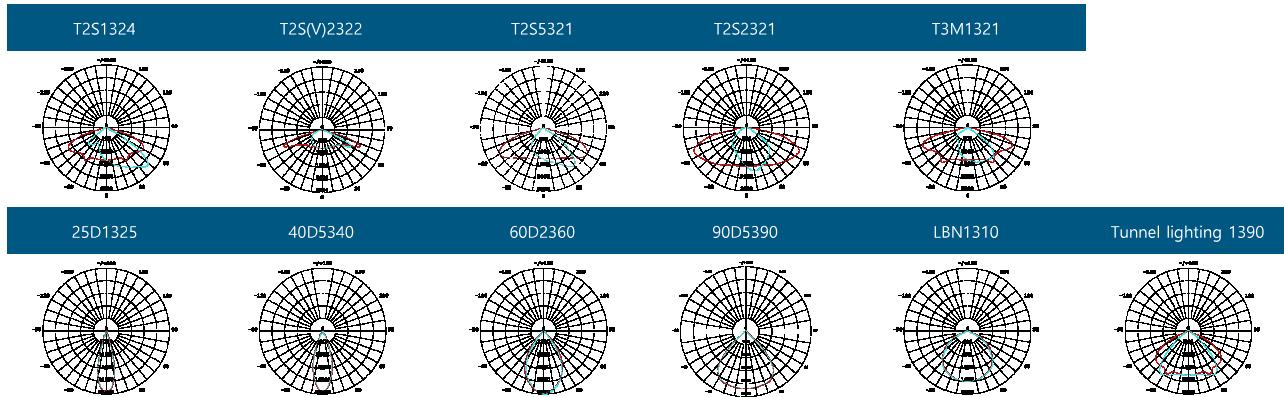
## Package Information

L (mm)	W (mm)	H (mm)	Module pcs/carton (PCS)	Package weight (kg)
650	375	190	20	14.9

Values shown are subject to ±5% tolerance.



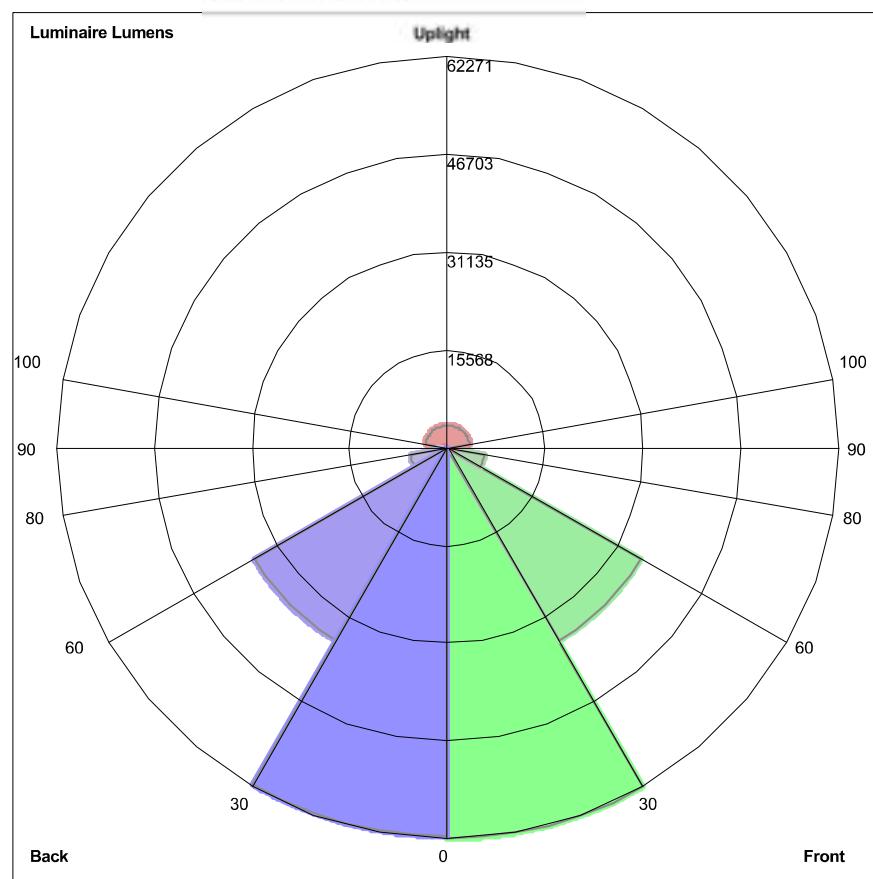
## Lighting distributions



## Version History

Change Date	Version	Description of Change		
		Item	From	To
20190905	Ver2.0	Data sheets release (new version) Update of luminous efficacy Optimized G.W of Module package	16.2kgs	14.9kgs

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:

Front: Low=62270.6, Medium=35421.7, High=5946.3, Very High= 1328.0  
Back: Low= 61920.0, Medium=35466.8, High=5958.8, Very High=1320.7  
Uplight: Low=493.0, High=3564.5

BUG Rating : B5-U5-G5

# **FIXTURE CUT SHEET**

## **TYPE B**

Project: \_\_\_\_\_

Type: \_\_\_\_\_

Drawn by: \_\_\_\_\_

Catalogue #: \_\_\_\_\_

Date: \_\_\_\_\_

## Series Spec Sheet

# WPS GEN 4

## CLASSIC WALL PACK

Selectable color temperature (3 000 K/4 000 K/5 000 K)<sup>1</sup>

Power selectable<sup>1</sup>

Integrated photocell<sup>1</sup>

Multi-Voltage (120-347 V)<sup>1</sup>

This wall pack series is a classic and familiar design integrated with modern LED technology to promote better energy efficiency and long life. Certain configurations come with integrated photocell, selectable power and/or selectable color temperature. It is best suited for entrances, underpasses or anywhere controlled security lighting is required, the series luminaire is a great addition to any commercial or industrial outdoor wall mount application. The tough die cast aluminum housing is moisture and dustproof. <sup>1</sup>



## FEATURES AND SPECIFICATIONS

### • Construction

#### Housing

- This luminaire is made of aluminum die cast and comes standard in a bronze powder coat finish.
- The housing has four conduit entries of 1/2" on each sides and some of the configurations comes with a button type photocell that can be turned off by using the internal switch if needed.<sup>1</sup>

#### Lens

Prismatic tempered glass lens is standard in this product series.

### • Electrical

- The drivers allows an input voltage from 120-277 V or 120-347 V AC 50/60 Hz and are 0-10 V dimmable. They are coming with an onboard surge protection:
- NS29: 2.5kV standard
- NS40, NS60, NS80, PS40, PS100: 2kV standard
- NS120: 4kV standard

- This wall pack series is suitable for ambient temperature range of -40°C to +50°C. Available in color temperatures of 4 000 K, 5 000 K or 3CCT selectable (3 000/4 000/5 000 K) with a lumen per watt ratio of 140 lm/W to 152 lm/W depending on the lumen package.
- The color temperature of the fixture is set by default at 4 000 K and can be changed on the field.

### • Compliances

- Wet location
- IP65
- Meets requirements of ICES-005 issue 5 for class B products
- cULus
- IK06
- BC Hydro

## OVERVIEW

Light source	LED
Watts (W)	25/30/40, 60/80/100 30, 40, 60, 80, 120
Lumens output (lm)	3 625 - 17 885
Efficiency (lm/W)	140 - 152
Color temperature (K)	3CCT (3 000/4 000/5 000) 4 000, 5 000
CRI	> 80

<sup>1</sup> Integrated photocell, multi-volt driver, CCT and Power selectable on some configurations. Consult Quick ship and technical specification table for more details.



Not all products are qualified on the DLC QPL. To view our DLC qualified products, please consult the DLC Qualified Products List at [www.designlights.org/search](http://www.designlights.org/search).

QUICK SHIP AND TECHNICAL SPECIFICATION TABLE 

Order code	Model number	DLC unique ID	Watts (W)	Volts (V)	Color temp. (K) <sup>2</sup>	Lumen output (lm) <sup>3</sup>	Efficiency (lm/W)	Photo-cell <sup>4</sup>	CRI	Life L70 (hrs) <sup>5</sup>	Tested hours LM-80 (hrs) <sup>5</sup>	Calculated TM21 (hrs) <sup>5</sup>	Finish	Dimming	B.I.G.	LED current (mA)	Power factor (%)	THD (master)	Case qty
<b>Power Select, CCT Select and Integrated Photocell<sup>6</sup></b>																			
68314	WPS-PS40-Q-3C	PLW61NEJG50K	25/30/40	120-347	3000/4000/5000	3875/4500/5000 <sup>1</sup>	141	Yes	>80	54 000	9 000	173 600	Bronze	Yes	B1U3G4	850	≥0.9	≤20	1
68315	WPS-PS100-Q-3C	PLF71YF9LCSH	60/80/100	120-347	3000/4000/5000	9300/12000/14500 <sup>1</sup>	137	Yes	>80	54 000	9 000	173 600	Bronze	Yes	B1U3G4	2 100	≥0.9	≤20	1
<b>Single Power, Single CCT and Integrated Photocell<sup>6</sup></b>																			
68524	WPS-NS30-W-40K/P127	PLVM09BUX07G	29	120-277	4 000	4 200	150	Yes	>80	54 000	9 000	173 600	Bronze	Yes	B1U3G5	230	≥0.9	≤20	1
68525	WPS-NS30-W-50K/P127	PL3ULW7TEV5H	29	120-277	5 000	4 300	148	Yes	>80	54 000	9 000	173 600	Bronze	Yes	B1U3G5	230	≥0.9	≤20	1
<b>Single Power and Single CCT</b>																			
68490	WPS-NS40-W-40K	PLVM09BUX07G	40	120-277	4 000	6 004	142	No	>80	54 000	9 000	173 600	Bronze	Yes	B1U3G4	354	≥0.9	≤20	1
68491	WPS-NS40-W-50K	PL3ULW7TEV5H	40	120-277	5 000	6 034	144	No	>80	54 000	9 000	173 600	Bronze	Yes	B1U3G4	354	≥0.9	≤20	1
68492	WPS-NS60-W-40K	PL6EFOUTBPWB	60	120-277	4 000	8 458	146	No	>80	54 000	9 000	173 600	Bronze	Yes	B1U3G5	486	≥0.9	≤20	1
68493	WPS-NS60-W-50K	PL01JETYSQ80	60	120-277	5 000	8 611	147	No	>80	54 000	9 000	173 600	Bronze	Yes	B1U3G5	486	≥0.9	≤20	1
68497	WPS-NS80-W-40K	PLVXL8TOP2UF	80	120-277	4 000	11 242	146	No	>80	54 000	9 000	173 600	Bronze	Yes	B1U4G5	645	≥0.9	≤20	1
68498	WPS-NS80-W-50K	PL2AZJG3L0RQ	80	120-277	5 000	11 446	148	No	>80	54 000	9 000	173 600	Bronze	Yes	B1U4G5	645	≥0.9	≤20	1
<b>Single Power, CCT Select and Integrated Photocell<sup>6</sup></b>																			
68316	WPS-NS120-Q-3C	PLYRMZYS3AY3	120	120-347	3000/4000/5000	16 943	137	Yes	>80	54 000	9 000	173 600	Bronze	Yes	B2U4G5	2 600	≥0.9	≤20	1

**1 QUICK SHIP:** Product availability is subject to change without notice. Please contact your Stanpro customer service representative to confirm inventory levels at time of order.

**2** Typical color temperature range: +/- 5 %.

**3** Lumen values are derived from photometric testing. Initial lumens range: +/- 10 %.

**4** Lumen values are based on 4 000 K default settings. Please refer to Quick ship Technical Specification Table for more details on other color temperatures.

**5** Life hours are derived from IESNA LM-80-08 testing report and projected per IESNA TM-21-11 extrapolations.

**6** Integrated ON/OFF photocell that can be easily disabled.

## ACCESSORIES (order separately)

Order code	Description
68370	18" Bronze metal backplate
68371	Bronze glareshield
68372	Stainless Steel wireguard



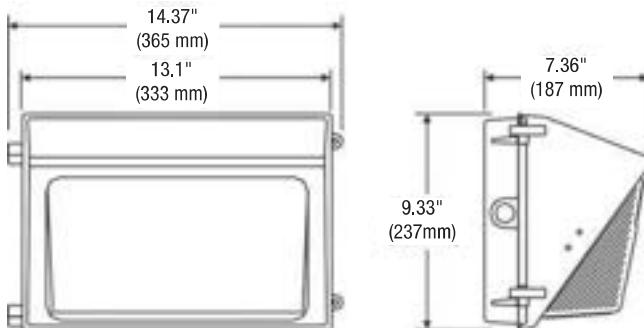
## ORDERING GUIDE

WPS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
Series	Lumen package (W)	Volts (V)	Color temp. (K)	Casting color				Options															
WPS	PS40 - 25/30/40	Q - 120-347	3C - 3 000/4 000/5 000	BR - Bronze (standard)				KV - 10 kV surge Protection								BK - Black							
	PS100 - 60/80/100			WH - White				PC - Polycarbonate lens								SP - Special color							
	NS120 - 120			KV - 10 kV surge Protection								P127 <sup>1</sup> - Button type photocell 120-277 V											
	NS30 <sup>1</sup> - 29	W - 120-277	40K - 4 000	PC - Polycarbonate lens																			
	NS40 - 40		50K - 5 000																				
	NS60 - 60																						
	NS80 - 80																						

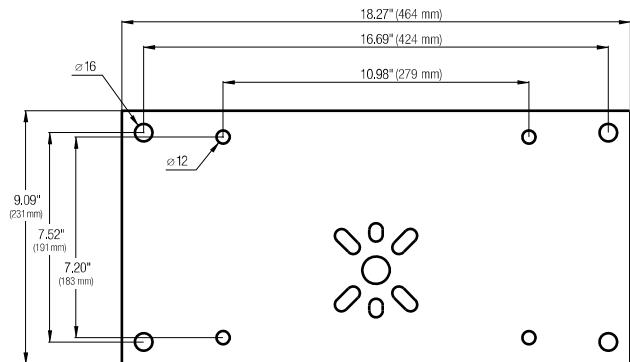
<sup>1</sup>Button type photocell 120-277 V comes standard with the "NS30" lumen package.

Data is based upon tests performed in a controlled environment. Actual performance can vary depending on operating conditions.  
All products are subject to change or may be discontinued any time without notice.

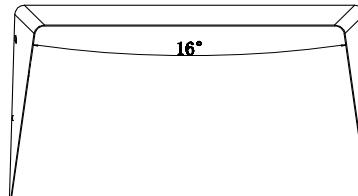
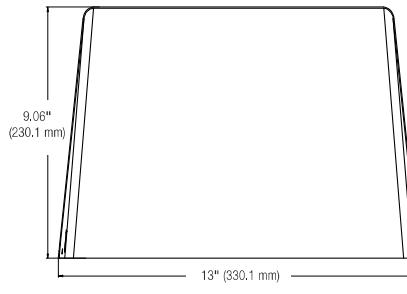
## DIMENSIONS



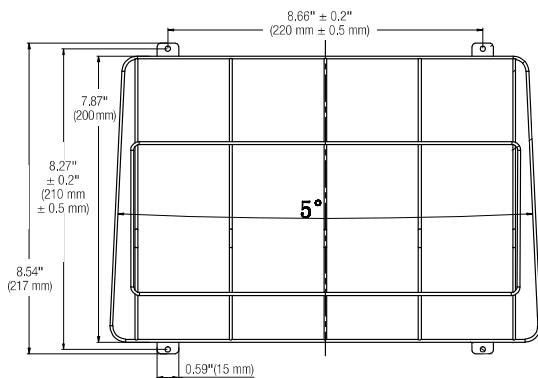
## BACKPLATE



## GLARESHIELD

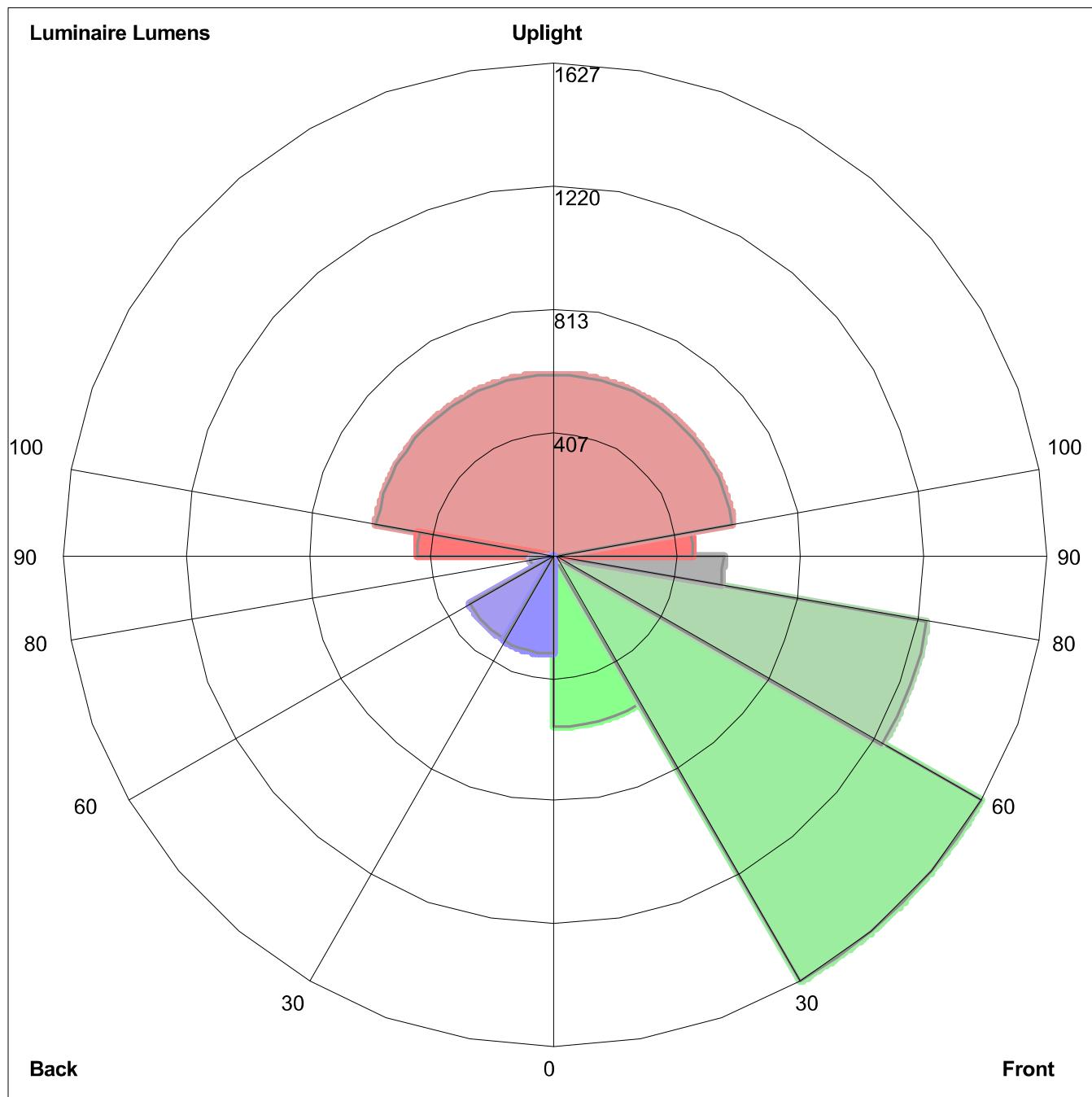


## WIREGUARD



Data is based upon tests performed in a controlled environment. Actual performance can vary depending on operating conditions.  
All products are subject to change or may be discontinued any time without notice.

## LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



## Luminaire Lumens:

Front: Low=566.0, Medium=1626.5, High=1251.8, Very High=558.0

Back: Low=327.7, Medium=323.2, High=79.4, Very High=11.6

Uplight: Low=456.3, High=599.7

BUG Rating : B1-U4-G4

# **FIXTURE CUT SHEET**

## **TYPE C**

# Pauluhn DLL LED luminaires

## For land-based drilling

Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zone 2  
Cl. II, Div. 2, Groups F, G  
Cl. III

UL Listed  
CSA Certified  
Marine & Wet Locations  
NEMA 4X; IP66

2L

The Pauluhn™ DLL linear LED is specifically designed to replace fluorescent T12, T8 and T5HO lighting on land-based and offshore drilling platforms. The rugged and durable design features the industry's most versatile and flexible mounting options. The Pauluhn DLL is the ideal solution for high vibration, impact and hose down in drilling applications.

Model	Typical lumens	Lumens per watt	Equivalent HID luminaire	Typical energy savings / lifetime
DLL2	3,958	32	T12HO	Up to 63%
			T8HO	Up to 59%
			T5HO	Up to 47%
			T12	Up to 36%
			T8	Up to 25%
			T5	Up to 9%
DLL4	7,900	63	T12HO	Up to 58%
			T8HO	Up to 54%
			T5HO	Up to 43%
			T12	Up to 37%
			T8	Up to 22%
			T5	Up to 10%

## Applications:

- Land-based and offshore rigs; areas include: derrick, mast, SCR house, top drive, operator's house, power and pump stations

## Features:

- High efficacy: up to 120 LPW
- 40°C to +65°C ambient operating temperature (standard model)
- Low profile (<3" height)
- Versatile ceiling/swivel, wall, flush, pole and pendant mounting options
- Wide and narrow optics for uniform illumination in control room and drill mast
- Four points of secondary retention
- 2,000 PSI high pressure hose rated
- High vibration resistance
- Emergency battery back-up (90 minutes) and surge protection options (up to 10 kV) <sup>A</sup>
- DesignLights Consortium® Qualified (some models are not DLC qualified) <sup>B</sup>
- 5 year fixture warranty

## Standard materials:

- Housing – copper-free aluminum; Corro-free epoxy powder coat (optional)
- Lens – clear polycarbonate; diffused polycarbonate

## Photometrics:

- Complete photometrics can be found at [www.crouse-hinds.com/photometrics](http://www.crouse-hinds.com/photometrics)

## Temperature performance data:

Simultaneous rating				
Ambient temp. °C	Min. temp. supply wire °C	Class I, Div. 2	Class II, Div. 2	Class I, Div. 2; Class II, Div. 2
40	60	T6	T6	T6
55	75	T5	T5	T5
65	90	T5	T5	T5



## Mounting (ordered separately):

Versatile mounting options:

- Flush back mount
- Swivel/ceiling back mount
- Offset ceiling mount
- Offset wall mount
- Pole mount
- Pendant mount

Easily retrofit to:

- Existing Pauluhn DuraPro and MagnaPro fluorescent light fixtures
- Rig-A-Lite and Snelson C1D2 fluorescent lighting fixtures

## Certifications and compliances:

### NEC:

- Class I, Division 2, Groups A, B, C, D
- Class I, Zone 2
- Class II, Division 2, Groups F, G
- Class III
- NEMA 4X, IP66
- Marine and wet locations

### UL standards:

- UL844 – Electrical Fixture Hangers for Hazardous Locations
- UL1598 – Luminaire
- UL1598A – Luminaire for Installation on Marine Vessels
- UL924 – Emergency Lighting

### CSA standard:

- C22.2 No. 137

### Additional certifications:

- ABS design assessed

## Electrical ratings:

	DLL2	DLL4
Lumen output	3,958	7,900
Frequency	50/60 Hz	50/60 Hz
Voltage	100-277 VAC, 108-250 VDC; 347-480 VAC	

Model	Voltage	Current (A)	Watts	Power factor	THD
DLL2/UNV1	100	0.33	32.5	0.92	<20%
DLL2/UNV1	277	0.13	34.3	0.92	<20%
DLL2/UNV34	347	0.10	32.2	0.92	<20%
DLL2/UNV34	480	0.07	34.5	0.92	<20%
DLL4/UNV1	100	0.63	63.4	0.92	<20%
DLL4/UNV1	277	0.23	62.5	0.92	<20%
DLL4/UNV34	347	0.18	61.4	0.92	<20%
DLL4/UNV34	480	0.13	63.9	0.92	<20%

## Weights:

Model	Lbs.	Kg.
DLL2	12.50	5.70
DLL4	22.50	10.20

<sup>A</sup>One year warranty.

<sup>B</sup>Refer to [www.designlights.org](http://www.designlights.org) Qualified Products List under Family Models for full listing details. Not all models are approved for all application categories.

# Pauluhn DLL LED luminaires

For land-based drilling

Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zone 2  
Cl. II, Div. 2, Groups F, G  
Cl. III

UL Listed  
CSA Certified  
Marine & Wet Locations  
NEMA 4X; IP66

2L

2L

**Designed for drilling.** Pauluhn DLL linear LED luminaires are engineered to handle demanding conditions faced on land-based drilling rigs. The DLL stands up to high vibration, hose down, shock and impact, while delivering long life and high lumen performance for up to 20 years.

#### Custom optics:

- Standard wide (120°) beam spread for control room and indoor application maximizes illumination on wall panels
- Narrow (80°) beam spread option for high mast/derrick application avoids spillage and light loss

#### Comprehensive certification:

- Single model certified for use in Class I, Division 2 and Class II, Division 2 harsh and hazardous applications

#### Quick & easy installation:

- Easy access to drivers and wiring
- No custom brackets or hardware needed
- Seven mounting options available
- Easily retrofit to Pauluhn DuraPro and MagnaPro, Rig-A-Lite and Snelson



#### Slim profile:

- 2.7" fixture height (excluding mounting brackets)
- Perfect for mounting in confined or low height areas

#### Built to last:

- Ingress protection from hose down water or diesel fuel in harsh operational conditions – passed 2,000 PSI high pressure test
- Vibration-, impact- and shock-resistant – passed 5G, 3-axis vibration test
- 60,000 hour lifetime at 55°C ambient



# Pauluhn DLL LED luminaires

For land-based drilling

Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zone 2  
Cl. II, Div. 2, Groups F, G  
Cl. III

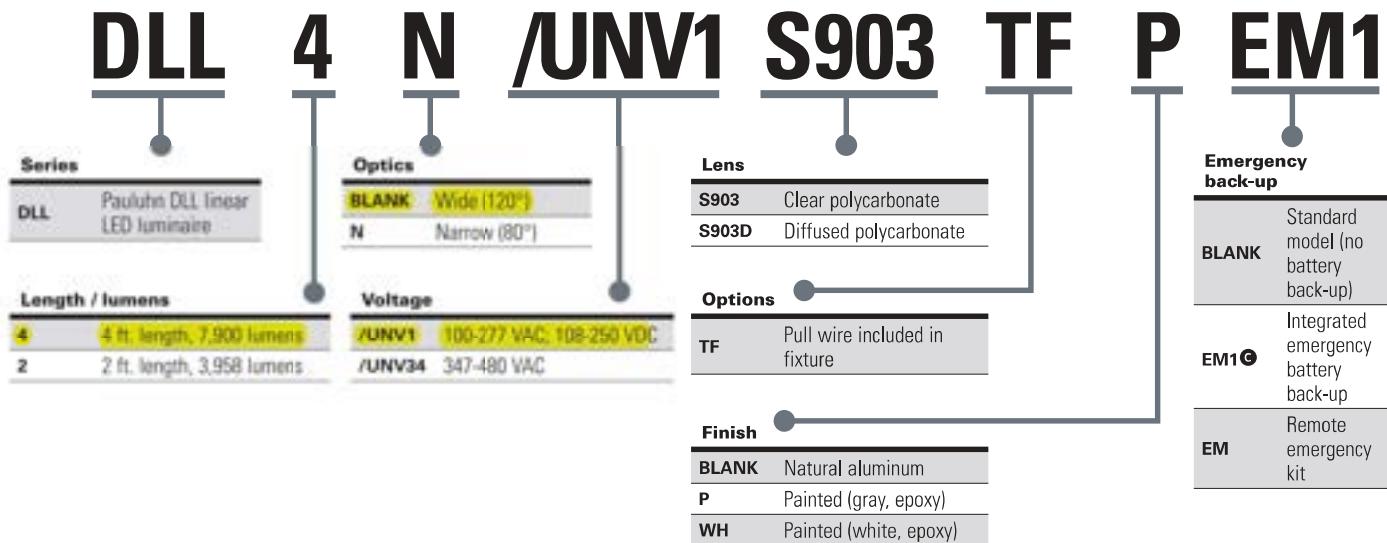
UL Listed  
CSA Certified  
Marine & Wet Locations  
NEMA 4X; IP66

2L

## Ordering information:

Part number example

DLL4N/UNV1 S903 TF P EM1

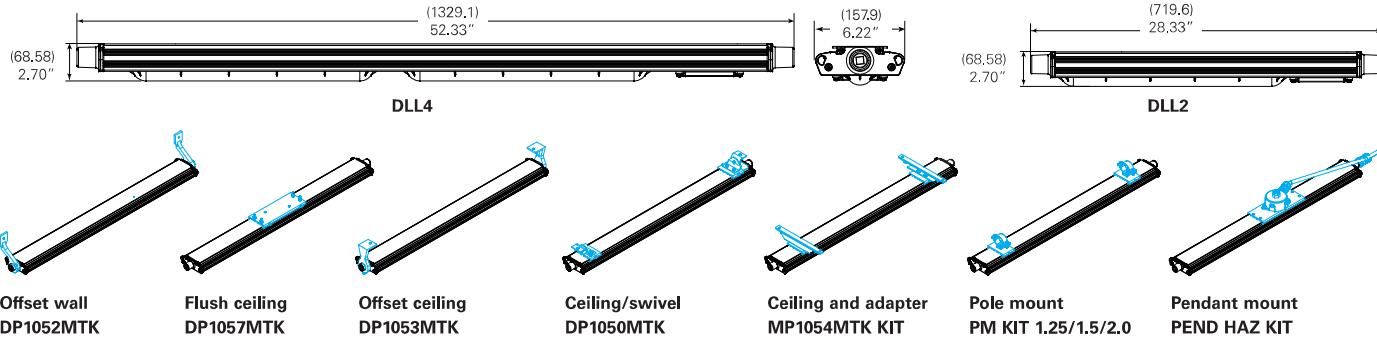


## Accessories (ordered separately):

Description	Cat. #
• Flush/back mount back plate.....	DP1057MTK
<i>Compatible with DuraPro</i>	
• Ceiling/swivel mount.....	DP1050MTK
<i>Compatible with DuraPro</i>	
• Ceiling/wall mount offset.....	DP1053MTK
<i>Compatible with DuraPro</i>	
• Ceiling mount bracket and adapter kit.....	MP1054MTK KIT
<i>Compatible with MagnaPro</i>	
• Offset wall mount.....	DP1052MTK
<i>Compatible with DuraPro</i>	
• Pole mount kit, 1.25" conduit.....	PM KIT 1.25
• Pole mount kit, 1.50" conduit.....	PM KIT 1.5
• Pole mount kit, 2.00" conduit.....	PM KIT 2.0

Description	Cat. #
• Pendant mount kit.....	PEND HAZ KIT
• Safety chain kit.....	SS KIT
• 1 amp driver replacement kit, 100-277 VAC for 4 ft. linear.....	VMVL/UNV1 80W 1A KIT
• 1 amp driver replacement kit, 347-480 VAC for 4 ft. linear.....	VMVL/UNV34 80W 1A KIT
• 0.5 amp driver replacement kit, 100-277 VAC for 2 ft. linear.....	VMVL/UNV1 80W 0.5A KIT
• 0.5 amp driver replacement kit, 347-480 VAC for 2 ft. linear.....	VMVL/UNV34 80W 0.5A KIT

## Dimensions and mounting options:



© One year warranty. Remote EM kit also available, 120-277 VAC only. Available with 4 ft. model only.

# Pauluhn DLL LED luminaires

## Integral battery back-up

2L

Cl. I, Div. 2, Groups A, B, C, D  
Cl. II, Div. 2, Groups F, G

UL Listed  
CSA Certified  
Wet Locations  
Type 4X; IP66

2L

Pauluhn DLL linear LED luminaires are available with an integral battery back-up module. Virtually the same size as the standard 4 foot model and 90 minutes of emergency lighting to keep your facility and personnel safe.

Model	EM output	Normal output
DLL4/UNV1 S903 EM1	1,400 lumens (100-277V)	6,720 lumens (100-277V)

### Applications:

- Egress and emergency lighting for areas requiring uninterrupted lighting during power failure
- Hazardous rated indoor and outdoor emergency lighting in manufacturing plants, heavy industrial, chemical and petrochemical facilities, platforms, loading docks and parking areas



### Features:

- Operating ambient: 0°C to +40°C
- 90-minute run time in emergency mode
- 6,720 lumen output for normal operation; 1,400 lumen output in emergency mode
- 50,000 hours rated life at 40°C
- IP66 rated enclosure
- LED indicator to check battery operation
- Nickel cadmium battery
- 1 year warranty

### Certifications and compliances:

#### NEC/CEC:

- Class I, Division 2, Groups A, B, C, D
- Class II, Division 2, Groups F, G
- Wet locations, Type 4X, IP66

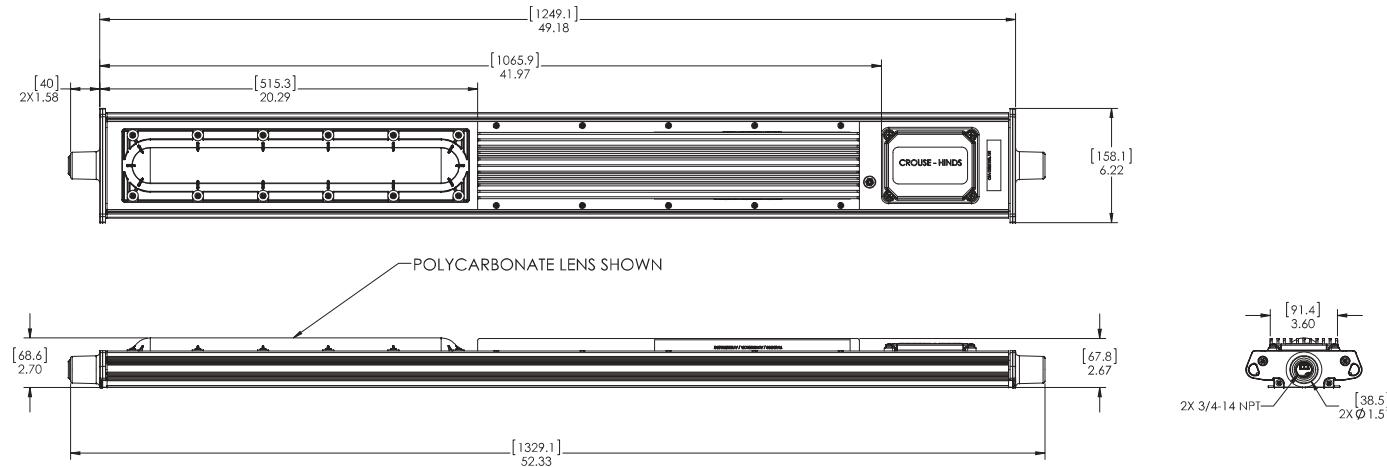
#### UL standards:

- UL844 – Hazardous (Classified)
- UL1598 – Luminaires
- UL1598A – Marine
- UL924 – Emergency Lighting

#### CSA standard:

- CSA C22.2 Nos. 137, 141

### Dimensions:



### Electrical ratings:

	EM output	Normal output
Voltage	120	277
Amperage at 120 VAC	0.480	0.212
Wattage at 120 VAC	57.8	57.7
Lumen output	1,400	6,720
Frequency	50/60 Hz	50/60 Hz
Power factor at 100 VAC	>0.90	>0.90
THD	6.58	11.70

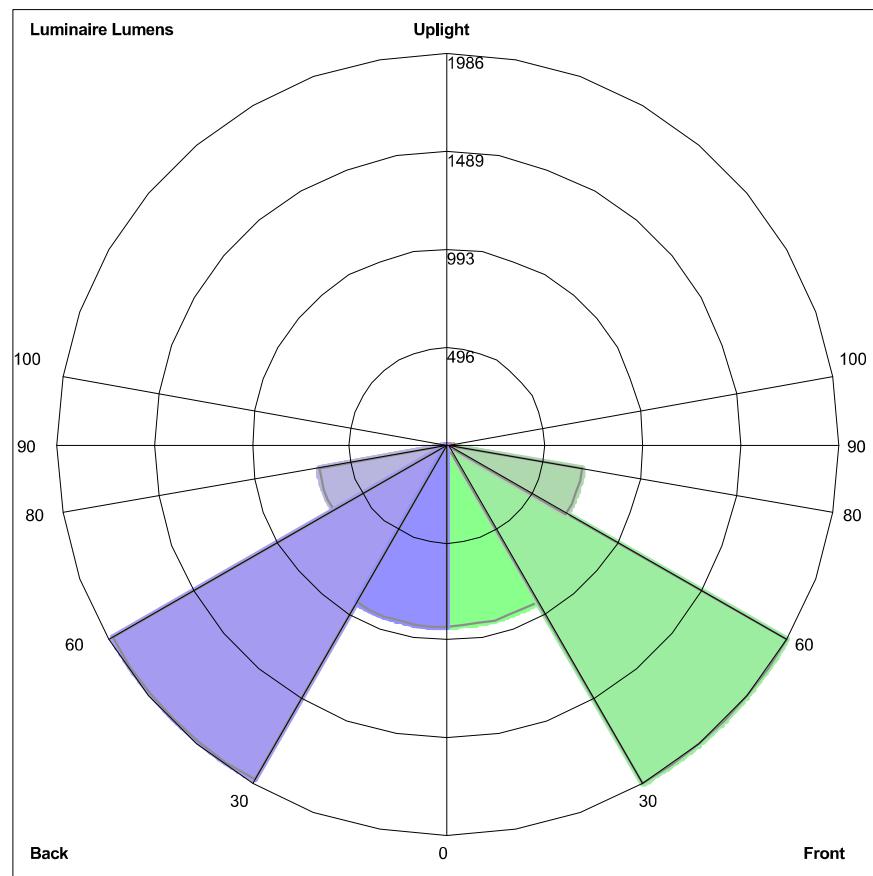
### Temperature performance data:

Ambient temp. °C	Min. temp. supply wire °C	Class I, Div. 2	Class II, Div. 2	Simultaneous rating
				Class I, Div. 2; Class II, Div. 2
40	60	T5	T6	T5

### Photometrics:

- Complete photometrics can be found at [www.crouse-hinds.com/photometrics](http://www.crouse-hinds.com/photometrics)

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:  
Front: Low=921.0, Medium=1985.6, High=698.7, Very High=29.2  
Back: Low=925.1, Medium=1963.4, High=664.7, Very High=26.5  
Uplight: Low=4.7, High=1.2

BUG Rating : B2-U1-G1

# **FIXTURE CUT SHEET**

## **TYPE D**



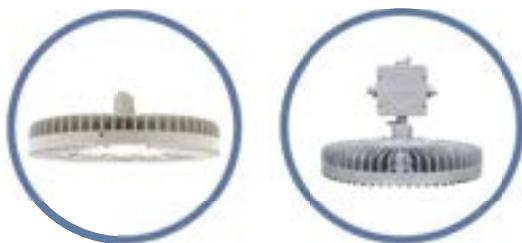
# Dialight® LED High Bay & Low Bay

## Technical Specification Sheet - Americas



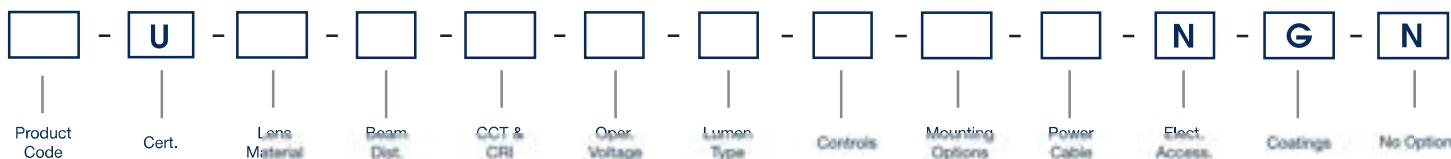
## Vigilant® LED High Bay - UL / CSA

Corded &amp; Integrated Wiring Box



Project Information		Specifications	
Part Number:			
Project:			
Fixture Type:		Date:	

## Ordering Information



Product Code	Beam Distribution	Lumen Type	Power Cable
HC High Bay Integrated Pendant Wiring Box	E Oval	A 11,600 Lumens	N No Cord (HC only)
HE High Bay 3/4" NPT	M Medium	B 14,900 Lumens	W 10' [3 meter] Power Cable (HE only)
	N Narrow	C 19,800 Lumens	
	W Wide	E 27,500 Lumens	
Certification			Electrical Accessories
U UL 1508/A, CSA	CCT & CRI	Controls	N No Plug
	C Cool White 5000K - 80 CRI	D Dimming (0-10V)	
	N Neutral White 4000K - 80 CRI	N No Dimming (HE only)	
	Operating Voltage	M Occupancy Sensor (HC only)	G Gray (RAL 7040)
2 Acrylic - Clear (dry location only)	2 100-277 VAC / 120-250 VDC		
4 Polycarbonate - Clear	5 347-480 VAC		
Lens Material		Mounting Options	Coatings
7 Glass - Clear		H Hook	
L Polycarbonate Dome - Diffused		N Pendant 3/4" NPT	
R Power Wash Glass, Clear		P Pendant 3/4" NPT with Safety Retention Tabs	
		R Safety Retention Tabs with Hook	N No Option

## Notes

- 1) Lumen type based on using a glass lens. See tables for lumens when changing lenses.
- 2) When ordering occupancy sensor, use prefix HC.
- 3) When ordering option HC, Controls = (D) Dimming or (M) Occupancy Sensor.

**DISCLAIMER.** All product information provided is, to the best of Dialight's knowledge, accurate as of the date of publication. When ordering, refer to [www.dialight.com](http://www.dialight.com) for current versions of: (a) relevant product documentation (including the relevant product data sheets); (b) Dialight terms and conditions of sale; and, (c) the relevant product warranty. To the extent that any contract is deemed formed between Dialight and the purchaser of Dialight products and/or an end-user, versions of documents available at [www.dialight.com](http://www.dialight.com) as at the date of sale shall be the versions incorporated therein. In the event of any discrepancy between this document or information provided at [www.dialight.com](http://www.dialight.com), the latter shall prevail.

# Ordering Information

## Vigilant® LED High Bay - Corded Model



### Corded Model - 3/4" Conduit - 100-277 VAC / 120-250 VDC

Part Number	Lumens	Wattage	lm/W	CCT	Lens	Beam Distribution	Hardware Options	Wiring
HEU-7MC2-ENN-NGN	27,500	185	149	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MC2-ENP-NGN	27,500	185	149	CW	Glass - Clear	Medium	Pendant 3/4" NPT with Safety Tabs	10' Power Cable
HEU-7MC2-EDN-NGN	27,500	185	149	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-4MC2-ENN-NGN	27,200	185	147	CW	Polycarbonate - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-2MC2-ENN-NGN	27,200	185	147	CW	Acrylic - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-LMC2-ENN-NGN	27,000	185	146	CW	Polycarbonate Dome - Diffused	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-2WC2-ENN-NGN	27,000	185	146	CW	Acrylic - Clear	Wide	Pendant 3/4" NPT	10' Power Cable
HEU-7MC2-CNN-NGN	19,800	130	152	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MC2-CNP-NGN	19,800	130	152	CW	Glass - Clear	Medium	Pendant 3/4" NPT with Safety Tabs	10' Power Cable
HEU-7MC2-CDN-NGN	19,800	130	152	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-4MC2-CNN-NGN	19,600	130	151	CW	Polycarbonate - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-LMC2-CNN-NGN	19,400	130	149	CW	Polycarbonate Dome - Diffused	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MN2-CNN-NGN	19,400	130	149	NW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MC2-BNN-NGN	14,900	100	149	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-4MC2-BNN-NGN	14,900	100	148	CW	Polycarbonate - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-LMC2-BNN-NGN	14,600	100	146	CW	Polycarbonate Dome - Diffused	Medium	Pendant 3/4" NPT with Safety Tabs	10' Power Cable
HEU-LMC2-BNN-NGN	14,600	100	146	CW	Polycarbonate Dome - Diffused	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MC2-ANN-NGN	11,600	80	145	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-4MC2-ANN-NGN	11,500	80	144	CW	Polycarbonate - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-2MC2-ANN-NGN	11,500	80	144	CW	Acrylic - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-LMC2-ANN-NGN	11,400	80	143	CW	Polycarbonate Dome - Diffused	Medium	Pendant 3/4" NPT	10' Power Cable

### Corded Model - 3/4" Conduit - 347-480 VAC

HEU-7MC5-EDN-NGN	27,500	185	149	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MC5-ENN-NGN	27,500	185	149	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MC5-ENP-NGN	27,500	185	149	CW	Glass - Clear	Medium	Pendant 3/4" NPT with Safety Tabs	10' Power Cable
HEU-4MC5-ENP-NGN	27,200	185	147	CW	Polycarbonate - Clear	Medium	Pendant 3/4" NPT with Safety Tabs	10' Power Cable
HEU-7WC5-ENP-NGN	27,200	185	147	CW	Glass - Clear	Wide	Pendant 3/4" NPT with Safety Tabs	10' Power Cable
HEU-7EC5-ENN-NGN	25,900	185	140	CW	Glass - Clear	Oval	Pendant 3/4" NPT	10' Power Cable
HCU-4EC5-EMN-NGN	25,600	185	138	CW	Polycarbonate - Clear	Oval	Pendant 3/4" NPT	10' Power Cable
HEU-7MC5-CDN-NGN	19,800	130	152	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MC5-CNHW-NGN	19,800	130	152	CW	Glass - Clear	Medium	Hook	10' Power Cable
HEU-7MC5-CNN-NGN	19,800	130	152	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-LMC5-CNN-NGN	19,400	130	149	CW	Polycarbonate Dome - Diffused	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MC5-BNN-NGN	14,900	100	149	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MC5-ADN-NGN	11,600	80	145	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-7MC5-ANN-NGN	11,600	80	145	CW	Glass - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-4MC5-ADN-NGN	11,500	80	144	CW	Polycarbonate - Clear	Medium	Pendant 3/4" NPT	10' Power Cable
HEU-LMC5-ANN-NGN	11,400	80	143	CW	Polycarbonate Dome - Diffused	Medium	Pendant 3/4" NPT	10' Power Cable

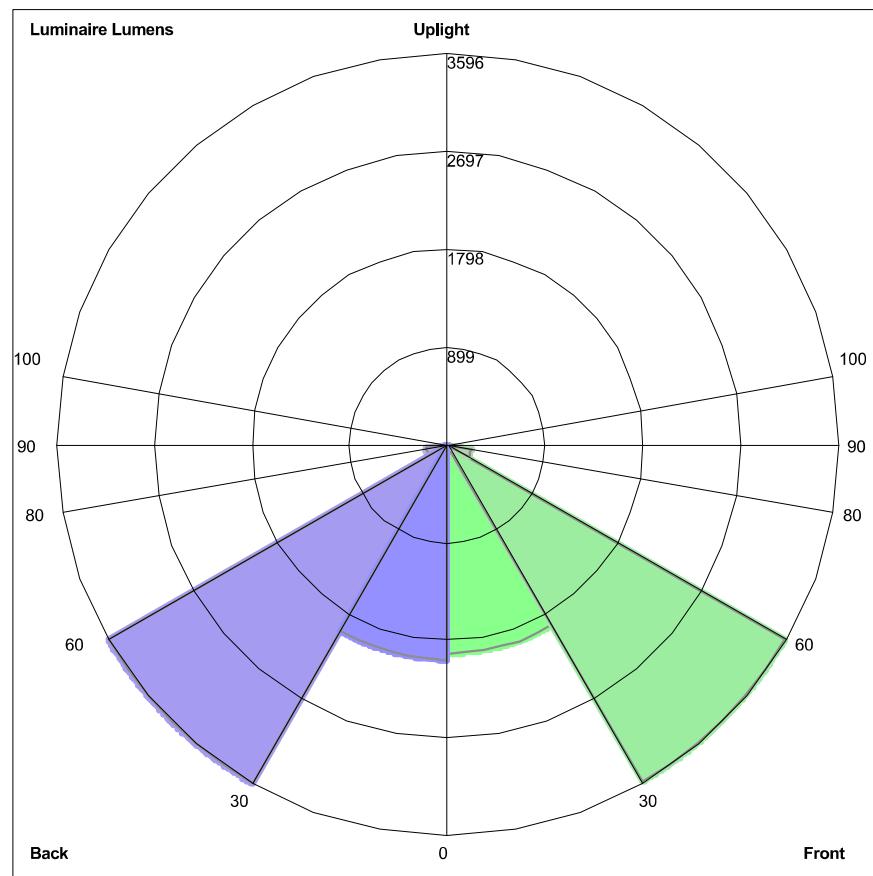
All values typical unless otherwise stated (tolerance +/- 10%)

0-10V dimming option available for products in the above table. Replace the ninth character **N** with **D**. Ex: HEU-7MC2-ENN-NGN becomes HEU-7MC2-EDN-NGN.

Acrylic lens is dry location only.

**DISCLAIMER:** All product information provided is, to the best of Dialight's knowledge, accurate as of the date of publication. When ordering, refer to [www.dialight.com](http://www.dialight.com) for current versions of: (a) relevant product documentation (including the relevant product data sheets); (b) Dialight terms and conditions of sale; and, (c) the relevant product warranty. To the extent that any contract is deemed formed between Dialight and the purchaser of Dialight products and/or an end-user, versions of documents available at [www.dialight.com](http://www.dialight.com) as at the date of sale shall be the versions incorporated therein. In the event of any discrepancy between this document or information provided at [www.dialight.com](http://www.dialight.com), the latter shall prevail.

## LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



## Luminaire Lumens:

Front: Low=1920.3, Medium=3580.5, High=221.0, Very High=4.4  
 Back: Low=1974.5, Medium=3596.1, High=199.5, Very High=3.8  
 Uplight: Low=0.0, High=0.0

BUG Rating : B3-U0-G0

# **FIXTURE CUT SHEET**

## **TYPE E**

# Pauluhn DFL HID hazardous area floodlights

Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zone 2, AEx nR II  
Cl. II, Div. 1, Groups F, G (250W  
max.)  
Ex nR II

Marine & Wet Locations  
NEMA 4X  
IP66

6L

## Applications:

- Onshore drilling and exploration
- Pipeline compressor and storage
- Corrosive environments
- Façade security lighting

## Features:

- 150-400W high pressure sodium or 175-400W metal halide
- AEx nR, Ex nR restricted breathing rating is standard – restricted breathing offers cooler T-numbers for increased hazardous locations suitability
- NEMA 7x6 butterfly beam floodlight pattern – wide, uniform and far reaching to provide excellent efficiency and more light where you need it
- NEMA Type 4X and IP66 heavy duty, die cast copper-free aluminum construction is designed for use indoors and outdoors in marine and wet locations with stainless steel external hardware suitable for saltwater and corrosive applications
- 40°C, 55°C and 65°C ambient suitability – addresses high ambient common at industrial facilities
- Low ambient capability to -40°C – perfect for colder climates
- Hinged door frame assembly – has captive cover screws for ease of relamping
- Yoke mount design – standard construction provides the greatest mounting flexibility; can be mounted vertically (wall), horizontally (rooftop or floor) or any angle in between
- 3-axis resonance withstand and UL844 vibration compliant – can stand up to the tough jobs
- Precision formed aluminum reflector – superior beam control, distribution and efficiency
- High light output with a low cost of operation – cost-effectiveness in a high wattage floodlight
- Slipfitter adapter for pole mounting and wall mounting bracket available

6L

## Certifications and compliances:

- Class I, Division 2, Groups A, B, C, D
- Class I, Zone 2, AEx nR II
- Class II, Division 1, Groups F, G (250W maximum)
- Ex nR II
- UL/cUL844 – Hazardous Locations
- UL/cUL1598 – Luminaires
- UL/cUL1598A – Supplemental Requirements for Luminaires for Installation on Marine Vessels
- 60079-15
- NEMA Type 4X
- IP66
- Marine and wet locations
- ABS



## Standard materials and finishes:

- Housing and lens frame – heavy duty die cast copper-free aluminum with Corro-free epoxy powder coat finish
- Lens – heat- and impact-resistant tempered glass
- Gasket – one-piece silicone
- Mounting brackets – aluminum with Corro-free epoxy powder coat finish
- Reflector – precision formed aluminum
- Lamp holder – porcelain
- Hardware – stainless steel

## Technical specifications:

- Entries – one  $\frac{3}{4}$ " AEx/Ex gland
- Wind rating – EPA: 2.90 at vertical
- Lamp type – high pressure sodium; probe start metal halide<sup>A</sup>; pulse start metal halide (lamps not provided)
- Lamp holder – mogul base
- Ballast – multi-tap 120/208/240/277V, 60 Hz (standard); 220-240V, 50 Hz (optional); tri-tap 120/277/347V (optional); 480V (optional)

## Mounting option:

- Yoke mount

## Photometrics:

- Complete photometrics can be found at [www.crouse-hinds.com/photometrics](http://www.crouse-hinds.com/photometrics)

<sup>A</sup>Not available in the U.S.

# Pauluhn DFL HID hazardous area floodlights

Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zone 2, AEx nR II  
Cl. II, Div. 1, Groups F, G (250W  
max.)  
Ex nR II

Marine & Wet Locations  
NEMA 4X  
IP66

6L

## Options:

Description	Suffix
• Lamps included .....	L
• 480V.....	<b>480</b>
Replace /MT in catalog number with /480	
• 230V.....	<b>230</b>
Replace /220 ONLY in catalog number with /230	

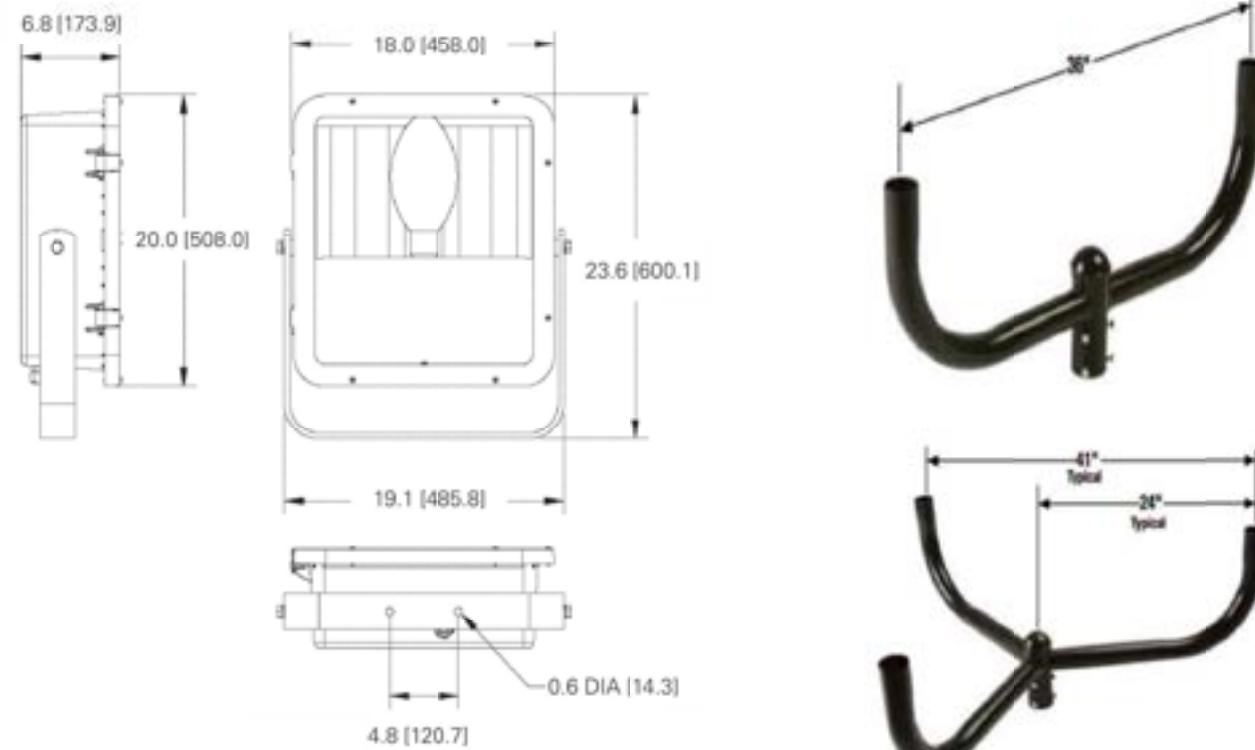
## Accessories (ordered separately):

Description	Cat. #
• Pole mount slipfitter adapter .....	<b>SFA6</b>
• Wall mount bracket adapter .....	<b>SWB6</b>
• Bull horn, 2 tenon, gray .....	<b>BLHN2</b>
• Bull horn, 3 tenon, gray .....	<b>BLHN3</b>

## Ordering information:

Cat. #	Lamp type	Watts	Weight (lbs.)	ANSI lamp type	Zone T-code	Division T-code	Ambient temperature °C	Supply wire °C
DFLMY250/MT 76 S828	Pulse start metal halide	250	42.0	M153	T3	T1	40/55/65	90/90/105
DFLMY400/MT 76 S828	Pulse start metal halide	400	44.0	M155	T3	T1	40/55	105/105
DFLMY230/MT 76 S828	Pulse start metal halide	320	44.0	M154	T2	T1	40/55	105/105
DFLMY250/TT 76 <sup>C</sup>	Probe start metal halide	250	42.0	M58 <sup>C</sup>	T3	T1	40/55/65	90/90/105
DFLMY400/TT 76 <sup>C</sup>	Probe start metal halide	400	44.0	M59 <sup>C</sup>	T3	T1	40/55	90/105
DFLMY250/220 50 76 <sup>C</sup>	Probe start metal halide	250	42.0	M58 <sup>C</sup>	T3	T1	40/55/65	90/90/105
DFLMY400/220 50 76 <sup>C</sup>	Probe start metal halide	400	44.0	M59 <sup>C</sup>	T3	T1	40/55	90/105
DFLSY250/MT 76	High pressure sodium	250	40.0	S50	T3	T1	40/55/65	90/90/105
DFLSY400/MT 76	High pressure sodium	400	44.0	S51	T3	T1	40/55	90/105
DFLSY250/TT 76	High pressure sodium	250	40.0	S50	T3	T1	40/55/65	90/90/105
DFLSY400/TT 76	High pressure sodium	400	44.0	S51	T3	T1	40/55	90/105
DFLSY250/220 50 76	High pressure sodium	250	40.0	S50	T3	T1	40/55/65	90/90/105
DFLSY400/220 50 76	High pressure sodium	400	44.0	S51	T3	T1	40/55	90/105

## Dimensions (in inches):

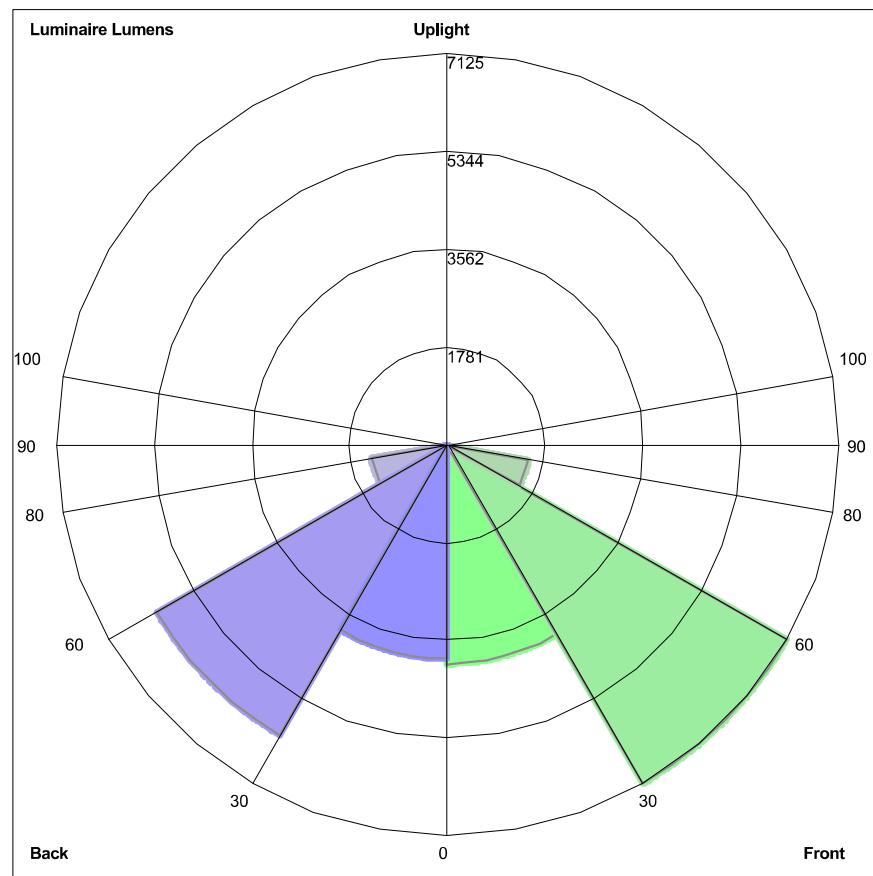


Bull horns – provided with 2 3/8" pole tenon

<sup>B</sup>Lamp is not included unless option 'L' is selected.

<sup>C</sup>Not available in the U.S.

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:  
Front: Low=3985.6, Medium= 7125.0, High=1500.3, Very High=28.6  
Back: Low=3894.8, Medium=6102.1, High=1404.5, Very High=40.2  
Uplight: Low=0.0, High=0.0

BUG Rating : B4-U0-G3

# **FIXTURE CUT SHEET**

## **TYPE F**

# Pauluhn DLL LED luminaires

## For land-based drilling

Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zone 2  
Cl. II, Div. 2, Groups F, G  
Cl. III

UL Listed  
CSA Certified  
Marine & Wet Locations  
NEMA 4X; IP66

2L

2L

The Pauluhn™ DLL linear LED is specifically designed to replace fluorescent T12, T8 and T5HO lighting on land-based and offshore drilling platforms. The rugged and durable design features the industry's most versatile and flexible mounting options. The Pauluhn DLL is the ideal solution for high vibration, impact and hose down in drilling applications.

Model	Typical lumens	Watts	Lumens per watt	Equivalent HID luminaire	Typical energy savings / lifetime
DLL2	3,958	32	124	T12HO	Up to 63%
				T8HO	Up to 59%
				T5HO	Up to 47%
				T12	Up to 36%
				T8	Up to 25%
				T5	Up to 9%
DLL4	7,900	63	130	T12HO	Up to 58%
				T8HO	Up to 54%
				T5HO	Up to 43%
				T12	Up to 37%
				T8	Up to 22%
				T5	Up to 10%



## Applications:

- Land-based and offshore rigs; areas include: derrick, mast, SCR house, top drive, operator's house, power and pump stations

## Features:

- High efficacy: up to 120 LPW
- 40°C to +65°C ambient operating temperature (standard model)
- Low profile (<3" height)
- Versatile ceiling/swivel, wall, flush, pole and pendant mounting options
- Wide and narrow optics for uniform illumination in control room and drill mast
- Four points of secondary retention
- 2,000 PSI high pressure hose rated
- High vibration resistance
- Emergency battery back-up (90 minutes) and surge protection options (up to 10 kV) <sup>A</sup>
- DesignLights Consortium® Qualified (some models are not DLC qualified) <sup>B</sup>
- 5 year fixture warranty

## Standard materials:

- Housing – copper-free aluminum; Corro-free epoxy powder coat (optional)
- Lens – clear polycarbonate; diffused polycarbonate

## Photometrics:

- Complete photometrics can be found at [www.crouse-hinds.com/photometrics](http://www.crouse-hinds.com/photometrics)

## Temperature performance data:

Simultaneous rating				
Ambient temp. °C	Min. temp. supply wire °C	Class I, Div. 2	Class II, Div. 2	Class I, Div. 2; Class II, Div. 2
40	60	T6	T6	T6
55	75	T5	T5	T5
65	90	T5	T5	T5

## Mounting (ordered separately):

Versatile mounting options:

- Flush back mount
- Swivel/ceiling back mount
- Offset ceiling mount
- Offset wall mount
- Pole mount
- Pendant mount

Easily retrofit to:

- Existing Pauluhn DuraPro and MagnaPro fluorescent light fixtures
- Rig-A-Lite and Snelson C1D2 fluorescent lighting fixtures

## Certifications and compliances:

### NEC:

- Class I, Division 2, Groups A, B, C, D
- Class I, Zone 2
- Class II, Division 2, Groups F, G
- Class III
- NEMA 4X, IP66
- Marine and wet locations

### UL standards:

- UL844 – Electrical Fixture Hangers for Hazardous Locations
- UL1598 – Luminaire
- UL1598A – Luminaire for Installation on Marine Vessels
- UL924 – Emergency Lighting

### CSA standard:

- C22.2 No. 137

### Additional certifications:

- ABS design assessed

## Electrical ratings:

	DLL2	DLL4
Lumen output	3,958	7,900
Frequency	50/60 Hz	50/60 Hz
Voltage	100-277 VAC, 108-250 VDC; 347-480 VAC	

Model	Voltage	Current (A)	Watts	Power factor	THD
DLL2/UNV1	100	0.33	32.5	0.92	<20%
DLL2/UNV1	277	0.13	34.3	0.92	<20%
DLL2/UNV34	347	0.10	32.2	0.92	<20%
DLL2/UNV34	480	0.07	34.5	0.92	<20%
DLL4/UNV1	100	0.63	63.4	0.92	<20%
DLL4/UNV1	277	0.23	62.5	0.92	<20%
DLL4/UNV34	347	0.18	61.4	0.92	<20%
DLL4/UNV34	480	0.13	63.9	0.92	<20%

## Weights:

Model	Lbs.	Kg.
DLL2	12.50	5.70
DLL4	22.50	10.20

<sup>A</sup>One year warranty.

<sup>B</sup>Refer to [www.designlights.org](http://www.designlights.org) Qualified Products List under Family Models for full listing details. Not all models are approved for all application categories.

# Pauluhn DLL LED luminaires

For land-based drilling

Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zone 2  
Cl. II, Div. 2, Groups F, G  
Cl. III

UL Listed  
CSA Certified  
Marine & Wet Locations  
NEMA 4X; IP66

2L

2L

**Designed for drilling.** Pauluhn DLL linear LED luminaires are engineered to handle demanding conditions faced on land-based drilling rigs. The DLL stands up to high vibration, hose down, shock and impact, while delivering long life and high lumen performance for up to 20 years.

#### Custom optics:

- Standard wide (120°) beam spread for control room and indoor application maximizes illumination on wall panels
- Narrow (80°) beam spread option for high mast/derrick application avoids spillage and light loss

#### Comprehensive certification:

- Single model certified for use in Class I, Division 2 and Class II, Division 2 harsh and hazardous applications

#### Quick & easy installation:

- Easy access to drivers and wiring
- No custom brackets or hardware needed
- Seven mounting options available
- Easily retrofit to Pauluhn DuraPro and MagnaPro, Rig-A-Lite and Snelson



#### Slim profile:

- 2.7" fixture height (excluding mounting brackets)
- Perfect for mounting in confined or low height areas



#### Built to last:

- Ingress protection from hose down water or diesel fuel in harsh operational conditions – passed 2,000 PSI high pressure test
- Vibration-, impact- and shock-resistant – passed 5G, 3-axis vibration test
- 60,000 hour lifetime at 55°C ambient

# Pauluhn DLL LED luminaires

For land-based drilling

Cl. I, Div. 2, Groups A, B, C, D  
Cl. I, Zone 2  
Cl. II, Div. 2, Groups F, G  
Cl. III

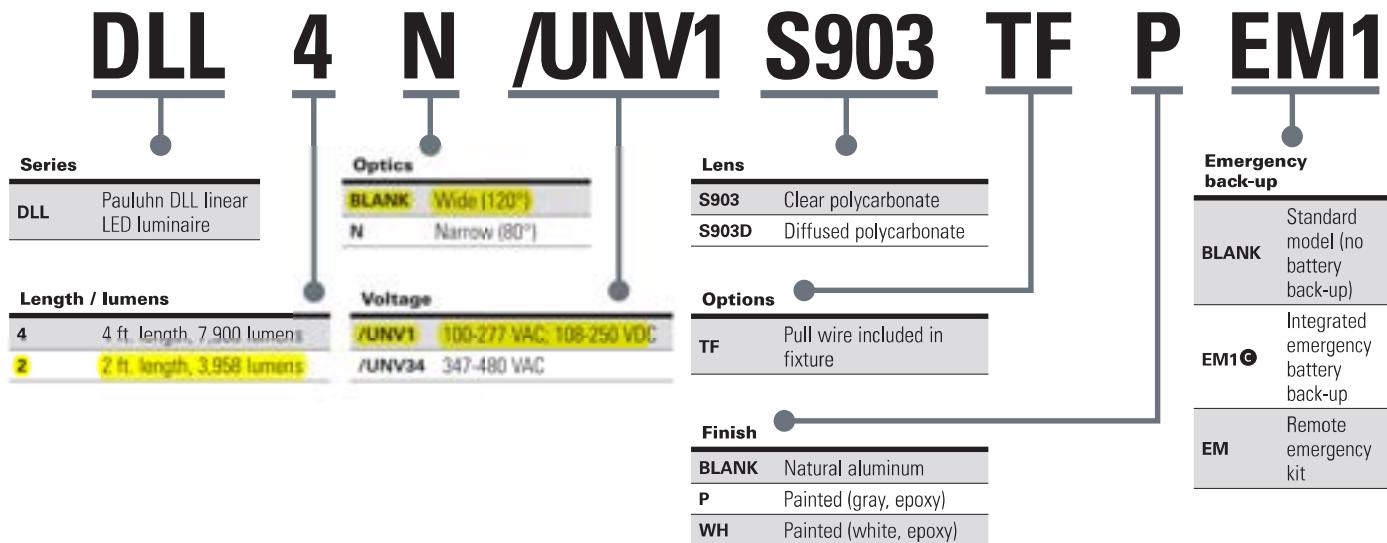
UL Listed  
CSA Certified  
Marine & Wet Locations  
NEMA 4X; IP66

2L

## Ordering information:

Part number example

DLL4N/UNV1 S903 TF P EM1

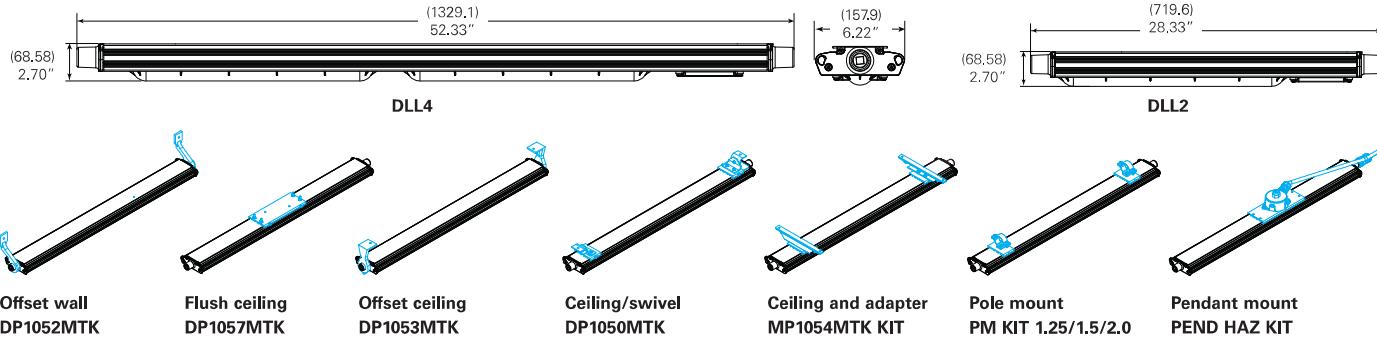


## Accessories (ordered separately):

Description	Cat. #
• Flush/back mount back plate.....	DP1057MTK
<i>Compatible with DuraPro</i>	
• Ceiling/swivel mount.....	DP1050MTK
<i>Compatible with DuraPro</i>	
• Ceiling/wall mount offset.....	DP1053MTK
<i>Compatible with DuraPro</i>	
• Ceiling mount bracket and adapter kit.....	MP1054MTK KIT
<i>Compatible with MagnaPro</i>	
• Offset wall mount.....	DP1052MTK
<i>Compatible with DuraPro</i>	
• Pole mount kit, 1.25" conduit.....	PM KIT 1.25
• Pole mount kit, 1.50" conduit.....	PM KIT 1.5
• Pole mount kit, 2.00" conduit.....	PM KIT 2.0

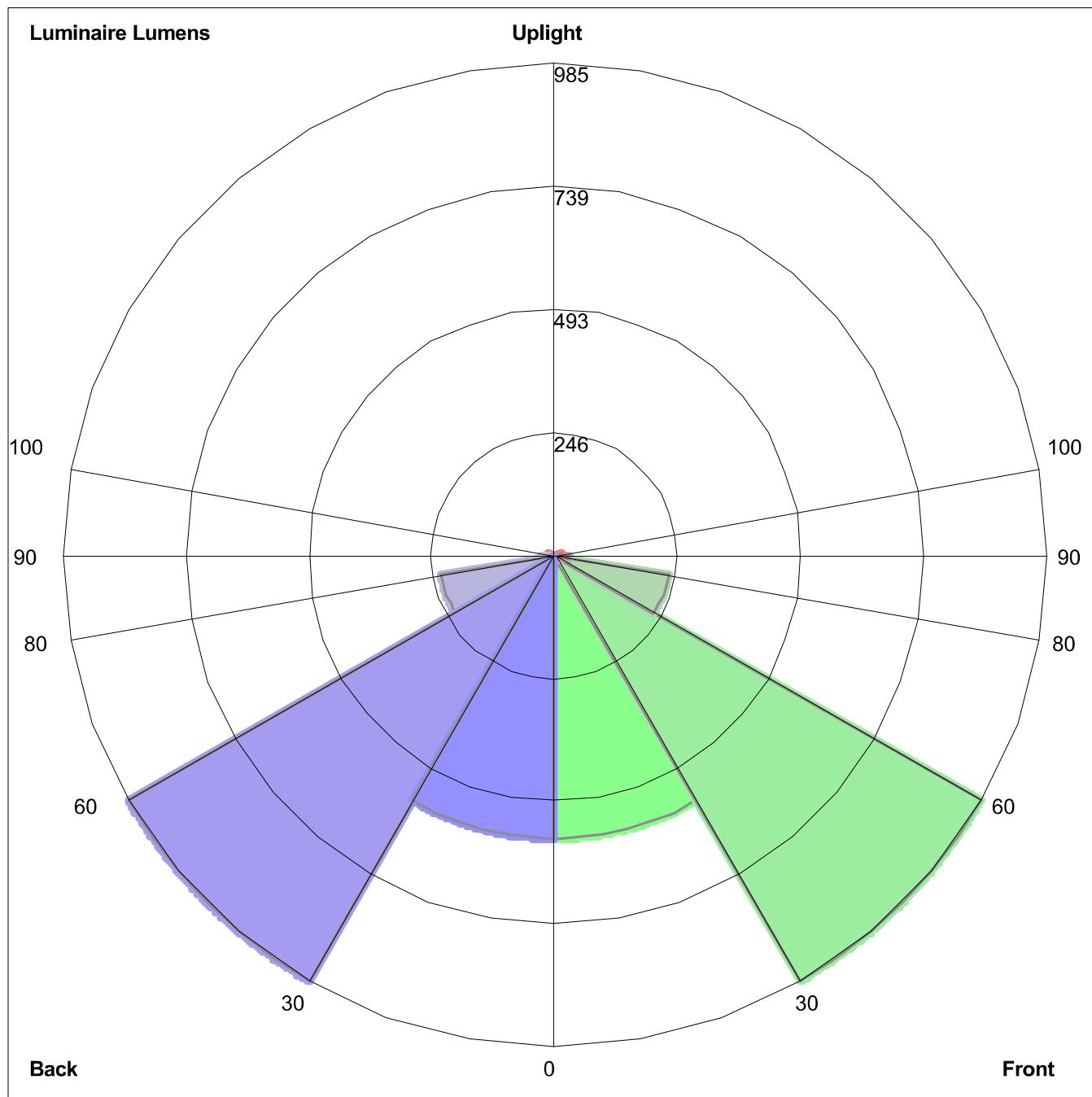
Description	Cat. #
• Pendant mount kit.....	PEND HAZ KIT
• Safety chain kit.....	SS KIT
• 1 amp driver replacement kit, 100-277 VAC for 4 ft. linear.....	VMVL/UNV1 80W 1A KIT
• 1 amp driver replacement kit, 347-480 VAC for 4 ft. linear.....	VMVL/UNV34 80W 1A KIT
• 0.5 amp driver replacement kit, 100-277 VAC for 2 ft. linear.....	VMVL/UNV1 80W 0.5A KIT
• 0.5 amp driver replacement kit, 347-480 VAC for 2 ft. linear.....	VMVL/UNV34 80W 0.5A KIT

## Dimensions and mounting options:



One year warranty. Remote EM kit also available, 120-277 VAC only. Available with 4 ft. model only.

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:  
Front: Low=568.6, Medium=985.4, High=230.6, Very High=28.4  
Back: Low=568.6, Medium=985.4, High=230.6, Very High=28.4  
Uplight: Low=12.8, High=0.3

BUG Rating : B2-U2-G1

# **FIXTURE CUT SHEET**

## **TYPE G**



Ultra high output, high efficiency LED floodlight with NEMA Types: 7H x 6V, 6H x 4V, 4H x 6V, 5H x 5V and 3H x 3V. patent-pending "Air-Flow" technology ensures long LED and driver lifespan. Use for general and security lighting for large areas, building façades, signs and landscapes.

Color: Bronze

Weight: 66.1 lbs

Project:

Type:

Prepared By:

Date:

#### Driver Info

Type	Constant Current	Watts	300W
120V	2.65A	Color Temp	5000K (Cool)
208V	1.59A	Color Accuracy	72 CRI
240V	1.38A	L70 Lifespan	100,000 Hours
277V	1.17A	Lumens	45,171
		Input Watts	325.9W
		Efficacy	138.6 lm/W

#### LED Info

## Technical Specifications

### Compliance

#### UL Listed:

Suitable for wet locations. Suitable for ground mounting.

#### IESNA LM-79 & LM-80 Testing:

RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80.

#### DLC Listed:

This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. DLC Product Code: PF5PMFXJ

### Optical

#### NEMA Type:

NEMA Beam Spread of 7H x 6V

### Performance

#### Lifespan:

100,000-Hour LED lifespan based on IES LM-80 results and TM-21 calculations

### Construction

#### IP Rating:

Ingress Protection rating of IP66 for dust and water

#### Maximum Ambient Temperature:

Suitable for use in up to 40°C (104°F)

#### Effective Projected Area:

EPA = 4

#### Cold Weather Starting:

Minimum starting temperature is -40°C (-40°F)

#### Thermal Management:

Superior thermal management with external "Air-Flow" fins

### Lens:

Tempered glass lens

### Housing:

Die-cast aluminum housing and door frame

### Mounting:

Heavy-duty slipfitter for 2 3/8"OD pipe

### Reflector:

Specular and semi-specular vacuum-metalized polycarbonate

## Technical Specifications (continued)

### Construction

#### Gaskets:

High-temperature silicone gaskets

#### Finish:

Formulated for high durability and long-lasting color

#### Green Technology:

Mercury and UV free. RoHS-compliant components.

#### Tilt Increment:

Rotates in 6 degree increments

### LED Characteristics

#### LEDs:

Multip-chip, high-output, long-life LEDs

### Color Consistency:

7-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color

### Color Stability:

LED color temperature is warrantied to shift no more than 200K in color temperature over a 5-year period

### Color Uniformity:

RAB's range of Correlated Color Temperature follows the guidelines of the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2017.

### Electrical

#### Drivers:

Constant Current, 1050mA, 50/60 Hz, 120-277V, 4 kV surge protection, 120V: 2.65A, 208V: 1.59A, 240V: 1.38A, 277V: 1.17A, THD <20%, Power Factor: 99%

#### THD:

9.26% at 120V, 12.56% at 277V

### Power Factor:

99.3% at 120V, 96.6% at 277V

#### Note:

All values are typical (tolerance +/- 10%)

### Other

#### Equivalency:

Equivalent to 1000W Metal Halide

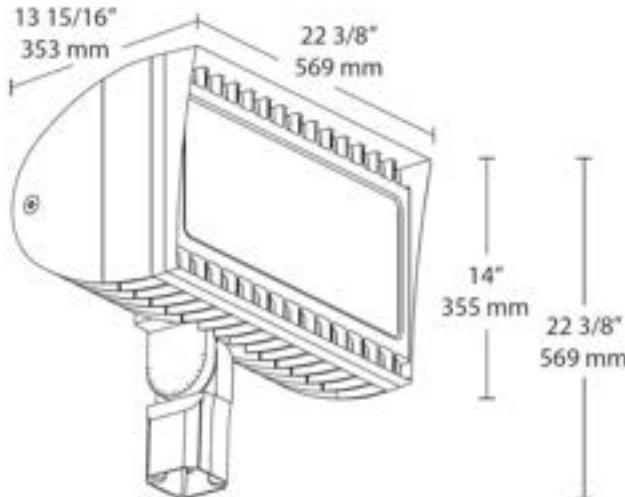
#### Warranty:

RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish. RAB's warranty is subject to all terms and conditions found at [rablighting.com/warranty](http://rablighting.com/warranty).

#### Buy American Act Compliance:

RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

### Dimensions



### Features

300W replaces 1000 MH floodlights

100,000-hour LED lifespan

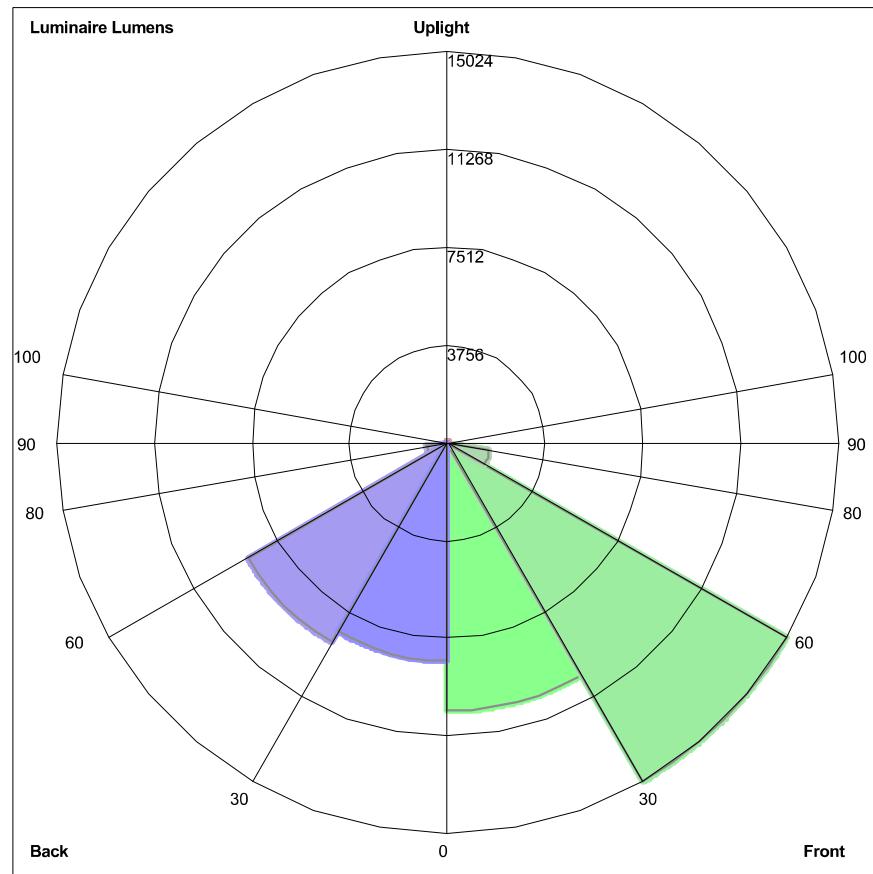
5-Year, No-Compromise Warranty

**Ordering Matrix**

Family	Wattage	Mounting	Color Temp	NEMA Type	Finish	Driver Options	Options	Other Options
FXLED	300	SF						
200 = 200W 300 = 300W	SF = Slipfitter T = Trunnion		<b>Blank</b> = 5000K (Cool) <b>N</b> = 4000K (Neutral) <b>Y</b> = 3000K (Warm)	<b>Blank</b> = 7H x 6V <b>B64</b> = 6H x 4V <b>B55</b> = 5H x 5V <b>B33</b> = 3H x 3V <b>B46</b> = 4H x 6V	<b>Blank</b> = Bronze <b>W</b> = White	<b>Blank</b> = 120-277V <b>/480</b> = 480V <b>/BL</b> = Bi-Level (Slipfitters only) <sup>1</sup> <b>/D10</b> = 0-10V Dimming	<b>Blank</b> = No option <b>/PCS</b> = 120V Swivel <b>/PCS2</b> = 277V Swivel <b>/PCT</b> = 120-277V Twistlock <b>/PCT4</b> = 480V Twistlock <b>/PCS4</b> = 480V Swivel <b>/LC</b> = Lightcloud® Controller	<b>USA</b> = BAA Compliant <b>Blank</b> = Standard

<sup>1</sup> Slipfitter models only

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:  
Front: Low=10319.6, Medium=15024.4, High=1636.8, Very High=9.1  
Back: Low= 8373.0, Medium=8865.3, High=802.5, Very High=9.9  
Uplight: Low=0.9, High=61.0

BUG Rating : B5-U3-G2

# **FIXTURE CUT SHEET**

## **TYPE H**



Color: Bronze

Weight: 6.8 lbs

Project:

Type:

Prepared By:

Date:

**Driver Info**

Type	Constant Current	Watts	40W
120V	0.40A	Color Temp	3000K/4000K/5000K
208V	0.30A	Color Accuracy	80 CRI
240V	0.20A	L70 Lifespan	100,000 Hours
277V	0.15A	Lumens	4595/5421/4826 lm
Input Watts	37.7/38.2/38.2W	Efficacy	121.9/141.8/126.5 lm/W

**LED Info**

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**Technical Specifications****Field Adjustability****Field Adjustable:**

Color temperature selectable by 3000K, 4000K and 5000K

**Compliance****UL Listed:**

Suitable for wet locations

**IESNA LM-79 & LM-80 Testing:**

RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80

**IP Rating:**

Ingress protection rating of IP65 for dust and water

**DLC Listed:**

This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. Designed to meet DLC 5.1 requirements.

DLC Product Code: PL3FKMCN0SF0

**Performance****Lifespan:**

100,000-Hour LED lifespan based on IES LM-80 results and TM-21 calculations

**Wattage Equivalency:**

Equivalent to 200W Metal Halide

**LED Characteristics****LEDs:**

Long-life, high-efficiency, surface-mount LEDs

**Electrical****Driver:**

Constant Current, Class 2, 120-277V, 50/60 Hz, 120V: 0.40A, 208V: 0.30A, 240V: 0.20A, 277V: 0.15A

**Dimming Driver:**

Driver includes dimming control wiring for 0-10V dimming systems. Requires separate 0-10V DC dimming circuit. Dims down to 10%.

**Photocell:**

120-277V selectable photocell that can be turned on and off.

**Construction****Cold Weather Starting:**

The minimum starting temperature is -40°C (-40°F)

**Maximum Ambient Temperature:**

Suitable for use in up to 50°C (122°F)

**Housing:**

Precision die-cast aluminum housing and door frame

**Technical Specifications (continued)****Construction****Lens:**

Polycarbonate lens

**Mounting:**

Hinged wiring access and conduit entries on the back, sides, top and bottom make installation a snap

**Cut Off:**

Full cutoff (0°)

**Finish:**

Formulated for high durability and long-lasting color

**Green Technology:**

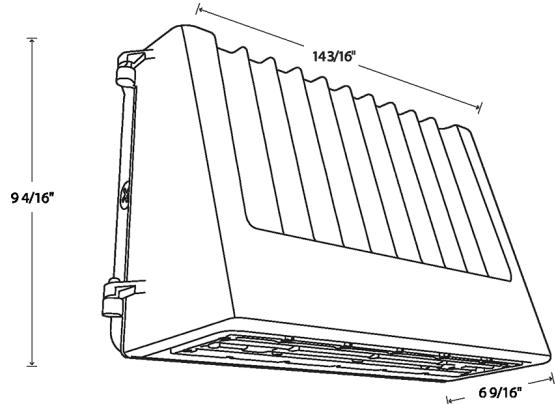
Mercury and UV free. RoHS-compliant components.

**Other****Note:**

All values are typical (tolerance +/- 10%)

**5 Yr Limited Warranty:**The RAB 5-year, limited warranty covers light output, driver performance and paint finish. RAB's warranty is subject to all terms and conditions found at [rablighting.com/warranty](http://rablighting.com/warranty).**Buy American Act Compliance:**

RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

**Dimensions****Features**

Selectable CCT

Full cutoff

Selectable on/off photocell

0-10V dimming, standard

**Ordering Matrix**

Family	Style	Wattage
SLIM17FA	FC	40
FC = Full cutoff		40 = 40W 60 = 60W

12 ft

slim17fafc40\_4k.ies  
Single (Arm)

