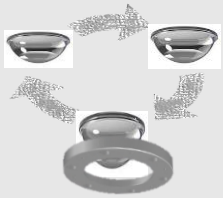
SuVi Design

2019 SUVI INDUSTRIAL LED LIGHTING

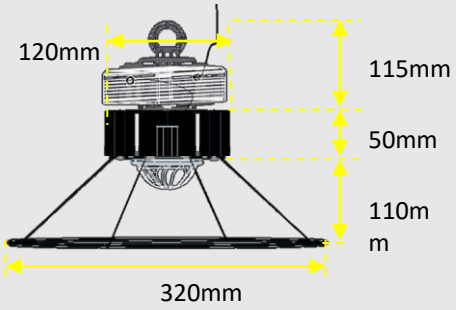
ASSEMBLE – QC – SUPPORT

MALAYSIA

Technical Parameters	35W Low Bay
Product Model	**SuVi-LB33W** (**ZT120H50**-LM1211-**INV035**-LXX°)
LED Light Engine	1 X COB
Comparable to HID	70W ~ 150W
Input Voltage	AC100~265V
Power Frequency	47~63Hz
Total Power Consumption	33W ± 2W
LED Power Consumption	33W ± 2W
LED Country of Origin	Malaysia Philips LumiLED
Power Factor	≥0.95
Total Harmonic Distortion	≤15%
Efficiency – lm/W (Tj=85°C}	120 lm/W
Luminous Flux – Tc = 60°C	4,194 lm
CRI	≥80
Color Temperature	3000K / 4000K / 5000K / 5700K
Beam Angle	Standard 60° / 80° / 120° / Beehive (optional)
IP Rating	IP44 (Standard) & IP65 (optional) LED Fixture / IP67 LED Driver
Operating Temperature	-30 to 60°C
Max Ambient Room Temperature	55°C
Lumen Maintenance	LM80 > 60,000Hrs
Light Fixture Material	Aluminum + Copper Heat Exchanger
Driver	External – Attach to Light Fixture / Remote Wall Mount



Changeable LENS

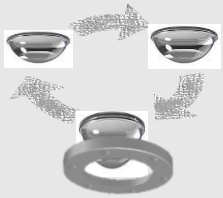


We provide FREE 3D simulation upon request and other technical datasheet. Terms applied.

**Note: NEW Model – Performance Increase*

SuVi Design

Technical Parameters	50W Low Bay
Product Model	**SuVi- LB50W** (ZT140H80-LM1211-INV060-LXX°)
LED Light Engine	1 X COB
Comparable to HID	70W ~ 150W
Input Voltage	220~265V (Optional Dimmable)
Power Frequency	47~63Hz
Total Power Consumption	40~49W ±8W (1050mA~1400mA Selection)
LED Power Consumption	40~49W ±8W
LED Country of Origin	Malaysia Philips LumiLED
Power Factor	≥0.95
Total Harmonic Distortion	≤15%
Efficiency – lm/W (Tj=85°C}	150lm/W
Luminous Flux – Tc = 60°C	6000~7500lm
CRI	≥80
Color Temperature	3000K / 4000K / 5000K / 5700K
Beam Angle	Standard 60° / 80° / 120° / Beehive (optional)
IP Rating	IP44 (Standard) & IP65 (optional) LED Fixture / IP67 LED Driver
Operating Temperature	-30 to 60°C
Max Ambient Room Temperature	55°C
Lumen Maintenance	LM80 > 60,000Hrs
Light Fixture Material	Aluminum + Copper Heat Exchanger
Driver	External – Attach to Light Fixture / Remote Wall Mount



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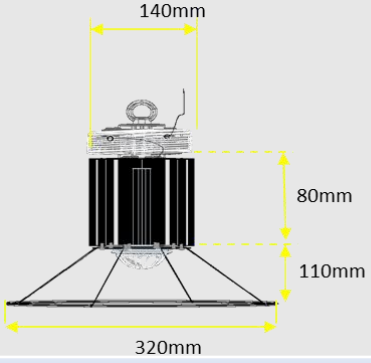

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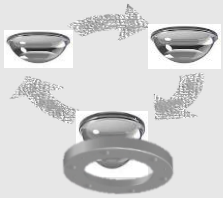
**Note: NEW Model – Performance Increase*

Technical Parameters	75W High Bay
Product Model	**SuVi- HB75W** (ZT140H80-LM1216-INV096-LXX°)
LED Light Engine	1 X COB
Comparable to HID	150W~250W
Input Voltage	AC100~265V
Power Frequency	47~63Hz
Total Power Consumption	75W ± 12W
LED Power Consumption	75W ±2W
LED Country of Origin	Malaysia Philips LumiLED
Power Factor	≥0.95
Total Harmonic Distortion	≤15%
Efficiency – lm/W (Tj=85°C}	145lm/W
Luminous Flux – Tc = 60°C	11,000 lm
CRI	≥80
Color Temperature	3000K / 4000K / 5000K / 5700K
Beam Angle	Standard 60° / 80° / 120° / Beehive (optional)
IP Rating	IP44 (Standard) & IP65 (optional) LED Fixture / IP67 LED Driver
Operating Temperature	-30 to 60°C
Max Ambient Room Temperature	55°C
Lumen Maintenance	LM80 > 60,000Hrs
Light Fixture Material	Aluminum + Copper Heat Exchanger
Driver	External – Attach to Light Fixture / Remote Wall Mount



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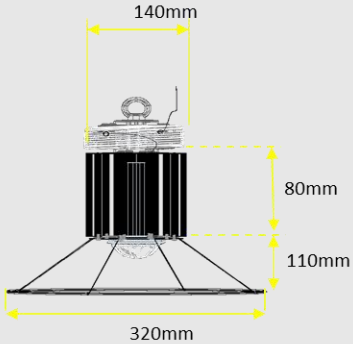


We provide FREE 3D simulation upon request and other technical datasheet. Terms applied.

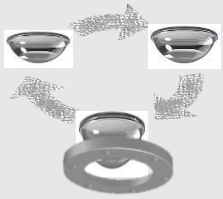
**Note: NEW Model – Performance Increase*

Technical Parameters	110W – 150W High Bay	
Product Model	**SuVi- HB110W /SuVI-HB130W / SuVi-HB150W** (ZT140H160-H1825-MWELG-LXX°)	
LED Light Engine	1 X COB	
Comparable to HID	400W~1000W	
Input Voltage	AC 90~240V	
Power Frequency	47~63Hz	
Total Power Consumption	107W ±10W / 130W ±10W / 147W ±10W	
LED Power Consumption	105W ±2W / 130W ±2W / 147W ±2W	
LED Country of Origin	Malaysia Philips LumiLED	
Power Factor	≥0.95	
Total Harmonic Distortion	≤15%	
Efficiency – lm/W (Tj=85°C}	163lm@105W / 158lm@130W / 154lm@147W	
Luminous Flux – Tc = 60°C	17,465 / 20,103 / 22,674 lm	
CRI	≥ 70 / 80	
Color Temperature	3000K / 4000K / 5000K / 5700K	
Beam Angle	Standard 60° / 80° / 120° / Beehive (optional)	
IP Rating	IP44 (Standard) & IP65 (optional) LED Fixture / IP67 LED Driver	
Operating Temperature	-30 to 60°C	-30 to 55°C
Max Ambient Room Temperature	60°C	55°C
Lumen Maintenance	LM80 > 60,000Hrs	
Light Fixture Material	Aluminum + Copper Heat Exchanger	
Driver	External – Attach to Light Fixture / Remote Wall Mount	

3 Year Standard Warranty

Available as an option

Upgraded to 5 years!



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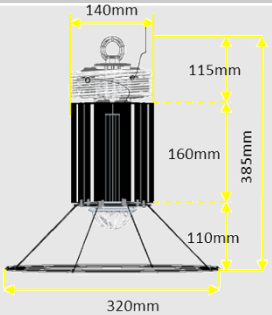
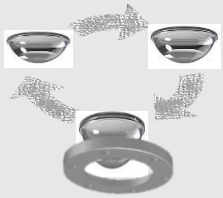


We provide FREE 3D simulation upon request and other technical datasheet. Terms applied.

**Note: NEW Model – Performance Increase*

Technical Parameters	105W High Bay – Class A2	
Product Model	SuVi- HB105W (RSH-ZD225H80-LM1825-MWELG-Lxx)	
LED Light Engine	SuVi Turbo Spec - 110W x 1 COB *(Can drive up to 150W - Total Lumen output = 23944 lm at Tc = 60°C)*	
Comparable to HID	400W~1000W	
Input Voltage	AC 90~265V	
Power Frequency	47~63Hz	
Total Power Consumption	107W ±10W	
LED Power Consumption	105W ±2W	
LED Country of Origin	Malaysia Philips LumiLED	
Power Factor	≥0.95	
Total Harmonic Distortion	≤15%	
Efficiency – lm/W (Tj=85°C}	173@105W / 168@130W / 154@147W	
Luminous Flux – Tc = 60°C	18,165 / 21,840 / 22,674 lm	
CRI	≥ 70 / 80	
Color Temperature	2200K / 2700K / 3000K / 4000K / 5000K / 5700K / 6500K	
Beam Angle	Standard 60° / 80° / 120° / Beehive (optional)	
IP Rating	IP44 (Standard) & IP65 (optional) LED Fixture / IP67 LED Driver	
Operating Temperature	-30 to 60°C	-30 to 55°C
Max Ambient Room Temperature	60°C	55°C
Lumen Maintenance	LM80 > 60,000Hrs	
Light Fixture Material	Aluminum + Copper Heat Exchanger	
Driver	External – Attach to Light Fixture / Remote Wall Mount	



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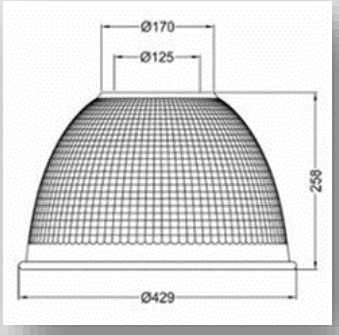
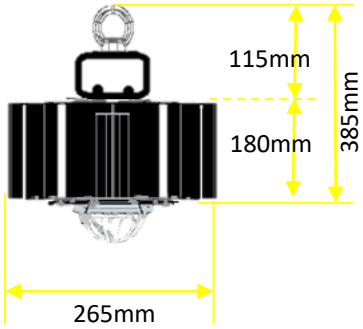


Material:
Aluminum

Appearance:
Black Coating

Technical Parameters	200W High Bay	
Product Model	**SuVi- HB200W** (RSH265H180-H1825-MWELG-LxxIP65)	
LED Light Engine	200W x 1 COB	
Comparable to HID	400W~1000W	
Total Power Consumption	203W ±10W	
LED Power Consumption	200W ±2W	
LED Country of Origin	Malaysia Philips LumiLED	
QC & ASSEMBLE	QC & ASSEMBLE IN MALAYSIA	
CRI	70 / 80	
Color Temperature	2200K / 2700K / 3000K / 4000K / 5000K / 5700K / 6500K	
LED Efficiency – Tc = 60°C	145 lm/W	
Luminous Flux – Tc = 60°C	28,992 lm	
Luminous Flux – Tc = 80°C	26,662 lm	
Power Factor Total Current Harmonic	> 0.90 < 20%	
Beam Angle	Standard 60° / 80° / 120° / Beehive (optional)	
IP Rating	IP44 (Standard) & IP65 (optional) LED Fixture	
Max Ambient Room Temperature	60°C ≥ 70°C (upon request)	55°C ≥ 70°C (upon request)
Lumen Maintenance	LM80 > 60,000Hrs	
Light Fixture Material	Aluminum + Copper Heat Exchanger	
Driver	External – Attach to Light Fixture / Remote Wall Mount	



Changeable LENS

Changeable LENS Beaming Angle

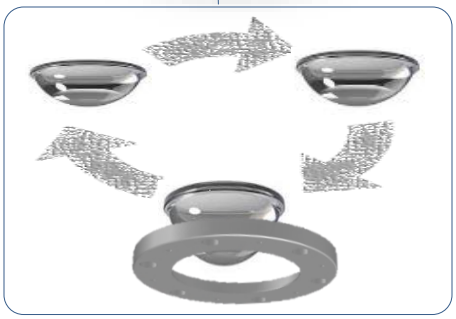
Fast & Easy Changeable Beam Angle

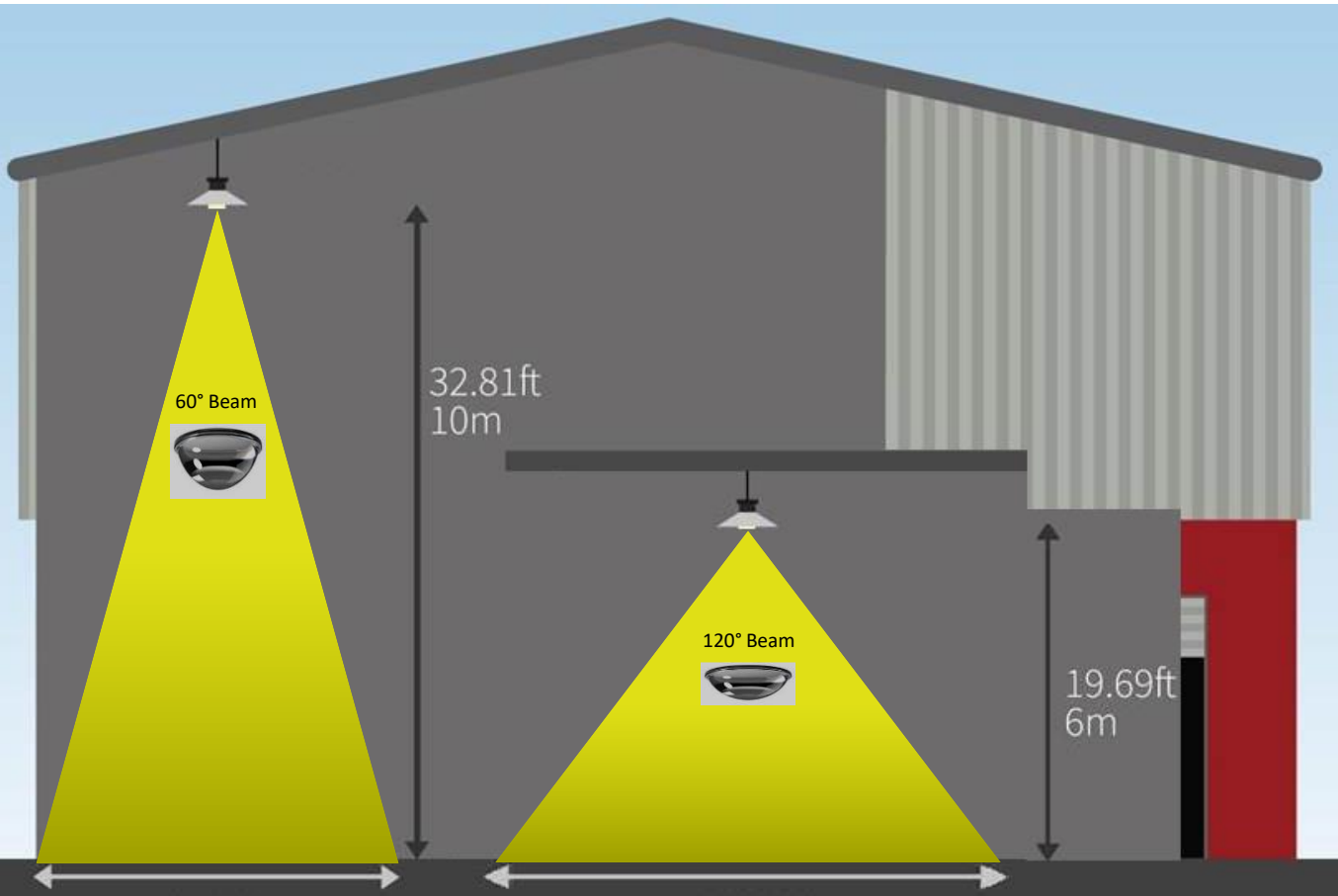
- To suite different environment such as height, lamp pitch and coverage area
- To save light losses for more energy saving


60° Beam


90° Beam


120° Beam





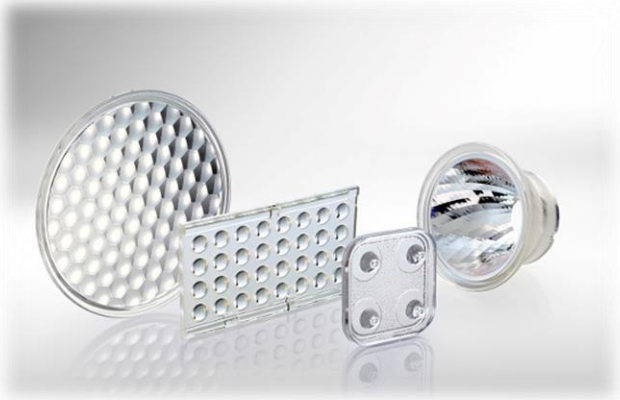
Focus Beam to achieve higher LUX Level & minimize unwanted light losses above roof top

Wide Beam to equalize LUX Level for better light distribution and larger coverage area

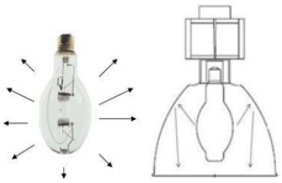
Used for illustration purposes only

DISADVANTAGES of SMD LED and Non Changeable Beam Angle Design

- Proprietary & Limited LENS Design for different PCB Design Maker.
- Almost impossible to change beam angle for finished product.
- High Stock Level and Less Flexibility for different beaming angle on each individual product design.
- PCB Size Larger – Limited Heat Sink Design Space
- A lot overlapping shadow – Non Flexibility & Limited to SPOT lighting effect



All the following items CANNOT Change Beam Angle



Mercury Lamp Shade
- **High Light Losses**
- **Low Efficiency Reflector Beam Angle**

COB LED With Frosted Plastic Cover

SMD LED without LENS Angle

COB LED – Front Transparent Plastic Cover Only

FUTURE REPLACEMENT MARKET ASSURANCE

"SuVi Design" Integrated Solutions Uses Japan / Malaysia COB Origin LED for more than 8 years:

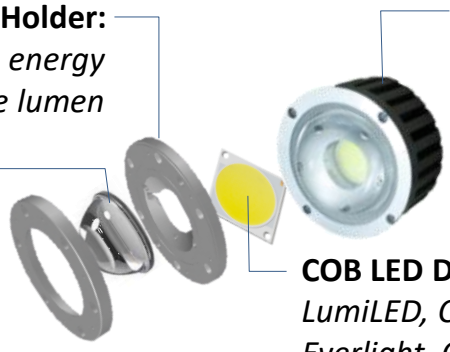
- We do not have product replacement issues with the same wattage to match the same size of the LED module
- We do not encountered **"Product Obsolescence".** It always happen to all SMD LED MAKER.
- After so many years of selling Japan / Malaysia COB Origin LED product, we have zero complaint about the LED manufacturing defect.
- Towards our understanding and passed experience from our customer from *"many **JAPAN factories, Top Glove, IAC Aero in Malaysia, Honda Indonesia & Thailand DENSO, PETRON Petrol Station and others*** we supplied and integrated our Perfect Thermal Solutions with "Japan / Malaysia COB Origin LED", to date more than 6 years, it is less than 0.02% of LED manufacturing defect failure or color shifted or lumen drop not more than 20% above 5 years.
- Japan / Malaysia COB Origin LED is not only supplying LED product to uncountable LED manufacturer and famous or branded maker using Japan / Malaysia COB Origin LED product. There are distributors through out the world.
- "SuVi Design" do not make LED PCB or LED Design LED Circuit Diagram, we leave it to more qualified engineers in Japan / Malaysia COB Origin LED manufacturer. . Japan / Malaysia COB Origin LED will fully design a finished LED product & latest technology named COB (Chip On Board) LED. Hassle free minimize all unnecessary assembly process such as SMD LED technology.

"SuVi Design" BUILD PERFECT MODULAR COB LED STRUCTURE:

- It is a choice of FREEDOM for customer to BUY or GET LED replacement from anyone in the market who use COB LED and it is not limited to ELANCOM alone.
- SuVi Design designed COB LED structure for perfect matching many types of well known branded COB LED such as: CREE, Seoul Semi, Epistar, Panasonic, Sharp, Everlight and etc.
- SuVi Design designed a good COB LED structure for perfect heat dissipation so that it really long lasting that able to achieve LED Life Span more than 60,000 hours. We are not a company to build a product to fail for revenue purposes.

SuVi Design LED performance LED Holder:
To provide best performance and more energy saving, longer life span & increase more lumen

Phase Exchanger Heat Sink:
200 times faster heat dissipation than ordinary heat sink in the market

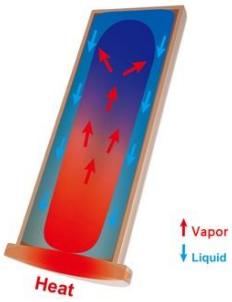


Changeable LENS Beam angle:
To minimize light loss in every different environment

COB LED Design Structure Match:
LumiLED, CREE, Seoul Semi, Epistar, Everlight, OSRAM and etc. (no limit)

Core Technology —— Phase - Change Heat Sink

Heat-Transfer Core Of Heat Sink: Heat Column High Thermal Conductivity: Far more than any material Low Temperature Starting Working: Less than 28°C Long Lifespan: More than 10 years Phase Change Principle: Vapor - liquid circulating transformation



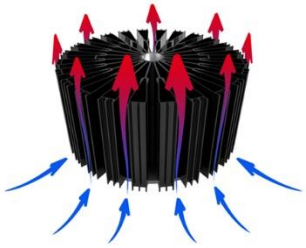
The Core Of Heat Sink—— Heat Column(Updated Heat Pipe) Updated Heat Pipe: High efficient heat transfer device Invention Patent Product. Thermal Conductivity is hundred times more than metal Can be designed for 360° usage Environmental friendly: non-poisonous and harmless inorganic medium

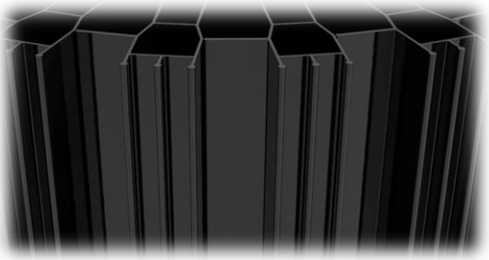
RSH-ZD225H80 LED Heat Sink Test Report of LED Multi Direction

Model: RSH-ZD225H80	Up (90°)	45° angle	Side (0°)	-45°angle	Down(-90°)
	The Temperature of Tc				
0 min	25.0	25.0	25.0	25.0	25.0
1 min	39.9	40.5	43.1	38.8	37.5
5 min	53.3	54.1	57.6	51.8	50.1
10 min	59.2	60.2	64.1	57.6	55.7
30 min	64.6	65.6	69.8	62.8	60.7
60 min	66.1	67.1	71.4	64.2	62.1
Result	65.2	66.2	70.5	63.4	61.3

Chimney Convection Enhance Cooling

A better air convection fin design by taking advantage of chimney effect lead to a much better heat dissipation.





Nano-coating Appearance offers a better heat dissipation, Corrosion-Proof and Rust-Proof. Color Options: Black or silvery.

WHY CHOOSE COB LED INSTEAD OF SMD LED ?

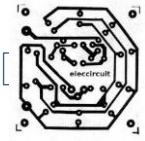
OVERALL TOO MANY PROCESS & HIGH CHANGES OF LED FAILURE

SMD LED OSRAM, PHILLIPS, CREE & ETC

Drawback:

- Too many types of non-standard SMD LED in the market.
- Even same SMD maker have so many range of SMD model such as 5050, 3128, 3528, 2835, 3014, 5730 & etc…

PCB Designer



Drawback:

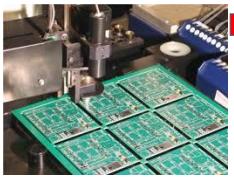
- Cannot design standardized a particular product due to too many non standard SMD LED maker.
- Very hard to determine a good or bad PCB design or overdesign from eye view.

PCB Maker

Drawback:

- Very hard to determine whether it is a good quality PCB or not from surface.
- There are many types of different quality PCB in the market such as FR4, Thermal Clad MP & etc…

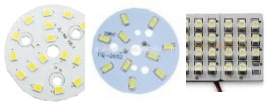
Soldering Hot Plate PCB Assembly Machine Factory



Drawback:

- Very hard to determine whether Heat Control, Solder LEAD quality and other quality factors being done correctly from the factory till it burns for many hours.

SMD LED PCB



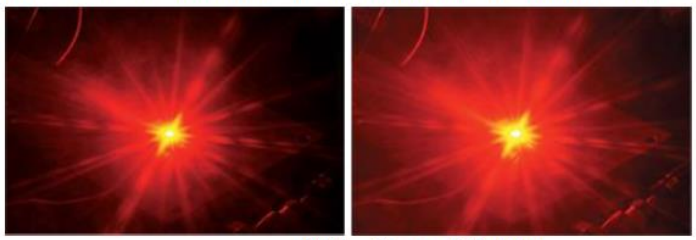
Drawback:

- Replacement market very limited due to too many PCB designers, PCB Die Packaging maker, too many SMD types of model, heat sink limitation and etc…
- High possibility product face out due to LED technology improvement too fast & redesign PCB is compulsory.
- High Thermal Resistance

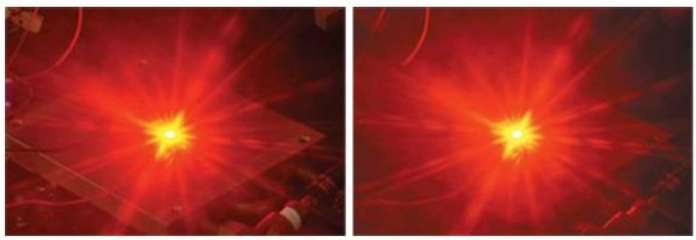
The Effect of Temperature

The LED's color, or wavelength, will change with temperature. As the die temperature increases, the wavelength of the color increases. This is particularly important with white light. The human eye can differentiate small color changes in white light. When Power LEDs are populated in an array, consistent thermal resistance from one die to the next assures consistent color. Because of the comparatively low thermal resistance Thermal Clad offers versus FR-4, die temperature is less affected by slight variances in the junction-to-case thermal resistance that occurs with eutectic or epoxy-die mounting techniques. It is also possible to pack the die more closely in an assembly that utilizes good thermal management techniques, thereby reducing the effects of temperature. Generally, a 30-50 percent drop in light output for a constant-forward current indicates end-of-life for Power LEDs. Power LED lifetimes have been extrapolated to over 50,000 hours.

Light output of the same LED die on different circuit board materials at a maintained die temperature of 80°C.



FR-4 110 Lumens | Thermal Clad MP 580 Lumens



Thermal Clad HT 620 Lumens | Thermal Clad HPL 630 Lumens

FLIR ELANCOM
PROVIDENCE A SOURCE OF COMFORT

# Thermal Test Report - iMai 110W High Bay LED - Gold
LED=CLU054-1825B8, Driver=EUC150S210DVA
Phase Exchanger=ZTD140H160
Ta=40DegC

Measurements	°C
Sp1	71.0
Sp2	40.4
Sp3	69.7
Sp4	69.0
Sp5	66.7
Sp6	69.7
Sp7	69.5
Sp8	67.0
Sp9	68.2
Sp10	68.7
Sp11	39.9
Sp12	40.3

Parameters	
Emissivity	0.95
Refl. temp.	20 °C

Geolocation

Location	N 0° 0' 0.00", E 0° 0' 0.00"

http://maps.google.com?z=17&t=k&q=0.0000,0.0000

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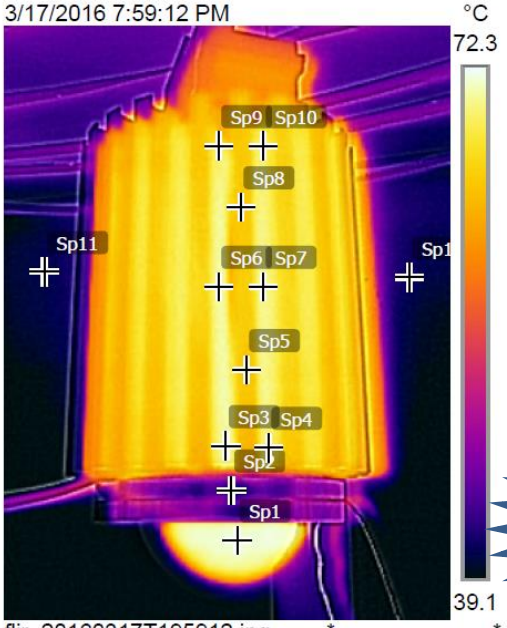

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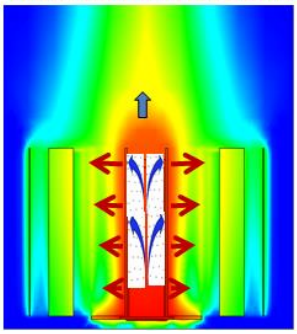
Heat Column Heat sink



Best Heat Thermal Integration – Heat Evenly Distributed

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FLIR ELANCOM
PROVIDENCE A SOURCE OF COMFORT

# Thermal Test Report - iMai 110W High Bay LED - Gold
LED=CLU056-1825B8, Driver=EUC150S210DVA
Phase Exchanger = ZTD140H160
Ta = 55~60DegC

Measurements	°C
Sp1	80.9
Sp2	41.7
Sp3	86.5
Sp4	86.3
Sp5	83.0
Sp6	87.1
Sp7	87.0
Sp8	84.2
Sp9	86.7
Sp10	86.6
Sp11	55.6
Sp12	53.7

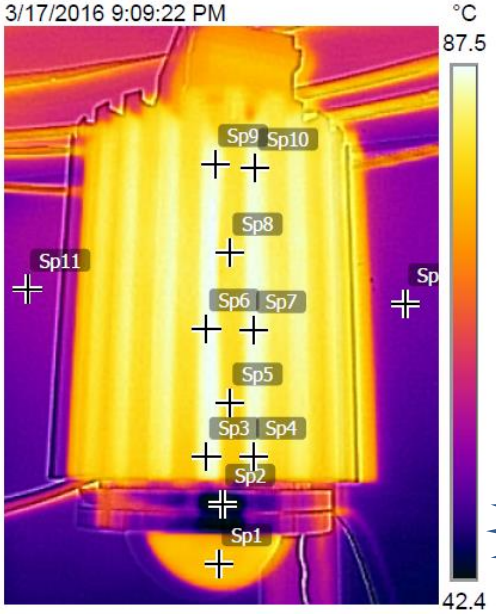
Parameters	
Emissivity	0.95
Refl. temp.	20 °C

Geolocation

Location	N 0° 0' 0.00", E 0° 0' 0.00"

http://maps.google.com?z=17&t=k&q=0.0000,0.0000

3/17/2016 9:09:22 PM



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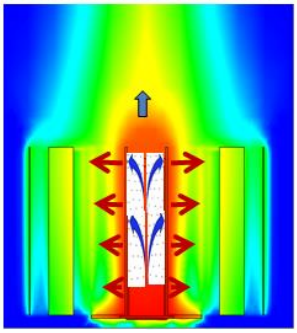
Heat Column Heat sink



Best Heat Thermal Integration – Heat Evenly Distributed

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FLIR ELANCOM
PROVIDENCE A SOURCE OF COMFORT

Thermal Report 110W LED High Bay - High Temperature
LED-C4 Tr-j 0.14 Spec-CC2.1
PHASE EXCHANGER-RSH-D290H120
Ta-Ambient Temperature Report = 65~72 Degree Celcius

Measurements	°C
Sp1	77.0
Sp2	79.7
Sp3	80.6
Sp4	80.7
Sp5	81.0
Sp6	82.0
Sp7	82.6
Sp8	82.1
Sp9	82.2
Sp10	82.5
Sp11	70.3
Sp12	69.4
Sp13	67.1
Sp14	65.8

Parameters

Emissivity	0.95
Refl. temp.	20 °C

Geolocation

Location	N 0° 0' 0.00", E 0° 0' 0.00"

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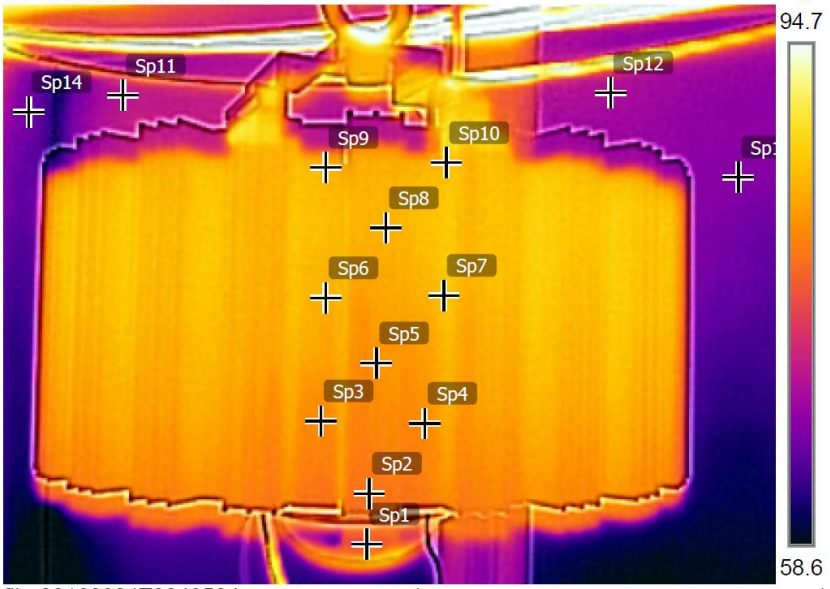

flir_20160324T224958.jpg * *

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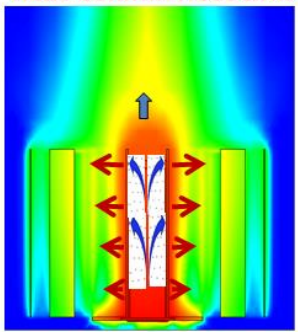
flir_20160324T224958.jpg * *

Heat Column Heat sink

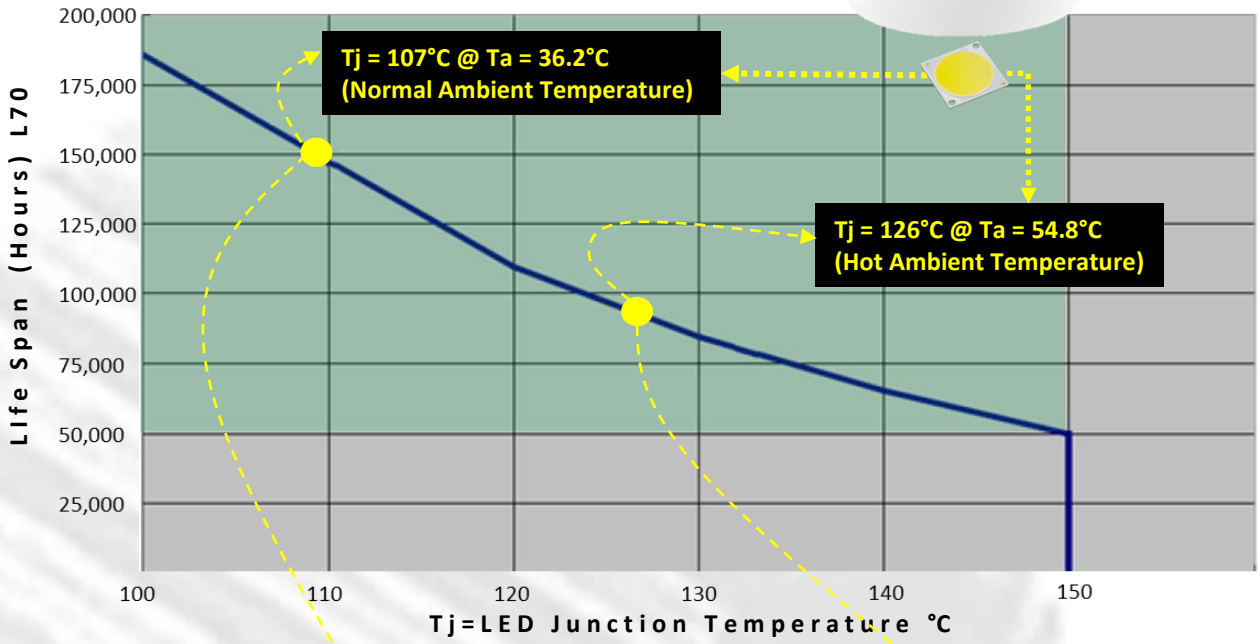


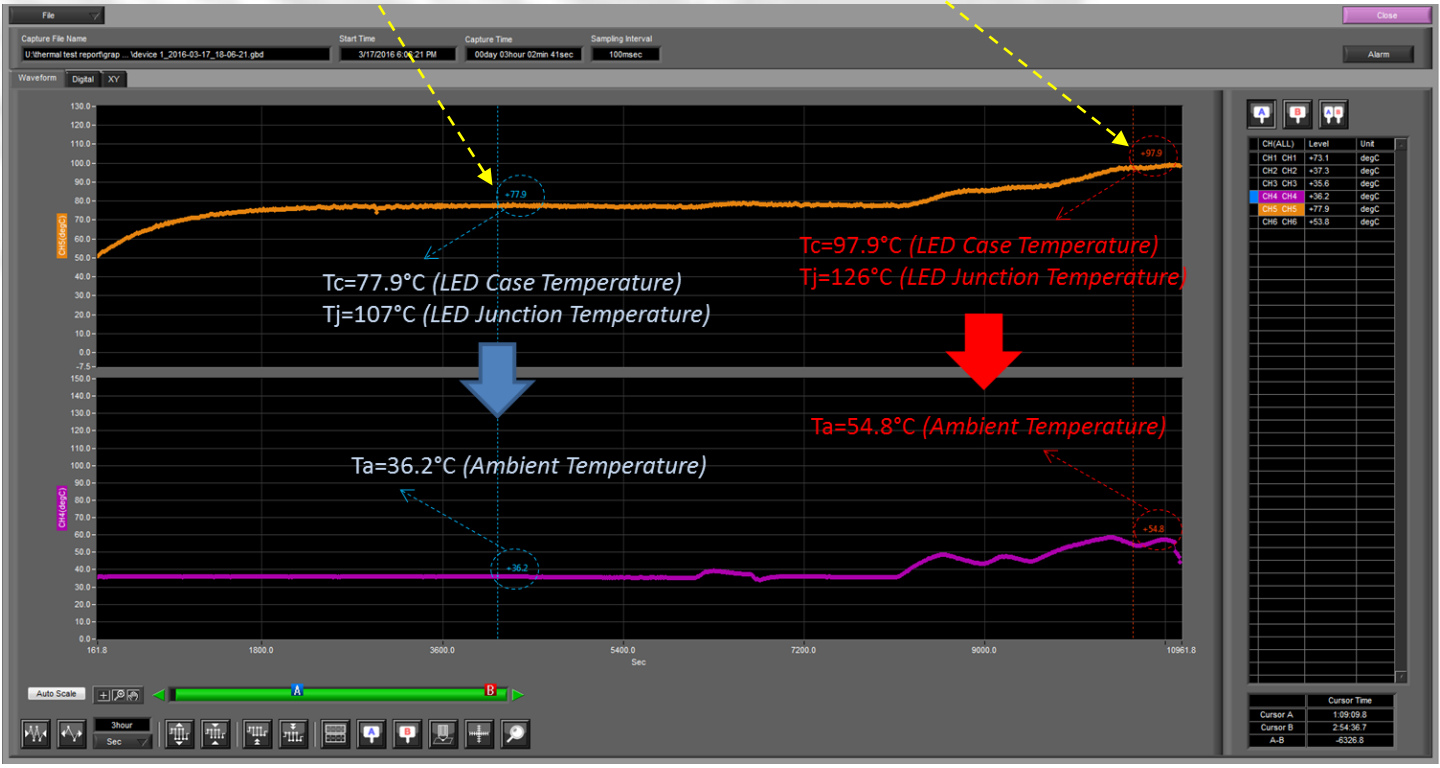
Best Heat Thermal Integration – Heat Evenly Distributed

THIS GRAPH SHOWN WHY SO IMPORTANT "SuVi Design" PERFECTED THERMAL INTEGRATION

Reference
IF=120mA/die

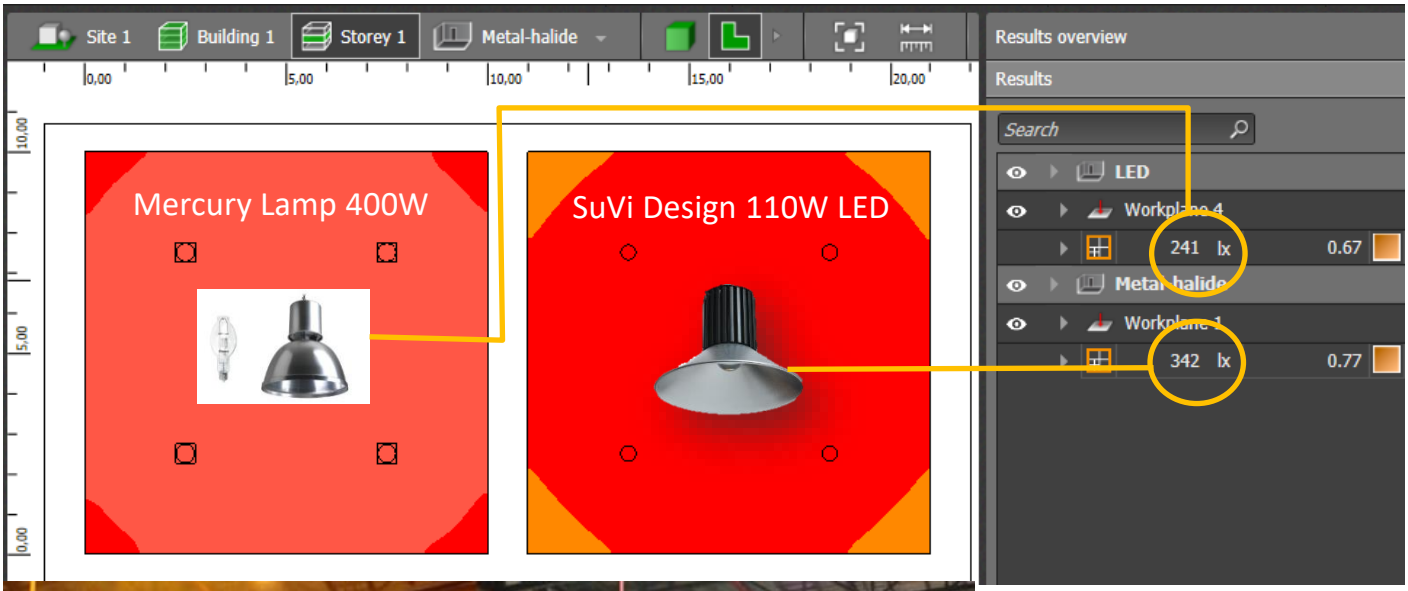
Phase Exchanger Heat Sink – LED
Lifetime Prediction for "CLL050" Series





Our Profession:

- Lighting Simulation
- Lighting Consultation



SuVi Design HPE Benefits:
(High Performance Efficacy)

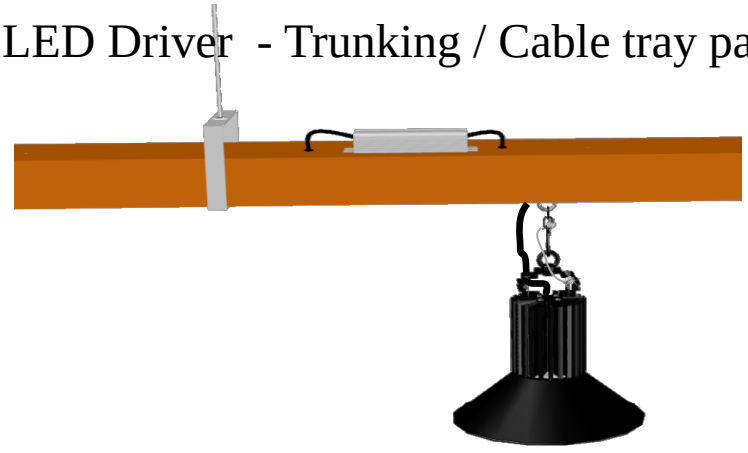
- Improve LED lumen
- Increase LED Life Span
- Low Power Usage Cost
- Low Maintenance Cost
- More Cost Saving HVAC *(Heat Ventilation Air Conditioning)*
- Low Inventory Cost
- Low Heat & High Ta *(Ambient Temperature)*

SuVi Design LED High Bay	Low Efficacy LED High Bay	Metal Halide High Bay
High Performance Efficacy SuVi COB Module Heat Exchanger Heat Sink	COB LED SMD LED	
110W (72.5% Saving)	160W (60% Saving)	400W
130W~150W (~81.4% Saving)	250W (64.3% Saving)	700W

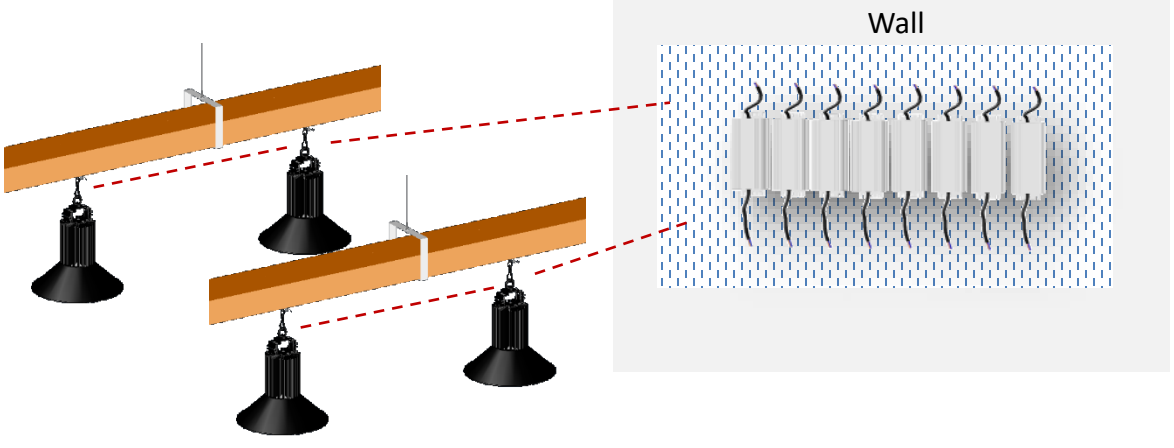
Power LED Driver Installation method :

1) Power LED Driver - Highbay Hanger

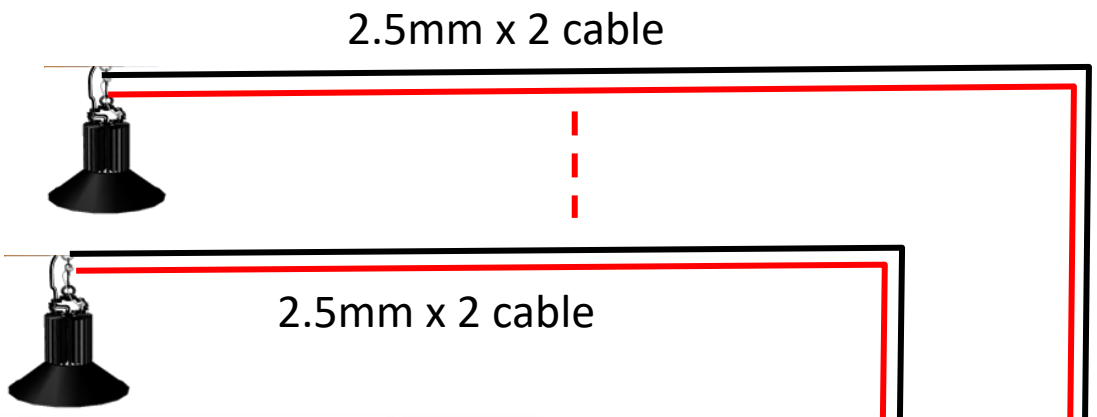
2) Power LED Driver - Trunking / Cable tray pathway

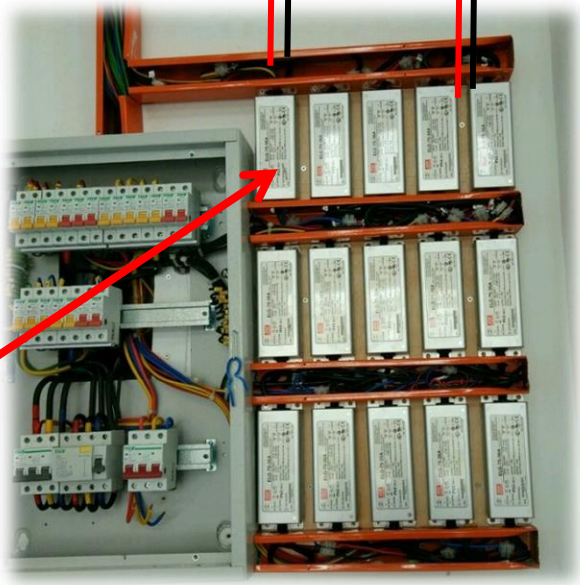


3) Power LED Driver – Centralization Zone



Centralize Method - Site Installation Example:





Note:
Each Individual Lamp Total Power Consumption = 130W Max (Light + Driver)